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## **Supplemental Information**

### **Lymphocyte-Specific Function of the DNA Polymerase Epsilon Subunit Pole3 Revealed by Neomorphic Alleles**

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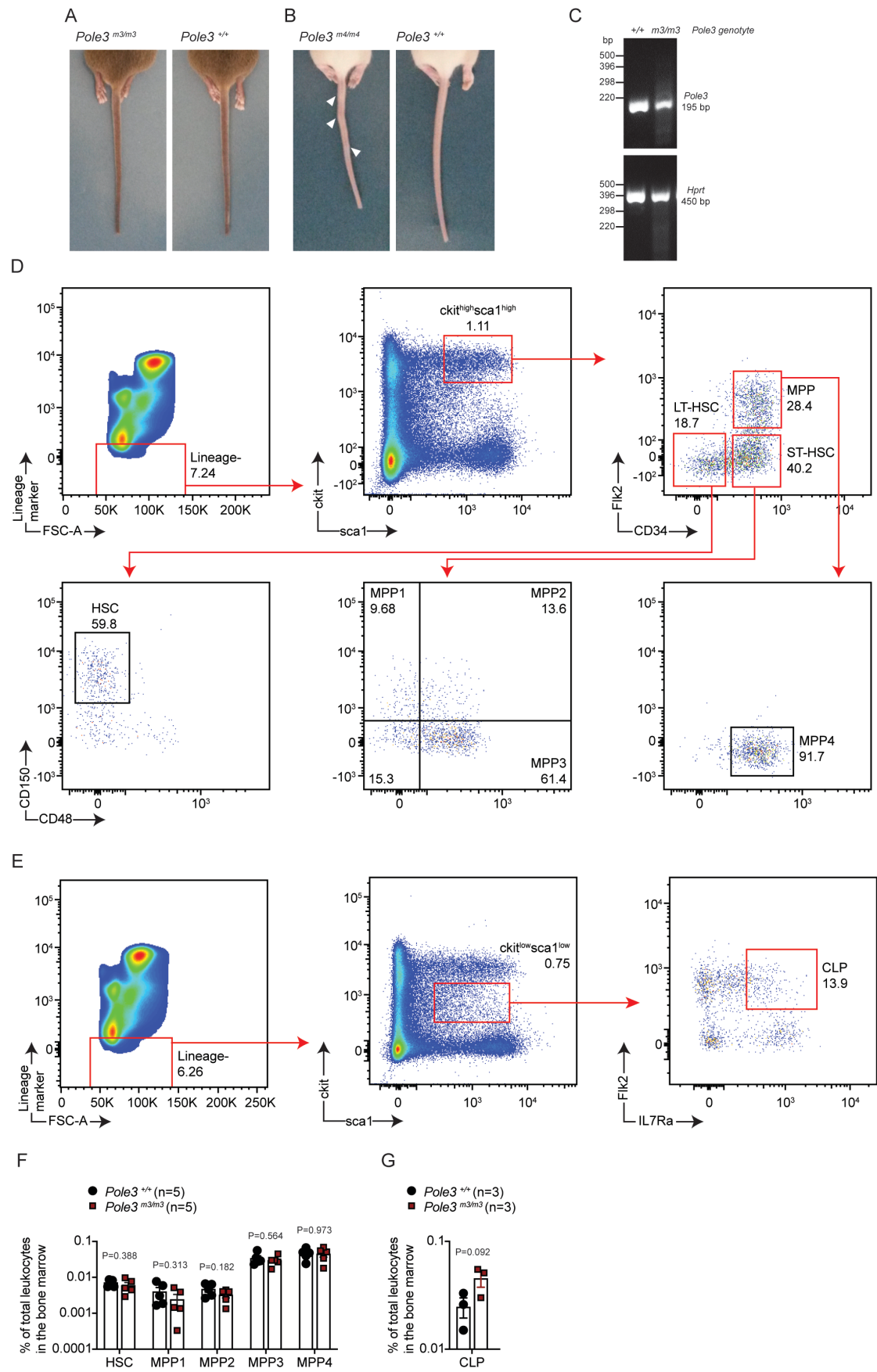
**Figure S1. Characterization of *Pole3* alleles, Related to Figures 1, 2.**

(A) Schematic representation of the mouse *Pole3* locus and the targeting replacement vector. The deletion cassette containing  $\beta$ -galactosidase and neomycin coding sequences replaces a genomic sequence of 1,056 bp spanning the entire encoding sequence of *Pole3*.

(B) Schematic representation of the predicted domains of mouse Pole3 and Pole4 proteins.

(C) Alignment of vertebrate POLE3 protein sequences using the EMBL-EBI Clustal Omega sequence alignment tool. Fully conserved residues are indicated by asterisk, residues with highly similar chemical properties are indicated by a colon, and those with related properties are denoted with a period. Genbank accession numbers: Human, NP\_001265184; mouse, NP\_067473; dog, XP\_855374; cat, XP\_003995820; chicken, NP\_001020525, zebrafish, NP\_957095.

(D) Relationship of the predicted secondary structures ( $\alpha$ -helices) of mouse Pole3 protein (top) to the exon/intron structure of the *Pole3* gene (bottom) with exons represented as squared boxes and introns as connecting lines. The color-coding indicates the contribution of exons to each structural motif of the Pole3 protein; numbers represent amino acid residues.



