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(54) **ADENO-ASSOCIATED VIRUS COMPOSITIONS HAVING INCREASED BRAIN ENRICHMENT AND/OR HEART ENRICHMENT**

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(57) **ABSTRACT**

Described herein are compositions and kits comprising recombinant adeno-associated viruses (rAAVs) with increased transduction enrichment in the brain, heart, or brain and heart. The rAAV compositions described herein encapsidate a transgene, such as a therapeutic nucleic acid. Gene therapy using the rAAVs is described. Also described are methods of treating brain-related and heart-related diseases and conditions.

Specification includes a Sequence Listing.

ADENO-ASSOCIATED VIRUS COMPOSITIONS HAVING INCREASED BRAIN ENRICHMENT AND/OR HEART ENRICHMENT

BACKGROUND

[0001] Recombinant adeno-associated viruses (rAAVs) are widely used as vectors for gene delivery in therapeutic applications because of their ability to transduce both dividing and non-dividing cells, their long-term persistence as episomal DNA in infected cells, and their low immunogenicity. These characteristics make them appealing for applications in therapeutic applications, such as gene therapy. However, there is a need to significantly improve the performance of existing AAV serotypes to selectively and efficiently express in distinct cell-types, upon systemic delivery to a subject. This need is especially acute when the AAV must be expressed in the brain or heart.

SUMMARY OF THE INVENTION

[0002] Disclosed herein are rAAVs with peptide insertions and substitutions engineered into the capsid structure through iterative rounds of selection in non-human primates (NHPs), yielding variants having increased transduction when measured in the brain, heart, or brain and heart relative to the wild type rAAV on which the variant is based.

[0003] The present invention provides rAAVs with widespread transduction to the brain, heart, or brain and heart. Following IV injection, unmodified rAAVs such as those derived from AAV9 (SEQ ID NO: 1) may not have sufficient tissue enrichment to treat many human diseases by delivery of an AAV cargo Directed evolution of AAV9 as described herein has provided modified rAAVs that exhibit increased viral tissue enrichment in the brain. Accordingly, engineered rAAVs described herein are particularly useful in delivering DNA cargo to brain tissue and/or heart tissue.

[0004] The present invention provides a mutant Adeno-Associated Virus (AAV) capsid protein comprising at least 95% sequence identity to the wild-type AAV capsid protein, wherein the mutant AAV capsid protein comprises a sequence selected from the group consisting of SEQ ID NO: 2-1496.

[0005] The mutant AAV capsid protein may comprise a 7-mer amino acid insertion sequence located between residues 588 and 589 in relation to the wild-type AAV capsid protein. The mutant AAV capsid protein may comprise at least a 95% sequence identity to the wild-type Adeno-Associated Virus serotype 9 (AAV9) capsid of SEQ ID NO: 1. In the AAV9 capsid, the amino acids immediately preceding the 7-mer amino acid insertion sequence are -AQ-. The amino acids immediately following the 7-mer amino acid insertion sequence are also typically -AQ-.

[0006] In aspects of the invention, 60 copies of the AAV capsid protein may be assembled into the AAV capsid. The AAV capsid protein may present in VP1, VP2, and VP3 of the mutant AAV capsid.

[0007] The mutant AAV capsid protein may comprise a sequence selected from the group consisting of SEQ ID NO: 2-898. Advantageously, the AAV capsid protein may be characterized with increased transduction enrichment relative to the wild-type AAV9 when measured in brain tissue in a subject when delivered to the subject systemically. In aspects of the invention, the mutant AAV capsid protein comprises a sequence selected from the group consisting of SEQ ID NO: 2-594.

[0008] The mutant AAV capsid protein may comprise a sequence selected from the group consisting of SEQ ID NO: 595-1496. Advantageously, the mutant AAV capsid protein may be characterized by an increased transduction enrichment relative to the wild-type AAV9 when measured in heart tissue in a subject when delivered to the subject systemically. In aspects of the invention, the mutant AAV capsid protein comprises a sequence selected from the group consisting of SEQ ID NO: 899-1496.

[0009] The mutant AAV capsid protein may comprise a sequence selected from the group consisting of SEQ ID NO: 595-898. The mutant AAV capsid protein may be characterized by an increased transduction enrichment relative to the wild-type AAV9 when measured in brain tissue and heart tissue in a subject when delivered to the subject systemically.

[0010] In aspects of the invention the AAV capsid protein is integrated into an AAV capsid. The AAV capsid is chimeric. The AAV capsid may be isolated and purified.

[0011] Aspects of the invention further provide a composition comprising the AAV capsid of the invention, wherein the AAV capsid comprises an AAV capsid protein comprising at least 95% sequence identity to the wild-type AAV capsid protein, wherein the mutant AAV capsid protein comprises a sequence selected from the group consisting of SEQ ID NO: 2-1496. The composition may be formulated for systematic administration to a subject. Systematic administration of the composition may result in expression of a gene product delivered by the AAV capsid. Administration of the composition results in increased transduction enrichment relative to the wild-type AAV9 when measured in heart and/or brain.

[0012] Aspects of the invention further provide a method of treating a disease or condition in a subject comprising administering a therapeutically effective amount of the composition of the invention. For example, provided is a composition for use in treating a disease or condition in a subject, the use comprising administering a therapeutically effective amount of a composition of the invention. Advantageously, because the compositions of the invention comprise AAV capsid proteins that are direct engineered AAVs to brain tissue, heart tissue, or brain and heart tissues 10 specifically, the compositions provide effective methods and uses for treating diseases associated with the brain, heart, or brain and heart.

TABLE 1

Brain Targeting sequences

SEQ ID NO:	AA sequence (#587-597)
2	AQAAATAAQAQ
3	AQAALPPRSAQ
4	AQAASSGHSAQ
5	AQAESRTSAAQ
6	AQAFSVSPDAQ
7	AQAGGHSNNAQ

TABLE 1-continued

Brain Targeting sequences	
SEQ ID NO:	AA sequence (#587-597)
8	AQAGPSNAMAQ
9	AQAGSIRDDAQ
10	AQAHGDGSLAQ
11	AQAHSSGVGAQ
12	AQAHTHTLSAQ
13	AQAIAGYASAQ
14	AQAISNTTVAQ
15	AQALARDHSAQ
16	AQALRGSLCAQ
17	AQAMDRTNMAQ
18	AQAMQTRNPAQ
19	AQAMSSLTAAQ
20	AQAPGALMTAQ
21	AQAPREIAIAQ
22	AQAQADRPDAQ
23	AQAQGNLAFAQ
24	AQARSNEMTAQ
25	AQASGHAPTAQ
26	AQASGSNAHAQ
27	AQASLAVTSAQ
28	AQASRDSGSAQ
29	AQASRSESYAQ
30	AQASTRVVNAQ
31	AQATSDRPTAQ
32	AQATVTHKDAQ
33	AQAVGTMAPAQ
34	AQDASRVLAAQ
35	AQDMTGLVIAQ
36	AQDNRTRTNAQ
37	AQDPSRSASAQ
38	AQDPTTRNEAQ
39	AQDRSNITLAQ
40	AQDSAQNRGAQ
41	AQDSGPSKAAQ
42	AQDSIQYSFAQ
43	AQDSREQGRAQ

TABLE 1-continued

Brain Targeting sequences	
SEQ ID NO:	AA sequence (#587-597)
44	AQDSRLGVTAQ
45	AQDSRQPPNAQ
46	AQDSRVPSQAQ
47	AQDSVNLSSAQ
48	AQDVRHGGTAQ
49	AQDVRSNTSAQ
50	AQDVSVSAFAQ
51	AQDYAYRTGAQ
52	AQEHTRGETAQ
53	AQEITHSHSAQ
54	AQENHTENKAQ
55	AQENRVANKAQ
56	AQEPERFMFAQ
57	AQEPRLATDAQ
58	AQERTASLHAQ
59	AQESNRHPYAQ
60	AQESSHTGGAQ
61	AQESVGRGEAQ
62	AQEVGGGSKAQ
63	AQFALPVPSAQ
64	AQFGSVQDRAQ
65	AQFGTGGVPAQ
66	AQFGTMGDKAQ
67	AQFGVTAGSAQ
68	AQFINTVPVAQ
69	AQFLVGGTVAQ
70	AQFSAFLPAAQ
71	AQFSGMSNSAQ
72	AQFVKIAKSAQ
73	AQFVTLVTSAQ
74	AQGADARLHAQ
75	AQGDAARSGAQ
76	AQGGGSHSSAQ
77	AQGHQHVTEAQ
78	AQGHSETRLAQ
79	AQGIGHMNDAQ

TABLE 1-continued

Brain Targeting sequences	
SEQ ID NO:	AA sequence (#587-597)
80	AQGLALTLNAQ
81	AQGLAVASPAQ
82	AQGLSSPLAAQ
83	AQGLVLSSTAQ
84	AQGLVSSSVAQ
85	AQGLYNIRSAQ
86	AQGNAVSVAAQ
87	AQGNHTRHAAQ
88	AQGNLTRLTAQ
89	AQGNNTRAHAQ
90	AQGNNTTSRAQ
91	AQGNQSNAAAQ
92	AQGNRTRAPAQ
93	AQGNRTTNDAQ
94	AQGNTTVNQAQ
95	AQGSDSRNSAQ
96	AQGSFTQFSAQ
97	AQGSGASVLAQ
98	AQGSGISSHAQ
99	AQGSGTPGHAQ
100	AQGSLTVLKAQ
101	AQGSMMHKDAQ
102	AQGSSRNEVAQ
103	AQGTGSERLAQ
104	AQGTQDRQLAQ
105	AQGTTLSSSAQ
106	AQGTTSHHLAQ
107	AQGVGLPTTAQ
108	AQGVGSSLSAQ
109	AQGVHASTQAQ
110	AQGVHGSNAAQ
111	AQGVISRPDAQ
112	AQGVSAVAAAQ
113	AQGVTSVVAAQ
114	AQHAGNITIAQ
115	AQHGSRSDYAQ

TABLE 1-continued

Brain Targeting sequences	
SEQ ID NO:	AA sequence (#587-597)
116	AQHGVTTQSAQ
117	AQHGVVSSSAQ
118	AQHHSPQSSAQ
119	AQHISLHQQAQ
120	AQHISSVQPAQ
121	AQHLGTVSAAQ
122	AQHMSGVNAAQ
123	AQHNVMSSFAQ
124	AQHNVSLANAQ
125	AQHQLHHGAAQ
126	AQHSSGTSGAQ
127	AQHSSSNIIAQ
128	AQHSTKAEVAQ
129	AQHTANLLDAQ
130	AQHTGASLTAQ
131	AQHTGPLSNAQ
132	AQHTLPIMSAQ
133	AQHTSTREMAQ
134	AQHTSVRIDAQ
135	AQHTTSHMEAQ
136	AQHYVSVPTAQ
137	AQIAGRNQSAQ
138	AQIAHLSSVAQ
139	AQIASSPLSAQ
140	AQIASSSLHAQ
141	AQIGGLTTPAQ
142	AQIGSLTGAAQ
143	AQIGSMNEKAQ
144	AQIGSSMPNAQ
145	AQILATGGSAQ
146	AQILDRSNMAQ
147	AQILRDGHQAQ
148	AQILSEHRVAQ
149	AQILTRSTFAQ
150	AQILVTSTSAQ
151	AQIMTSTLPAQ

TABLE 1-continued

Brain Targeting sequences	
SEQ ID NO:	AA sequence (#587-597)
152	AQINRETSFAQ
153	AQINSAGLLAQ
154	AQISAASTSAQ
155	AQISAGALIAQ
156	AQISLTNSNAQ
157	AQISSSRNGAQ
158	AQISTGKLGAQ
159	AQISTRESIAQ
160	AQITGQMSAAQ
161	AQITGQMSVAQ
162	AQITSSPTSAQ
163	AQITSSVMQAQ
164	AQITTHPTTAQ
165	AQIVAGHRDAQ
166	AQIVDTRNPAQ
167	AQIVGKPMEAQ
168	AQIVLPSTYAQ
169	AQIVSGSLGAQ
170	AQIYSSSVSAQ
171	AQKDQNRESAQ
172	AQKDSHSYNAQ
173	AQKEQQAVSAQ
174	AQKHNIPNVAQ
175	AQKPTVGFAAQ
176	AQKQAGTSVAQ
177	AQKQHSDHPAQ
178	AQKSQTNDVAQ
179	AQKSSLRFYAQ
180	AQKTSSSTVAQ
181	AQLAHQTRDAQ
182	AQLAQAASAAQ
183	AQLARTTTDAQ
184	AQLASASSVAQ
185	AQLASSTLMAQ
186	AQLDRSGSTAQ
187	AQLDTSTALAQ

TABLE 1-continued

Brain Targeting sequences	
SEQ ID NO:	AA sequence (#587-597)
188	AQLGAGPHVAQ
189	AQLGGSYGSAQ
190	AQLGSLANTAQ
191	AQLGTNRMSAQ
192	AQLGVSSVEAQ
193	AQLHNTVVSAQ
194	AQLHSPASNAQ
195	AQLHSSPSTAQ
196	AQLILTTSEAQ
197	AQLKDQGSSAQ
198	AQLLDTHYRAQ
199	AQLLDTLMQAQ
200	AQLLITAVQAQ
201	AQLLLTPQLAQ
202	AQLLRSTLPAQ
203	AQLLSATTHAQ
204	AQLLSSSNSAQ
205	AQLMSILTMAQ
206	AQLMSSVSAAQ
207	AQLNHSVSGAQ
208	AQLNHTSPGAQ
209	AQLNPQGTSAQ
210	AQLNSDKSSAQ
211	AQLNSTRTYAQ
212	AQLNTAQSTAQ
213	AQLNTGSNAAQ
214	AQLNVSTTSAQ
215	AQLPASDISAQ
216	AQLPRDKWEAQ
217	AQLPSETKFAQ
218	AQLQSNRSDAQ
219	AQLQSRSFGAQ
220	AQLQTSLSLAQ
221	AQLRNSESTAQ
222	AQLRNSSELAQ
223	AQLRTDSLEAQ

TABLE 1-continued

Brain Targeting sequences	
SEQ ID NO:	AA sequence (#587-597)
224	AQLSDHNLKAQ
225	AQLSGFNVLAQ
226	AQLSGHFSFAQ
227	AQLSGMSGNAQ
228	AQLSGQSMDAQ
229	AQLSGQVTMAQ
230	AQLSNESRSAQ
231	AQLSNITNSAQ
232	AQLSQASSAAQ
233	AQLSQSGKEAQ
234	AQLSRSFVPAQ
235	AQLSRSSSPAQ
236	AQLSSANLQAQ
237	AQLSSSITQAQ
238	AQLSSSVVNAQ
239	AQLSSTLTSAQ
240	AQLSSTYANAQ
241	AQLSTDASQAQ
242	AQLSTISSHAQ
243	AQLSTSGPSAQ
244	AQLSVAQGSAQ
245	AQLSVLSQIAQ
246	AQLTGNQSVAQ
247	AQLTHTIPSAQ
248	AQLTNVIMGAQ
249	AQLTSLPQVAQ
250	AQLTTPSAAAQ
251	AQLTTSSTLAQ
252	AQLTTTHSQAQ
253	AQLVIMGMSAQ
254	AQLVSSESRAQ
255	AQLVTAGTAAQ
256	AQMDTHNLVAQ
257	AQMDYSTSPAQ
258	AQMGSSGQMAQ
259	AQMGTAHTIAQ

TABLE 1-continued

Brain Targeting sequences	
SEQ ID NO:	AA sequence (#587-597)
260	AQMGTHVVTAQ
261	AQMHDGRLVAQ
262	AQMLAKTATAQ
263	AQMLSSTMRAQ
264	AQMLSTTSGAQ
265	AQMLVKHAGAQ
266	AQMMSSTNAAQ
267	AQMNHNQQHAQ
268	AQMNHTSNKAQ
269	AQMNNKSPGAQ
270	AQMNNSTRPAQ
271	AQMNSSSHSAQ
272	AQMSGNSMAAQ
273	AQMSTSYSSAQ
274	AQMYLENNSAQ
275	AQNAGYSAAAQ
276	AQNANHAMPAQ
277	AQNAQGTHVAQ
278	AQNASEKSSAQ
279	AQNASNSTTAQ
280	AQNGLRADTAQ
281	AQNGRTGTGAQ
282	AQNGRTTTVAQ
283	AQNGSITGTAQ
284	AQNGSRGAAAQ
285	AQNHEQYQWAQ
286	AQNHSGTTSAQ
287	AQNHTGVSPAQ
288	AQNHVGGATAQ
289	AQNIQSLSTAQ
290	AQNLGLISVAQ
291	AQNLSLTHEAQ
292	AQNMSSNKDAQ
293	AQNMTSMQSAQ
294	AQNPTRSLSAQ
295	AQNQCQSHVAQ

TABLE 1-continued

Brain Targeting sequences	
SEQ ID NO:	AA sequence (#587-597)
296	AQNQFTATEAQ
297	AQNQLGNSAAQ
298	AQNQQNKANAQ
299	AQNRNEVHSAQ
300	AQNRSDSAMAQ
301	AQNSAFTAQAQ
302	AQNSFSPATAQ
303	AQNSGNYQIAQ
304	AQNSHGHALAQ
305	AQNSPGYTAAQ
306	AQNSSAATGAQ
307	AQNSSGHGVAQ
308	AQNSSSGSAAQ
309	AQNSSSSPGAQ
310	AQNSTSISHAQ
311	AQNTLSNISAQ
312	AQNTQTHSSAQ
313	AQNTTQPSNAQ
314	AQNVMSSGAAQ
315	AQNVQSSNLAQ
316	AQNYCGKECAQ
317	AQPATGTSGAQ
318	AQPAVGSAGAQ
319	AQPIGGSNMAQ
320	AQPIHQTGVAQ
321	AQPLQTSNAAQ
322	AQPLTGQTNAQ
323	AQPLYNQTPAQ
324	AQPPKPPSIAQ
325	AQPQPHRLLAQ
326	AQPQRSQHIAQ
327	AQPQSNVSTAQ
328	AQPSAEQAQAQ
329	AQPSGAYGEAQ
330	AQPSGQKIDAQ
331	AQPSGSHSIAQ

TABLE 1-continued

Brain Targeting sequences	
SEQ ID NO:	AA sequence (#587-597)
332	AQPSGTNIGAQ
333	AQPSNALAGAQ
334	AQPSNPQSYAQ
335	AQPSPSTMRAQ
336	AQPSRDVTPAQ
337	AQPSSYSDSAQ
338	AQPVAAHVRAQ
339	AQPVHGSTDAQ
340	AQQAAVSGGAQ
341	AQQATHVALAQ
342	AQQDSTKALAQ
343	AQQIHGPMQAQ
344	AQQLLVSVTAQ
345	AQQLSGSLMAQ
346	AQQLSHEKSAQ
347	AQQNNTHGGAQ
348	AQQNSGPLHAQ
349	AQQRTDQQTAQ
350	AQQVAHTQIAQ
351	AQQVGKSSAAQ
352	AQQVISTGSAQ
353	AQQVRTNTSAQ
354	AQRADRVQEAQ
355	AQRDKMVFMAQ
356	AQRDSVTDSAQ
357	AQRESRVSQAQ
358	AQRGHGQEIAQ
359	AQRGLSAVNAQ
360	AQRIGSSAIAQ
361	AQRISSETSAQ
362	AQRLDIHMCAQ
363	AQRNTSNQEAQ
364	AQRSNNCIGAQ
365	AQRSNVDGLAQ
366	AQRSSLHTSAQ
367	AQRSTESLHAQ

TABLE 1-continued

Brain Targeting sequences	
SEQ ID NO:	AA sequence (#587-597)
368	AQRTAANHEAQ
369	AQRTDGTSIAQ
370	AQRTHSAMPAQ
371	AQRTSGPAAAQ
372	AQSAPNRTDAQ
373	AQSAQSAIQAQ
374	AQSARGMSGAQ
375	AQSASRDPAAQ
376	AQSDHSVRDAQ
377	AQSDKNLQQAQ
378	AQSDLICCPAQ
379	AQSERSYPSAQ
380	AQSFSGQSLAQ
381	AQSFSNVSPAQ
382	AQSGLNTLAAQ
383	AQSGNHNPAAQ
384	AQSGPVQNQAQ
385	AQSGSSHERAQ
386	AQSGSVMSSAQ
387	AQSHIVSSSAQ
388	AQSHLSSQVAQ
389	AQSHNSAFEAQ
390	AQSIARDLAAQ
391	AQSIGSSYPAQ
392	AQSIKQNEGAQ
393	AQSITQGSAAQ
394	AQSKNDTSMAQ
395	AQSLAGTLSAQ
396	AQSLANSQTAQ
397	AQSLGAQLFAQ
398	AQSLHLSSSAQ
399	AQSLSHTRPAQ
400	AQSLSQTVGAQ
401	AQSLSSTGGAQ
402	AQSLVSLKEAQ
403	AQSLVVTTPAQ

TABLE 1-continued

Brain Targeting sequences	
SEQ ID NO:	AA sequence (#587-597)
404	AQSMGSSNWAQ
405	AQSMISSNRAQ
406	AQSMMSLDQAQ
407	AQSMPQPLVAQ
408	AQSMSSNLTAQ
409	AQSMTLSNYAQ
410	AQSNATHRFAQ
411	AQSNHTKPIAQ
412	AQSNQTRHVAQ
413	AQSPKPPSTAQ
414	AQSQDTASKAQ
415	AQSQIAEPAAQ
416	AQSQKAPDIAQ
417	AQSQLSPSNAQ
418	AQSQMSSAGAQ
419	AQSQSSSQTAQ
420	AQSRESPSTAQ
421	AQSRLLESSAQ
422	AQSRNQPAEAQ
423	AQSRSSDAFAQ
424	AQSRTDLLSAQ
425	AQSRTSNQAAQ
426	AQSRVEEMNAQ
427	AQSRVNTLDAQ
428	AQSSAVLLNAQ
429	AQSSDRVSSAQ
430	AQSSGHSSEAQ
431	AQSSGLRLGAQ
432	AQSSGSREVAQ
433	AQSSHDTLQAQ
434	AQSSLSVLWAQ
435	AQSSLSVVPAQ
436	AQSSMWHKDAQ
437	AQSSQSFGYAQ
438	AQSSREVVTAQ
439	AQSSRGETPAQ

TABLE 1-continued

Brain Targeting sequences	
SEQ ID NO:	AA sequence (#587-597)
440	AQSSSQSSDAQ
441	AQSSTQHEKAQ
442	AQSSVSRTSAQ
443	AQSSYGYRSAQ
444	AQSTALTTGAQ
445	AQSTATSPAAQ
446	AQSTGQGFTAQ
447	AQSTGQGINAQ
448	AQSTGTSGQAQ
449	AQSTISTGSAQ
450	AQSTKQNVNAQ
451	AQSTMAIGSAQ
452	AQSTMGALKAQ
453	AQSTNRAEQAQ
454	AQSTSALGPAQ
455	AQSTSDYSRAQ
456	AQSTSPTYVAQ
457	AQSTSSITVAQ
458	AQSTSSPTSAQ
459	AQSTSYASIAQ
460	AQSTTRVVDAQ
461	AQSVAPIANAQ
462	AQSVGNGNIAQ
463	AQSVRSGFKAQ
464	AQSVSDGGFAQ
465	AQSVSSNIVAQ
466	AQSVSTAAQAQ
467	AQTAHNVEQAQ
468	AQTAPQSMDAQ
469	AQTDRGQVQAQ
470	AQTDSSRESAQ
471	AQTEAGSAAAQ
472	AQTEQRHAPAQ
473	AQTFGKASDAQ
474	AQTGAASNIAQ
475	AQTGLSAEGAQ

TABLE 1-continued

Brain Targeting sequences	
SEQ ID NO:	AA sequence (#587-597)
476	AQTGTVHSTAQ
477	AQTHMQVGAAQ
478	AQTHQPAEKAQ
479	AQTHTALPDAQ
480	AQTHTRSMIAQ
481	AQTINNVVAAQ
482	AQTKHSTTEAQ
483	AQTLAGSSIAQ
484	AQTLRTSDLAQ
485	AQTLSGLVMAQ
486	AQTLSTHVVAQ
487	AQTNITRAQAQ
488	AQTNSTRNLAQ
489	AQTNSTRNVAQ
490	AQTNTHSVTAQ
491	AQTNTLHTAAQ
492	AQTNTRTMQAQ
493	AQTNVSSEIAQ
494	AQTPTSSSSAQ
495	AQTQASASGAQ
496	AQTQGDRGTAQ
497	AQTQSKSESAQ
498	AQTQTHVTSAQ
499	AQTQTVPTNAQ
500	AQTRTDSNGAQ
501	AQTSAHANQAQ
502	AQTSGHSSTAQ
503	AQTSLKIVPAQ
504	AQTSLTVNIAQ
505	AQTSSHSKDAQ
506	AQTSSNYVSAQ
507	AQTSSTGVQAQ
508	AQTSTHIRDAQ
509	AQTSVAGSNAQ
510	AQTSVTYQDAQ
511	AQTTGQITVAQ

TABLE 1-continued

Brain Targeting sequences	
SEQ ID NO:	AA sequence (#587-597)
512	AQTTSQALYAQ
513	AQTTSSSVNAQ
514	AQTTSTMSTAQ
515	AQTTTSPAIAQ
516	AQTVGRAMEAQ
517	AQTVGVLAAAQ
518	AQTVRASTDAQ
519	AQTVVSGTGAQ
520	AQVANDSFKAQ
521	AQVARGDSDAQ
522	AQVASGVATAQ
523	AQVASRDQFAQ
524	AQVATRPDAAQ
525	AQVCHLRTSAQ
526	AQVDNVTRSAQ
527	AQVDSRSTPAQ
528	AQVEPIRICAQ
529	AQVERLQSGAQ
530	AQVFGAHSFAQ
531	AQVGASSSTAQ
532	AQVGGANLAAQ
533	AQVGNAPPHAQ
534	AQVGSNVGQAQ
535	AQVGSSSVSAQ
536	AQVGTVSNSAQ
537	AQVGVNRTNAQ
538	AQVHLQAHNAQ
539	AQVHSLPSVAQ
540	AQVHTKYTDAQ
541	AQVIAATAEAQ
542	AQVIWQNQVAQ
543	AQVKSGSMAAQ
544	AQVLSGQSPAQ
545	AQVLSSMSLAQ
546	AQVLTSSDLAQ
547	AQVNHGAITAQ

TABLE 1-continued

Brain Targeting sequences	
SEQ ID NO:	AA sequence (#587-597)
548	AQVNSHLTGAQ
549	AQVNTHTSSAQ
550	AQVNVTRSNAQ
551	AQVPGGAGFAQ
552	AQVPSSNVSAQ
553	AQVQLVANVAQ
554	AQVQSHGVYAQ
555	AQVRSGSNIAQ
556	AQVRTAAQPAQ
557	AQVSGHEHYAQ
558	AQVSIHLTQAQ
559	AQVSNSMATAQ
560	AQVSNTLLGAQ
561	AQVSSFQSSAQ
562	AQVSSLPSPAQ
563	AQVSTANTSAQ
564	AQVSTSSLTAQ
565	AQVSVSSTAAQ
566	AQVTGSTKLAQ
567	AQVTSQIMDAQ
568	AQVTSVSYSAQ
569	AQVVSGSSHAQ
570	AQVVTDAYRAQ
571	AQWINAFKAAQ
572	AQWSQSNKAAQ
573	AQWSSRLNSAQ
574	AQYAHQYNAAQ
575	AQYDMYYDKAQ
576	AQYERSKVDAQ
577	AQYGTMIQVAQ
578	AQYHSGVGEAQ
579	AQYKATHIAAQ
580	AQYKTGNHEAQ
581	AQYLSNLMMAQ
582	AQYNGHSNNAQ
583	AQYNGQSSMAQ

TABLE 1-continued

Brain Targeting sequences	
SEQ ID NO:	AA sequence (#587-597)
584	AQYNHTRLLAQ
585	AQYNSTRASAQ
586	AQYPSSSSMAQ
587	AQYQHSSLTAQ
588	AQYQLVPRSAQ
589	AQYQTSISPAQ
590	AQYQTSTQGAQ
591	AQYSGTHTAAQ
592	AQYSSGHANAQ
593	AQYSSGLAGAQ
594	AQYVNHGLGAQ

TABLE 2

Brain and Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
595	AQAAGVSAGAQ
596	AQAGHNMGGAQ
597	AQANKVKDLAQ
598	AQANLTRVTAQ
599	AQANNTMKQAQ
600	AQANQTRPFAQ
601	AQANSVKNIAQ
602	AQANTTKSSAQ
603	AQANTTRQTAQ
604	AQANTVRNTAQ
605	AQARAAPQTAQ
606	AQASAGSSGAQ
607	AQASNHTSGAQ
608	AQASRSEIGAQ
609	AQASSSAREAQ
610	AQATGYSGAAQ
611	AQATHSREQAQ
612	AQATNSAVGAQ
613	AQDARPSPNAQ
614	AQDNHVRTVAQ

TABLE 2-continued

Brain and Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
615	AQDNKVKTFAQ
616	AQDNMIRSIAQ
617	AQDNSTRISAQ
618	AQDNSVKHSAQ
619	AQDNSVRLTAQ
620	AQDNSVRPSAQ
621	AQDNSVRSPAQ
622	AQDNVIRSIAQ
623	AQDRAQSHSAQ
624	AQDRSQSHSAQ
625	AQDTSHRASAQ
626	AQEGGTGKVAQ
627	AQENHVRSSAQ
628	AQENKIKTNAQ
629	AQENNTRMVAQ
630	AQENQVRNTAQ
631	AQENRIINHAQ
632	AQENSTKSMAQ
633	AQENSTRVQAQ
634	AQENTTKHLAQ
635	AQENTTKSLAQ
636	AQENTVRNMAQ
637	AQETAVRSSAQ
638	AQETHNRAGAQ
639	AQEVRGGTMAQ
640	AQFNSTKVVAQ
641	AQFNSTRSVAQ
642	AQFNSVRPVAQ
643	AQGGAPPTNAQ
644	AQGNAIRNGAQ
645	AQGNAVKPFAQ
646	AQGNGTRGFAQ
647	AQGNGTRPTAQ
648	AQGNITKVFAQ
649	AQGNNSKPAAQ
650	AQGNNTKQMAQ

TABLE 2-continued

Brain and Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
651	AQGNNTRLTAQ
652	AQGNQLKNTAQ
653	AQGNRIAQVAQ
654	AQGNRKPNEAQ
655	AQGNRTQPSAQ
656	AQGNRTSGGAQ
657	AQGNRVQNVAQ
658	AQGNSIINHAQ
659	AQGNSSKNLAQ
660	AQGNSVKDSAQ
661	AQGNSVKGTAQ
662	AQGNSVRISAQ
663	AQGNSVRTVAQ
664	AQGNTIKDYAQ
665	AQGNTTRHPAQ
666	AQGNTTRVPAQ
667	AQGNTVKSEAQ
668	AQGRNTSMEAQ
669	AQGRSSQGEAQ
670	AQGSRGSGAAQ
671	AQGTRSTDNAQ
672	AQGTSSNTGAQ
673	AQGVASSHQAQ
674	AQHGSSTLGAQ
675	AQHGSTFTGAQ
676	AQHIGSIPAAQ
677	AQHNNVRPVAQ
678	AQHNSTRNAAQ
679	AQHNTTKPIAQ
680	AQHSQSSKDAQ
681	AQHTSSISSAQ
682	AQIAHASSMAQ
683	AQIAHSSSGAQ
684	AQIISSNVPAQ
685	AQINATRNQAQ
686	AQINHVRDTAQ

TABLE 2-continued

Brain and Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
687	AQINTTKPIAQ
688	AQIRSTTMDAQ
689	AQISAGPREAQ
690	AQLHGTSTAAQ
691	AQLNATKPIAQ
692	AQLNHTKQTAQ
693	AQLNNTKPIAQ
694	AQLNNTRPGAQ
695	AQLNSTARSAQ
696	AQLNSTKPIAQ
697	AQLNTAKPIAQ
698	AQLNTIKPIAQ
699	AQLNTSKPIAQ
700	AQLNTTKAIAQ
701	AQLNTTKHIAQ
702	AQLNTTKLAAQ
703	AQLNTTKLIAQ
704	AQLNTTKPFAQ
705	AQLNTTKPGAQ
706	AQLNTTKPIAQ
707	AQLNTTKPLAQ
708	AQLNTTKPMAQ
709	AQLNTTKPNAQ
710	AQLNTTKPSAQ
711	AQLNTTKPTAQ
712	AQLNTTKPVAQ
713	AQLNTTKSIAQ
714	AQLNTTKSVAQ
715	AQLNTTKTIAQ
716	AQLNTTRPIAQ
717	AQLNTVKPLAQ
718	AQLNYVRQVAQ
719	AQLPQHGSGAQ
720	AQLPSAHSSAQ
721	AQLSSPSTAAQ
722	AQLTNQSSAAQ

TABLE 2-continued

Brain and Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
723	AQLVGTSAMAQ
724	AQLVRNTDLAQ
725	AQMHNIATPAQ
726	AQMNHTRREAQ
727	AQMNNTARPAQ
728	AQMNNTKQTAQ
729	AQMNNTRGSAQ
730	AQMNNTVRAAQ
731	AQMNSTRAAAQ
732	AQMPGHGSSAQ
733	AQMPTQHASAQ
734	AQMTHSHGSAQ
735	AQNAHNVSTAQ
736	AQNNLTRNNAQ
737	AQNNMTRAIAQ
738	AQNNMTRNNAQ
739	AQNNQIKLMAQ
740	AQNNRSPTLAQ
741	AQNNSIRLAAQ
742	AQNNSIRSSAQ
743	AQNNSTKLLAQ
744	AQNNSVRPSAQ
745	AQNNTSKNVAQ
746	AQNNTTKLAAQ
747	AQNNTTTRTAQ
748	AQNNTVKNLAQ
749	AQNNTVRPSAQ
750	AQNNVVRSTAQ
751	AQNNYVRSAAQ
752	AQNQHSSQTAQ
753	AQNRGIQSDAQ
754	AQNSHNVPSAQ
755	AQNSNNVAGAQ
756	AQNSRSVSDAQ
757	AQNSSTRTGAQ
758	AQNSTKPITAQ

TABLE 2-continued

Brain and Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
759	AQNSTRPLTAQ
760	AQNTRGLVEAQ
761	AQNTTKGMAAQ
762	AQNTTRMTTAQ
763	AQNTTRSESAQ
764	AQNVRNVLDAQ
765	AQPAGRNLDAQ
766	AQPGYGNQGAQ
767	AQPMSRDTSAQ
768	AQPNAVKPMAQ
769	AQPNITRNNAQ
770	AQPNIVRSTAQ
771	AQPNQTKTTAQ
772	AQPNTTKLSAQ
773	AQPNTTKPIAQ
774	AQPNTTRSTAQ
775	AQPNVTRGFAQ
776	AQPNVTRTVAQ
777	AQQATVRTEAQ
778	AQQDRSSAVAQ
779	AQQHGVSAPAQ
780	AQQIQRSIDAQ
781	AQQNAIRQSAQ
782	AQQNATKGIAQ
783	AQQNLTRMTAQ
784	AQQNNVRPSAQ
785	AQQNSIRSVAQ
786	AQQNSTRSLAQ
787	AQQNTTRTSAQ
788	AQQNYTKVAAQ
789	AQQRIPSNTAQ
790	AQQRTSSQEAQ
791	AQQSSSRLGAQ
792	AQQVRSDMGAQ
793	AQRDGLILIAQ
794	AQRDNIILIAQ

TABLE 2-continued

Brain and Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
795	AQRDSTMHAAQ
796	AQRDTHVFHAQ
797	AQRGDLHFQAQ
798	AQRLSQSSDAQ
799	AQRSGLILFAQ
800	AQRSGSHFVAQ
801	AQRVGQSVSAQ
802	AQRVVGPLFAQ
803	AQSDRGNHSAQ
804	AQSDSRNASAQ
805	AQSESARGNAQ
806	AQSGHNASGAQ
807	AQSGSHTNSAQ
808	AQSGSSRGEAQ
809	AQSLSQPERAQ
810	AQSMGHSHAAQ
811	AQSMSYGSSAQ
812	AQSNAAKPVAQ
813	AQSNATTRAAQ
814	AQSNDIRNNAQ
815	AQSNDTKNTAQ
816	AQSNGIRNTAQ
817	AQSNHTTRSAQ
818	AQSNLVRQTAQ
819	AQSNNAKPSAQ
820	AQSNNSSRPAQ
821	AQSNQTRGNAQ
822	AQSNSTKMIAQ
823	AQSNSTKNAAQ
824	AQSNSTKNVAQ
825	AQSNSTKSLAQ
826	AQSNSTRSSAQ
827	AQSNSVKAPAQ
828	AQSNSVKERAQ
829	AQSNSVKITAQ
830	AQSNSVKSFAQ

