

Humanization results: 25 sequence pairs

Legend:

- Line 1: Nearest human germline to experimentally humanized sequence
 - Line 2: Experimentally humanized sequence
 - Line 3: Parental sequence
 - Line 4: Sequence humanized by Sapiens (3 iterations)
 - Line 5: Nearest human germline to Sapiens humanized sequence

Parental and humanized sequences are colored in red gradient based on number of non-human overlapping 9-mers at given position (based on OASis relaxed identity)

Germline sequences are colored in green when the humanized sequence matches germline

CDR and Vernier regions are shown using dark and light grey border around parental sequence

AntiCD28

Heavy chain

```

EVQLVQSGGGLVQPGGSLRLSCAGSGFTSSYAMHWVRQAPGKGLWVSA1GTGGTTYADSVKGRFTISRDNAKNSLYQMNSLRAEDMAYVYCAR-----YFDYWQGQTLTVVSS IGHV3/0R16-10*02,IGHJ4*01
EVQLVQSGGGLVQPGGSLRLSCAGSGFTSDYGVHWRQAPGKGLWVSAIWAGGGTNYASSVMGRFTISRDNAKNSLYQMNSLRAEDMAYVYCARDKGYSYYYSMDYWQGQTLTVVSS Humanized (Experimental)
EVKLQSQSPGPGLVTPSQLSITCTVSGFSLSDYGVHWRQSPGQGLEWLGIWAGGGTNYNSALMSRSKISKDMSKQFLKMNLQADDTAVVYCARDKGYSYYYSMDYWQGQTSVTVSS Parental
EVKLQSQSPGPGLVTPSQLSITCTVSGFSLSDYGVHWRQSPGQGLEWLGIWAGGGTNYNSALMSRSKISKDMSKQFLKMNLQADDTAVVYCARDKGYSYYYSMDYWQGQTSVTVSS Humanized (Sapiens^3)
EVKLQSQSPGPGLVTPSQLSITCTVSGFSLSDYGVHWRQSPGQGLEWLGIWAGGGTNYNSALMSRSV1S1DTSKSVQSLKNSLTAAADTAVVYCARDKGYSYYYSMDYWQGQTSVTVSS Humanized (Sapiens^3)
EVKLQSQSPGPGLVTPSQLSITCTVSGFSLSDYGVHWRQSPGQGLEWLGIWAGGGTNYNSALMSRSV1S1DTSKSVQSLKNSLTAAADTAVVYCARDKGYSYYYSMDYWQGQTSVTVSS IGHV4-4*08,IGHJ6*01

```

Light chain

Bevacizumab

Heavy chain

EVQLVSGGGLVQPGGSLRLSCAASGFTSSYAMSWVQAPGKGLEW**SAISGSGGTYYADSVKRFTISRDN**KNTLYQ**LQMNSLRAEDTAVYYCAK**-----**YWYFDLWGRGLTVT**VSS IGHV3-23*04, IGHJ2*01
EVQLVSGGGLVQPGGSLRLSCAASGYTFTNYGMNWRVQAPGKGLEW**GWIN**TYGEPTYAADF**KRRTFSLDTSK**STAYL**QMN**SLRAEDTAVYYCAK**PHYGGSHWYFDWVGQ**TLTVT**VSS** Humanized (Experimental)
EIQLVQSGPELKQPGETVRISCKASGYTFTNYGMNWR**QAPGKGLK**MGW**INT**TYGEPTYAADF**KRRTFSL**SETSASTAYL**QISNLK**NDDTAT**YFCAK****PHYGGSHWYFDWVGAGT**TVT**VSS** Parental
QVQLVQSGSELKKPGASVRISCKASGYTF**TNYGMNWRVQAPGQ**GLEW**MGWIN**TYGEPTYAADF**KRRTFVFSL**TSV**STAYLQISNLK**AADD**TAVYFC**CARY**PHYGGSHWYFDWVG**RTLV**VSS** Humanized (Sapiens^3)
QVQLVQSGSELKKPGASVKSCKASGYTF**TSAMNWRVQAPGQ**GLEW**MGIN**TY**NTNGP**TY**QAQFTGRFVFSL**TSV**STAYLQISSLKA**ED**TAVYYC**-----**YWYFDLWGRGLTVT**VSS IGHV7-4-1*02, IGHJ2*01

Light chain

```

DIQMTQSPSSLSASVGDRVITCRASQGINSYLAWQQKPGKAPKSLIYAASSLQSGVPSRFSFGSGSDFTLTISSLQQPEDFATYYCQQYNS-WTFQGQTKVEIK IGKV1-16*01, IGKV1-16*01
DIQMTQSPSSLSASVGDRVITCSASQDISNYLNWYQQKPGKAPKVLIYFTSSLHSGVPSRFSFGSGSDFTLTISSLQQPEDFATYYCQQYSTVPWFQGQTKVEIK Humanized (Experimental)
DIQMTQTSSLSASLGDRVIISCASQDISNYLNWYQQKPDGTVKVLIYFTSSLHSGVPSRFSFGSGSDFTLTISSLNLEPEDIATYYCQQYSTVPWFGGGTKEIK Parental
DIQMTQSPSSLSASVGDRVITCSASQDISNYLNWYQQKPGKAPKLLIYFTSSLHSGVPSRFSFGSGSDFTLTISSLQQPEDIATYYCQQYSTVPWFQGQTKVEIK Humanized (Sapiens^3)
DIQMTQSPSSLSASVGDRVITCQASQDISNYLNWYQQKPGKAPKLLIYDASNLETGVPSRFSFGSGSDFTLTISSLQQPEDIATYYCQQYDN-WTFQGQTKVEIK IGKV1-33*01, IGKV1-33*01

```

Campath

Heavy chain

EVQLQESGPGLVKPSQTLSTCTVSGGSIGDYYWSWIRQAPGKGLEWIGYIYYS---GSTYNNPSLKSRSVTISVDTSKNQFSKLSSVTAADTAVYYCAR-----YFDYWQGQTLTVSS IGHV4-30-4*01,IGHJ4*01
EVQLQESGPGLVRPSQTLSTCTVSGFTFTDFYMNWVRQPPGRGLEWIGFIRDKAKGYTTEYNPSVKGRVTMLVDTSKNQFSLRSSVTAADTAVYYCAREGHTAAPFDYWGQGSLTVSS Humanized (Experimental)
EVKLLESGGGLVQPGGSMRLSCAGSGFTFTDFYMNWIRQAPGKLEWIGFIRDKAKGYTTEYNPSVKGRFTISRDNTQNMLYLOMNTLRAEDTATYYCAREGHTAAPFDYWGQGSLTVSS Parental
EVQLVESGGGLVQPGGSLRLSCAASGFTFSDFYMNWIRQAPGKLEWIGFIRDKAKGYTTEYNPSVKGRFTISRDDSNSLYLOMNSLRAEDTAVYYCAREGHTAAPFDYWGQGSLTVSS Humanized (Sapiens^3)
EVQLVESGGGLVQPGGSLRLSCAASGFTSDYMSWVRQAPGKLEWVGFIKNANGTTE-TTSVKGRFTISRDDSNSITYLOMNSLRAEDTAVYYCAR-----YFDYWQGQTLTVSS IGHV3-71*01,IGHJ4*01

