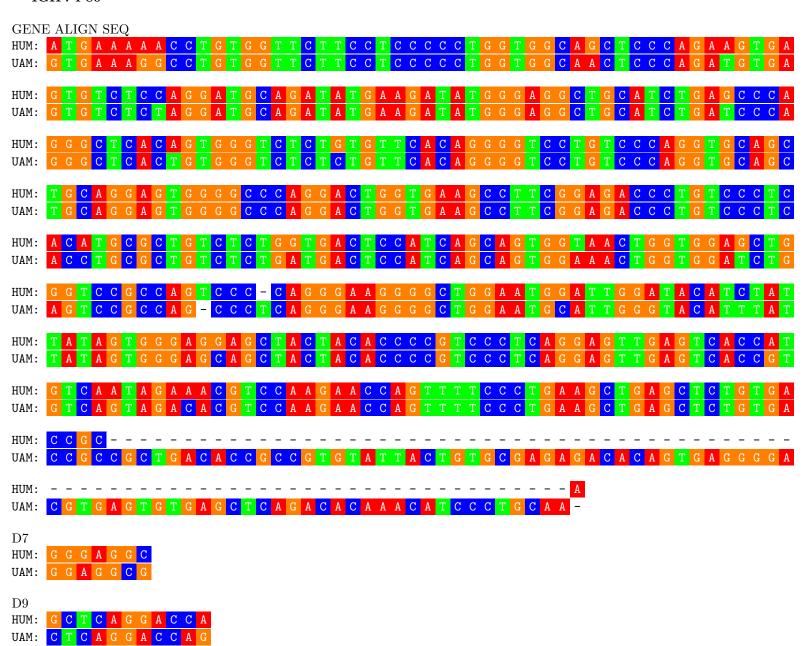
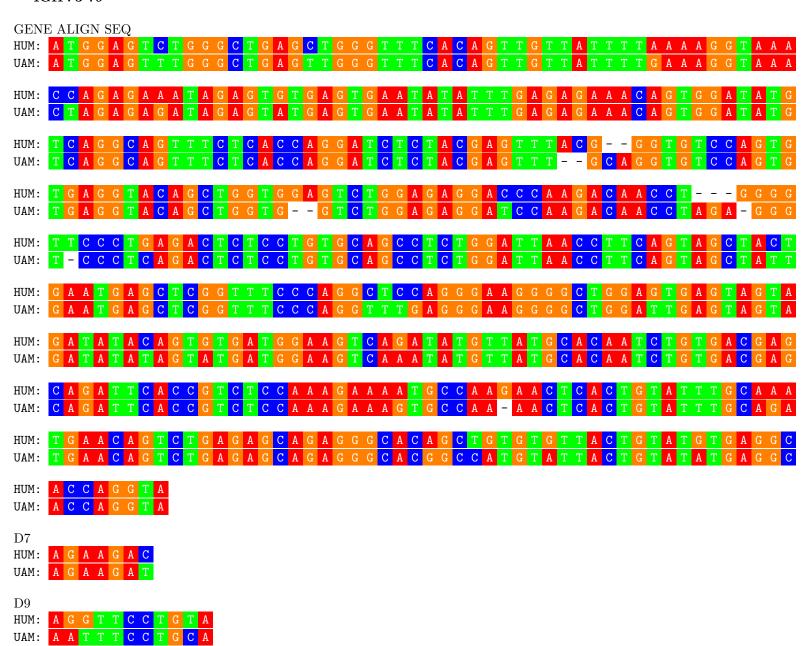
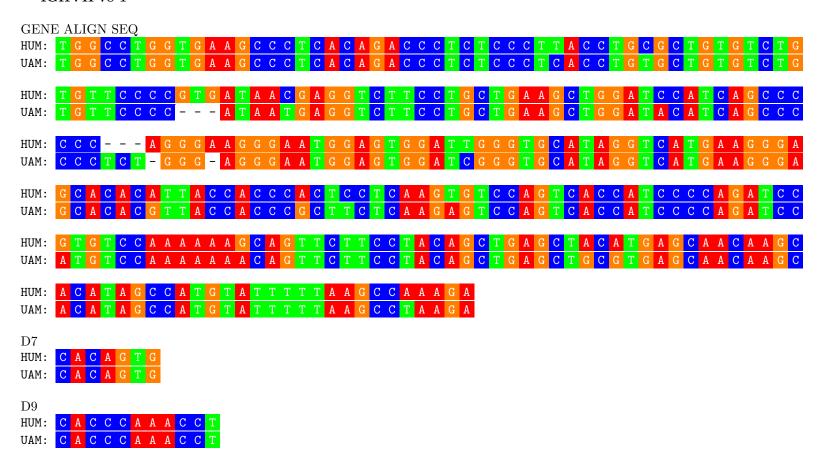
Human genes (HUM) and their mappings (UAMs) in Orangutans

IGHV4-80

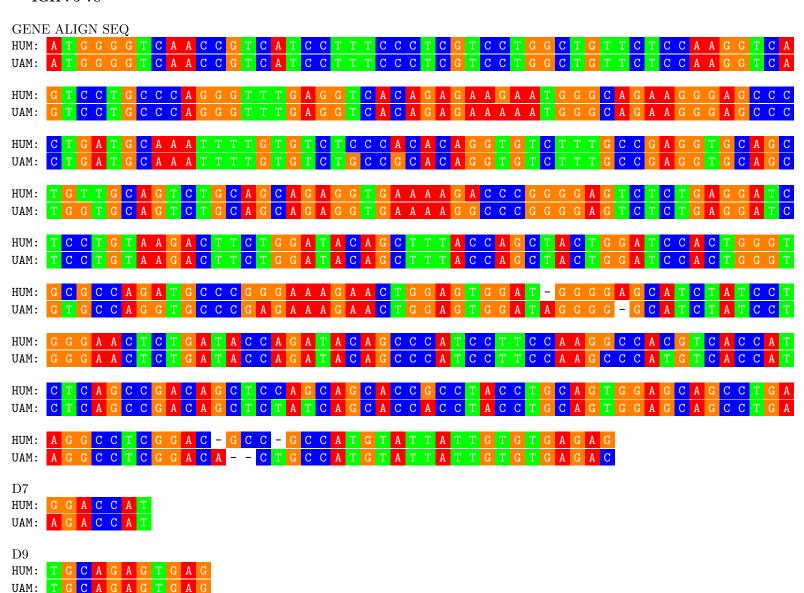




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IGHV5-78



IGHVIII-76-1

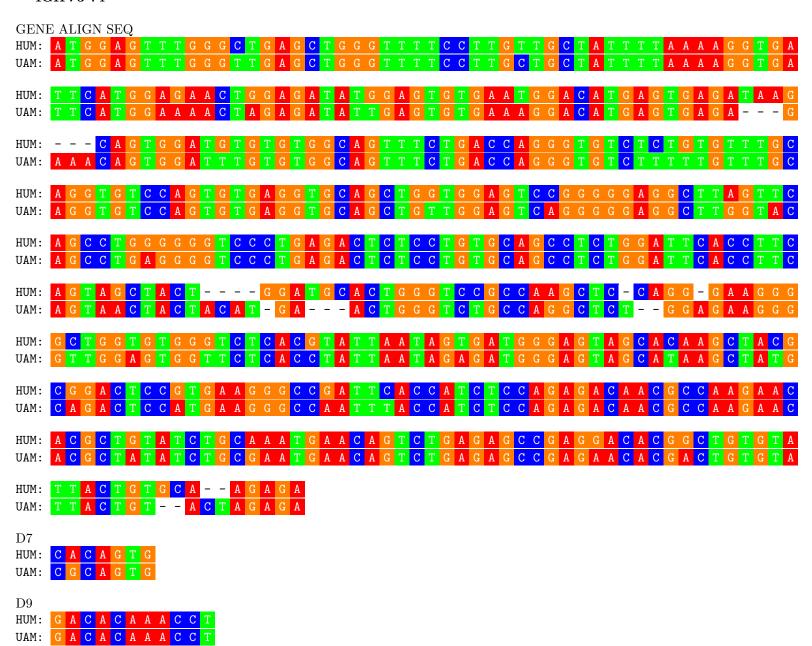
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UAM: GAG <mark>TCCTACAAGAAGTTCACT</mark> CACTGGTGGTGGAAGAA <mark>TCT</mark> GGAAGAA <mark>T</mark> GG <mark>T</mark> ACAG <mark>C</mark>
HUM: CTAACTGTTCTCAGAGACCTATTTTTACAAAGCCTTCTGAATTTACATT
UAM: C C A A C A A T T C T C A G A G C T T T T T T A C A A A G C C T T T T T A C A A A G C C T C T C A A A T T T A C C T T C A T T
HUM: GACTCTAGCAGGCTCAGGCAGGCTGAGGCTGAGGCAGGGAAGAGGGAAGAGGGAAGAGGGAAGAGGAAGGAAGAG
UAM: G A C T C T A G C A T G A G C T C A G C C C A G C A G G C T T C A G G G G T T G T G T G T G T G T G T G
HUM: G G A G G C A A A A G C G A G G G A T T C A A G T G G A A T T T G T T A G T G G T A C C C T C C A T
UAM: G G A G G C A A C A G C A A G T G A T T C A A G T G A A G T G A A G T T C A A G T G G A A T T T G T T A G T G G T A C C C T C C A T
HUM: C A A T A C A A A G A A A A T C A T A A T C A T A A T C C T C A G C C T T G T C A G C A C A G T C
UAM: C A A T A C A A A G A A A A T C A T A A T C T T C A G G A C A C C T T G T C A G C A C A G T C
HUM: T C C C T C A A A A T G A C C A A C C T G A G A G C C A A G G C C A T G T A C T G
UAM: T C C C T C A A A A T G A C C A A C C T G A G A G C C A G C C A T G T A T T A C
HUM: T G A G A G A UAM: T G A G A G A
D7
HUM: C A C A G G A UAM: C A C A G G A
D9
HUM: A C A G G G G A C A C UAM: A C A G G A C A C

GENE ALIGN SEQ
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HUM: T C A A G A A G A A C T A G A A A T A T T G T C T G T G A G T G A T A T G A G T G A G A
HUM: G T G G A T C T G T G T G C A G T T T C T G A C A A G A A T G T C T G T G T T T G C A G G T G
UAM: G T G G A T C T G T G T G G C A G T T T C T G A C A A G A A T G T C T G T G T T T G C A G G T G
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HUM: C T A T G G C A T G C A C T A G G T A G G T A G G T A G G T A G G T G G A C T A G G T G G A G T G G A G T G G A G T G G A G T G G A G T G G A G T G G A G T G G A G T G G A G T G G A G T G G A G T G G G A G T G G G A G T G G G A G T G G G A G T G G G A G T G G G A G T G G G A G T G G G A G T G G G G
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D7 HUM: C A C A G T G UAM: C A C A G T G
D9 HUM: G T C A C A A A C C T UAM: G T A A C A A A C C T

GENE ALIGN SEQ HUM: A T G G G G T T T G C T G A C T T G G G A T T T A C T T A C T A T T T A A A A G T A G A
UAM: A T G G G G T T T G T G C T G A C C T G G G A T T T A C T T A C T A C T A T T T A A A A
HUM: T T C A G G G T G A A C T A G A G A T T T T G A G T G A G T G A G T A A C A G T T A A G G A A A UAM: T T C A G G A G T G A G T G A G T G A G T A A G G A A A G A A G A A G A A G A A G A A G A A A G A
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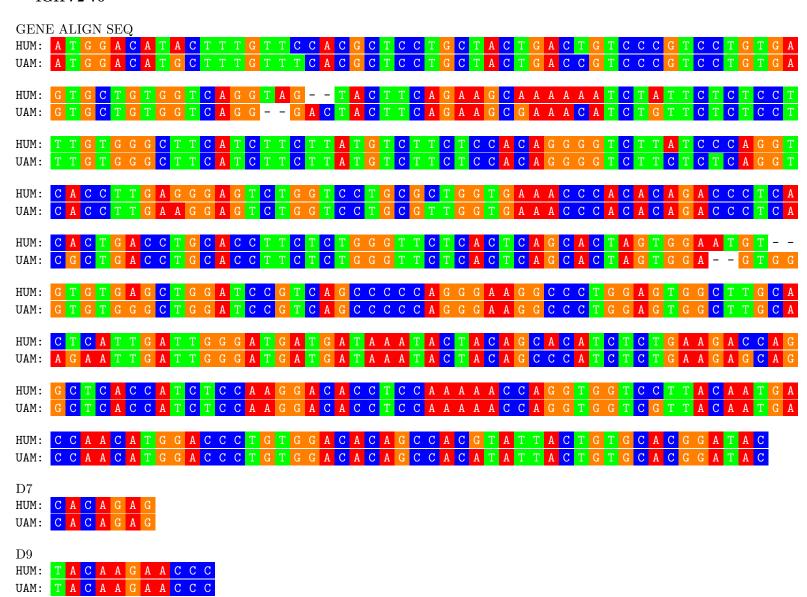
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UAM:	A A	C A	G T	G	С	Т '	ГА	T	G	Α	С	Т	G (G (C	С	Т	G	A A	I I	Т	Т	G	C C	Α	G	С	C C	Α	G	G.	A A	A A	G	G	G	C '	Γ	G	Α
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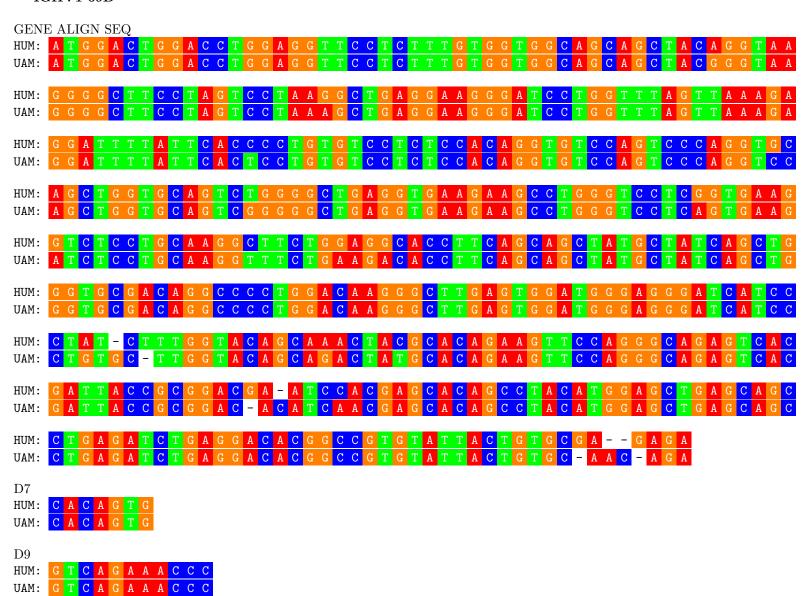
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HUM: A A C A C G G C G T A T C T G C A A T G A A C A G C T G A A A C C G A G C C T G A A A C C G A G G A C A C G G C C T G A A A A C C G A G G A C A C G G C C T G A A A A C C G A G G A C A C G G C C T T G A A A A C C G A G G A C A C G G C C T T G A A A A C C G A G G A C A C G G C C T T G A A A A C C G A G G A C A C A C G G C C T T G A A A A C C G A G G A C A C A C G G C C T T T T T T T T T T T T T T T
HUM: G T A T T A C T G T A G A C A G A C A UAM: G T A C T A C T A G A T A G A T A
D7 HUM: C A C A G T G UAM: C A C A G T G
D9 HUM: G A C A A A C C T UAM: G A T A C A A A C C T

GENE ALIGN SEQ HUM: A T G G A G T T T G G G A G T T T G G G G
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HUM: G G T T G G C C G T A C T A G A A A C A A A G C T A A C A G T T A C A C C A C A G A A T A C G C C G UAM: G G T T G C C C G T A T A C A C A C A C A C A C A C A C A
HUM: C G T C T G T G A A A G G C A G A T T C A C C A T C T C A A G A G A T T C A A A G A A C T C A UAM: C G T C T G T G T G A A A G A A G A A G A G A G
HUM: C T G T A T C T G C A A A T G A A C A G C C T G A A A C C G A G C C T G A A A A C C G A G G C C G T G T A T T A UAM: C T G T G T A C A C A A A T G A G C A G C C T G A A A C C G A G G A C A C G G C C G T G T A T T A
HUM: C T G T G C T A G A G A UAM: C T G T G C T A G A G A D7
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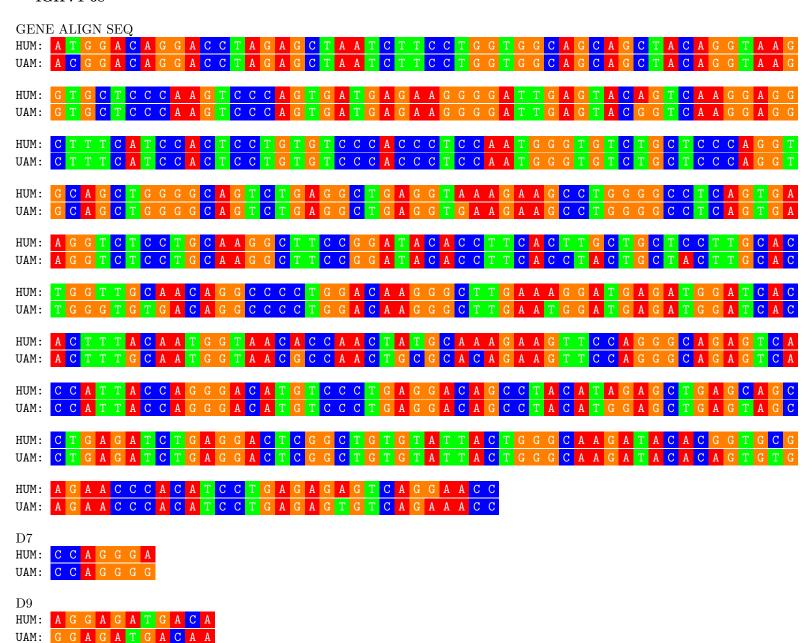
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IGHV1-69D



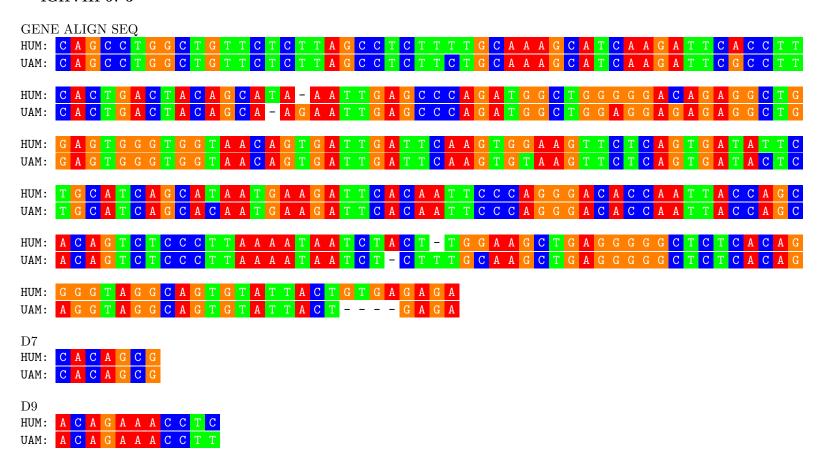
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IGHVIII-67-4

