

# Analyzing the ‘degree of humanness’ of antibody sequences

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## Supplementary Material

Family	VBase Gene name	Humanness	Family	VBase Gene name	Humanness
VH-I	1-3 1-02	0.04	VH-III	1-3 3-43	1.44
VH-I	1-3 1-03	0.12	VH-III	1-3 3-48	1.81
VH-I	1-3 1-08	-0.34	VH-III	1-U 3-49	0.89
VH-I	1-2 1-18	0.00	VH-III	1-1 3-53	1.87
VH-I	1-U 1-24	-0.50	VH-III	1-3 3-64	1.76
VH-I	1-3 1-45	-0.84	VH-III	1-1 3-66	2.18
VH-I	1-3 1-46	0.38	VH-III	1-4 3-72	1.19
VH-I	1-3 1-58	-0.64	VH-III	1-4 3-73	1.10
VH-I	1-2 1-69	0.15	VH-III	1-3 3-74	1.94
VH-I	1-2 1-e	0.32	VH-III	1-6 3-d	1.24
VH-I	1-2 1-f	-0.36	VH-IV	2-1/1-1 4-04	0.44
VH-II	3-1/2-1 2-05	-2.12	VH-IV	2-1 4-28	0.14
VH-II	3-1 2-26	-1.83	VH-IV	3-1 4-30.1	0.35
VH-II	3-1 2-70	-1.79	VH-IV	3-1 4-30.2	0.11
VH-III	1-3 3-07	1.88	VH-IV	3-1 4-30.4	0.38
VH-III	1-3 3-09	1.36	VH-IV	3-1 4-31	0.35
VH-III	1-3 3-11	1.99	VH-IV	1-1 4-34	-0.01
VH-III	1-1 3-13	1.26	VH-IV	3-1 4-39	0.12
VH-III	1-U 3-15	1.48	VH-IV	1-1 4-59	0.52
VH-III	1-3 3-20	1.37	VH-IV	3-1 4-61	0.38
VH-III	1-3 3-21	1.89	VH-IV	2-1 4-b	0.50
VH-III	1-3 3-23	2.17	VH-V	1-2 5-51	0.18
VH-III	1-3 3-30	2.07	VH-V	1-2 5-a	0.32
VH-III	1-3 3-30.3	2.20	VH-VI	3-5 6-01	-1.00
VH-III	1-3 3-30.5	2.07	VH-VII	1-2 7-4.1	-0.12
VH-III	1-3 3-33	2.15			

Table S1. Humanness scores for human heavy chain germline-encoded sequences extracted from VBase.

Family	VBase	Gene name	Humanness	Family	VBase	Gene name	Humanness
V $\kappa$ I	2-1-(1)	O12	1.20	V $\kappa$ II	3-1-(1)	O1	-1.79
V $\kappa$ I	2-1-(1)	O2	1.20	V $\kappa$ II	4-1-(1)	A17	-1.97
V $\kappa$ I	2-1-(1)	O18	0.56	V $\kappa$ II	4-1-(1)	A1	-2.09
V $\kappa$ I	2-1-(1)	O8	0.56	V $\kappa$ II	4-1-(1)	A18	-1.71
V $\kappa$ I	2-1-(U)	A20	0.78	V $\kappa$ II	4-1-(1)	A2	-1.77
V $\kappa$ I	2-1-(1)	A30	0.34	V $\kappa$ II	4-1-(1)	A19	-1.40
V $\kappa$ I	2-1-(1)	L14	-0.19	V $\kappa$ II	4-1-(1)	A3	-1.40
V $\kappa$ I	2-1-(1)	L1	0.89	V $\kappa$ II	4-1-(1)	A23	-2.37
V $\kappa$ I	2-1-(1)	L15	0.75	V $\kappa$ III	6-1-(1)	A27	1.05
V $\kappa$ I	2-1-(1)	L4	1.02	V $\kappa$ III	6-1-(1)	A11	0.87
V $\kappa$ I	2-1-(1)	L18	1.02	V $\kappa$ III	2-1-(1)	L2	0.94
V $\kappa$ I	2-1-(1)	L5	0.84	V $\kappa$ III	2-1-(1)	L16	0.94
V $\kappa$ I	2-1-(1)	L19	0.84	V $\kappa$ III	2-1-(1)	L6	1.04
V $\kappa$ I	2-1-(1)	L8	0.86	V $\kappa$ III	2-1-(U)	L20	0.98
V $\kappa$ I	2-1-(1)	L23	0.36	V $\kappa$ III	6-1-(1)	L25	1.00
V $\kappa$ I	2-1-(1)	L9	0.69	V $\kappa$ IV	3-1-(1)	B3	0.07
V $\kappa$ I	U-1-(1)	L24	0.54	V $\kappa$ V	2-1-(1)	B2	-3.67
V $\kappa$ I	2-1-(1)	L11	0.68	V $\kappa$ VI	2-1-(1)	A26	-1.28
V $\kappa$ I	2-1-(U)	L12	1.04	V $\kappa$ VI	2-1-(1)	A10	-1.28
V $\kappa$ II	3-1-(1)	O11	-1.79	V $\kappa$ VI	2-1-(1)	A14	-1.12