Light chain

DIQMTQSPSSLSASVGDRVITTCQASQDISNYLNWYQQKPGKAPKLLIYDASNLETGVPSRSGSGSGTDFTTISSLQPEDIATYYCQYDN--WTFQGQTKVEIK IGKV1-33*01,IGKJ1*01
DIQMTQSPSSLSASVGDRVITTCASQNDKYLWYQQKPGKAPKLLIYNTNLQTVPSRSGSGSGTDFTTISSLQPEDIATYYCLQHISRPRTFQGQGKVEIK Humanized (Experimental)
DIKMTQSPSPFLSASVGDRVTLNCASQNDKYLWYQQKPGKAPKLLIYNTNLQTVPSRSGSGSGTDFTTISSLQPEDIATYYCLQHISRPRTFQGQGKVEIK Parental
DIQMTQSPSSLSASVGDRVITTCASQNDKYLWYQQKPGKAPKLLIYNTNLQTVPSRSGSGSGTDFTTISSLQPEDIATYYCLQHISRPRTFQGQGKVEIK Humanized (Sapiens^3)
DIQMTQSPSSLSASVGDRVITCRASQDISNYLNWYQQKPGKAPKLLIYAASSLQSGVPSRSGSGSGTDFTTISSLQPEDIATYYCQSYS--YTFQGQTKLEIK IGKV1-39*01,IGKJ2*01

Certolizumab

Heavy chain

EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYAMSWVRQAPGKLEWVAISGSGGTYADSVKGRFTISRDNSKNTLYLOMNSLRAEDTAVYYCAR-----YFDYWQGQTLTVSS IGHV3-23*04,IGHJ4*01
EVQLVESGGGLVQPGGSLRLSCAASGYVFTDYGMNWVRQAPGKLEWMGWINTYIGEPIYADSVKGRFTSLDTSKSTAYLQOMNSLRAEDTAVYYCARGYRSYAMDYWGQGTLTVSS Humanized (Experimental)
QIQLQSGPELKPGELKKPGETVKISKASGYVFTDYGMNWVRQAPGKAFKWMGWINTYIGEPIYVDDFKGRFAFSLETSASTAFLQINNLKNEDTATYFCARGYRSYAMDYWGQGTLTVSS Parental
QVQLVSGSELKKPGASVKISCKASGYFTDYGMNWVRQAPGQGLEMGWINTNTGPTYAOGFTGRFVSLDTSVSTAYLQICSLKAEDTAVYYCAR-----YFDYWQGQTLTVSS Humanized (Sapiens^3)
QVQLVSGSELKKPGASVKISCKASGYFTSYAMNWVRQAPGQGLEMGWINTNTGPTYAOGFTGRFVSLDTSVSTAYLQICSLKAEDTAVYYCAR-----YFDYWQGQTLTVSS IGHV7-4-1*01,IGHJ4*01

Light chain

DIQMTQSPSSLSASVGDRVITCRASQGISNYLAWFQQKPGKAPKSIIYAASSLQSGVPSRSGSGSGTDFTTISSLQPEDIATYYCQQNS--WTFQGQTKVEIK IGKV1-16*01,IGKJ1*01
DIQMTQSPSSLSASVGDRVITTCASQNVGTNAWYQQKPGKAPKALIYASASFLYSGVPYRFTGSGSGTDFTTISSLQPEDIATYYCQYNIYPLTFQGQGKVEIK Humanized (Experimental)
DIVMTQSQKFMSTSVDGRVSVTCKASQNVGTNAWYQQKPGQSPKALIYASASFLYSGVPYRFTGSGSGTDFTTISSLQSEDLAEYFCQYNIYPLTFQGQGKVEIK Parental
DIQMTQSPSSLSASVGDRVITTCASQNVGTNAWYQQKPGKAPKLLIYASASFLYSGVPYRFTGSGSGSGTDFTTISSLQPEDIATYYCQYNIYPLTFQGQGKVEIK Humanized (Sapiens^3)
DIQMTQSPSSVSAVGDRVITCRASQGISSWLAWYQQKPGKAPKLLIYAASSLQSGVPSRSGSGSGTDFTTISSLQPEDIATYYCQQANS--YTFQGQTKLEIK IGKV1-12*01,IGKJ2*01

Clazakizumab

Heavy chain

EVQLVESGGGLVQPGGSLRLSCAASGFTVSSNYMSWVRQAPGKLEWSVIYSGGTYADSVKGRFTISRDNSKNTLYLOMNSLRAEDTAVYYCAR-----AEYFQHWQGQTLTVSS IGHV3-66*01,IGHJ1*01
EVQLVESGGGLVQPGGSLRLSCAASGFSLSNYYTWRQAPGKLEWGIYGSDETAYATSAIGRFTISRDNSKNTLYLOMNSLRAEDTAVYYCARDDSSWDAKFNLWGQGTLTVSS Humanized (Experimental)
QSLEESGGRLVTGPTPLTCTASGFLSNYYVTWRQAPGKLEWIGIYGSDETAYATWAIGRFTISKTVDLKMSTSAAATATYFCARDSSWDAKFNLWGQGTLTVSS Parental
VQLEESGGGLVQPGESRLSCTASGFLSNYYVTWRQAPGKLEWISIYGSDETAYATWAIGTISIDKSKNVYLMKTSAAATDavyFCARDSSWDAKFNLWGQGTLTVSS Humanized (Sapiens^3)
VQLVESGGGLVQPGGSLRLSCAASGFTVSSNYMSWVRQAPGKLEWSVIYSGGTYADSVKFTISRDNSKNTLYLOMNSLRAEDTAVYYCAR-----AEYFQHWQGQTLTVSS IGHV3-66*01,IGHJ1*01

Light chain

DIQMTQSPSSLSASVGDRVITCRASQDISNYWYQQKPGKAPKLLIYAASSLQSGVPSRSGSGSGTDFTTISSLQPEDIATYYCQSYS---LTFGGGKVEIK IGKV1-39*01,IGKJ4*01
AIQMTQSPSSLSASVGDRVITTCQASQINNELSWYQQKPGKAPKLLIYRASTLASGVPSRSGSGSGTDFTTISSLQPEDIATYYCQGYSLRNIDNAFGGGKVEIK Humanized (Experimental)
AYDMTQTPASVAAVGGTIKQASQINNELSWYQQKPGQRPKLLIYRASTLASGVSSRFKGSGSGTEFTLTISLQEDCADAATYYCQGYSLRNIDNAFGGGKVEIK Parental
DIQMTQSPSSLSASVGDRVITTCQASQINNELSWYQQKPGKAPKLLIYRASTLASGVPSRSGSGSGTDFTTISSLQPEDIATYYCQGYSLRNIDNAFGGGKVEIK Humanized (Sapiens^3)
DIQMTQSPSSLSASVGDRVITCRASQISYYLNWYQQKPGKAPKLLIYAASSLQSGVPSRSGSGSGTDFTTISSLQPEDIATYYCQSYS---LTFGGGKVEIK IGKV1-39*01,IGKJ4*01