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IGHVIII-67-3



IGHVIII-67-2

GENE ALIGN SEQ

D7

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UAM: C A C A T G A

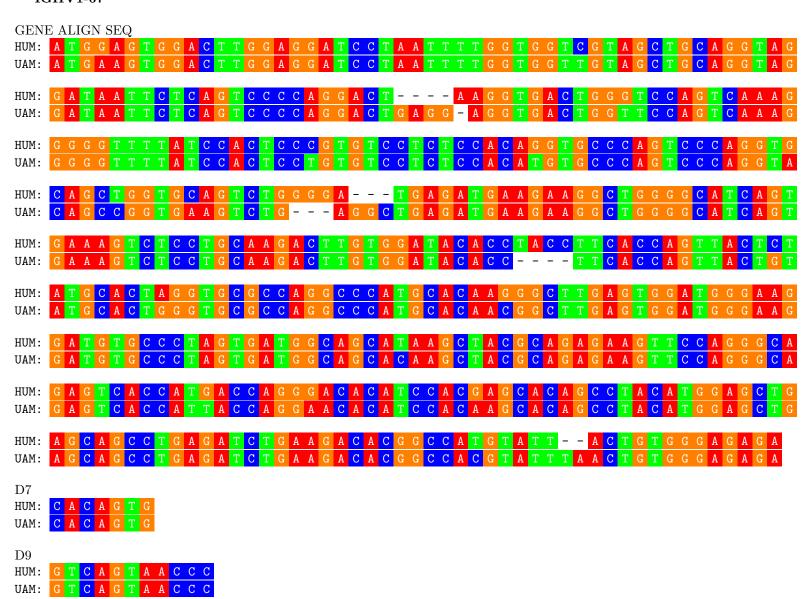
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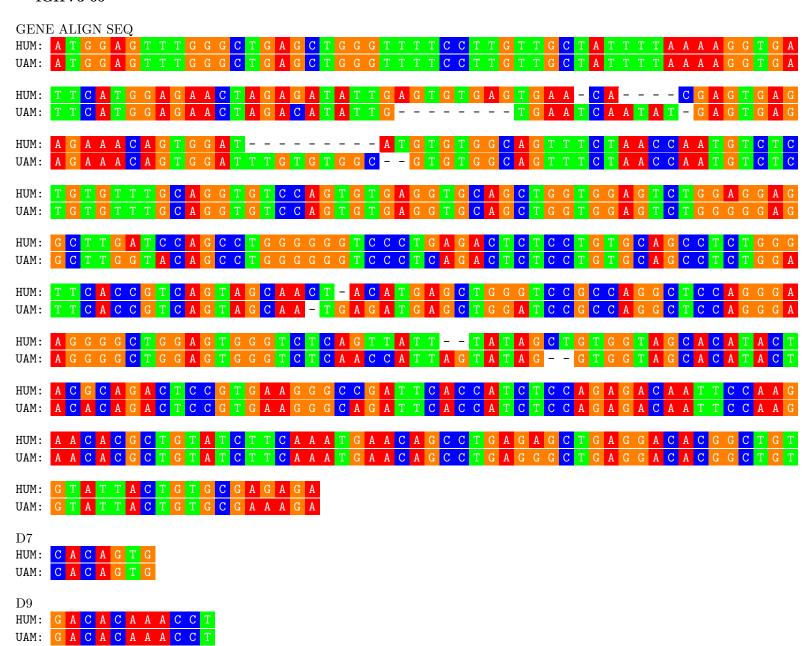
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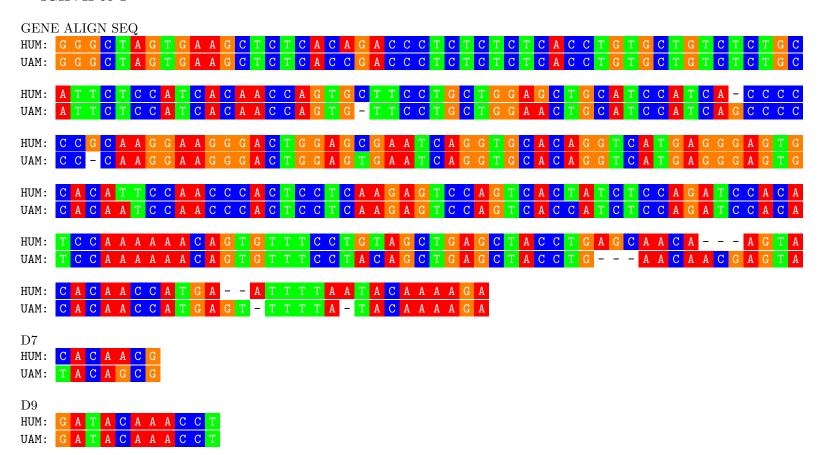
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UAM:	Α	T A	T	C C	T	A	T	T	С	Α	G (G A	A G	C	A	G	C	Т	Α	С	A	G	С	Α	G	Т	C	A	Γ	C	С	T	A	G	A	T	G	T	G	Α	Α	G	A	Γ	A	Ī
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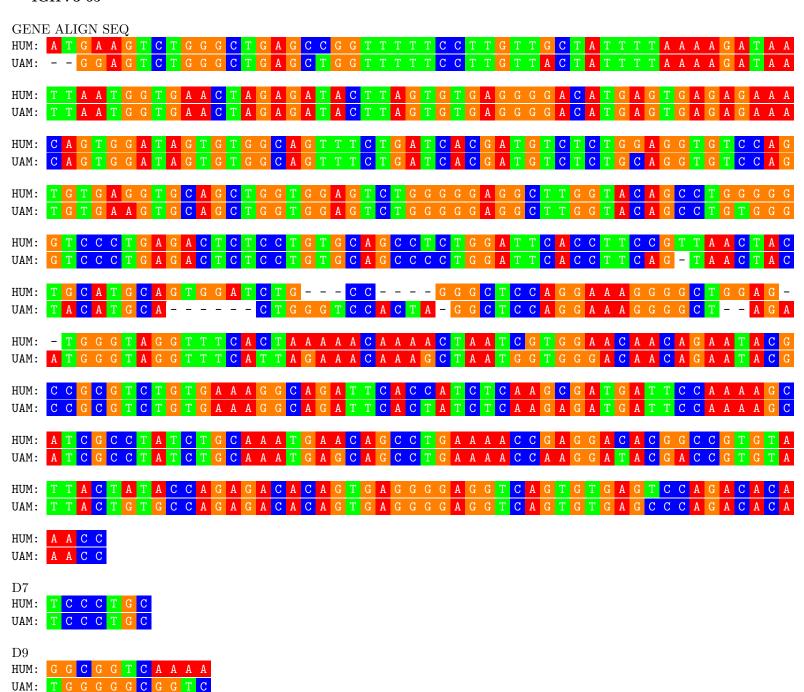
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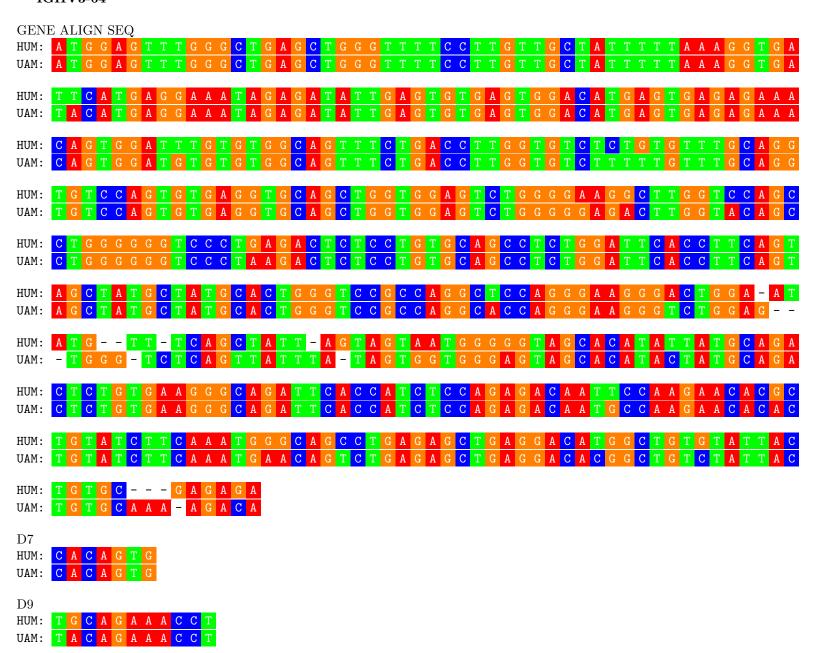


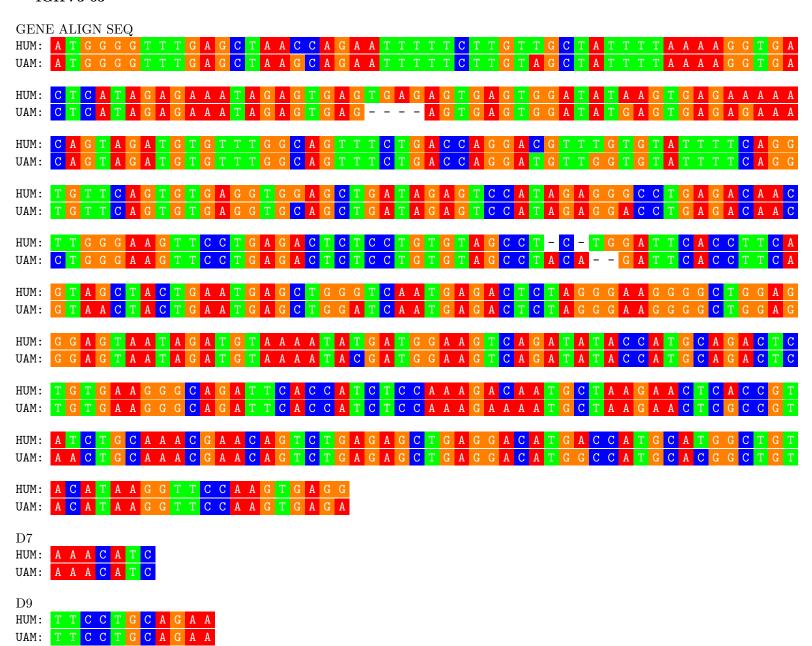


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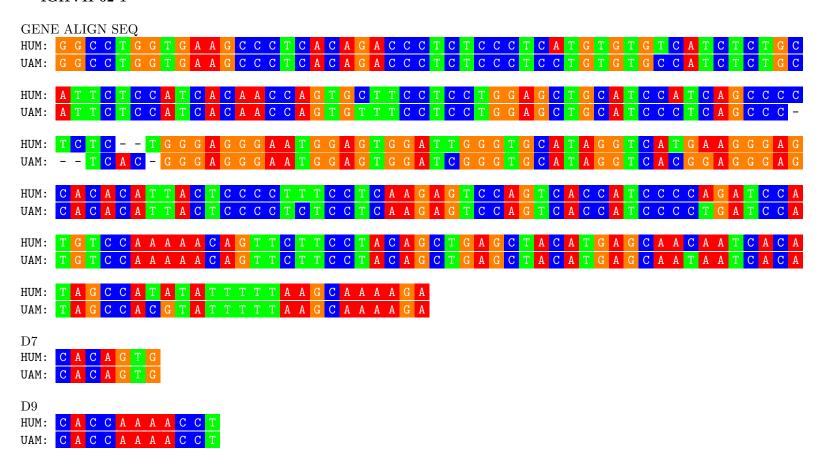




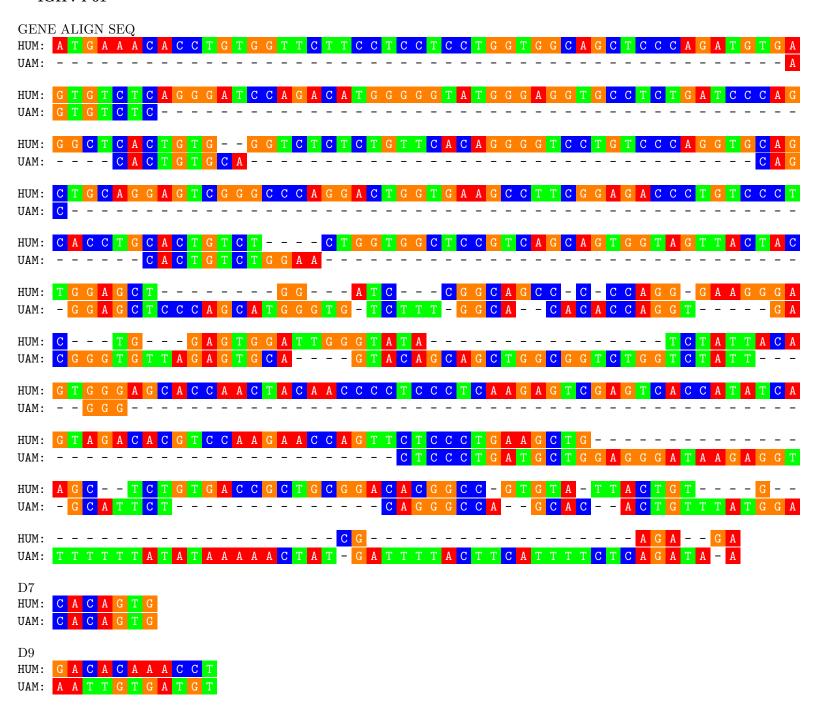




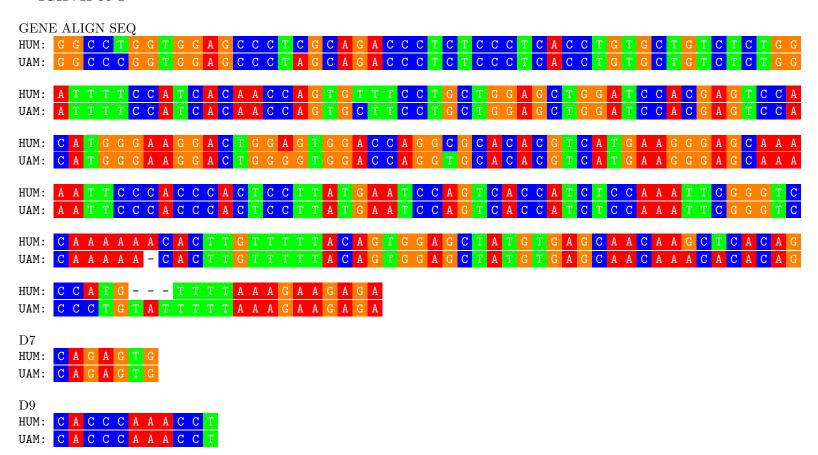
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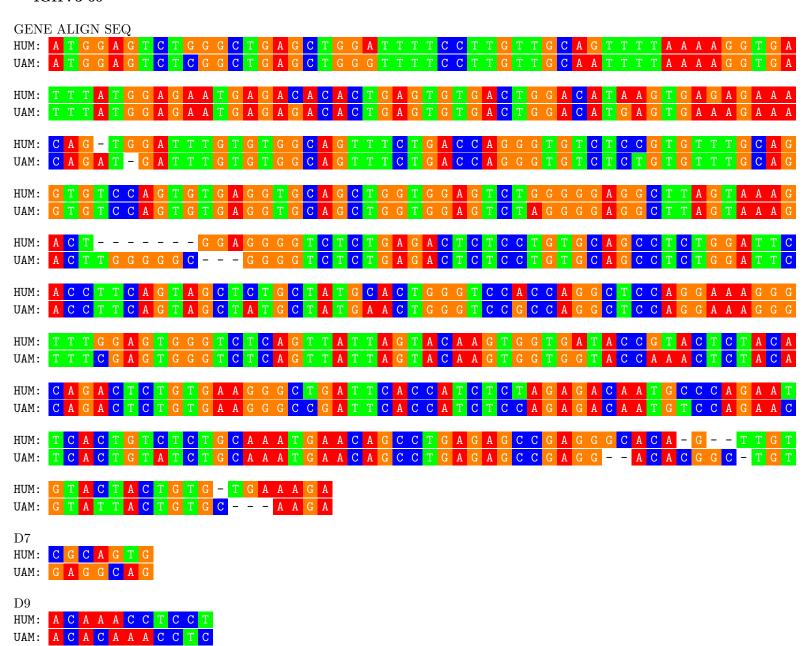


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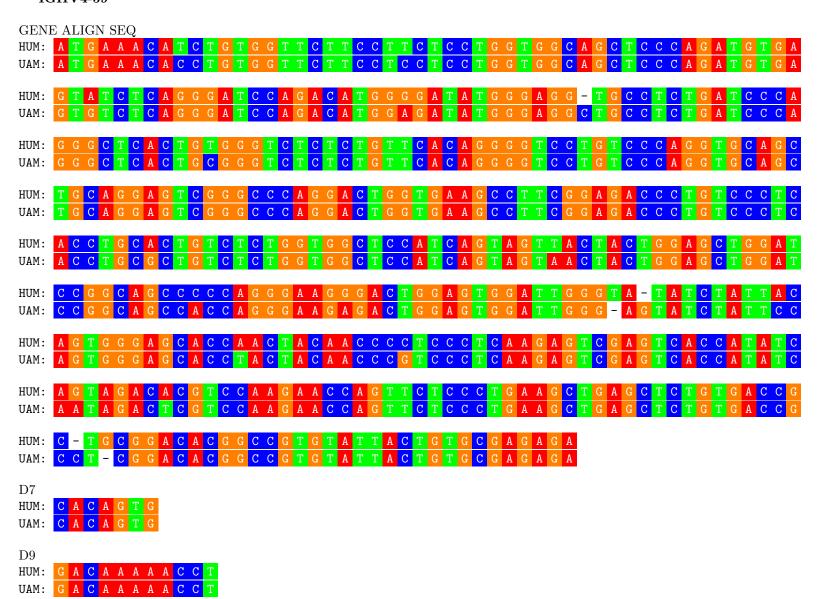


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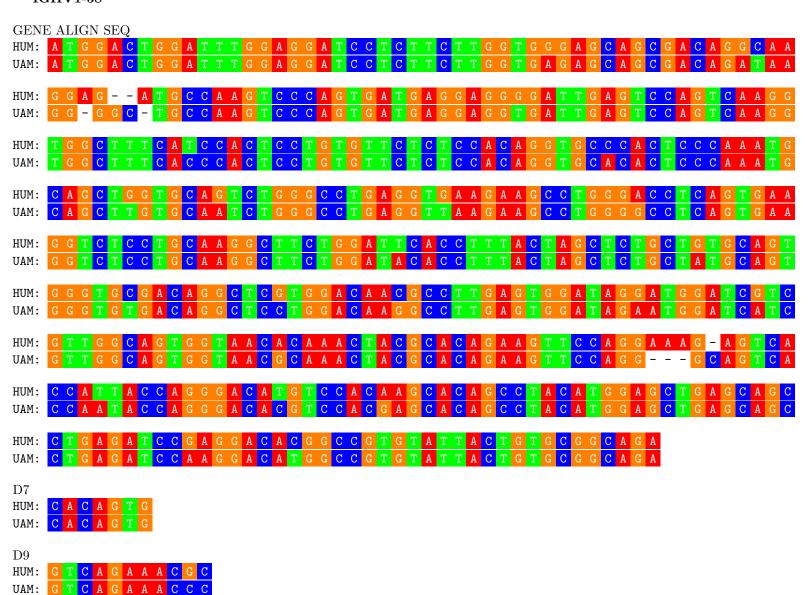