**Figure S2. Abnormal tail structure of *Pole3*<sup>m4/m4</sup> mice, Related to Figure 2.**

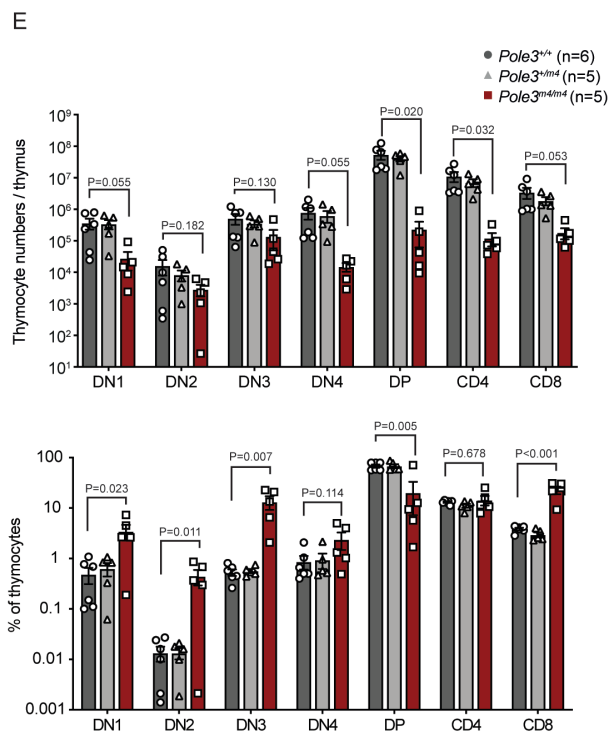
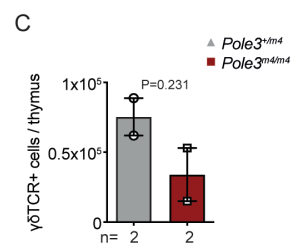
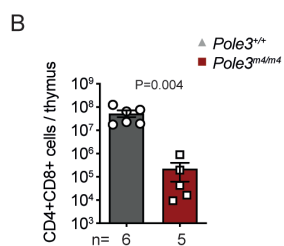
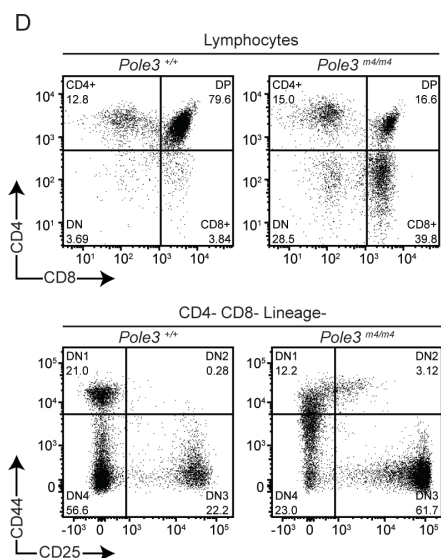
(A, B) Tails of adult *Pole3*<sup>m3/m3</sup> (A) and *Pole3*<sup>m4/m4</sup> (B) mice. Tail kinks in *Pole3*<sup>m4/m4</sup> mice are indicated with white arrowheads.

(C) RT-PCR analysis of *Pole3* (upper panel) and *Hprt* (lower panel) expression using RNA extracted from thymi of wild-type and *Pole3*<sup>m3/m3</sup> mice.

(D) Gating strategy for phenotypic analysis of the hematopoietic progenitor populations HSC, MPP1, MPP2, MPP3 and MPP4.

(E) Gating strategy for phenotypic analysis of the CLP population.

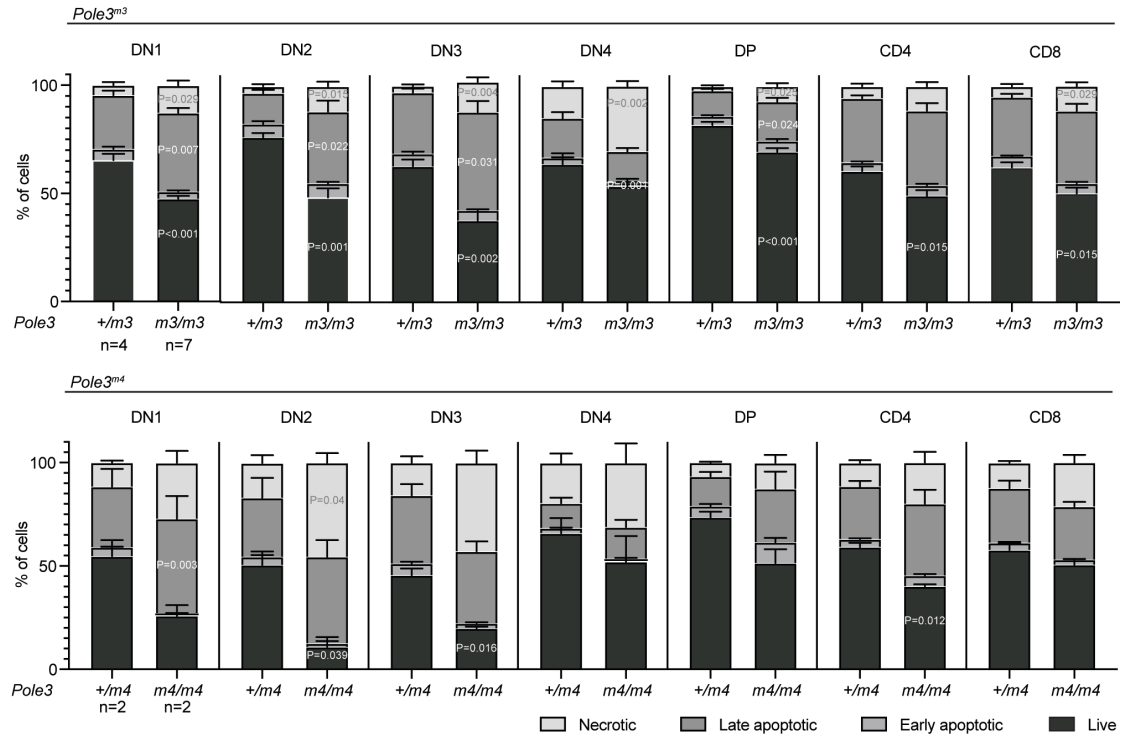
(F, G) Frequency of hematopoietic progenitor populations (F) and the CLP population (G) in the bone marrow in adult mice of the indicated genotypes. Bar graphs indicate means $\pm$ SEM. Significance levels as determined by t-test are indicated; each data point represents one mouse. Abbreviations, LT long-term; ST short term; HSC hematopoietic stem cell; MPP multipotent progenitor, CLP common lymphoid progenitor.