TABLE 2-continued

Brain and Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
831	AQSNSVKTVAQ
832	AQSNSVRLVAQ
833	AQSNTTKPIAQ
834	AQSNTTRPMAQ
835	AQSNTTRQTAQ
836	AQSNTTTRAAQ
837	AQSNTVKAMAQ
838	AQSNTVKNAAQ
839	AQSNTVRNSAQ
840	AQSNTVRSSAQ
841	AQSNVIRNSAQ
842	AQSNYTRSPAQ
843	AQSPSRHTEAQ
844	AQSQHASSAAQ
845	AQSQSSSGSAQ
846	AQSSATRVDAQ
847	AQSSGYAQQAQ
848	AQSSNSGREAQ
849	AQSSSGGTGAQ
850	AQSTAIRQDAQ
851	AQSTQTRAAAQ
852	AQSTQVRSEAQ
853	AQSTRGNDNAQ
854	AQSTSTHGAAQ
855	AQTGVRSGDAQ
856	AQTMRQTNDAQ
857	AQTNHTREVAQ
858	AQTNHVKTMAQ
859	AQTNHVRSAAQ
860	AQTNLVKPTAQ
861	AQTNMTRTTAQ
862	AQTNNATRPAQ
363	AQTNNAVRAAQ
864	AQTNNTKSTAQ
865	AQTNNTLRSAQ
866	AQTNNTSPGAQ

TABLE 2-continued

Brain and Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
867	AQTNNVRAPAQ
868	AQTNSIKSTAQ
869	AQTNSIRPIAQ
870	AQTNSVKLIAQ
871	AQTNTTKSMAQ
872	AQTNTVRASAQ
873	AQTNTVRQTAQ
874	AQTRGASNEAQ
875	AQTSGRSDAAQ
876	AQTVSDRSGAQ
877	AQVGHSAVSAQ
878	AQVHNRADVAQ
879	AQVHSGPVSAQ
880	AQVNATRNVAQ
881	AQVNHTKGLAQ
882	AQVNSLGNNAQ
883	AQVNSTKSMAQ
884	AQVNSTKSTAQ
885	AQVNSTRGNAQ
886	AQVNTTKPIAQ
887	AQVNTTQSGAQ
888	AQVSDTRAGAQ
889	AQVSHSLASAQ
890	AQVSSSGMTAQ
891	AQVSVTRSDAQ
892	AQWAANTSGAQ
893	AQYAGVSSPAQ
894	AQYGSHGVGAQ
895	AQYNSTKNGAQ
896	AQYNSTKNMAQ
897	AQYNSTKSHAQ
898	AQYNTTKPIAQ

TABLE 3

Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
899	AQAAHNKDSAQ
900	AQADARNTSAQ
901	AQAESRGSAAQ
902	AQAESRIGSAQ
903	AQAESRTMPAQ
904	AQAHAATSAAQ
905	AQAISLRGDAQ
906	AQAKGSTLLAQ
907	AQALARSVSAQ
908	AQALGQSRVAQ
909	AQALSHSSGAQ
910	AQANHTRVAAQ
911	AQAQGENLLAQ
912	AQARTGPMLAQ
913	AQARTHLQDAQ
914	AQARVGATAAQ
915	AQARVGTNVAQ
916	AQASHSRDAAQ
917	AQASSNKTAAQ
918	AQASSSTAGAQ
919	AQATARNAVAQ
920	AQATGRLPEAQ
921	AQATRNTDMAQ
922	AQATSIRGPAQ
923	AQATVSSRIAQ
924	AQAVNKPLSAQ
925	AQAVPQSAGAQ
926	AQAVPSHHGAQ
927	AQAVRGAMNAQ
928	AQAVSGIRIAQ
929	AQAVSRSVDAQ
930	AQAVWPTRNAQ
931	AQAYARGESAQ
932	AQAYGETFWAQ
933	AQCLGPCLQAQ
934	AQDGIRLTPAQ

TABLE 3-continued

Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
935	AQDGRTVSMAQ
936	AQDGSTRMGAQ
937	AQDIRSTASAQ
938	AQDLSTARSAQ
939	AQDLSTRVAAQ
940	AQDMSRSTGAQ
941	AQDNVHSRGAQ
942	AQDQHNKSQAQ
943	AQDQKNATGAQ
944	AQDRAQSNMAQ
945	AQDRGTSQTAQ
946	AQDRRSSDLAQ
947	AQDRSHGHNAQ
948	AQDRSNTSNAQ
949	AQDRSTTHAAQ
950	AQDSLPEPYAQ
951	AQDSNRAVAAQ
952	AQDSNRPSNAQ
953	AQDSRQSKEAQ
954	AQDSSNRTGAQ
955	AQDSYTRSAAQ
956	AQDTHARGLAQ
957	AQDTRQSFSAQ
958	AQEASIRSGAQ
959	AQEGNISRPAQ
960	AQELTMPPYAQ
961	AQEMSKANMAQ
962	AQENQRSGAAQ
963	AQERGKNLEAQ
964	AQERGTVSTAQ
965	AQERNALREAQ
966	AQESGQRNQAQ
967	AQESNSYRPAQ
968	AQESRATTPAQ
969	AQESTKYHAAQ
970	AQESTRISGAQ

TABLE 3-continued

Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
971	AQETGRYNPAQ
972	AQETTSWVFAQ
973	AQEVNRSSYAQ
974	AQEVSRGKDAQ
975	AQEYGKATAAQ
976	AQFAGMRTAAQ
977	AQFDSVRNSAQ
978	AQFGSRDGSAQ
979	AQFGSRQPEAQ
980	AQFHNTRSEAQ
981	AQFNSDRPGAQ
982	AQFNSTRIVAQ
983	AQFNVSSTGAQ
984	AQFQVATRDAQ
985	AQFSNRTASAQ
986	AQFSRGVNEAQ
987	AQGAGALRGAQ
988	AQGAGRTLEAQ
989	AQGDRLTHGAQ
990	AQGFGHSVSAQ
991	AQGGTAARGAQ
992	AQGGVRNAEAQ
993	AQGHHRTVEAQ
994	AQGHSANLGAQ
995	AQGIRNQAEAQ
996	AQGLGTSSNAQ
997	AQGLNRLTPAQ
998	AQGLRSSDSAQ
999	AQGMRTSNDAQ
1000	AQGNGSRMAAQ
1001	AQGNRIAREAQ
1002	AQGRSLTTDAQ
1003	AQGSKPSQMAQ
1004	AQGSYANSQAQ
1005	AQGVAKGNEAQ
1006	AQGVMGMRNAQ

TABLE 3-continued

Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
1007	AQGVRSGLSAQ
1008	AQGVRSHDAAQ
1009	AQGVSNRANAQ
1010	AQGVSRATPAQ
1011	AQGVTLGSRAQ
1012	AQGYNSTPGAQ
1013	AQGYSGATGAQ
1014	AQGYSHSSGAQ
1015	AQHFVDSGLAQ
1016	AQHGTSRPDAQ
1017	AQHIVTHDLAQ
1018	AQHLVDRSLAQ
1019	AQHMSDSPHAQ
1020	AQHMVPSLLAQ
1021	AQHNLPVLHAQ
1022	AQHNPTRADAQ
1023	AQHPVQSSLAQ
1024	AQHQAKLQNAQ
1025	AQHQIAYDLAQ
1026	AQHQVPSLLAQ
1027	AQHRIATVEAQ
1028	AQHRVSEHFAQ
1029	AQHSSIGSSAQ
1030	AQHSVSHHFAQ
1031	AQHYLSTDFAQ
1032	AQIASRGLAAQ
1033	AQIDNRHNGAQ
1034	AQIGASSGGAQ
1035	AQIGGAVTTAQ
1036	AQIGGHERPAQ
1037	AQIGHVSANAQ
1038	AQIGRVTNEAQ
1039	AQIGSRASDAQ
1040	AQIGSSRLGAQ
1041	AQIHGKEREAQ
1042	AQIHLSSATAQ

TABLE 3-continued

Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
1043	AQIHSRGDTAQ
1044	AQIHSTNPGAQ
1045	AQIISNRAVAQ
1046	AQILHLPMNAQ
1047	AQILTSTVGAQ
1048	AQINSTATGAQ
1049	AQIPNFPTLAQ
1050	AQIPSGNVSAQ
1051	AQIPSKSPAAQ
1052	AQIPSTHTGAQ
1053	AQIPSTRAGAQ
1054	AQIRHGATDAQ
1055	AQIRPRPEDAQ
1056	AQIRSDHSSAQ
1057	AQIRSDSAMAQ
1058	AQIRSSTGDAQ
1059	AQIRSSTIFAQ
1060	AQIRTMSSEAQ
1061	AQISNRTSSAQ
1062	AQISRQEVLAQ
1063	AQISSHSPGAQ
1064	AQISSSRLSAQ
1065	AQISVSLRSAQ
1066	AQITGVPMNAQ
1067	AQITRNADNAQ
1068	AQITSSTQFAQ
1069	AQITTRIEQAQ
1070	AQIVKPNITAQ
1071	AQIVSRTENAQ
1072	AQIVVRGDSAQ
1073	AQIYSASTPAQ
1074	AQKGQPPFLAQ
1075	AQKHHVPFDAQ
1076	AQKLDLPMTAQ
1077	AQKLLGGLSAQ
1078	AQKLSLPTTAQ

TABLE 3-continued

Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
1079	AQKNGQPVQAQ
1080	AQKPYVPHDAQ
1081	AQKQRSEDPAQ
1082	AQKSGSMLVAQ
1083	AQKSQSLAGAQ
1084	AQKSQTSYMAQ
1085	AQKTTTSLAAQ
1086	AQLAGRGAGAQ
1087	AQLAPIMREAQ
1088	AQLATTRVEAQ
1089	AQLDRANPQAQ
1090	AQLEHRSGSAQ
1091	AQLFGPLLLAQ
1092	AQLFSWRNAAQ
1093	AQLFTTSNIAQ
1094	AQLGHSLTSAQ
1095	AQLGHSSQIAQ
1096	AQLGNLGHQAQ
1097	AQLGRVQSDAQ
1098	AQLGSSSVSAQ
1099	AQLHGPTLLAQ
1100	AQLHGVPMNAQ
1101	AQLHHNRESAQ
1102	AQLHNFPDNAQ
1103	AQLHSIGTSAQ
1104	AQLHSSTLGAQ
1105	AQLIHNGAAAQ
1106	AQLKVGPMDAQ
1107	AQLKVPVLMAQ
1108	AQLLDHISKAQ
1109	AQLLPATRDAQ
1110	AQLNHGANAAQ
1111	AQLNHTRPGAQ
1112	AQLNSPSFLAQ
1113	AQLNSSRASAQ
1114	AQLNSVKHYAQ

TABLE 3-continued

Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
1115	AQLNTTKTNAQ
1116	AQLPGRSTSAQ
1117	AQLPSYHSAAQ
1118	AQLQRSTDGAQ
1119	AQLQTTYSSAQ
1120	AQLRNSSGDAQ
1121	AQLRSLSAEAQ
1122	AQLSHSYSSAQ
1123	AQLSNSVKTAQ
1124	AQLSSHAYQAQ
1125	AQLSSRPDAAQ
1126	AQLSSSRSAAQ
1127	AQLSSSYTVAQ
1128	AQLSTSYSSAQ
1129	AQLTHVSNIAQ
1130	AQLTTSVRIAQ
1131	AQLTTTRTEAQ
1132	AQLTVAGRSAQ
1133	AQMGSKSNEAQ
1134	AQMKVPILLAQ
1135	AQMLAGRESAQ
1136	AQMNAGRSGAQ
1137	AQMNSSKPTAQ
1138	AQMNSVRTGAQ
1139	AQMNTSRSPAQ
1140	AQMNTTRVPAQ
1141	AQMPTKMTDAQ
1142	AQMRTGSNEAQ
1143	AQMRTLTGDAQ
1144	AQMRTSHTEAQ
1145	AQMRTSNLTAQ
1146	AQMSGHRQDAQ
1147	AQMSHSSGAAQ
1148	AQMSNRVLEAQ
1149	AQMSTTRSSAQ
1150	AQMTSKPESAQ

TABLE 3-continued

Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
1151	AQMVNRVQSAQ
1152	AQMVRSNDPAQ
1153	AQMYTTGQSAQ
1154	AQNAGRYGDAQ
1155	AQNGARTPPAQ
1156	AQNGQRLSPAQ
1157	AQNGRVGSNAQ
1158	AQNGSATRVAQ
1159	AQNGSKLAGAQ
1160	AQNGSRVIAAQ
1161	AQNGTMRLAAQ
1162	AQNHRPSGDAQ
1163	AQNLANTRDAQ
1164	AQNLQPGKIAQ
1165	AQNLRGTSVAQ
1166	AQNLSSVNGAQ
1167	AQNRTGGFDAQ
1168	AQNRVAQGEAQ
1169	AQNSATMRQAQ
1170	AQNSDPYRFAQ
1171	AQNSHISRDAQ
1172	AQNSQTLRSAQ
1173	AQNSRAAEHAQ
1174	AQNSRGPVAAQ
1175	AQNSSHANSAQ
1176	AQNSTQYNAAQ
1177	AQNTGHASMAQ
1178	AQNTGRSDSAQ
1179	AQNTNMPQYAQ
1180	AQNTSSVRGAQ
1181	AQNTVNVSGAQ
1182	AQNVAGRLDAQ
1183	AQNVSNLHGAQ
1184	AQNVSQLRDAQ
1185	AQNVTRGHEAQ
1186	AQNVYNVSGAQ

TABLE 3-continued

Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
1187	AQPARPNNPAQ
1188	AQPFTPKPMAQ
1189	AQPGVGKQPAQ
1190	AQPHDSVMWAQ
1191	AQPINLPMSAQ
1192	AQPKSSHEWAQ
1193	AQPNNTIRGAQ
1194	AQPQKTGSAAQ
1195	AQPQSGPLPAQ
1196	AQPQSNRPAAQ
1197	AQPQSRGDSAQ
1198	AQPRLPEVFAQ
1199	AQPRTGTPPAQ
1200	AQPSHSVLFAQ
1201	AQPSRGQTAAQ
1202	AQPSRGQTTAQ
1203	AQPSTDTFWAQ
1204	AQPSVTGRSAQ
1205	AQPSYGGSGAQ
1206	AQPTGLPINAQ
1207	AQPTQRTGTAQ
1208	AQPTRGTGTAQ
1209	AQPTSALPMAQ
1210	AQPVSRSPAAQ
1211	AQQAGRSVAAQ
1212	AQQAGSSVAAQ
1213	AQQASRNEIAQ
1214	AQQATRGDSAQ
1215	AQQDRILSAAQ
1216	AQQDSMRGLAQ
1217	AQQDTRSHAAQ
1218	AQQGGLILLAQ
1219	AQQGSIRSDAQ
1220	AQQGYGGQTAQ
1221	AQQHAPSLLAQ
1222	AQQLPGGLHAQ

TABLE 3-continued

Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
1223	AQQLSNKTNAQ
1224	AQQLSRDVPAQ
1225	AQQLVQHRDAQ
1226	AQQMRTGGIAQ
1227	AQQPGYSSDAQ
1228	AQQPRANQIAQ
1229	AQQPRTNESAQ
1230	AQQQLPVLMAQ
1231	AQQRESPLDAQ
1232	AQQRHLPTDAQ
1233	AQQSAGKLGAQ
1234	AQQSLSSLSAQ
1235	AQQSNLPMTAQ
1236	AQQSNVYREAQ
1237	AQQTSRLQEAQ
1238	AQQTTDRSGAQ
1239	AQQVGPILMAQ
1240	AQQVGSYQHAQ
1241	AQQVSTARPAQ
1242	AQQYGSVSQAQ
1243	AQQYSSGSSAQ
1244	AQRAGVSQIAQ
1245	AQRDTTYTTAQ
1246	AQRERSSEVAQ
1247	AQRGHGSSDAQ
1248	AQRGPLTLLAQ
1249	AQRGTLDLLAQ
1250	AQRIASPYDAQ
1251	AQRIGTATVAQ
1252	AQRIGTMSAAQ
1253	AQRLPGGLSAQ
1254	AQRLTQHEPAQ
1255	AQRMSNGSTAQ
1256	AQRMSSSSDAQ
1257	AQRNHSAGDAQ
1258	AQRNLPQVYAQ

TABLE 3-continued

Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
1259	AQRNYSPTEAQ
1260	AQRPEVPNWAQ
1261	AQRPQGSAGAQ
1262	AQRPTMPEYAQ
1263	AQRSDRLTDAQ
1264	AQRSGMAVEAQ
1265	AQRSGSGSDAQ
1266	AQRSGSSADAQ
1267	AQRSNLLAEAQ
1268	AQRSNSSVGAQ
1269	AQRSTAIVAAQ
1270	AQRTGMTGAAQ
1271	AQRTGSVVNAQ
1272	AQRTGTQSSAQ
1273	AQRTIGTSTAQ
1274	AQRTSQIQSAQ
1275	AQRVGASGTAQ
1276	AQRVGSSLSAQ
1277	AQRVPAGGGAQ
1278	AQRVSATQTAQ
1279	AQRVVGGLTAQ
1280	AQSALHVSGAQ
1281	AQSASLGGYAQ
1282	AQSASLRSDAQ
1283	AQSAVVRSGAQ
1284	AQSDMPRTFAQ
1285	AQSDTRSMSAQ
1286	AQSFNHGATAQ
1287	AQSFTRIPPAQ
1288	AQSGNFSGGAQ
1289	AQSGSALHGAQ
1290	AQSGSRLLDAQ
1291	AQSGSSRDMAQ
1292	AQSGSSRPSAQ
1293	AQSGSYSTVAQ
1294	AQSHEKFLYAQ

TABLE 3-continued

Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
1295	AQSHSASREAQ
1296	AQSHSNTGNAQ
1297	AQSIPGKGMAQ
1298	AQSIRSQLPAQ
1299	AQSISAGRVAQ
1300	AQSISGRSDAQ
1301	AQSISGRVGAQ
1302	AQSISRQSEAQ
1303	AQSISRSGYAQ
1304	AQSLAAEFWAQ
1305	AQSLDPLGLAQ
1306	AQSLIHSIWAQ
1307	AQSLNRVVEAQ
1308	AQSLQRSVDAQ
1309	AQSLSRDGTAQ
1310	AQSLVKSGQAQ
1311	AQSMSRLNEAQ
1312	AQSNTLRNVAQ
1313	AQSNYVRSPAQ
1314	AQSPRSNVTAQ
1315	AQSPRSSIGAQ
1316	AQSPVAPNWAQ
1317	AQSQALRADAQ
1318	AQSQGVRVPAQ
1319	AQSQKMLHGAQ
1320	AQSQPGPFNAQ
1321	AQSQSAKGPAQ
1322	AQSRGQTTDAQ
1323	AQSRGSETTAQ
1324	AQSRISNVSAQ
1325	AQSRQTGLTAQ
1326	AQSRSQATDAQ
1327	AQSRSTDTGAQ
1328	AQSRVGLSTAQ
1329	AQSSAGKSPAQ
1330	AQSSAGRTGAQ

TABLE 3-continued

Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
1331	AQSSATVREAQ
1332	AQSSDSRSSAQ
1333	AQSSGISRDAQ
1334	AQSSGPIILAQ
1335	AQSSHSANMAQ
1336	AQSSIVRQEAQ
1337	AQSSQNVSGAQ
1338	AQSSQRGHEAQ
1339	AQSSSSRGPAQ
1340	AQSSTVRNAAQ
1341	AQSSVTHSSAQ
1342	AQSSYQSNGAQ
1343	AQSTAARPVAQ
1344	AQSTGHNTQAQ
1345	AQSTGSSTSAQ
1346	AQSTGTPNWAQ
1347	AQSTHIARDAQ
1348	AQSTIVYREAQ
1349	AQSTMQNRIAQ
1350	AQSTNHGNNAQ
1351	AQSTQIHAGAQ
1352	AQSTQLRSGAQ
1353	AQSTRALQPAQ
1354	AQSTRSSDSAQ
1355	AQSTRTAPEAQ
1356	AQSTSNRPAAQ
1357	AQSTSPPRPAQ
1358	AQSTSRLPAAQ
1359	AQSTSSHTPAQ
1360	AQSTSSRTSAQ
1361	AQSTSSRTTAQ
1362	AQSTTSAPGAQ
1363	AQSTVTAVGAQ
1364	AQSVGELPFAQ
1365	AQSVPAKGSAQ
1366	AQSVRAGLNAQ

TABLE 3-continued

Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
1367	AQSVRSPVTAQ
1368	AQSVRSSDYAQ
1369	AQSVTRTVAAQ
1370	AQSVYSHSSAQ
1371	AQSYAPQLLAQ
1372	AQSYSNRSVAQ
1373	AQTAAVRSGAQ
1374	AQTALKAVGAQ
1375	AQTANTRAEAQ
1376	AQTASQLSAAQ
1377	AQTDRITISAQ
1378	AQTDTRHATAQ
1379	AQTERNTASAQ
1380	AQTFHAVKEAQ
1381	AQTGSLAHGAQ
1382	AQTIGMRSAAQ
1383	AQTINKPNAAQ
1384	AQTISNSSGAQ
1385	AQTITRGTDAQ
1386	AQTLQNVNYAQ
1387	AQTLSSSREAQ
1388	AQTMGRNVSAQ
1389	AQTQGNRTDAQ
1390	AQTQHSTQSAQ
1391	AQTQSAYGSAQ
1392	AQTQSLRHDAQ
1393	AQTQTDRHSAQ
1394	AQTQTNIGRAQ
1395	AQTRHSSSDAQ
1396	AQTRSSSEAAQ
1397	AQTRSTIQEAQ
1398	AQTSATYSGAQ
1399	AQTSGTRHEAQ
1400	AQTSHAPNNAQ
1401	AQTSHSSSVAQ
1402	AQTSHVSSAAQ

TABLE 3-continued

Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
1403	AQTSILRNEAQ
1404	AQTSNSSGQAQ
1405	AQTSNYGATAQ
1406	AQTSQSRVEAQ
1407	AQTSRANDTAQ
1408	AQTSRSNETAQ
1409	AQTSTPNKIAQ
1410	AQTSYSTTTAQ
1411	AQTTARNLEAQ
1412	AQTTGILRDAQ
1413	AQTTGTPRPAQ
1414	AQTTGYSQAAQ
1415	AQTTIRNAVAQ
1416	AQTTNITRTAQ
1417	AQTTSMGKVAQ
1418	AQTTSMSGHAQ
1419	AQTTSPKLPAQ
1420	AQTTSSSYNAQ
1421	AQTTSTHNAAQ
1422	AQTTSVRSTAQ
1423	AQTTTAGKVAQ
1424	AQTTTKFTPAQ
1425	AQTVITASGAQ
1426	AQTVQSHSTAQ
1427	AQTVSSGRPAQ
1428	AQTYNATRSAQ
1429	AQVAGRNVSAQ
1430	AQVAGTSQGAQ
1431	AQVAGYSRDAQ
1432	AQVATPSFLAQ
1433	AQVFTNRSAAQ
1434	AQVGHGSLPAQ
1435	AQVGSYSRDAQ
1436	AQVGTLSSSAQ
1437	AQVGVNVHGAQ
1438	AQVIRGLEQAQ

TABLE 3-continued

Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
1439	AQVISRDSSAQ
1440	AQVISSHHSAQ
1441	AQVKANQATAQ
1442	AQVLHASMSAQ
1443	AQVLHGSSYAQ
1444	AQVLRSNVMAQ
1445	AQVNLPVLLAQ
1446	AQVPGHSGLAQ
1447	AQVPGQSSLAQ
1448	AQVPRSSTDAQ
1449	AQVPRTGLTAQ
1450	AQVPTSHSTAQ
1451	AQVQSHGVNAQ
1452	AQVQYGGLTAQ
1453	AQVRGLYSDAQ
1454	AQVRHSGMEAQ
1455	AQVRPPNPSAQ
1456	AQVRSTLTDAQ
1457	AQVRSVGLDAQ
1458	AQVRTPLFAAQ
1459	AQVRTSYSDAQ
1460	AQVSGIRGDAQ
1461	AQVSGRSLSAQ
1462	AQVSNSYLGAQ
1463	AQVSNTYSGAQ
1464	AQVSRSESAAQ
1465	AQVSSYPNSAQ
1466	AQVTGLRGIAQ
1467	AQVTHASLSAQ
1468	AQVTQLGRSAQ
1469	AQVTRSAGEAQ
1470	AQVTSKNDLAQ
1471	AQVTTKTQLAQ
1472	AQVVANTSRAQ
1473	AQVVGSNREAQ
1474	AQVVRSGNEAQ

TABLE 3-continued

Heart Sequences	
SEQ ID NO:	AA sequence (#587-597)
1475	AQVVRSVNDAQ
1476	AQVVRTPNSAQ
1477	AQWGSHPTGAQ
1478	AQWLKSVSSAQ
1479	AQWRHTSAEAQ
1480	AQYAGNSGNAQ
1481	AQYASSSNNAQ
1482	AQYERNHNAAQ
1483	AQYKSSLSEAQ
1484	AQYLHGLQQAQ
1485	AQYNQIRGDAQ
1486	AQYNSSNFGAQ
1487	AQYPGNRMEAQ
1488	AQYRNTVQDAQ
1489	AQYRQSSSDAQ
1490	AQYRSGTQEAQ
1491	AQYTGSISVAQ
1492	AQYTSSVTGAQ
1493	AQYVASSPMAQ
1494	AQYVGSGTAAQ
1495	AQYVHSNNAAQ
1496	AQYYSSSGGAQ

DETAILED DESCRIPTION OF THE DISCLOSURE

[0013] In certain aspects the disclosure provides modified rAAVs with increased expression levels in the brain, heart, or brain and heart when compared to a parent AAV (e.g., AAV9).

[0014] In certain aspects, the disclosure provides rAAVs with a peptide insertion and or substitution comprising or consisting of an amino-acid sequence set forth in any one of Tables 1-3.

[0015] In certain embodiments, the parental AAV is AAV9. In some embodiments, the parental AAV comprises SEQ ID NO: 1. In various embodiments, the AAV capsid protein comprises a 7-mer insertion inserted into the parental AAV between amino acid 588 and amino acid 589 of the parent AAV, wherein positions 587-597 of the mutant AAV capsid protein (with AA position numbering including the insertion) are selected from the sequence provided in Tables 1-3 or selected from the group consisting of SEQ ID NO: 2-1496.

[0016] Generally, the insertion comprises a seven-amino acid sequence (7-mer) that is inserted or substituted at the 588 loop in a parental AAV capsid protein. Aspects provided herein provide amino acid insertions comprising seven amino acid polymer (7-mer) inserted at AA588-589 to produce an eleven amino acid polymer (11-mer) at the 588 loop of a parental AAV capsid protein.

[0017] Also disclosed herein are methods and kits for producing therapeutic recombinant AAV (rAAV) particles, as well as methods and pharmaceutical compositions or formulations comprising the rAAV particles, for the treatment of a disease or condition affecting the brain, heart, or brain and heart.

[0018] Disclosed herein are AAV capsids engineered with increased viral transduction in the brain, heart, or brain and heart. Disclosed further herein AAV capsids engineered with increased viral transduction in the heart. Advantageously, disclosed herein are AAV capsids engineered with increased viral transduction in the brain, heart, or brain and heart.

[0019] The AAV capsids can encapsidate a viral vector with a heterologous nucleic acid encoding, for example, a therapeutic gene expression product. Transduction of the heterologous nucleic acid in the brain, heart, or brain and heart can be achieved upon systemic delivery to a subject of the AAV capsid of the present disclosure encapsidating a heterologous nucleic acid. The AAV capsids disclosed herein are advantageous for many applications of gene therapy to treat human disease, including, but not limited to, disorders of the brain and/or heart.

[0020] The recombinant AAV vectors comprising a nucleic acid sequence encoding the AAV capsid proteins of the present disclosure as also provided herein. For example, the viral vectors of the present disclosure comprise a nucleic acid sequence comprising the AAV viral Cap (Capsid) encoding VP1, VP2, and VP3, at least one of which is modified to produce the AAV capsid proteins of the present disclosure. The recombinant AAV vector provided can be derived from an AAV serotype (e.g., AAV9) or a variant AAV serotype including an insertion of the present invention.

AAV Capsids

[0021] Provided herein are modified adeno-associated (AAV) virus capsid compositions useful for integrating a transgene into a target cell or environment (in a subject when they are administered systemically to the subject.

[0022] An rAAV comprises an AAV capsid that can be engineered to encapsidate a heterologous nucleic acid (e.g., therapeutic nucleic acid, gene editing machinery). The AAV capsid is made up of three AAV capsid protein monomers, VP1, VP2, and VP3. Sixty copies of these three VP proteins interact in a 1:1:10 ratio to form the viral capsid. VP1 covers the whole of VP2 protein in addition to a ~137 amino acid N-terminal region (VP1u), VP2 covers the whole of VP3 in addition to ~65 amino acid N-terminal region (VP1/2 common region). The three capsid proteins share a conserved amino acid sequence of VP3, which in some cases is the region beginning at amino acid position 138 (e.g., AA139-736).

[0023] While not wishing to be bound by theory, it is understood that a parent AAV capsid sequence comprises a VP1 region. In certain embodiments, a parent AAV capsid sequence comprises a VP1, VP2 and/or VP3 region, or any combination thereof. A parent VP1 sequence may be considered synonymous with a parent AAV capsid sequence.

[0024] The AAV VP3 structure contains highly conserved regions that are common to all serotypes, a core eight-stranded β-barrel motif (βB-βI) and a small α-helix (αA). The loop regions inserted between the β-strands consist of the distinctive HI loop between β-strands H and I, the DE loop between β-strands D and E, and nine variable regions (VRs), which form the top of the loops. These VRs, such as the AA588 loop, are found on the capsid surface and can be associated with specific functional roles in the AAV life cycle including receptor binding, transduction and antigenic specificity.

[0025] In some aspects, the rAAV variant of the present invention comprises an AAV capsid protein having a peptide insertion at the residues corresponding to amino acids 588-589 of the AAV9 native sequence of SEQ ID NO: 1.

[0026] The AAV capsids comprise AAV capsid proteins (e.g., VP1, VP2, and VP3), each with an insertion, such as in the 588 loop of a parental AAV capsid protein structure (AAV9 VP1 numbering). The 588 loop contains the site of heparan sulfate binding of AAV2 and is amenable to peptide display. The only known receptors for AAV9 is N-linked terminal galactose and AAV receptor (AAVR), but many indications point toward there being others. Modifications to AAV9 588 loop are shown herein to confer an increased transgene transduction in target in vivo environments.

[0027] The present invention provides, in an aspect, a peptide insertion at the AAV 588 loop comprising or consisting of an amino-acid sequence set forth in any one of Tables 1-3.

[0028] Disclosed herein are AAV capsids comprising AAV capsid proteins with an insertion at the 588 loop that confer a higher transduction in brain cell types (e.g., brain endothelial cells, neurons, astrocytes) and/or heart cell types (e.g., cardiomyocytes, vascular cells, stromal cells, mesothelial cells). In particular, the AAV capsid proteins disclosed herein enable rAAV-mediated transduction of a heterologous nucleic acid (e.g., transgene) in the brain, heart, or brain and heart of a subject. The AAV capsids of the present disclosure may be formulated as a pharmaceutical composition. In addition, the AAV capsids can be isolated and purified to be used for a variety of applications.

[0029] In some embodiments, the rAAV capsid of the present disclosure are generated using the methods disclosed herein. In some instances, the rAAV capsid is chimeric. In some instances, the rAAV, or variant AAV protein comprises therein, confer an increase in a localization of the rAAV within the target tissue, as compared to the parental AAV capsid or capsid protein.

AAV Capsid Proteins

[0030] Disclosed herein are recombinant AAV (rAAV) capsids which comprise AAV capsid proteins that are engineered with a modified capsid protein (e.g., VP1, VP2, VP3). In some embodiments, the rAAV capsid proteins of the present disclosure are generated using the methods disclosed herein. In some embodiments, the AAV capsid proteins are used in the methods of delivering a therapeutic nucleic acid (e.g., a transgene) to a subject. In some instances, the rAAV capsid proteins have desired AAV expression rendering them particularly suitable for certain therapeutic applications, e.g., the treatment of a disease or disorder in a subject such as those disclosed herein.

[0031] The rAAV capsid proteins may be engineered for optimized expression in the CNS, for example the brain, of a subject upon systemic administration of the rAAV to the subject. The rAAV capsid proteins are engineered to include the insertions provided in Tables 1-2. The rAAV capsid proteins including the insertions provided in Tables 1-2 are engineered to achieve efficient transduction of an encapsidated transgene. In particular, the rAAV capsid proteins have increased expression in the brain of a subject.

[0032] The rAAV capsid proteins may also be engineered for optimized expression in the heart of a subject upon systemic administration of the rAAV to the subject. The rAAV capsid proteins are engineered to include the insertions provided in Tables 2-3. The rAAV capsid proteins including the insertions provided in Tables 2-3 are engineered to achieve efficient transduction of an encapsidated transgene. In particular, the rAAV capsid proteins have increased expression in the heart of a subject.

[0033] The rAAV capsid proteins may also be engineered for optimized expression in the brain and heart of a subject upon systemic administration of the rAAV to the subject. The rAAV capsid proteins are engineered to include the insertions provided in Table 2. The rAAV capsid proteins including the insertions provided in Table 2 are engineered to achieve efficient transduction of an encapsidated transgene. In particular, the rAAV capsid proteins have increased expression in the brain and heart of a subject.

[0034] The engineered AAV capsid proteins described herein have, in some cases, an insertion of an amino acid that is heterologous to the parental AAV capsid protein at amino acid positions in the 588 loop. In some embodiments, the amino acid is not endogenous to the parental AAV capsid protein at the amino acid position of the insertion. The amino acid may be a naturally occurring amino acid in the same or equivalent amino acid position as the insertion of the substitution in a different AAV capsid protein.

[0035] The 7-mers described herein were advantageously generated using polymerase chain reaction (PCR) with degenerate primers, where each of the seven amino acids is encoded by a deoxyribose nucleic acid (DNA) sequence. This method of generating random 7-mer amino acid sequences enables sampling of the 207 (1.28 billion) possible 7mer amino acid combinations at the protein level.

[0036] The rAAV capsid proteins of the present disclosure comprise an insertion of an amino acid in an amino acid sequence of an AAV capsid protein. The AAV capsid, from which an engineered AAV capsid protein of the present disclosure is produced, is referred to as a "parental" AAV capsid. The complete genome of AAV-1 is provided in GenBank Accession No. NC_002077; the complete genome of AAV-2 is provided in GenBank Accession No. NC_001401 and Srivastava et al., J. Virol., 45:555-564 (1983); the complete genome of AAV-3 is provided in GenBank Accession No. NC_1829; the complete genome of AAV-4 is provided in GenBank Accession No. NC_001829; the AAV-5 genome is provided in GenBank Accession No. AF085716; the complete genome of AAV-6 is provided in GenBank Accession No. NC_00 1862; at least portions of AAV-7 and AAV-8 genomes are provided in GenBank Accession Nos. AX753246 and AX753249, respectively; the AAV-9 genome is provided in Gao et al., J. Virol., 78:6381-6388 (2004); the AAV-10 genome is provided in Mol. Ther., 13 (1): 67-76 (2006); the AAV-11 genome is provided in Virology, 330(2): 375-383 (2004); portions of the AAV-12 genome are provided in Genbank Accession No. DQ813647; portions of the AAV-13 genome are provided in Genbank Accession No. EU285562.

[0037] In some cases, the parental AAV is derived from an AAV with a serotype selected from AAV1, AAV2, AAV3, AAV4, AAV5, AAV6, AAV7, AAV8, AAV9, AAV10, AAV11 and AAV12. The AAV capsid protein that is "derived" from another may be a variant AAV capsid protein. A variant may include, for example, a heterologous amino acid in an amino acid sequence of the AAV capsid protein. The heterologous amino acid may be non-naturally occurring in the AAV capsid protein. The heterologous amino acid may be naturally occurring in a different AAV capsid protein. In some instances, the parental AAV capsid is described in US Pat Publication 2020/0165576 and U.S. Pat. App. Ser. No. 62/832,826 and PCT/US20/20778; the content of each of which is incorporated herein.

