

**Supplementary Table 2. Sequence characteristics of immunoglobulin variable regions used in this study**

ID	HEAVY					LIGHT			
	VH	D	JH	CDR3* (aa)	Mutations** (aa)	Vk	Jk	CDR3* (aa)	Mutations** (aa)
MS-A1	IGHV3-15	IGHD5-12	IGHJ4	CTTDD <b>T</b> GH <b>D</b> WGHW	7	IGKV1-12	IGKJ1	CQQAN <b>S</b> FPSF	3
MS-A2	IGHV4-59	IGHD1-26	IGHJ5	CARG <b>K</b> D <b>W</b> L <b>D</b> P <b>W</b>	8	IGKV1-9	IGKJ2	CQQ <b>V</b> N <b>A</b> YPYTF	3
MS-A3	IGHV6-1	IGHD6-6	IGHJ4	C <b>A</b> TGGQ <b>Y</b> T <b>S</b> W <b>S</b> F <b>D</b> S <b>W</b>	9	IGKV1-16	IGKJ4	CQQ <b>Y</b> H <b>N</b> LLTF	8
MS-A4	IGHV3-30	IGHD2-2	IGHJ4	C <b>A</b> K <b>E</b> I <b>D</b> L <b>A</b> Y <b>L</b> N <b>S</b> W	6	IGKV1-9	IGKJ2	CQQ <b>V</b> N <b>A</b> YPYTF	3
MS-A5	IGHV3-30	IGHD2-2	IGHJ4	C <b>A</b> K <b>E</b> I <b>D</b> L <b>A</b> Y <b>L</b> N <b>S</b> W	7	IGKV1-9	IGKJ2	CQQ <b>V</b> N <b>A</b> YPYTF	3
MS-A6	IGHV1-18	IGHD3-10	IGHJ4	C <b>V</b> R <b>G</b> V <b>V</b> A <b>G</b> D <b>D</b> Y <b>W</b>	9	IGKV1-9	IGKJ2	CQQ <b>V</b> N <b>A</b> YPYTF	3
MS-B1	IGHV2-26	IGHD3-22	IGHJ6	C <b>A</b> R <b>L</b> H <b>P</b> V <b>A</b> Y <b>E</b> G <b>Y</b> <b>Y</b> H <b>H</b> V <b>H</b> G <b>V</b> D <b>V</b> W	7	IGKV1-39	IGKJ5	C <b>L</b> Q <b>S</b> Y <b>N</b> T <b>P</b> L <b>T</b> F	5
MS-C1	IGHV3-9	IGHD5-12	IGHJ4	C <b>A</b> R <b>D</b> S <b>G</b> Y <b>E</b> F <b>L</b> D <b>Y</b> W	12	IGKV1-33	IGKJ4	CQQ <b>Y</b> D <b>N</b> L <b>R</b> P <b>L</b> T <b>F</b>	3
MS-C2	IGHV2-5	IGHD1-26	IGHJ6	C <b>A</b> H <b>T</b> R <b>I</b> V <b>G</b> A <b>T</b> R <b>H</b> S <b>Y</b> Y <b>H</b> A <b>M</b> D <b>V</b> W	9	IGKV1-39	IGKJ1	CQQ <b>S</b> Y <b>T</b> F <b>S</b> W <b>T</b> F	8
MS-C3	IGHV2-5	IGHD2-2	IGHJ4	C <b>A</b> H <b>V</b> F <b>R</b> D <b>C</b> S <b>T</b> <b>T</b> R <b>C</b> Y <b>D</b> R <b>G</b> Y <b>D</b> Y <b>W</b>	8	IGKV1-33	IGKJ4	CQ <b>H</b> Y <b>D</b> S <b>L</b> P <b>L</b> T <b>F</b>	9
MS-C4	IGHV1-2	IGHD6-25	IGHJ3	C <b>A</b> R <b>D</b> G <b>G</b> R <b>H</b> T <b>S</b> G <b>Y</b> Y <b>E</b> W <b>T</b> A <b>L</b> D <b>I</b> W	10	IGKV1-39	IGKJ1	CQQ <b>S</b> Y <b>T</b> F <b>S</b> W <b>T</b> F	8
MS-D1	IGHV1-46	IGHD5-18	IGHJ3	C <b>T</b> T <b>E</b> L <b>G</b> Y <b>S</b> L <b>G</b> L <b>R</b> A <b>S</b> D <b>V</b> W	8	IGKV3-11	IGKJ2	C <b>H</b> L <b>R</b> G <b>N</b> W <b>P</b> R <b>T</b> F	5
MS-D2	IGHV1-46	IGHD5-18	IGHJ3	C <b>T</b> T <b>E</b> L <b>G</b> Y <b>S</b> L <b>G</b> L <b>R</b> A <b>S</b> D <b>V</b> W	8	IGKV1-39	IGKJ2	CQQ <b>S</b> D <b>S</b> P <b>Y</b> T <b>F</b>	6
MS-D3	IGHV3-7	IGHD2-2	IGHJ6	C <b>A</b> R <b>E</b> V <b>R</b> D <b>C</b> S <b>S</b> T <b>C</b> Y <b>A</b> E <b>D</b> L <b>I</b> Y <b>F</b> Y <b>Y</b> Y <b>M</b> D <b>V</b> W	9	IGKV3-11	IGKJ2	C <b>H</b> L <b>R</b> G <b>N</b> W <b>P</b> R <b>T</b> F	5
MS-D4	IGHV5-51	IGHD5-12	IGHJ6	C <b>A</b> R <b>H</b> S <b>P</b> P <b>G</b> Y <b>D</b> Y <b>N</b> A <b>M</b> D <b>V</b> W	6	IGHKV3-11	IGKJ2	C <b>H</b> L <b>R</b> G <b>N</b> W <b>P</b> R <b>T</b> F	5
MS-E1	IGHV2-5	IGHD1-14	IGHJ4	C <b>A</b> H <b>R</b> P <b>I</b> E <b>H</b> N <b>R</b> I <b>P</b> F <b>D</b> F <b>W</b>	4	IGKV1-39	IGKJ1	CQQ <b>S</b> Y <b>S</b> T <b>L</b> W <b>T</b> F	4