Crizanlizumab

Heavy chain

Light chain

Eculizumab

Heavy chain

```

QVQLVQSGAEVKKGASVKSCASGYFTSYYMHWROAPGQGLEWMGIINPSGGSTSYAQKFGRRVTMTRDTSTVYMEMLSSRSEDAVYYCAR-----YWFDFLWGRGLT VTVSS IGHV1-46*01,IGHJ2*01
QVQLVQSGAEVKKGASVKSCASGYIFSNSYWQIWRQAPGQGLEWMGEILPGSGSTEYENFKDRVTMTRDTSTVYMEMLSSRSEDAVYYCARYFFGSSPNWYFDVWGQGLT VTVSS Humanized (Experimental)
QVQLQSQSGAEELMKPGASVKMSCKATGYIFSNSYWQIWKORPGHGLEWIGEILPGSGSTEYENFKDKAAFTADTSSNTAYMLQSSLTSEDASVYCAR YFFGSSPNWYFDVWGAGTT VTVSS Parental
QVQLVQSGAEVKKGASVKISCKASGYIFSNSYWQIWRQAPGQGLEWMGEILPGSGSTEYENFKDRVTMTRDTSTVYMEMLSSRSEDAVYYCARYFFGSSPNWYFDVWGRT VTVSS Humanized (Sapiens^3)
QVQLVQSGAEVKKGASVKSCASGYFTSYYMHWROAPGQGLEWMGIINPSGGSTSYAQKFGRRVTMTRDTSTVYMEMLSSRSEDAVYYCAR-----YWFDFLWGRGLT VTVSS IGHV1-46*01,IGHJ2*01

```

Light chain

Etaracizumab

Heavy chain

Light chain

EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLPEPDAVYYCQQRSN- LTFGGGTKVEIK IGKV3-11*01, IGKJ4*01
EIVLTQSPATLSLSPGERATLSCQASQSIISNFLHWYQQRPQGQAPRLLIYRQSISGIPARFSGSGSGTDFTLTISSLPEPDAVYYCQGSWPLTFGGGTKEIK Humanized (Experimental)
EIVLTQSPATLSVTPGDSVSLSCRASQSIISNHLHWYQQKSHESPRLLIYKAYASQSIISGIPSRFSGSGSGTDFTLSINSVETEDFGMYFCQQSNSWPHFTFGGGTKLEIK Parental
EIVMTQSPATLSVTPGDSVSLSCRASQSIISNHLHWYQQKPGQAPRLLIYASQSIISGIPARFSGSGSGTDFTLSINSVETEDFGMYFCQQSNSWPHFTFGGGTKLEIK Humanized (Sapiens^3)
EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLPEPDAVYYCQQRSN- YTFGGTKEIK IGKV3-11*01, IGKJ2*01

Herceptin

Heavy chain

Light chain

AIQLTQSPSSLSASVGDRVTITCRASOGISSALAWYQQKPGKAPKLLIYDASSLESQVPSRFSRGSGSGTDFDTLTISSLQQPEDFATYYCQOFNS-WTFGGQTKVEIK IGKV1-13*02, IGKV1 Humanized (Experimental)
 DIQMTQSPSSLSASVGDRVTITCRASQDVNTAVAWYQQKPGKAPKLLIYSASFLESQVPSRFSRGSGTDFDTLTISSLQQPEDFATYYCQHQHHTTPPTFGGQTKVEIK Humanized (Experimental)
 DIVMTQSHKFMSLTVGDRVSITCKASQDVNTAVAWYQQKPGHSPKLLIYSASFRTYGVPDFRTGNRSQGTDFTFTISSLVQAEDLAVYYCQHQHHTTPPTFGGGTKVEIK Parental
 DIQMTQSPSFLSASVGDRVTITCKASQDVNTAVAWYQQKPGKAPKLLIYSASFRTYGVPSRFSRGSGSGTDFDTLTISSLQQPEDFATYYCQHQHHTTPPTFGGGTKVEIK Humanized (Sapiens^3)
 DIQMTQSPSSLSASVGDRVTITCRASOISSSLYWQQKPGKAPKLLIYAASSLQSGVPSRFSRGSGSGTDFDTLTISSLQQPEDFATYYCQQSYS-LTFGGQTKVEIK IGKV1-39*01, IGKV4 Humanized (Experimental)

Idarucizumab

Heavy chain

QVQLQESGPLVKPSETSLTCTVSGGSISSYWSIRQPQPKGLEWIGYIYTSGSTNYNPSLKSRSVTISVDTSKNQFSLKLSVTAADTAVVYCAR-----YFDYWQGTLTVSS IGHV4-4*08,IGHJ4*01
 QVQLQESGPLVKPSETSLTCTVSGFSLTSYIVDWIRQPQPKGLEWIGVIWAGGSTGYNSALRSRSVTSKDTSKNQFSLKLSVTAADTAVVYCASAAYYSYNNYDGFAWQGTLTVSS Humanized (Experimental)
 QVQLQESGPLVAPSQLSITCTVSGFSLTSYIVDWVRQSPGKGLELGVIWAGGSTGYNSALRSRSLTSKNSKSQVFLQMSLQTDDTAIIYCCASAAYYSYYNDGFAYWQGTLTVSA Parental
 QVQLQESGPLVKPSETSLTCTVGGSLTSYIVDWVRQSPGKGLELGVIWAGGSTGYNSALRSRSLTSKSKSQVFLQMSLTAADTAAIYCARAAYYSYNNYDGFAWQGTLTVSS Humanized (Sapiens^3)
 QVQLQESGPLVKPSETSLTCTVSGGSISSYWSIRQPQPKGLEWIGYIYTSGSTNYNPSLKSRSVTISVDTSKNQFSLKLSVTAADTAVVYCAR-----YFDYWQGTLTVSS IGHV4-4*08,IGHJ4*01