Table S2. Humanness scores for human kappa light chain germline-encoded sequences extracted from VBase.

Family	VBase Gene name	Humanness	Family	VBase Gene name	Humanness
V $\lambda$ 1	13-7(A) 1a	0.40	V $\lambda$ 3	11-7 3e	-0.17
V $\lambda$ 1	14-7(A) 1e	1.17	V $\lambda$ 3	11-7 3m	0.50
V $\lambda$ 1	13-7(A) 1c	0.90	V $\lambda$ 3	11-7 2-19	0.32
V $\lambda$ 1	13-7(A) 1g	0.89	V $\lambda$ 4	12-11 4c	-3.27
V $\lambda$ 1	13-7(A) 1b	0.92	V $\lambda$ 4	12-11 4a	-2.28
V $\lambda$ 2	14-7(A) 2c	1.09	V $\lambda$ 4	12-11 4b	-2.62
V $\lambda$ 2	14-7(A) 2e	1.27	V $\lambda$ 5	14-11 5e	-1.70
V $\lambda$ 2	14-7(A) 2a2	1.02	V $\lambda$ 5	14-11 5c	-1.91
V $\lambda$ 2	14-7(A) 2d	1.24	V $\lambda$ 5	14-11 5b	-2.38
V $\lambda$ 2	14-7(A) 2b2	0.92	V $\lambda$ 6	13-7(B) 6a	-0.34
V $\lambda$ 3	11-7 3r	0.67	V $\lambda$ 7	14-7(B) 7a	-2.39
V $\lambda$ 3	11-7 3j	0.46	V $\lambda$ 7	14-7(B) 7b	-2.26
V $\lambda$ 3	11-7 3p	0.44	V $\lambda$ 8	14-7(B) 8a	-1.27
V $\lambda$ 3	11-7 3a	0.04	V $\lambda$ 9	12-12 9a	-3.28
V $\lambda$ 3	11-7 3l	0.19	V $\lambda$ 10	13-7(C) 10a	-1.19
V $\lambda$ 3	11-7 3h	0.42			

Table S3. Humanness scores for human lambda light chain germline-encoded sequences extracted from VBase.

Antibody	Source of sequence
Zenapax	Queen <i>et al</i> (1989). A humanized antibody that binds to the interleukin 2 receptor. <i>Proc. Natl. Acad. Sci. (USA)</i> . <b>86</b> , 10029–10033.
HuBrE-3	US5804187
Synagis	Johnson <i>et al</i> (1997). Development of a humanized monoclonal antibody (MEDI-493) with potent in vitro and in vivo activity against respiratory syncytial virus. <i>J. Infect. Dis.</i> <b>176</b> , 1215–1224.
Herceptin	Carter <i>et al</i> (1992). Humanization of an anti-p185HER2 antibody for human cancer therapy. <i>Proc. Natl. Acad. Sci. (USA)</i> . <b>89</b> , 4285–4289.
Hu-A33	US5773001
Xolair	US6682735
Campath-1H	PDB 1CE1; James <i>et al</i> (1999). 1.9Å structure of the therapeutic antibody CAMPATH-1H Fab in complex with a synthetic peptide antigen. <i>J. Mol. Biol.</i> <b>289</b> , 293–301.
Infliximab	US6284471
Rituximab	US6399061
ch14.18	US6969517
U36	US6972324
Humira	US6509015

Table S4. Sources of sequence information for the the therapeutic antibodies. The prefix of US indicates US patents.