[0038] In some instances, the parental AAV is AAV9. In some instances, the amino acid sequence of the AAV9 capsid protein comprises SEQ ID NO: 1. The amino acid sequence of AAV9 VP1 capsid protein is provided in SEQ ID NO: 1

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(MAADGYLPDWLEDNLSEGIREWWALKPGAPQPKANQQHQDNARGLVLP
GYKYLGPGNGLDKGEPVNAADAAALEHDKAYDQQLKAGDNPYLKYNHAD
AEFQERLKEDTSFGGNLGRAVFQAKKRLLEPLGLVEEAAKTAPGKKRPV
EQSPQEPDSSAGIGKSGAQPAKKRLNFGQTGDTESVPDPQPIGEPPAAP
SGVGSLTMASGGGAPVADNNEGADGVGSSSGNWHCDSQWLGDRVITTST
RTWALPTYNNHLYKQISNSTSGGSSNDNAYFGYSTPWGYFDFNRFHCHF
SPRDWQRLINNNWGFRPKRLNFKLFNIQVKEVTDNNGVKTIANNLTSTV
QVFTDSDYQLPYVLGSAHEGCLPPFPADVFMIPQYGYLTLNDGSQAVGR
SSFYCLEYFPSQMLRTGNNFQFSYEFENVPFHSSYAHSQSLDRLMNPLI
DQYLYYLSKTINGSGQNQQTLKFSVAGPSNMAVQGRNYIPGPSYRQQRV
STTVTQNNNSEFAWPGASSWALNGRNSLMNPGPAMASHKEGEDRFFPLS
GSLIFGKQGTGRDNVDADKVMITNEEEIKTTNPVATESYGQVATNHQSA
QAQAQTGWVQNQGILPGMVWQDRDVYLQGPIWAKIPHTDGNFHPSPLMG
GFGMKHPPPQILIKNTPVPADPPTAFNKDKLNSFITQYSTGQVSVEIEW
ELQKENSKRWNPEIQYTSNYYKSNNVEFAVNTEGVYSEPRPIGTRYLTR
NL).
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[0039] In some instances, the parental AAV capsid protein sequence is 70%, 75%, 80%, 85%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98%, 99%, or 100% homologous to SEQ ID NO: 1.

[0040] AAV capsid proteins from native AAV serotypes, such as AAV9, with tropisms including the liver activate the innate immune response, which in some cases causes a severe inflammatory response in a subject, which can lead to multi-organ failure. By improving transduction of a native AAV serotype for a target in vivo tissue (e.g., brain and/or heart) the rAAV particles of the present disclosure reduce the immunogenic properties of AAV-mediated transgene delivery and prevent activation of the innate immune response. Moreover, with increased transduction efficiency, the amount of the AAV composition needed to be delivered for effective transgene expression can be reduced. By reducing

the total volume of the transgene delivered, off-target delivery and expression of the transgene is reduced.

[0041] In some instances, the parental AAV capsid protein comprises the entire VP1 region provided in SEQ ID NO: 1 (e.g., amino acids 1-736). In some instances, the parental AAV capsid protein comprises amino acids 217-736 in SEQ ID NO: 1, which is the common region found in VP1, VP2 and VP3 AAV9 capsid proteins. In some instances, the AAV capsid protein comprises amino acids 64-736 in SEQ ID NO: 1, which is the common region found in VP1 and VP2. The parental AAV capsid protein sequence may comprise amino acids selected from 1-736, 10-736, 20-736, 30-736, 40-736, 50-736, 60-736, 70-736, 80-736, 90-736, 100-736, 110-736, 120-736, 130-736, 140-736, 150-736, 160-736, 170-736, 180-736, 190-736, 200-736, 210-736, 220-736, 230-736, 240-736, 250-736, 260-736, 270-736, 280-736, 290-736, 300-736, 310-736, 320-736, 330-736, 340-736, 350-736, 360-736, 370-736, 380-736, 390-736, 400-736, 410-736, 420-736, 430-736, 440-736, and 450-736, from SEQ ID NO: 1. In some aspects, the rAAV variant comprises an AAV capsid protein comprising an amino acid sequence that is at least 98% identical to amino acid 217 to amino acid 736 of SEQ ID NO: 1. In some instances, the amino acid insertion is at a three (3)-fold axis of symmetry of a corresponding parental AAV capsid protein.

[0042] Disclosed herein are insertions of an amino acid sequence in an AAV capsid protein. Where the sequence numbering designation "588-589" is noted for AAV9, for example AAV VP1, the invention also includes insertions in similar locations in the other AAV serotypes. As used herein, "AA588-589" indicates that the insertion of the amino acid (or amino acid sequence) is immediately after an amino acid (AA) at position 588 and immediately before an AA at position 589 within an amino acid sequence of a parental AAV VP capsid protein (VP1 numbering). Amino acids 587-591 include a motif comprising "AQAQA" as set forth in SEQ ID NO: 1. It is envisioned that the sequences disclosed herein (Tables 1-3) may be inserted at AA588-589 in an amino acid sequence of a parental AAV9 capsid protein, a variant thereof, or equivalent amino acid position of a parental AAV of a different serotype (e.g., AAV1, AAV2, AAV3, and the like). In certain embodiments, the aforementioned "AQAQ" sequence flanking the insertion may include one or more substitutions.

[0043] The insertions described herein may, in some cases, comprise a 7-mer insertion at AA588-589.

[0044] Disclosed herein are AAV capsid proteins with an insertion described above in a parental AAV capsid protein that confers an increased transduction in the brain, heart, or brain and heart in a subject, even when delivered systemically. One of the many advantages of the AAV capsid proteins described herein is their ability to target tissue and cells within the brain, heart, or brain and heart. The tissue can be the brain, heart, or brain and heart.

[0045] Non-limiting examples of brain cells include a neuron and a glial cell. Glial cells can be selected from an oligodendrocyte, an ependymal cell, an astrocyte and a microglia.

[0046] Non-limiting examples of heart cells include cardiomyocytes, vascular cells, stromal cells, mesothelial cells

[0047] In some instances, the AAV capsid protein comprises an insertion/substitution of at least or about seven, eight, nine, ten or eleven amino acids of an amino acid sequence of Tables 1-3 at an amino acid position 588-589 in a parental AAV9 capsid protein (SEQ ID NO: 1).

[0048] In some cases, the AAV capsid protein has an increased viral transduction enrichment in brain, heart, or brain and heart.

[0049] The rAAV capsid proteins described herein may be isolated and purified. The AAV may be isolated and purified by methods standard in the art such as by column chromatography, iodixanol gradients, or cesium chloride gradients. Methods for purifying AAV from helper virus are known in the art and may include methods disclosed in, for example, Clark et al., Hum. Gene Ther., 10 (6): 1031-1039 (1999); Schenpp and Clark, Methods Mol. Med., 69:427-443 (2002); U.S. Pat. No. 6,566,118 and WO 98/09657.

[0050] In addition, the AAV capsid proteins disclosed herein, either isolated and purified, or not, may be formulated into a pharmaceutical formulation, which in some cases, further comprises a pharmaceutically acceptable carrier.

[0051] The rAAV capsid protein can be conjugated to a nanoparticle, a second molecule, or a viral capsid protein. In some cases, the nanoparticle or viral capsid protein would encapsidate the therapeutic nucleic acid described herein. In some instances, the second molecule is a therapeutic agent, e.g., a small molecule, antibody, antigen-binding fragment, peptide, or protein, such as those described herein.

[0052] "Percent Identity" is the percent of the symbols that actually match. Percent Similarity is the percent of the symbols that are similar. Symbols that are across from gaps are ignored. A similarity is scored when the scoring matrix value for a pair of symbols is greater than or equal to 0.50, the similarity threshold. The scoring matrix used in Version 10 of the Wisconsin Genetics Software Package is BLOSUM62 (see: Henikoff and Henikoff, (1989) Proc. Natl. Acad. Sci. USA 89:10915).

[0053] Sequence identity/similarity values provided herein can refer to the value obtained using the BLAST+ 2.5.0 suite of programs using default settings (blast.ncbi.nlm.nih.gov) (Camacho, C., et al. (2009) BLAST+: architecture and applications. BMC Bioinformatics 10:421).

[0054] As those of ordinary skill in the art will understand, BLAST searches assume that proteins can be modeled as random sequences. However, many real proteins comprise regions of nonrandom sequences, which may be homopolymeric tracts, short-period repeats, or regions enriched in one or more amino acids. Such low-complexity regions may be aligned between unrelated proteins even though other regions of the protein are entirely dissimilar. A number of low-complexity filter programs can be employed to reduce such low-complexity alignments. For example, the SEG (Wooten and Federhen, (1993) Comput. Chem. 17:149-63) and XNU (Ci-ayerie and States (1993) Comput. Chem. 17:191-201) low-complexity filters can be employed alone or in combination.

[0055] The terms "substantial identity" and "substantially identical" indicate that a polypeptide or nucleic acid comprises a sequence with between 55-100% sequence identity to a reference sequence, with at least 55% sequence identity, or at least 60%, or at least 65%, or at least 70%, or at least 75%, or at least 80%, or at least 85%, or at least 90%, or at least 95%, or at least 99% sequence identity or any percentage of value within the range of 55-100% sequence identity relative to the reference sequence. The percent sequence identity may occur over a specified comparison window.

Optimal alignment may be ascertained or conducted using the homology alignment algorithm of Needleman and Wunsch, supra.

[0056] For example, the insertion sequences may include, but are not limited to, sequences that are not exactly the same as the sequences disclosed herein, but which have, in addition to the substitutions explicitly described for various sequences listed herein, additional substitutions of amino acid residues which substantially do not impair the activity or properties of the sequences described herein, such as those predicted by homology software e.g. BLOSUM62 matrices.

AAV Particles

[0057] The rAAV particles with the insertion sequences described herein have an increased transduction enrichment in the brain, heart, or brain and heart. In some instances, the increased transduction enrichment comprises a 1-fold, 2-fold, 3-fold, 4-fold, 5-fold, 6-fold, 7-fold, 8-fold, 9-fold or 10-fold increase, or more. In some instances, the increased transduction enrichment is at least 1-fold. In some instances, the increased transduction enrichment is at least 2-fold. In some instances, the increased transduction enrichment is at least 4-fold.

[0058] The rAAV particles with the insertion sequences described herein have an increased expression enrichment in the brain. Detecting whether a rAAV possesses more or less specificity for a target in vivo environment, includes measuring a level of gene expression product (e.g., RNA or protein) expressed from the heterologous nucleic acid encapsidated by the rAAV in a tissue sample obtained from a subject. Suitable methods for measuring expression of a gene expression product include next-generation sequencing (NGS) and quantitative polymerase chain reaction (qPCR).

[0059] The increased expression in the brain, heart, or brain and heart is represented by the enrichment values provided in Tables 1-3

Heterologous Nucleic Acids

[0060] Disclosed herein are therapeutic nucleic acids useful for the treatment or prevention of a disease or condition, or symptom of the disease or condition. In some embodiments, the therapeutic nucleic acids encode a therapeutic gene expression product. Non-limiting examples of gene expression products include proteins, polypeptides, peptides, enzymes, antibodies, antigen binding fragments, nucleic acid (RNA, DNA, antisense oligonucleotide, siRNA, and the like), and gene editing components, for use in the treatment, prophylaxis, and/or amelioration of the disease or disorder, or symptoms of the disease or disorder. In some instances, the therapeutic nucleic acids are placed in an organism, cell, tissue or organ of a subject by way of a rAAV, such as those disclosed herein.

[0061] Disclosed herein are rAAVs, each comprising a viral vector (e.g., a single stranded DNA molecule (ssDNA)). In some instances, the viral vector comprises two inverted terminal repeat (ITR) sequences that are about 145 bases each, flanking a transgene. In some embodiments, the transgene comprises a therapeutic nucleic acid, and in some cases, a promoter in cis with the therapeutic nucleic acid in an open reading frame (ORF). The promoter is capable of initiating transcription of therapeutic nucleic acid in the nucleus of the target cell. The ITR sequences can be from any AAV serotype. Non-limiting examples of AAV serotypes include AAV1, AAV2, AAV3, AAV4, AAV5, AAV6, AAV7, AAV8, AAV9, AAV10, AAV11, and AAV12. In some cases, an ITR is from AAV2. In some cases, an ITR is from AAV9.

[0062] Disclosed herein are transgenes that can comprise any number of nucleotides. In some cases, a transgene can comprise less than about 100 nucleotides. In some cases, a transgene can comprise at least about 100 nucleotides. In some cases, a transgene can comprise at least about 200 nucleotides. In some cases, a transgene can comprise at least about 300 nucleotides. In some cases, a transgene can comprise at least about 400 nucleotides. In some cases, a transgene can comprise at least about 500 nucleotides. In some cases, a transgene can comprise at least about 1000 nucleotides. In some cases, a transgene can comprise at least about 5000 nucleotides. In some cases, a transgene can comprise over 5,000 nucleotides. In some cases, a transgene can comprise between about 500 and about 5000 nucleotides. In some cases, a transgene comprises about 5000 nucleotides. In any of the cases disclosed herein, the transgene can comprise DNA, RNA, or a hybrid of DNA and RNA. In some cases, the transgene can be single stranded. In some cases, the transgene can be double stranded.

[0063] Disclosed herein are transgenes useful for modulating the expression or activity of a target gene or gene expression product thereof. In some instances, the transgene is encapsidated by an rAAV capsid protein of an rAAV particle described herein. In some instances, the rAAV particle is delivered to a subject to treat a disease or condition disclosed herein in the subject. In some instances, the delivery is systemic.

[0064] The transgenes disclosed herein are useful for expressing an endogenous gene at a level similar to that of a healthy or normal individual. This is particularly useful in the treatment of a disease or condition related to the underexpression, or lack of expression, of a gene expression product. In some embodiments, the transgenes disclosed herein are useful for overexpressing an endogenous gene, such that an expression level of the endogenous gene is above the expression level of a healthy or normal individual. Additionally, transgenes can be used to express exogenous genes (e.g., active agent such as an antibody, peptide, nucleic acid, or gene editing components). In some embodiments, the therapeutic gene expression product is capable of altering, enhancing, increasing, or inducing the activity of one or more endogenous biological processes in the cell. In some embodiments, the transgenes disclosed herein are useful for reducing expression of an endogenous gene, for example, a dominant negative gene. In some embodiments, the therapeutic gene expression product is capable of altering, inhibiting, reducing, preventing, eliminating, or impairing the activity of one or more endogenous biological processes in the cell. In some aspects, the increase of gene expression refers to an increase by at least about 20%, 30%, 40%, 50%, 60%, 70%, 80%, 85%, 90%, 95% and 100%. In certain aspects, the protein product of the targeted gene may be increased by at least about 20%, 30%, 40%, 50%, 60%, 70%, 80%, 85%, 90%, 95% and 100%. In some aspects, the decrease of gene expression refers to an increase by at least about 20%, 30%, 40%, 50%, 60%, 70%, 80%, 85%, 90%, 95% and 100%. In certain aspects, the protein product of the targeted gene may be decreased by at least about 20%, 30%, 40%, 50%, 60%, 70%, 80%, 85%, 90%, 95% and 100%.

[0065] When endogenous sequences (endogenous or part of a transgene) are expressed with a transgene, the endogenous sequences can be full-length sequences (wild-type or mutant) or partial sequences. The endogenous sequences can be functional. Non-limiting examples of the function of these full length or partial sequences include increasing the serum half-life of the polypeptide expressed by a transgene (e.g., therapeutic gene) and/or acting as a carrier.

[0066] A transgene can be inserted into an endogenous gene such that all, some or none of the endogenous gene is expressed. For example, a transgene as described herein can be inserted into an endogenous locus such that some (N-terminal and/or C-terminal to a transgene) or none of the endogenous sequences are expressed, for example as a fusion with a transgene. In other cases, a transgene (e.g., with or without additional coding sequences of the endogenous gene) is integrated into any endogenous locus, for example a safe-harbor locus. For example, a Frataxin (FXN) transgene can be inserted into an endogenous FXN gene. A transgene can be inserted into any gene, e.g., the genes as described herein.

[0067] At least one advantage of the present disclosure is that virtually any therapeutic nucleic acid may be used to express any therapeutic gene expression product. In some instances, the therapeutic gene expression product is a therapeutic protein or a peptide (e.g., antibody, antigen-binding fragment, peptide, or protein). In one embodiment the protein encoded by the therapeutic nucleic acid is between 50-5000 amino acids in length. In some embodiments the protein encoded is between 50-2000 amino acids in length. In some embodiments the protein encoded is between 50-1000 amino acids in length. In some embodiments the protein encoded is between 50-1500 amino acids in length. In some embodiments the protein encoded is between 50-800 amino acids in length. In some embodiments the protein encoded is between 50-600 amino acids in length. In some embodiments the protein encoded is between 50-400 amino acids in length. In some embodiments the protein encoded is between 50-200 amino acids in length. In some embodiments the protein encoded is between 50-100 amino acids in length. In some embodiments the peptide encoded is between 4-50 amino acids in length. In some embodiments, the protein encoded is a tetrapeptide, a pentapeptide, a hexapeptide, a heptapeptide, an octapeptide, a nonapeptide, or a decapeptide. In some embodiments, the protein encoded comprises a peptide of 2-30 amino acids, such as for example 5-30, 10-30, 2-25, 5-25, 10-25, or 10-20 amino acids. In some embodiments, the protein encoded comprises a peptide of at least 11, 12, 13, 14, 15, 17, 20, 25 or 30 amino acids, or a peptide that is no longer than 50 amino acids, e.g. no longer than 35, 30, 25, 20, 17, 15, 14, 13, 12, 11 or 10 amino acids.

[0068] Non-limiting examples of therapeutic protein or peptides include an adrenergic agonist, an anti-apoptosis factor, an apoptosis inhibitor, a cytokine receptor, a cytokine, a cytotoxin, an erythropoietic agent, a glutamic acid decarboxylase, a glycoprotein, a growth factor, a growth factor receptor, a hormone, a hormone receptor, an interferon, an interleukin, an interleukin receptor, a kinase, a kinase inhibitor, a nerve growth factor, a netrin, a neuroactive peptide, a neuroactive peptide receptor, a neurogenic factor, a neurogenic factor receptor, a neuropilin, a neurotrophic factor, a neurotrophin, a neurotrophin receptor, an N-methyl-D-aspartate antagonist, a plexin, a protease, a protease inhibitor, a protein decarboxylase, a protein kinase, a protein kinsase inhibitor, a proteolytic protein, a proteolytic protein inhibitor, a semaphoring, a semaphorin receptor, a serotonin transport protein, a serotonin uptake inhibitor, a serotonin receptor, a serpin, a serpin receptor, and a tumor suppressor. In certain embodiments, the therapeutic protein or peptide is selected from brain-derived neurotrophic factor (BDNF), ciliary neurotrophic factor (CNTF), macrophage colony-stimulating factor (CSF), epidermal growth factor (EGF), fibroblast growth factor (FGF), gonadotropin, interferon-gamma (IFN), insulin-like growth factor 1 (IFG-1), nerve growth factor (NGF), platelet-derived growth factor (PDGF), pigment epithelium-derived factor (PEDF), transforming growth factor (TGF), transforming growth factor-beta (TGF-B), tumor necrosis factor (TNF), vascular endothelial growth factor (VEGF), prolactin, somatotropin, X-linked inhibitor of apoptosis protein 1 (XIAP1), interleukin 1 (IL-1), IL-2, IL-3, IL-4, IL-5, IL-6, IL-7, IL-8, IL-9, IL-10, IL-10, viral IL-10, IL-11, IL-12, IL-13, IL-14, IL-15, IL-16, IL-17, and IL-18.

[0069] A therapeutic gene expression product can comprise gene editing components. Non-limiting examples of gene editing components include those required for CRISPR/Cas, artificial site-specific RNA endonuclease (ASRE), zinc finger endonuclease (ZFN), and transcription factor like effector nuclease (TALEN). In a non-limiting example, a subject having Huntington's disease is identified. The subject is then systemically administered a first amount of a rAAV encapsidating a viral vector encoding ZFN engineered to represses the transcription of the Huntingtin (HTT) gene. The rAAV will include a modified AAV capsid protein that includes an amino acid sequence provided in any one of Tables 1-3, so as to allow proper targeting of the ZFN to the brain and/or heart system. If needed, the subject is administered a second or third dose of the rAAV, until a therapeutically effective amount of the ZFN is expressed in the subject's nervous system.

[0070] A therapeutic nucleic acid can comprise a non-protein coding gene e.g., sequences encoding antisense RNAs, RNAi, shRNAs and micro RNAs (miRNAs), miRNA sponges or decoys, recombinase delivery for conditional gene deletion, conditional (recombinase-dependent) expression, includes those required for the gene editing components described herein. The non-protein coding gene may also encode a tRNA, rRNA, tmRNA, piRNA, double stranded RNA, snRNA, snoRNA, and/or long non-coding RNA (lncRNA). In some cases, the non-protein coding gene can modulate the expression or the activity of a target gene or gene expression product. For example, the RNAs described herein may be used to inhibit gene expression in the brain, heart, or brain and heart. In some cases, inhibition of gene expression refers to an inhibition by at least about 20%, 30%, 40%, 50%, 60%, 70%, 80%, 85%, 90%, 95% and 100%. In some cases, the protein product of the targeted gene may be inhibited by at least about 20%, 30%, 40%, 50%, 60%, 70%, 80%, 85%, 90%, 95% and 100%. The gene can be either a wild type gene or a gene with at least one mutation. The targeted protein may be either a wild type protein or a protein with at least one mutation.

[0071] A therapeutic nucleic acid can modulate the expression or activity of a gene or gene expression product expressed from the gene that is implicated in a disease or disorder of the brain, heart, or brain and heart. For example, the therapeutic nucleic acid, in some cases is a gene or a

modified version of the gene described herein. In some instances, the gene or gene expression product is inhibited. In some instances, the gene or gene expression product is enhanced.

[0072] In another example, the therapeutic nucleic acid comprises an effector gene expression product such as a gene editing component specific to target a gene therein. Non-limited examples of genes include target gene or gene expression product selected from ATP1A2, CACNAIA, SETD5, SHANK3, NF2, DNMT1, TCF4, RAI1, PEX1, ARSA, EIF2B5, EIF2B1, EIF2B2, NPC1, ADAR, MFSD8, STXBP1, PRICKLE2, PRRT2, IDUA, STX1B, Sarcoglycan Alpha (SGCA), glutamic acid decarboxylase 65 (GAD65), glutamic acid decarboxylase 67 (GAD67), CLN2, Nerve Growth Factor (NGF), glial cell derived neurotrophic factor (GDNF), Survival Of Motor Neuron 1, STXBP1, Telomeric (SMN1), Factor X (FIX), Retinoid Isomerohydrolase (RPE65), sarco/endoplasmic reticulum Ca2+-ATPase (SERCA2a), Glucocerebrosidase (GCase), galactocerebrosidase (GALC), CDKL5, Frataxin (FXN), Huntingtin (HTT), methyl-CpG binding protein 2 (MECP2), a peroxisomal biogenesis factor (PEX), progranulin (GRN), an anti-tubulin agent, copper-zinc superoxide dismutase (SOD1), iduronate 2 sulfatase (hIDS), Glucosylceramidase Beta (GBA), fragile X mental retardation 1 (FMR1), NPC Intracellular Cholesterol Transporter 1 (NPC1), SCN1A, C9orf72, NPS3 and a NLRP3 inflammasome. In some embodiments, the peroxisomal biogenesis factor (PEX) is selected from PEX1, PEX2, PEX3, PEX4, PEX5, PEX6, PEX7, PEX10, PEX11B, PEX12, PEX13, PEX14, PEX16, PEX19, and PEX26. In some instances, the gene or gene expression product is inhibited. In some instances, the gene or gene expression product is enhanced.

AAV Vectors

[0073] Aspects disclosed herein comprise plasmid vectors comprising a nucleic acid sequence encoding the AAV capsids and AAV capsid proteins described herein. AAV vectors described herein are useful for the assembly of a rAAV and viral packaging of a heterologous nucleic acid. In addition, an AAV vector may encode a transgene comprising the heterologous nucleic acid.

[0074] An AAV vector can comprise a transgene, which in some cases encodes a heterologous gene expression product (e.g., therapeutic gene expression product, recombinant capsid protein, and the like). The transgene is in cis with two inverted terminal repeats (ITRs) flanking the transgene. The transgene may comprise a therapeutic nucleic acid encoding a therapeutic gene expression product. Due to the limited packaging capacity of the rAAV (~5 KB), in some cases, a longer transgene may be split between two AAV vectors, the first with 3' splice donor and the second with a 5' splice acceptor. Upon co-infection of a cell, concatemers form, which are spliced together to express a full-length transgene.

[0075] A transgene is generally inserted so that its expression is driven by the endogenous promoter at the integration site, namely the promoter that drives expression of the endogenous gene into which a transgene is inserted. In some instances, a transgene comprises a promoter and/or enhancer, for example a constitutive promoter or an inducible or tissue/cell specific promoter. As a non-limiting example, the promoter may be CMV promoter, a CMV-β-Actin-intron-β-Globin hybrid promoter (CAG), CBA promoter, FRDA or FXN promoter, UBC promoter, GUSB promoter, NSE promoter, Synapsin promoter, MeCP2 promoter, GFAP promoter, H1 promoter, U6 promoter, NFL promoter, NFH promoter, SCN8A promoter, or PGK promoter. As a non-limiting example, promoters can be tissue-specific expression elements include, but are not limited to, human elongation factor 1α-subunit (EF1α), immediate-early cytomegalovirus (CMV), chicken β-actin (CBA) and its derivative CAG, the β glucuronidase (GUSB), and ubiquitin C (UBC). The transgene may include a tissue-specific expression elements for neurons such as, but not limited to, neuron-specific enolase (NSE), platelet-derived growth factor (PDGF), platelet-derived growth factor B-chain (PDGF-β), the synapsin (Syn), the methyl-CpG binding protein 2 (MeCP2), Ca2+/calmodulin-dependent protein kinase II (CaMKII), metabotropic glutamate receptor 2 (mGluR2), NFL, NFH, np32, PPE, Enk and EAAT2 promoters. The transgene may comprise a tissue-specific expression element for astrocytes such as, but not limited to, the glial fibrillary acidic protein (GFAP) and EAAT2 promoters. The transgene may comprise tissue-specific expression elements for oligodendrocytes such as, but not limited to, the myelin basic protein (MBP) promoter.

[0076] In some embodiments, the promoter is less than 1 kb. The promoter may have a length of 200, 210, 220, 230, 240, 250, 260, 270, 280, 290, 300, 310, 320, 330, 340, 350, 360, 370, 380, 390, 400, 410, 420, 430, 440, 450, 460, 470, 480, 490, 500, 510, 520, 530, 540, 550, 560, 570, 580, 590, 600, 610, 620, 630, 640, 650, 660, 670, 680, 690, 700, 710, 720, 730, 740, 750, 760, 770, 780, 790, 800 or more than 800. The promoter may have a length between 200-300, 200-400, 200-500, 200-600, 200-700, 200-800, 300-400, 300-500, 300-600, 300-700, 300-800, 400-500, 400-600, 400-700, 400-800, 500-600, 500-700, 500-800, 600-700, 600-800 or 700-800. The promoter may provide expression of the therapeutic gene expression product for a period of time in targeted tissues such as, but not limited to, the brain, heart, or brain and heart. Expression of the therapeutic gene expression product may be for a period of 1 hour, 2, hours, 3 hours, 4 hours, 5 hours, 6 hours, 7 hours, 8 hours, 9 hours, 10 hours, 11 hours, 12 hours, 13 hours, 14 hours, 15 hours, 16 hours, 17 hours, 18 hours, 19 hours, 20 hours, 21 hours, 22 hours, 23 hours, 1 day, 2 days, 3 days, 4 days, 5 days, 6 days, 1 week, 8 days, 9 days, 10 days, 11 days, 12 days, 13 days, 2 weeks, 15 days, 16 days, 17 days, 18 days, 19 days, 20 days, 3 weeks, 22 days, 23 days, 24 days, 25 days, 26 days, 27 days, 28 days, 29 days, 30 days, 31 days, 1 month, 2 months, 3 months, 4 months, 5 months, 6 months, 7 months, 8 months, 9 months, 10 months, 11 months, 1 year, 13 months, 14 months, 15 months, 16 months, 17 months, 18 months, 19 months, 20 months, 21 months, 22 months, 23 months, 2 years, 3 years, 4 years, 5 years, 6 years, 7 years, 8 years, 9 years, 10 years, 11 years, 12 years, 13 years, 14 years, 15 years, 16 years, 17 years, 18 years, 19 years, 20 years, 21 years, 22 years, 23 years, 24 years, 25 years, 26 years, 27 years, 28 years, 29 years, 30 years, 31 years, 32 years, 33 years, 34 years, 35 years, 36 years, 37 years, 38 years, 39 years, 40 years, 41 years, 42 years, 43 years, 44 years, 45 years, 46 years, 47 years, 48 years, 49 years, 50 years, 55 years, 60 years, 65 years, or more than 65 years. Expression of the payload may be for 1-5 hours, 1-12 hours, 1-2 days, 1-5 days, 1-2 weeks, 1-3 weeks, 1-4 weeks, 1-2 months, 1-4 months, 1-6 months, 2-6 months, 3-6 months, 3-9 months, 4-8 months, 6-12 months, 1-2 years, 1-5 years, 2-5 years, 3-6 years, 3-8 years, 4-8 years or 5-10 years or

10-15 years, or 15-20 years, or 20-25 years, or 25-30 years, or 30-35 years, or 35-40 years, or 40-45 years, or 45-50 years, or 50-55 years, or 55-60 years, or 60-65 years.

[0077] An AAV vector can comprise a genome of a helper virus. Helper virus proteins are required for the assembly of a recombinant AAV (rAAV), and packaging of a transgene containing a heterologous nucleic acid into the rAAV. The helper virus genes are adenovirus genes E4, E2a and VA, that when expressed in the cell, assist with AAV replication. In some embodiments, an AAV vector comprises E2. In some embodiments, an AAV vector comprises E4. In some embodiments, an AAV vector comprises VA. In some instances, the AAV vector comprises one of helper virus proteins, or any combination.

[0078] The target gene or gene expression product for use in a transgene can be selected from ATP1A2, CACNAIA, SETD5, SHANK3, NF2, DNMT1, TCF4, RAI1, PEX1, ARSA, EIF2B5, EIF2B1, EIF2B2, NPC1, ADAR, MFSD8, STXBP1, PRICKLE2, PRRT2, IDUA, STX1B, Sarcoglycan Alpha (SGCA), glutamic acid decarboxylase 65 (GAD65), glutamic acid decarboxylase 67 (GAD67), CLN2, Nerve Growth Factor (NGF), glial cell derived neurotrophic factor (GDNF), Survival Of Motor Neuron 1, STXBP1, Telomeric (SMN1), Factor X (FIX), Retinoid Isomerohydrolase (RPE65), sarco/endoplasmic reticulum Ca2+-ATPase (SERCA2a), Glucocerebrosidase (GCase), galactocerebrosidase (GALC), CDKL5, Frataxin (FXN), Huntingtin (HTT), methyl-CpG binding protein 2 (MECP2), a peroxisomal biogenesis factor (PEX), progranulin (GRN), an anti-tubulin agent, copper-zinc superoxide dismutase (SOD1), iduronate 2 sulfatase (hIDS), Glucosylceramidase Beta (GBA), fragile X mental retardation 1 (FMR1), NPC Intracellular Cholesterol Transporter 1 (NPC1), SCN1A, C9orf72, NPS3 and a NLRP3 inflammasome. In some embodiments, the peroxisomal biogenesis factor (PEX) is selected from PEX1, PEX2, PEX3, PEX4, PEX5, PEX6, PEX7, PEX10, PEX11B, PEX12, PEX13, PEX14, PEX16, PEX19, and PEX26.

[0079] An AAV vector can comprise a viral genome comprising a nucleic acid encoding the recombinant AAV (rAAV) capsid protein described herein. The viral genome can comprise a Replication (Rep) gene encoding a Rep protein, and Capsid (Cap) gene encoding an AAP protein in the first open reading frame (ORF1) or a Cap protein in the second open reading frame (ORF2). The Rep protein is selected from Rep78, Rep68, Rep52, and Rep40. In some instances, the Cap gene is modified encoding a modified AAV capsid protein described herein. A wild-type Cap gene encodes three proteins, VP1, VP2, and VP3. In some cases, VP1 is modified. In some cases, VP2 is modified. In some cases, VP3 is modified. In some cases, all three VP1-VP3 are modified. The AAV vector can comprise nucleic acids encoding wild-type Rep78, Rep68, Rep52, Rep40 and AAP proteins.

Methods of Producing rAAVs

[0080] Disclosed herein are methods of producing the AAV capsids comprising the AAV capsid proteins and viral vector encoding a therapeutic nucleic acid. The AAV capsid proteins are produced by introducing into a cell (e.g., immortalized stem cell) a first vector containing a transgene cassette flanked by inverted terminal repeat (ITR) sequences from a parental AAV virus (the transgene cassette has a promoter sequence that drives transcription of a heterologous nucleic acid in the nucleus of the target cell), a second vector encoding the AAV genome with a AAV capsid protein (encoding the AAV Rep gene as well as the modified Cap gene for the variant being produced), and a third vector encoding helper virus proteins, required for assembly of the AAV capsid structure and packaging of the transgene in the modified AAV capsid structure. The assembled AAV capsid can be isolated and purified from the cell using suitable methods known in the art.

[0081] The transgenes contained in a recombinant AAV (rAAV) vector and encapsidated by the AAV capsid proteins of the present disclosure are also provided herein. The transgenes disclosed herein are delivered to a subject for a variety of purposes, such as to treat a disease or condition in the subject. The transgene can be gene editing components that modulate the activity or expression of a target gene or gene expression product. Alternatively, the transgene is a gene encoding a therapeutic gene expression product that is effective to modulate the activity or expression of itself, or another target gene or gene expression product.

[0082] Aspects disclosed herein provide methods of manufacturing rAAV virus or virus particles comprising: (a) introducing into a cell a nucleic acid comprising: (i) first vector containing a transgene cassette flanked by inverted terminal repeat (ITR) sequences from a parental AAV virus (the transgene cassette has a promoter sequence that drives transcription of a heterologous nucleic acid in the nucleus of the target cell); (ii) a second vector encoding the AAV genome with a AAV capsid protein of the present invention; and (iii) a vector encoding helper virus proteins, required for assembly of the AAV capsid structure and packaging of the transgene in the modified AAV capsid structure; (b) expressing in the cell the AAV capsid protein described herein; (c) assembling an AAV particle comprising the AAV capsid proteins disclosed herein; and (d) packaging the AAV particle. In some instances, the cell is mammalian. In some instances, the cell is immortalized. In some instances, the immortalized cell is an embryonic stem cell. In some instances, the embryonic stem cell is a human embryonic stem cell. In some instances, the human embryonic stem cell is a human embryonic kidney 293 (HEK-293) cell. In some instances, the Cap gene is derived from the deoxyribose nucleic acid (DNA) provided in SEQ ID NO: 6. In some instances, the 5' ITR and the 3' ITR are derived from an AAV2 serotype. In some instances, the 5' ITR and the 3' ITR are derived from an AAV5 serotype. In some instances, the 5' ITR and the 3' ITR are derived from an AAV9 serotype. In some instances, the first nucleic acid sequence and the second nucleic acid sequence are in trans. In some instances, the first nucleic acid sequence and the second nucleic acid sequence are in cis. In some instances, the first nucleic acid sequence, the second nucleic acid sequence and the third nucleic acid sequence, are in trans.

[0083] The Cap gene disclosed here comprises any one of SEQ ID NOS: 57-73 from Table 4, which are DNA sequences encoding the modified AAV capsid protein portions of the present disclosure.

[0084] In some instances, the methods comprise packing the first nucleic acid sequence encoding the therapeutic gene expression product such that it becomes encapsidated by the modified AAV capsid protein. In some embodiments, the rAAV particles are isolated, concentrated, and purified using suitable viral purification methods, such as those described herein.

[0085] In some cases, rAAVs of the present disclosure are generated using the methods described in Challis, R. C. et al. Nat. Protoc. 14, 379 (2019). Briefly, triple transfection of HEK293T cells (ATCC) using polyethylenimine (PEI) is performed, viruses are collected after 120 hours from both cell lysates and media and purified over iodixanol. In a non-limiting example, the rAAVs are generated by triple transfection of precursor cells (e.g., HEK293T) cells using a standard transfection protocol (e.g., PEI). Viral particles are harvested from the media after a period of time (e.g., 72 h post transfection) and from the cells and media at a later point in time (e.g., 120 h post transfection). Virus present in the media is concentrated by precipitation with 8% polyethylene glycol (PEG) and 500 mM sodium chloride and the precipitated virus is added to the lysates prepared from the collected cells. The viruses are purified over iodixanol (Optiprep, Sigma) step gradients (15%, 25%, 40% and 60%). Viruses are concentrated and formulated in PBS. Virus titers are determined by measuring the number of DNaseI-resistant vector genome copies (VGs) using qPCR and the linearized genome plasmid as a control.