Light chain

DVVMQTSPSLPVTLGQPAISCRSSQLVYSDGNTYLNWFQQRPGQSPRRLIYKVSNRDRSGVPDRFSGSGSGTDFTLKISRVAEDGVYVYCMQGH--LTFGGTKVEIK IGKV2-30*01, IGKV4*01
 DVVMQTSPSLPVTLGQPAISCRSSQLLTYDGKTYLYWFLQRPQGQSPRRLIYLVSKLDSGVPDRFSGSGSGTDFTLKISRVAEDGVYVYCLQSTHFPHTFGGGTKVEIK Humanized (Experimental)
 DVVMTQTPLTLSVTIGQPAISCRSSQLLYTNGKTYLYWLLQRPQGQSPKRRIYLVSKLD**SGVPDRFSGSGSGTDFTLKISRVAEDGVYIYYCLQSTHFPHTFGGGTKLEIK** Parental
 DVVMTQTSPSLSVTPGPQPAISCRSSQLLYTNGKTYLYWFLQRPQGQSPRRLIYLVSKLD**SGVPDRFSGSGSGTDFTLKISRVAEDGVYIYYCLQSTHFPHTFGGGTKLEIK** Humanized (Sapiens^3)
 DVVMTQTSPSLPVTLGQPAISCRSSQLVYSDGNTYLNWFQQRPGQSPRRLIYKVSNRDRSGVPDRFSGSGSGTDFTLKISRVAEDGVYVYCMQGH--YTFGQGTKEIK IGKV2-30*01, IGKV2*01

Ixekizumab

Heavy chain

QVQLVQSGAEVKKGSSVKVSKCASGGTFSYAIISWVRQAPGQGLEMMGIPIFGTANYAQKFQGRVTITADESTSTAYMELSSLRSEDAVYYCAR-----YFDYWQGQTLTVSS IGHV1-69*01, IGHJ4*01
 QVQLVQSGAEVKKGSSVKVSKCASGYSFTDYHHWVRQAPGQGLEWMGVINPMYGTTDYNQRFKGRVTITADESTSTAYMELSSLRSEDAVYYCARDYFTGTGVYWGQGQTLTVSS Humanized (Experimental)
 QVQLQQSRPELVKPGASVKISCKASGYSFTDYNMNVKQNSNGKSLEWIGVINPNPYGTTDYNQRFKGRKTLDQSSRTAYMQLNSLTSEDASAVYYCIVYDYATGTGGYWQGSPLTVSS Parental
 QVQLVQSGPELKKPGASVKVSKCASGYSFTDYNMNVWVQAPGQGLEWMGVINPNPYGTTDYNQRFKGRVTLTRDTSIRTYMELNSLTSEDASAVYYCIVYDYATGTGGYWQGQTLTVSS Humanized (Sapiens^3)
 QVQLVQSGAEVKKGSSVKVSKCASGYSFTGYYMHWVRQAPGQGLEWMGVINPNSSGGTNYAQKFQGRVTITRDTSTIAYMELSLRSDDTAVYYCAR-----YFDYWQGQTLTVSS IGHV1-2*02, IGHJ4*01

Light chain

Ligelizumab

Heavy chain

QVQLVQSGAEVKPGSSVKVSCKASGGTFSYAIISWVRQAPGQGLEMGGIPIFGTANYAQKFQGRVTITADESTSTAYMELSSLRSEDTAVYYCAR-----YFDYWQGQTLTVSS IGHV1-69*01,IGHJ4*01
QVQLVQSGAEVMKPGSSVKVSCKASGYTFSWYIWEVVRQAPGHLWGEIDPGFTTNYNEKFKAARTFTADTSTSTAYMELSSLRSEDTAVYYCARSHFSGSNYDYFDYWQGQTLTVSS Humanized (Experimental)
QVQLVQSGAEVMKPGASVKISCKTTGYTFMSMYWLEWVKQRPGRHGLEWGEISPGFTTNYNEKFKAARTFTADTSSNTAYLQLSGLTSEDAVYFCARSHFSGSNYDYFDYWQGQTLTVSS Parental
QVQLVQSGAEVKPGASVKISCKTSGTYTFMSMYWLEWVRQAPGQGLEWGEISPGFTTNYNEKFKAARTFTADTSTNTAYLESGLTSEDAVYFCARSHFSGSNYDYFDYWQGQTLTVSS Humanized (Sapiens^3)
QVQLVQSGAEVKPGSSVKVSCKASGGTFSYAIISWVRQAPGQGLEMGGIPIFGTANYAQKFQGRVTITADESTSTAYMELSSLRSEDTAVYYCAR-----YFDYWQGQTLTVSS IGHV1-69*01,IGHJ4*01

Light chain

EIVMTQSPATLSVSPGERATLSCRASQSVSSNLAWYQQKPGQAPRLLIYGASTRATGIPARFSGSGSGTEFTLTISSLQSEDFAVYYCQQYNN--LTFGGTKVEIK IGKV3-15*01,IGKJ4*01
EIVMTQSPATLSVSPGERATLSCRASQSIGTNIHWYQQKPGQAPRLLIYYASESISIGIPARFSGSGSGTEFTLTISSLQSEDFAVYYCQQSWSWPTTFGGGTKEIK Humanized (Experimental)
DILLTQSPAILSVPGERVSFSCRASQSIGTNIHWYQQRTDGSPRLIKYASESISIGIPARFSGSGSGTEFTLNINSVESEDIADYYCQQSDSWPTTFGGGTKEIK Parental
DIVILTQSPATLSVSPGERVTLSCRASQSIGTNIHWYQQRPGQAPRLLIYYASESISIGIPARFSGSGSGTEFTLTINSLQSEDFAVYYCQQSDSWPTTFGGGTKEIK Humanized (Sapiens^3)
EIVMTQSPATLSVSPGERATLSCRASQSVSSNLAWYQQKPGQAPRLLIYGASTRATGIPARFSGSGSGTEFTLTISSLQSEDFAVYYCQQYNN--WTFGQGKVEIK IGKV3-15*01,IGKJ1*01

Lorvotuzumab

Heavy chain

QVQLVESGGGVQPGRSRSLSCAASGFTFSSYGMHWVRQAPGKGLEWVAISYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR-----YFDYWQGQTLTVSS IGHV3-30*03,IGHJ4*01
QVQLVESGGGVQPGRSRSLSCAASGFTFSSFGMHWVRQAPGKGLEWAVIYSSGSFTIYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCARMRKGYAMDYWDWGQGTTVSS Humanized (Experimental)
DVQLVESGGGLVQPGGSRKLSCAASGFTFSSFGMHWVRQAPGKGLEWAVIYSSGSFTIYHADTVKGRFTISRDNPKNLFLQMTSLRAEDTAHYCARMRKGYAMDYWDWGQGTTVSS Parental
EVQLVESGGGLVQPGGSLRLSCAASGFTFSSFGMHWVRQAPGKGLEWAVIYSSGSFTIYHADTVKGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARMRKGYAMDYWDWGQGTTVSS Humanized (Sapiens^3)
EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYSMWVRQAPGKGLEWSYISSLSTIYADSVKGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCAR-----DAFDVWQGQTMVTVSS IGHV3-48*01,IGHJ3*01