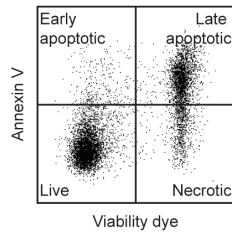
**Figure S3. Characterization of T cell development in adult mice carrying the *Pole3*<sup>m4</sup> allele, Related to Figure 3.**

- (A) Representative images of thymi and spleens taken at 5 weeks of age.
- (B) Total numbers of CD4<sup>+</sup>CD8<sup>+</sup> double-positive thymocytes.
- (C) Total cell numbers of  $\gamma\delta$  TCR<sup>+</sup> T cells in the thymus.
- (D) Flow cytometric profiles of adult thymocytes.
- (E) Thymocyte populations in adult mice of the indicated genotypes; absolute numbers are shown at the top, proportions are indicated at the bottom. Bar graphs indicate means $\pm$ SEM. Significance levels as determined by t-test are indicated; each data point represents one mouse.

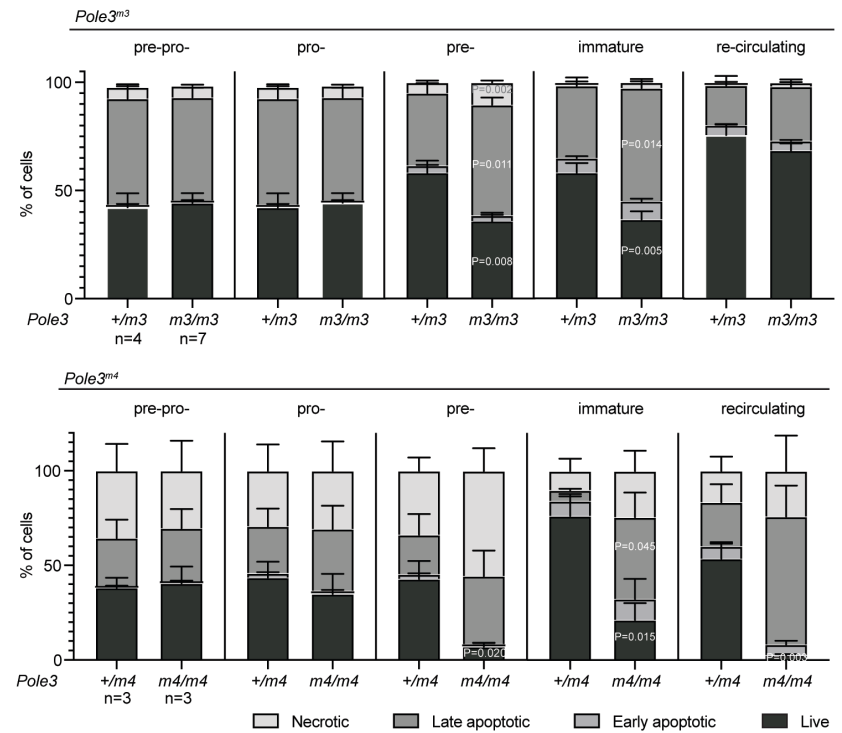
B



A



C

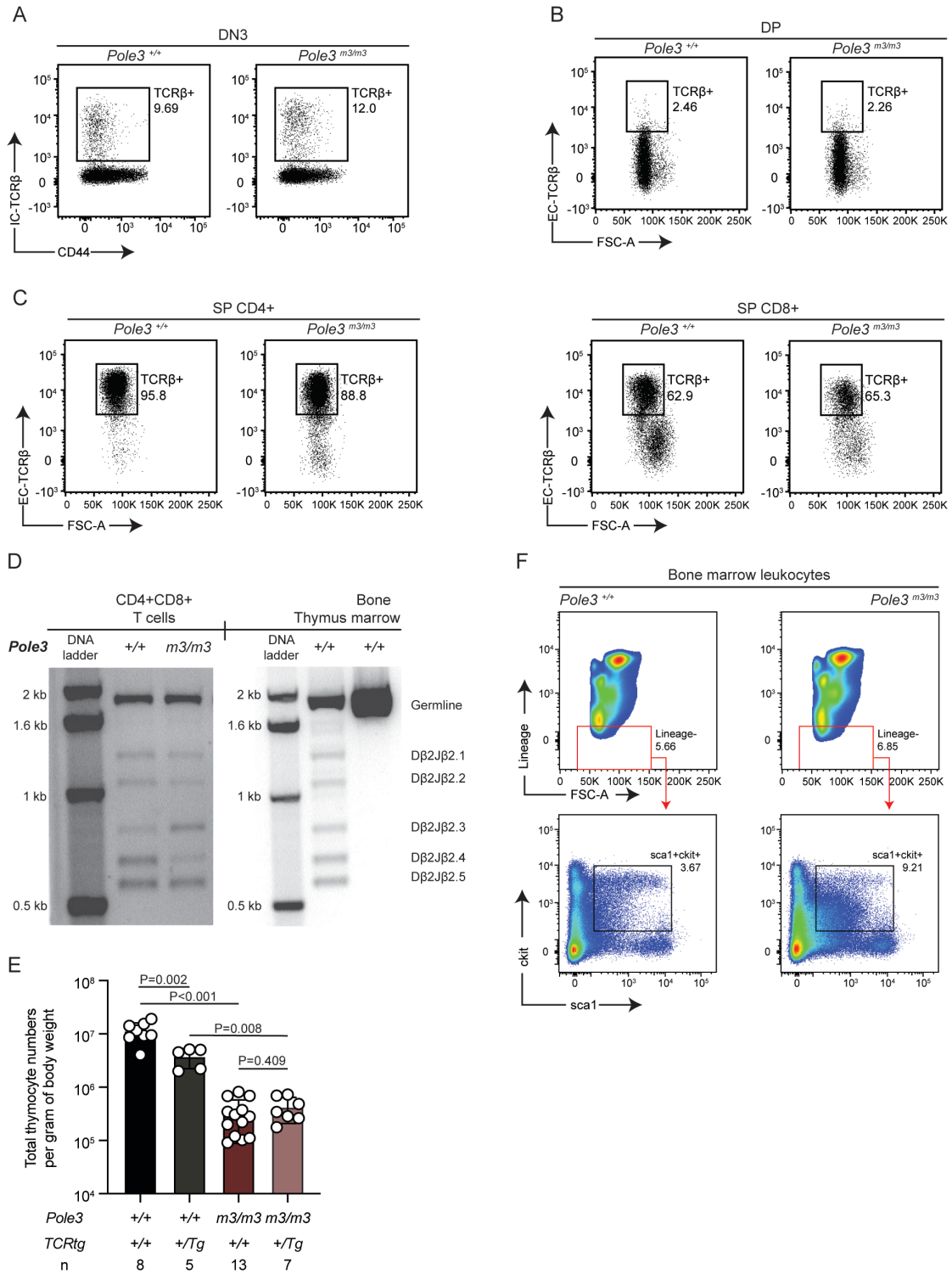




**Figure S4. Apoptosis in *Pole3* mutant lymphocytes, Related to Figures 3 and 4.**

(A) Gating strategy for the detection of apoptotic cells in differentiating lymphocyte populations.

