

MBD4^{+/+} Leader
 TTCTCCCCTCTCTCCTCTCCCT**T**CCAGGTTCCCTGGTGCAG**GGCAGCGCTGACTCAGCCGGCCTCGGTGTCAGCAAACCCAGGAGAA**

MBD4^{Δ/Δ}

MBD4^{+/+} CDR1
 ACCGTCAAGATCACCT**TGCT**CCGGGGGTGGCAGCTAT**TGCTGGAAAGTTACTATTATGGCTGGTACCAGCAGAAGTCTCCTGGCAGTGCC**

MBD4^{Δ/Δ} C11.1
 C11.3 *T

MBD4^{+/+} CDR2
 CCTGTCACTGTGATCTATG**AACAACGACAAGAGACCCTCGG**ACATCCCTTCACGATTCTCC**GGTTCCAAATCCGGCTCCACAGCCACA**

MBD4^{Δ/Δ} C11.1
 C11.3
 C11.4 *T
 C11.5
 C11.7
 C11.8
 C11.10
 C11.12

MBD4^{+/+} CDR3
 TTA**ACC**ATCACTGGGGTCCG**AGCC**GATGACGAG**GGCT**GTCTATTCTGTGG**AGCT**ACGAAGACAACAGTGG**TGCTGCA**TTTGGGGCC

MBD4^{Δ/Δ}

MBD4^{+/+}
 GGGACA**ACC**CTGACCGTCCTAGGTGAGTCGCTGACCTCGTCT

MBD4^{Δ/Δ}

Suppl. Figure 1. SHM in the IgL gene of MBD4^{Δ/Δ}.11 subclones. The leader and CDR1, CDR2 and CDR3 motifs in the reference sequence are boxed. Mutations are from MBD4^{Δ/Δ}.11 (n=8, green). AID hotspot motifs (RGYW, WRCY) are highlighted in bold.

MBD4^{+/+} Leader
 TTCTCCCCTCTCTCCTCTCCCTTCCAGGTTCCCTGGTGCA**GGCAGCGCTGACTCAGCCGGCCTCGGTGT**AGCAA**ACCAGGAGAA**

MBD4^{Δ/Δ}

MBD4^{+/+} CDR1
 ACCGTC AAGATCACCT**GGCT**CCGGGGTGGCAGCTAT**TGCTGGAAAGTT**ACTATTAT**GGCTGGTACCAGC**AGAAGTCTCCT**GGCAGTGCC**

MBD4^{Δ/Δ} C12.1 G
 C12.2 G
 C12.3 G
 C12.4 G
 C12.5 G
 C12.6 G
 C12.7 G
 C12.8 G
 C12.9 G
 C12.10 G
 C12.11 G
 C12.12 G

MBD4^{+/+} CDR2
 CCTGTCACTGTGATCTATG**AACAACGACAAGAGACCC**TGGACATCCCTTCACGATTCCTCC**GGTTCCAAATCCGGCTCCACAGCCACA**

MBD4^{Δ/Δ}

MBD4^{+/+} CDR3
 TTA**ACC**ATCACTGGGGTCCG**AGCCG**ATGACGAG**GGCT**GTCTATTCTGTGG**AGCTACGAAGACAACAGTGGTGGCTGCA**TTTGGGGCC

MBD4^{Δ/Δ} C12.9 TG-A T A

MBD4^{+/+}
 GGGACA**ACC**CTGACCGTCCCTAGGTGAGTCGCTGACCTCGTCT

MBD4^{Δ/Δ}

Suppl. Figure 2. SHMs occur in the IgL gene of MBD4^{Δ/Δ}.12 subclones. The leader and CDR1, CDR2 and CDR3 motifs in the reference sequence are boxed. Mutations are from MBD4^{Δ/Δ}.12 (n=12, blue) below the reference sequence. AID hotspot motifs (RGYW, WRCY) are highlighted in bold.