Light chain

DVVMTQSPLSLPVTLQPASISCRSSQSLVHSDGNTYLNWFQQRPGQSPRLLIYKVSNRDGSVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCMQTH--WTFGQGKVEIK IGKV2-30*02,IGKJ1*01
DVVMTQSPLSLPVTLQPASISCRSSQIIHSDGNTYLEWFQQRPGQSPRLLIYKVSNRDGSVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQSHVPHTFGQGKVEIK Humanized (Experimental)
DVLMQTPLSLPVSLQDQASISCRSSQIIHSDGNTYLEWLQKPGQSPKLIIYKVSNRDGSVPDRFSGSGSGTDFTLKISRVEAEDLGVYYCFQSHVPHTFGQGKVEIK Parental
DVVMTQPLSLPVTLQPASISCRSSQIIHSDGNTYLEWLQKPGQSPQPLLIIYKVSNRDGSVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQSHVPHTFGQGKVEIK Humanized (Sapiens^3)
DVIMTQPLSLSVTPQGPASISCKSSQSLHHSDGKTYLYWYLQKPGQSPQPLLIIYEVSRRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCMQGI--YTFGQGKLEIK IGKV2-29*02,IGKJ2*01

Mogamulizumab

Heavy chain

EVQLVESGGGLVKPGGSLRSCAASGFTFSSYSMNWVRQAPGKGLEWSSISSSSYIYYADSVKGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCAR-----YFDYWQGQTLTVSS IGHV3-21*01,IGHJ4*01
EVQLVESGGDLVQPGRSRSLSCAASGFIISNYGMSWVRQAPGKGLEWATISSASTYSYPDVSVKGRFTISRDNAKNSLYLQMNSLRVEDTALEYCGRHSDGNFAGYWDWGQGTLTVSS Humanized (Experimental)
EVQLVESGGGLMKPGGSLKISCAASGFIISNYGMSWVRQTPDMRLEWVATISSASTYSYPDVSVKGRFTISRDNAENSLYLQMNSLSEDTGIIYCCGRHSDGNFAGYWDWGQGTLTVSA Parental
EVQLVESGGGLVQPGGSLRLSCAASGFTFSNYGMSWVRQAPGKGLEWSTISSASTYSYPDVSVKGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARHSDGNFAGYWDWGQGTLTVSS Humanized (Sapiens^3)
EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYSMNWVRQAPGKGLEWVSSISSSSYIYYADSVKGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCAR-----YFDYWQGQTLTVSS IGHV3-21*01,IGHJ4*01

Light chain

DIVMTQSPLSLPVTPGEPASISCRSSQSLLHSNGNYLDWYLOKPGQSPQPLLIIYLGSNRASGVDPDRFSGSGSGTDFTLKISRVEAEDVGVYYCMQALQ--WTFGQGKVEIK IGKV2-28*01,IGKJ1*01
DVLMQTPLSLPVTPGEPASISCRSSRNIVHINGDTYLEWLQKPGQSPQPLLIIYKVSNRDGSVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQSLLPWTFGQGTRLEIK Humanized (Experimental)
DVLMQTPLSLPVSLQDQASISCRSSRNIVHINGDTYLEWLQKPGQSPQPLLIIYKVSNRDGSVPDRFSGSGSGTDFTLKISRVEAEDLGVYYCFQSLLPWTFGGGTRLEIR Parental
DVVMTQSPLSLPVTLQPASISCRSSRNIVHINGDTYLEWLQKPGQSPQPLLIIYKVSNRDGSVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQSLLPWTFGQGTRLEIK Humanized (Sapiens^3)
DVVMTQSPLSLPVTLQPASISCRSSQSLVHSDGNTYLNWFQQRPGQSPRLLIYKVSNRDGSVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCMQTH--ITFGQGTRLEIK IGKV2-30*02,IGKJ5*01

Omalizumab

Heavy chain

Light chain

DIQMTQSPSSLSASVGDRVITCRASQSI---SSLYNWWQQKPGAKPLLIYAASSLQSGVPSRSFGSGSGTDFTLTISSLQPEDFATYCCQCSYS--WTFQGQGTKVEIK IGKV1-39*01, IGKJ1*01
 DIQLTQSPSSLSASVGDRVITCRASQSVYDGDSYMWWQQKPGAKPLLIYAASYLESQGVPSRSFGSGSGTDFTLTISSLQPEDFATYCCQCSHEDPYTFQGQGTKVEIK Humanized (Experimental)
 DIQLTQSPASLAVSLQPRATISCKASQSVYDGDSYMWWQQKPGQQPKILLIYAASYLGSEIPARFSGSGSGTDFTLNIPVEEDAATFYCCQCSHEDPYTFQGAGTKLEIK Parental
 DIVLTQSPDSLAVSPGERATISCKASQSVYDGDSYMWWQQKPGQQPKILLIYAASYLGSVPDRFSGSGSGTDFTLTSRVAEDAVVYCCQCSHEDPYTFQGQGTKLEIK Humanized (Sapiens^3)
 DIVMTQSPDSLAVSLGERATINCKSSQSVLYNNKYLAWYYQKPGQQPKILLIYWASTRESQGVPSRFSGSGSGTDFTLTISSLQAEVDAVVYCCQYYSS--YTFQGQGTKLEIK IGKV4-1*01, IGKJ2*01

Palivizumab

Heavy chain

Light chain

```

DIQMTQSPSTL SASVGDRVTITCRASQ SISWLAWYQQKPGKAPKLLIYDASSL ESGVPSRFS GSGSGT EFTLT ISSLQ PDDFAT YYC QQYNS - YTFGQGTKLEIK IGKV1-5*01, IGKJ2*01
DIQMTQSPSTL SASVGDRVTITCKQLS VGYMHWYQQKPGKAPKLLIYDTSKLASGVPSRFS GSGSGT EFTLT ISSLQ PDDFAT YYC FQGS GYPFTFGQGTKLEIK Humanized (Experimental)
DIQLTQSPA IMSPAGEKVMTCSASSSVGYMHWYQQKS STSPKLWYDTSKLASGVPGRFSGSGSGNSYLT ISSIQAEDV ATYYC FQGS GYPFTFGQGTKLEIK Parental
DIVLTQSPATL SLS PGERATL SC SASSSVGYMHWYQQKPGKAPKLLIYDTSKLASGVPSRFS GSGSGT DFTLT ISSLQ AEDV ATYYC FQGS GYPFTFGQGTKLEIK Humanized (Sapiens^3)
EIVLTQSPATL SLS PGERATL SC RASQSVS LAWYQQKPGQAPRLLIYDASNRATGIPARFSGSGSGT DFTLT ISSLQ EPDFAVYYC QQRSN - YTFGQGTKLEIK IGKV3-11*01, IGKJ2*01