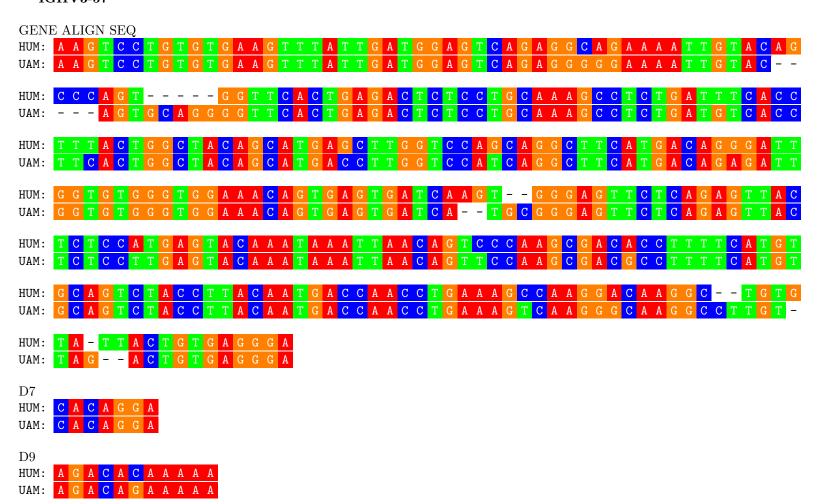


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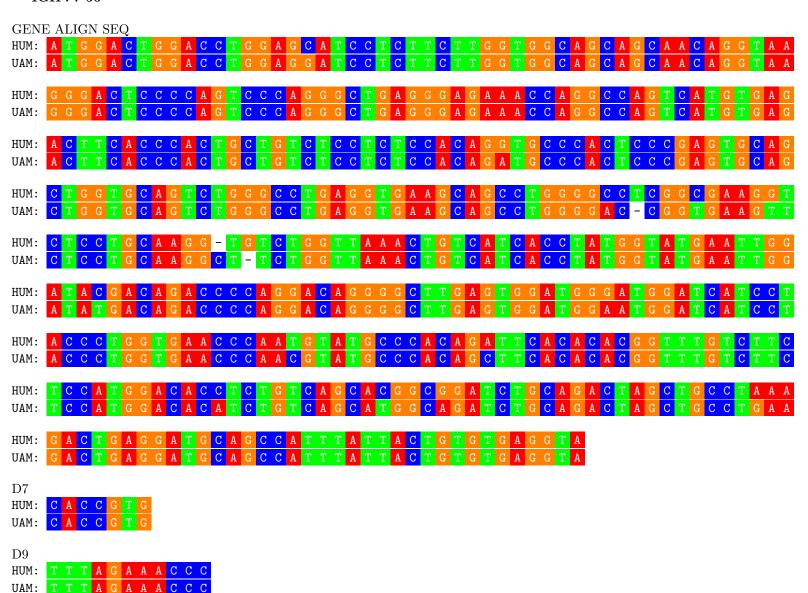


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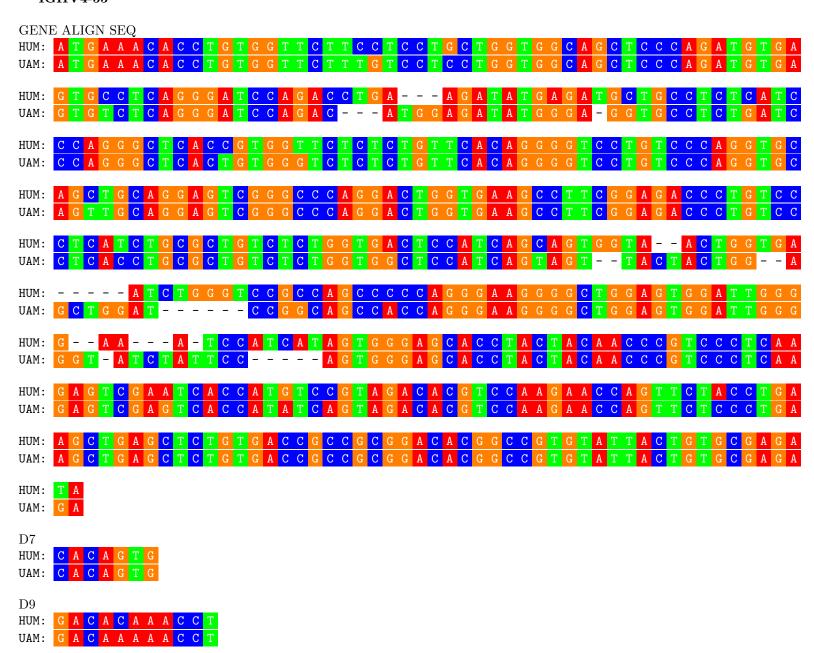


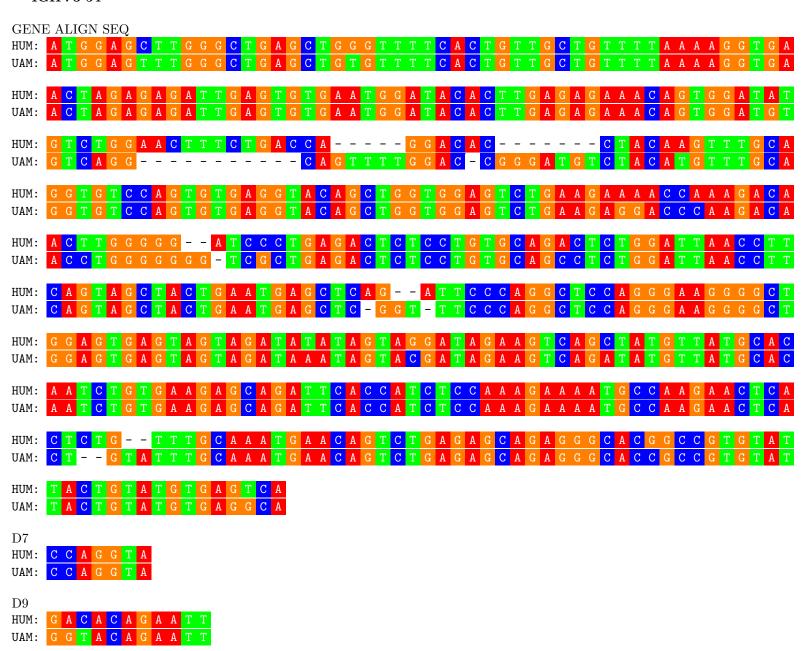


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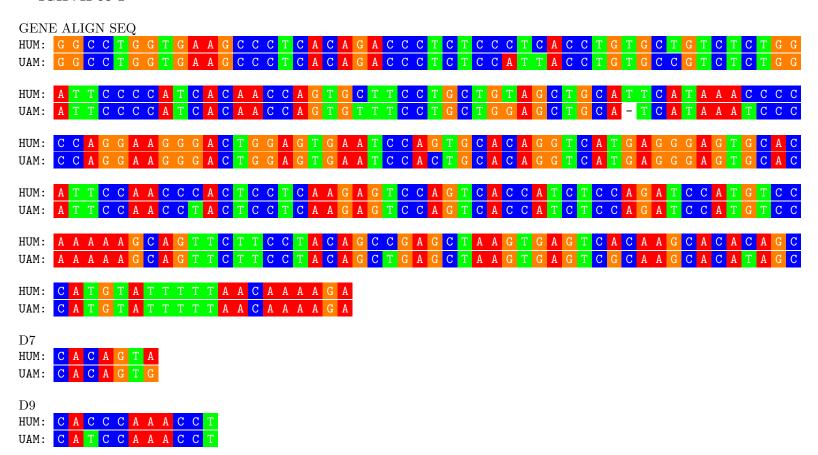


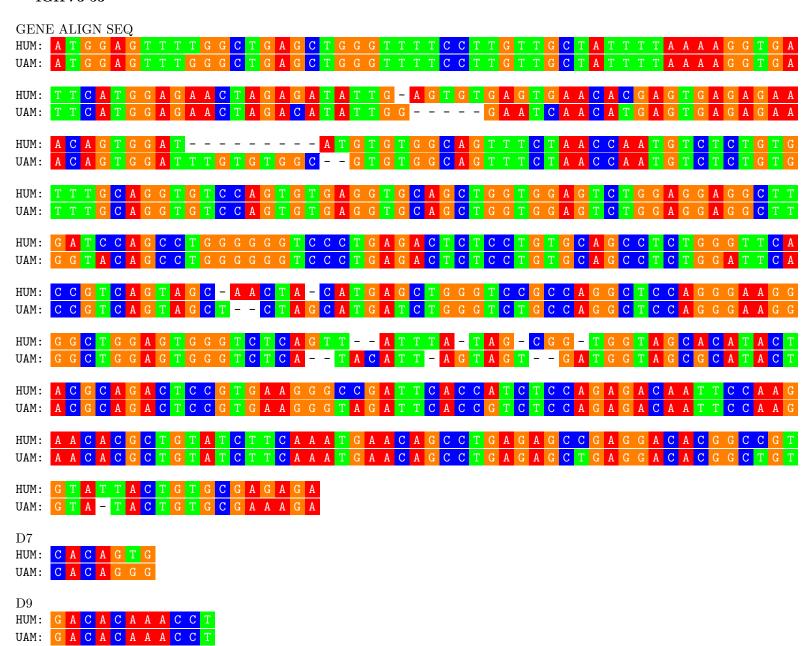
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IGHVII-53-1



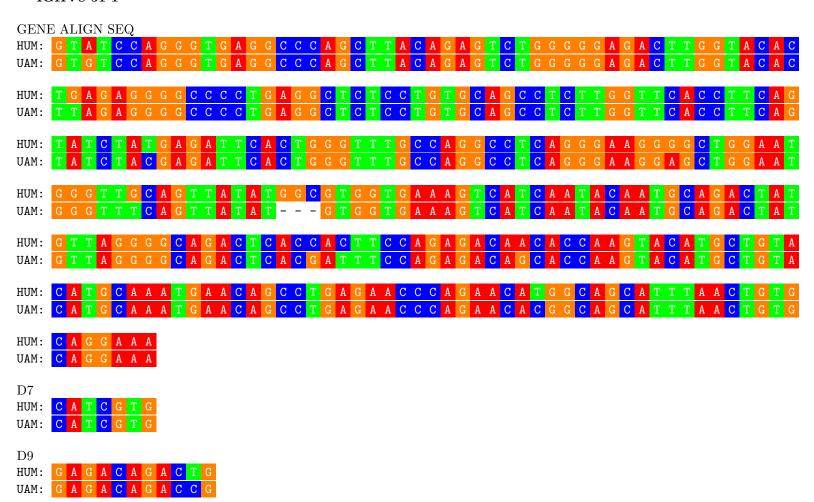


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HUM: T T C A T G G G G A A T G A G T T G A A T G A A T G A A T A A T G A A T G A A T G A A T A T	
HUM: G A T G T G T G C G G C A G T T T C T G A C G G T T T T C T G A C C A G G T C T C T C T G T G T T T G T G T G	
HUM: T C C A G T G T G A G T G T G T G C A G T T G C A G C T G G T G G T G G T G G T G A G T C T G G G T G A G G T T G G T A UAM: T C C A G T G A G G T G A G T G A G T G A G G T A G T	
HUM: G G A G G G T C C C T G A G A C T C T C T C T C T C T C T T T T C A C C T T T T	
HUM: C T C C T G G A T G C A C T G G G T C T G G G T C T G C A G G C T C G G A G A G A G G G C T G G G T C T G G G T C T G G G T C T G G G T C T G G G T C T G G G T C T G G G T C T G G G T C T G G G T C T G G G T C T G G G T C T G G G T C T G G G T C T C	
HUM: T G G C C G A C A T A A A G T G A C A T A A A G T G A C A T A A A G T G A C G A A G T G A G A A A T A C T A T G T A G A G A C UAM: T G G C A A A T A C T A T G C A G A G A G T G A G A A G T G A G A G T G A G A	
HUM: A A G G G G C C G A T T G A C C A T C T C C A G A G A T G G C C A A G A C T C C T UAM: A A G G G C C G A T T G A C C A T C T C C A G A G A G A G A G A G A G T C T C T C T C T C T C T C T C T C T	
HUM: G C A A G T G A A C A G C T G A G C T G A G C T G A G C T G A G C T G A G C T G A G G T G T A T T A C T UAM: G C A A A T G A A C A C A C A C A C A C A C A T G G C C G T A T A T A C T	
HUM: G A G G UAM: G A G A	
D7 HUM: C A C A G T G UAM: C A C A G T G	
D9 HUM: G A C A C A A A C C T UAM: G A C A C A A A C C T	

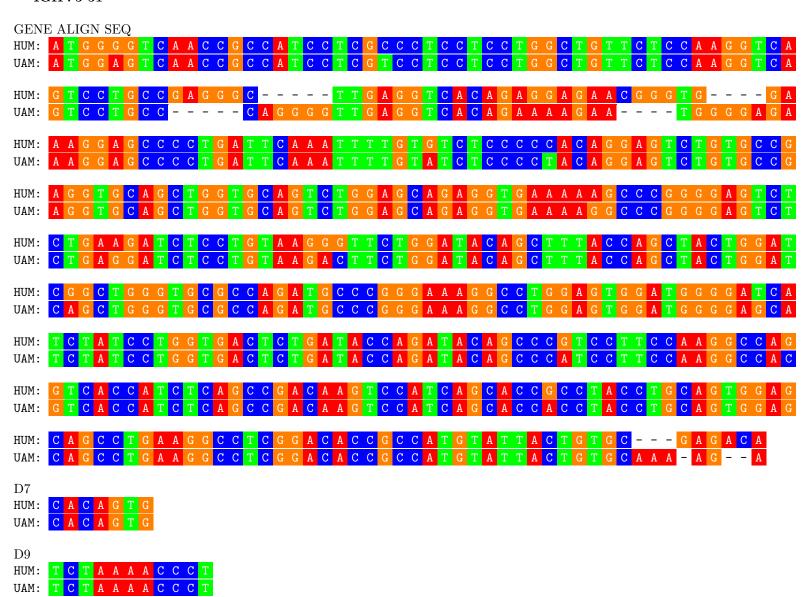
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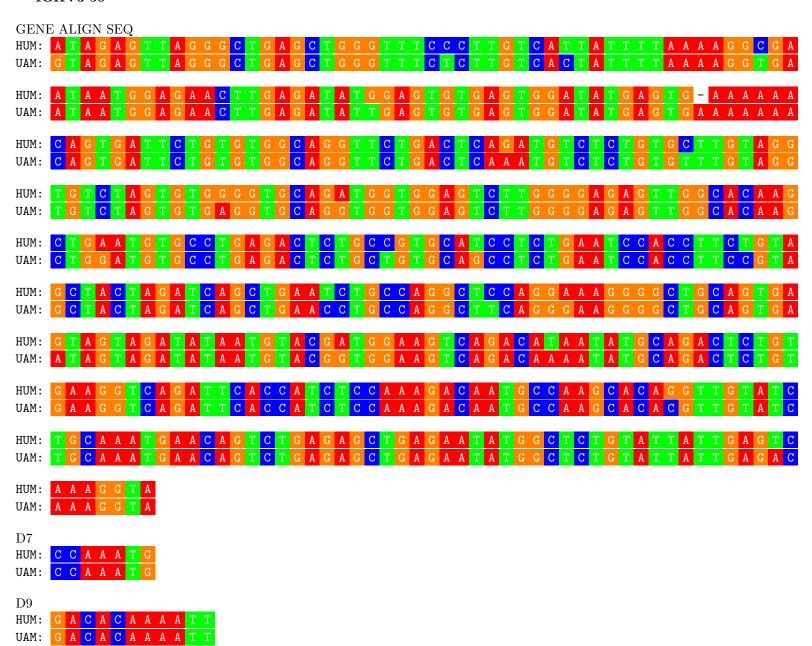
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UAM: G G C C T G G T G A G G C C C T C - C G A G A C C C C T C C C T C A C C T G T G T G T C T	C T G
	m a a
HUM: G A T T C T C C A T C A C A A C T A G T C C T G C T G G A G C T G G A T C G C A	
UAM: GATTCTCACAACAACCAGCTTCCTGCTGCTGCTGCTGCTGCAG	
HUM: TCAGTCAAGGGAAGTGAAAT	ТСТ
UAM: T C A G T C A A G G A A G T G G A T C A G G G C A T A G G T A A C G A G G G A G C A C A A A T	ТСТ
HUM: A A C C C A C T C C T C A T G A G C T C A G T C A G T C A G T C A G T C A G T C C A G A T C C A C G T C C A A	G A A
UAM: A A C C C A C T C C T C A T G A G C T C A G T C A T G A A G C T C A G T C A C C A T C T C C A G G T C C A C G T C C A A	G A A
HUM: CCAAATTTTCTTAGCTTTTAGCTGAGTTCTGAGCAACAACAATGCAACAACAACAACAACAACAACAACAACAACAACAACAA	
UAM: C C A A A T T T T C T T T T A G C T G A G T T C T T A G C T G A G T T C T G T G A C C A A C A A C G C C A C A A C C A A C C A C A	T G T
HUM: A T T A C T G T G A G A G G	
UAM: A T T A C T G T G A G A G G	
D7	
HUM: A A C A G A A	
UAM: A A C A G A G	
D9	
HUM: CAAACTTCC	
UAM: CAAACTTCC	

IGHV8-51-1

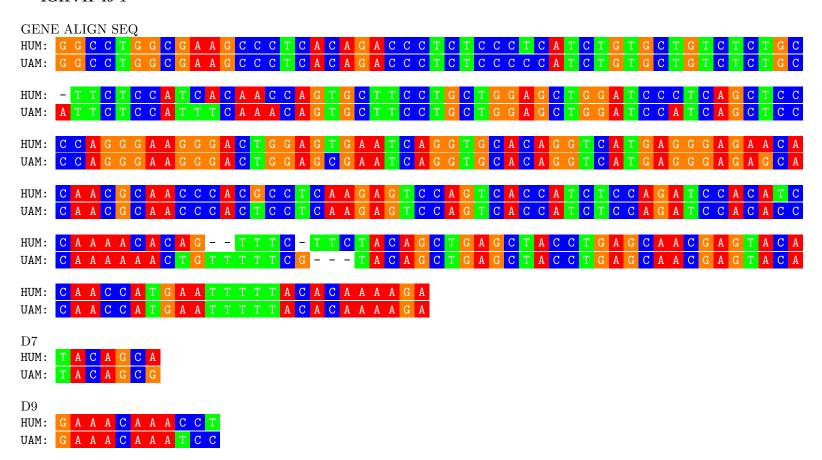


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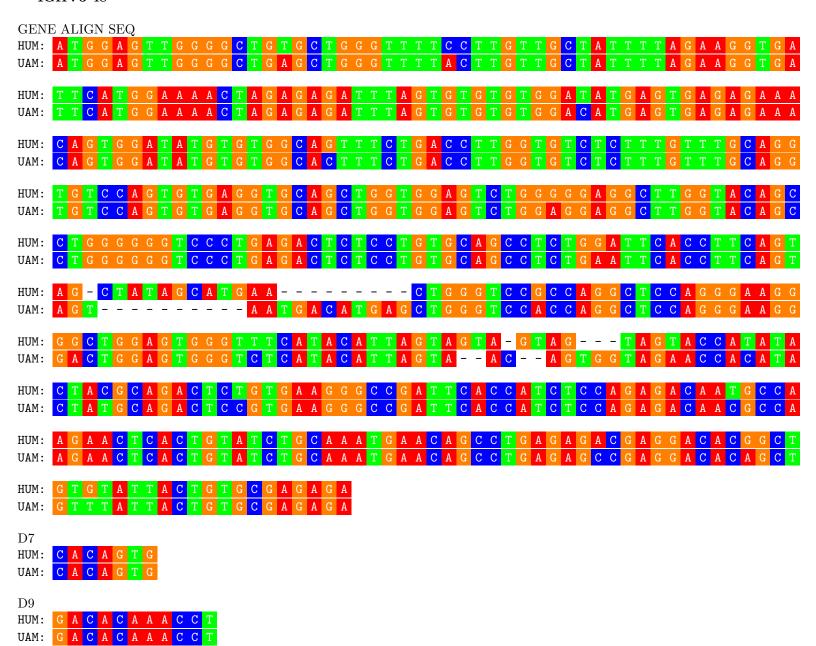