[0086] The cell can be selected from a human, a primate, a murine, a feline, a canine, a porcine, an ovine, a bovine, an equine, an epine, a caprine and a lupine host cell. In some instances, the cell is a progenitor or precursor cell, such as a stem cell. In some instances, the stem cell is a mesenchymal cell, embryonic stem cell, induced pluripotent stem cell (iPSC), fibroblast or other tissue specific stem cell. The cell can be immortalized. In some cases, the immortalized cell is a HEK293cell. In some instances, the cell is a differentiated cell. Based on the disclosure provided, it is expected that this system can be used in conjunction with any transgenic line expressing a recombinase in the target cell type of interest to develop AAV capsids that more efficiently transduce that target cell population.

Methods of Treatment

[0087] Disclosed herein are methods of treating a disease or condition, or a symptom of the disease or condition, in a subject, comprising administrating of therapeutically effective amount of one or more compositions (e.g., rAAV particle, AAV vector, pharmaceutical composition) disclosed herein to the subject. In some embodiments, the composition is a rAAV capsid protein described herein. In some embodiments, the composition is an isolated and purified rAAV capsid protein described herein. In some embodiments, the rAAV particle encapsidates an AAV vector comprising a transgene (e.g., therapeutic nucleic acid). In some embodiments, the composition is a rAAV capsid protein described herein conjugated with a therapeutic agent disclosed herein. In some embodiments, the composition is a pharmaceutical composition comprising the rAAV particle and a pharmaceutically acceptable carrier. In some embodiments, the one or more compositions are administered to the subject alone (e.g., stand-alone therapy). In some embodiments, the composition is a first-line therapy for the disease or condition. In some embodiments, the composition is a second-line, third-line, or fourth-line therapy, for the disease or condition.

[0088] Recombinant adeno-associated virus (rAAV) mediated gene delivery leverages the AAV mechanism of viral transduction for nuclear expression of an episomal heterologous nucleic acid (e.g., a transgene, therapeutic nucleic acid). Upon delivery to a host in vivo environment, a rAAV will (1) bind or attach to cellular surface receptors on the target cell, (2) endocytose, (3) traffic to the nucleus, (4) uncoat the virus to release the encapsidated heterologous nucleic acid, (5) convert of the heterologous nucleic acid from single-stranded to double-stranded DNA as a template for transcription in the nucleus, and (6) transcribe of the episomal heterologous nucleic acid in the nucleus of the host cell ("transduction"). rAAVs engineered to have an increased transduction enrichment (transcription of the episomal heterologous nucleic acid in the host cell) are desirable for gene therapy applications.

[0089] Aspects disclosed herein provide methods of treating a disease or condition in a subject, the method comprising administering to the subject a therapeutically effective amount of the rAAV of the present disclosure, or the pharmaceutical formulation of the present disclosure, wherein the gene product is a therapeutic gene product. In some embodiments, the administering is by intracranial, intraventricular, intracerebroventricular, intravenous, intraarterial, intranasal, intrathecal, intracisternae magna, or subcutaneous.

[0090] Provided here, are methods of treating a disease or a condition associated with an aberrant expression or activity of a target gene or gene expression product thereof, the method comprising modulating the expression or the activity of a target gene or gene expression product in a subject by administering a rAAV encapsidating a heterologous nucleic acid of the present disclosure. In some instances, the expression or the activity of the target gene or gene expression product is decreased, relative to that in a normal (non-diseased) individual; and administering the rAAV to the subject is sufficient to increase the expression of the activity of the target gene or gene expression product. In some instances, the expression or the activity of the gene or gene expression product is increased, relative to that in a normal individual; and administering the rAAV to the subject is sufficient to decrease the expression or the activity of the target gene or gene expression product. In a non-limiting example, a subject diagnosed with Alzheimer's disease, which is caused, in some cases, by a gain-of-function of a Presenilin 1 and/or Presenilin 2 (encoded by the gene PSEN1 and PSEN2, respectively) is administered a rAAV disclosed herein encapsidating a therapeutic nucleic acid that is a silencing RNA (siRNA), or other RNAi with a loss-of-function effect on PSEN1 mRNA.

[0091] Also provided are methods of preventing a disease or condition disclosed herein in a subject comprising administering to the subject a therapeutically effective amount of an rAAV vector comprising a nucleic acid sequence encoding a therapeutic gene expression product described herein. The rAAV vector may be encapsidated in the modified capsid protein or rAAV viral particle described herein. In some instances, the therapeutic gene expression product is effective to modulate the activity or expression of a target gene or gene expression product.

[0092] Disclosed herein are methods of treating a disease or condition in a subject by administering a composition comprising a rAAV disclosed herein. An advantage of the rAAVs disclosed herein, is that the rAAV may be used to treat virtually any disease or condition that would benefit from a transgene therapy, including but not limited to spinal muscular atrophy (SMA), amyotrophic lateral sclerosis (ALS), Parkinson's disease, Pompe disease, mucopolysaccharidosis type II, fragile X syndrome, STXBP1 encepha-

lopathy, Krabbe disease, Huntington's disease, Alzheimer's disease, Battens disease, lysosomal storage disorders, glioblastoma multiforme, Rett syndrome, Leber's congenital amaurosis, Late infantile neuronal ceroid lipofuscinosis (LINCL), chronic pain, stroke, spinal cord injury, traumatic brain injury and lysosomal storage disorders.

[0093] In some cases, the disease or condition is localized to a particular in vivo environment in the subject, e.g., the brain, heart, or brain and heart. The compositions of the present disclosure are particularly useful for the treatment of the diseases or conditions described herein because they specifically or more efficiently target the in vivo environment and deliver a therapeutic nucleic acid engineered to modulate the activity or the expression of a target gene expression product involved with the pathogenesis or pathology of the disease or condition.

[0094] Provided herein are methods of treating a disease or a condition, or a symptom of the disease or condition, in a subject, comprising: (a) diagnosing a subject with a disease or a condition affecting a target in vivo environment; and (b) treating the disease or the condition by administering to the subject a therapeutically effective amount of a composition disclosed herein (e.g., rAAV particle, AAV vector, pharmaceutical composition), wherein the composition is engineered with an increased specificity for the target in vivo environment.

[0095] Disclosed herein are methods of treating a disease or a condition, or a symptom of the disease or the condition, afflicting a target in a subject comprising: (a) administering to the subject a composition (e.g., rAAV particle, AAV vector, pharmaceutical composition); and (b) expressing the therapeutic nucleic acid into a target in vivo environment in the subject with an increased transduction enrichment.

[0096] In some embodiments, methods of treating a disease or condition affecting the brain, heart, or brain and heart comprise administering a rAAV particle to a brain, heart, or brain and heart, respectively, in a subject, the rAAV particle comprising an rAAV capsid protein comprising an insertion of about, five, six, or seven amino acids of an amino acid sequence provided in Tables 1-3 at an amino acid position 588-589 in a parental AAV capsid protein. In some embodiments, methods of treating a disease or condition affecting the brain, heart, or brain and heart comprise administering a rAAV particle to a brain, heart, or brain and heart in a subject, respectively, the rAAV particle comprising an rAAV capsid protein comprising an insertion of about, five, six, or seven amino acids of an amino acid sequence as well as one or more substitution at amino acid found at amino acid positions 587-590 [AQAQ] such as provided in Tables 1-3. In some embodiments, the parental AAV capsid protein is AAV9 capsid protein (for e.g., provided in SEQ ID NO: 1.

[0097] Also provided are methods of modulating a target gene expression product, the methods comprising administering to a subject in need thereof a composition (e.g., rAAV particle, AAV vector, pharmaceutical composition) disclosed herein. For example, methods provided herein comprise administering to a subject a rAAV with a rAAV capsid protein encapsidating a viral vector comprising a heterologous nucleic acid that modulates the expression or the activity of the target gene expression product.

[0098] The term "normal individual" refers to an individual that is not afflicted with the disease or the condition characterized by the variation in expression or activity of the gene or gene expression product thereof.

[0099] In some embodiments, the disease or condition of the brain selected from Absence of the Septum Pellucidum, Acid Lipase Disease, Acid Maltase Deficiency, Acquired Epileptiform Aphasia, Acute Disseminated Encephalomyelitis, Attention Deficit-Hyperactivity Disorder (ADHD), Adie's Pupil, Adie's Syndrome, Adrenoleukodystrophy, Agenesis of the Corpus Callosum, Agnosia, Aicardi Syndrome, Aicardi-Goutieres Syndrome Disorder, AIDS-Neurological Complications, Alexander Disease, Alpers' Disease, Alternating Hemiplegia, Alzheimer's Disease, Amyotrophic Lateral Sclerosis (ALS), Anencephaly, Aneurysm, Angelman Syndrome, Angiomatosis, Anoxia, Antiphospholipid Syndrome, Aphasia, Apraxia, Arachnoid Cysts, Arachnoiditis, Arnold-Chiari Malformation, Arteriovenous Malformation, Asperger Syndrome, Ataxia, Ataxia Telangiectasia, Ataxias and Cerebellar or Spinocerebellar Degeneration, Atrial Fibrillation and Stroke, Attention Deficit-Hyperactivity Disorder, Autism Spectrum Disorder, Autonomic Dysfunction, Back Pain, Barth Syndrome, Batten Disease, Becker's Myotonia, Behcet's Disease, Bell's Palsy, Benign Essential Blepharospasm, Benign Focal Amyotrophy, Benign Intracranial Hypertension, Bernhardt-Roth Syndrome, Binswanger's Disease, Blepharospasm, Bloch-Sulzberger Syndrome, Brachial Plexus Birth Injuries, Brachial Plexus Injuries, Bradbury-Eggleston Syndrome, Brain and Spinal Tumors, Brain Aneurysm, Brain Injury, Brown-Sequard Syndrome, Bulbospinal Muscular Atrophy, Cerebral Autosomal Dominant Arteriopathy with Subcortical Infarcts and Leukoencephalopathy (CADASIL), Canavan Disease, Carpal Tunnel Syndrome, Causalgia, Cavernomas, Cavernous Angioma, Cavernous Malformation, Central Cervical Cord Syndrome, Central Cord Syndrome, Central Pain Syndrome, Central Pontine Myelinolysis, Cephalic Disorders, Ceramidase Deficiency, Cerebellar Degeneration, Cerebellar Hypoplasia, Cerebral Aneurysms, Cerebral Arteriosclerosis, Cerebral Atrophy, Cerebral Beriberi, Cerebral Cavemous Malformation, Cerebral Gigantism, Cerebral Hypoxia, Cerebral Palsy, Cerebro-Oculo-Facio-Skeletal Syndrome (COFS), Charcot-Marie-Tooth Disease, Charcot-Marie-Tooth syndrome, classical rhizomelic chondrodysplasia punctata (RCDP), Chiari Malformation, Cholesterol Ester Storage Disease, Chorea, Choreoacanthocytosis, Chronic Inflammatory Demyelinating Polyneuropathy (CIDP), Chronic Orthostatic Intolerance, Chronic Pain, Cockayne Syndrome, Cockayne Syndrome Type II, Coffin Lowry Syndrome, Colpocephaly, Coma, Complex Regional Pain Syndrome, Congenital Facial Diplegia, Congenital Myasthenia, Congenital Myopathy, Congenital Vascular Cavernous Malformations, Corticobasal Degeneration, Cranial Arteritis, Craniosynostosis, Cree encephalitis, Creutzfeldt-Jakob Disease, Cumulative Trauma Disorders, Cushing's Syndrome, Cytomegalic Inclusion Body Disease, Cytomegalovirus Infection, Dancing Eyes-Dancing Feet Syndrome, Dandy-Walker Syndrome, Dawson Disease, Deafness, De Morsier's Syndrome, Dejerine-Klumpke Palsy, Dementia, Dementia-Multi-Infarct, Dementia-Semantic, Dementia-Subcortical, Dementia With Lewy Bodies, Dentate Cerebellar Ataxia, Dentatorubral Atrophy, Dermatomyositis, Developmental Dyspraxia, Devic's Syndrome, Diabetic Neuropathy, Diffuse Sclerosis, Dravet Syndrome, Duchenne muscular dystrophy, Dysautonomia, Dysgraphia, Dyslexia, Dysphagia, Dyspraxia, Dyssynergia Cerebellaris Myoclonica, Dyssynergia Cerebellaris Progressiva, Dystonias, Early Infantile Epileptic

Encephalopathy, Empty Sella Syndrome, Encephalitis, Encephalitis Lethargica, Encephaloceles, Encephalopathy, Encephalopathy (familial infantile), Encephalotrigeminal Angiomatosis, Epilepsy, Epileptic Hemiplegia, Erb's Palsy, Erb-Duchenne and Dejerine-Klumpke Palsies, Essential Tremor, Extrapontine Myelinolysis, Fabry Disease, Fahr's Syndrome, Fainting, Familial Dysautonomia, Familial Hemangioma, Familial Idiopathic Basal Ganglia Calcification, Familial Periodic Paralyses, Familial Spastic Paralysis, Farber's Disease, Febrile Seizures, Fibromuscular Dysplasia, Fisher Syndrome, Floppy Infant Syndrome, Foot Drop, Fragile X syndrome, Friedreich's Ataxia, Frontotemporal Dementia (FTD), Gaucher Disease, Generalized Gangliosidoses, Gerstmann's Syndrome, Gerstmann-Straussler-Scheinker Disease, Giant Axonal Neuropathy, Giant Cell Arteritis, Giant Cell Inclusion Disease, glioblastoma, Globoid Cell Leukodystrophy, Glossopharyngeal Neuralgia, Glycogen Storage Disease, Guillain-Barre Syndrome, Hallervorden-Spatz Disease, Head Injury, Headache, Hemicrania Continua, Hemifacial Spasm, Hemiplegia Alterans, Hereditary Neuropathies, Hereditary Spastic Paraplegia, Heredopathia Atactica Polyneuritiformis, Herpes Zoster, Herpes Zoster Oticus, Hirayama Syndrome, Holmes-Adie syndrome, Holoprosencephaly, HTLV-1 Associated Myelopathy, Hughes Syndrome, Huntington's Disease, Hydranencephaly, Hydrocephalus, Hydrocephalus-Normal Pressure, Hydromyelia, Hypercortisolism, Hypersomnia, Hypertonia, Hypotonia, Hypoxia, Immune-Mediated Encephalomyelitis, Inclusion Body Myositis, Incontinentia Pigmenti, Infantile Hypotonia, Infantile Neuroaxonal Dystrophy, Infantile Phytanic Acid Storage Disease, Infantile Refsum Disease (IRD), Infantile Spasms, Inflammatory Myopathies, Iniencephaly, Intestinal Lipodystrophy, Intracranial Cysts, Intracranial Hypertension, Isaacs' Syndrome, Joubert Syndrome, Kearns-Sayre Syndrome, Kennedy's Disease, Kinsbourne syndrome, Kleine-Levin Syndrome, Klippel-Feil Syndrome, Klippel-Trenaunay Syndrome (KTS), Kliiver-Bucy Syndrome, Korsakoff s Amnesic Syndrome, Krabbe Disease, Kugelberg-Welander Disease, Kuru, Lambert-Eaton Myasthenic Syndrome, Landau-Kleffner Syndrome, Lateral Femoral Cutaneous Nerve Entrapment, Lateral Medullary Syndrome, Learning Disabilities, Leigh's Disease, Lennox-Gastaut Syndrome, Lesch-Nyhan Syndrome, Leukodystrophy, Levine-Critchley Syndrome, Lewy Body Dementia, Lipid Storage Diseases, Lipoid Proteinosis, Lissencephaly, Locked-In Syndrome, Lou Gehrig's Disease, Lupus-Neurological Sequelae, Lyme Disease-Neurological Complications, Machado-Joseph Disease, Macrencephaly, Maple syrup urine disease, Megalencephaly, Melkersson-Rosenthal Syndrome, Meningitis, Meningitis and Encephalitis, Menkes Disease, Menkes syndrome, Meralgia Paresthetica, Metachromatic Leukodystrophy, Microcephaly, Migraine, Miller Fisher Syndrome, Mini Stroke, Mitochondrial Myopathy, Moebius Syndrome, Monomelic Amyotrophy, Motor Neuron Diseases, Moyamoya Disease, Mucolipidoses, Mucopolysaccharidosis, Mucopolysaccharidosis II, Multi-Infarct Dementia, Multifocal Motor Neuropathy, Multiple Sclerosis, Multiple System Atrophy, Multiple System Atrophy with Orthostatic Hypotension, Muscular Dystrophy, Myasthenia-Congenital, Myasthenia Gravis, Myelinoclastic Diffuse Sclerosis, Myoclonic Encephalopathy of Infants, Myoclonus, Myopathy, Myopathy-Congenital, Myopathy-Thyrotoxic, Myotonia, Myotonia Congenita, Myotonic dystrophy, Narcolepsy, Neuroacanthocytosis, Neurodegeneration with Brain Iron Accumulation, Neurofibromatosis, Neuroleptic Malignant Syndrome, Neurological Complications of AIDS, Neurological Complications of Lyme Disease, Neurological Consequences of Cytomegalovirus Infection, Neurological Manifestations of Pompe Disease, Neurological Sequelae Of Lupus, Neuromyelitis Optica, Neuromyotonia, Neuronal Ceroid Lipofuscinosis, Neuronal Migration Disorders, Neuropathy-Hereditary, Neurosarcoidosis, Neurosyphilis, Neurotoxicity, Nevus Cavernosus, Niemann-Pick Disease, O'Sullivan-McLeod Syndrome, Occipital Neuralgia, Ohtahara Syndrome, Olivopontocerebellar Atrophy, Opsoclonus Myoclonus, Orthostatic Hypotension, Overuse Syndrome, Pain-Chronic, Pantothenate Kinase-Associated Neurodegeneration, Paraneoplastic Syndromes, Paresthesia, Parkinson's Disease, Paroxysmal Choreoathetosis, Paroxysmal Hemicrania, Parry-Romberg, Pelizaeus-Merzbacher Disease, Pena Shokeir II Syndrome, Perineural Cysts, Periodic Paralyses, Peripheral Neuropathy, Periventricular Leukomalacia, Persistent Vegetative State, Pervasive Developmental Disorders, Phenylketonuria, Phytanic Acid Storage Disease, Pick's Disease, Pinched Nerve, Piriformis Syndrome, Pituitary Tumors, Polymyositis, Pompe Disease, Porencephaly, Post-Polio Syndrome, Postherpetic Neuralgia, Postinfectious Encephalomyelitis, Postural Hypotension, Postural Orthostatic Tachycardia Syndrome, Postural Tachycardia Syndrome, Prader-Willi syndrome, Primary Dentatum Atrophy, Primary Lateral Sclerosis, Primary Progressive Aphasia, Prion Diseases, Progressive Hemifacial Atrophy, Progressive Locomotor Ataxia, Progressive Multifocal Leukoencephalopathy, Progressive Sclerosing Poliodystrophy, Progressive Supranuclear Palsy, Prosopagnosia, Pseudo-Torch syndrome, Pseudotoxoplasmosis syndrome, Pseudotumor Cerebri, Psychogenic Movement, Ramsay Hunt Syndrome I, Ramsay Hunt Syndrome II, Rasmussen's Encephalitis, Reflex Sympathetic Dystrophy Syndrome, Refsum Disease, Refsum Disease-Infantile, Repetitive Motion Disorders, Repetitive Stress Injuries, Restless Legs Syndrome, Retrovirus-Associated Myelopathy, Rett Syndrome, Reye's Syndrome, Rheumatic Encephalitis, Riley-Day Syndrome, Sacral Nerve Root Cysts, Saint Vitus Dance, Salivary Gland Disease, Sandhoff Disease, Schilder's Disease, Schizencephaly, Seitelberger Disease, Seizure Disorder, Semantic Dementia, Septo-Optic Dysplasia, Severe Myoclonic Epilepsy of Infancy (SMEI), Shaken Baby Syndrome, Shingles, Shy-Drager Syndrome, Sjogren's Syndrome. Sleep Apnea, Sleeping Sickness, Sotos Syndrome, Spasticity, Spina Bifida, Spinal Cord Infarction, Spinal Cord Injury, Spinal Cord Tumors, Spinal Muscular Atrophy, Spinocerebellar ataxia, Spinocerebellar Atrophy, Spinocerebellar Degeneration, Steele-Richardson-Olszewski Syndrome, Stiff-Person Syndrome, Striatonigral Degeneration, Stroke, Sturge-Weber Syndrome, STXBP1 encephalopathy. Subacute Sclerosing Panencephalitis, Subcortical Arteriosclerotic Encephalopathy, Short-lasting, Unilateral, Neuralgiform (SUNCT) Headache, Swallowing Disorders, Sydenham Chorea, Syncope, Syphilitic Spinal Sclerosis, Syringohydromyelia, Syringomyelia, Systemic Lupus Erythematosus, Tabes Dorsalis, Tangier disease, Tardive Dyskinesia, Tarlov Cysts, Tay-Sachs Disease, Temporal Arteritis, Tethered Spinal Cord Syndrome, Thomsen's Myotonia, Thoracic Outlet Syndrome, Thyrotoxic Myopathy, Tic Douloureux, Todd's Paralysis, Tourette Syndrome, Transient Ischemic Attack, Transmissible Spongiform Encepha-

lopathies, Transverse Myelitis, Traumatic Brain Injury, Tremor, Trigeminal Neuralgia, Tropical Spastic Paraparesis, Troyer Syndrome, Tuberous Sclerosis, Vascular Erectile Tumor, Vasculitis Syndromes of the Central Nervous Systems, Von Economo's Disease, Von Hippel-Lindau Disease (VHL), Von Hippel-Lindau syndrome, Von Recklinghausen's Disease, Wallenberg's Syndrome, Werdnig-Hoffman Disease, Wernicke-Korsakoff Syndrome, West Syndrome, Whiplash, Whipple's Disease, Williams Syndrome, Wilson Disease, Wolman's Disease, X-Linked Spinal and Bulbar Muscular Atrophy and Zellweger syndrome.

[0100] In some embodiments, the pharmaceutical formulation comprises a therapeutic nucleic acid encoding a therapeutic gene expression product. In some instances, the therapeutic gene expression product is effective to modulate an activity or an expression of a target gene or gene expression product selected from ATP1A2, CACNAIA, SETD5, SHANK3, NF2, DNMT1, TCF4, RAI1, PEX1, ARSA, EIF2B5, EIF2B1, EIF2B2, NPC1, ADAR, MFSD8, STXBP1, PRICKLE2, PRRT2, IDUA, STX1B, Sarcoglycan Alpha (SGCA), glutamic acid decarboxylase 65 (GAD65), glutamic acid decarboxylase 67 (GAD67), CLN2, Nerve Growth Factor (NGF), glial cell derived neurotrophic factor (GDNF), Survival Of Motor Neuron 1, STXBP1, Telomeric (SMN1), Factor X (FIX), Retinoid Isomerohydrolase (RPE65), sarco/endoplasmic reticulum Ca2+-ATPase (SERCA2a), Glucocerebrosidase (GCase), galactocerebrosidase (GALC), CDKL5, Frataxin (FXN), Huntingtin (HTT), methyl-CpG binding protein 2 (MECP2), a peroxisomal biogenesis factor (PEX), progranulin (GRN), an anti-tubulin agent, copper-zinc superoxide dismutase (SOD1), iduronate 2 sulfatase (hIDS), Glucosylceramidase Beta (GBA), fragile X mental retardation 1 (FMR1), NPC Intracellular Cholesterol Transporter 1 (NPC1), SCN1A, C9orf72, NPS3 and a NLRP3 inflammasome. In some embodiments, the peroxisomal biogenesis factor (PEX) is selected from PEX1, PEX2, PEX3, PEX4, PEX5, PEX6, PEX7, PEX10, PEX11B, PEX12, PEX13, PEX14, PEX16, PEX19, and PEX26.

[0101] In some aspects, other examples of genes involved in neurologic or brain diseases or disorders include MAPT, IDUA, SNCA, ATXN2, Ube3a, GNS, HGSNAT, NAGLU, SGSH, CLN1, CLN3, CLN4, CLN5, CLN6, CLN7, CLN8, CTSD, ABCD1, HEXA, HEXB, ASM, ASPA, GLB1, AADC, MFN2, GNAO1, SYNGAP1, GRIN2A, GRIN2B, KCNQ2, EPM2A, NHLRC1, SLC6A1, SLC13A5, SURF1, GBE1, ATXN1, ATXN3, and ATXN7.

[0102] In some embodiments, the disease or condition of the heart includes any disease of the cardiopulmonary system, including, but not limited to heart failure, ischemia, arrhythmia, myocardial infarction, congestive heart failure, transplant rejection, abnormal heart contractility, non-ischaemic cardiomyopathy, mitral valve regurgitation, refractory myocardial ischaemia, non-ischaemic heart failure, aortic stenosis or regurgitation, abnormal Ca2+ metabolism, dysregulation of a heart-specific protein or a protein effective in modulating cardiac activity or physiology.

[0103] In some embodiments, genes involved in heart disease include those the express proteins involved in the regulation of calcium cycling in cardiomyocytes, such as a sarcoplasmic endoplasmic reticulum Ca2+ ATPase pump.

[0104] In some embodiments, cells of the heart or heart tissue comprise tissue or cells of any portion of the cardiopulmonary system. In certain aspects, cells of the heart or heart tissue comprises cardiac muscle cells/tissue, cells/tissue of the cardiac vasculature, and cells/tissue present in a cardiac valve. Cells of the heart may include cardiomyocytes, epithelial cells, endothelial cells, fibroblasts, cells of the conducting tissue, cardiac pacemaking cells, and neurons.

[0105] In some instances, the therapeutic gene expression product comprises gene editing components. In some instances, the gene editing components are selected from an artificial site-specific RNA endonuclease (ASRE), a zinc finger endonuclease (ZFN), a transcription factor like effector nuclease (TALEN), a clustered regularly interspaced short palindromic repeats (CRISPR)/Cas enzyme, and a CRISPR)/Cas guide RNA.

[0106] In some instances, the expression of a gene or expression or activity of a gene expression product is inhibited by the administration of the composition to the subject. In some instances, the expression of a gene or the expression or the activity of a gene expression product is enhanced by the administration of the composition to the subject.

Formulations, Dosages, and Routes of Administration

[0107] Disclosed herein are methods comprising delivering a rAAV particle encapsidating a heterologous nucleic acid to the brain, heart, or brain and heart in a subject, the rAAV particle comprising (i) an increased transduction of the heterologous nucleic acid in the brain, heart, or brain and heart, wherein the rAAV particle has an rAAV capsid protein comprising an insertion of five, six, or seven amino acids of an amino acid sequence provided in Tables 1-3, at an amino acid position 588-589 in a parental AAV capsid protein as well as one or more substitution at amino acid found at amino acid positions 587-590 [AQAQ] such as provided in Tables 1-3. In various embodiments, the rAAV capsid protein may comprise one or more substitutions at amino acid positions 452-458 alone or in combination with the modifications above.

[0108] In general, methods disclosed herein comprise administering a therapeutic rAAV composition by systemic administration. In some instances, methods comprise administering a therapeutic rAAV composition by intravenous ("i.v.") administration. One may administer therapeutic rAAV compositions by additional routes, such as subcutaneous injection, intramuscular injection, intradermal injection, transdermal injection, percutaneous administration, intranasal administration, intralymphatic injection, rectal administration intragastric administration, intraocular administration, intracerebroventricular administration, intrathecally, intracisternal, or any other suitable parenteral administration. Routes, dosage, time points, and duration of administrating therapeutics may be adjusted. In some embodiments, administration of therapeutics is prior to, or after, onset of either, or both, acute and chronic symptoms of the disease or condition. Other routes of delivery to the brain, heart, or brain and heart include, but are not limited to intracranial administration, lateral cerebroventricular administration, and endovascular administration.

[0109] An effective dose and dosage of pharmaceutical compositions to prevent or treat the disease or condition disclosed herein is defined by an observed beneficial response related to the disease or condition, or symptom of the disease or condition. Beneficial response comprises preventing, alleviating, arresting, or curing the disease or

condition, or symptom of the disease or condition. In some embodiments, the beneficial response may be measured by detecting a measurable improvement in the presence, level, or activity, of biomarkers, transcriptomic risk profile, or intestinal microbiome in the subject. An "improvement," as used herein refers to shift in the presence, level, or activity towards a presence, level, or activity, observed in normal individuals (e.g individuals who do not suffer from the disease or condition). In instances wherein the therapeutic rAAV composition is not therapeutically effective or is not providing a sufficient alleviation of the disease or condition, or symptom of the disease or condition, then the dosage amount and/or route of administration may be changed, or an additional agent may be administered to the subject, along with the therapeutic rAAV composition. In some embodiments, as a patient is started on a regimen of a therapeutic rAAV composition, the patient is also weaned off (e.g., step-wise decrease in dose) a second treatment regimen.

[0110] In some cases, a dose of the pharmaceutical composition may comprise a concentration of infectious particles of at least or about 10^7, 10^8, 10^9, 10^{10}, 10^{11}, 10^{12}, 10^{13}, 10^{14}, 10^{15}, 10^{16}, or 10^{17}. In some cases, the concentration of infectious particles is 2×10^7, 2×10^8, 2×10^9, 2×10^{10}, 2×10^{11}, 2×10^{12}, 2×10^{13}, 2×10^{14}, 2×10^{15}, 2×10^{16}, or 2×10^{17}. In some cases, the concentration of the infectious particles is 3×10^7, 3×10^8, 3×10^9, 3×10^{10}, 3×10^{11}, 3×10^{12}, 3×10^{13}, 3×10^{14}, 3×10^{15}, 3×10^{16}, or 3×10^{17}. In some cases, the concentration of the infectious particles is 4×10^7, 4×10^8, 4×10^9, 4×10^{10}, 4×10^{11}, 4×10^{12}, 4×10^{13}, 4×10^{14}, 4×10^{15}, 4×10^{16}, or 4×10^{17}. In some cases, the concentration of the infectious particles is 5×10^7, 5×10^8, 5×10^9, 5×10^{10}, 5×10^{11}, 5×10^{12}, 5×10^{13}, 5×10^{14}, 5×10^{15}, 5×10^{16}, or 5×10^{17}. In some cases, the concentration of the infectious particles is 6×10^7, 6×10^8, 6×10^9, 6×10^{10}, 6×10^{11}, 6×10^{12}, 6×10^{13}, 6×10^{14}, 6×10^{15}, 6×10^{16}, or 6×10^{17}. In some cases, the concentration of the infectious particles is 7×10^7, 7×10^8, 7×10^9, 7×10^{10}, 7×10^{11}, 7×10^{12}, 7×10^{13}, 7×10^{14}, 7×10^{15}, 7×10^{16}, or 7×10^{17}. In some cases, the concentration of the infectious particles is 8×10^7, 8×10^8, 8×10^9, 8×10^{10}, 8×10^{11}, 8×10^{12}, 8×10^{13}, 8×10^{14}, 8×10^{15}, 8×10^{16}, or 8×10^{17}. In some cases, the concentration of the infectious particles is 9×10^7, 9×10^8, 9×10^9, 9×10^{10}, 9×10^{11}, 9×10^{12}, 9×10^{13}, 9×10^{14}, 9×10^{15}, 9×10^{16}, or 9×10^{17}.

[0111] Disclosed herein, in some embodiments are formulations of pharmaceutically-acceptable excipients and carrier solutions suitable for delivery of the rAAV compositions described herein, as well as suitable dosing and treatment regimens for using the particular compositions described herein in a variety of treatment regimens. In some embodiments, the amount of therapeutic gene expression product in each therapeutically-useful composition may be prepared is such a way that a suitable dosage will be obtained in any given unit dose of the compound. Factors such as solubility, bioavailability, biological half-life, route of administration, product shelf life, as well as other pharmacological considerations will be contemplated by one skilled in the art of preparing such pharmaceutical formulations, and as such, a variety of dosages and treatment regimens may be desirable.

[0112] In some embodiments, the pharmaceutical forms of the rAAV-based viral compositions suitable for injectable use include sterile aqueous solutions or dispersions and sterile powders for the extemporaneous preparation of sterile injectable solutions or dispersions. The carrier can be a solvent or dispersion medium containing, for example, water, ethanol, polyol (e.g., glycerol, propylene glycol, and liquid polyethylene glycol, and the like), suitable mixtures thereof, and/or vegetable oils. Proper fluidity may be maintained, for example, by the use of a coating, such as lecithin, by the maintenance of the required particle size in the case of dispersion and by the use of surfactants. The prevention of the action of microorganisms can be brought about by various antibacterial and antifungal agents, for example, parabens, chlorobutanol, phenol, sorbic acid, thimerosal, and the like. In many cases, it will be preferable to include isotonic agents, for example, sugars or sodium chloride.

[0113] In some cases, for administration of an injectable aqueous solution, the solution may be suitably buffered, if necessary, and the liquid diluent first rendered isotonic with sufficient saline or glucose. These particular aqueous solutions are especially suitable for intravenous, intramuscular, subcutaneous and intraperitoneal administration. Some variation in dosage will necessarily occur depending on the condition of the subject being treated. The person responsible for administration will, in any event, determine the appropriate dose for the individual subject. Moreover, for human administration, preparations should meet sterility, pyrogenicity, and the general safety and purity standards as required by FDA Office of Biologics standards.

[0114] Disclosed herein are sterile injectable solutions comprising the rAAV compositions disclosed herein, which are prepared by incorporating the rAAV compositions disclosed herein in the required amount in the appropriate solvent with several of the other ingredients enumerated above, as required, followed by filtered sterilization. Generally, dispersions are prepared by incorporating the various sterilized active ingredients into a sterile vehicle which contains the basic dispersion medium and the required other ingredients from those enumerated above. In the case of sterile powders for the preparation of sterile injectable solutions, the preferred methods of preparation are vacuum-drying and freeze-drying techniques which yield a powder of the active ingredient plus any additional desired ingredient from a previously sterile-filtered solution thereof. Injectable solutions may be advantageous for systemic administration, for example by intravenous or intrathecal administration.

[0115] Suitable dose and dosage administrated to a subject is determined by factors including, but not limited to, the particular therapeutic rAAV composition, disease condition and its severity, the identity (e.g., weight, sex, age) of the subject in need of treatment, and can be determined according to the particular circumstances surrounding the case, including, e.g., the specific agent being administered, the route of administration, the condition being treated, and the subject or host being treated.

[0116] The amount of rAAV compositions and time of administration of such compositions will be within the purview of the skilled artisan having benefit of the present teachings. It is likely, however, that the administration of therapeutically-effective amounts of the disclosed compositions may be achieved by a single administration, for example, a single injection of sufficient numbers of infectious particles to provide therapeutic benefit to the patient undergoing such treatment. This is made possible, at least in part, by the fact that certain target cells (e.g., neurons) do not divide, obviating the need for multiple or chronic dosing.

[0117] In certain embodiments, the data obtained from cell culture assays and animal studies are used in formulating the

therapeutically effective daily dosage range and/or the therapeutically effective unit dosage amount for use in mammals, including humans. In certain embodiments, the dosage range and/or the unit dosage amount varies within this range depending upon the dosage form employed and the route of administration utilized.

Combination Therapies

[0118] A therapeutic rAAV may be used alone or in combination with an additional therapeutic agent (together, "therapeutic agents"). In some cases, a therapeutic rAAV as used herein is administered alone. The therapeutic agent may be administered together or sequentially in a combination therapy. The combination therapy may be administered within the same day, or may be administered one or more days, weeks, months, or years apart.

[0119] The additional therapeutic agent can comprise a small molecule. The additional therapeutic agent can comprise an antibody, or antigen-binding fragment. The additional therapeutic agent can include lipid nanoparticle-based therapies, anti-sense oligonucleotide therapies, as well as other viral therapies.

[0120] The additional therapeutic agent can comprise a cell-based therapy. Exemplary cell-based therapies include without limitation immune effector cell therapy, chimeric antigen receptor T-cell (CAR-T) therapy, natural killer cell therapy and chimeric antigen receptor natural killer (NK) cell therapy. Either NK cells, or CAR-NK cells, or a combination of both NK cells and CAR-NK cells can be used in combination with the methods disclosed herein. In some embodiments, the NK cells and CAR-NK cells are derived from human induced pluripotent stem cells (iPSC), umbilical cord blood, or a cell line. The NK cells and CAR-NK cells can comprise a cytokine receptor and a suicide gene. The cell-based therapy can comprise a stem cell therapy. The stem cell therapy may be embryonic or somatic stem cells. The stem cells may be isolated from a donor (allogeneic) or isolated from the subject (autologous). The stem cells may be expanded adipose-derived stem cells (eASCs), hematopoietic stem cells (HSCs), mesenchymal stem (stromal) cells (MSCs), or induced pluripotent stem cells (iPSCs) derived from the cells of the subject.