```

Pembrolizumab

Heavy chain

QVQLVQSGAEVKPGASVKVSKCASGTYTFNYMMWVRQAPGQGLEMWGIPNSGGTINYAQKFQGRVTMRTDTSI^{STAYMELSLRSDDTAVYYCAR}YFDYWQGTLTVSS IGHV1-2*02,IGHJ4*01
 QVQLVQSGEVVKPGASVKVSKCASGTYFTNYYMWVRQAPGQGLEMWGIPNSGGTINYAQKFQGRVTMRTDTSI^{STAYMELSLRSDDTAVYYCAR}YFDYWQGTLTVSS Humanized (Experimental)
 QVQLQQQPGAEVLKPGTSVKLCKASGTYFTNYYMWVKQRPGQGLEWIGGINPSNGGTNFNEKFKNKATLTD^{TTYMOQLSSLTSEDAVYYCTRRDYRFDMGFDYWQGQTTLVSS} Parental
 QVQLVQSGAEVKPGASVKVSKCASGTYTFNYMMWVRQAPGQGLEMWGIPNSGGTINYAQKFQGRVTMRTDTSI^{STAYMELSLRSDDTAVYYCAR}YFDYWQGTLTVSS Humanized (Sapiens^3)
 QVQLVQSGAEVKPGASVKVSKCASGTYFTSYYMMWVRQAPGQGLEMWGIPNSGGTINYAQKFQGRVTMRTDTSI^{STAYMELSLRSDDTAVYYCAR}YFDYWQGTLTVSS IGHV1-46*01,IGHJ4*01

Light chain

Pertuzumab

Heavy chain

EVQLVESGGGVQPGGSLRLSCAASGFTSSYAMNWRQAPGKGLEWVSAISGSGSTYADSVKGRFTISRDNKNTLYLQMNSLRAEDTAVYYCAK-----YFDYWQGTLTVSS IGHV3-23*04, IGHJ4*01
EVQLVESGGGVQPGGSLRLSCAASGFTFTDYTMWDVRQAPGKGLEWVADVPNPNGGSIYNQRFKGRFTLSVDRSKNTLYLQMNSLRAEDTAVYYCARNLGPSPFYFDYWQGTLTVSS Humanized (Experimental)
EVQLQQSGPVELVKPGTSVKISCKASGFTFTDYTMWDVKQSHGKSLEWIGDVNPNGGSIYNQRFKGRFTLSVDRSKNTLYLQMNSLRAEDTAVYYCARNLGPSPFYFDYWQGTLTVSS Parental
QVQLVQSGPVEVKPGASVKVSCKASGYTFTDYTMWDVRQAPGQLEWMDVNPNGGSIYNQRFKGRFTLSRDTISRTVYMEMLRSLTfedTAVYYCARNLGPSPFYFDYWQGTLTVSS Humanized (Sapiens^3)
QVQLVQSGAEVKPGASVKVSCKASGYTFTGYMMHWRQAPGQLEWMGWINPNNGGTNYAQKFQGRVTMTRDTSISTAYMELSRSLRSDDTAVYYCAR-----YFDYWQGTLTVSS IGHV1-2*02, IGHJ4*01

Light chain

DIQMTQSPSSLSASVGDRVITTCQASQDISNYLNWYQQKPGKAPKLLIYDASNLETGVPSRFSGSGSTDFTTISSLQPEDATYYCQYDN--WTFQGQTKVEIK IGKV1-33*01, IGKJ1*01
DIQMTQSPSSLSASVGDRVITCKASQDVSIGVAWYQQKPGKAPKLLIYSASYRTGVPSRFSGSGSTDFTTISSLQPEDATYYCQYIYPYTFQGQTKVEIK Humanized (Experimental)
DTVMTQSHKIMSTSVGDRVSITCKASQDVSIGVAWYQQRPGQSPKLLIYSASYRTGVPSRFSGSGSTDFTTISSLQPEDATYYCQYIYPYTFQGQTKLEIK Parental
DIQMTQSPSSLSASVGDRVITCKASQDVSIGVAWYQQKPGKAPKLLIYSASYRTGVPSRFSGSGSTDFTTISSLQPEDATYYCQYIYPYTFQGQTKLEIK Humanized (Sapiens^3)
DIQMTQSPSSLSASVGDRVITCQASQDISNYLNWYQQKPGKAPKLLIYDASNLETGVPSRFSGSGSTDFTTISSLQPEDATYYCQYDN--YTFQGQTKLEIK IGKV1-33*01, IGKJ2*01

Pinatuzumab

Heavy chain

EVQLVESGGGVQPGGSLRLSCAASGFTVSSNNYMSWVRQAPGKGLEWVSIYSG-GSTYYADSVKGRFTISRDNKNTLYLQMNSLRAEDTAVYYCAR-----YWFDLWGRGTLTVSS IGHV3-66*01, IGHJ2*01
EVQLVESGGGVQPGGSLRLSCAASGYEFSRSWNNWVRQAPGKGLEWVGRIYPGDGTNYSGKFKGRFTISADTSKNTAYLQMNSLRAEDTAVYYCARDGSSWDYFWQGTLTVSS Humanized (Experimental)
QVQLVQSGPVELVKPGASVKISCKASGYEFSRSWNNWVKQRPQGQREWIGRIYPGDGTNYSGKFKGRFTISADTSKNTAYLQMNSLRAEDTAVYYCARDGSSWDYFWQGTLTVSS Parental
QVQLVQSGPVELKKPGASVKISCKASGYTFTGYMMHWRQAPGQLEWMGRINPNNGGTNYAQKFQGRVTMTRDTSISTAYMELSRSLRSDDTAVYYCAR-----YWFDLWGRGTLTVSS Humanized (Sapiens^3)
QVQLVQSGAEVKPGASVKVSCKASGYTFTGYMMHWRQAPGQLEWMGRINPNNGGTNYAQKFQGRVTMTRDTSISTAYMELSRSLRSDDTAVYYCAR-----YWFDLWGRGTLTVSS IGHV1-2*06, IGHJ2*01

Light chain

DIQMTQSPSSLSASVGDRVITCRASQSI-----SSYLNWYQQKPGKAPKLLIYAASSLQSGVPSRFSGSGSTDFTTISSLQPEDATYYCQSYS--WTFQGQTKVEIK IGKV1-39*01, IGKJ1*01
DIQMTQSPSSLSASVGDRVITCRSSQIVHSVGNTFLEWYQQKPGKAPKLLIYKVSNRFSGVPSRFSGSGSTDFTTISSLQPEDATYYCFQGSPFQYTFQGQTKVEIK Humanized (Experimental)
DILMTQTPLSLPVSLGDQASICRSSQSIVHSNGNTFLEWYQKPGQSPKLLIYKVSNRFSGVPSRFSGSGSTDFTLKISRVAEADLGVYYCFQGSQFPYTFGGGTKEIK Parental
DIVMTQTPLSLPVLPQGQASICRSSQSIVHSNGNTFLEWYQKPGQSPKLLIYKVSNRFSGVPSRFSGSGSTDFTLKISRVAEADVGVYYCMQSIQ-LTFGGGTKEIK Humanized (Sapiens^3)
DIVMTQTPLSLSVTPQGQASICRKSSQSLHSDGKTYLYWYLQKPGQSPQLLIYEVSNRFSGVPSRFSGSGSTDFTLKISRVAEADVGVYYCMQSIQ-LTFGGGTKEIK IGKV2D-29*02, IGKJ4*01