(B, C) Frequency of live, early apoptotic, late apoptotic and necrotic cells in thymocyte populations in (B) in *Pole3<sup>m3</sup>* (upper panel) and *Pole3<sup>m4</sup>* (lower panel) adult mice and in differentiating B cell populations (C) in the bone marrow of *Pole3<sup>m3</sup>* (upper panel) and *Pole3<sup>m4</sup>* (lower panel) adult mice. Bar graphs indicate means $\pm$ SEM. Significance levels as determined by t-test are indicated where  $P < 0.05$ .



**Figure S5. Characterization of the TCR $\beta$  status in adult *Pole3*<sup>m3/m3</sup> mice, Related to Figure 6.**

(A) Intracellular TCR $\beta$  protein levels of DN3 thymocytes.

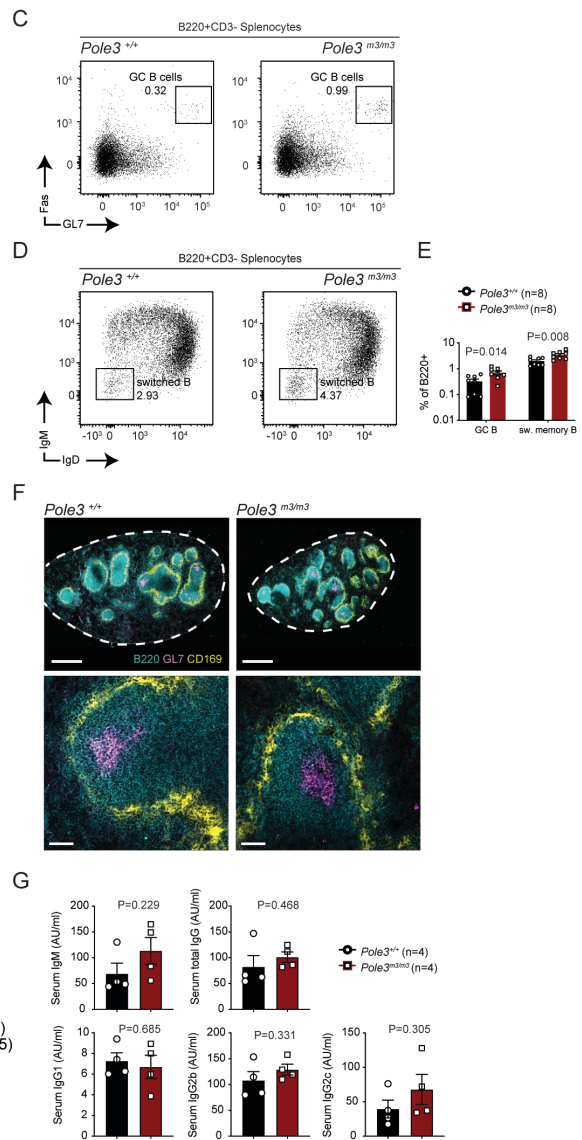
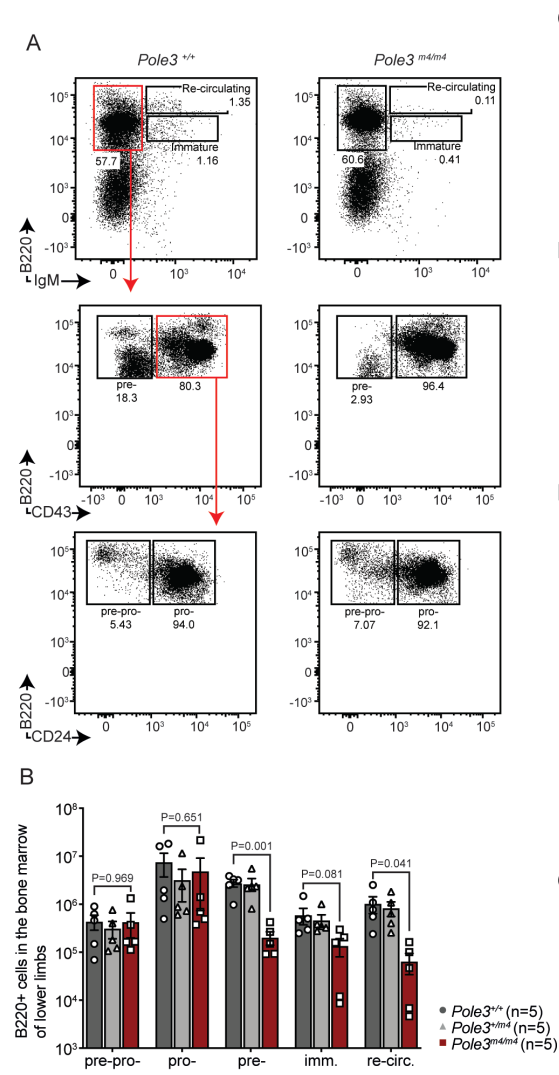
(B) Surface levels of TCR $\beta$  of DP thymocytes.

(C) Surface levels of TCR $\beta$  of single positive CD4<sup>+</sup> CD8<sup>+</sup> thymocytes. In (A-C), numbers indicate the percentages of cells in the indicated gates.

Abbreviations, IC, intracellular; EC, extracellular.

(D) D-J rearrangements of the *Tcrb2* gene in purified CD4<sup>+</sup>CD8<sup>+</sup> double-positive thymocytes (left panel) as examined by PCR. Whole thymocytes and total bone marrow cells of a wild-type mouse were used as positive and negative controls, respectively (right panel). (E) Total thymocyte numbers per gram of body weight in adult *Pole3*<sup>m3/m3</sup> mutant mice in the presence or absence of an  $\alpha\beta$ TCR transgene (Tg). Bar graphs indicate means $\pm$ SEM. Significance levels as determined by t-test are indicated; each data point represents one mouse.