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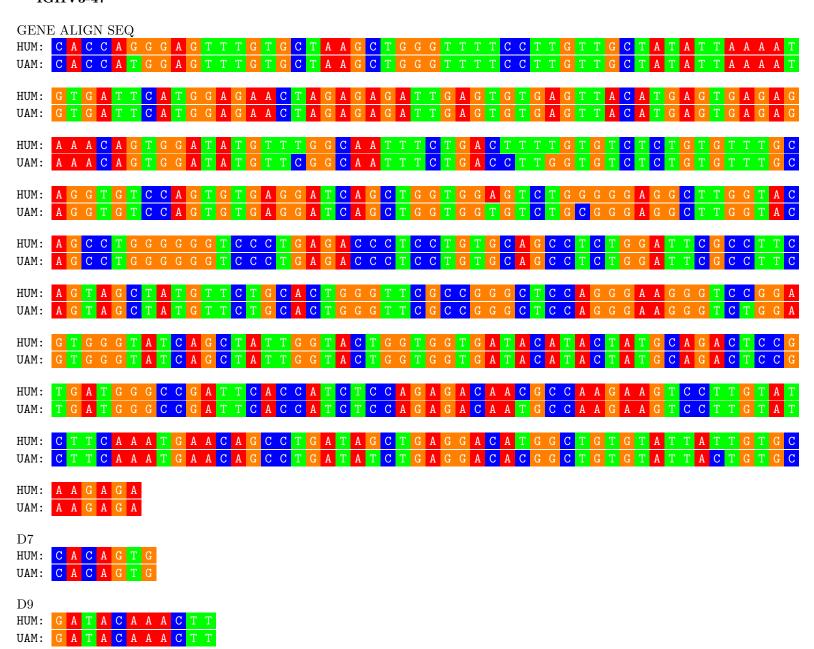


GENE ALIGN SEQ HUM: A T G G A G T T T G G G C T T A G G G C T T A G G G T T G G T T G C T T G T G T T G C T A T T T A A A A G G T A UAM: A T G G A G T T T G G T T G C T T G T T G C T T G T T T T	
HUM: T T C A T G G T G T A C T A G A T A C T A A G A G A T A C T A G A G A T A C T A A G A A A A A A A A A A A A A A A A	
HUM: C A G T G G A T A T G T G G A T A T G T G	
HUM: T G T C C A A T G T G A G G T G A G T G A G T G A G T G A G T G A G T G A G T G A G T G A G T G A G T G A G T G A G T G A G T C T G G G G G A G G C T T G G T A A A G UAM: T G T C A A A T G T G A G G T A G G T A G G T A A A G T G T	
HUM: C A G G G C G G T C C T G A C T C T G A G G T C C T G A G A C T C T C T G T A C T G T G G A T T C T G A C T T T G G UAM: C A G G G G G G T C C T G A G C T T T G G A C T T G G A C T T T G G	
HUM: G A T T A T G C T A T G A G C T A T G A G C T G G T T C C G C A G G C T C A G G G A A G G G G C T G G A G T T C C A G G G G G C T G G A G T T G T T G G A G T T T G G A G T T T G G T T T G G A G T T T G T T T T	
HUM: G G T A G G T T T C A T T A G A A G C T T T C A T T A G A A G C A A G C T T A T G G T G G A C A A C A G A T A C G C T T A T G G T G G A C A A C A G A A T A C G C T T A T A C G C T T A T A C G C T T A T A C G C T T A T A C G C T T A T A C G C T T A T A C G C T T A T A C G C T T A T A C G C T T A T A C G C T T A T A C G C T T A T A C G C T T A T A C G C T T A T A C G C T T A T A C G C T T A C T A C A C A C A C A C A C A C	
HUM: C G T C T G T G A A A G G C A G A T C A C A T C A G A A A G G C A G A T T C A C C A T C T C A A G A G A T C C A A A A G C A T C A A G A T C A A G A T C A A G A T C A A A A G C A A A A G C A T C A A A A A G C A T C A A A A A G C A T C A A A A A A A A A A A A A A A A	
HUM: G C C T A T C T G C A A A T G A A C A G C C T G A A A T C A G C C T G A A A A C C G A G G A C A G C G T G T A T T UAM: G C C T A T C T G C A A A T G A A C A G C C T G A A A A C C G A G G A C A C G C G T G T A T T	A A
HUM: C T G T A C T A G A	
D7 HUM: C A C A G T G UAM: C A C A G T G	
D9 HUM: G A C A C A A A C C T UAM: G A C A C A A A C C T	

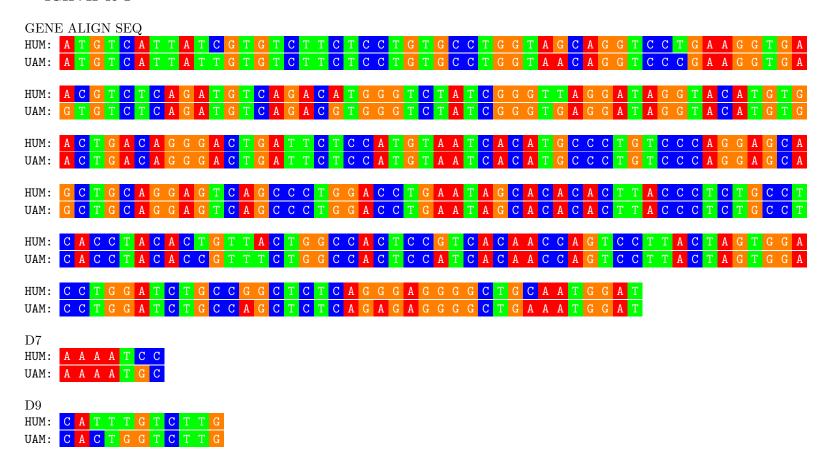


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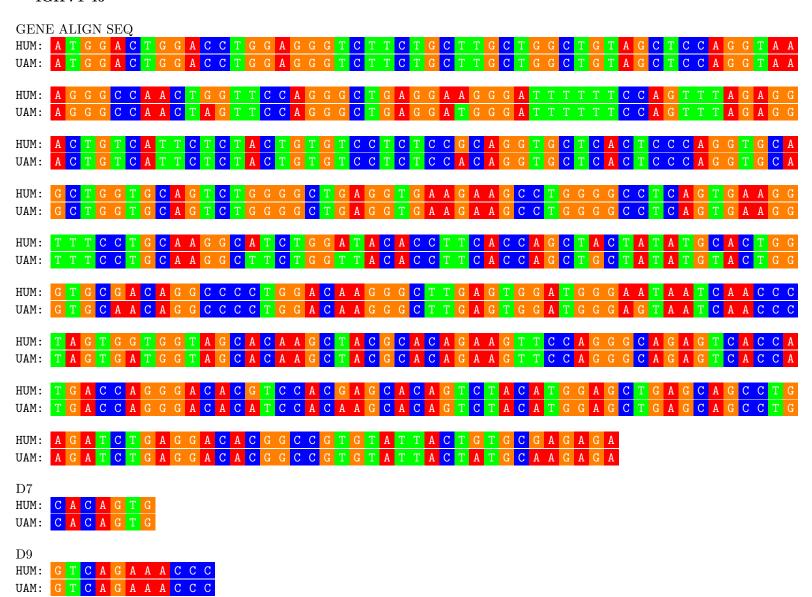
GENE ALIGN SEQ	
HUM: A G G T C C C T G T G A A G T T A A T T A C T G G A G T C T C T C A G A G A A	
UAM: A G G T C C C T G T G A A G T T A A T T A G T G G A G T C T C A G A G A A	A A T A C T A C A G A
HUM: CCAAGAATTCTCAGACTTTTCTGGAAACCCTTGTGATTCA	
UAM: C C A A G A A T T C T C A G A C T T T T C T G G A A A G C C T C T G G A T T C A	
HUM: A A A C A G C A T A A G C T T G G T C C A G C A G G T T C A T G A C A G G G	
UAM: A A A C A G C A T A A G C T T C G T C C A G C A G G T T C A T G A C A G G G	TTGGTGTGGGG
HUM: T G A T A A C A T C A G T A A T T C A A G T G G A A G T T C T C A G T G G A C UAM: T G A T A A C A T C A G T A A T T C A A G T G G A A G T T C T C A G T G G G A C	
OAM. IGATAACATCAGTAATTCAAGTGGAAGTTCTCAGTGGGAC	
HUM: TACAAAGAAGAAGATTAACAG <mark>TCCTC</mark> AGAGA <mark>CAC</mark> TTTTCA	GATGATTCTCT
UAM: TACAAAGAAGAAGATA CACA CACA CACA CACA CA	GATGATTCTCT
HUM: C T T A A G A T G A T T A A C C T G A G A G C T C A G G A A A A T T C C G T T T	
UAM: TTTAAAGA <mark>T</mark> GA <mark>TT</mark> AA <mark>CCT</mark> GAGAG <mark>CTC</mark> AGGAAAA <mark>TTCC</mark> G <mark>TT</mark>	T A T T A C T G T G A
HUM: G G G A	
UAM: G G G A	
D7	
HUM: C A C G G T G	
UAM: C A C A G T G	
D9	
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UAM: G A C A A A C C T	



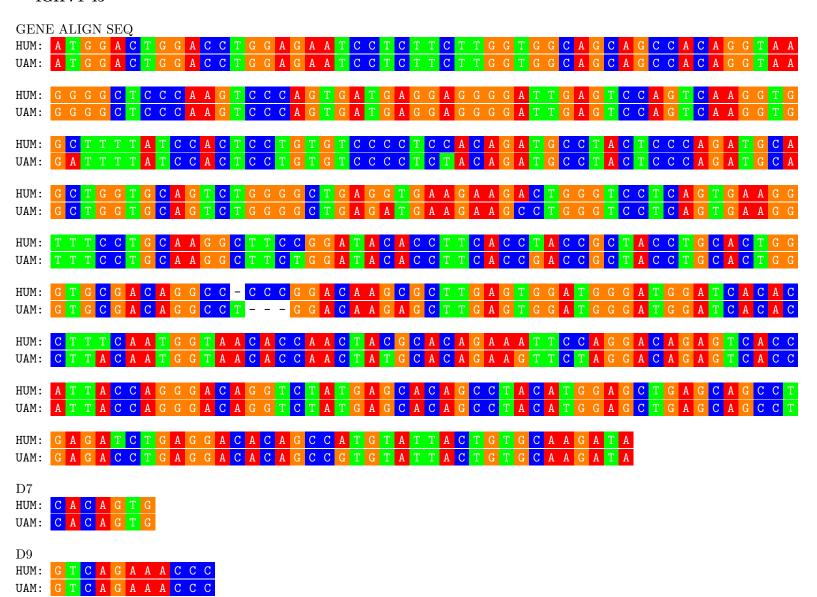
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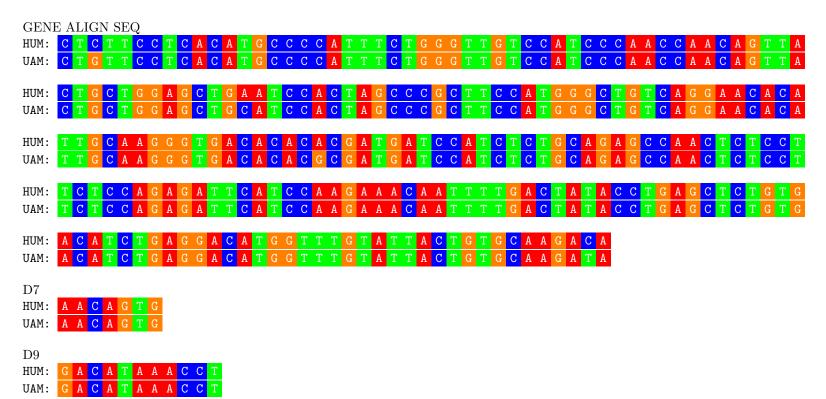
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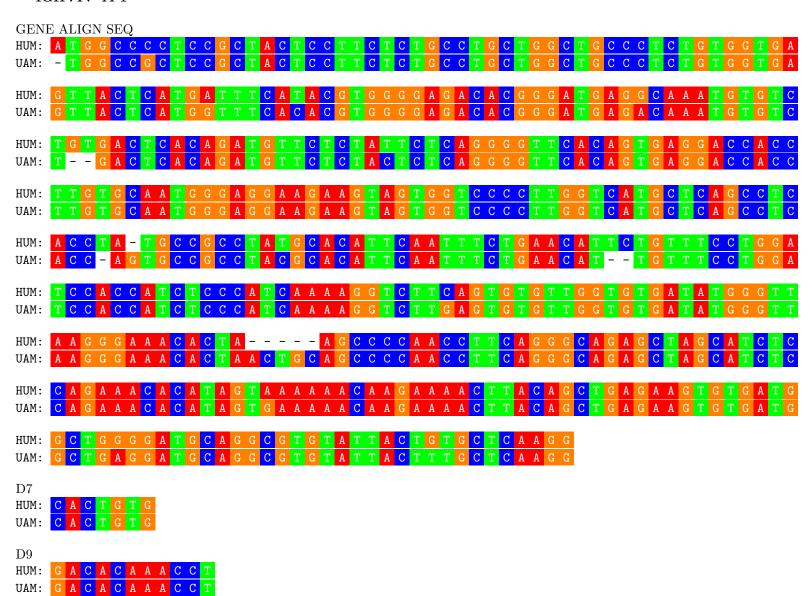
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IGHVII-44-2



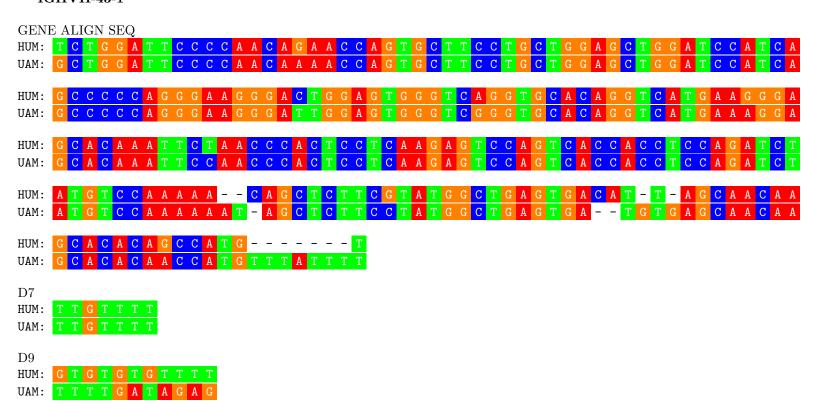
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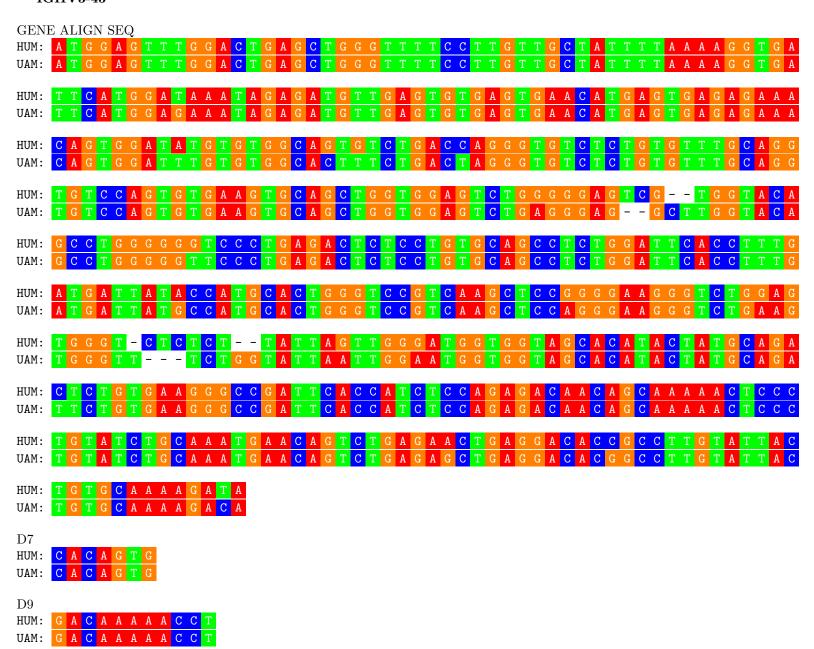


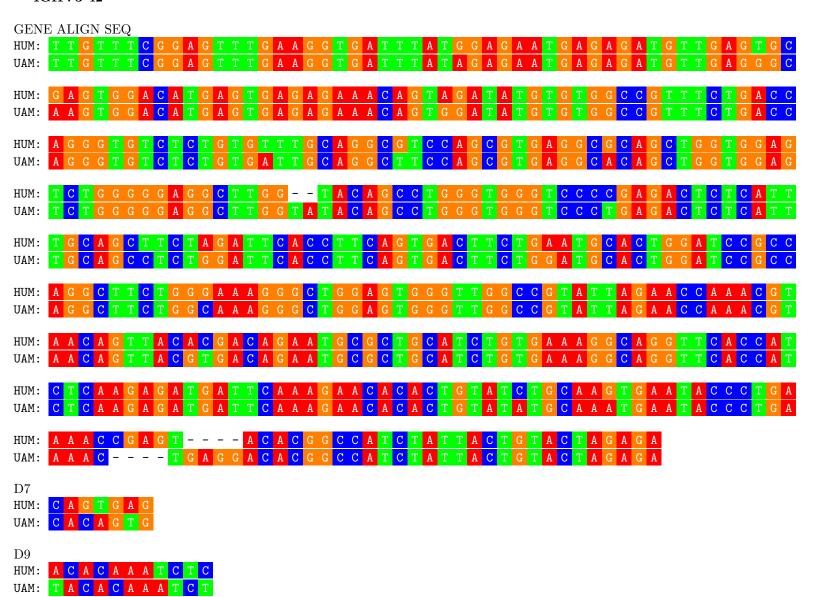
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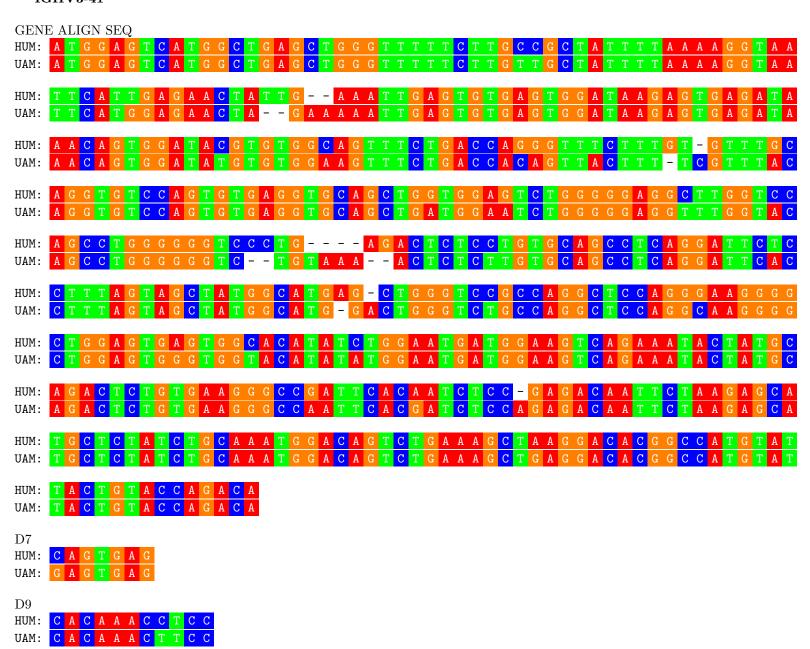
GENE	E ALIG	N SE	CQ																																					
HUM:	A T G	ТТ	G	T T	T	G	G	G (T	G	A	G	C	T	G (G (G C	T	T	Т	C	C T	T	G	T	T A	C	Т	A	Т 1	ΓТ	Т	Α	Α	G L	A (3 G	Т	G.	Α
UAM:	A T G	ТТ	G	т т	T	G	G	G (T	G	A	G	C	T	G (G (G	T	T	T	C	C T	T	G	T	T A	C	T	A	Т 7	Τ	T	A	A	G .	A (; G	Т	G.	A
HUM:	т т с	A T	G	A A			A	C 1					_		_							T G						Т	A	Т 7	C A	G	Α	G	A A	A A	A C	Α	G	Т
UAM:	T T C	A	G	A A	G	A	A	C 1	A	С	A	G	A	T .	A T	7	G	Т	T	T	G	T G	A	G	T	G (A	Т	A	Τ 7	A	G	A	G	A A	A A	C	A	G	T
HUM:	G G A	T A	T	G I	G	Т	G	G (A	G	Т	T	G	C '	Γ	G A	A C	C	Α	G	G	A T	Т	T	C	T (T	G	Т	G 7	Τ	T	G	C	A (G (i T	G	T	G
UAM:	G G A	TG	Т	G T	G	T	G	G (A	G	Т	T	T	C	Γ	G A	A C	C	A	G	G	A T	G	T	C	T	Τ	G	Т	G I	Т	T	G	C	A	G (T	G	T	G
	C A G															_					_																			
UAM:	C A G	TA	Τ	G A	G	G	Τ	G (A	G	С	Τ	G	G	Γ	A (3 A	G	T	С	T																			
D7																																								
HUM:	ТТТ	TT	T	T																																				
UAM:	ТТТ	ТТ	T	T																																				
D9																																								
HUM:	G A A	C A	T	C C	A	T	G																																	
UAM:	A C C	CA	T	A G	G	T	T																																	