MS-F1	IGHV3-23	IGHD3-16	IGHJ6	CANARFY <b>C</b> STSNCPAAGMDVW	11	IGKV2-28	IGKJ4	CMQ <b>S</b> LQTPPTF	6
GCT-A1	IGHV4-61	IGHD3-22	IGHJ3	CARDLLYY <b>S</b> DSSG <b>F</b> YGAFDIW	3	IGKV4-1	IGKJ1	CQQYY <b>T</b> TLGTF	1
GCT-A2	IGHV3-43	IGHD2-8	IGHJ4	CAKSSRDI <b>L</b> LGTTGFMD <b>V</b> W	4	IGKV1-33	IGKJ4	CQQYDNL <b>P</b> PTF	3
GCT-A3	IGHV4-61	IGHD2-2	IGHJ3	CARGLVTY <b>C</b> RT <b>N</b> CYD <b>V</b> FDIW	5	IGKV1-12	IGKJ2	CQQANS <b>F</b> PYTF	5
GCT-A4	IGHV3-7	IGHD6-19	IGHJ6	CARWAHSPVAESFHYYYY <b>A</b> MDVW	2	IGKV3-20	IGKJ2	CQQY <b>G</b> NSPPYTF	6
GCT-A5	IGHV5-10	NI	IGHJ6	CARDY <b>G</b> DVW	9	IGKV4-1	IGKJ1	CQQYY <b>T</b> IPRTF	2
GCT-A6	IGHV3-33	IGHD3-3	IGHJ4	CARDSTPFNYDFWSGYYSVPPPTATADYW	2	IGKV1-33	IGKJ5	CQQY <b>G</b> DLPRAF	5
GCT-A7	IGHV5-51	IGHD3-22	IGHJ4	CARPS <b>S</b> MMSPFDYW	6	IGKV1-33	IGKJ5	CQQY <b>G</b> DLPRAF	4
GCT-A8	IGHV5-10	IGHD2-2	IGHJ4	CARHDGAAMARY <b>G</b> YW	4	IGKV2-30	IGKJ1	CMQGT <b>Q</b> WPWTF	4
GCT-A9	IGHV1-24	IGHD3-22	IGHJ5	CATASRDYYDSSGYLSTKNWFDPW	0	IGKV1-33	IGKJ4	CQQYD <b>D</b> LPLTF	3
GCT-A10	IGHV4-61	IGHD3-22	IGHJ3	CARDLVYY <b>S</b> DSSG <b>F</b> YGAFDIW	4	IGKV4-1	IGKJ1	CQQYY <b>T</b> TLGTF	1
IBM-A1	IGHV3-9	IGHD3-22	IGHJ4	<b>C</b> V <b>K</b> EDY <b>G</b> T <b>G</b> GYRFD <b>H</b> W	10	IGKV1-39	IGKJ2	CQQSY <b>T</b> SPYTF	5
IBM-A2	IGHV2-70	IGHD3-10	IGHJ6	CARVRVVRGAGYYYGMDVW	11	IGKV4-1	IGKJ4	CQQYY <b>D</b> TPLTF	11
IBM-A3	IGHV5-51	IGHD3-3	IGHJ6	CARLKY <b>H</b> FW <b>N</b> GHDYYYYGMDVW	13	IGKV4-1	IGKJ2	CQQYY <b>S</b> PPYTF	4
IBM-B1	IGHV1-69	IGHD1-26	IGHJ1	CE <b>G</b> GFQHW	27	IGKV2-28	IGKJ2	CMQAR <b>R</b> QTVYTF	8
IBM-B2	IGHV3-9	IGHD3-10	IGHJ4	<b>C</b> V <b>K</b> DRGYA <b>S</b> LSFGDLE <b>Y</b> W	5	IGKV3-15	IGKJ4	CQQY <b>D</b> NWPSF	7
IBM-B3	IGHV1-2	IGHD3-3	IGHJ4	CASLR <b>I</b> K <b>I</b> FG <b>L</b> I <b>N</b> PYDYW	12	IGKV3-20	IGKJ5	CQQY <b>A</b> NSVF	7
H8-18C5	IGHV1-18	IGHD4-23	IGHJ1	CATGNTMVNMPYW	10	IGKV4-1	IGKJ4	CQNDHSYPLTF	1

\* Bold amino acids indicate replacement mutations

\*\*  $V_H$  and  $V_K$  gene segment mutation count does not include those indicated in the CDR3

The sequences of the  $V_H$  and  $V_L$  domains listed in the table have been deposited in GenBank under accession numbers KT984419-KT984484 following the same order in which they appear in the table.

NI = not identifiable (usually due to particularly short D-segments)