Refanezumab

Heavy chain

QVQLVQSGSELKKPGASVKVSCKASGYTFTSYAMNWRQAPGQGLEWMGWINTNTGNTYQGFTGRFVSLDTSTVSTAYLQISSLKAEDTAVYYCAR-----YYYYGMDVWQGTTTVSS IGHV7-4-1*02, IGHJ6*01
QVQLVQSGSELKKPGASVKVSCKASGYTFTNYGMNWVRQAPGQGLEWMGWINTYTGEPTYADDFTGRFVSLDTSTVSTAYLQISSLKAEDTAVYYCARNPINYGINYEGVMDYWGQGTLTVSS Humanized (Experimental)
EIQLVQSGPVELKKPGGETNKISCKASGYTFTNYGMNWVKQAPGKGLWMGWINTYTGEPTYADDFTGRFVSLDTSTVSTAYLQISSLKAEDTAVYYCARNPINYGINYEGVMDYWGQGTLTVSS Parental
QVQLVQSGSELKKPGASVKVSCKASGYTFTNYGMNWVRQAPGQGLEWMGWINTYTGEPTYADDFTGRFVSLDTSTVSTAYLQISSLKAEDTAVYYCARNPINYGINYEGVMDYWGQGTLTVSS Humanized (Sapiens^3)
QVQLVQSGSELKKPGASVKVSCKASGYTFTSYAMNWRQAPGQGLEWMGWINTNTGNTYQGFTGRFVSLDTSTVSTAYLQISSLKAEDTAVYYCAR-----YYYYGMDVWQGTTTVSS IGHV7-4-1*02, IGHJ6*01

Light chain

DIVMTQSPDSLAVSLGERATINCKSSQSVLYSSNNKNLYAWYQQKPGQPPKLLIYWASTRESGVPSRFSGSGSTDFTTISSLQAEDEVAVYYCQYY--YTFQGQTKLEIK IGKV4-1*01, IGKJ2*01
DIVMTQSPDSLAVSLGERATINCKSSHVLYSSNQKNLYAWYQQKPGQPPKLLIYWASTRESGVPSRFSGSGSTDFTTISSLQAEDEVAVYYCHQYLSLTFGQGTLKEIK Humanized (Experimental)
NIMMTQSPSSLAvgAGEKVTMSCKSSHVLYSSNQKNLYAWYQQKPGQPPKLLIYWASTRESGVPSRFSGSGSTDFTTISSLQAEDEVAVYYCHQYLSLTFGQGTLKEIK Parental
DIVMTQSPDSLAVSLGERATINCKSSHVLYSSNQKNLYAWYQQKPGQPPKLLIYWASTRESGVPSRFSGSGSTDFTTISSLQAEDEVAVYYCHQYLSLTFGQGTLKEIK Humanized (Sapiens^3)
DIVMTQSPDSLAVSLGERATINCKSSQSVLYSSNNKNLYAWYQQKPGQPPKLLIYWASTRESGVPSRFSGSGSTDFTTISSLQAEDEVAVYYCQYY--YTFQGQTKLEIK IGKV4-1*01, IGKJ2*01

Reslizumab

Heavy chain

Light chain

DIQMTQSPSSLSASVGRVTITCRASQSISSYLNWYQQKPGKAPKLIIYAASSLQSGVPSRFSGSGSGTDFDTLTISSLQPEDFATYYCQQSYS-**WTFGQGTKVEIK** IGKV1-39*01, IGKJ1*01
 DIQMTQSPSSLSASVGRVTITCLASEGISSYLAWSYQQKPGKAPKLIIYGANSLQTGVPSRFSGSGSATDYTLTISSLQPEDFATYYCQQSYS**KFPNTFGAGTKVEWK** Humanized (Experimental)
 DIQMTQSPASLSASGETISIECLASEGISSYLAWSYQQKPGKSPOLIYGANSLQTGVPSRFSGSGSATQYSLKISSMQPEDDGYFCQQSYS**KFPNTFGAGTKLEIK** Parental
 DIQMTQSPSSLSASVGRVTITCLASEGISSYLAWSYQQKPGKAPKLIIYGANSLQTGVPSRFSGSGSGTDFDTLTISSLQPEDFATYYCQQSYS**KFPNTFGAGTKLEIK** Humanized (Sapiens^3)
 DIQMTQSPSSLSASVGRVTITCRASQSISSYLNWYQQKPGKAPKLIIYAASSLQSGVPSRFSGSGSGTDFDTLTISSLQPEDFATYYCQQSYS-**YTFGQGTKLEIK** IGKV1-39*01, IGKJ2*01

Rovalpituzumab

Heavy chain

Light chain

Solanezumab

Heavy chain

```

EVQLLESGGGVLQPGGSLRLSCAASGFTSSYAMSWVRQAPGKGLEWVSIYSGSSTYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAK-DYWQGQTLTVSS IGHV3-23*03,IGHJ4*01
EVQLVESGGGLVQPGGSLRLSCAASGFTFSRYSMSWVRQAPGKGLELVAQINSVGNSTYYPDtvKGRFTISRDNAKNTLYLQMNSLRAEDTAVYYCAGSDYWGQGQTLTVSS Humanized (Experimental)
EVKLVESGGGLVQPGGSLKLSCAVSGFTFSRYSMSWVRQTPKEKRLELVAQINSVGNSTYYPDtvKGRFTISRDNAEYTLSQLMSGLRSDDTATYYCAGSDYWGQGQTLTVSS Parental
EVQLVESGGGLVQPGGSLRLSCAASGFTFSRYSMSWVRQAPGKLEWVSIYSGSSTYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAK-DYWQGQTLTVSS Humanized (Sapiens^3)
EVQLLESGGGVLQPGGSLRLSCAASGFTSSYAMSWVRQAPGKGLEWVSIYSGSSTYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAK-DYWQGQTLTVSS IGHV3-23*03,IGHJ4*01

