

Human genes in HG38 (HUM) and their mappings (UAMs) in Chm13Tert

IGHV(III)-82

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 292, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV7-81

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 296, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV4-80

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 261, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV(II)-78-1

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 274, 'I': 0, 'D': 0, 'X': 1
Both human gene and its mapping are pseudogenes

IGHV5-78

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 294, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV(III)-76-1

GENE ALIGN SEQ

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

Alignment stats: 'M': 288, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV3-76

GENE ALIGN SEQ

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

Alignment stats: 'M': 292, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV3-74

GENE ALIGN SEQ

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

Alignment stats: 'M': 296, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV3-73

GENE ALIGN SEQ

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

Alignment stats: 'M': 302, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV3-72

GENE ALIGN SEQ

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

Alignment stats: 'M': 302, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV3-71

GENE ALIGN SEQ

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

Alignment stats: 'M': 302, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV2-70

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 301, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV1-68

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 296, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV(III)-67-4

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 294, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV(III)-67-3

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 275, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV(III)-67-2

GENE ALIGN SEQ

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

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

D7

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

D9

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

Alignment stats: 'M': 99, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV(II)-67-1

GENE ALIGN SEQ

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

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

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

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

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

Alignment stats: 'M': 139, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV1-67

GENE ALIGN SEQ

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

Alignment stats: 'M': 300, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV3-66

GENE ALIGN SEQ

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

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

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

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

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

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

Alignment stats: 'M': 293, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV(II)-65-1

GENE ALIGN SEQ

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

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

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

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

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

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

D7

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

D9

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

Alignment stats: 'M': 300, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV3-64

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 296, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV3-63

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 298, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV(II)-62-1

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 273, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV3-62

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 296, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV4-61

GENE ALIGN SEQ

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

Alignment stats: 'M': 299, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV(II)-60-1

GENE ALIGN SEQ

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

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

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

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

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

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

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

D9
HUM: C A C C C A A A C C T
UAM: C A C C C A A A C C T

Alignment stats: 'M': 269, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV3-60

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 297, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV4-59

GENE ALIGN SEQ

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

Alignment stats: 'M': 293, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV1-58

GENE ALIGN SEQ

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

Alignment stats: 'M': 296, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV3-57

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 295, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV7-56

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 294, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV4-55

GENE ALIGN SEQ

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

Alignment stats: 'M': 296, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV3-54

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 245, 'I': 0, 'D': 0, 'X': 5
Both human gene and its mapping are pseudogenes

IGHV(II)-53-1

GENE ALIGN SEQ

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

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

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

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

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

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

D7

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

D9

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

Alignment stats: 'M': 267, 'I': 0, 'D': 0, 'X': 3
Both human gene and its mapping are pseudogenes

IGHV3-53

GENE ALIGN SEQ

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

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

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

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

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

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

Alignment stats: 'M': 292, 'I': 0, 'D': 0, 'X': 1
Neither human gene nor its mapping is pseudogene

IGHV3-52

GENE ALIGN SEQ

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

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

Alignment stats: 'M': 296, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV(II)-51-2

GENE ALIGN SEQ

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

D9

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

Alignment stats: 'M': 263, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV5-51

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 296, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV3-50

GENE ALIGN SEQ

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

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

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

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

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

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

D7

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

D9

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

Alignment stats: 'M': 297, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV(II)-49-1

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 298, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV3-49

GENE ALIGN SEQ

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

Alignment stats: 'M': 300, 'I': 0, 'D': 0, 'X': 2
Neither human gene nor its mapping is pseudogene

IGHV3-48

GENE ALIGN SEQ

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

Alignment stats: 'M': 287, 'I': 0, 'D': 0, 'X': 9
Neither human gene nor its mapping is pseudogene

IGHV(III)-47-1

GENE ALIGN SEQ

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

D7

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

Alignment stats: 'M': 293, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV3-47

GENE ALIGN SEQ

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

Alignment stats: 'M': 289, 'I': 0, 'D': 0, 'X': 4
Neither human gene nor its mapping is pseudogene

IGHV(II)-46-1

GENE ALIGN SEQ

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

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

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

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

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

Alignment stats: 'M': 147, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV1-46

GENE ALIGN SEQ

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

Alignment stats: 'M': 296, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV1-45

GENE ALIGN SEQ

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

Alignment stats: 'M': 296, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV(II)-44-2

GENE ALIGN SEQ

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

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

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

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

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

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

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

Alignment stats: 'M': 237, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV(IV)-44-1

GENE ALIGN SEQ

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

D7

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

Alignment stats: 'M': 288, 'I': 0, 'D': 0, 'X': 1
Both human gene and its mapping are pseudogenes

IGHV(II)-43-1

GENE ALIGN SEQ

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

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

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

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

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

D7

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

D9

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

Alignment stats: 'M': 210, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV3-43

GENE ALIGN SEQ

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

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

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

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

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

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

Alignment stats: 'M': 298, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV3-42

GENE ALIGN SEQ

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

Alignment stats: 'M': 303, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV3-41

GENE ALIGN SEQ

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

Alignment stats: 'M': 292, 'I': 0, 'D': 1, 'X': 1
Both human gene and its mapping are pseudogenes