IGHVII-43-1









IGHVII-40-1

GENE ALIGN SEQ

D7

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UAM: T A G G C A C

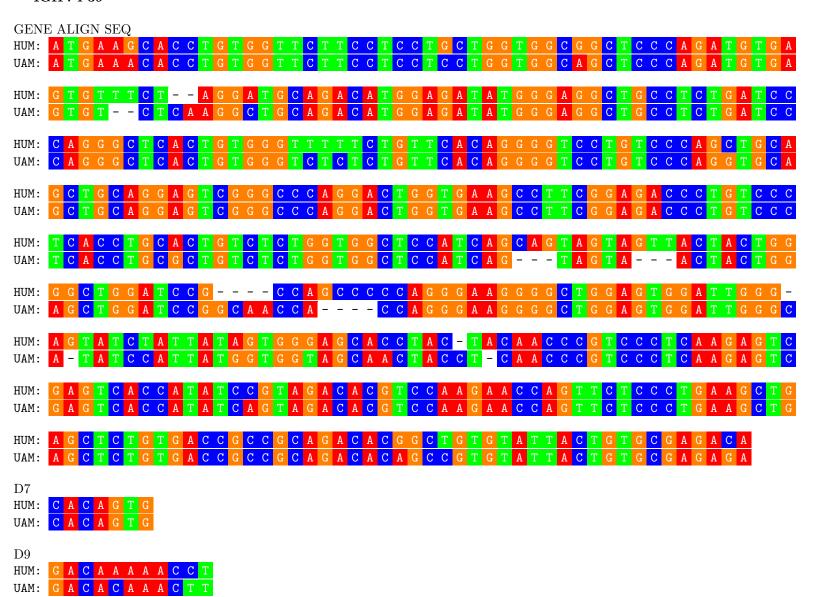
D9

HUM: G T C A G G T G C A T UAM: G T C A G G T G C A T

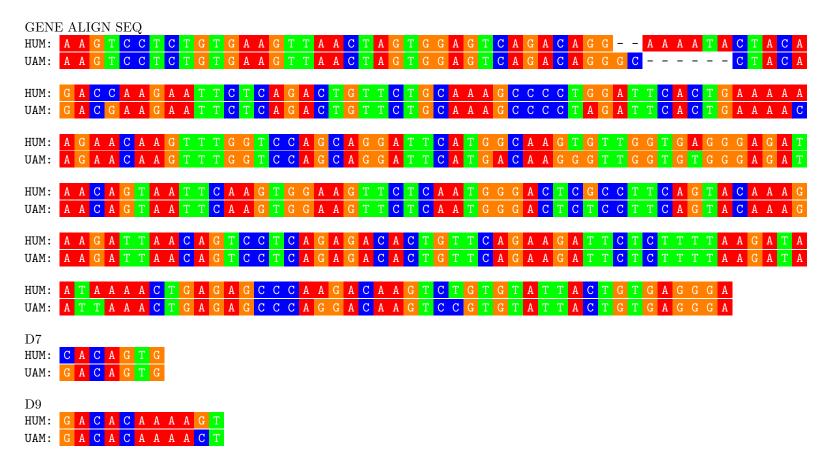
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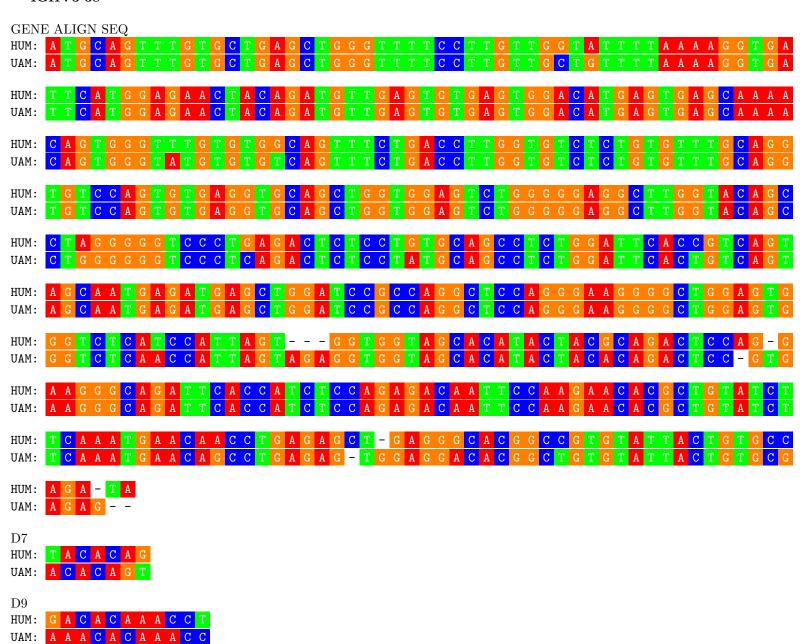
GENE ALIGN SEQ HUM: T A T G G T A T G A A T T C A G T G T A T C A G T G T G T G T G T G T G T G T G T G
HUM: G G G A T G G A T C A T C A C T A C A C T T T UAM: G G G A T G G A T C A T C A T C A T C A T C A T A T A
HUM: C A C A G G A C G G T T T C T A T C T A T C T A T C T A T C T A T C T C
HUM: T G C A G A T C A G C T A A A A G C T A A A A G C T A A A G G C T A A A G G C T A A A G G C T A A A G G C T A A A G G C T A A G G C T A A G G C T A A G G C T A A G G C T A A G G C T A A A A G G C T A A G G C A G C A T A T G A T G A T G A T G A T G A T G A T G A T G A T G T A T G A T G T A T G A T G T A T G A T G T A T G A T G T A T G A T G T A T G A T G T A T G A T G T A T G
HUM: A G A G A UAM: A G A G A
D7 HUM: C A C A G T G UAM: C A C A G T G
D9 HUM: G T C A G A A A C C C UAM: G T C A G A A A C C C

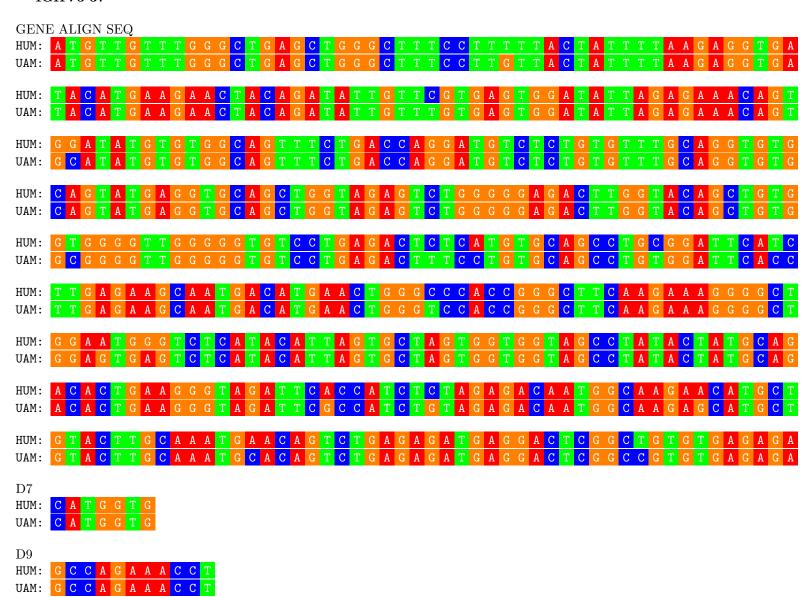
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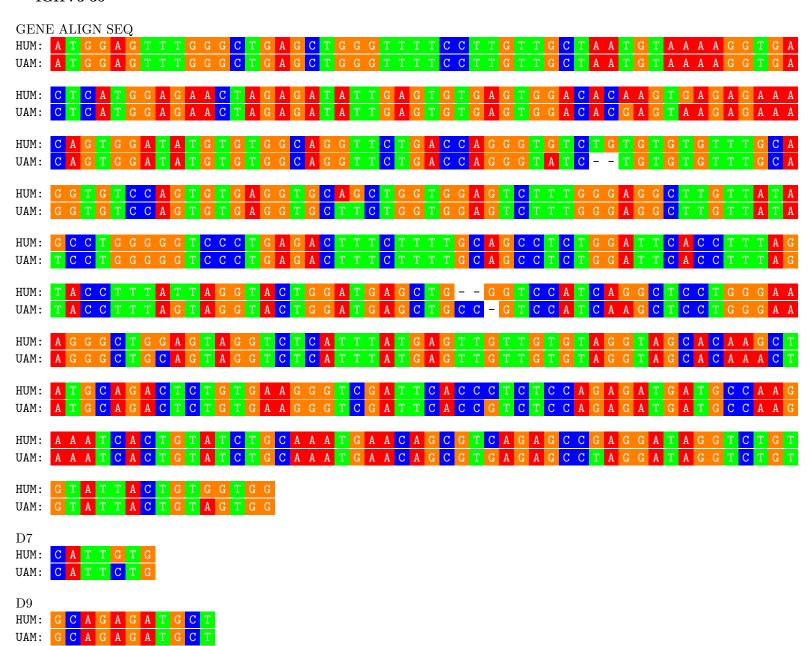


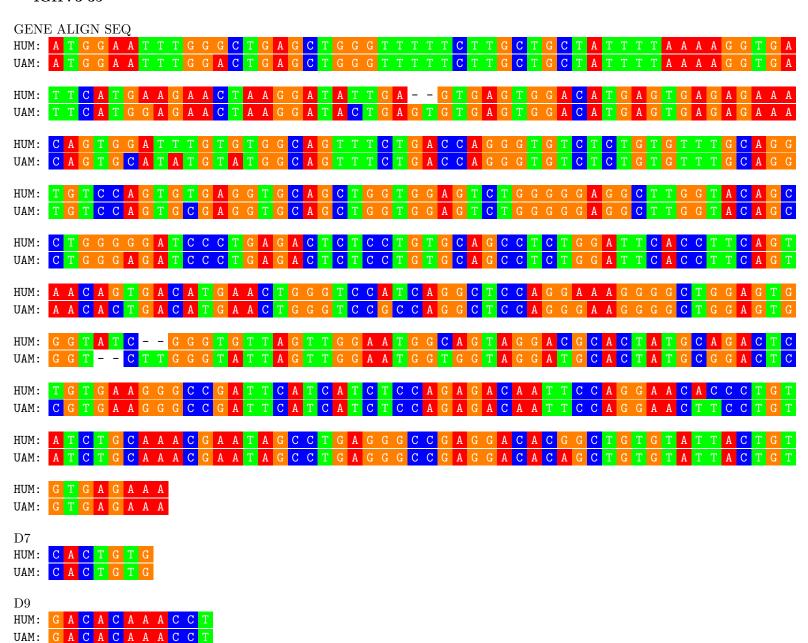
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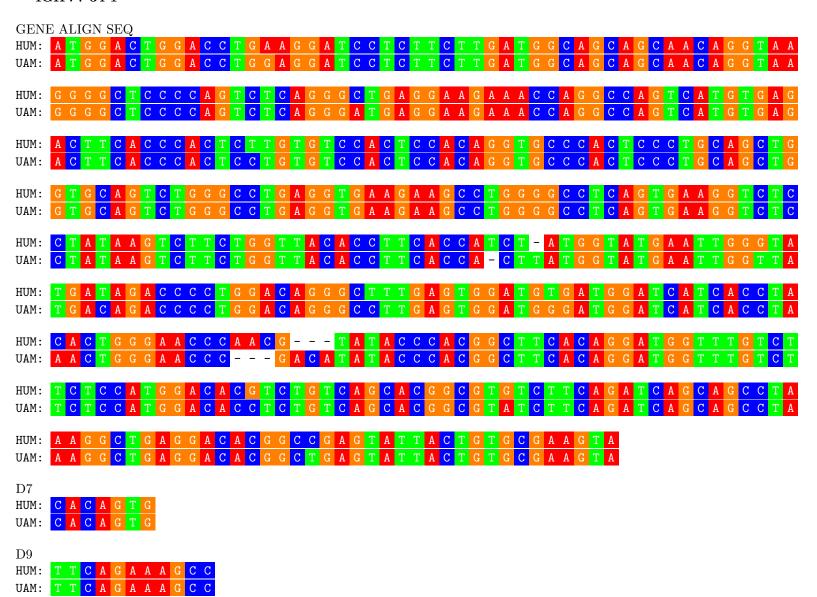