MBD4^{+/+} Leader
 TTCTCCCCTCTCTCCTCTCCCTTCCAGGTTCCCTGGTGCAG**GGCAGCGCTGACTCAGCCGGCCTCGGTGTCAGCAAACCAGGAGAA**

MBD4^{Δ/Δ}

MBD4^{+/+} CDR1
 ACCGTCAAGATCACCT**GGCT**CCGGGGGTGGCAGCTAT**TGCTGGAAGTTACTATTATGGCT**GGTACCAGCAGAAGTCTCCT**GGCAGTGCC**

MBD4^{Δ/Δ}

C14.1 A
 C14.2 A
 C14.3 A
 C14.4 A
 C14.5 A
 C14.6 A
 C14.7 A
 C14.8 A
 C14.9 A
 C14.10 A
 C14.11 A
 C14.12 A

MBD4^{+/+} CDR2
 CCTGTCACTGTGATCTATG**AACAACGACAAGAGACCCTCGG**ACATCCCTCAGATTCTCC**GGTTCCAAATCCGGCTCCACAGCCACA**

MBD4^{Δ/Δ}

C14.10 C

MBD4^{+/+} CDR3
 TTA**ACC**ATCACTGGGGTCCG**AGCC**GATGACGAG**GGCT**GTCTATT**TCTGTGGAGCTACGAAGACAACAGTGGTGGCTGCA**TTTGGGGCC

MBD4^{Δ/Δ}

C14.1 A
 C14.2 A
 C14.4 A
 C14.6 A
 C14.8 A
 C14.9 A
 C14.11 A
 C14.12 A

MBD4^{+/+}

GGGACA**ACC**CTGACCGTCTAGGTGAGTCGCTGACCTCGTCT

MBD4^{Δ/Δ}

Suppl. Figure 3. SHMs occur largely at G/C residues in the IgL gene of MBD4^{Δ/Δ} subclones.

The leader and CDR1, CDR2 and CDR3 motifs in the reference sequence are boxed. Mutations are from MBD4^{Δ/Δ}.14 (n=12, red) deletion clones, below the reference sequence. AID hotspot motifs (RGYW, WRCY) are highlighted in bold.

MBD4^{+/+} Leader
 TTCTCCCTCTCTCCTCTCCCTTCCAGGTTCCCTGGTGCAG**GGC**AGCGCTGACTC**AGCC**GGCCTCGGTGTC**AGCAA**ACCAGGAGAA

MBD4^{Δ/Δ} WT.12 A
 WT.11 A
 WT.9 A
 WT.8 A
 WT.6 A
 WT.5 A
 WT.4 A
 WT.3 A
MBD4^{+/+} WT.2 CDR1 A
 WT.1 A
 A**CCG**TCAAGATCACCT**TGCT**CCGGGGTGGCAGCTA**TGCT**GGAA**AGT**TA**CT**ATTAT**GGC**TGGTACC**AGC**AGAAGTCTCCT**GGC**AGT**GCC**

MBD4^{Δ/Δ}

MBD4^{+/+} CDR2
 CCTGTCACTGTGATCTATG**AACA**CGACAAGAGAC**CC**TCCGACATCCCTTCACGATTCTCC**GGTT**CCAAATCC**GGCT**CCAC**AGCC**ACA

MBD4^{Δ/Δ} WT.12 T
 WT.11 T
 WT.9 T A
 WT.8 T C
 WT.6 T A
 WT.5 T A
 WT.4 T
MBD4^{+/+} WT.3 T
 WT.2 T A
 WT.1 T
 TTA**ACC**ATCACTGGGGTCCG**AGCC**GATGACG**AGGCT**GTCTAT**TCT**GTGGG**AGCT**ACGAAGACAACAGTGGT**TGCT**GCATT**T**TGGGGCC

MBD4^{Δ/Δ}

MBD4^{+/+}
 GGGACA**ACC**CTGACCGTCC**TAG**GTGAGTCGCTGACCTCGTCT

MBD4^{Δ/Δ}

Suppl. Figure 4. SHMs occur in the IgL gene of MBD4^{+/+} subclones. The leader and CDR1, CDR2 and CDR3 motifs in the reference sequence are boxed. Mutations are from the parental (n=11, black; above the reference sequence). AID hotspot motifs (RGYW, WRCY) are highlighted in bold.