IGHV(II)-40-1

GENE ALIGN SEQ

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

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

D7

HUM:	T	A	G	G	C	A	C
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

Alignment stats: 'M': 77, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV7-40

GENE ALIGN SEQ

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

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

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

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

HUM: A G A
UAM: 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

Alignment stats: 'M': 203, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV4-39

GENE ALIGN SEQ

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

Alignment stats: 'M': 299, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV(III)-38-1

GENE ALIGN SEQ

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

Alignment stats: 'M': 282, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV3-38

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 292, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV3-37

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 294, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV3-36

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 301, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV3-35

GENE ALIGN SEQ

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

D7

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

Alignment stats: 'M': 296, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV7-34-1

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 293, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV4-34

GENE ALIGN SEQ

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

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

Alignment stats: 'M': 293, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV3-33-2

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 298, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV(II)-30-21

GENE ALIGN SEQ

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

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

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

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

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

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

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

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

Alignment stats: 'M': 257, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV4-30-2

GENE ALIGN SEQ

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

D7

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

Alignment stats: 'M': 299, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV3-30-2

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 298, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV(II)-30-1

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 301, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV3-30

GENE ALIGN SEQ

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

Alignment stats: 'M': 296, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV3-29

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 297, 'I': 0, 'D': 0, 'X': 1
Both human gene and its mapping are pseudogenes

IGHV(II)-28-1

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 282, 'I': 0, 'D': 0, 'X': 1
Both human gene and its mapping are pseudogenes

IGHV4-28

GENE ALIGN SEQ

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

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

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

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

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

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

Alignment stats: 'M': 296, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV7-27

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 282, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV(II)-26-2

GENE ALIGN SEQ

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

Alignment stats: 'M': 302, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV(III)-26-1

GENE ALIGN SEQ

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

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

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

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

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

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

D7

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

D9

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

Alignment stats: 'M': 296, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV2-26

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 301, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV(III)-25-1

GENE ALIGN SEQ

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

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

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

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

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

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

D7

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

D9

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

Alignment stats: 'M': 280, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV3-25

GENE ALIGN SEQ

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

Alignment stats: 'M': 294, 'I': 0, 'D': 0, 'X': 2
Both human gene and its mapping are pseudogenes

IGHV1-24

GENE ALIGN SEQ

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

Alignment stats: 'M': 296, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV3-23

GENE ALIGN SEQ

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

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

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

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

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

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

Alignment stats: 'M': 295, 'I': 0, 'D': 0, 'X': 1
Neither human gene nor its mapping is pseudogene

IGHV(III)-22-2

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 30, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV(II)-22-1

GENE ALIGN SEQ

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

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

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

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

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

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

D7

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

D9

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

Alignment stats: 'M': 269, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV3-22

GENE ALIGN SEQ

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

Alignment stats: 'M': 302, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV3-21

GENE ALIGN SEQ

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

Alignment stats: 'M': 296, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV3-20

GENE ALIGN SEQ

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

Alignment stats: 'M': 295, 'I': 0, 'D': 0, 'X': 1
Neither human gene nor its mapping is pseudogene

IGHV3-19

GENE ALIGN SEQ

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

D7

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

Alignment stats: 'M': 296, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV1-18

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 295, 'I': 0, 'D': 0, 'X': 1
Neither human gene nor its mapping is pseudogene

IGHV1-17

GENE ALIGN SEQ

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

Alignment stats: 'M': 295, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV(III)-16-1

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 301, 'I': 0, 'D': 1, 'X': 1
Both human gene and its mapping are pseudogenes

IGHV3-16

GENE ALIGN SEQ

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

D7

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

Alignment stats: 'M': 296, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV(II)-15-1

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 271, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV3-15

GENE ALIGN SEQ

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

Alignment stats: 'M': 302, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV1-14

GENE ALIGN SEQ

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

Alignment stats: 'M': 295, 'I': 0, 'D': 0, 'X': 1
Both human gene and its mapping are pseudogenes

IGHV(III)-13-1

GENE ALIGN SEQ

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

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

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

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

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

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

Alignment stats: 'M': 293, 'I': 0, 'D': 0, 'X': 1
Both human gene and its mapping are pseudogenes

IGHV3-13

GENE ALIGN SEQ

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

Alignment stats: 'M': 292, 'I': 0, 'D': 0, 'X': 1
Neither human gene nor its mapping is pseudogene

IGHV1-12

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 296, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV(III)-11-1

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 268, 'I': 0, 'D': 0, 'X': 1
Both human gene and its mapping are pseudogenes

IGHV3-11

GENE ALIGN SEQ

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

Alignment stats: 'M': 289, 'I': 0, 'D': 0, 'X': 7
Neither human gene nor its mapping is pseudogene

IGHV3-64D

GENE ALIGN SEQ

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

Alignment stats: 'M': 363, 'I': 35, 'D': 41, 'X': 48
Both human gene and its mapping are pseudogenes

IGHV3-7

GENE ALIGN SEQ

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

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

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

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

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

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

Alignment stats: 'M': 295, 'I': 0, 'D': 0, 'X': 1
Neither human gene nor its mapping is pseudogene