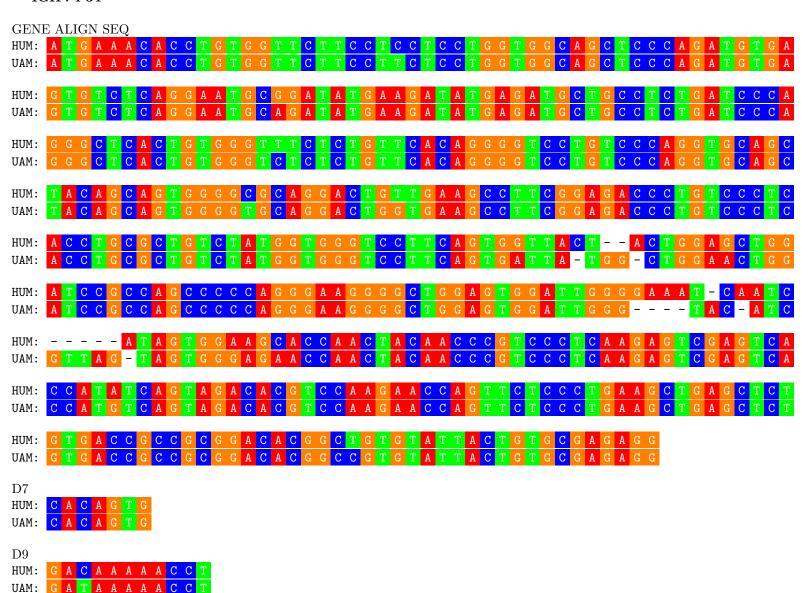




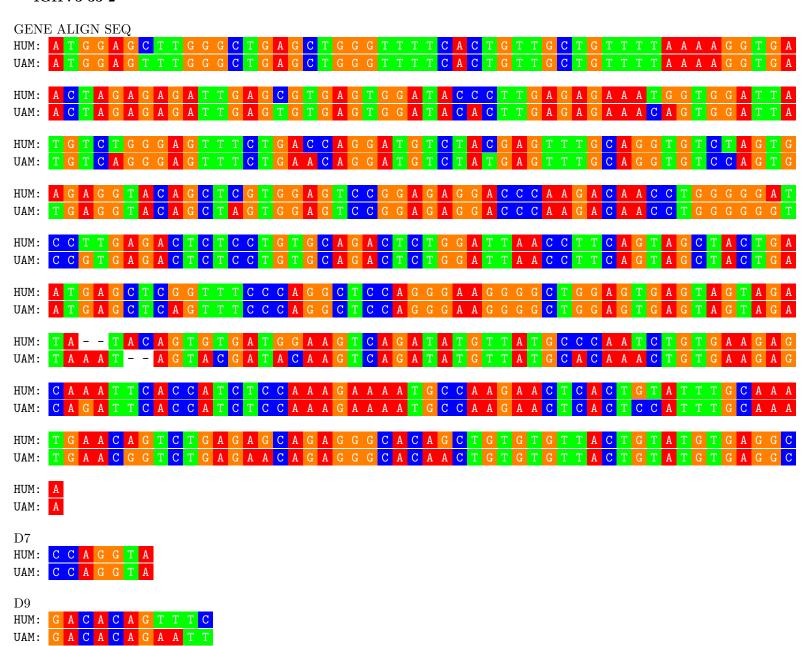
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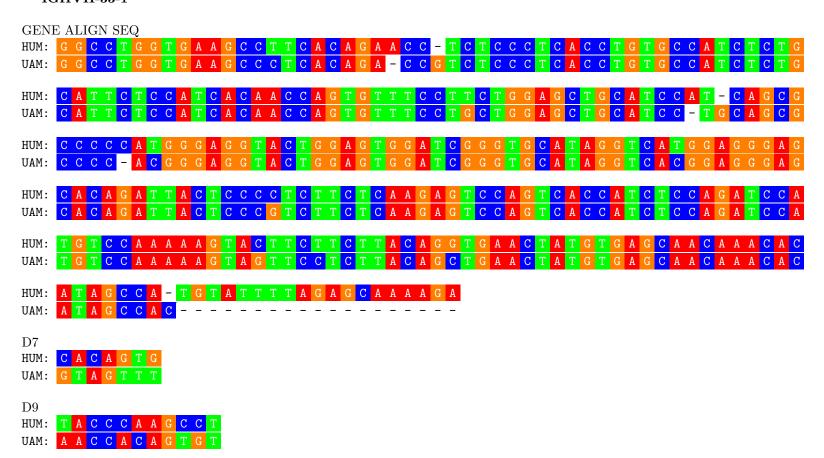
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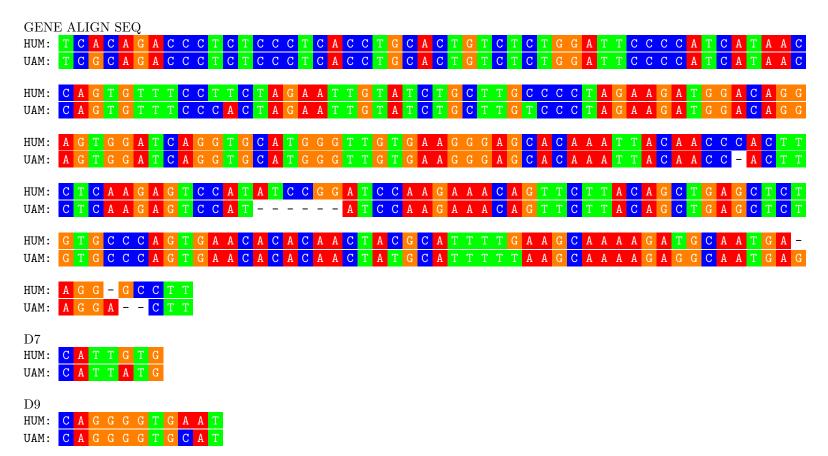
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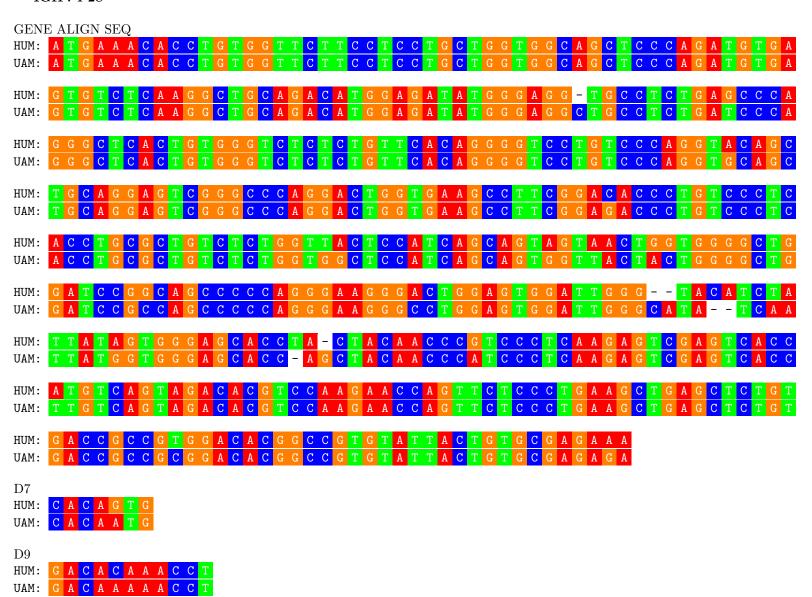
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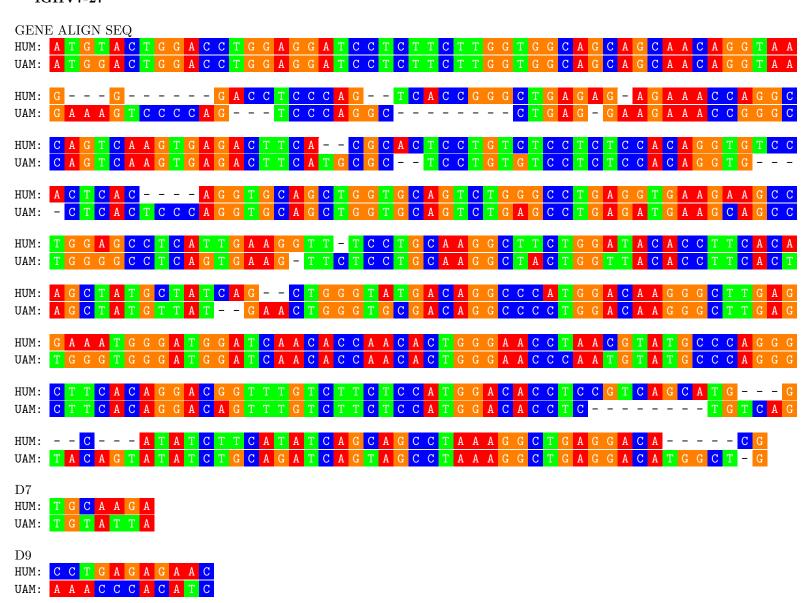
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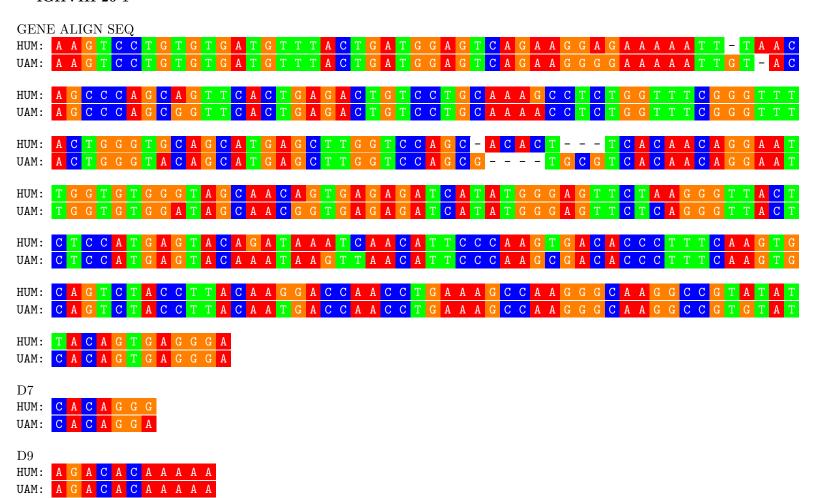
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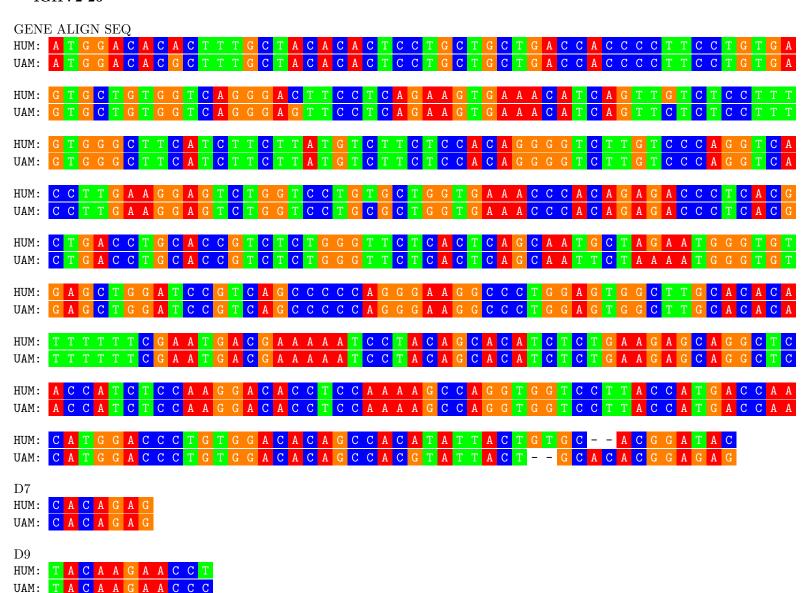
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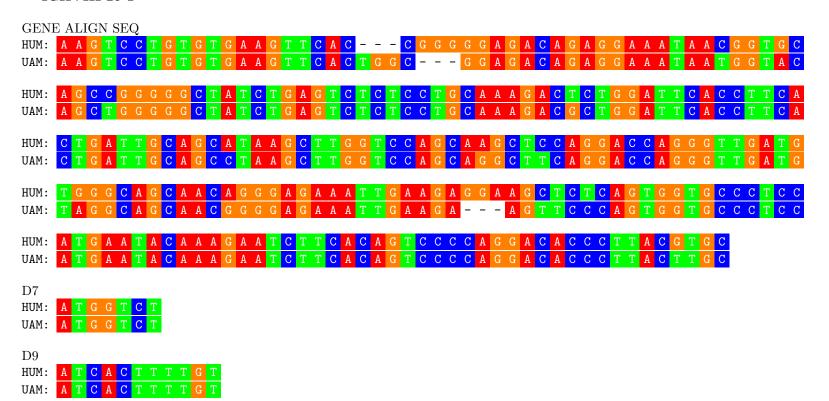
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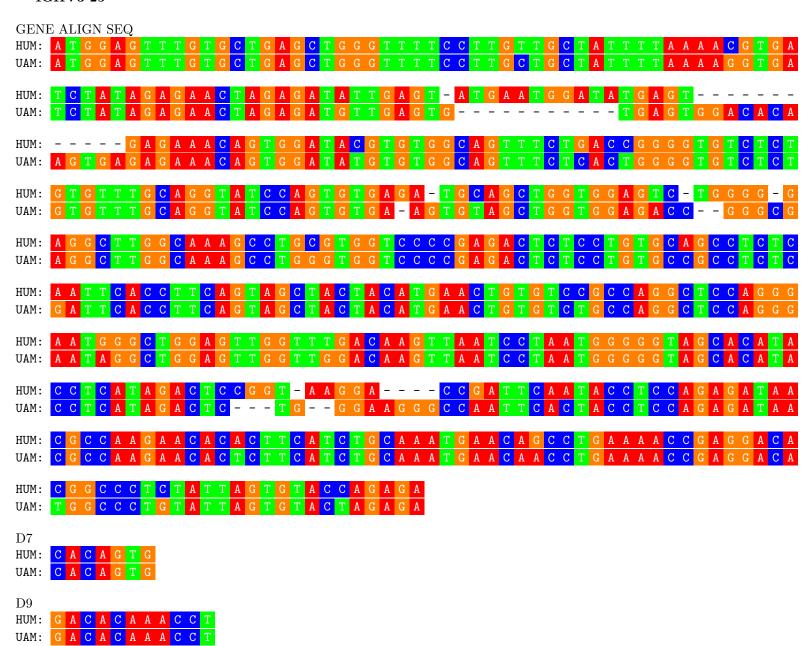


IGHV2-26



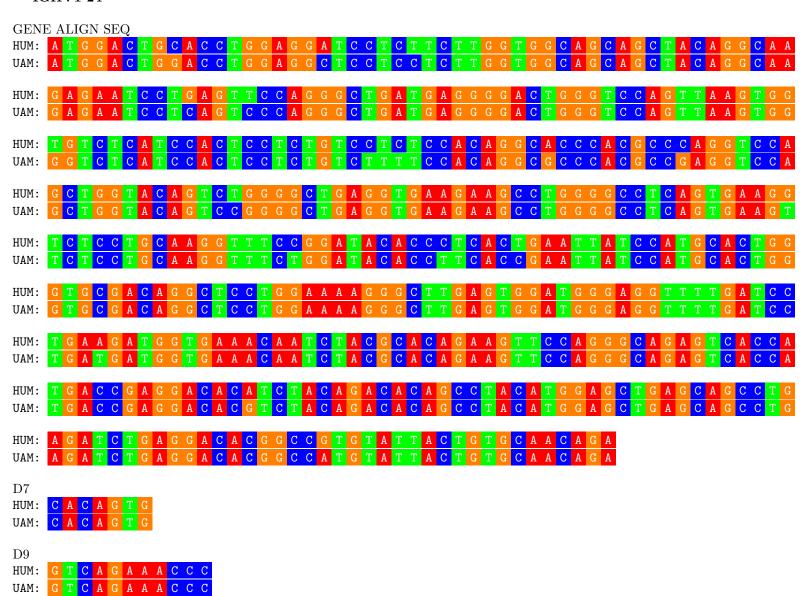
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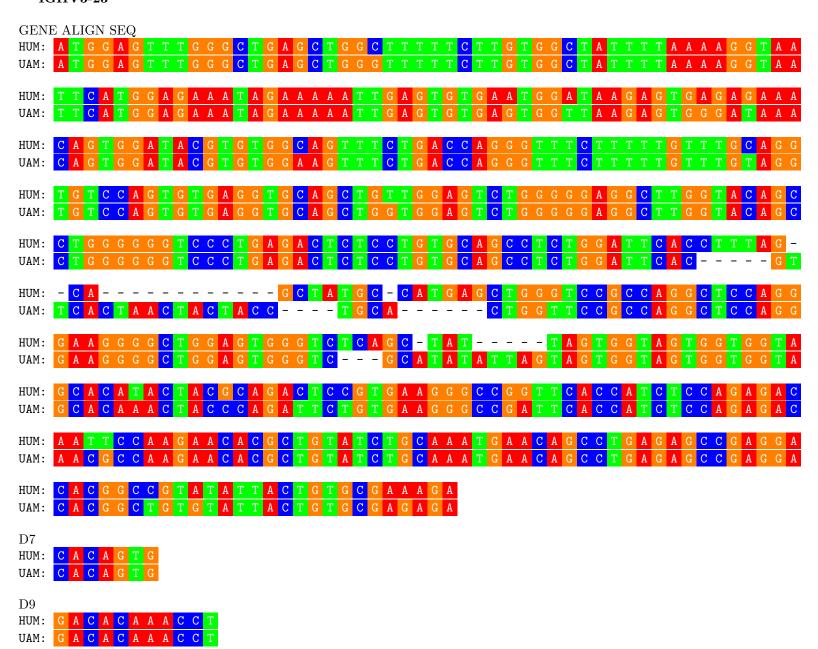




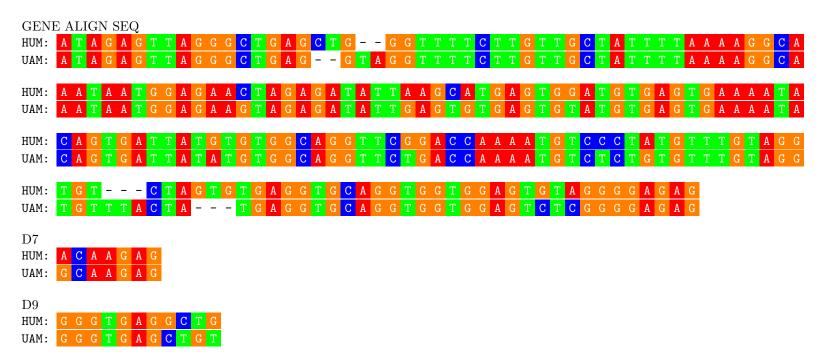
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IGHV1-24

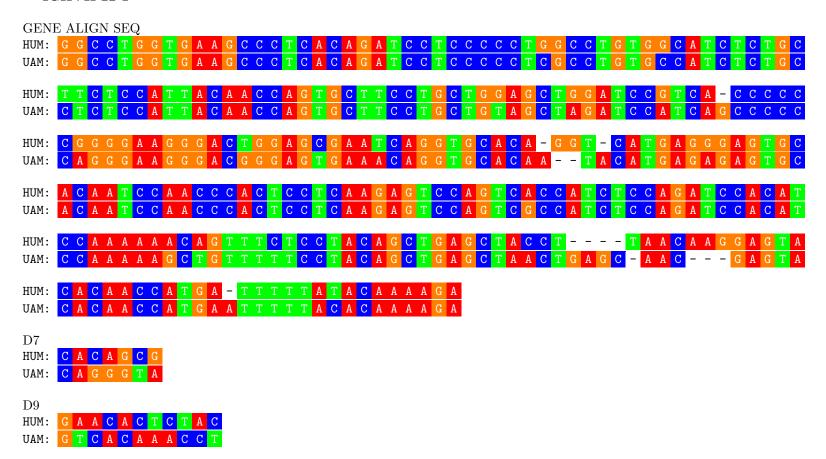


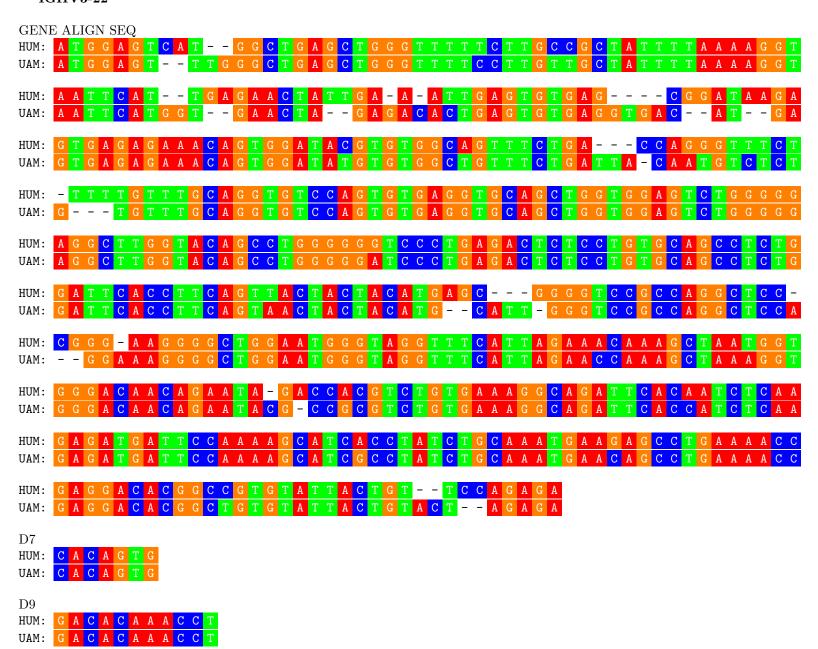


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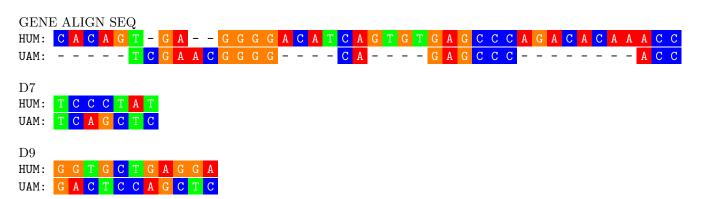