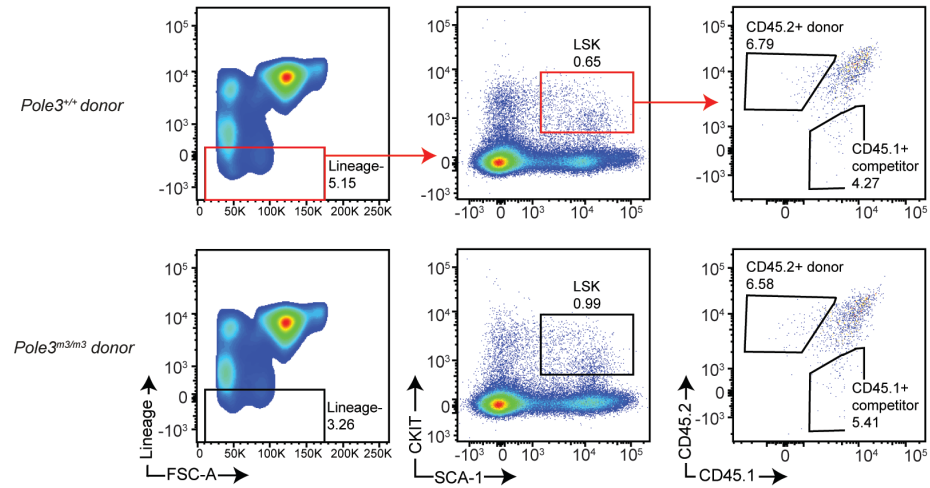
(F) Representative flow cytometry plots indicating the increased expression levels of Sca1<sup>+</sup> on cells within the Lin<sup>-</sup>c-kit<sup>+</sup> cell population of the bone marrow of *Pole3*<sup>m3/m3</sup> mice. Numbers indicate percentages of cells in each gate.



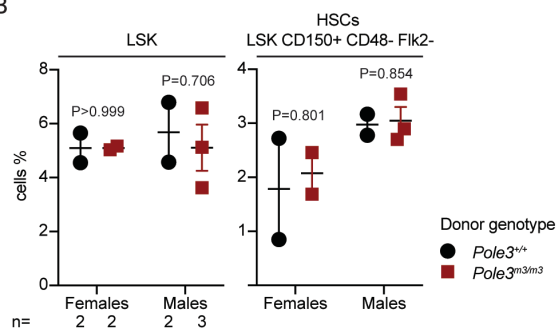
**Figure S6. Characterization of the adult B cell compartment in *Pole3<sup>m3/m3</sup>* and *Pole3<sup>m4/m4</sup>* mice, Related to Figure 4.**

- (A) Gating strategy applied for flow cytometric analysis of developmental B cell stages in the bone marrow of *Pole3<sup>m4</sup>* mice on the FVB genetic background. Numbers indicate percentage of cells in the respective gates.
- (B) Total numbers of B220<sup>+</sup> cells in each B cell stage of bone marrow taken from the lower limbs (combined cells of femur, tibia and pelvis). Abbreviations, imm. immature, re-circ. re-circulating.
- (C, D) Gating strategy for flow cytometric analysis of germinal center B cells (C) and switched memory B cells (D) in the spleen of *Pole3<sup>m3/m3</sup>* mice. Numbers indicate percentages of cells in each gate.
- (E) Proportion of germinal center B cells and switched memory B cells within the B220<sup>+</sup> cell compartment of the spleen. Abbreviations, GC germinal center, sw. switched.
- (F) Immunofluorescence staining of spleen sections from *Pole3<sup>m3</sup>* mice. Distribution of germinal centers (GL7<sup>+</sup>, violet) within B cell follicles (B220<sup>+</sup>, cyan). CD169<sup>+</sup> macrophages (yellow) mark the boundaries of the B cell follicles. Scale bar (upper panel) 100  $\mu$ m, (lower panel) 20  $\mu$ m.
- (G) Serum concentrations of IgM (upper left), total IgG (upper, right) and IgG subclasses IgG1 (bottom, left), IgG2b (bottom, middle) and IgG2c (bottom, right) as arbitrary units (AU) per mL serum. Bar graphs indicate means $\pm$ SEM. Significance levels as determined by t-test are indicated; each data point represents one mouse.

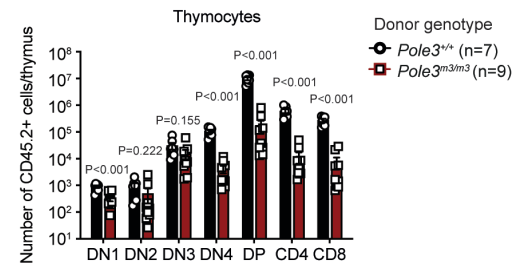
A



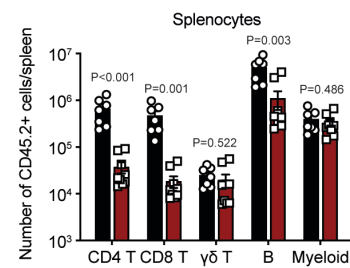
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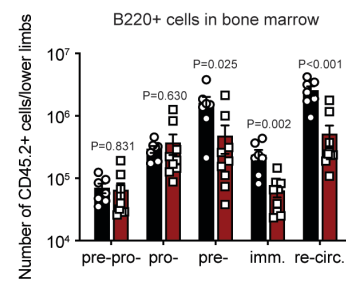
C



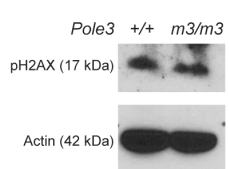
D



E



F



**Figure S7. Potency of hematopoietic cells of *Pole3*<sup>m3/m3</sup> mice, Related to Figure 5.**

(A) Presence of *Pole3*<sup>m3/m3</sup> mutant hematopoietic progenitors in the bone marrow of recipient mice, 16 hours after transplantation. The gating strategy identifying the LSK populations (Lin<sup>-</sup>;Sca1<sup>high</sup>;c-kit<sup>high</sup>) in CD45.2-expressing mutant and CD45.1-expressing wild-type competitor cells. Numbers indicate percentages of cells in the respective gates.