Kits

[0121] Disclosed herein are kits comprising compositions disclosed herein. Also disclosed herein are kits for the treatment or prevention of a disease or conditions of the brain, heart, or brain and heart. In some instances, the disease or condition is cancer, a pathogen infection, pulmonary disease or condition, neurological disease, muscular disease, or an immune disorder, such as those described herein.

[0122] In one embodiment, a kit can include a therapeutic or prophylactic composition containing an effective amount of a composition of a rAAV particle encapsidating a recombinant AAV vector encoding a therapeutic nucleic acid (e.g., therapeutic nucleic acid) and a recombinant AAV (rAAV) capsid protein of the present disclosure. In another embodiment, a kit can include a therapeutic or prophylactic composition containing an effective amount of cells modified by the TAAV described herein ("modified cell"), in unit dosage form that express therapeutic nucleic acid. In some embodiments, a kit comprises a sterile container which can contain a therapeutic composition; such containers can be boxes, ampules, bottles, vials, tubes, bags, pouches, blister-packs, or other suitable container forms known in the art. Such containers can be made of plastic, glass, laminated paper, metal foil, or other materials suitable for holding medicaments.

[0123] In some instances, the kit further comprises a cell. In some instances, the cell is mammalian. In some instances, the cell is immortalized. In some instances, the immortalized cell is an embryonic stem cell. In some instances, the embryonic stem cell is a human embryonic stem cell. In some instances, the human embryonic stem cell is a human embryonic kidney 293 (HEK-293) cell. In some instances, the kit further comprises an AAV vector comprising a heterologous nucleic acid encoding a therapeutic gene expression product. In some instances, the AAV vector is an episome.

[0124] In some cases, rAAV are provided together with instructions for administering the rAAV to a subject having or at risk of developing the disease or condition (e.g., disease of the brain, heart, or brain and heart). Instructions can generally include information about the use of the composition for the treatment or prevention of the disease or condition.

[0125] In some cases, the instructions include at least one of the following: description of the therapeutic rAAV composition; dosage schedule and administration for treatment or prevention of the disease or condition disclosed herein; precautions; warnings; indications; counter-indications; overdosage information; adverse reactions; animal pharmacology; clinical studies; and/or references. The instructions can be printed directly on the container (when present), or as a label applied to the container, or as a separate sheet, pamphlet, card, or folder supplied in or with the container. In some cases, instructions provide procedures for administering the rAAV to the subject alone. In some instances, the instructions provide that the rAA Vis formulated for systemic delivery.

Definitions

[0126] The terminology used herein is for the purpose of describing particular cases only and is not intended to be limiting. As used herein, the singular forms "a", "an" and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. Furthermore, to the extent that the terms "including", "includes", "having", "has", "with", or variants thereof are used in either the detailed description and/or the claims, such terms are intended to be inclusive in a manner similar to the term "comprising."

[0127] The term "about" or "approximately" means within an acceptable error range for the particular value as determined by one of ordinary skill in the art, which will depend in part on how the value is measured or determined, e.g., the limitations of the measurement system. For example, "about" can mean within 1 or more than 1 standard deviation, per the practice in the given value. Where particular values are described in the application and claims, unless otherwise stated the term "about" should be assumed to mean an acceptable error range for the particular value.

[0128] As used herein "consisting essentially of" when used to define compositions and methods, shall mean excluding other elements of any essential significance to the combination for the stated purpose. Thus, a composition

consisting essentially of the elements as defined herein would not exclude other materials or steps that do not materially affect the basic and novel characteristic(s) of the claimed disclosure, such as compositions for treating skin disorders like acne, eczema, psoriasis, and rosacea.

[0129] The terms "homologous," "homology," or "percent homology" are used herein to generally mean an amino acid sequence or a nucleic acid sequence having the same, or similar sequence to a reference sequence. Percent homology of sequences can be determined using the most recent version of BLAST, as of the filing date of this application.

[0130] The terms "increased," or "increase" are used herein to generally mean an increase by a statically significant amount. In some embodiments, the terms "increased," or "increase," mean an increase of at least 10% as compared to a reference level, for example an increase of at least about 10%, at least about 20%, or at least about 30%, or at least about 40%, or at least about 50%, or at least about 60%, or at least about 70%, or at least about 80%, or at least about 90% or up to and including a 100% increase or any increase between 10-100% as compared to a reference level, standard, or control. Other examples of "increase" include an increase of at least 2-fold, at least 5-fold, at least 10-fold, at least 20-fold, at least 50-fold, at least 100-fold, at least 1000-fold or more as compared to a reference level.

[0131] The terms, "decreased" or "decrease" are used herein generally to mean a decrease by a statistically significant amount. In some embodiments, "decreased" or "decrease" means a reduction by at least 10% as compared to a reference level, for example a decrease by at least about 20%, or at least about 30%, or at least about 40%, or at least about 50%, or at least about 60%, or at least about 70%, or at least about 80%, or at least about 90% or up to and including a 100% decrease (e.g., absent level or non-detectable level as compared to a reference level), or any decrease between 10-100% as compared to a reference level. In the context of a marker or symptom, by these terms is meant a statistically significant decrease in such level. The decrease can be, for example, at least 10%, at least 20%, at least 30%, at least 40% or more, and is preferably down to a level accepted as within the range of normal for an individual without a given disease.

[0132] The terms "subject" is any organism. In some instances, the organism is a mammal. Non-limiting examples of mammal include, any member of the mammalian class: humans, non-human primates such as chimpanzees, and other apes and monkey species; farm animals such as cattle, horses, sheep, goats, swine; domestic animals such as rabbits, dogs, and cats; laboratory animals including rodents, such as rats, mice and guinea pigs, and the like. In certain aspects, the mammal is a human. The term "animal" as used herein comprises human beings and non-human animals. In one embodiment, a "non-human animal" is a mammal, for example a rodent such as rat or a mouse. In one embodiment, a "non-human primate" is a mammal, for example a monkey. In some instances, the subject is a patient, which as used herein, may refer to a subject diagnosed with a particular disease or disorder.

[0133] The term "gene," as used herein, refers to a segment of nucleic acid that encodes an individual protein or RNA (also referred to as a "coding sequence" or "coding region"), optionally together with associated regulatory region such as promoter, operator, terminator and the like, which may be located upstream or downstream of the coding sequence.

[0134] The term "adeno-associated virus," or "AAV" as used herein refers to the adeno-associated virus or derivatives thereof. Non-limited examples of AAV's include AAV type 1 (AAV1), AAV type 2 (AAV2), AAV type 3 (AAV3), AAV type 4 (AAV4), AAV type 5 (AAV5), AAV type 6 (AAV6), AAV type 7 (AAV7), AAV type 8 (AAV8), AAV type 9 (AAV9), AAV type 10 (AAV10), AAV type 11 (AAV11), AAV type 12 (AAV12), avian AAV, bovine AAV, canine AAV, equine AAV, primate AAV, non-primate AAV, and ovine AAV. In some instances, the AAV is described as a "Primate AAV," which refers to AAV that infect primates. Likewise an AAV may infect bovine animals (e.g., "bovine AAV", and the like). In some instances, the AAV is wildtype, or naturally occurring. In some instances, the AAV is recombinant.

[0135] The term "AAV capsid" as used herein refers to a capsid protein or peptide of an adeno-associated virus. In some instances, the AAV capsid protein is configured to encapsidate genetic information (e.g., a transgene, therapeutic nucleic acid, viral genome). In some instances, the AAV capsid of the instant disclosure is a modified AAV capsid, relative to a corresponding parental AAV capsid protein.

[0136] The term "tropism" as used herein refers to a quality or characteristic of the AAV capsid that may include specificity for, and/or an increase or a decrease in enrichment of, expressing the encapsidated genetic information into an in vivo environment, relative to a second in vivo environment. An in vivo environment, in some instances, is a cell-type. An in vivo environment, in some instances, is an organ or organ system.

[0137] The term "AAV vector" as used herein refers to nucleic acid polymer encoding genetic information related to the virus. The AAV vector may be a recombinant AAV vector (rAAV), which refers to an AAV vector generated using recombinatorial genetics methods. In some instances, the rAAV vector comprises at least one heterologous polynucleotide (e.g. a polynucleotide other than a wild-type or naturally occurring AAV genome such as a transgene).

[0138] The term "AAV particle" as used herein refers to an AAV virus, virion, AAV capsid protein or component thereof. In some cases, the AAV particle is modified relative to a parental AAV particle.

[0139] The term "gene product" of "gene expression product" refers to an expression product of a polynucleotide sequence such as, for e.g., a polypeptide, peptide, protein or RNA, including interfering RNA (e.g., siRNA, miRNA, shRNA) and messenger RNA (mRNA).

[0140] The term "heterologous" as used herein refers to a genetic element (e.g., coding region) or gene expression product (e.g., RNA, protein) that is derived from a genotypically distinct entity from that of the rest of the entity to which it is being compared.

[0141] The term "endogenous" as used herein refers to a genetic element (e.g., coding region) or gene expression product (e.g., RNA, protein) that is naturally occurring in or associated with an organism or a particular cell within the organism.

[0142] The terms "treat," "treating," and "treatment" as used herein refers to alleviating or abrogating a disorder, disease, or condition; or one or more of the symptoms associated with the disorder, disease, or condition; or alle-

viating or eradicating a cause of the disorder, disease, or condition itself. Desirable effects of treatment can include, but are not limited to, preventing occurrence or recurrence of disease, alleviation of symptoms, diminishing any direct or indirect pathological consequences of the disease, preventing metastasis, decreasing the rate of disease progression, amelioration or palliation of the disease state and remission or improved prognosis.

[0143] The term "therapeutically effective amount" refers to the amount of a compound or therapy that, when administered, is sufficient to prevent development of, or alleviate to some extent, one or more of the symptoms of a disorder, disease, or condition of the disease; or the amount of a compound that is sufficient to elicit biological or medical response of a cell, tissue, system, animal, or human that is being sought by a researcher, veterinarian, medical doctor, or clinician.

[0144] The term "pharmaceutically acceptable carrier," "pharmaceutically acceptable excipient," "physiologically acceptable carrier," or "physiologically acceptable excipient" refers to a pharmaceutically acceptable material, composition, or vehicle, such as a liquid or solid filler, diluent, excipient, solvent, or encapsulating material. A component can be "pharmaceutically acceptable" in the sense of being compatible with the other ingredients of a pharmaceutical formulation. It can also be suitable for use in contact with the tissue or organ of humans and animals without excessive toxicity, irritation, allergic response, immunogenicity, or other problems or complications, commensurate with a reasonable benefit/risk ratio. See, Remington: The Science and Practice of Pharmacy, 21st Edition; Lippincott Williams & Wilkins: Philadelphia, PA, 2005; Handbook of Pharmaceutical Excipients, 5th Edition; Rowe et al., Eds., The Pharmaceutical Press and the American Pharmaceutical Association: 2005; and Handbook of Pharmaceutical Additives, 3rd Edition; Ash and Ash Eds., Gower Publishing Company: 2007; Pharmaceutical Preformulation and Formulation, Gibson Ed., CRC Press LLC: Boca Raton, FL, 2004).

[0145] The term "pharmaceutical composition" refers to a mixture of a compound disclosed herein with other chemical components, such as diluents or carriers. The pharmaceutical composition can facilitate administration of the compound to an organism. Multiple techniques of administering a compound exist in the art including, but not limited to, systemic administration.

[0146] Non-limiting examples of "sample" include any material from which nucleic acids and/or proteins can be obtained. As non-limiting examples, this includes whole blood, peripheral blood, plasma, serum, saliva, mucus, urine, semen, lymph, fecal extract, cheek swab, cells or other bodily fluid or tissue, including but not limited to tissue obtained through surgical biopsy or surgical resection. Alternatively, a sample can be obtained through primary patient derived cell lines, or archived patient samples in the form of preserved samples, or fresh frozen samples.

[0147] The term "in vivo" is used to describe an event that takes place in a subject's body.

[0148] The term "in vitro" is used to describe an event that takes places contained in a container for holding laboratory reagent such that it is separated from the biological source from which the material is obtained. In vitro assays can encompass cell-based assays in which living or dead cells are employed. In vitro assays can also encompass a cell-free assay in which no intact cells are employed.

[0149] The term "brain" means a tissue selected from brain, thalamus, cortex, putamen, lateral ventricles, medulla, the pons, the amygdala, the motor cortex, caudate, hypothalamus, striatum, ventral midbrain, neocortex, basal ganglia, hippocampus, cerebrum, cerebellum, brain stem, and spinal cord. The brain includes a variety of cortical and subcortical areas, including the frontal, temporal, occipital and parietal lobes.

[0150] The term "systemic delivery" is defined as a route of administration of medication or other substance into a circulatory system so that the entire body is affected. Administration can take place via enteral administration (absorption of the drug through the gastrointestinal tract) or parenteral administration (generally injection, infusion, or implantation). "Circulatory system" includes both blood or cerebrospinal fluid circulatory systems. Examples of systemic administration for the brain include intraarterial, intravenous or intrathecal injection. Other examples include administration to the cerebrospinal fluid at any location, in the spine (i.e. but not limited to lumbar) or brain (i.e. but not limited to cisterna magna). The terms "systemic administration" and "systemic delivery" are used interchangeably.

[0151] The section headings used herein are for organizational purposes only and are not to be construed as limiting the subject matter described.

[0152] While preferred embodiments of the present invention have been shown and described herein, it will be obvious to those skilled in the art that such embodiments are provided by way of example only. Numerous variations, changes, and substitutions will now occur to those skilled in the art without departing from the invention. It should be understood that various alternatives to the embodiments of the invention described herein may be employed in practicing the invention. It is intended that the following claims define the scope of the invention and that methods and structures within the scope of these claims and their equivalents be covered thereby.

[0153] All publications, patents, and patent applications mentioned in this specification are herein incorporated by reference to the same extent as if each individual publication, patent, or patent application was specifically and individually indicated to be incorporated by reference.

EXAMPLES

Example 1

Method of Identifying the Modified Capsid Proteins in Cynomolgus Macaques

[0154] Following IV injection, unmodified AAV9 does not have sufficient tissue enrichment to treat many human diseases that would otherwise be amenable to treatment via delivery of an AAV cargo of 4.7 kbp DNA. Directed evolution of AAV9 was performed as a means of increasing viral tissue enrichment to levels that enable disease treatment.

[0155] Adeno-Associated Virus serotype 9 (AAV9) was modified by inserting a stretch of 7 amino acids (7mer) following residue #588 in its capsid coding sequence. The 7mer was randomly generated via degenerate DNA basepairs, thus sampling all 207 possible 7mer amino acid

sequences. Three batches of this library with billions of variants were prepared separately.

[0156] One batch was IV injected into three African Green Monkeys, then three weeks later the animals were sacrificed and tissue samples were screened with PCR to uncover the best 7mer sequences that caused improved enrichment relative to AAV9 in the brain and heart. The other batch was IV injected into two Cynomologus Macaque Non-Human Primates, then two weeks later the animals were sacrificed and tissue samples were screened with PCR to uncover the best 7mer sequences that caused improved enrichment relative to AAV9 in the brain and heart. The third batch was delivered identically to the second batch and data were analyzed identically, but in a separate study using different Cynomolgus Macaques.

[0157] Following these three PCR screenings of tissues, the top 41,000 variants identified in the NHP brains and hearts were brought forward into a 'round 2' screening. This smaller library was IV injected into three Cynomologus Macaque Non-Human Primates, then two weeks later the animals were sacrificed and tissue samples were screened with PCR to uncover the best 7mer sequences that caused further improved enrichment relative to AAV9 in the brain and heart.

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source                  1..11
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REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 27
AQASLAVTSA Q                                                    11

SEQ ID NO: 28           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
```

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```
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 28
AQASRDSGSA Q                                                    11

SEQ ID NO: 29           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 29
AQASRSESYA Q                                                    11

SEQ ID NO: 30           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 30
AQASTRVVNA Q                                                    11

SEQ ID NO: 31           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 31
AQATSDRPTA Q                                                    11

SEQ ID NO: 32           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 32
AQATVTHKDA Q                                                    11

SEQ ID NO: 33           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 33
AQAVGTMAPA Q                                                    11

SEQ ID NO: 34           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 34
AQDASRVLAA Q                                                    11

SEQ ID NO: 35           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 35
AQDMTGLVIA Q                                                    11
```

-continued

```
SEQ ID NO: 36           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 36
AQDNRTRTNA Q                                                    11

SEQ ID NO: 37           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 37
AQDPSRSASA Q                                                    11

SEQ ID NO: 38           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 38
AQDPTTRNEA Q                                                    11

SEQ ID NO: 39           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 39
AQDRSNITLA Q                                                    11

SEQ ID NO: 40           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 40
AQDSAQNRGA Q                                                    11

SEQ ID NO: 41           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 41
AQDSGPSKAA Q                                                    11

SEQ ID NO: 42           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 42
AQDSIQYSFA Q                                                    11

SEQ ID NO: 43           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
```

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```
                        organism = synthetic construct
SEQUENCE: 43
AQDSREQGRA Q                                                    11

SEQ ID NO: 44           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 44
AQDSRLGVTA Q                                                    11

SEQ ID NO: 45           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 45
AQDSRQPPNA Q                                                    11

SEQ ID NO: 46           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 46
AQDSRVPSQA Q                                                    11

SEQ ID NO: 47           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 47
AQDSVNLSSA Q                                                    11

SEQ ID NO: 48           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 48
AQDVRHGGTA Q                                                    11

SEQ ID NO: 49           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 49
AQDVRSNTSA Q                                                    11

SEQ ID NO: 50           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 50
AQDVSVSAFA Q                                                    11

SEQ ID NO: 51           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
```

-continued

```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 51
AQDYAYRTGA Q                                                    11

SEQ ID NO: 52           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 52
AQEHTRGETA Q                                                    11

SEQ ID NO: 53           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 53
AQEITHSHSA Q                                                    11

SEQ ID NO: 54           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 54
AQENHTFNKA Q                                                    11

SEQ ID NO: 55           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 55
AQENRVANKA Q                                                    11

SEQ ID NO: 56           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 56
AQEPERFMFA Q                                                    11

SEQ ID NO: 57           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 57
AQEPRLATDA Q                                                    11

SEQ ID NO: 58           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 58
```

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```
AQERTASLHA Q                                                    11

SEQ ID NO: 59           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 59
AQESNRHPYA Q                                                    11

SEQ ID NO: 60           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 60
AQESSHTGGA Q                                                    11

SEQ ID NO: 61           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 61
AQESVGRGEA Q                                                    11

SEQ ID NO: 62           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 62
AQEVGGGSKA Q                                                    11

SEQ ID NO: 63           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 63
AQFALPVPSA Q                                                    11

SEQ ID NO: 64           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 64
AQFGSVQDRA Q                                                    11

SEQ ID NO: 65           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 65
AQFGTGGVPA Q                                                    11

SEQ ID NO: 66           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
```

-continued

```
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 66
AQFGTMGDKA Q                                                    11

SEQ ID NO: 67           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 67
AQFGVTAGSA Q                                                    11

SEQ ID NO: 68           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 68
AQFINTVPVA Q                                                    11

SEQ ID NO: 69           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 69
AQFLVGGTVA Q                                                    11

SEQ ID NO: 70           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 70
AQFSAFLPAA Q                                                    11

SEQ ID NO: 71           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 71
AQFSGMSNSA Q                                                    11

SEQ ID NO: 72           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 72
AQFVKIAKSA Q                                                    11

SEQ ID NO: 73           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 73
AQFVTLVTSA Q                                                    11
```

-continued

```
SEQ ID NO: 74           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 74
AQGADARLHA Q                                                    11

SEQ ID NO: 75           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 75
AQGDAARSGA Q                                                    11

SEQ ID NO: 76           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 76
AQGGGSHSSA Q                                                    11

SEQ ID NO: 77           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 77
AQGHQHVTEA Q                                                    11

SEQ ID NO: 78           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 78
AQGHSETRLA Q                                                    11

SEQ ID NO: 79           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 79
AQGIGHMNDA Q                                                    11

SEQ ID NO: 80           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 80
AQGLALTLNA Q                                                    11

SEQ ID NO: 81           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
```

-continued

```
                        organism = synthetic construct
SEQUENCE: 81
AQGLAVASPA Q                                                    11

SEQ ID NO: 82           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 82
AQGLSSPLAA Q                                                    11

SEQ ID NO: 83           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 83
AQGLVLSSTA Q                                                    11

SEQ ID NO: 84           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 84
AQGLVSSSVA Q                                                    11

SEQ ID NO: 85           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 85
AQGLYNIRSA Q                                                    11

SEQ ID NO: 86           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 86
AQGNAVSVAA Q                                                    11

SEQ ID NO: 87           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 87
AQGNHTRHAA Q                                                    11

SEQ ID NO: 88           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 88
AQGNLTRLTA Q                                                    11

SEQ ID NO: 89           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
```

-continued

```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 89
AQGNNTRAHA Q                                                    11

SEQ ID NO: 90           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 90
AQGNNTTSRA Q                                                    11

SEQ ID NO: 91           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 91
AQGNQSNAAA Q                                                    11

SEQ ID NO: 92           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 92
AQGNRTRAPA Q                                                    11

SEQ ID NO: 93           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 93
AQGNRTTNDA Q                                                    11

SEQ ID NO: 94           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 94
AQGNTTVNQA Q                                                    11

SEQ ID NO: 95           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 95
AQGSDSRNSA Q                                                    11

SEQ ID NO: 96           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 96
```

-continued

```
AQGSFTQFSA Q                                                    11

SEQ ID NO: 97           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 97
AQGSGASVLA Q                                                    11

SEQ ID NO: 98           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 98
AQGSGISSHA Q                                                    11

SEQ ID NO: 99           moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 99
AQGSGTPGHA Q                                                    11

SEQ ID NO: 100          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 100
AQGSLTVLKA Q                                                    11

SEQ ID NO: 101          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 101
AQGSMMHKDA Q                                                    11

SEQ ID NO: 102          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 102
AQGSSRNEVA Q                                                    11

SEQ ID NO: 103          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 103
AQGTGSERLA Q                                                    11

SEQ ID NO: 104          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
```

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```
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 104
AQGTQDRQLA Q                                                    11

SEQ ID NO: 105          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 105
AQGTTLSSSA Q                                                    11

SEQ ID NO: 106          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 106
AQGTTSHHLA Q                                                    11

SEQ ID NO: 107          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 107
AQGVGLPTTA Q                                                    11

SEQ ID NO: 108          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 108
AQGVGSSLSA Q                                                    11

SEQ ID NO: 109          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 109
AQGVHASTQA Q                                                    11

SEQ ID NO: 110          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 110
AQGVHGSNAA Q                                                    11

SEQ ID NO: 111          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 111
AQGVISRPDA Q                                                    11
```

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```
SEQ ID NO: 112          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 112
AQGVSAVAAA Q                                                    11

SEQ ID NO: 113          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 113
AQGVTSVVAA Q                                                    11

SEQ ID NO: 114          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 114
AQHAGNITIA Q                                                    11

SEQ ID NO: 115          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 115
AQHGSRSDYA Q                                                    11

SEQ ID NO: 116          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 116
AQHGVTTQSA Q                                                    11

SEQ ID NO: 117          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 117
AQHGVVSSSA Q                                                    11

SEQ ID NO: 118          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 118
AQHHSPQSSA Q                                                    11

SEQ ID NO: 119          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
```

-continued

```
                        organism = synthetic construct
SEQUENCE: 119
AQHISLHQQA Q                                                    11

SEQ ID NO: 120          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 120
AQHISSVQPA Q                                                    11

SEQ ID NO: 121          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 121
AQHLGTVSAA Q                                                    11

SEQ ID NO: 122          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 122
AQHMSGVNAA Q                                                    11

SEQ ID NO: 123          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 123
AQHNVMSSFA Q                                                    11

SEQ ID NO: 124          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 124
AQHNVSLANA Q                                                    11

SEQ ID NO: 125          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 125
AQHQLHHGAA Q                                                    11

SEQ ID NO: 126          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 126
AQHSSGTSGA Q                                                    11

SEQ ID NO: 127          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
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```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 127
AQHSSSNIIA Q                                                    11

SEQ ID NO: 128          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 128
AQHSTKAEVA Q                                                    11

SEQ ID NO: 129          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 129
AQHTANLLDA Q                                                    11

SEQ ID NO: 130          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 130
AQHTGASLTA Q                                                    11

SEQ ID NO: 131          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 131
AQHTGPLSNA Q                                                    11

SEQ ID NO: 132          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 132
AQHTLPIMSA Q                                                    11

SEQ ID NO: 133          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 133
AQHTSTREMA Q                                                    11

SEQ ID NO: 134          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 134
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AQHTSVRIDA Q                                                    11

SEQ ID NO: 135          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 135
AQHTTSHMEA Q                                                    11

SEQ ID NO: 136          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 136
AQHYVSVPTA Q                                                    11

SEQ ID NO: 137          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 137
AQIAGRNQSA Q                                                    11

SEQ ID NO: 138          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 138
AQIAHLSSVA Q                                                    11

SEQ ID NO: 139          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 139
AQIASSPLSA Q                                                    11

SEQ ID NO: 140          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 140
AQIASSSLHA Q                                                    11

SEQ ID NO: 141          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 141
AQIGGLTTPA Q                                                    11

SEQ ID NO: 142          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
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source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 142
AQIGSLTGAA Q                                                    11

SEQ ID NO: 143          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 143
AQIGSMNEKA Q                                                    11

SEQ ID NO: 144          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 144
AQIGSSMPNA Q                                                    11

SEQ ID NO: 145          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 145
AQILATGGSA Q                                                    11

SEQ ID NO: 146          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 146
AQILDRSNMA Q                                                    11

SEQ ID NO: 147          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 147
AQILRDGHQA Q                                                    11

SEQ ID NO: 148          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 148
AQILSEHRVA Q                                                    11

SEQ ID NO: 149          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 149
AQILTRSTFA Q                                                    11
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SEQ ID NO: 150          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 150
AQILVTSTSA Q                                                    11

SEQ ID NO: 151          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 151
AQIMTSTLPA Q                                                    11

SEQ ID NO: 152          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 152
AQINRETSFA Q                                                    11

SEQ ID NO: 153          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 153
AQINSAGLLA Q                                                    11

SEQ ID NO: 154          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 154
AQISAASTSA Q                                                    11

SEQ ID NO: 155          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 155
AQISAGALIA Q                                                    11

SEQ ID NO: 156          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 156
AQISLTNSNA Q                                                    11

SEQ ID NO: 157          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
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                        organism = synthetic construct
SEQUENCE: 157
AQISSSRNGA Q                                                    11

SEQ ID NO: 158          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 158
AQISTGKLGA Q                                                    11

SEQ ID NO: 159          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 159
AQISTRESIA Q                                                    11

SEQ ID NO: 160          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 160
AQITGQMSAA Q                                                    11

SEQ ID NO: 161          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 161
AQITGQMSVA Q                                                    11

SEQ ID NO: 162          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 162
AQITSSPTSA Q                                                    11

SEQ ID NO: 163          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 163
AQITSSVMQA Q                                                    11

SEQ ID NO: 164          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 164
AQITTHPTTA Q                                                    11

SEQ ID NO: 165          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
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REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 165
AQIVAGHRDA Q                                                    11

SEQ ID NO: 166          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 166
AQIVDTRNPA Q                                                    11

SEQ ID NO: 167          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 167
AQIVGKPMEA Q                                                    11

SEQ ID NO: 168          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 168
AQIVLPSTYA Q                                                    11

SEQ ID NO: 169          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 169
AQIVSGSLGA Q                                                    11

SEQ ID NO: 170          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 170
AQIYSSSVSA Q                                                    11

SEQ ID NO: 171          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 171
AQKDQNRESA Q                                                    11

SEQ ID NO: 172          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 172
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AQKDSHSYNA Q                                                    11

SEQ ID NO: 173          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 173
AQKEQQAVSA Q                                                    11

SEQ ID NO: 174          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 174
AQKHNIPNVA Q                                                    11

SEQ ID NO: 175          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 175
AQKPTVGFAA Q                                                    11

SEQ ID NO: 176          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 176
AQKQAGTSVA Q                                                    11

SEQ ID NO: 177          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 177
AQKQHSDHPA Q                                                    11

SEQ ID NO: 178          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 178
AQKSQTNDVA Q                                                    11

SEQ ID NO: 179          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 179
AQKSSLRFYA Q                                                    11

SEQ ID NO: 180          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
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source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 180
AQKTSSSTVA Q                                                    11

SEQ ID NO: 181          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 181
AQLAHQTRDA Q                                                    11

SEQ ID NO: 182          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 182
AQLAQAASAA Q                                                    11

SEQ ID NO: 183          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 183
AQLARTTTDA Q                                                    11

SEQ ID NO: 184          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 184
AQLASASSVA Q                                                    11

SEQ ID NO: 185          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 185
AQLASSTLMA Q                                                    11

SEQ ID NO: 186          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 186
AQLDRSGSTA Q                                                    11

SEQ ID NO: 187          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 187
AQLDTSTALA Q                                                    11
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SEQ ID NO: 188          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 188
AQLGAGPHVA Q                                                    11

SEQ ID NO: 189          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 189
AQLGGSYGSA Q                                                    11

SEQ ID NO: 190          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 190
AQLGSLANTA Q                                                    11

SEQ ID NO: 191          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 191
AQLGTNRMSA Q                                                    11

SEQ ID NO: 192          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 192
AQLGVSSVEA Q                                                    11

SEQ ID NO: 193          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 193
AQLHNTVVSA Q                                                    11

SEQ ID NO: 194          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 194
AQLHSPASNA Q                                                    11

SEQ ID NO: 195          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
```

-continued

```
                        organism = synthetic construct
SEQUENCE: 195
AQLHSSPSTA Q                                                    11

SEQ ID NO: 196          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 196
AQLILTTSEA Q                                                    11

SEQ ID NO: 197          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 197
AQLKDQGSSA Q                                                    11

SEQ ID NO: 198          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 198
AQLLDTHYRA Q                                                    11

SEQ ID NO: 199          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 199
AQLLDTLMQA Q                                                    11

SEQ ID NO: 200          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 200
AQLLITAVQA Q                                                    11

SEQ ID NO: 201          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 201
AQLLLTPQLA Q                                                    11

SEQ ID NO: 202          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 202
AQLLRSTLPA Q                                                    11

SEQ ID NO: 203          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
```

-continued

```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 203
AQLLSATTHA Q                                                    11

SEQ ID NO: 204          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 204
AQLLSSSNSA Q                                                    11

SEQ ID NO: 205          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 205
AQLMSILTMA Q                                                    11

SEQ ID NO: 206          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 206
AQLMSSVSAA Q                                                    11

SEQ ID NO: 207          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 207
AQLNHSVSGA Q                                                    11

SEQ ID NO: 208          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 208
AQLNHTSPGA Q                                                    11

SEQ ID NO: 209          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 209
AQLNPQGTSA Q                                                    11

SEQ ID NO: 210          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 210
```

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```
AQLNSDKSSA Q                                                    11

SEQ ID NO: 211          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 211
AQLNSTRTYA Q                                                    11

SEQ ID NO: 212          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 212
AQLNTAQSTA Q                                                    11

SEQ ID NO: 213          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 213
AQLNTGSNAA Q                                                    11

SEQ ID NO: 214          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 214
AQLNVSTTSA Q                                                    11

SEQ ID NO: 215          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 215
AQLPASDISA Q                                                    11

SEQ ID NO: 216          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 216
AQLPRDKWEA Q                                                    11

SEQ ID NO: 217          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 217
AQLPSETKFA Q                                                    11

SEQ ID NO: 218          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
```

-continued

```
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 218
AQLQSNRSDA Q                                                    11

SEQ ID NO: 219          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 219
AQLQSRSFGA Q                                                    11

SEQ ID NO: 220          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 220
AQLQTSLSLA Q                                                    11

SEQ ID NO: 221          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 221
AQLRNSESTA Q                                                    11

SEQ ID NO: 222          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 222
AQLRNSSELA Q                                                    11

SEQ ID NO: 223          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 223
AQLRTDSLEA Q                                                    11

SEQ ID NO: 224          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 224
AQLSDHNLKA Q                                                    11

SEQ ID NO: 225          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 225
AQLSGFNVLA Q                                                    11
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SEQ ID NO: 226          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 226
AQLSGHFSFA Q                                                    11

SEQ ID NO: 227          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 227
AQLSGMSGNA Q                                                    11

SEQ ID NO: 228          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 228
AQLSGQSMDA Q                                                    11

SEQ ID NO: 229          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 229
AQLSGQVTMA Q                                                    11

SEQ ID NO: 230          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 230
AQLSNESRSA Q                                                    11

SEQ ID NO: 231          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 231
AQLSNITNSA Q                                                    11

SEQ ID NO: 232          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 232
AQLSQASSAA Q                                                    11

SEQ ID NO: 233          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
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                        organism = synthetic construct
SEQUENCE: 233
AQLSQSGKEA Q                                                    11

SEQ ID NO: 234          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 234
AQLSRSFVPA Q                                                    11

SEQ ID NO: 235          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 235
AQLSRSSSPA Q                                                    11

SEQ ID NO: 236          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 236
AQLSSANLQA Q                                                    11

SEQ ID NO: 237          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 237
AQLSSSITQA Q                                                    11

SEQ ID NO: 238          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 238
AQLSSSVVNA Q                                                    11

SEQ ID NO: 239          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 239
AQLSSTLTSA Q                                                    11

SEQ ID NO: 240          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 240
AQLSSTYANA Q                                                    11

SEQ ID NO: 241          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
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-continued

```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 241
AQLSTDASQA Q                                                    11

SEQ ID NO: 242          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 242
AQLSTISSHA Q                                                    11

SEQ ID NO: 243          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 243
AQLSTSGPSA Q                                                    11

SEQ ID NO: 244          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 244
AQLSVAQGSA Q                                                    11

SEQ ID NO: 245          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 245
AQLSVLSQIA Q                                                    11

SEQ ID NO: 246          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 246
AQLTGNQSVA Q                                                    11

SEQ ID NO: 247          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 247
AQLTHTIPSA Q                                                    11

SEQ ID NO: 248          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 248
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AQLTNVIMGA Q                                                    11

SEQ ID NO: 249          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 249
AQLTSLPQVA Q                                                    11

SEQ ID NO: 250          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 250
AQLTTPSAAA Q                                                    11

SEQ ID NO: 251          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 251
AQLTTSSTLA Q                                                    11

SEQ ID NO: 252          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 252
AQLTTTHSQA Q                                                    11

SEQ ID NO: 253          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 253
AQLVIMGMSA Q                                                    11

SEQ ID NO: 254          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 254
AQLVSSESRA Q                                                    11

SEQ ID NO: 255          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 255
AQLVTAGTAA Q                                                    11

SEQ ID NO: 256          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
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source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 256
AQMDTHNLVA Q                                                    11

SEQ ID NO: 257          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 257
AQMDYSTSPA Q                                                    11

SEQ ID NO: 258          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 258
AQMGSSGQMA Q                                                    11

SEQ ID NO: 259          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 259
AQMGTAHTIA Q                                                    11

SEQ ID NO: 260          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 260
AQMGTHVVTA Q                                                    11

SEQ ID NO: 261          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 261
AQMHDGRLVA Q                                                    11

SEQ ID NO: 262          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 262
AQMLAKTATA Q                                                    11

SEQ ID NO: 263          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 263
AQMLSSTMRA Q                                                    11
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SEQ ID NO: 264          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 264
AQMLSTTSGA Q                                                    11

SEQ ID NO: 265          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 265
AQMLVKHAGA Q                                                    11

SEQ ID NO: 266          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 266
AQMMSSTNAA Q                                                    11

SEQ ID NO: 267          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 267
AQMNHNQQHA Q                                                    11

SEQ ID NO: 268          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 268
AQMNHTSNKA Q                                                    11

SEQ ID NO: 269          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 269
AQMNNKSPGA Q                                                    11

SEQ ID NO: 270          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 270
AQMNNSTRPA Q                                                    11

SEQ ID NO: 271          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
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                        organism = synthetic construct
SEQUENCE: 271
AQMNSSSHSA Q                                                    11

SEQ ID NO: 272          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 272
AQMSGNSMAA Q                                                    11

SEQ ID NO: 273          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 273
AQMSTSYSSA Q                                                    11

SEQ ID NO: 274          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 274
AQMYLFNNSA Q                                                    11

SEQ ID NO: 275          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 275
AQNAGYSAAA Q                                                    11

SEQ ID NO: 276          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 276
AQNANHAMPA Q                                                    11

SEQ ID NO: 277          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 277
AQNAQGTHVA Q                                                    11

SEQ ID NO: 278          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 278
AQNASEKSSA Q                                                    11

SEQ ID NO: 279          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
```