IGHVII-22-1

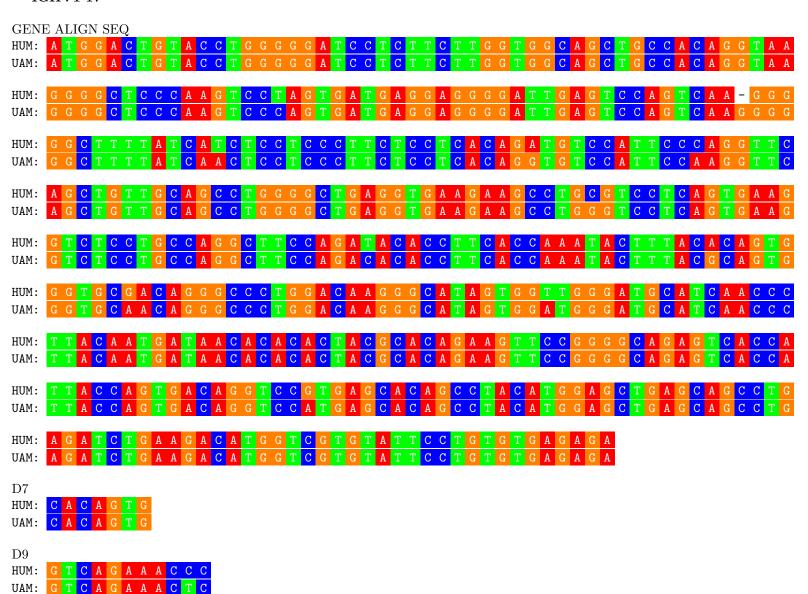




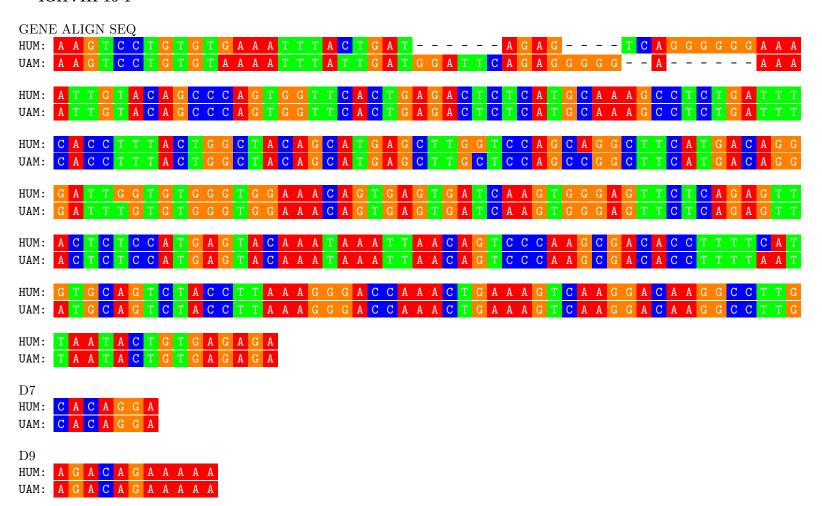
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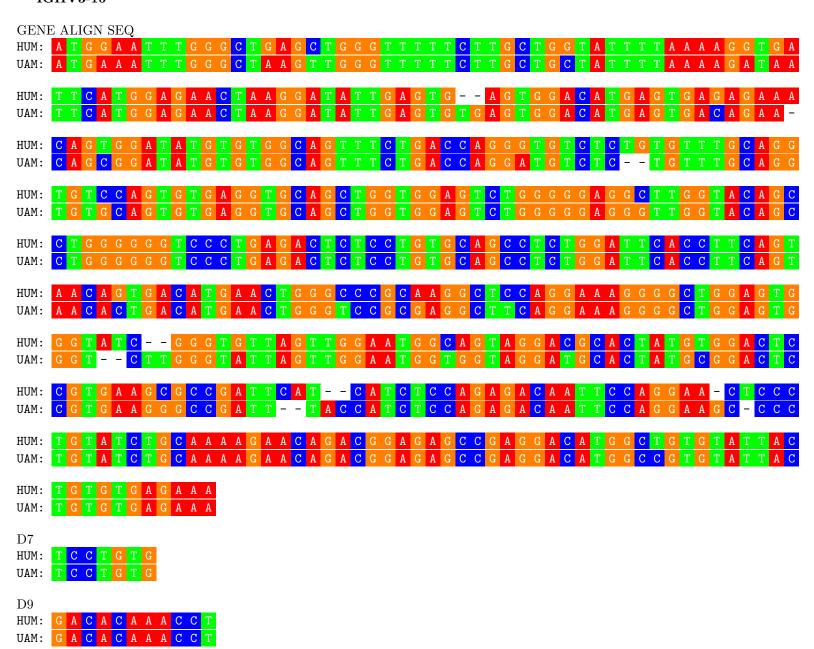


IGHV1-17



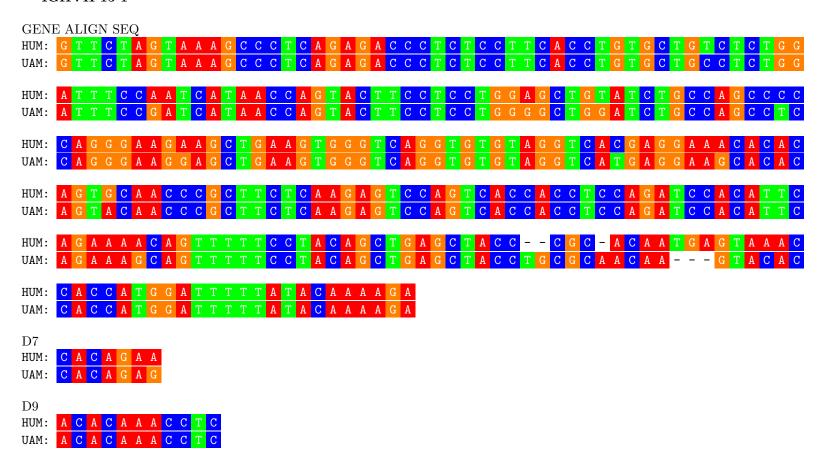
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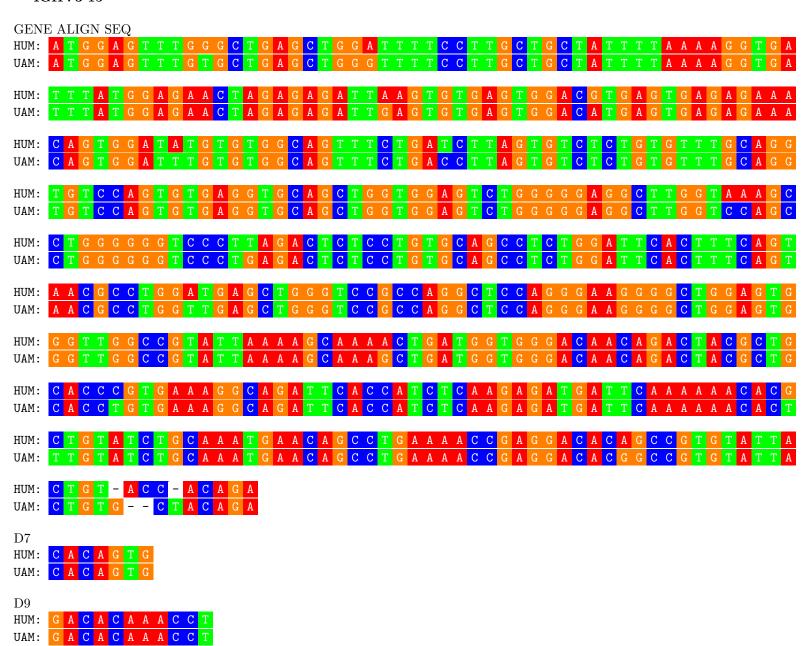




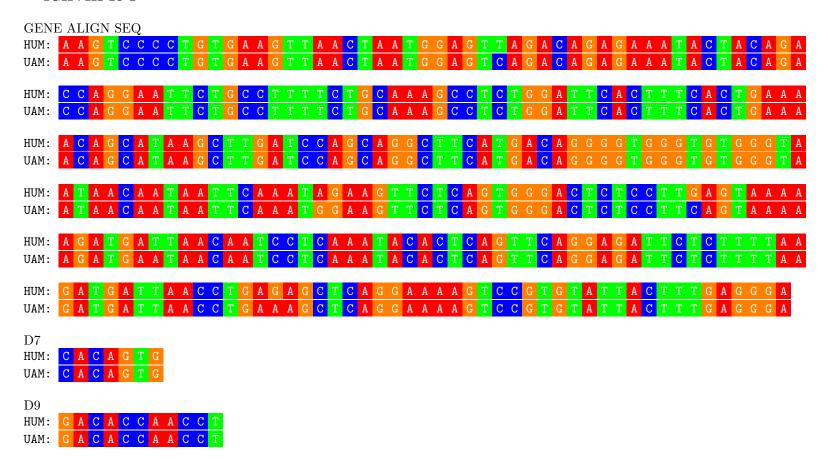
87

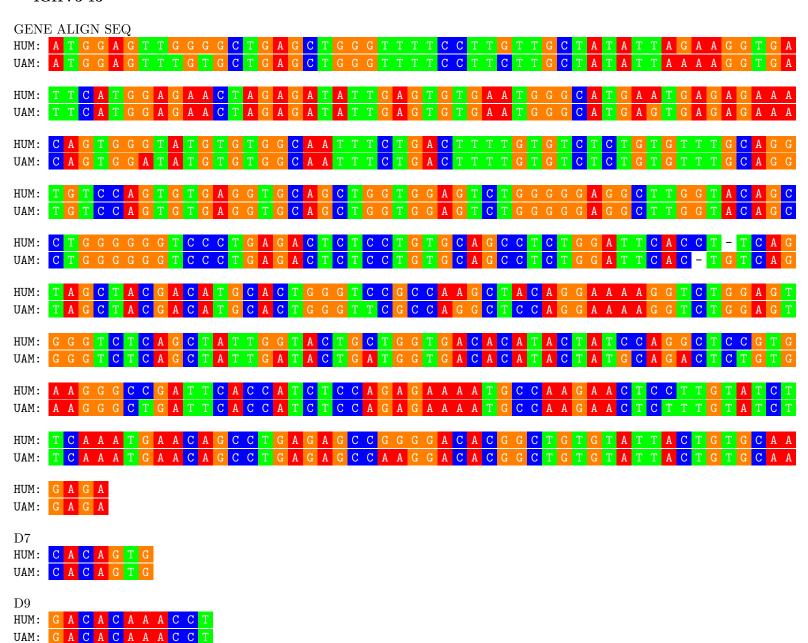
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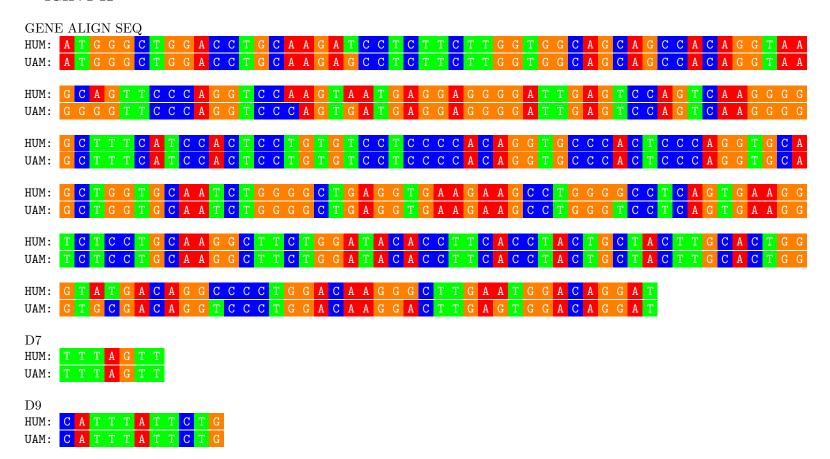
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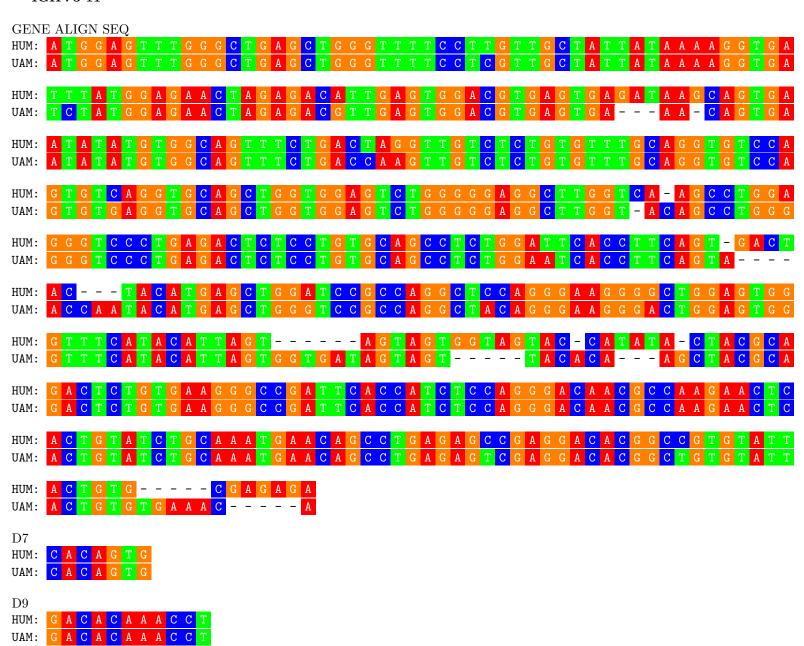


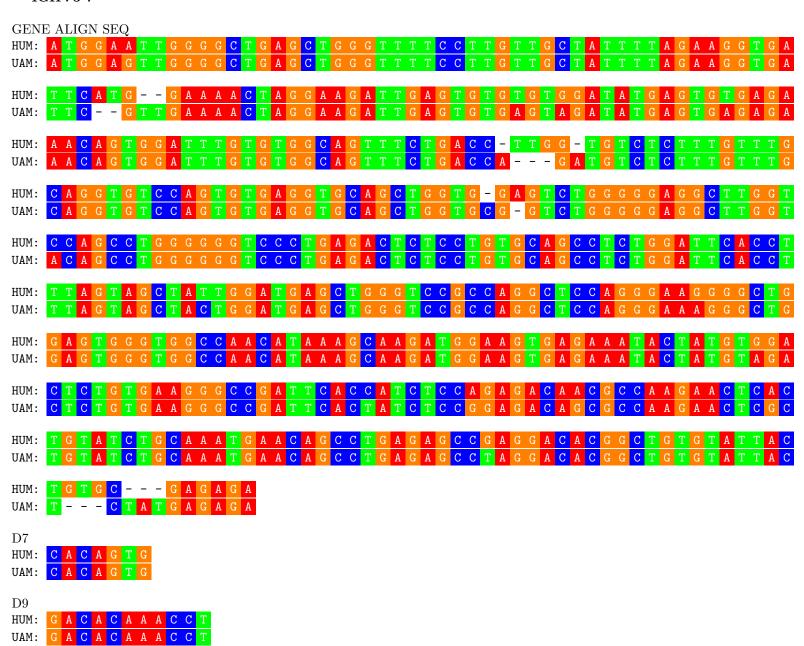


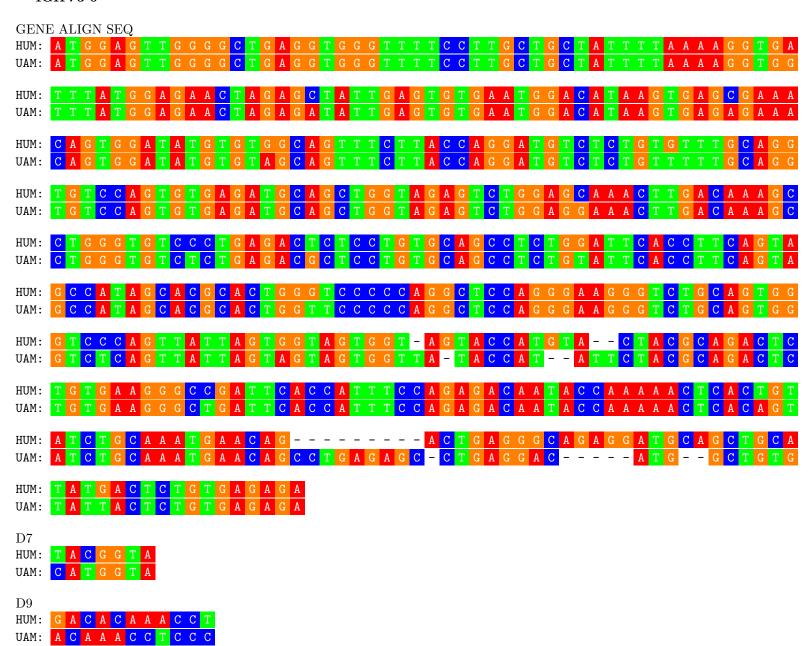
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IGHV1-12