(B) Frequencies of wild-type and mutant CD45.2<sup>+</sup> donor cells within the LSK and HSC (LSK<sup>+</sup>CD150<sup>+</sup>CD48<sup>-</sup>Flk2<sup>-</sup>) fractions in female and male recipient mice, as determined 16 hours after transplantation. Bar graphs indicate means±SEM. Significance levels as determined by t-test are indicated; each data point represents one mouse.

(C-E) Total numbers of CD45.2<sup>+</sup> donor cells of the indicated genotypes in the thymus (C), spleen (D), and bone marrow (E) of recipient cells. Bar graphs indicate means±SEM. Significance levels as determined by t-test are indicated; each data point represents one mouse.

(F) Similar levels of phosphorylated (Ser139) H2AX histone in the thymus of *Pole3*<sup>m3/m3</sup> and control mice as shown by western blot.

**Table S1.** Genotype distribution at 3 weeks of age, related to Figure 2.

	+/+	+/ <i>m</i>	<i>m/m</i>
<i>Pole3</i> <sup><i>m1</i></sup>	13	23	17
<i>Pole3</i> <sup><i>m2</i></sup>	23	37	23
<i>Pole3</i> <sup><i>m3</i></sup>	120	259	107
<i>Pole3</i> <sup><i>m4</i></sup>	135	252	16

Genotype distribution of *Pole3* allelic variants at 3 weeks of age. The *Pole3*<sup>*m4/m4*</sup> is significantly underrepresented at this age; all other distributions conform to the expected Mendelian ratios.

**Table S2.** Body weight at 4-6 weeks of age, related to Figure 2.

	+/+	+/ <i>m</i>	<i>m/m</i>
<i>Pole3</i> <sup><i>m1</i></sup>	23.475±0.78 n=4	n.d.	20.52±1.93 n=5
<i>Pole3</i> <sup><i>m2</i></sup>	20.65±1.46 n=8	n.d.	20.1±1.39 n=11
<i>Pole3</i> <sup><i>m3</i></sup>	18.75±0.58 n=8	20.96±2.36 n=2	17.33±0.92 n=9
<i>Pole3</i> <sup><i>m4</i></sup>	20.98±0.91 n=9	19.78±0.67 n=7	16.01±1.23 n=8 *

Summary of body weights at 4-6 weeks of age (means±SEM; number of animals in each group is indicated). The weight of the *Pole3*<sup>*m4/m4*</sup> mice is significantly reduced (P=0.00493; t-test).

**Table S3.** guide RNA sequences (sgRNA) and DNA repair template for CRISPR-Cas9 mutagenesis, related to STAR Methods.

sgRNAs	Target sequence (5'>3')*	Single-stranded DNA repair template
sgRNA #1: <i>Pole3</i> <sup><i>m1</i></sup> , <i>Pole3</i> <sup><i>m2</i></sup>	TACAGGCGGGAGCAGAA	
sgRNA #2: <i>Pole3</i> <sup><i>m1</i></sup> , <i>Pole3</i> <sup><i>m2</i></sup>	ACGACCAGAACGAAGAG G	
sgRNA #3: <i>Pole3</i> <sup><i>m3</i></sup> , <i>Pole3</i> <sup><i>m4</i></sup>	CGGGAGCAGAAAGGCAA G	CGGTTTGTCTAATTAAACCATAATAT CCTGCTTCCTTACAGCGTACAGGC AGGAACAGAAGGGCAAGAAGGAGG CTTCGGAGCAAAAAGAAGAAGGACA AAGACAAAAAGGA



**Table S4.** Genotyping primers, related to STAR Methods.

Target	Forward primer (5'>3') Reverse primer (5'>3')	Amplicon size (bp)	Sequencing Primer (5'>3')
<b>Mouse</b>			
<i>Pole3</i> knockout	GCAGCCTCTGTTCCACATACACTTCA CTTTAGTGCTTCTGTGACTTGGAACA	493	
<i>Pole3</i> wild-type allele	GTGTGTTTCATCTCCACTCTCCTCGC ACCTGCTCCAGAATGTGTGACAACT	255	
<i>Pole3</i> <sup>m1</sup> , <i>Pole3</i> <sup>m2</sup> alleles	TGCTCATCAGTATCAGTGCC CGGTTTCTGTAACCTCAGATGC	517 (wt) 385 (m1) 356 (m2)	
<i>Pole3</i> wildtype allele	TGCTCATCAGTATCAGTGCC TTCTGGTCGTCTCGTCCAG	305	
<i>Pole3</i> <sup>m3</sup> , <i>Pole3</i> <sup>m4</sup> alleles	CACCTGTGCCTCGGTTTGTG CATGTCTCAGGATCTCAGGG	277 (wt) 278 (m3) 279 (m4)	CATGTCTCAGGATCTCA GGG
<i>TCRtg</i>	CTGAGGCTGATCCATTACTC TAACACGAGGAGCCGAGTGCCT	216	

**Table S5.** RT-PCR Primers, related to STAR Methods.

Target	Forward primer (5'>3') Reverse primer (5'>3')	Amplicon size (bp)
<i>Pole3</i>	GAAGCTCTAGAAGCGTACAGG CCTACTCTCTCCATTTCAGTTG	195
<i>Hprt</i>	GATTATGGACAGGACTGAAAG CAAGGGCATATCCAACAACAACT	450