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```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 279
AQNASNSTTA Q                                                    11

SEQ ID NO: 280          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 280
AQNGLRADTA Q                                                    11

SEQ ID NO: 281          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 281
AQNGRTGTGA Q                                                    11

SEQ ID NO: 282          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 282
AQNGRTTTVA Q                                                    11

SEQ ID NO: 283          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 283
AQNGSITGTA Q                                                    11

SEQ ID NO: 284          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 284
AQNGSRGAAA Q                                                    11

SEQ ID NO: 285          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 285
AQNHEQYQWA Q                                                    11

SEQ ID NO: 286          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 286
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```
AQNHSGTTSA Q                                                    11

SEQ ID NO: 287          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 287
AQNHTGVSPA Q                                                    11

SEQ ID NO: 288          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 288
AQNHVGGATA Q                                                    11

SEQ ID NO: 289          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 289
AQNIQSLSTA Q                                                    11

SEQ ID NO: 290          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 290
AQNLGLISVA Q                                                    11

SEQ ID NO: 291          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 291
AQNLSLTHEA Q                                                    11

SEQ ID NO: 292          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 292
AQNMSSNKDA Q                                                    11

SEQ ID NO: 293          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 293
AQNMTSMQSA Q                                                    11

SEQ ID NO: 294          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
```

-continued

```
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 294
AQNPTRSLSA Q                                                    11

SEQ ID NO: 295          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 295
AQNQCQSHVA Q                                                    11

SEQ ID NO: 296          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 296
AQNQFTATEA Q                                                    11

SEQ ID NO: 297          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 297
AQNQLGNSAA Q                                                    11

SEQ ID NO: 298          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 298
AQNQQNKANA Q                                                    11

SEQ ID NO: 299          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 299
AQNRNEVHSA Q                                                    11

SEQ ID NO: 300          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 300
AQNRSDSAMA Q                                                    11

SEQ ID NO: 301          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 301
AQNSAFTAQA Q                                                    11
```

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```
SEQ ID NO: 302          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 302
AQNSFSPATA Q                                                    11

SEQ ID NO: 303          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 303
AQNSGNYQIA Q                                                    11

SEQ ID NO: 304          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 304
AQNSHGHALA Q                                                    11

SEQ ID NO: 305          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 305
AQNSPGYTAA Q                                                    11

SEQ ID NO: 306          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 306
AQNSSAATGA Q                                                    11

SEQ ID NO: 307          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 307
AQNSSGHGVA Q                                                    11

SEQ ID NO: 308          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 308
AQNSSSGSAA Q                                                    11

SEQ ID NO: 309          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
```

-continued

```
                        organism = synthetic construct
SEQUENCE: 309
AQNSSSSPGA Q                                                    11

SEQ ID NO: 310          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 310
AQNSTSISHA Q                                                    11

SEQ ID NO: 311          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 311
AQNTLSNISA Q                                                    11

SEQ ID NO: 312          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 312
AQNTQTHSSA Q                                                    11

SEQ ID NO: 313          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 313
AQNTTQPSNA Q                                                    11

SEQ ID NO: 314          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 314
AQNVMSSGAA Q                                                    11

SEQ ID NO: 315          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 315
AQNVQSSNLA Q                                                    11

SEQ ID NO: 316          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 316
AQNYCGKECA Q                                                    11

SEQ ID NO: 317          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
```

-continued

```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 317
AQPATGTSGA Q                                                    11

SEQ ID NO: 318          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 318
AQPAVGSAGA Q                                                    11

SEQ ID NO: 319          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 319
AQPIGGSNMA Q                                                    11

SEQ ID NO: 320          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 320
AQPIHQTGVA Q                                                    11

SEQ ID NO: 321          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 321
AQPLQTSNAA Q                                                    11

SEQ ID NO: 322          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 322
AQPLTGQTNA Q                                                    11

SEQ ID NO: 323          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 323
AQPLYNQTPA Q                                                    11

SEQ ID NO: 324          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 324
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AQPPKPPSIA Q                                                    11

SEQ ID NO: 325          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 325
AQPQPHRLLA Q                                                    11

SEQ ID NO: 326          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 326
AQPQRSQHIA Q                                                    11

SEQ ID NO: 327          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 327
AQPQSNVSTA Q                                                    11

SEQ ID NO: 328          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 328
AQPSAEQAQA Q                                                    11

SEQ ID NO: 329          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 329
AQPSGAYGEA Q                                                    11

SEQ ID NO: 330          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 330
AQPSGQKIDA Q                                                    11

SEQ ID NO: 331          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 331
AQPSGSHSIA Q                                                    11

SEQ ID NO: 332          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
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source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 332
AQPSGTNIGA Q                                                    11

SEQ ID NO: 333          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 333
AQPSNALAGA Q                                                    11

SEQ ID NO: 334          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 334
AQPSNPQSYA Q                                                    11

SEQ ID NO: 335          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 335
AQPSPSTMRA Q                                                    11

SEQ ID NO: 336          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 336
AQPSRDVTPA Q                                                    11

SEQ ID NO: 337          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 337
AQPSSYSDSA Q                                                    11

SEQ ID NO: 338          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 338
AQPVAAHVRA Q                                                    11

SEQ ID NO: 339          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 339
AQPVHGSTDA Q                                                    11
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SEQ ID NO: 340          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 340
AQQAAVSGGA Q                                                    11

SEQ ID NO: 341          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 341
AQQATHVALA Q                                                    11

SEQ ID NO: 342          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 342
AQQDSTKALA Q                                                    11

SEQ ID NO: 343          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 343
AQQIHGPMQA Q                                                    11

SEQ ID NO: 344          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 344
AQQLLVSVTA Q                                                    11

SEQ ID NO: 345          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 345
AQQLSGSLMA Q                                                    11

SEQ ID NO: 346          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 346
AQQLSHEKSA Q                                                    11

SEQ ID NO: 347          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
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                        organism = synthetic construct
SEQUENCE: 347
AQQNNTHGGA Q                                                    11

SEQ ID NO: 348          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 348
AQQNSGPLHA Q                                                    11

SEQ ID NO: 349          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 349
AQQRTDQQTA Q                                                    11

SEQ ID NO: 350          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 350
AQQVAHTQIA Q                                                    11

SEQ ID NO: 351          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 351
AQQVGKSSAA Q                                                    11

SEQ ID NO: 352          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 352
AQQVISTGSA Q                                                    11

SEQ ID NO: 353          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 353
AQQVRTNTSA Q                                                    11

SEQ ID NO: 354          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 354
AQRADRVQEA Q                                                    11

SEQ ID NO: 355          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
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-continued

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REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 355
AQRDKMVFMA Q                                                    11

SEQ ID NO: 356          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 356
AQRDSVTDSA Q                                                    11

SEQ ID NO: 357          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 357
AQRESRVSQA Q                                                    11

SEQ ID NO: 358          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 358
AQRGHGQEIA Q                                                    11

SEQ ID NO: 359          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 359
AQRGLSAVNA Q                                                    11

SEQ ID NO: 360          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 360
AQRIGSSAIA Q                                                    11

SEQ ID NO: 361          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 361
AQRISSETSA Q                                                    11

SEQ ID NO: 362          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 362
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AQRLDIHMCA Q                                                    11

SEQ ID NO: 363          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 363
AQRNTSNQEA Q                                                    11

SEQ ID NO: 364          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 364
AQRSNNCIGA Q                                                    11

SEQ ID NO: 365          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 365
AQRSNVDGLA Q                                                    11

SEQ ID NO: 366          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 366
AQRSSLHTSA Q                                                    11

SEQ ID NO: 367          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 367
AQRSTESLHA Q                                                    11

SEQ ID NO: 368          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 368
AQRTAANHEA Q                                                    11

SEQ ID NO: 369          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 369
AQRTDGTSIA Q                                                    11

SEQ ID NO: 370          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
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source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 370
AQRTHSAMPA Q                                                    11

SEQ ID NO: 371          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 371
AQRTSGPAAA Q                                                    11

SEQ ID NO: 372          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 372
AQSAPNRTDA Q                                                    11

SEQ ID NO: 373          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 373
AQSAQSAIQA Q                                                    11

SEQ ID NO: 374          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 374
AQSARGMSGA Q                                                    11

SEQ ID NO: 375          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 375
AQSASRDPAA Q                                                    11

SEQ ID NO: 376          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 376
AQSDHSVRDA Q                                                    11

SEQ ID NO: 377          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 377
AQSDKNLQQA Q                                                    11
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SEQ ID NO: 378          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 378
AQSDLICCPA Q                                                    11

SEQ ID NO: 379          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 379
AQSERSYPSA Q                                                    11

SEQ ID NO: 380          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 380
AQSFSGQSLA Q                                                    11

SEQ ID NO: 381          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 381
AQSFSNVSPA Q                                                    11

SEQ ID NO: 382          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 382
AQSGLNTLAA Q                                                    11

SEQ ID NO: 383          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 383
AQSGNHNPAA Q                                                    11

SEQ ID NO: 384          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 384
AQSGPVQNQA Q                                                    11

SEQ ID NO: 385          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
```

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                        organism = synthetic construct
SEQUENCE: 385
AQSGSSHERA Q                                                    11

SEQ ID NO: 386          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 386
AQSGSVMSSA Q                                                    11

SEQ ID NO: 387          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 387
AQSHIVSSSA Q                                                    11

SEQ ID NO: 388          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 388
AQSHLSSQVA Q                                                    11

SEQ ID NO: 389          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 389
AQSHNSAFEA Q                                                    11

SEQ ID NO: 390          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 390
AQSIARDLAA Q                                                    11

SEQ ID NO: 391          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 391
AQSIGSSYPA Q                                                    11

SEQ ID NO: 392          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 392
AQSIKQNEGA Q                                                    11

SEQ ID NO: 393          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
```

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```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 393
AQSITQGSAA Q                                                    11

SEQ ID NO: 394          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 394
AQSKNDTSMA Q                                                    11

SEQ ID NO: 395          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 395
AQSLAGTLSA Q                                                    11

SEQ ID NO: 396          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 396
AQSLANSQTA Q                                                    11

SEQ ID NO: 397          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 397
AQSLGAQLFA Q                                                    11

SEQ ID NO: 398          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 398
AQSLHLSSSA Q                                                    11

SEQ ID NO: 399          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 399
AQSLSHTRPA Q                                                    11

SEQ ID NO: 400          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 400
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```
AQSLSQTVGA Q                                                    11

SEQ ID NO: 401          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 401
AQSLSSTGGA Q                                                    11

SEQ ID NO: 402          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 402
AQSLVSLKEA Q                                                    11

SEQ ID NO: 403          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 403
AQSLVVTTPA Q                                                    11

SEQ ID NO: 404          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 404
AQSMGSSNWA Q                                                    11

SEQ ID NO: 405          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 405
AQSMISSNRA Q                                                    11

SEQ ID NO: 406          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 406
AQSMMSLDQA Q                                                    11

SEQ ID NO: 407          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 407
AQSMPQPLVA Q                                                    11

SEQ ID NO: 408          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
```

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```
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 408
AQSMSSNLTA Q                                                    11

SEQ ID NO: 409          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 409
AQSMTLSNYA Q                                                    11

SEQ ID NO: 410          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 410
AQSNATHRFA Q                                                    11

SEQ ID NO: 411          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 411
AQSNHTKPIA Q                                                    11

SEQ ID NO: 412          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 412
AQSNQTRHVA Q                                                    11

SEQ ID NO: 413          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 413
AQSPKPPSTA Q                                                    11

SEQ ID NO: 414          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 414
AQSQDTASKA Q                                                    11

SEQ ID NO: 415          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 415
AQSQIAEPAA Q                                                    11
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```
SEQ ID NO: 416          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 416
AQSQKAPDIA Q                                                    11

SEQ ID NO: 417          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 417
AQSQLSPSNA Q                                                    11

SEQ ID NO: 418          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 418
AQSQMSSAGA Q                                                    11

SEQ ID NO: 419          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 419
AQSQSSSQTA Q                                                    11

SEQ ID NO: 420          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 420
AQSRESPSTA Q                                                    11

SEQ ID NO: 421          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 421
AQSRLLESSA Q                                                    11

SEQ ID NO: 422          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 422
AQSRNQPAEA Q                                                    11

SEQ ID NO: 423          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
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                        organism = synthetic construct
SEQUENCE: 423
AQSRSSDAFA Q                                                    11

SEQ ID NO: 424          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 424
AQSRTDLLSA Q                                                    11

SEQ ID NO: 425          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 425
AQSRTSNQAA Q                                                    11

SEQ ID NO: 426          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 426
AQSRVEEMNA Q                                                    11

SEQ ID NO: 427          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 427
AQSRVNTLDA Q                                                    11

SEQ ID NO: 428          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 428
AQSSAVLLNA Q                                                    11

SEQ ID NO: 429          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 429
AQSSDRVSSA Q                                                    11

SEQ ID NO: 430          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 430
AQSSGHSSEA Q                                                    11

SEQ ID NO: 431          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
```

-continued

```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 431
AQSSGLRLGA Q                                                    11

SEQ ID NO: 432          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 432
AQSSGSREVA Q                                                    11

SEQ ID NO: 433          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 433
AQSSHDTLQA Q                                                    11

SEQ ID NO: 434          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 434
AQSSLSVLWA Q                                                    11

SEQ ID NO: 435          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 435
AQSSLSVVPA Q                                                    11

SEQ ID NO: 436          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 436
AQSSMWHKDA Q                                                    11

SEQ ID NO: 437          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 437
AQSSQSFGYA Q                                                    11

SEQ ID NO: 438          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 438
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```
AQSSREVVTA Q                                                    11

SEQ ID NO: 439          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 439
AQSSRGETPA Q                                                    11

SEQ ID NO: 440          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 440
AQSSSQSSDA Q                                                    11

SEQ ID NO: 441          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 441
AQSSTQHEKA Q                                                    11

SEQ ID NO: 442          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 442
AQSSVSRTSA Q                                                    11

SEQ ID NO: 443          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 443
AQSSYGYRSA Q                                                    11

SEQ ID NO: 444          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 444
AQSTALTTGA Q                                                    11

SEQ ID NO: 445          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 445
AQSTATSPAA Q                                                    11

SEQ ID NO: 446          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
```

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source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 446
AQSTGQGFTA Q                                                    11

SEQ ID NO: 447          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 447
AQSTGQGINA Q                                                    11

SEQ ID NO: 448          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 448
AQSTGTSGQA Q                                                    11

SEQ ID NO: 449          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 449
AQSTISTGSA Q                                                    11

SEQ ID NO: 450          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 450
AQSTKQNVNA Q                                                    11

SEQ ID NO: 451          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 451
AQSTMAIGSA Q                                                    11

SEQ ID NO: 452          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 452
AQSTMGALKA Q                                                    11

SEQ ID NO: 453          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 453
AQSTNRAEQA Q                                                    11
```

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SEQ ID NO: 454          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 454
AQSTSALGPA Q                                                    11

SEQ ID NO: 455          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 455
AQSTSDYSRA Q                                                    11

SEQ ID NO: 456          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 456
AQSTSPTYVA Q                                                    11

SEQ ID NO: 457          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 457
AQSTSSITVA Q                                                    11

SEQ ID NO: 458          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 458
AQSTSSPTSA Q                                                    11

SEQ ID NO: 459          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 459
AQSTSYASIA Q                                                    11

SEQ ID NO: 460          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 460
AQSTTRVVDA Q                                                    11

SEQ ID NO: 461          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
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-continued

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                        organism = synthetic construct
SEQUENCE: 461
AQSVAPIANA Q                                                    11

SEQ ID NO: 462          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 462
AQSVGNGNIA Q                                                    11

SEQ ID NO: 463          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 463
AQSVRSGFKA Q                                                    11

SEQ ID NO: 464          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 464
AQSVSDGGFA Q                                                    11

SEQ ID NO: 465          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 465
AQSVSSNIVA Q                                                    11

SEQ ID NO: 466          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 466
AQSVSTAAQA Q                                                    11

SEQ ID NO: 467          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 467
AQTAHNVEQA Q                                                    11

SEQ ID NO: 468          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 468
AQTAPQSMDA Q                                                    11

SEQ ID NO: 469          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
```

-continued

```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 469
AQTDRGQVQA Q                                                    11

SEQ ID NO: 470          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 470
AQTDSSRESA Q                                                    11

SEQ ID NO: 471          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 471
AQTEAGSAAA Q                                                    11

SEQ ID NO: 472          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 472
AQTEQRHAPA Q                                                    11

SEQ ID NO: 473          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 473
AQTFGKASDA Q                                                    11

SEQ ID NO: 474          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 474
AQTGAASNIA Q                                                    11

SEQ ID NO: 475          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 475
AQTGLSAEGA Q                                                    11

SEQ ID NO: 476          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 476
```

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```
AQTGTVHSTA Q                                                    11

SEQ ID NO: 477          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 477
AQTHMQVGAA Q                                                    11

SEQ ID NO: 478          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 478
AQTHQPAEKA Q                                                    11

SEQ ID NO: 479          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 479
AQTHTALPDA Q                                                    11

SEQ ID NO: 480          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 480
AQTHTRSMIA Q                                                    11

SEQ ID NO: 481          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 481
AQTINNVVAA Q                                                    11

SEQ ID NO: 482          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 482
AQTKHSTTEA Q                                                    11

SEQ ID NO: 483          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 483
AQTLAGSSIA Q                                                    11

SEQ ID NO: 484          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
```

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```
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 484
AQTLRTSDLA Q                                                    11

SEQ ID NO: 485          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 485
AQTLSGLVMA Q                                                    11

SEQ ID NO: 486          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 486
AQTLSTHVVA Q                                                    11

SEQ ID NO: 487          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 487
AQTNITRAQA Q                                                    11

SEQ ID NO: 488          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 488
AQTNSTRNLA Q                                                    11

SEQ ID NO: 489          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 489
AQTNSTRNVA Q                                                    11

SEQ ID NO: 490          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 490
AQTNTHSVTA Q                                                    11

SEQ ID NO: 491          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 491
AQTNTLHTAA Q                                                    11
```

-continued

```
SEQ ID NO: 492          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 492
AQTNTRTMQA Q                                                    11

SEQ ID NO: 493          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 493
AQTNVSSEIA Q                                                    11

SEQ ID NO: 494          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 494
AQTPTSSSSA Q                                                    11

SEQ ID NO: 495          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 495
AQTQASASGA Q                                                    11

SEQ ID NO: 496          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 496
AQTQGDRGTA Q                                                    11

SEQ ID NO: 497          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 497
AQTQSKSESA Q                                                    11

SEQ ID NO: 498          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 498
AQTQTHVTSA Q                                                    11

SEQ ID NO: 499          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
```

-continued

```
                        organism = synthetic construct
SEQUENCE: 499
AQTQTVPTNA Q                                                    11

SEQ ID NO: 500          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 500
AQTRTDSNGA Q                                                    11

SEQ ID NO: 501          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 501
AQTSAHANQA Q                                                    11

SEQ ID NO: 502          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 502
AQTSGHSSTA Q                                                    11

SEQ ID NO: 503          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 503
AQTSLKIVPA Q                                                    11

SEQ ID NO: 504          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 504
AQTSLTVNIA Q                                                    11

SEQ ID NO: 505          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 505
AQTSSHSKDA Q                                                    11

SEQ ID NO: 506          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 506
AQTSSNYVSA Q                                                    11

SEQ ID NO: 507          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
```

-continued

```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 507
AQTSSTGVQA Q                                                    11

SEQ ID NO: 508          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 508
AQTSTHTRDA Q                                                    11

SEQ ID NO: 509          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 509
AQTSVAGSNA Q                                                    11

SEQ ID NO: 510          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 510
AQTSVTYQDA Q                                                    11

SEQ ID NO: 511          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 511
AQTTGQITVA Q                                                    11

SEQ ID NO: 512          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 512
AQTTSQALYA Q                                                    11

SEQ ID NO: 513          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 513
AQTTSSSVNA Q                                                    11

SEQ ID NO: 514          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 514
```

-continued

```
AQTTSTMSTA Q                                                    11

SEQ ID NO: 515          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 515
AQTTTSPAIA Q                                                    11

SEQ ID NO: 516          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 516
AQTVGRAMEA Q                                                    11

SEQ ID NO: 517          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 517
AQTVGVLAAA Q                                                    11

SEQ ID NO: 518          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 518
AQTVRASTDA Q                                                    11

SEQ ID NO: 519          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 519
AQTVVSGTGA Q                                                    11

SEQ ID NO: 520          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 520
AQVANDSFKA Q                                                    11

SEQ ID NO: 521          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 521
AQVARGDSDA Q                                                    11

SEQ ID NO: 522          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
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source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 522
AQVASGVATA Q                                                    11

SEQ ID NO: 523          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 523
AQVASRDQFA Q                                                    11

SEQ ID NO: 524          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 524
AQVATRPDAA Q                                                    11

SEQ ID NO: 525          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 525
AQVCHLRTSA Q                                                    11

SEQ ID NO: 526          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 526
AQVDNVTRSA Q                                                    11

SEQ ID NO: 527          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 527
AQVDSRSTPA Q                                                    11

SEQ ID NO: 528          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 528
AQVEPIRICA Q                                                    11

SEQ ID NO: 529          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 529
AQVERLQSGA Q                                                    11
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SEQ ID NO: 530          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 530
AQVFGAHSFA Q                                                    11

SEQ ID NO: 531          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 531
AQVGASSSTA Q                                                    11

SEQ ID NO: 532          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 532
AQVGGANLAA Q                                                    11

SEQ ID NO: 533          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 533
AQVGNAPPHA Q                                                    11

SEQ ID NO: 534          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 534
AQVGSNVGQA Q                                                    11

SEQ ID NO: 535          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 535
AQVGSSSVSA Q                                                    11

SEQ ID NO: 536          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 536
AQVGTVSNSA Q                                                    11

SEQ ID NO: 537          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
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                        organism = synthetic construct
SEQUENCE: 537
AQVGVNRTNA Q                                                    11

SEQ ID NO: 538          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 538
AQVHLQAHNA Q                                                    11

SEQ ID NO: 539          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 539
AQVHSLPSVA Q                                                    11

SEQ ID NO: 540          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 540
AQVHTKYTDA Q                                                    11

SEQ ID NO: 541          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 541
AQVIAATAEA Q                                                    11

SEQ ID NO: 542          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 542
AQVIWQNQVA Q                                                    11

SEQ ID NO: 543          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 543
AQVKSGSMAA Q                                                    11

SEQ ID NO: 544          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 544
AQVLSGQSPA Q                                                    11

SEQ ID NO: 545          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
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REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 545
AQVLSSMSLA Q                                                    11

SEQ ID NO: 546          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 546
AQVLTSSDLA Q                                                    11

SEQ ID NO: 547          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 547
AQVNHGAITA Q                                                    11

SEQ ID NO: 548          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 548
AQVNSHLTGA Q                                                    11

SEQ ID NO: 549          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 549
AQVNTHTSSA Q                                                    11

SEQ ID NO: 550          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 550
AQVNVTRSNA Q                                                    11

SEQ ID NO: 551          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 551
AQVPGGAGFA Q                                                    11

SEQ ID NO: 552          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 552
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AQVPSSNVSA Q                                                    11

SEQ ID NO: 553          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 553
AQVQLVANVA Q                                                    11

SEQ ID NO: 554          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 554
AQVQSHGVYA Q                                                    11

SEQ ID NO: 555          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 555
AQVRSGSNIA Q                                                    11

SEQ ID NO: 556          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 556
AQVRTAAQPA Q                                                    11

SEQ ID NO: 557          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 557
AQVSGHEHYA Q                                                    11

SEQ ID NO: 558          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 558
AQVSIHLTQA Q                                                    11

SEQ ID NO: 559          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 559
AQVSNSMATA Q                                                    11

SEQ ID NO: 560          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
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source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 560
AQVSNTLLGA Q                                                    11

SEQ ID NO: 561          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 561
AQVSSFQSSA Q                                                    11

SEQ ID NO: 562          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 562
AQVSSLPSPA Q                                                    11

SEQ ID NO: 563          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 563
AQVSTANTSA Q                                                    11

SEQ ID NO: 564          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 564
AQVSTSSLTA Q                                                    11

SEQ ID NO: 565          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 565
AQVSVSSTAA Q                                                    11

SEQ ID NO: 566          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 566
AQVTGSTKLA Q                                                    11

SEQ ID NO: 567          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 567
AQVTSQIMDA Q                                                    11
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SEQ ID NO: 568          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 568
AQVTSVSYSA Q                                                    11

SEQ ID NO: 569          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 569
AQVVSGSSHA Q                                                    11

SEQ ID NO: 570          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 570
AQVVTDAYRA Q                                                    11

SEQ ID NO: 571          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 571
AQWINAFKAA Q                                                    11

SEQ ID NO: 572          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 572
AQWSQSNKAA Q                                                    11

SEQ ID NO: 573          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 573
AQWSSRLNSA Q                                                    11

SEQ ID NO: 574          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 574
AQYAHQYNAA Q                                                    11

SEQ ID NO: 575          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
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                        organism = synthetic construct
SEQUENCE: 575
AQYDMYYDKA Q                                                    11

SEQ ID NO: 576          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 576
AQYERSKVDA Q                                                    11

SEQ ID NO: 577          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 577
AQYGTMIQVA Q                                                    11

SEQ ID NO: 578          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 578
AQYHSGVGEA Q                                                    11

SEQ ID NO: 579          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 579
AQYKATHIAA Q                                                    11

SEQ ID NO: 580          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 580
AQYKTGNHEA Q                                                    11

SEQ ID NO: 581          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 581
AQYLSNLMMA Q                                                    11

SEQ ID NO: 582          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 582
AQYNGHSNNA Q                                                    11

SEQ ID NO: 583          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
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REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 583
AQYNGQSSMA Q                                                    11

SEQ ID NO: 584          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 584
AQYNHTRLLA Q                                                    11

SEQ ID NO: 585          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 585
AQYNSTRASA Q                                                    11

SEQ ID NO: 586          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 586
AQYPSSSSMA Q                                                    11

SEQ ID NO: 587          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 587
AQYQHSSLTA Q                                                    11

SEQ ID NO: 588          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 588
AQYQLVPRSA Q                                                    11

SEQ ID NO: 589          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 589
AQYQTSISPA Q                                                    11

SEQ ID NO: 590          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 590
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AQYQTSTQGA Q                                                    11

SEQ ID NO: 591          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 591
AQYSGTHTAA Q                                                    11

SEQ ID NO: 592          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 592
AQYSSGHANA Q                                                    11

SEQ ID NO: 593          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 593
AQYSSGLAGA Q                                                    11

SEQ ID NO: 594          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 594
AQYVNHGLGA Q                                                    11

SEQ ID NO: 595          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 595
AQAAGVSAGA Q                                                    11

SEQ ID NO: 596          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 596
AQAGHNMGGA Q                                                    11

SEQ ID NO: 597          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 597
AQANKVKDLA Q                                                    11

SEQ ID NO: 598          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
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source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 598
AQANLTRVTA Q                                                    11

SEQ ID NO: 599          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 599
AQANNTMKQA Q                                                    11

SEQ ID NO: 600          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 600
AQANQTRPFA Q                                                    11

SEQ ID NO: 601          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 601
AQANSVKNIA Q                                                    11

SEQ ID NO: 602          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 602
AQANTTKSSA Q                                                    11

SEQ ID NO: 603          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 603
AQANTTRQTA Q                                                    11

SEQ ID NO: 604          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 604
AQANTVRNTA Q                                                    11

SEQ ID NO: 605          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 605
AQARAAPQTA Q                                                    11
```

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SEQ ID NO: 606          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 606
AQASAGSSGA Q                                                    11

SEQ ID NO: 607          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 607
AQASNHTSGA Q                                                    11

SEQ ID NO: 608          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 608
AQASRSEIGA Q                                                    11

SEQ ID NO: 609          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 609
AQASSSAREA Q                                                    11

SEQ ID NO: 610          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 610
AQATGYSGAA Q                                                    11

SEQ ID NO: 611          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 611
AQATHSREQA Q                                                    11

SEQ ID NO: 612          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 612
AQATNSAVGA Q                                                    11

SEQ ID NO: 613          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
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                        organism = synthetic construct
SEQUENCE: 613
AQDARPSPNA Q                                                    11

SEQ ID NO: 614          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 614
AQDNHVRTVA Q                                                    11

SEQ ID NO: 615          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 615
AQDNKVKTFA Q                                                    11

SEQ ID NO: 616          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 616
AQDNMIRSIA Q                                                    11

SEQ ID NO: 617          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 617
AQDNSTRISA Q                                                    11

SEQ ID NO: 618          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 618
AQDNSVKHSA Q                                                    11

SEQ ID NO: 619          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 619
AQDNSVRLTA Q                                                    11

SEQ ID NO: 620          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 620
AQDNSVRPSA Q                                                    11

SEQ ID NO: 621          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
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REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 621
AQDNSVRSPA Q                                                    11

SEQ ID NO: 622          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 622
AQDNVIRSIA Q                                                    11

SEQ ID NO: 623          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 623
AQDRAQSHSA Q                                                    11

SEQ ID NO: 624          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 624
AQDRSQSHSA Q                                                    11

SEQ ID NO: 625          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 625
AQDTSHRASA Q                                                    11

SEQ ID NO: 626          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 626
AQEGGTGKVA Q                                                    11

SEQ ID NO: 627          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 627
AQENHVRSSA Q                                                    11

SEQ ID NO: 628          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 628
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AQENKIKTNA Q                                                    11

SEQ ID NO: 629          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 629
AQENNTRMVA Q                                                    11

SEQ ID NO: 630          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 630
AQENQVRNTA Q                                                    11

SEQ ID NO: 631          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 631
AQENRIINHA Q                                                    11

SEQ ID NO: 632          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 632
AQENSTKSMA Q                                                    11

SEQ ID NO: 633          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 633
AQENSTRVQA Q                                                    11

SEQ ID NO: 634          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 634
AQENTTKHLA Q                                                    11

SEQ ID NO: 635          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 635
AQENTTKSLA Q                                                    11

SEQ ID NO: 636          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
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source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 636
AQENTVRNMA Q                                                    11

SEQ ID NO: 637          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 637
AQETAVRSSA Q                                                    11

SEQ ID NO: 638          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 638
AQETHNRAGA Q                                                    11

SEQ ID NO: 639          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 639
AQEVRGGTMA Q                                                    11

SEQ ID NO: 640          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 640
AQFNSTKVVA Q                                                    11

SEQ ID NO: 641          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 641
AQFNSTRSVA Q                                                    11

SEQ ID NO: 642          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 642
AQFNSVRPVA Q                                                    11

SEQ ID NO: 643          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 643
AQGGAPPTNA Q                                                    11
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SEQ ID NO: 644          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 644
AQGNAIRNGA Q                                                    11

SEQ ID NO: 645          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 645
AQGNAVKPFA Q                                                    11

SEQ ID NO: 646          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 646
AQGNGTRGFA Q                                                    11

SEQ ID NO: 647          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 647
AQGNGTRPTA Q                                                    11

SEQ ID NO: 648          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 648
AQGNITKVFA Q                                                    11

SEQ ID NO: 649          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 649
AQGNNSKPAA Q                                                    11

SEQ ID NO: 650          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 650
AQGNNTKQMA Q                                                    11

SEQ ID NO: 651          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
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                        organism = synthetic construct
SEQUENCE: 651
AQGNNTRLTA Q                                                    11

SEQ ID NO: 652          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 652
AQGNQLKNTA Q                                                    11

SEQ ID NO: 653          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 653
AQGNRIAQVA Q                                                    11

SEQ ID NO: 654          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 654
AQGNRKPNEA Q                                                    11

SEQ ID NO: 655          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 655
AQGNRTQPSA Q                                                    11

SEQ ID NO: 656          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 656
AQGNRTSGGA Q                                                    11

SEQ ID NO: 657          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 657
AQGNRVQNVA Q                                                    11

SEQ ID NO: 658          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 658
AQGNSIINHA Q                                                    11

SEQ ID NO: 659          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
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REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 659
AQGNSSKNLA Q                                                    11

SEQ ID NO: 660          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 660
AQGNSVKDSA Q                                                    11

SEQ ID NO: 661          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 661
AQGNSVKGTA Q                                                    11

SEQ ID NO: 662          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 662
AQGNSVRISA Q                                                    11

SEQ ID NO: 663          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 663
AQGNSVRTVA Q                                                    11

SEQ ID NO: 664          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 664
AQGNTIKDYA Q                                                    11

SEQ ID NO: 665          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 665
AQGNTTRHPA Q                                                    11

SEQ ID NO: 666          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 666
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AQGNTTRVPA Q                                                    11

SEQ ID NO: 667          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 667
AQGNTVKSEA Q                                                    11

SEQ ID NO: 668          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 668
AQGRNTSMEA Q                                                    11

SEQ ID NO: 669          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 669
AQGRSSQGEA Q                                                    11

SEQ ID NO: 670          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 670
AQGSRGSGAA Q                                                    11

SEQ ID NO: 671          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 671
AQGTRSTDNA Q                                                    11

SEQ ID NO: 672          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 672
AQGTSSNTGA Q                                                    11

SEQ ID NO: 673          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 673
AQGVASSHQA Q                                                    11

SEQ ID NO: 674          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
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source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 674
AQHGSSTLGA Q                                                    11

SEQ ID NO: 675          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 675
AQHGSTFTGA Q                                                    11

SEQ ID NO: 676          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 676
AQHIGSIPAA Q                                                    11

SEQ ID NO: 677          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 677
AQHNNVRPVA Q                                                    11

SEQ ID NO: 678          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 678
AQHNSTRNAA Q                                                    11

SEQ ID NO: 679          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 679
AQHNTTKPIA Q                                                    11

SEQ ID NO: 680          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 680
AQHSQSSKDA Q                                                    11

SEQ ID NO: 681          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 681
AQHTSSISSA Q                                                    11
```

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SEQ ID NO: 682          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 682
AQIAHASSMA Q                                                    11

SEQ ID NO: 683          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 683
AQIAHSSSGA Q                                                    11

SEQ ID NO: 684          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 684
AQIISSNVPA Q                                                    11

SEQ ID NO: 685          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 685
AQINATRNQA Q                                                    11

SEQ ID NO: 686          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 686
AQINHVRDTA Q                                                    11

SEQ ID NO: 687          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 687
AQINTTKPIA Q                                                    11

SEQ ID NO: 688          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 688
AQIRSTTMDA Q                                                    11

SEQ ID NO: 689          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
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                        organism = synthetic construct
SEQUENCE: 689
AQISAGPREA Q                                                    11

SEQ ID NO: 690          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 690
AQLHGTSTAA Q                                                    11

SEQ ID NO: 691          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 691
AQLNATKPIA Q                                                    11

SEQ ID NO: 692          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 692
AQLNHTKQTA Q                                                    11

SEQ ID NO: 693          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 693
AQLNNTKPIA Q                                                    11

SEQ ID NO: 694          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 694
AQLNNTRPGA Q                                                    11

SEQ ID NO: 695          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 695
AQLNSTARSA Q                                                    11

SEQ ID NO: 696          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 696
AQLNSTKPIA Q                                                    11

SEQ ID NO: 697          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
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```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 697
AQLNTAKPIA Q                                                    11

SEQ ID NO: 698          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 698
AQLNTIKPIA Q                                                    11

SEQ ID NO: 699          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 699
AQLNTSKPIA Q                                                    11

SEQ ID NO: 700          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 700
AQLNTTKAIA Q                                                    11

SEQ ID NO: 701          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 701
AQLNTTKHIA Q                                                    11

SEQ ID NO: 702          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 702
AQLNTTKLAA Q                                                    11

SEQ ID NO: 703          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 703
AQLNTTKLIA Q                                                    11

SEQ ID NO: 704          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 704
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AQLNTTKPFA Q                                                    11

SEQ ID NO: 705          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 705
AQLNTTKPGA Q                                                    11

SEQ ID NO: 706          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 706
AQLNTTKPIA Q                                                    11

SEQ ID NO: 707          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 707
AQLNTTKPLA Q                                                    11

SEQ ID NO: 708          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 708
AQLNTTKPMA Q                                                    11