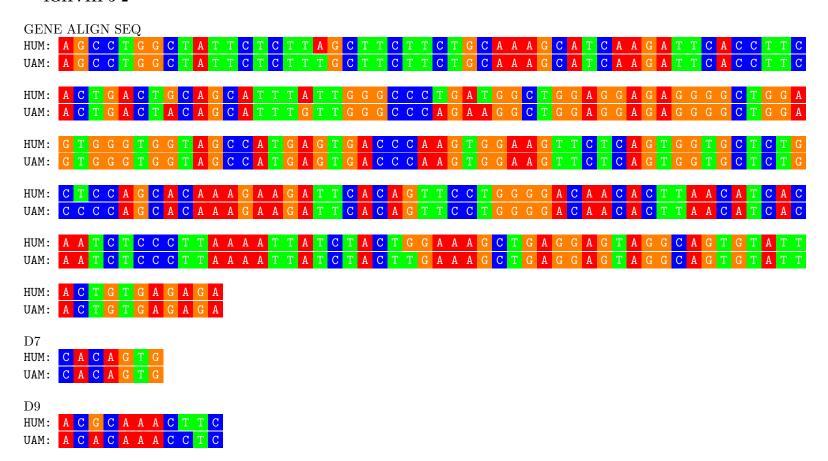








IGHVIII-5-2



IGHVIII-5-1

GENE ALIGN SEQ

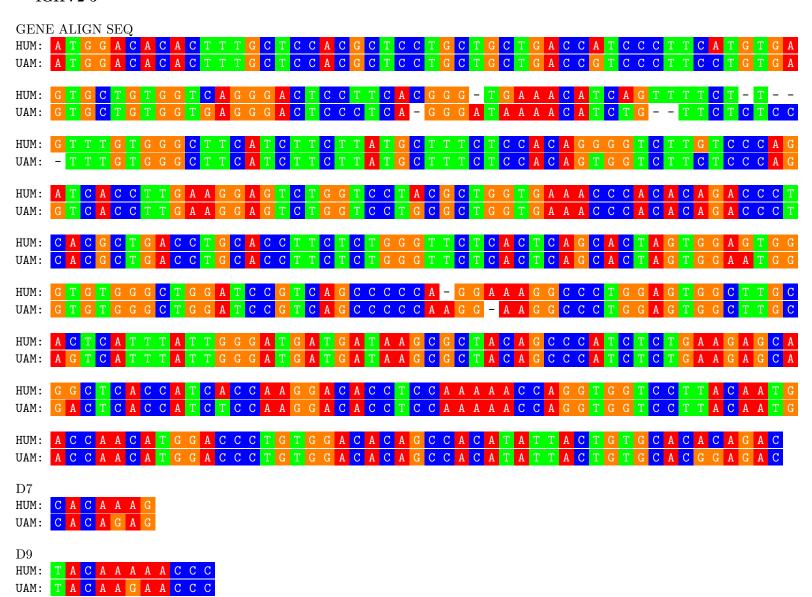
D7

HUM: C A C A T G A
UAM: C G C A T G A

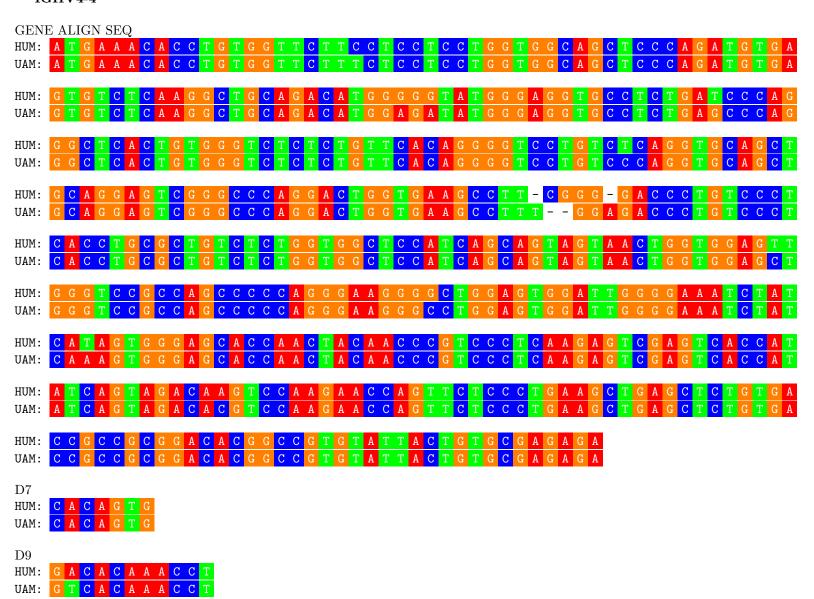
D9

HUM: A A C C T C C A G G A UAM: A A A C T C C A G G G

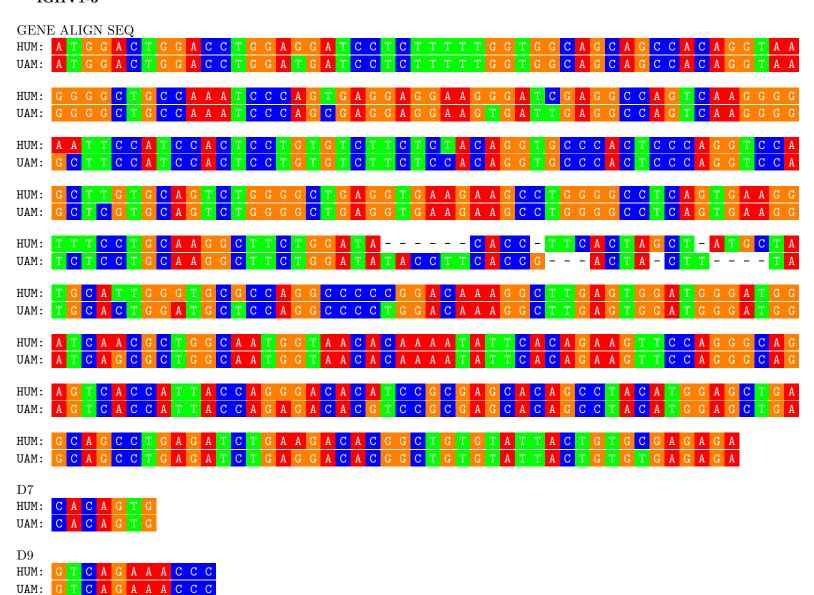
IGHV2-5



IGHV4-4



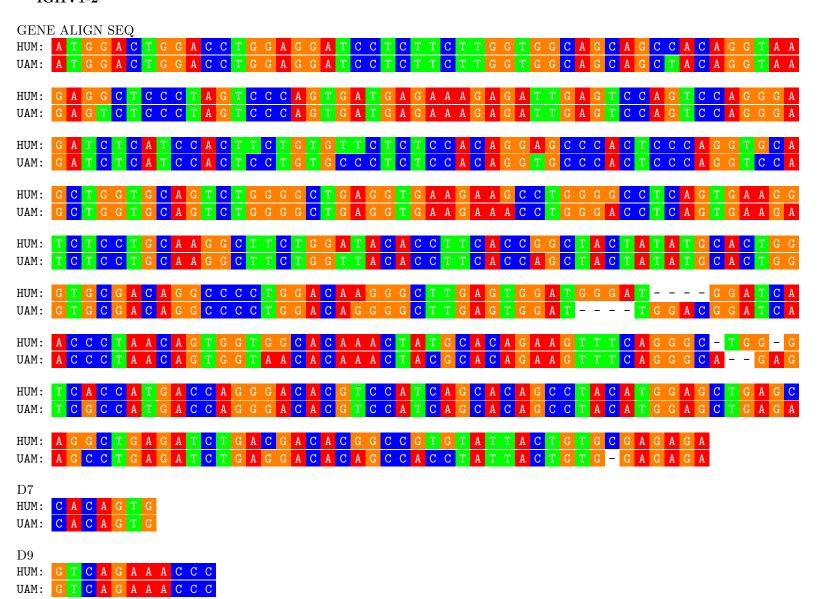
IGHV1-3



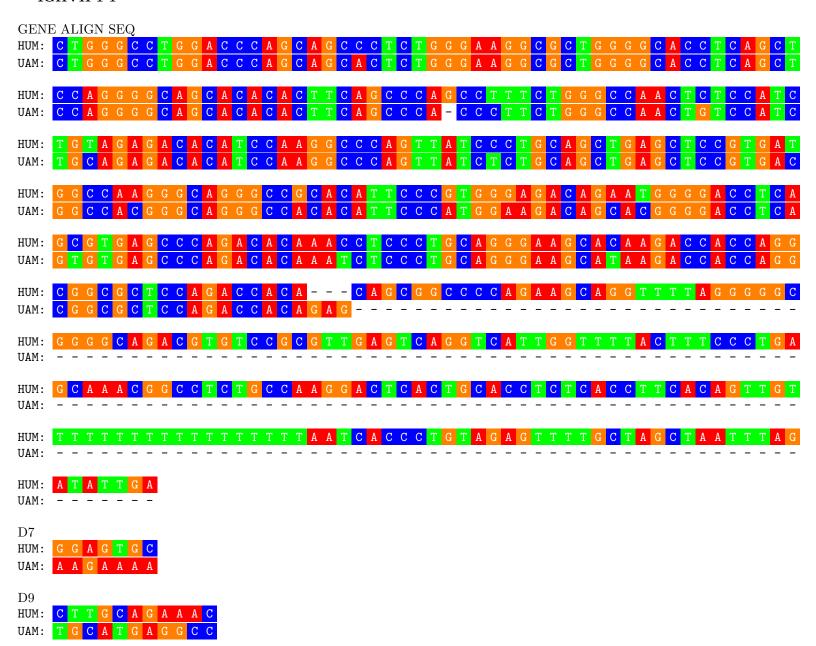
IGHVIII-2-1

GENE ALIGN SEQ
HUM: A A G T C T G T G T G A A G T T T A C T G A T G A G T T T A C A G A G A G A G A A A A T T T T A C A
UAM: A A G T C C T G T G T G A A G T T T A C T G A T G A G T T T A C A G A G A G A G A A A A A T T T T A C A
HUM: G C C C A G T G G - T G A G A C T C T C C T G C A A A G C C T C T G G T T T C A C C T T T A C T G G
UAM: G C C T A G C G G T T G A G A C T C T C C G C A A A G C T C T G G T T T C A C C T T T A C T G G
HUM: TTACAGCATGAGCTTGGTCAGCATGCTTCACAGCAACAGGATAGG
UAM: C T A C C G C A T G A G C T T G G T C A G C A T G A G C A T G G T C C A G C A T G C A T C A C A A C A G G G A T A G G T G T G G G
HUM: T G C C A A C A G T G A G T G A G T C A A G T A T G A A T T C T C A G G G T T A C T C T C C A T G A G
UAM: T G C C A A C A G T G A G T G A T C A A G T A T G A A T T C T C A G G G T T A C T C T C C A T G A G
HUM: TACAAATAAATAAA <mark>TAAACAAT</mark> CAA <mark>TCAACAACAACAACAACACATTTAAAGTGCAGTCA</mark>
UAM: TACAAATAAATAAATAAACAATCCAAGCAACAAGCAAGCA
HUM: TTACAATGACAATCAATCAATCAATCAAAGCCAAAGGAAAGGAAGAAGAAGATAACTAAC
UAM: TTACAATGACAATGACCAATCAAACAGCCAAGGAAGGCAAGGCAATGTATAC—TGAAG
HUM: T G A
UAM: T G A
D7 HUM: CACAGTG
UAM: C A C A G T G
D9
HUM: G A C A A A G C T
UAM: GACAAAGCT

IGHV1-2



IGHVII-1-1



IGHD1-1

U9
HUM: C A G A T T C T G A A
UAM: C A G A T T C T G A A
UAM: C A C G G T G
UAM: C A C A G T G

GENE ALIGN SEQ
HUM: G G T A C A A C T G G A A C G A C
UAM: C A C C G T G
UAM: C A C C A A A A C T G
UAM: C A C T G T G
UAM: C A C T G T G

IGHD2-2

U9
HUM: A G G A T T T T G T G
UAM: A G G A T T T T G T G
UAM: C A C A G T G T G
UAM: C A C A G T G T G T A G T A G T A G T A G T A G T A G C T G C T A T A C C
UAM: A G G A T A T T G T A G T G G T G G T A G C T G C T A T A C C
UAM: C A C A G T G
UAM: C A C A G T G
UAM: C A C A G T G
UAM: T T C C C A A A G C C
UAM: T T C C C A A A G C C

IGHD3-3

IGHD4-4

U9
HUM: G G C T T T T T G T G
UAM: G G C T T T T T G T G
UAM: T A C T G T G
UAM: T G C T G T G
UAM: T G A C T A C A G T A A C T A C
UAM: T G A C T A C G T G T G
UAM: T G A C T A C G T G T G
UAM: T G A C T A C G T G T G
UAM: T G A C T A C G T G T G
UAM: C A C A G T G
UAM: C A C A G T G
UAM: C A C A G T G
UAM: G G C A A A A A A C T A

IGHD5-5

U9
HUM: T G G T T A T T G T C
UAM: T G G T T A T T G T C

U7
HUM: G A C T G T G
UAM: G T G G A T A C A G C T A T G G C T A C G G T T A C
UAM: G T G G A T A C A G C T A T G G C T A C G G T T A C

D7
HUM: C A C A G T G
UAM: C A C A G T G
UAM: C A C A G T G
UAM: A G C A G C A A C C A
UAM: A G C A G C A A C C A

IGHD6-6

U9
HUM: A A G T T T C T G A A
UAM: A A G T T T C T G A A

UAM: C A C A G T G

UAM: C A C A G T G

UAM: G A G T A T A G C A G T G

UAM: G A G T A T A G C A G T G

D7
HUM: C A C A G T G

UAM: C A C A G T G

D7
HUM: C A C A G T G

UAM: C A C A G T G

UAM: C A C A G T G

D9
HUM: G C C A G A A A C C C

UAM: G C C A G A A A C C C

UAM: G C C A G A A A C C C

IGHD1-7

U9
HUM: C G G A T T C T G A A
UAM: C G G A T T C T G A A

UAM: C A C A G T G
UAM: C A C A G T G
UAM: C A C A G T G

UAM: G G T A T A A C T G G A A C T A C
UAM: G G T A T A A C T G G A A C T A C

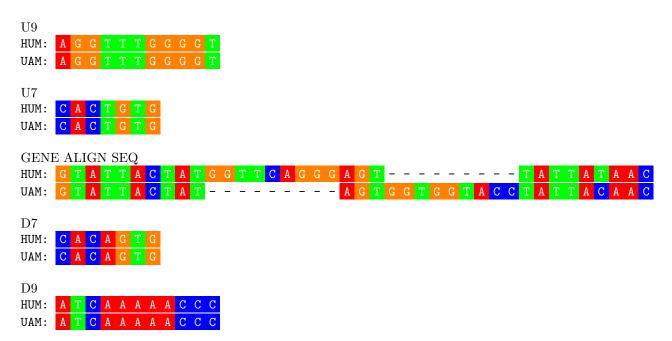
D7
HUM: C A C T G T G
UAM: C A C T G T G

D9
HUM: G T C C A A A A C G G

UAM: G T C C A A A A C T G

IGHD2-8

IGHD3-10



IGHD4-11

U9
HUM: G G C T T T T T G T G
UAM: G G C T T T T T G T G
UAM: G G C T T T T T G T G
UAM: T G C T G T G
UAM: T A C T G T G
UAM: T G A C T A C A G T - - - A A C T A C
UAM: T G A C T A C A G T G C T A C
UAM: T G A C T A C A G T G
UAM: C A C A G T G
UAM: A G C A A A A A A C T G
UAM: A G C A A A A A A C T G

IGHD5-12

U9
HUM: T G G T T A T T G T C
UAM: T G G T T A T T G T C
UAM: T G G T T A T T G T C

UAM: G A C T G T G
UAM: G G C C G T G

UAM: G T G G A T A T A T A G T G
UAM: G T G G A T A T A T A G T G
UAM: G T G G A T A T A T A G T G
UAM: G T G G A T A T A T A G T G
UAM: G T G G A T A T A T A G T G
UAM: G T G G A T A T A T A G
UAM: A G C A G T G

D9
HUM: A G C A G C A A C C A
UAM: A G C A G C A A C C A

IGHD6-13

U9
HUM: A G G T T T C T G A A
UAM: A G G T T T C T G A A

UAM: A G G T T T C T G A A

UAM: C A C A G T G

UAM: C A C A G T G

UAM: G G G T A T A G C A G C A G C A G C T G T A C

UAM: G G G T A T A G C A G C A G C A G C T G T A C

D7
HUM: C A C A G T G

UAM: C A C A G T G

IGHD1-14

U9
HUM: C G G A T T C C G A A
UAM: C A G A T T C T G A A

UT7
HUM: C A C A G C G
UAM: C A C A G T G

GENE ALIGN SEQ
HUM: G G T A T A A C C G G A A C T A C
UAM: C A C T G T C
UAM: C A C T G T C

UAM: C A C T G T C

UAM: C A C T G T C

UAM: G T C A A A A A C T G

IGHD2-15

U9
HUM: A G G A T T T T G T G
UAM: A G G A T T T T T G T G
UAM: A G G A T T T T G T G
UAM: C A C T G T G
UAM: A G G A T A T T G T A G T G G T G G T A - - - G C T G C T A C T C C
UAM: A G G A T A T T G T A G T G G T - - - A G T G G T G C T A C G C C

D7
HUM: C A C A G T G
UAM: C A C A G T G
UAM: C A C A G T G
UAM: C T C C C A A A G C C
UAM: C T C C C A A A G C C

IGHD3-16

IGHD4-17

U9
HUM: G G C T T T T T G T G
UAM: G G C T T T T T G T G
UAM: T A C T G T G
UAM: T A C T G T G
UAM: T G A C T A C G G T G A C T A C
UAM: T G G C T A C A G T G
UAM: C A C A A A A A C T G
UAM: G G G A A A A A C T G

IGHD5-18

U9
HUM: T G G T T A T C G T C
UAM: T G G T T A T G T G
UAM: G A C T G A A T A T A G T G G C T A C G A T T A C
UAM: G T G G A T A T A C T G G C T A C G G T T A C
UAM: C A C A G T G
UAM: C A C A G T G
UAM: A G C A G C A A C C A
UAM: A G C G G C A A C C A

IGHD6-19

U9
HUM: A G G T T T C T G A A
UAM: A G G T T T C T G A A

UAM: C A C A G T G

UAM: C A C A G T G

UAM: G G G T A T A G C A G T G C T G G T C C

D7
HUM: C A C A G T G

UAM: C A C A G T G

D9
HUM: C A C A G T G

UAM: C A C A G T G

IGHD1-20

U9
HUM: C G G A T T C T G A A
UAM: C A G A T T C T G A A

UAM: C A C A G T G

UAM: C A C A G T G

UAM: C A C A G T G

GENE ALIGN SEQ

HUM: G G T A T A A C T G G A A C G A C
UAM: C A C C G T G

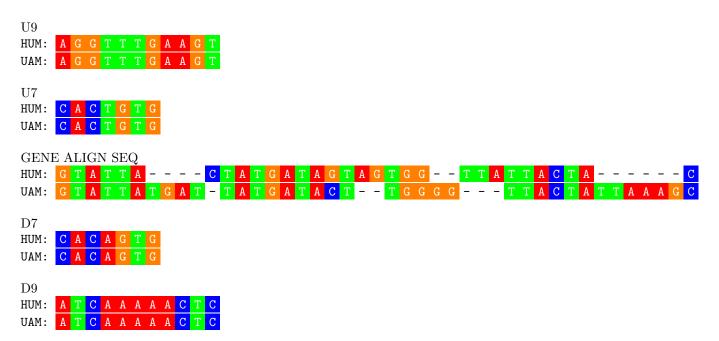
UAM: C A C T G T G

UAM: A T C C A A A A C T G

IGHD2-21

U9
HUM: A G G A T T T T G T G
UAM: A G G A T T T T G T G
UAM: C A C T G T G
UAM: A G C A T A T T G T A G T G C C
UAM: A G G A T A T T G T A G T G G T G G T A G C T A C G C C
UAM: C A C A G T G
UAM: T T C C T A A A G C C
UAM: T T C C A A A G C C

IGHD3-22



IGHD4-23

U9
HUM: G G C T T T T T G T G
UAM: G G C T T T T T T G T G
UAM: T G C T G T G
UAM: T A C T G T T

GENE ALIGN SEQ
HUM: T G A C T A C G G T G T A A C T C C
UAM: T G A C T A C G G T G T A A C T C C
UAM: T G A C T A C G G T G T A A C T C C

D7
HUM: C A C A G T G
UAM: T A C A G T G

IGHD5-24

U9
HUM: T G G T T A T T G T C
UAM: T T A T T G T C
UAM: T A T T G T G G

UAM: C A T G G T G

UAM: C A G A G A T G G C T A C A A T T A C

UAM: C A C A G T G

IGHD6-25

U9
HUM: A G G T T T C T G A A
UAM: A G G T T T C C G A A

UAM: A G G T T T C C G A A

UT

HUM: C G C A G T C
UAM: C A C A G T G

GENE ALIGN SEQ
HUM: G G G T A T A G C A G T G C T A C
UAM: G A C A A T G
UAM: C A C A A T G
UAM: C A C A A T G
UAM: G A C A G A A T C C C
UAM: G A C A G A A A C C C

IGHD1-26

U9
HUM: T G G A T T C T G A A
UAM: T G G A T T C T G A A

UAM: T G G A T T C T G A A

UAM: C A C G G T G
UAM: C A T G G T G

UAM: G G T A T A G T G G G A G C T A C T A C

D7
HUM: G G T A T A G T G G G A G C T A C T A C

D7
HUM: C A C T G T G
UAM: G T C C A A A A A C T G
UAM: G T C C A A A A A C T G

IGHD7-27

U9
HUM: G G G T T T T T G G C T
UAM: G G G T T T T T G G C T
UAM: G G G T T T T T G G C T

U7
HUM: C A C T G T G
UAM: C A C C G T G

GENE ALIGN SEQ
HUM: C T A A C T G G G G A
UAM: C A G T G G G G A

D7
HUM: C A G A G T G
UAM: C A G A G T G

IGHJ1P

U9

HUM: C A C G T G T T T T G
UAM: C G T G T G T T T T G

U7

HUM: C A C T G G C UAM: C A C T G G C

GENE ALIGN SEQ

HUM: A T C A
UAM: A C C A

U9

HUM: T G G G T T T C T G T UAM: T G G G T T T C T G C

U7

HUM: C A C C G T G
UAM: C A C C G T G

GENE ALIGN SEQ

HUM: A G G T UAM: A G G T

U9

HUM: T G T G T T T T G T UAM: T G T G T T T T T G T

U7

HUM: G G C T G T G UAM: G G C T G T G

GENE ALIGN SEQ

HUM: C A G G T UAM: C A G G T

IGHJ2P

U9

HUM: G C T G T T C A T G T

UAM: G C T G T T C A T G T

U7

HUM: T A G T G T G UAM: T A G T G T G

GENE ALIGN SEQ

HUM: C T G G G A A C T T UAM: C T G G G A A C T T

U9

HUM: A G G T T T G T G T C
UAM: G G G T T T G T G T C

U7

HUM: C C C T G T G
UAM: C C C T G T G

GENE ALIGN SEQ

HUM: C A G G T UAM: C A G G T

U9

HUM: A G G T T T T T G T G
UAM: A G G T T T T T G T G

U7

HUM: C A A T G T G
UAM: C A A T G T G

GENE ALIGN SEQ

HUM: A C T A C T T T G A C T A

U9

HUM: C A G T T C T G C C
UAM: C A G T T C T C C C

U7

HUM: C A A T G T G UAM: C A A T G T G

GENE ALIGN SEQ

HUM: G G T UAM: G G T

IGHJ3P

U9

HUM: G G G G T T T T T G G

UAM: A G G A T T T T T G G

U7

HUM: C C G T C T G
UAM: C C G T C T G

GENE ALIGN SEQ

HUM: G UAM: G

U9
HUM: T G G G T T T T T G T
UAM: T G G G T T T T T G T

U7
HUM: C A T T G T G
UAM: C A T T G T G

GENE ALIGN SEQ

HUM: A T T A C T A

HUM: T C A C C G T C T C A G G T UMM: T C A C C G T C T C A G G T