

Supplemental Table 1: Comparison of the mature sequence of the Fab19 heavy chain variable region gene with that of the inferred germline gene segments. These analyses were used to design the reverted unmutated ancestor variant sequences. The heavy chain nucleotide gene sequence was obtained from GenBank accession number L02258. The sequence was analyzed using the IMGT database.

Inferred germline gene segments

V_H gene segment is V_H3-21*01

D_H gene segment is D_H6-25*01. The D region is in reading frame 2.

J_H gene segment is J_H4*02

Alignment of the Fab19 nucleotide gene sequence with the VH3-21*01 inferred germline gene segment, indicating the IMGT framework (FR-IMGT) or complementarity determining region (CDR-IMGT) delimitations

Fab19
AB019439 Homsap IGHV3-21*01 F

<----- FR1-IMGT -----
gtgaaaactgctcgaggagtctggggga...ggcctggtcaggctggcggggccctaaga
-a-gtg-a---g-t-----a-----ct-g-----g---

Fab19
AB019439 Homsap IGHV3-21*01 F

ctctcgtgtgcagcctctggaaccaccctc.....agtggtataccatgcac
-----c-----tt-----t-----a-----g-----a-----

Fab19
AB019439 Homsap IGHV3-21*01 F

----- FR2-IMGT -----> CDR
tgggtccgccaggctccaggaaaggggctggagtgggtctcatccattactggagg...
-----g-a-ta-----

Fab19
AB019439 Homsap IGHV3-21*01 F

2-IMGT _____ <-----
...agcaacttcataaaactactcagactcagtgaag...ggccgattcaccatctccaga
....-t-gt-a----t-----g-----

Fab19
AB019439 Homsap IGHV3-21*01 F

----- FR3-IMGT -----
gacaacgccaagaactcacttatctgcaaatacagcctgacagccgaggatacggct
-----g-----c-----

Fab19
AB019439 Homsap IGHV3-21*01 F

-----> CDR3-IMGT -----
gtctattattgtgcaccgcccctatagcaccgcctactttgaccactggggccaggga
--g-----c-----ga-a-----

Fab19
AB019439 Homsap IGHV3-21*01 F

accctggtcaccgtctcctca

The following table shows the analysis of the $V_H/N/D_H/N/J_H$ junction encoding the HCDR3. Underlined nucleotides indicate differences from the inferred germline gene segment.

3' end of V_H gene	N addition region 1	D_H gene	N addition region 2	5' end of J_H gene
tgtgcga....	ccgcccc	...tatagcaccg.....	cc	.ctacttt <u>gacc</u> actgg