SEQ ID NO: 709          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 709
AQLNTTKPNA Q                                                    11

SEQ ID NO: 710          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 710
AQLNTTKPSA Q                                                    11

SEQ ID NO: 711          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 711
AQLNTTKPTA Q                                                    11

SEQ ID NO: 712          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
```

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source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 712
AQLNTTKPVA Q                                                    11

SEQ ID NO: 713          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 713
AQLNTTKSIA Q                                                    11

SEQ ID NO: 714          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 714
AQLNTTKSVA Q                                                    11

SEQ ID NO: 715          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 715
AQLNTTKTIA Q                                                    11

SEQ ID NO: 716          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 716
AQLNTTRPIA Q                                                    11

SEQ ID NO: 717          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 717
AQLNTVKPLA Q                                                    11

SEQ ID NO: 718          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 718
AQLNYVRQVA Q                                                    11

SEQ ID NO: 719          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 719
AQLPQHGSGA Q                                                    11
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SEQ ID NO: 720          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 720
AQLPSAHSSA Q                                                    11

SEQ ID NO: 721          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 721
AQLSSPSTAA Q                                                    11

SEQ ID NO: 722          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 722
AQLTNQSSAA Q                                                    11

SEQ ID NO: 723          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 723
AQLVGTSAMA Q                                                    11

SEQ ID NO: 724          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 724
AQLVRNTDLA Q                                                    11

SEQ ID NO: 725          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 725
AQMHNIATPA Q                                                    11

SEQ ID NO: 726          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 726
AQMNHTRREA Q                                                    11

SEQ ID NO: 727          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
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                        organism = synthetic construct
SEQUENCE: 727
AQMNNTARPA Q                                                    11

SEQ ID NO: 728          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 728
AQMNNTKQTA Q                                                    11

SEQ ID NO: 729          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 729
AQMNNTRGSA Q                                                    11

SEQ ID NO: 730          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 730
AQMNNTVRAA Q                                                    11

SEQ ID NO: 731          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 731
AQMNSTRAAA Q                                                    11

SEQ ID NO: 732          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 732
AQMPGHGSSA Q                                                    11

SEQ ID NO: 733          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 733
AQMPTQHASA Q                                                    11

SEQ ID NO: 734          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 734
AQMTHSHGSA Q                                                    11

SEQ ID NO: 735          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
```

-continued

```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 735
AQNAHNVSTA Q                                                    11

SEQ ID NO: 736          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 736
AQNNLTRNNA Q                                                    11

SEQ ID NO: 737          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 737
AQNNMTRAIA Q                                                    11

SEQ ID NO: 738          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 738
AQNNMTRNNA Q                                                    11

SEQ ID NO: 739          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 739
AQNNQIKLMA Q                                                    11

SEQ ID NO: 740          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 740
AQNNRSPTLA Q                                                    11

SEQ ID NO: 741          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 741
AQNNSIRLAA Q                                                    11

SEQ ID NO: 742          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 742
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AQNNSIRSSA Q                                                    11

SEQ ID NO: 743          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 743
AQNNSTKLLA Q                                                    11

SEQ ID NO: 744          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 744
AQNNSVRPSA Q                                                    11

SEQ ID NO: 745          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 745
AQNNTSKNVA Q                                                    11

SEQ ID NO: 746          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 746
AQNNTTKLAA Q                                                    11

SEQ ID NO: 747          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 747
AQNNTTTRTA Q                                                    11

SEQ ID NO: 748          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 748
AQNNTVKNLA Q                                                    11

SEQ ID NO: 749          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 749
AQNNTVRPSA Q                                                    11

SEQ ID NO: 750          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
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source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 750
AQNNVVRSTA Q                                                    11

SEQ ID NO: 751          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 751
AQNNYVRSAA Q                                                    11

SEQ ID NO: 752          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 752
AQNQHSSQTA Q                                                    11

SEQ ID NO: 753          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 753
AQNRGIQSDA Q                                                    11

SEQ ID NO: 754          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 754
AQNSHNVPSA Q                                                    11

SEQ ID NO: 755          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 755
AQNSNNVAGA Q                                                    11

SEQ ID NO: 756          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 756
AQNSRSVSDA Q                                                    11

SEQ ID NO: 757          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 757
AQNSSTRTGA Q                                                    11
```

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SEQ ID NO: 758          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 758
AQNSTKPITA Q                                                    11

SEQ ID NO: 759          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 759
AQNSTRPLTA Q                                                    11

SEQ ID NO: 760          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 760
AQNTRGLVEA Q                                                    11

SEQ ID NO: 761          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 761
AQNTTKGMAA Q                                                    11

SEQ ID NO: 762          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 762
AQNTTRMTTA Q                                                    11

SEQ ID NO: 763          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 763
AQNTTRSESA Q                                                    11

SEQ ID NO: 764          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 764
AQNVRNVLDA Q                                                    11

SEQ ID NO: 765          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
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                        organism = synthetic construct
SEQUENCE: 765
AQPAGRNLDA Q                                                    11

SEQ ID NO: 766          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 766
AQPGYGNQGA Q                                                    11

SEQ ID NO: 767          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 767
AQPMSRDTSA Q                                                    11

SEQ ID NO: 768          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 768
AQPNAVKPMA Q                                                    11

SEQ ID NO: 769          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 769
AQPNITRNNA Q                                                    11

SEQ ID NO: 770          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 770
AQPNIVRSTA Q                                                    11

SEQ ID NO: 771          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 771
AQPNQTKTTA Q                                                    11

SEQ ID NO: 772          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 772
AQPNTTKLSA Q                                                    11

SEQ ID NO: 773          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
```

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```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 773
AQPNTTKPIA Q                                                    11

SEQ ID NO: 774          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 774
AQPNTTRSTA Q                                                    11

SEQ ID NO: 775          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 775
AQPNVTRGFA Q                                                    11

SEQ ID NO: 776          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 776
AQPNVTRTVA Q                                                    11

SEQ ID NO: 777          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 777
AQQATVRTEA Q                                                    11

SEQ ID NO: 778          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 778
AQQDRSSAVA Q                                                    11

SEQ ID NO: 779          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 779
AQQHGVSAPA Q                                                    11

SEQ ID NO: 780          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 780
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AQQIQRSIDA Q                                                    11

SEQ ID NO: 781          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 781
AQQNAIRQSA Q                                                    11

SEQ ID NO: 782          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 782
AQQNATKGIA Q                                                    11

SEQ ID NO: 783          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 783
AQQNLTRMTA Q                                                    11

SEQ ID NO: 784          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 784
AQQNNVRPSA Q                                                    11

SEQ ID NO: 785          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 785
AQQNSIRSVA Q                                                    11

SEQ ID NO: 786          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 786
AQQNSTRSLA Q                                                    11

SEQ ID NO: 787          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 787
AQQNTTRTSA Q                                                    11

SEQ ID NO: 788          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
```

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```
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 788
AQQNYTKVAA Q                                                    11

SEQ ID NO: 789          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 789
AQQRIPSNTA Q                                                    11

SEQ ID NO: 790          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 790
AQQRTSSQEA Q                                                    11

SEQ ID NO: 791          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 791
AQQSSSRLGA Q                                                    11

SEQ ID NO: 792          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 792
AQQVRSDMGA Q                                                    11

SEQ ID NO: 793          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 793
AQRDGLILIA Q                                                    11

SEQ ID NO: 794          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 794
AQRDNIILIA Q                                                    11

SEQ ID NO: 795          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 795
AQRDSTMHAA Q                                                    11
```

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```
SEQ ID NO: 796          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 796
AQRDTHVFHA Q                                                    11

SEQ ID NO: 797          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 797
AQRGDLHFQA Q                                                    11

SEQ ID NO: 798          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 798
AQRLSQSSDA Q                                                    11

SEQ ID NO: 799          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 799
AQRSGLILFA Q                                                    11

SEQ ID NO: 800          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 800
AQRSGSHFVA Q                                                    11

SEQ ID NO: 801          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 801
AQRVGQSVSA Q                                                    11

SEQ ID NO: 802          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 802
AQRVVGPLFA Q                                                    11

SEQ ID NO: 803          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
```

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```
                        organism = synthetic construct
SEQUENCE: 803
AQSDRGNHSA Q                                                    11

SEQ ID NO: 804          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 804
AQSDSRNASA Q                                                    11

SEQ ID NO: 805          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 805
AQSESARGNA Q                                                    11

SEQ ID NO: 806          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 806
AQSGHNASGA Q                                                    11

SEQ ID NO: 807          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 807
AQSGSHTNSA Q                                                    11

SEQ ID NO: 808          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 808
AQSGSSRGEA Q                                                    11

SEQ ID NO: 809          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 809
AQSLSQPERA Q                                                    11

SEQ ID NO: 810          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 810
AQSMGHSHAA Q                                                    11

SEQ ID NO: 811          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
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```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 811
AQSMSYGSSA Q                                                    11

SEQ ID NO: 812          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 812
AQSNAAKPVA Q                                                    11

SEQ ID NO: 813          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 813
AQSNATTRAA Q                                                    11

SEQ ID NO: 814          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 814
AQSNDIRNNA Q                                                    11

SEQ ID NO: 815          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 815
AQSNDTKNTA Q                                                    11

SEQ ID NO: 816          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 816
AQSNGIRNTA Q                                                    11

SEQ ID NO: 817          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 817
AQSNHTTRSA Q                                                    11

SEQ ID NO: 818          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 818
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AQSNLVRQTA Q                                                    11

SEQ ID NO: 819          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 819
AQSNNAKPSA Q                                                    11

SEQ ID NO: 820          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 820
AQSNNSSRPA Q                                                    11

SEQ ID NO: 821          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 821
AQSNQTRGNA Q                                                    11

SEQ ID NO: 822          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 822
AQSNSTKMIA Q                                                    11

SEQ ID NO: 823          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 823
AQSNSTKNAA Q                                                    11

SEQ ID NO: 824          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 824
AQSNSTKNVA Q                                                    11

SEQ ID NO: 825          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 825
AQSNSTKSLA Q                                                    11

SEQ ID NO: 826          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
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source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 826
AQSNSTRSSA Q                                                    11

SEQ ID NO: 827          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 827
AQSNSVKAPA Q                                                    11

SEQ ID NO: 828          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 828
AQSNSVKERA Q                                                    11

SEQ ID NO: 829          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 829
AQSNSVKITA Q                                                    11

SEQ ID NO: 830          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 830
AQSNSVKSFA Q                                                    11

SEQ ID NO: 831          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 831
AQSNSVKTVA Q                                                    11

SEQ ID NO: 832          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 832
AQSNSVRLVA Q                                                    11

SEQ ID NO: 833          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 833
AQSNTTKPIA Q                                                    11
```

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SEQ ID NO: 834          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 834
AQSNTTRPMA Q                                                    11

SEQ ID NO: 835          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 835
AQSNTTRQTA Q                                                    11

SEQ ID NO: 836          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 836
AQSNTTTRAA Q                                                    11

SEQ ID NO: 837          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 837
AQSNTVKAMA Q                                                    11

SEQ ID NO: 838          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 838
AQSNTVKNAA Q                                                    11

SEQ ID NO: 839          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 839
AQSNTVRNSA Q                                                    11

SEQ ID NO: 840          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 840
AQSNTVRSSA Q                                                    11

SEQ ID NO: 841          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
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                        organism = synthetic construct
SEQUENCE: 841
AQSNVIRNSA Q                                                    11

SEQ ID NO: 842          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 842
AQSNYTRSPA Q                                                    11

SEQ ID NO: 843          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 843
AQSPSRHTEA Q                                                    11

SEQ ID NO: 844          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 844
AQSQHASSAA Q                                                    11

SEQ ID NO: 845          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 845
AQSQSSSGSA Q                                                    11

SEQ ID NO: 846          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 846
AQSSATRVDA Q                                                    11

SEQ ID NO: 847          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 847
AQSSGYAQQA Q                                                    11

SEQ ID NO: 848          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 848
AQSSNSGREA Q                                                    11

SEQ ID NO: 849          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
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REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 849
AQSSSGGTGA Q                                                    11

SEQ ID NO: 850          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 850
AQSTAIRQDA Q                                                    11

SEQ ID NO: 851          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 851
AQSTQTRAAA Q                                                    11

SEQ ID NO: 852          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 852
AQSTQVRSEA Q                                                    11

SEQ ID NO: 853          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 853
AQSTRGNDNA Q                                                    11

SEQ ID NO: 854          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 854
AQSTSTHGAA Q                                                    11

SEQ ID NO: 855          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 855
AQTGVRSGDA Q                                                    11

SEQ ID NO: 856          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 856
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AQTMRQTNDA Q                                                    11

SEQ ID NO: 857          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 857
AQTNHTREVA Q                                                    11

SEQ ID NO: 858          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 858
AQTNHVKTMA Q                                                    11

SEQ ID NO: 859          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 859
AQTNHVRSAA Q                                                    11

SEQ ID NO: 860          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 860
AQTNLVKPTA Q                                                    11

SEQ ID NO: 861          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 861
AQTNMTRTTA Q                                                    11

SEQ ID NO: 862          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 862
AQTNNATRPA Q                                                    11

SEQ ID NO: 863          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 863
AQTNNAVRAA Q                                                    11

SEQ ID NO: 864          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
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-continued

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source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 864
AQTNNTKSTA Q                                                    11

SEQ ID NO: 865          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 865
AQTNNTLRSA Q                                                    11

SEQ ID NO: 866          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 866
AQTNNTSPGA Q                                                    11

SEQ ID NO: 867          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 867
AQTNNVRAPA Q                                                    11

SEQ ID NO: 868          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 868
AQTNSIKSTA Q                                                    11

SEQ ID NO: 869          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 869
AQTNSIRPIA Q                                                    11

SEQ ID NO: 870          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 870
AQTNSVKLIA Q                                                    11

SEQ ID NO: 871          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 871
AQTNTTKSMA Q                                                    11
```

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```
SEQ ID NO: 872          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 872
AQTNTVRASA Q                                                    11

SEQ ID NO: 873          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 873
AQTNTVRQTA Q                                                    11

SEQ ID NO: 874          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 874
AQTRGASNEA Q                                                    11

SEQ ID NO: 875          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 875
AQTSGRSDAA Q                                                    11

SEQ ID NO: 876          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 876
AQTVSDRSGA Q                                                    11

SEQ ID NO: 877          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 877
AQVGHSAVSA Q                                                    11

SEQ ID NO: 878          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 878
AQVHNRADVA Q                                                    11

SEQ ID NO: 879          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
```

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                        organism = synthetic construct
SEQUENCE: 879
AQVHSGPVSA Q                                                    11

SEQ ID NO: 880          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 880
AQVNATRNVA Q                                                    11

SEQ ID NO: 881          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 881
AQVNHTKGLA Q                                                    11

SEQ ID NO: 882          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 882
AQVNSLGNNA Q                                                    11

SEQ ID NO: 883          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 883
AQVNSTKSMA Q                                                    11

SEQ ID NO: 884          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 884
AQVNSTKSTA Q                                                    11

SEQ ID NO: 885          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 885
AQVNSTRGNA Q                                                    11

SEQ ID NO: 886          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 886
AQVNTTKPIA Q                                                    11

SEQ ID NO: 887          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
```

-continued

```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 887
AQVNTTQSGA Q                                                    11

SEQ ID NO: 888          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 888
AQVSDTRAGA Q                                                    11

SEQ ID NO: 889          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 889
AQVSHSLASA Q                                                    11

SEQ ID NO: 890          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 890
AQVSSSGMTA Q                                                    11

SEQ ID NO: 891          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 891
AQVSVTRSDA Q                                                    11

SEQ ID NO: 892          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 892
AQWAANTSGA Q                                                    11

SEQ ID NO: 893          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 893
AQYAGVSSPA Q                                                    11

SEQ ID NO: 894          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 894
```

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```
AQYGSHGVGA Q                                                    11

SEQ ID NO: 895          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 895
AQYNSTKNGA Q                                                    11

SEQ ID NO: 896          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 896
AQYNSTKNMA Q                                                    11

SEQ ID NO: 897          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 897
AQYNSTKSHA Q                                                    11

SEQ ID NO: 898          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 898
AQYNTTKPIA Q                                                    11

SEQ ID NO: 899          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 899
AQAAHNKDSA Q                                                    11

SEQ ID NO: 900          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 900
AQADARNTSA Q                                                    11

SEQ ID NO: 901          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 901
AQAESRGSAA Q                                                    11

SEQ ID NO: 902          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
```

-continued

```
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 902
AQAESRIGSA Q                                                    11

SEQ ID NO: 903          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 903
AQAESRTMPA Q                                                    11

SEQ ID NO: 904          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 904
AQAHAATSAA Q                                                    11

SEQ ID NO: 905          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 905
AQAISLRGDA Q                                                    11

SEQ ID NO: 906          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 906
AQAKGSTLLA Q                                                    11

SEQ ID NO: 907          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 907
AQALARSVSA Q                                                    11

SEQ ID NO: 908          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 908
AQALGQSRVA Q                                                    11

SEQ ID NO: 909          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 909
AQALSHSSGA Q                                                    11
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SEQ ID NO: 910          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 910
AQANHTRVAA Q                                                    11

SEQ ID NO: 911          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 911
AQAQGFNLLA Q                                                    11

SEQ ID NO: 912          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 912
AQARTGPMLA Q                                                    11

SEQ ID NO: 913          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 913
AQARTHLQDA Q                                                    11

SEQ ID NO: 914          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 914
AQARVGATAA Q                                                    11

SEQ ID NO: 915          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 915
AQARVGTNVA Q                                                    11

SEQ ID NO: 916          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 916
AQASHSRDAA Q                                                    11

SEQ ID NO: 917          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
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                        organism = synthetic construct
SEQUENCE: 917
AQASSNKTAA Q                                                    11

SEQ ID NO: 918          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 918
AQASSSTAGA Q                                                    11

SEQ ID NO: 919          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 919
AQATARNAVA Q                                                    11

SEQ ID NO: 920          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 920
AQATGRLPEA Q                                                    11

SEQ ID NO: 921          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 921
AQATRNTDMA Q                                                    11

SEQ ID NO: 922          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 922
AQATSIRGPA Q                                                    11

SEQ ID NO: 923          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 923
AQATVSSRIA Q                                                    11

SEQ ID NO: 924          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 924
AQAVNKPLSA Q                                                    11

SEQ ID NO: 925          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
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-continued

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REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 925
AQAVPQSAGA Q                                                    11

SEQ ID NO: 926          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 926
AQAVPSHHGA Q                                                    11

SEQ ID NO: 927          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 927
AQAVRGAMNA Q                                                    11

SEQ ID NO: 928          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 928
AQAVSGIRIA Q                                                    11

SEQ ID NO: 929          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 929
AQAVSRSVDA Q                                                    11

SEQ ID NO: 930          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 930
AQAVWPTRNA Q                                                    11

SEQ ID NO: 931          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 931
AQAYARGESA Q                                                    11

SEQ ID NO: 932          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 932
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AQAYGETFWA Q                                                    11

SEQ ID NO: 933          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 933
AQCLGPCLQA Q                                                    11

SEQ ID NO: 934          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 934
AQDGIRLTPA Q                                                    11

SEQ ID NO: 935          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 935
AQDGRTVSMA Q                                                    11

SEQ ID NO: 936          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 936
AQDGSTRMGA Q                                                    11

SEQ ID NO: 937          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 937
AQDIRSTASA Q                                                    11

SEQ ID NO: 938          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 938
AQDLSTARSA Q                                                    11

SEQ ID NO: 939          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 939
AQDLSTRVAA Q                                                    11

SEQ ID NO: 940          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
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source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 940
AQDMSRSTGA Q                                                    11

SEQ ID NO: 941          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 941
AQDNVHSRGA Q                                                    11

SEQ ID NO: 942          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 942
AQDQHNKSQA Q                                                    11

SEQ ID NO: 943          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 943
AQDQKNATGA Q                                                    11

SEQ ID NO: 944          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 944
AQDRAQSNMA Q                                                    11

SEQ ID NO: 945          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 945
AQDRGTSQTA Q                                                    11

SEQ ID NO: 946          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 946
AQDRRSSDLA Q                                                    11

SEQ ID NO: 947          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 947
AQDRSHGHNA Q                                                    11
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SEQ ID NO: 948          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 948
AQDRSNTSNA Q                                                    11

SEQ ID NO: 949          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 949
AQDRSTTHAA Q                                                    11

SEQ ID NO: 950          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 950
AQDSLPEPYA Q                                                    11

SEQ ID NO: 951          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 951
AQDSNRAVAA Q                                                    11

SEQ ID NO: 952          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 952
AQDSNRPSNA Q                                                    11

SEQ ID NO: 953          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 953
AQDSRQSKEA Q                                                    11

SEQ ID NO: 954          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 954
AQDSSNRTGA Q                                                    11

SEQ ID NO: 955          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
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                        organism = synthetic construct
SEQUENCE: 955
AQDSYTRSAA Q                                                    11

SEQ ID NO: 956          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 956
AQDTHARGLA Q                                                    11

SEQ ID NO: 957          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 957
AQDTRQSFSA Q                                                    11

SEQ ID NO: 958          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 958
AQEASIRSGA Q                                                    11

SEQ ID NO: 959          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 959
AQEGNISRPA Q                                                    11

SEQ ID NO: 960          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 960
AQELTMPPYA Q                                                    11

SEQ ID NO: 961          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 961
AQEMSKANMA Q                                                    11

SEQ ID NO: 962          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 962
AQENQRSGAA Q                                                    11

SEQ ID NO: 963          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
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REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 963
AQERGKNLEA Q                                                    11

SEQ ID NO: 964          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 964
AQERGTVSTA Q                                                    11

SEQ ID NO: 965          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 965
AQERNALREA Q                                                    11

SEQ ID NO: 966          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 966
AQESGQRNQA Q                                                    11

SEQ ID NO: 967          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 967
AQESNSYRPA Q                                                    11

SEQ ID NO: 968          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 968
AQESRATTPA Q                                                    11

SEQ ID NO: 969          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 969
AQESTKYHAA Q                                                    11

SEQ ID NO: 970          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 970
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AQESTRISGA Q                                                    11

SEQ ID NO: 971          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 971
AQETGRYNPA Q                                                    11

SEQ ID NO: 972          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 972
AQETTSWVFA Q                                                    11

SEQ ID NO: 973          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 973
AQEVNRSSYA Q                                                    11

SEQ ID NO: 974          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 974
AQEVSRGKDA Q                                                    11

SEQ ID NO: 975          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 975
AQEYGKATAA Q                                                    11

SEQ ID NO: 976          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 976
AQFAGMRTAA Q                                                    11

SEQ ID NO: 977          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 977
AQFDSVRNSA Q                                                    11

SEQ ID NO: 978          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
```

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source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 978
AQFGSRDGSA Q                                                    11

SEQ ID NO: 979          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 979
AQFGSRQPEA Q                                                    11

SEQ ID NO: 980          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 980
AQFHNTRSEA Q                                                    11

SEQ ID NO: 981          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 981
AQFNSDRPGA Q                                                    11

SEQ ID NO: 982          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 982
AQFNSTRIVA Q                                                    11

SEQ ID NO: 983          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 983
AQFNVSSTGA Q                                                    11

SEQ ID NO: 984          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 984
AQFQVATRDA Q                                                    11

SEQ ID NO: 985          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 985
AQFSNRTASA Q                                                    11
```

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```
SEQ ID NO: 986          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 986
AQFSRGVNEA Q                                                    11

SEQ ID NO: 987          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 987
AQGAGALRGA Q                                                    11

SEQ ID NO: 988          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 988
AQGAGRTLEA Q                                                    11

SEQ ID NO: 989          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 989
AQGDRLTHGA Q                                                    11

SEQ ID NO: 990          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 990
AQGFGHSVSA Q                                                    11

SEQ ID NO: 991          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 991
AQGGTAARGA Q                                                    11

SEQ ID NO: 992          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 992
AQGGVRNAEA Q                                                    11

SEQ ID NO: 993          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
```

-continued

```
                        organism = synthetic construct
SEQUENCE: 993
AQGHHRTVEA Q                                                    11

SEQ ID NO: 994          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 994
AQGHSANLGA Q                                                    11

SEQ ID NO: 995          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 995
AQGIRNQAEA Q                                                    11

SEQ ID NO: 996          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 996
AQGLGTSSNA Q                                                    11

SEQ ID NO: 997          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 997
AQGLNRLTPA Q                                                    11

SEQ ID NO: 998          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 998
AQGLRSSDSA Q                                                    11

SEQ ID NO: 999          moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 999
AQGMRTSNDA Q                                                    11

SEQ ID NO: 1000         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1000
AQGNGSRMAA Q                                                    11

SEQ ID NO: 1001         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
```

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```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1001
AQGNRIAREA Q                                                    11

SEQ ID NO: 1002         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1002
AQGRSLTTDA Q                                                    11

SEQ ID NO: 1003         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1003
AQGSKPSQMA Q                                                    11

SEQ ID NO: 1004         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1004
AQGSYANSQA Q                                                    11

SEQ ID NO: 1005         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1005
AQGVAKGNEA Q                                                    11

SEQ ID NO: 1006         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1006
AQGVMGMRNA Q                                                    11

SEQ ID NO: 1007         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1007
AQGVRSGLSA Q                                                    11

SEQ ID NO: 1008         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1008
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```
AQGVRSHDAA Q                                                    11

SEQ ID NO: 1009         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1009
AQGVSNRANA Q                                                    11

SEQ ID NO: 1010         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1010
AQGVSRATPA Q                                                    11

SEQ ID NO: 1011         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1011
AQGVTLGSRA Q                                                    11

SEQ ID NO: 1012         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1012
AQGYNSTPGA Q                                                    11

SEQ ID NO: 1013         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1013
AQGYSGATGA Q                                                    11

SEQ ID NO: 1014         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1014
AQGYSHSSGA Q                                                    11

SEQ ID NO: 1015         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1015
AQHFVDSGLA Q                                                    11

SEQ ID NO: 1016         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
```

-continued

```
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1016
AQHGTSRPDA Q                                                    11

SEQ ID NO: 1017         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1017
AQHIVTHDLA Q                                                    11

SEQ ID NO: 1018         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1018
AQHLVDRSLA Q                                                    11

SEQ ID NO: 1019         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1019
AQHMSDSPHA Q                                                    11

SEQ ID NO: 1020         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1020
AQHMVPSLLA Q                                                    11

SEQ ID NO: 1021         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1021
AQHNLPVLHA Q                                                    11

SEQ ID NO: 1022         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1022
AQHNPTRADA Q                                                    11

SEQ ID NO: 1023         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1023
AQHPVQSSLA Q                                                    11
```

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SEQ ID NO: 1024         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1024
AQHQAKLQNA Q                                                    11

SEQ ID NO: 1025         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1025
AQHQIAYDLA Q                                                    11

SEQ ID NO: 1026         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1026
AQHQVPSLLA Q                                                    11

SEQ ID NO: 1027         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1027
AQHRIATVEA Q                                                    11

SEQ ID NO: 1028         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1028
AQHRVSEHFA Q                                                    11

SEQ ID NO: 1029         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1029
AQHSSIGSSA Q                                                    11

SEQ ID NO: 1030         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1030
AQHSVSHHFA Q                                                    11

SEQ ID NO: 1031         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
```

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                        organism = synthetic construct
SEQUENCE: 1031
AQHYLSTDFA Q                                                    11

SEQ ID NO: 1032         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1032
AQIASRGLAA Q                                                    11

SEQ ID NO: 1033         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1033
AQIDNRHNGA Q                                                    11

SEQ ID NO: 1034         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1034
AQIGASSGGA Q                                                    11

SEQ ID NO: 1035         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1035
AQIGGAVTTA Q                                                    11

SEQ ID NO: 1036         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1036
AQIGGHERPA Q                                                    11

SEQ ID NO: 1037         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1037
AQIGHVSANA Q                                                    11

SEQ ID NO: 1038         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1038
AQIGRVTNEA Q                                                    11

SEQ ID NO: 1039         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
```

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```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1039
AQIGSRASDA Q                                                    11

SEQ ID NO: 1040         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1040
AQIGSSRLGA Q                                                    11

SEQ ID NO: 1041         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1041
AQIHGKEREA Q                                                    11

SEQ ID NO: 1042         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1042
AQIHLSSATA Q                                                    11

SEQ ID NO: 1043         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1043
AQIHSRGDTA Q                                                    11

SEQ ID NO: 1044         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1044
AQIHSTNPGA Q                                                    11

SEQ ID NO: 1045         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1045
AQIISNRAVA Q                                                    11

SEQ ID NO: 1046         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1046
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AQILHLPMNA Q                                                    11

SEQ ID NO: 1047         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1047
AQILTSTVGA Q                                                    11

SEQ ID NO: 1048         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1048
AQINSTATGA Q                                                    11

SEQ ID NO: 1049         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1049
AQIPNFPTLA Q                                                    11

SEQ ID NO: 1050         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1050
AQIPSGNVSA Q                                                    11

SEQ ID NO: 1051         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1051
AQIPSKSPAA Q                                                    11

SEQ ID NO: 1052         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1052
AQIPSTHTGA Q                                                    11

SEQ ID NO: 1053         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1053
AQIPSTRAGA Q                                                    11

SEQ ID NO: 1054         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
```

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```
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1054
AQIRHGATDA Q                                                    11

SEQ ID NO: 1055         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1055
AQIRPRPEDA Q                                                    11

SEQ ID NO: 1056         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1056
AQIRSDHSSA Q                                                    11

SEQ ID NO: 1057         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1057
AQIRSDSAMA Q                                                    11

SEQ ID NO: 1058         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1058
AQIRSSTGDA Q                                                    11

SEQ ID NO: 1059         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1059
AQIRSSTIFA Q                                                    11

SEQ ID NO: 1060         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1060
AQIRTMSSEA Q                                                    11

SEQ ID NO: 1061         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1061
AQISNRTSSA Q                                                    11
```

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```
SEQ ID NO: 1062         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1062
AQISRQEVLA Q                                                    11

SEQ ID NO: 1063         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1063
AQISSHSPGA Q                                                    11

SEQ ID NO: 1064         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1064
AQISSSRLSA Q                                                    11

SEQ ID NO: 1065         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1065
AQISVSLRSA Q                                                    11

SEQ ID NO: 1066         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1066
AQITGVPMNA Q                                                    11

SEQ ID NO: 1067         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1067
AQITRNADNA Q                                                    11

SEQ ID NO: 1068         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1068
AQITSSTQFA Q                                                    11

SEQ ID NO: 1069         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
```

-continued

```
                        organism = synthetic construct
SEQUENCE: 1069
AQITTRIEQA Q                                                    11

SEQ ID NO: 1070         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1070
AQIVKPNITA Q                                                    11

SEQ ID NO: 1071         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1071
AQIVSRTENA Q                                                    11

SEQ ID NO: 1072         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1072
AQIVVRGDSA Q                                                    11

SEQ ID NO: 1073         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1073
AQIYSASTPA Q                                                    11

SEQ ID NO: 1074         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1074
AQKGQPPFLA Q                                                    11

SEQ ID NO: 1075         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1075
AQKHHVPFDA Q                                                    11

SEQ ID NO: 1076         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1076
AQKLDLPMTA Q                                                    11

SEQ ID NO: 1077         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
```

-continued

```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1077
AQKLLGGLSA Q                                                    11

SEQ ID NO: 1078         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1078
AQKLSLPTTA Q                                                    11

SEQ ID NO: 1079         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1079
AQKNGQPVQA Q                                                    11

SEQ ID NO: 1080         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1080
AQKPYVPHDA Q                                                    11

SEQ ID NO: 1081         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1081
AQKQRSEDPA Q                                                    11

SEQ ID NO: 1082         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1082
AQKSGSMLVA Q                                                    11

SEQ ID NO: 1083         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1083
AQKSQSLAGA Q                                                    11

SEQ ID NO: 1084         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1084
```

-continued

```
AQKSQTSYMA Q                                                    11

SEQ ID NO: 1085         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1085
AQKTTTSLAA Q                                                    11

SEQ ID NO: 1086         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1086
AQLAGRGAGA Q                                                    11

SEQ ID NO: 1087         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1087
AQLAPIMREA Q                                                    11

SEQ ID NO: 1088         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1088
AQLATTRVEA Q                                                    11

SEQ ID NO: 1089         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1089
AQLDRANPQA Q                                                    11

SEQ ID NO: 1090         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1090
AQLEHRSGSA Q                                                    11

SEQ ID NO: 1091         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1091
AQLFGPLLLA Q                                                    11

SEQ ID NO: 1092         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
```

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```
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1092
AQLFSWRNAA Q                                                    11

SEQ ID NO: 1093         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1093
AQLFTTSNIA Q                                                    11

SEQ ID NO: 1094         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1094
AQLGHSLTSA Q                                                    11

SEQ ID NO: 1095         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1095
AQLGHSSQIA Q                                                    11

SEQ ID NO: 1096         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1096
AQLGNLGHQA Q                                                    11

SEQ ID NO: 1097         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1097
AQLGRVQSDA Q                                                    11

SEQ ID NO: 1098         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1098
AQLGSSSVSA Q                                                    11

SEQ ID NO: 1099         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1099
AQLHGPTLLA Q                                                    11
```

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SEQ ID NO: 1100         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1100
AQLHGVPMNA Q                                                    11

SEQ ID NO: 1101         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1101
AQLHHNRESA Q                                                    11

SEQ ID NO: 1102         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1102
AQLHNFPDNA Q                                                    11

SEQ ID NO: 1103         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1103
AQLHSIGTSA Q                                                    11

SEQ ID NO: 1104         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1104
AQLHSSTLGA Q                                                    11

SEQ ID NO: 1105         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1105
AQLIHNGAAA Q                                                    11

SEQ ID NO: 1106         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1106
AQLKVGPMDA Q                                                    11

SEQ ID NO: 1107         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
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```
                        organism = synthetic construct
SEQUENCE: 1107
AQLKVPVLMA Q                                                    11

SEQ ID NO: 1108         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1108
AQLLDHISKA Q                                                    11

SEQ ID NO: 1109         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1109
AQLLPATRDA Q                                                    11

SEQ ID NO: 1110         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1110
AQLNHGANAA Q                                                    11

SEQ ID NO: 1111         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1111
AQLNHTRPGA Q                                                    11

SEQ ID NO: 1112         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1112
AQLNSPSFLA Q                                                    11

SEQ ID NO: 1113         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1113
AQLNSSRASA Q                                                    11

SEQ ID NO: 1114         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1114
AQLNSVKHYA Q                                                    11

SEQ ID NO: 1115         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
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```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1115
AQLNTTKTNA Q                                                    11

SEQ ID NO: 1116         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1116
AQLPGRSTSA Q                                                    11

SEQ ID NO: 1117         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1117
AQLPSYHSAA Q                                                    11

SEQ ID NO: 1118         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1118
AQLQRSTDGA Q                                                    11

SEQ ID NO: 1119         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1119
AQLQTTYSSA Q                                                    11

SEQ ID NO: 1120         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1120
AQLRNSSGDA Q                                                    11

SEQ ID NO: 1121         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1121
AQLRSLSAEA Q                                                    11

SEQ ID NO: 1122         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1122
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-continued

```
AQLSHSYSSA Q                                                    11

SEQ ID NO: 1123         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1123
AQLSNSVKTA Q                                                    11

SEQ ID NO: 1124         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1124
AQLSSHAYQA Q                                                    11

SEQ ID NO: 1125         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1125
AQLSSRPDAA Q                                                    11

SEQ ID NO: 1126         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1126
AQLSSSRSAA Q                                                    11

SEQ ID NO: 1127         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1127
AQLSSSYTVA Q                                                    11

SEQ ID NO: 1128         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1128
AQLSTSYSSA Q                                                    11

SEQ ID NO: 1129         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1129
AQLTHVSNIA Q                                                    11

SEQ ID NO: 1130         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
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-continued

```
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1130
AQLTTSVRIA Q                                                    11

SEQ ID NO: 1131         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1131
AQLTTTRTEA Q                                                    11

SEQ ID NO: 1132         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1132
AQLTVAGRSA Q                                                    11

SEQ ID NO: 1133         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1133
AQMGSKSNEA Q                                                    11

SEQ ID NO: 1134         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1134
AQMKVPILLA Q                                                    11

SEQ ID NO: 1135         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1135
AQMLAGRESA Q                                                    11

SEQ ID NO: 1136         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1136
AQMNAGRSGA Q                                                    11