IGHV3-6

GENE ALIGN SEQ

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

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

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

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

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

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

D7

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

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

Alignment stats: 'M': 293, 'I': 0, 'D': 0, 'X': 2
Both human gene and its mapping are pseudogenes

IGHV(III)-5-1

GENE ALIGN SEQ

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

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

D7

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

D9

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

Alignment stats: 'M': 99, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV2-5

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 301, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV7-4-1

GENE ALIGN SEQ

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

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

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

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

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

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

Alignment stats: 'M': 296, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV4-4

GENE ALIGN SEQ

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

Alignment stats: 'M': 296, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV1-3

GENE ALIGN SEQ

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

Alignment stats: 'M': 296, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV(III)-2-1

GENE ALIGN SEQ

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

Alignment stats: 'M': 291, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV1-2

GENE ALIGN SEQ

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

Alignment stats: 'M': 296, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHV(II)-1-1

GENE ALIGN SEQ

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

D7

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

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

Alignment stats: 'M': 182, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHV6-1

GENE ALIGN SEQ

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

Alignment stats: 'M': 305, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

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

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

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

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

Alignment stats: 'M': 17, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

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

U7

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

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 31, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHD3-3

U9

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

U7

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

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 31, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

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

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

GENE ALIGN SEQ
HUM: 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 A A C T A C

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

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

Alignment stats: 'M': 16, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

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	A	C	T	G	T	G

GENE ALIGN SEQ

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

D7

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

Alignment stats: 'M': 20, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

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

U7

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

GENE ALIGN SEQ

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

D7

HUM:	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

Alignment stats: 'M': 18, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

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

U7

HUM:	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	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	G	G

Alignment stats: 'M': 17, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHD2-8

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

U7

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

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 29, 'I': 0, 'D': 0, 'X': 2
Both human gene and its mapping are pseudogenes

IGHD3-9

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

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

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

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

D9
HUM: A T C A A A A A C C C
UAM: A T C A A A A A C C C

Alignment stats: 'M': 31, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHD3-10

U9

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

U7

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

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 30, 'I': 0, 'D': 0, 'X': 1
Both human gene and its mapping are pseudogenes

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

U7

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

GENE ALIGN SEQ

HUM:	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	A	A	C	T	A	C

D7

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

D9

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

Alignment stats: 'M': 16, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

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

U7

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

GENE ALIGN SEQ

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

D7

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

Alignment stats: 'M': 23, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

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

U7

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

GENE ALIGN SEQ

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

D7

HUM:	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

Alignment stats: 'M': 21, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHD1-14

U9

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

U7

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

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 17, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHD2-15

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

U7

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

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 31, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHD3-16

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

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

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

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

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

Alignment stats: 'M': 36, 'I': 0, 'D': 0, 'X': 1
Both human gene and its mapping are pseudogenes

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

U7

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

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 16, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHD5-18

U9

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

U7

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

GENE ALIGN SEQ

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

D7

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

Alignment stats: 'M': 12, 'I': 3, 'D': 0, 'X': 8
Neither human gene nor its mapping is pseudogene

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

U7

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

D7

HUM:	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

Alignment stats: 'M': 21, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHD1-20

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

U7

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

D7

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

D9

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

Alignment stats: 'M': 17, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

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

U7

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

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 27, 'I': 0, 'D': 0, 'X': 1
Both human gene and its mapping are pseudogenes

IGHD3-22

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

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

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

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

D9
HUM: A T C A A A A A C T C
UAM: A T C A A A A A C T C

Alignment stats: 'M': 31, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHD4-23

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

U7

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

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 19, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHD5-24

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

GENE ALIGN SEQ

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

D7

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

Alignment stats: 'M': 20, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHD6-25

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

U7

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

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 18, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

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

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

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

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

Alignment stats: 'M': 20, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHJ1P

U9

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

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

Alignment stats: 'M': 54, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHD7-27

U9

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

U7

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

GENE ALIGN SEQ

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

D7

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

D9

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

Alignment stats: 'M': 11, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHJ1

U9

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

U7

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

GENE ALIGN SEQ

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

HUM:	A	G
UAM:	A	G

Alignment stats: 'M': 52, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHJ2

U9

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

HUM:	C	A	G
UAM:	C	A	G

Alignment stats: 'M': 53, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

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:

UAM:

HUM:

UAM:

Alignment stats: 'M': 62, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHJ3

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

Alignment stats: 'M': 50, 'I': 0, 'D': 0, 'X': 0
Both human gene and its mapping are pseudogenes

IGHJ4

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

Alignment stats: 'M': 48, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHJ5

U9

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

U7

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

GENE ALIGN SEQ

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

HUM:	G
UAM:	G

Alignment stats: 'M': 51, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHJ3P

U9

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

Alignment stats: 'M': 50, 'I': 0, 'D': 0, 'X': 0
Neither human gene nor its mapping is pseudogene

IGHJ6

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

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

Alignment stats: 'M': 59, 'I': 0, 'D': 0, 'X': 4
Neither human gene nor its mapping is pseudogene