```

Light chain

DVVMQTQPLSLPVTLGQPASISCRSSQLVYSDGNTYLNWFQQRPGQSPRLLIYKVSNRDSGPDRFSGSGSTDFTLKISRVEADGVVYCYCQGTH—WTFGGQTKVEIK IGKV2-30*01, IGKV1J1*01
 DVVMTQSPSLPVTLGQPASISCRSSQLIYSDGNAYLHWFLQPKGQSPRLLIYKVSNRFSGPDRFSGSGSTDFTLKISRVEADGVVYCCSQTSHVPWTFGGGTKEIK Humanized (Experimental)
 DVVMTQPLSLPVSLGDQASISCRSSQLIYSDGNAYLHWFLQPKGQSPKLIIYKVSNRFSGPDRFSGSGSTDFTLKISRVEATEDLVYFCQSHTHVPWTFGGGTKEIK Parental
 DVVMTQPLSLPVTLGQPASISCRSSQLIYSDGNAYLHWLQPKGQSPQLLIYKVSNRFSGPDRFSGSGSTDFTLKISRVEADGVVYCCSQTSHVPWTFGGGTKEIK Humanized (Sapiens^3)
 DVVMQTQPLSLPVTLGQPASISCRSSQLVYSDGNTYLNWFQQRPGQSPRLLIYKVSNRDSGPDRFSGSGSTDFTLKISRVEADGVVYCYCQGTH—WTFGGQTKVEIK IGKV2-30*01, IGKV1J1*01

Talacotuzumab

Heavy chain

EVQLVQSGAEVKPGESLRISCKGSGYSFTSYWISWVRQMPGKGLEWMGRIDPSDSYTNYSPSFQGOVTISADKSISTAYLQWSSLKASDTAMYCAR-----AEYFQHWGQGTIVTVSS IGHV5-10-1*04, IGHJ1*01
EVQLVQSGAEVKPGESLKISCKGSGYSFTDYYMKWARQMPGKGLEWMGDIIPSGATFYNQKFKGQVTISADKSISTTYLQWSSLKASDTAMYCARSHLLRASWFAYWQQGTMVTSS Humanized (Experimental)
EVQLQSGPVELVKPGASVKMSCKASGYFTDYYMKWVKQSHGKSLEWIGDIIPSGATFYNQKFKGATLTVDRSSSTAYMHLNSLTSEDAVYYCTRSHLLRASWFAYWQQGTLVTVSA Parental
QVQLVQSGAEVKPGASVKVSCKASGYFTDYYMKWVRQAPGQGLEWMGDIIPSGATFYNQKFKGRTLTDSTSTAYMELNSLTSEDAVYYCARSHLLRASWFAYWQQGTLVTVSS Humanized (Sapiens^3)
QVQLVQSGAEVKPGASVKVSCKASGYFTSYMMHWVRQAPGQGLEWMGINPSGGTSVAQKFQGRVTMTRDTSTVYMELSSLRSEDAVYYCAR-----AEYFQHWGQGTIVTVSS IGHV1-46*01, IGHJ1*01

Light chain

DIVMTQSPDSLAVSLGERATINCKSSQSVLYSSNNKNYLWYQQKPGQPPKLLIYWA
STRESGVPDFSGSGSGTDFTLTISSLQAEDVAVYYCQQYYS--YTFQGQGTKEIK IGKV4-1*01, IGKJ2*01
DIVMTQSPDSLAVSLGERATINCESSQSLNSGNQKNYLWYQQKPGQPPKPLIYWA
STRESGVPDFSGSGSGTDFTLTISSLQAEDVAVYYCQNDYSYPYTFQGQGTKEIK Humanized (Experimental)
DFVMTQSPSLLTVAGEKVTMSCKSSQSLNSGNQKNYLWYQQKPGQPPKLLIYWA
STRESGVPDFRTGSGSGTDFTLTISSVQAEDLVAVYYCQNDYSYPYTFGGGTKEIK Parental
DIVMTQSPDSLAVSLGERATINCKSSQSLNSGNQKNYLWYQQKPGQPPKLLIYWA
STRESGVPDFSGSGSGTDFTLTISSLQAEDVAVYYCQNDYSYPYTFQGQGTKEIK Humanized (Sapiens^3)
DIVMTQSPDSLAVSLGERATINCKSSQSVLYSSNNKNYLWYQQKPGQPPKLLIYWA
STRESGVPDFSGSGSGTDFTLTISSLQAEDVAVYYCQQYYS--YTFQGQGTKEIK IGKV4-1*01, IGKJ2*01

Tocilizumab

Heavy chain

QVQLQESGPGLVKPSETLSLCTVSGGSI-SHYWSIRQPPGKLEWIGIYIYSGSTNYNPSLKSRTVISVDTSKNQFSKLSSVTAADTAVYYCAR-----YFDYWQGTLTVVSS IGHV4-59*11, IGHJ4*01
QVQLQESGPGLVRPSQTLSLCTVSGYSITSDHAWSWVRQPPGRGLEWIGIYISYSGITTYNPSLKSRTVMLRDTSKNQFSLRLSSVTAADTAVYYCARSLARTTAMDYWQGSLTVVSS Humanized (Experimental)
DVQLQESGPVLVKPSQSLSLCTVTGYSITSDHAWSWIRQFPGNKLEWIGIYISYSGITTYNPSLKSRTISRTDTSKNQFSLRLSSVTAADTAVYYCARSLARTTAMDYWQGSLTVVSS Parental
QVQLQESGPGLVKPSQTLSLCTVSGGSI-SHYWSIRQPPGKLEWIGIYIYSGSTNYNPSLKSRTVISVDTSKNQFSLKLSSVTAADTAVYYCAR-----YFDYWQGTLTVVSS IGHV4-59*11, IGHJ4*01

Light chain

DIQMTQSPSLLSASVGDRVTITCQASQDISNLYNWYQQKPGKAPKLLIYDASNL
ETGVPSRFSGSGSGTDFTTISSLQPEDIATYYCQQYDN--WTFQGQGTKEIK IGKV1-33*01, IGHJ1*01
DIQMTQSPSLLSASVGDRVTITCRASQDISSYLNWYQQKPGKAPKLLIYDASNL
ETGVPSRFSGSGSGTDFTTISSLQPEDIATYYCQQGNTLPYTFQGQGTKEIK Humanized (Experimental)
DIQMTQTTSSLSASLGDRVТИCRASQDISSYLNWYQQKPGKAPKLLIYDASNL
ETGVPSRFSGSGSGTDFTTISSLQPEDIATYYCQQGNTLPYTFGGGTKEIN Parental
DIQMTQSPSLLSASVGDRVTITCRASQDISSYLNWYQQKPGKAPKLLIYDASNL
ETGVPSRFSGSGSGTDFTTISSLQPEDFATYYCQQGNTLPYTFQGQGTKEIK Humanized (Sapiens^3)
DIQMTQSPSLLSASVGDRVTITCRASQDISSYLNWYQQKPGKAPKLLIYDASNL
ETGVPSRFSGSGSGTDFTTISSLQPEDFATYYCQQSYS--YTFQGQGTKEIK IGKV1-39*01, IGHJ2*01