**Table S6.** Fluorescently labeled antibodies, related to STAR Methods.

Antigen/Staining Reagent	Clone	Conjugate	Source	Identifier
<b>Thymocyte stage analysis, related to Figures 1C, 3B-3F, and Figure S3</b>				
CD4	GK1.5	APC Cy7	Biolegend	100414
CD8a	53-6.7	PE	eBioscience	12-0081-85
CD44	IM7	APC	eBioscience	17-0441-81
CD25	PC61	PE Cy7	BD Biosciences	552880
B220 (CD45R)	RA3-6B2	FITC	Biolegend	103206
TCR $\gamma\delta$	eBioGL3	FITC	eBioscience	11-5711-82
NK1.1	PK136	FITC	Biolegend	108706
CD11c	HL3	FITC	BD Biosciences	557400
CD11b (Mac1)	M1/70	FITC	BD Biosciences	557396
<b>Annexin V detection in thymocytes, related to Figure S4A-S4B</b>				
CD4	GK1.5	PE Dazzle	Biolegend	100455
CD8a	53-6.7	BV421	Biolegend	100738
CD44	IM7	APC	eBioscience	17-0441-81
CD25	PC61	PE Cy7	BD Biosciences	552880
TCR $\gamma\delta$	GL3	PerCP Cy5.5	Biolegend	118118
B220 (CD45R)	RA3-6B2	PE	Biolegend	103208
NK1.1	PK136	PE	eBioscience	12-5941-83
CD11c	N418	PE	eBioscience	12-0114-82
CD11b (Mac1)	M1/70	PE	BD Biosciences	553311
<b>Thymocyte stages TCR-<math>\beta</math>, related to Figure S5A-S5C</b>				
CD4	GK1.5	APC Cy7	Biolegend	100414
CD8a	53-6.7	BV421	Biolegend	100738
CD44	IM7	APC	eBioscience	17-0441-81
CD25	PC61	PE Cy7	BD Biosciences	552880
B220 (CD45R)	RA3-6B2	FITC	Biolegend	103206
NK1.1	PK136	FITC	Biolegend	108706
CD11c	HL3	FITC	BD Biosciences	557400
CD11b (Mac1)	M1/70	FITC	BD Biosciences	557396
TCR $\gamma\delta$	GL3	PerCP Cy5.5	Biolegend	118118
TCR- $\beta$	H57-597	PE	eBioscience	12-5961-83
<b>Thymocyte stages CXCR4, related to Figure 3G-3H</b>				
CD4	GK1.5	APC Cy7	Biolegend	100414
CD8a	53-6.7	BV421	Biolegend	100738
CD44	IM7	APC	eBioscience	17-0441-81
CD25	PC61	PE Cy7	BD Biosciences	552880
B220 (CD45R)	RA3-6B2	FITC	Biolegend	103206
NK1.1	PK136	FITC	Biolegend	108706
CD11c	HL3	FITC	BD Biosciences	557400
CD11b (Mac1)	M1/70	FITC	BD Biosciences	557396
TCR $\gamma\delta$	GL3	PerCP Cy5.5	Biolegend	118118
CXCR4 (CD184)	L276F12	PE	Biolegend	146506
<b>Thymocyte stages SCA1, related to Figure 3I-3J</b>				
CD4	GK1.5	APC Cy7	Biolegend	100414
CD8a	53-6.7	BV421	Biolegend	100738
CD44	IM7	PE	BD Biosciences	553134
CD25	PC61	Alexa Fluor 647	Biolegend	102020
B220 (CD45R)	RA3-6B2	FITC	Biolegend	103206
NK1.1	PK136	FITC	Biolegend	108706
CD11c	HL3	FITC	BD Biosciences	557400
CD11b (Mac1)	M1/70	FITC	BD Biosciences	557396
TCR $\gamma\delta$	GL3	PerCP Cy5.5	Biolegend	118118
Sca1 (Ly-6A/E)	D7	PE Cy7	Biolegend	108113
<b>Thymocyte stages sort, related to Figure S5D</b>				
CD4	GK1.5	APC Cy7	Biolegend	100414
CD8a	53-6.7	BV421	Biolegend	100738
CD44	IM7	PE	BD Biosciences	553134
CD25	PC61	Alexa Fluor 647	Biolegend	102020
B220 (CD45R)	RA3-6B2	FITC	Biolegend	103206
TCR $\gamma\delta$	eBioGL3	FITC	eBioscience	11-5711-82
NK1.1	PK136	FITC	Biolegend	108706

CD11c	HL3	FITC	BD Biosciences	557400
CD11b (Mac1)	M1/70	FITC	BD Biosciences	557396
<b>B cell stage analysis, related to Figure 2H, Figure 4, and Figure S6A-S6B</b>				
IgM	II/41	FITC	BD Biosciences	553437
BP-1 (Ly51)	6C3	PE	Thermo Fischer	12-5891-83
CD43	S7	APC	BD Biosciences	560663
B220 (CD45R)	RA3-6B2	PE Cy7	eBioscience	25-0452-82
CD24	M1/69	eFluor® 450	eBioscience	48-0242-82
<b>Annexin V detection in B cells in the bone marrow, related to Figures S4A, and S4C</b>				
IgM	II/41	PE	eBioscience	12-5790-81
CD43	S7	APC	BD Biosciences	560663
B220 (CD45R)	RA3-6B2	PE Cy7	eBioscience	25-0452-82
CD24	M1/69	eF450	eBioscience	48-0242-82
CD3	145-2C11	PerCP Cy5.5	Biolegend	100328
<b>Germinal center B cells in the spleen, related to Figure S4C, and S4E</b>				
CD3	145-2C11	PE	Biolegend	100308
B220 (CD45R)	RA3-6B2	FITC	Biolegend	103206
Fas (CD95)	SA367H8	APC	Biolegend	152603
GL7	GL7	BV421	BD Biosciences	562967
<b>Switched memory B cells in the spleen, related to Figure S4D, and S4E</b>				
CD3	145-2C11	PE	Biolegend	100308
B220 (CD45R)	RA3-6B2	FITC	Biolegend	103206
IgM	II/41	eFluor® 450	eBioscience	48-5790-82
IgD	11-26c.2a	Alexa Fluor® 647	Biolegend	405707
<b>Germinal centers in spleen sections, related to Figure S4F</b>				
GL7	GL7	Alexa Fluor488	Biolegend	144612
B220 (CD45R)	RA3-6B2	Alexa Fluor® 647	BD Biosciences	557683
CD169 (Siglec-1)	3D6.112	BV421	Biolegend	142421
<b>Peripheral lymphocyte analysis, related to Figure 3C, and S3C</b>				
CD4	GK1.5	APC Cy7	Biolegend	100414
CD8a	53-6.7	BV421	Biolegend	100738
TCR γδ	GL3	PerCP Cy5.5	Biolegend	118118
B220 (CD45R)	RA3-6B2	FITC	Biolegend	103206
CD11c	HL3	FITC	BD Biosciences	557400
CD11b (Mac1)	M1/70	FITC	BD Biosciences	557396
CD3e	145-2C11	APC	Thermo Fischer	17-0031-82
α-GalCer Loaded CD1 tetramer		PE	ProlImmune	E001-2X
<b>EdU incorporation in Thymus, related to Figure 7C-7D</b>				
CD4	GK1.5	APC Cy7	Biolegend	100414
CD8a	53-6.7	BV421	Biolegend	100738
CD44	IM7	APC	eBioscience	17-0441-81
CD25	PC61	BV605	Biolegend	102035
<b>Peripheral lymphocyte analysis, related to Figure 2C-2G, and 6</b>				
CD8a	53-6.7	PE Cy7	eBioscience	25-0081-82
CD4	GK1.5	PE Dazzle	Biolegend	100455
TCRβ	H57-597	BV421	Biolegend	109229
CD62L	MEL-14	Alexa Fluor® 700	Biolegend	104426
CD44	IM7	APC	eBioscience	17-0441-81
CD19	eBio1D3	PE	eBioscience	12-0193-83
<b>HSC-MPP phenotyping, related to Figure S2D, and S2F</b>				
CD3e	145-2C11	FITC	Biolegend	100306
B220 (CD45R)	RA3-6B2	FITC	Biolegend	103206
CD11b (Mac1)	M1/70	FITC	BD Biosciences	557396
Gr1 (Ly-6G/Ly-6C)	RB6-8C5	FITC	Biolegend	108406
TER-119	TER-119	FITC	eBioscience	11-5921-81
Sca1 (Ly-6A/E)	D7	APC	eBioscience	17-5981-81
Ckit (CD117)	2B8	BV421	Biolegend	105827
Flk2 (CD135)	A2F10.1	PE	BD Biosciences	561068
CD34	RAM34	Alexa Fluor® 700	eBioscience	56-0341-82
CD150 (SLAMF6)	TC15-12F12.2	BV605	Biolegend	115927
CD48	HM48-1	APC Cy7	Biolegend	103431
<b>CLP phenotyping, related to Figure S2E, and S2G</b>				
CD3e	145-2C11	FITC	Biolegend	100306