SEQ ID NO: 1137         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1137
AQMNSSKPTA Q                                                    11
```

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```
SEQ ID NO: 1138         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1138
AQMNSVRTGA Q                                                    11

SEQ ID NO: 1139         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1139
AQMNTSRSPA Q                                                    11

SEQ ID NO: 1140         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1140
AQMNTTRVPA Q                                                    11

SEQ ID NO: 1141         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1141
AQMPTKMTDA Q                                                    11

SEQ ID NO: 1142         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1142
AQMRTGSNEA Q                                                    11

SEQ ID NO: 1143         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1143
AQMRTLTGDA Q                                                    11

SEQ ID NO: 1144         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1144
AQMRTSHTEA Q                                                    11

SEQ ID NO: 1145         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
```

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```
                        organism = synthetic construct
SEQUENCE: 1145
AQMRTSNLTA Q                                                    11

SEQ ID NO: 1146         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1146
AQMSGHRQDA Q                                                    11

SEQ ID NO: 1147         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1147
AQMSHSSGAA Q                                                    11

SEQ ID NO: 1148         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1148
AQMSNRVLEA Q                                                    11

SEQ ID NO: 1149         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1149
AQMSTTRSSA Q                                                    11

SEQ ID NO: 1150         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1150
AQMTSKPESA Q                                                    11

SEQ ID NO: 1151         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1151
AQMVNRVQSA Q                                                    11

SEQ ID NO: 1152         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1152
AQMVRSNDPA Q                                                    11

SEQ ID NO: 1153         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
```

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```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1153
AQMYTTGQSA Q                                                    11

SEQ ID NO: 1154         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1154
AQNAGRYGDA Q                                                    11

SEQ ID NO: 1155         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1155
AQNGARTPPA Q                                                    11

SEQ ID NO: 1156         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1156
AQNGQRLSPA Q                                                    11

SEQ ID NO: 1157         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1157
AQNGRVGSNA Q                                                    11

SEQ ID NO: 1158         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1158
AQNGSATRVA Q                                                    11

SEQ ID NO: 1159         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1159
AQNGSKLAGA Q                                                    11

SEQ ID NO: 1160         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1160
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AQNGSRVIAA Q                                                    11

SEQ ID NO: 1161         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1161
AQNGTMRLAA Q                                                    11

SEQ ID NO: 1162         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1162
AQNHRPSGDA Q                                                    11

SEQ ID NO: 1163         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1163
AQNLANTRDA Q                                                    11

SEQ ID NO: 1164         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1164
AQNLQPGKIA Q                                                    11

SEQ ID NO: 1165         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1165
AQNLRGTSVA Q                                                    11

SEQ ID NO: 1166         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1166
AQNLSSVNGA Q                                                    11

SEQ ID NO: 1167         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1167
AQNRTGGFDA Q                                                    11

SEQ ID NO: 1168         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
```

-continued

```
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1168
AQNRVAQGEA Q                                                    11

SEQ ID NO: 1169         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1169
AQNSATMRQA Q                                                    11

SEQ ID NO: 1170         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1170
AQNSDPYRFA Q                                                    11

SEQ ID NO: 1171         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1171
AQNSHISRDA Q                                                    11

SEQ ID NO: 1172         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1172
AQNSQTLRSA Q                                                    11

SEQ ID NO: 1173         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1173
AQNSRAAEHA Q                                                    11

SEQ ID NO: 1174         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1174
AQNSRGPVAA Q                                                    11

SEQ ID NO: 1175         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1175
AQNSSHANSA Q                                                    11
```

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```
SEQ ID NO: 1176         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1176
AQNSTQYNAA Q                                                    11

SEQ ID NO: 1177         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1177
AQNTGHASMA Q                                                    11

SEQ ID NO: 1178         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1178
AQNTGRSDSA Q                                                    11

SEQ ID NO: 1179         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1179
AQNTNMPQYA Q                                                    11

SEQ ID NO: 1180         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1180
AQNTSSVRGA Q                                                    11

SEQ ID NO: 1181         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1181
AQNTVNVSGA Q                                                    11

SEQ ID NO: 1182         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1182
AQNVAGRLDA Q                                                    11

SEQ ID NO: 1183         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
```

-continued

```
                        organism = synthetic construct
SEQUENCE: 1183
AQNVSNLHGA Q                                                    11

SEQ ID NO: 1184         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1184
AQNVSQLRDA Q                                                    11

SEQ ID NO: 1185         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1185
AQNVTRGHEA Q                                                    11

SEQ ID NO: 1186         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1186
AQNVYNVSGA Q                                                    11

SEQ ID NO: 1187         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1187
AQPARPNNPA Q                                                    11

SEQ ID NO: 1188         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1188
AQPFTPKPMA Q                                                    11

SEQ ID NO: 1189         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1189
AQPGVGKQPA Q                                                    11

SEQ ID NO: 1190         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1190
AQPHDSVMWA Q                                                    11

SEQ ID NO: 1191         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
```

-continued

```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1191
AQPINLPMSA Q                                                    11

SEQ ID NO: 1192         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1192
AQPKSSHEWA Q                                                    11

SEQ ID NO: 1193         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1193
AQPNNTIRGA Q                                                    11

SEQ ID NO: 1194         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1194
AQPQKTGSAA Q                                                    11

SEQ ID NO: 1195         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1195
AQPQSGPLPA Q                                                    11

SEQ ID NO: 1196         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1196
AQPQSNRPAA Q                                                    11

SEQ ID NO: 1197         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1197
AQPQSRGDSA Q                                                    11

SEQ ID NO: 1198         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1198
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AQPRLPEVFA Q                                                    11

SEQ ID NO: 1199         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1199
AQPRTGTPPA Q                                                    11

SEQ ID NO: 1200         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1200
AQPSHSVLFA Q                                                    11

SEQ ID NO: 1201         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1201
AQPSRGQTAA Q                                                    11

SEQ ID NO: 1202         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1202
AQPSRGQTTA Q                                                    11

SEQ ID NO: 1203         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1203
AQPSTDTFWA Q                                                    11

SEQ ID NO: 1204         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1204
AQPSVTGRSA Q                                                    11

SEQ ID NO: 1205         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1205
AQPSYGGSGA Q                                                    11

SEQ ID NO: 1206         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
```

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```
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1206
AQPTGLPINA Q                                                    11

SEQ ID NO: 1207         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1207
AQPTQRTGTA Q                                                    11

SEQ ID NO: 1208         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1208
AQPTRGTGTA Q                                                    11

SEQ ID NO: 1209         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1209
AQPTSALPMA Q                                                    11

SEQ ID NO: 1210         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1210
AQPVSRSPAA Q                                                    11

SEQ ID NO: 1211         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1211
AQQAGRSVAA Q                                                    11

SEQ ID NO: 1212         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1212
AQQAGSSVAA Q                                                    11

SEQ ID NO: 1213         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1213
AQQASRNEIA Q                                                    11
```

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```
SEQ ID NO: 1214         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1214
AQQATRGDSA Q                                                    11

SEQ ID NO: 1215         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1215
AQQDRILSAA Q                                                    11

SEQ ID NO: 1216         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1216
AQQDSMRGLA Q                                                    11

SEQ ID NO: 1217         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1217
AQQDTRSHAA Q                                                    11

SEQ ID NO: 1218         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1218
AQQGGLILLA Q                                                    11

SEQ ID NO: 1219         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1219
AQQGSIRSDA Q                                                    11

SEQ ID NO: 1220         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1220
AQQGYGGQTA Q                                                    11

SEQ ID NO: 1221         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
```

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```
                        organism = synthetic construct
SEQUENCE: 1221
AQQHAPSLLA Q                                                    11

SEQ ID NO: 1222         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1222
AQQLPGGLHA Q                                                    11

SEQ ID NO: 1223         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1223
AQQLSNKTNA Q                                                    11

SEQ ID NO: 1224         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1224
AQQLSRDVPA Q                                                    11

SEQ ID NO: 1225         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1225
AQQLVQHRDA Q                                                    11

SEQ ID NO: 1226         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1226
AQQMRTGGIA Q                                                    11

SEQ ID NO: 1227         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1227
AQQPGYSSDA Q                                                    11

SEQ ID NO: 1228         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1228
AQQPRANQIA Q                                                    11

SEQ ID NO: 1229         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
```

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```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1229
AQQPRTNESA Q                                                    11

SEQ ID NO: 1230         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1230
AQQQLPVLMA Q                                                    11

SEQ ID NO: 1231         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1231
AQQRESPLDA Q                                                    11

SEQ ID NO: 1232         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1232
AQQRHLPTDA Q                                                    11

SEQ ID NO: 1233         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1233
AQQSAGKLGA Q                                                    11

SEQ ID NO: 1234         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1234
AQQSLSSLSA Q                                                    11

SEQ ID NO: 1235         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1235
AQQSNLPMTA Q                                                    11

SEQ ID NO: 1236         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1236
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```
AQQSNVYREA Q                                                    11

SEQ ID NO: 1237         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1237
AQQTSRLQEA Q                                                    11

SEQ ID NO: 1238         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1238
AQQTTDRSGA Q                                                    11

SEQ ID NO: 1239         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1239
AQQVGPILMA Q                                                    11

SEQ ID NO: 1240         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1240
AQQVGSYQHA Q                                                    11

SEQ ID NO: 1241         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1241
AQQVSTARPA Q                                                    11

SEQ ID NO: 1242         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1242
AQQYGSVSQA Q                                                    11

SEQ ID NO: 1243         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1243
AQQYSSGSSA Q                                                    11

SEQ ID NO: 1244         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
```

-continued

```
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1244
AQRAGVSQIA Q                                                    11

SEQ ID NO: 1245         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1245
AQRDTTYTTA Q                                                    11

SEQ ID NO: 1246         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1246
AQRERSSEVA Q                                                    11

SEQ ID NO: 1247         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1247
AQRGHGSSDA Q                                                    11

SEQ ID NO: 1248         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1248
AQRGPLTLLA Q                                                    11

SEQ ID NO: 1249         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1249
AQRGTLDLLA Q                                                    11

SEQ ID NO: 1250         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1250
AQRIASPYDA Q                                                    11

SEQ ID NO: 1251         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1251
AQRIGTATVA Q                                                    11
```

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```
SEQ ID NO: 1252         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1252
AQRIGTMSAA Q                                                    11

SEQ ID NO: 1253         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1253
AQRLPGGLSA Q                                                    11

SEQ ID NO: 1254         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1254
AQRLTQHEPA Q                                                    11

SEQ ID NO: 1255         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1255
AQRMSNGSTA Q                                                    11

SEQ ID NO: 1256         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1256
AQRMSSSSDA Q                                                    11

SEQ ID NO: 1257         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1257
AQRNHSAGDA Q                                                    11

SEQ ID NO: 1258         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1258
AQRNLPQVYA Q                                                    11

SEQ ID NO: 1259         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
```

-continued

```
                        organism = synthetic construct
SEQUENCE: 1259
AQRNYSPTEA Q                                                    11

SEQ ID NO: 1260         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1260
AQRPEVPNWA Q                                                    11

SEQ ID NO: 1261         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1261
AQRPQGSAGA Q                                                    11

SEQ ID NO: 1262         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1262
AQRPTMPEYA Q                                                    11

SEQ ID NO: 1263         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1263
AQRSDRLTDA Q                                                    11

SEQ ID NO: 1264         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1264
AQRSGMAVEA Q                                                    11

SEQ ID NO: 1265         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1265
AQRSGSGSDA Q                                                    11

SEQ ID NO: 1266         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1266
AQRSGSSADA Q                                                    11

SEQ ID NO: 1267         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
```

-continued

```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1267
AQRSNLLAEA Q                                                    11

SEQ ID NO: 1268         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1268
AQRSNSSVGA Q                                                    11

SEQ ID NO: 1269         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1269
AQRSTAIVAA Q                                                    11

SEQ ID NO: 1270         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1270
AQRTGMTGAA Q                                                    11

SEQ ID NO: 1271         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1271
AQRTGSVVNA Q                                                    11

SEQ ID NO: 1272         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1272
AQRTGTQSSA Q                                                    11

SEQ ID NO: 1273         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1273
AQRTIGTSTA Q                                                    11

SEQ ID NO: 1274         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1274
```

-continued

```
AQRTSQIQSA Q                                                    11

SEQ ID NO: 1275         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1275
AQRVGASGTA Q                                                    11

SEQ ID NO: 1276         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1276
AQRVGSSLSA Q                                                    11

SEQ ID NO: 1277         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1277
AQRVPAGGGA Q                                                    11

SEQ ID NO: 1278         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1278
AQRVSATQTA Q                                                    11

SEQ ID NO: 1279         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1279
AQRVVGGLTA Q                                                    11

SEQ ID NO: 1280         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1280
AQSALHVSGA Q                                                    11

SEQ ID NO: 1281         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1281
AQSASLGGYA Q                                                    11

SEQ ID NO: 1282         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
```

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```
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1282
AQSASLRSDA Q                                                    11

SEQ ID NO: 1283         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1283
AQSAVVRSGA Q                                                    11

SEQ ID NO: 1284         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1284
AQSDMPRTFA Q                                                    11

SEQ ID NO: 1285         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1285
AQSDTRSMSA Q                                                    11

SEQ ID NO: 1286         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1286
AQSFNHGATA Q                                                    11

SEQ ID NO: 1287         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1287
AQSFTRIPPA Q                                                    11

SEQ ID NO: 1288         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1288
AQSGNFSGGA Q                                                    11

SEQ ID NO: 1289         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1289
AQSGSALHGA Q                                                    11
```

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```
SEQ ID NO: 1290         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1290
AQSGSRLLDA Q                                                    11

SEQ ID NO: 1291         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1291
AQSGSSRDMA Q                                                    11

SEQ ID NO: 1292         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1292
AQSGSSRPSA Q                                                    11

SEQ ID NO: 1293         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1293
AQSGSYSTVA Q                                                    11

SEQ ID NO: 1294         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1294
AQSHEKFLYA Q                                                    11

SEQ ID NO: 1295         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1295
AQSHSASREA Q                                                    11

SEQ ID NO: 1296         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1296
AQSHSNTGNA Q                                                    11

SEQ ID NO: 1297         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
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```
                        organism = synthetic construct
SEQUENCE: 1297
AQSIPGKGMA Q                                                    11

SEQ ID NO: 1298         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1298
AQSIRSQLPA Q                                                    11

SEQ ID NO: 1299         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1299
AQSISAGRVA Q                                                    11

SEQ ID NO: 1300         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1300
AQSISGRSDA Q                                                    11

SEQ ID NO: 1301         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1301
AQSISGRVGA Q                                                    11

SEQ ID NO: 1302         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1302
AQSISRQSEA Q                                                    11

SEQ ID NO: 1303         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1303
AQSISRSGYA Q                                                    11

SEQ ID NO: 1304         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1304
AQSLAAEFWA Q                                                    11

SEQ ID NO: 1305         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
```

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```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1305
AQSLDPLGLA Q                                                    11

SEQ ID NO: 1306         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1306
AQSLIHSIWA Q                                                    11

SEQ ID NO: 1307         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1307
AQSLNRVVEA Q                                                    11

SEQ ID NO: 1308         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1308
AQSLQRSVDA Q                                                    11

SEQ ID NO: 1309         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1309
AQSLSRDGTA Q                                                    11

SEQ ID NO: 1310         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1310
AQSLVKSGQA Q                                                    11

SEQ ID NO: 1311         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1311
AQSMSRLNEA Q                                                    11

SEQ ID NO: 1312         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1312
```

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```
AQSNTLRNVA Q                                                    11

SEQ ID NO: 1313         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1313
AQSNYVRSPA Q                                                    11

SEQ ID NO: 1314         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1314
AQSPRSNVTA Q                                                    11

SEQ ID NO: 1315         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1315
AQSPRSSIGA Q                                                    11

SEQ ID NO: 1316         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1316
AQSPVAPNWA Q                                                    11

SEQ ID NO: 1317         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1317
AQSQALRADA Q                                                    11

SEQ ID NO: 1318         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1318
AQSQGVRVPA Q                                                    11

SEQ ID NO: 1319         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1319
AQSQKMLHGA Q                                                    11

SEQ ID NO: 1320         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
```

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```
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1320
AQSQPGPFNA Q                                                    11

SEQ ID NO: 1321         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1321
AQSQSAKGPA Q                                                    11

SEQ ID NO: 1322         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1322
AQSRGQTTDA Q                                                    11

SEQ ID NO: 1323         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1323
AQSRGSETTA Q                                                    11

SEQ ID NO: 1324         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1324
AQSRISNVSA Q                                                    11

SEQ ID NO: 1325         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1325
AQSRQTGLTA Q                                                    11

SEQ ID NO: 1326         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1326
AQSRSQATDA Q                                                    11

SEQ ID NO: 1327         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1327
AQSRSTDTGA Q                                                    11
```

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```
SEQ ID NO: 1328         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1328
AQSRVGLSTA Q                                                    11

SEQ ID NO: 1329         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1329
AQSSAGKSPA Q                                                    11

SEQ ID NO: 1330         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1330
AQSSAGRTGA Q                                                    11

SEQ ID NO: 1331         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1331
AQSSATVREA Q                                                    11

SEQ ID NO: 1332         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1332
AQSSDSRSSA Q                                                    11

SEQ ID NO: 1333         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1333
AQSSGISRDA Q                                                    11

SEQ ID NO: 1334         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1334
AQSSGPIILA Q                                                    11

SEQ ID NO: 1335         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
```

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```
                        organism = synthetic construct
SEQUENCE: 1335
AQSSHSANMA Q                                                    11

SEQ ID NO: 1336         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1336
AQSSIVRQEA Q                                                    11

SEQ ID NO: 1337         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1337
AQSSQNVSGA Q                                                    11

SEQ ID NO: 1338         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1338
AQSSQRGHEA Q                                                    11

SEQ ID NO: 1339         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1339
AQSSSSRGPA Q                                                    11

SEQ ID NO: 1340         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1340
AQSSTVRNAA Q                                                    11

SEQ ID NO: 1341         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1341
AQSSVTHSSA Q                                                    11

SEQ ID NO: 1342         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1342
AQSSYQSNGA Q                                                    11

SEQ ID NO: 1343         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
```

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```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1343
AQSTAARPVA Q                                                    11

SEQ ID NO: 1344         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1344
AQSTGHNTQA Q                                                    11

SEQ ID NO: 1345         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1345
AQSTGSSTSA Q                                                    11

SEQ ID NO: 1346         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1346
AQSTGTPNWA Q                                                    11

SEQ ID NO: 1347         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1347
AQSTHIARDA Q                                                    11

SEQ ID NO: 1348         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1348
AQSTIVYREA Q                                                    11

SEQ ID NO: 1349         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1349
AQSTMQNRIA Q                                                    11

SEQ ID NO: 1350         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1350
```

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```
AQSTNHGNNA Q                                                    11

SEQ ID NO: 1351         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1351
AQSTQIHAGA Q                                                    11

SEQ ID NO: 1352         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1352
AQSTQLRSGA Q                                                    11

SEQ ID NO: 1353         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1353
AQSTRALQPA Q                                                    11

SEQ ID NO: 1354         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1354
AQSTRSSDSA Q                                                    11

SEQ ID NO: 1355         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1355
AQSTRTAPEA Q                                                    11

SEQ ID NO: 1356         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1356
AQSTSNRPAA Q                                                    11

SEQ ID NO: 1357         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1357
AQSTSPPRPA Q                                                    11

SEQ ID NO: 1358         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
```

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```
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1358
AQSTSRLPAA Q                                                    11

SEQ ID NO: 1359         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1359
AQSTSSHTPA Q                                                    11

SEQ ID NO: 1360         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1360
AQSTSSRTSA Q                                                    11

SEQ ID NO: 1361         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1361
AQSTSSRTTA Q                                                    11

SEQ ID NO: 1362         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1362
AQSTTSAPGA Q                                                    11

SEQ ID NO: 1363         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1363
AQSTVTAVGA Q                                                    11

SEQ ID NO: 1364         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1364
AQSVGELPFA Q                                                    11

SEQ ID NO: 1365         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1365
AQSVPAKGSA Q                                                    11
```

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```
SEQ ID NO: 1366         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1366
AQSVRAGLNA Q                                                    11

SEQ ID NO: 1367         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1367
AQSVRSPVTA Q                                                    11

SEQ ID NO: 1368         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1368
AQSVRSSDYA Q                                                    11

SEQ ID NO: 1369         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1369
AQSVTRTVAA Q                                                    11

SEQ ID NO: 1370         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1370
AQSVYSHSSA Q                                                    11

SEQ ID NO: 1371         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1371
AQSYAPQLLA Q                                                    11

SEQ ID NO: 1372         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1372
AQSYSNRSVA Q                                                    11

SEQ ID NO: 1373         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
```

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```
                        organism = synthetic construct
SEQUENCE: 1373
AQTAAVRSGA Q                                                    11

SEQ ID NO: 1374         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1374
AQTALKAVGA Q                                                    11

SEQ ID NO: 1375         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1375
AQTANTRAEA Q                                                    11

SEQ ID NO: 1376         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1376
AQTASQLSAA Q                                                    11

SEQ ID NO: 1377         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1377
AQTDRITISA Q                                                    11

SEQ ID NO: 1378         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1378
AQTDTRHATA Q                                                    11

SEQ ID NO: 1379         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1379
AQTERNTASA Q                                                    11

SEQ ID NO: 1380         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1380
AQTFHAVKEA Q                                                    11

SEQ ID NO: 1381         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
```

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```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1381
AQTGSLAHGA Q                                                    11

SEQ ID NO: 1382         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1382
AQTIGMRSAA Q                                                    11

SEQ ID NO: 1383         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1383
AQTINKPNAA Q                                                    11

SEQ ID NO: 1384         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1384
AQTISNSSGA Q                                                    11

SEQ ID NO: 1385         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1385
AQTITRGTDA Q                                                    11

SEQ ID NO: 1386         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1386
AQTLQNVNYA Q                                                    11

SEQ ID NO: 1387         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1387
AQTLSSSREA Q                                                    11

SEQ ID NO: 1388         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1388
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```
AQTMGRNVSA Q                                                    11

SEQ ID NO: 1389         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1389
AQTQGNRTDA Q                                                    11

SEQ ID NO: 1390         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1390
AQTQHSTQSA Q                                                    11

SEQ ID NO: 1391         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1391
AQTQSAYGSA Q                                                    11

SEQ ID NO: 1392         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1392
AQTQSLRHDA Q                                                    11

SEQ ID NO: 1393         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1393
AQTQTDRHSA Q                                                    11

SEQ ID NO: 1394         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1394
AQTQTNIGRA Q                                                    11

SEQ ID NO: 1395         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1395
AQTRHSSSDA Q                                                    11

SEQ ID NO: 1396         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
```

-continued

```
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1396
AQTRSSSEAA Q                                                    11

SEQ ID NO: 1397         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1397
AQTRSTIQEA Q                                                    11

SEQ ID NO: 1398         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1398
AQTSATYSGA Q                                                    11

SEQ ID NO: 1399         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1399
AQTSGTRHEA Q                                                    11

SEQ ID NO: 1400         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1400
AQTSHAPNNA Q                                                    11

SEQ ID NO: 1401         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1401
AQTSHSSSVA Q                                                    11

SEQ ID NO: 1402         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1402
AQTSHVSSAA Q                                                    11

SEQ ID NO: 1403         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1403
AQTSILRNEA Q                                                    11
```

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```
SEQ ID NO: 1404         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1404
AQTSNSSGQA Q                                                    11

SEQ ID NO: 1405         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1405
AQTSNYGATA Q                                                    11

SEQ ID NO: 1406         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1406
AQTSQSRVEA Q                                                    11

SEQ ID NO: 1407         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1407
AQTSRANDTA Q                                                    11

SEQ ID NO: 1408         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1408
AQTSRSNETA Q                                                    11

SEQ ID NO: 1409         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1409
AQTSTPNKIA Q                                                    11

SEQ ID NO: 1410         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1410
AQTSYSTTTA Q                                                    11

SEQ ID NO: 1411         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
```

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```
                        organism = synthetic construct
SEQUENCE: 1411
AQTTARNLEA Q                                                    11

SEQ ID NO: 1412         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1412
AQTTGILRDA Q                                                    11

SEQ ID NO: 1413         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1413
AQTTGTPRPA Q                                                    11

SEQ ID NO: 1414         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1414
AQTTGYSQAA Q                                                    11

SEQ ID NO: 1415         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1415
AQTTIRNAVA Q                                                    11

SEQ ID NO: 1416         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1416
AQTTNITRTA Q                                                    11

SEQ ID NO: 1417         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1417
AQTTSMGKVA Q                                                    11

SEQ ID NO: 1418         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1418
AQTTSMSGHA Q                                                    11

SEQ ID NO: 1419         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
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```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1419
AQTTSPKLPA Q                                                    11

SEQ ID NO: 1420         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1420
AQTTSSSYNA Q                                                    11

SEQ ID NO: 1421         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1421
AQTTSTHNAA Q                                                    11

SEQ ID NO: 1422         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1422
AQTTSVRSTA Q                                                    11

SEQ ID NO: 1423         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1423
AQTTTAGKVA Q                                                    11

SEQ ID NO: 1424         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1424
AQTTTKFTPA Q                                                    11

SEQ ID NO: 1425         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1425
AQTVITASGA Q                                                    11

SEQ ID NO: 1426         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1426
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AQTVQSHSTA Q                                                    11

SEQ ID NO: 1427         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1427
AQTVSSGRPA Q                                                    11

SEQ ID NO: 1428         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1428
AQTYNATRSA Q                                                    11

SEQ ID NO: 1429         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1429
AQVAGRNVSA Q                                                    11

SEQ ID NO: 1430         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1430
AQVAGTSQGA Q                                                    11

SEQ ID NO: 1431         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1431
AQVAGYSRDA Q                                                    11

SEQ ID NO: 1432         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1432
AQVATPSFLA Q                                                    11

SEQ ID NO: 1433         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1433
AQVFTNRSAA Q                                                    11

SEQ ID NO: 1434         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
```

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```
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1434
AQVGHGSLPA Q                                                    11

SEQ ID NO: 1435         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1435
AQVGSYSRDA Q                                                    11

SEQ ID NO: 1436         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1436
AQVGTLSSSA Q                                                    11

SEQ ID NO: 1437         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1437
AQVGVNVHGA Q                                                    11

SEQ ID NO: 1438         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1438
AQVIRGLEQA Q                                                    11

SEQ ID NO: 1439         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1439
AQVISRDSSA Q                                                    11

SEQ ID NO: 1440         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1440
AQVISSHHSA Q                                                    11

SEQ ID NO: 1441         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1441
AQVKANQATA Q                                                    11
```

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```
SEQ ID NO: 1442         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1442
AQVLHASMSA Q                                                    11

SEQ ID NO: 1443         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1443
AQVLHGSSYA Q                                                    11

SEQ ID NO: 1444         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1444
AQVLRSNVMA Q                                                    11

SEQ ID NO: 1445         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1445
AQVNLPVLLA Q                                                    11

SEQ ID NO: 1446         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1446
AQVPGHSGLA Q                                                    11

SEQ ID NO: 1447         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1447
AQVPGQSSLA Q                                                    11

SEQ ID NO: 1448         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1448
AQVPRSSTDA Q                                                    11

SEQ ID NO: 1449         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
```

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                        organism = synthetic construct
SEQUENCE: 1449
AQVPRTGLTA Q                                                    11

SEQ ID NO: 1450         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1450
AQVPTSHSTA Q                                                    11

SEQ ID NO: 1451         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1451
AQVQSHGVNA Q                                                    11

SEQ ID NO: 1452         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1452
AQVQYGGLTA Q                                                    11

SEQ ID NO: 1453         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1453
AQVRGLYSDA Q                                                    11

SEQ ID NO: 1454         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1454
AQVRHSGMEA Q                                                    11

SEQ ID NO: 1455         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1455
AQVRPPNPSA Q                                                    11

SEQ ID NO: 1456         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1456
AQVRSTLTDA Q                                                    11

SEQ ID NO: 1457         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
```

-continued

```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1457
AQVRSVGLDA Q                                                    11

SEQ ID NO: 1458         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1458
AQVRTPLFAA Q                                                    11

SEQ ID NO: 1459         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1459
AQVRTSYSDA Q                                                    11

SEQ ID NO: 1460         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1460
AQVSGIRGDA Q                                                    11

SEQ ID NO: 1461         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1461
AQVSGRSLSA Q                                                    11

SEQ ID NO: 1462         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1462
AQVSNSYLGA Q                                                    11

SEQ ID NO: 1463         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1463
AQVSNTYSGA Q                                                    11

SEQ ID NO: 1464         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1464
```

-continued

```
AQVSRSESAA Q                                                    11

SEQ ID NO: 1465         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1465
AQVSSYPNSA Q                                                    11

SEQ ID NO: 1466         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1466
AQVTGLRGIA Q                                                    11

SEQ ID NO: 1467         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1467
AQVTHASLSA Q                                                    11

SEQ ID NO: 1468         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1468
AQVTQLGRSA Q                                                    11

SEQ ID NO: 1469         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1469
AQVTRSAGEA Q                                                    11

SEQ ID NO: 1470         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1470
AQVTSKNDLA Q                                                    11

SEQ ID NO: 1471         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1471
AQVTTKTQLA Q                                                    11

SEQ ID NO: 1472         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
```

-continued

```
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1472
AQVVANTSRA Q                                                    11

SEQ ID NO: 1473         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1473
AQVVGSNREA Q                                                    11

SEQ ID NO: 1474         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1474
AQVVRSGNEA Q                                                    11

SEQ ID NO: 1475         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1475
AQVVRSVNDA Q                                                    11

SEQ ID NO: 1476         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1476
AQVVRTPNSA Q                                                    11

SEQ ID NO: 1477         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1477
AQWGSHPTGA Q                                                    11

SEQ ID NO: 1478         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1478
AQWLKSVSSA Q                                                    11

SEQ ID NO: 1479         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1479
AQWRHTSAEA Q                                                    11
```

-continued

```
SEQ ID NO: 1480         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1480
AQYAGNSGNA Q                                                    11

SEQ ID NO: 1481         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1481
AQYASSSNNA Q                                                    11

SEQ ID NO: 1482         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1482
AQYERNHNAA Q                                                    11

SEQ ID NO: 1483         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1483
AQYKSSLSEA Q                                                    11

SEQ ID NO: 1484         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
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source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1484
AQYLHGLQQA Q                                                    11

SEQ ID NO: 1485         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1485
AQYNQIRGDA Q                                                    11

SEQ ID NO: 1486         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1486
AQYNSSNFGA Q                                                    11

SEQ ID NO: 1487         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
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source                  1..11
                        mol_type = protein
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```
                        organism = synthetic construct
SEQUENCE: 1487
AQYPGNRMEA Q                                                    11

SEQ ID NO: 1488         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1488
AQYRNTVQDA Q                                                    11

SEQ ID NO: 1489         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1489
AQYRQSSSDA Q                                                    11

SEQ ID NO: 1490         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1490
AQYRSGTQEA Q                                                    11

SEQ ID NO: 1491         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1491
AQYTGSISVA Q                                                    11

SEQ ID NO: 1492         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1492
AQYTSSVTGA Q                                                    11

SEQ ID NO: 1493         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1493
AQYVASSPMA Q                                                    11

SEQ ID NO: 1494         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1494
AQYVGSGTAA Q                                                    11

SEQ ID NO: 1495         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
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-continued

```
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1495
AQYVHSNNAA Q                                                    11

SEQ ID NO: 1496         moltype = AA  length = 11
FEATURE                 Location/Qualifiers
REGION                  1..11
                        note = Synthetic
source                  1..11
                        mol_type = protein
                        organism = synthetic construct
SEQUENCE: 1496
AQYYSSSGGA Q                                                    11
```

What is claimed is:

1. A mutant Adeno-Associated Virus (AAV) capsid protein comprising at least 95% sequence identity to the wild-type AAV capsid protein, wherein the mutant AAV capsid protein comprises a sequence selected from the group consisting of SEQ ID NO: 2-1496.

2. The mutant AAV capsid protein of claim **1**, wherein the mutant AAV capsid protein comprises 7-mer amino acid insertion sequence located between residues 588 and 589 in relation to the wild-type AAV capsid protein.

3. The mutant AAV capsid protein of claim **1**, wherein the mutant AAV capsid protein comprises at least 95% sequence identity to the wild-type Adeno-Associated Virus serotype 9 (AAV9) capsid of SEQ ID NO: 1.

4. The mutant AAV capsid protein of claim **1**, wherein the amino acids immediately preceding the 7-mer amino acid insertion sequence are -AQ-.

5. The mutant AAV capsid protein of claim **1**, wherein the amino acids immediately following the 7-mer amino acid insertion sequence are -AQ-.

6. The mutant AAV capsid protein of claim **1**, wherein 60 copies of the AAV capsid protein are assembled into the AAV capsid.

7. The mutant AAV capsid protein of claim **1**, wherein the AAV capsid protein is present in VP1, VP2, and VP3 of the mutant AAV capsid.

8. The mutant AAV capsid protein of claim **1**, wherein the mutant AAV capsid protein comprises a sequence selected from the group consisting of SEQ ID NO: 2-898.

9. The mutant AAV capsid protein of claim **8**, further characterized by an increased transduction enrichment relative to the wild-type AAV9 when measured in brain tissue in a subject when delivered to the subject systemically.

10. The mutant AAV capsid protein of claim **9**, wherein the mutant AAV capsid protein comprises a sequence selected from the group consisting of SEQ ID NO: 2-594.

11. The mutant AAV capsid protein of claim **1**, wherein the mutant AAV capsid protein comprises a sequence selected from the group consisting of SEQ ID NO: 595-1496.

12. The mutant AAV capsid protein of claim **11**, further characterized by an increased transduction enrichment relative to the wild-type AAV9 when measured in heart tissue in a subject when delivered to the subject systemically.

13. The mutant AAV capsid protein of claim **12**, wherein the mutant AAV capsid protein comprises a sequence selected from the group consisting of SEQ ID NO: 899-1496.

14. The mutant AAV capsid protein of claim **1**, wherein the mutant AAV capsid protein comprises a sequence selected from the group consisting of SEQ ID NO: 595-898.

15. The mutant AAV capsid protein of claim **14**, further characterized by an increased transduction enrichment relative to the wild-type AAV9 when measured in brain tissue and heart tissue in a subject when delivered to the subject systemically.

16. An AAV capsid comprising a mutant AAV capsid protein comprising at least 95% sequence identity to the wild-type AAV capsid protein, wherein the mutant AAV capsid protein comprises a sequence selected from the group consisting of SEQ ID NO: 2-1496.

17. The AAV capsid of claim **16**, wherein the AAV capsid is chimeric.

18. The AAV capsid of claim **17**, wherein the capsid is isolated and purified.

19. The AAV capsid of claim **16**, wherein the mutant AAV capsid protein comprises a sequence selected from the group consisting of SEQ ID NO: 2-898.

20. The AAV capsid of claim **19**, further characterized by an increased transduction enrichment relative to the wild-type AAV9 when measured in brain tissue in a subject when delivered to the subject systemically.

21. The AAV capsid of claim **20**, wherein the mutant AAV capsid protein comprises a sequence selected from the group consisting of SEQ ID NO: 2-594.

22. The AAV capsid of claim **16**, wherein the mutant AAV capsid protein comprises a sequence selected from the group consisting of SEQ ID NO: 595-1496.

23. The AAV capsid of claim **22**, further characterized by an increased transduction enrichment relative to the wild-type AAV9 when measured in heart tissue in a subject when delivered to the subject systemically.

24. The AAV capsid of claim **23**, wherein the mutant AAV capsid protein comprises a sequence selected from the group consisting of SEQ ID NO: 899-1496.

25. The AAV capsid of claim **16**, wherein the mutant AAV capsid protein comprises a sequence selected from the group consisting of SEQ ID NO: 595-898.

26. The AAV capsid of claim **25**, further characterized by an increased transduction enrichment relative to the wild-type AAV9 when measured in brain tissue and heart tissue in a subject when delivered to the subject systemically.

27. A composition comprising an AAV capsid, wherein the AAV capsid comprises an AAV capsid protein comprising at least 95% sequence identity to the wild-type AAV capsid protein, wherein the mutant AAV capsid protein comprises a sequence selected from the group consisting of SEQ ID NO: 2-1496.

28. The composition of claim **27**, formulated for systematic administration to a subject.

29. The composition of claim **28**, wherein systematic administration of the composition results in expression of a gene product delivered by the AAV capsid.

30. The composition of claim **29**, wherein administration of the composition results in increased transduction enrichment relative to the wild-type AAV9 when measured in heart and/or brain.

31. A method of treating a disease or condition in a subject comprising administering a therapeutically effective amount of a composition of claim **27**.

32. The composition of claim **27**, for use in treating a disease or condition in a subject, the use comprising administering a therapeutically effective amount of a composition of claim **27**.

* * * * *