B220 (CD45R)	RA3-6B2	FITC	Biolegend	103206
CD11b (Mac1)	M1/70	FITC	BD Biosciences	557396
Gr1 (Ly-6G/Ly-6C)	RB6-8C5	FITC	Biolegend	108406
TER-119	TER-119	FITC	eBioscience	11-5921-81
Sca1 (Ly-6A/E)	D7	APC	eBioscience	17-5981-81
Ckit (CD117)	2B8	BV421	Biolegend	105827
IL-7Ra	A7R34	PE Dazzle	Biolegend	135031
Flk2 (CD135)	A2F10	PerCP efluor710	eBioscience	46-1351-80
<b>Peripheral blood reconstitution, related to Figure 5A-5E</b>				
CD45.1	A20	PE	eBioscience	12-0453-83
CD45.2	104	BV421	Biolegend	109831
CD11b (Mac1)	M1/70	FITC	BD Biosciences	557396
Gr1 (Ly-6G/Ly-6C)	RB6-8C5	FITC	Biolegend	108406
CD3e	145-2C11	APC	Thermo Fischer	17-0031-82
B220 (CD45R)	RA3-6B2	PE Cy7	eBioscience	25-0452-82
<b>HSC engraftment analysis, related to Figure S7A-S7B</b>				
CD3e	145-2C11	FITC	Biolegend	100306
B220 (CD45R)	RA3-6B2	FITC	Biolegend	103206
CD11b (Mac1)	M1/70	FITC	BD Biosciences	557396
Gr1 (Ly-6G/Ly-6C)	RB6-8C5	FITC	Biolegend	108406
Ter119	TER-119	FITC	eBioscience	11-5921-81
Sca1 (Ly-6A/E)	D7	PE Cy7	Biolegend	108113
CD48	HM48-1	PerCP efluor710	eBioscience	46-0481-82
CD150 (SLAMF6)	TC15-12F12.2	PE Dazzle	Biolegend	115935
Flk2 (CD135)	A2F10.1	PE	BD Biosciences	561068
CD45.2	104	Alexa Fluor 700	Biolegend	109822
CD45.1	A20	APC Cy7	Biolegend	110716
<b>Thymocyte engraftment analysis, related to Figure 5F, and S7C</b>				
CD4	GK1.5	PE Cy7	Biolegend	100422
CD8	53-6.7	BV421	Biolegend	100738
CD44	IM7	PE	BD Biosciences	553134
CD25	PC61	BV605	Biolegend	102035
TCR γδ	GL3	PerCP Cy5.5	Biolegend	118118
B220 (CD45R)	RA3-6B2	FITC	Biolegend	103206
NK1.1	PK136	FITC	Biolegend	108706
CD11c	HL3	FITC	BD Biosciences	557400
CD11b (Mac1)	M1/70	FITC	BD Biosciences	557396
CD45.2	104	Alexa Fluor 700	Biolegend	109822
CD45.1	A20	APC Cy7	Biolegend	110716
<b>Analysis of B cell engraftment in the bone marrow, related to Figure 5I, and S7E</b>				
IgM	II/41	FITC	BD Biosciences	553437
CD43	S7	PE	BD Biosciences	553271
B220 (CD45R)	RA3-6B2	PE Cy7	eBioscience	25-0452-82
CD24	M1/69	eF450	eBioscience	48-0242-82
CD45.2	104	Alexa Fluor 700	Biolegend	109822
CD45.1	A20	APC Cy7	Biolegend	110716
<b>Analysis of engraftment of peripheral leukocytes, related to Figure 5G-5H, and S7D</b>				
CD4	GK1.5	PE Cy7	Biolegend	100422
CD8	53-6.7	BV421	Biolegend	100738
B220 (CD45R)	RA3-6B2	FITC	Biolegend	103206
TCR γδ	GL3	PerCP Cy5.5	Biolegend	118118
CD11b (Mac1)	M1/70	PE	BD Biosciences	553311
Gr1 (Ly-6G/Ly-6C)	RB6-8C5	PE	Biolegend	108408
CD45.2	104	Alexa Fluor 700	Biolegend	109822
CD45.1	A20	APC Cy7	Biolegend	110716