

SUPPLEMENTARY TABLES

Supplementary Table 1. Summary of splenic CD19+ B cells.

WT	<i>Xlf</i> ^{-/-}	<i>Mri</i> ^{-/-}	<i>Xlf</i> ^{-/-} <i>Mri</i> ^{-/-} <i>Trp53</i> ^{+/-}	<i>Paxx</i> ^{-/-}	<i>Xlf</i> ^{-/-} <i>Paxx</i> ^{-/-} <i>Trp53</i> ^{+(-)/-}		<i>Paxx</i> ^{-/-} <i>Mri</i> ^{-/-}	<i>Dna-pkcs</i> ^{-/-}
					<i>Trp53</i> ^{+/-}	<i>Trp53</i> ^{-/-}		
55.82	38.91	41.56	0.48	28.22	0.18	0.42	21.71	0.02
60.49	59.69	56.91	0.23	29.15	0.11	1.53	34.40	0.36
79.07	41.87	42.70	0.80	91.10	0.05	0.93	42.52	0.03
63.94	39.23	92.59	0.48	58.69	0.20		55.20	0.08
36.16	54.24	79.30	0.19	55.26	0.16		21.26	0.02
56.50	41.89	48.03		61.57	2.21		31.01	0.05
63.69	36.46	55.14		56.28	1.82		25.84	
42.85	37.87			39.59	0.58		15.51	
75.05	28.68			55.36	0.08		32.73	
67.60	39.08			61.29			58.43	
38.27	29.73			80.28			64.75	
79.47	47.11			61.29			36.96	
29.43	56.65			93.23			37.92	
52.58	44.10			61.86			63.63	
65.47	34.65						31.99	
62.80	30.79						22.31	
56.68	34.55						28.62	
57.03	50.48							
54.05	52.23							
75.79	36.41							

CD19+ splenocytes ($\times 10^6$) in WT, *Xlf*^{-/-}, *Mri*^{-/-}, *Xlf*^{-/-}*Mri*^{-/-}*Trp53*^{+/-}, *Paxx*^{-/-}, *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+(-)/-} and *Paxx*^{-/-}*Mri*^{-/-} mice. *Dna-pkcs*^{-/-} mice were used as an immunodeficient control. *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+(-)/-} is a combination of *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+/-} and *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{-/-}.

Supplementary Table 2. Summary of splenic CD3+ T cells.

WT	<i>Xlf</i> ^{-/-}	<i>Mri</i> ^{-/-}	<i>Xlf</i> ^{-/-} <i>Mri</i> ^{-/-} <i>Trp53</i> ^{+/-}	<i>Paxx</i> ^{-/-}	<i>Xlf</i> ^{-/-} <i>Paxx</i> ^{-/-} <i>Trp53</i> ^{+(-)/-}		<i>Paxx</i> ^{-/-} <i>Mri</i> ^{-/-}	<i>Dna-pkcs</i> ^{-/-}
					<i>Trp53</i> ^{+/-}	<i>Trp53</i> ^{-/-}		
41.61	15.06	23.01	5.55	34.34	0.13	0.41	26.93	0.38
37.93	36.01	36.61	3.31	21.89	0.52	1.42	24.53	0.23
42.64	33.33	23.12	3.05	38.84	0.42	0.84	36.66	0.03
29.44	39.67	32.84	2.36	23.51	0.26		41.18	0.09
15.25	30.11	30.74	1.55	31.11	0.92		15.22	0.02
22.62	15.19	19.45		16.26	0.25		18.83	0.07
20.41	49.15	25.38		14.86	0.71		20.21	
18.50	24.24			10.45	0.38		13.65	
27.19	17.04			14.62			17.85	
24.49	14.83			16.18			25.19	
13.86	15.41			21.20			28.55	
28.79	11.67			16.18			20.70	
19.05	15.90			24.62			16.90	
23.72	12.10			16.34			32.74	
22.75	19.17						17.44	
20.53	23.05						19.22	
27.01	17.94						18.25	
25.60	14.10							
35.90	12.52							
	14.06							
	20.54							
	21.25							
	42.82							
	14.81							

CD3+ splenocytes ($\times 10^6$) in WT, *Xlf*^{-/-}, *Mri*^{-/-}, *Xlf*^{-/-}*Mri*^{-/-}*Trp53*^{+/-}, *Paxx*^{-/-}, *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+(-)/-} and *Paxx*^{-/-}*Mri*^{-/-} mice. *Dna-pkcs*^{-/-} mice were used as an immunodeficient control. *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+(-)/-} is a combination of *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+/-} and *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{-/-}.

Supplementary Table 3. Summary of splenic CD4+ T cells.

WT	<i>Xlf</i> ^{-/-}	<i>Mri</i> ^{-/-}	<i>Xlf</i> ^{-/-} <i>Mri</i> ^{-/-} <i>Trp53</i> ^{+/-}	<i>Paxx</i> ^{-/-}	<i>Xlf</i> ^{-/-} <i>Paxx</i> ^{-/-} <i>Trp53</i> ^{+(-)/-}		<i>Paxx</i> ^{-/-} <i>Mri</i> ^{-/-}	<i>Dna-pkcs</i> ^{-/-}
					<i>Trp53</i> ^{+/-}	<i>Trp53</i> ^{-/-}		
19.51	5.46	10.36	1.14	12.17	0.03	0.49	8.3	0.08
17.39	11.43	15.61	1.66	9.96	0.01	0.34	12.54	0.05
18.17	18.99	13.88	1.09	24.65	0.49	0.56	17.64	0.09
9.23	15.66	19.32	0.96	15.97	0.59		18.51	
13.63	14.9	17.57		19.38	0.35		6.66	
12.38	6.88	13.25			0.37		8.13	
11.89	21.81	14.42			0.37		8.92	
9.844					0.27		5.51	
8.961							9.67	
9.96							15.61	
15.85							18.01	
19.29							10.36	
16.42								
12.85								

CD4+ splenocytes (×10⁶) in WT, *Xlf*^{-/-}, *Mri*^{-/-}, *Xlf*^{-/-}*Mri*^{-/-}*Trp53*^{+/-}, *Paxx*^{-/-}, *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+(-)/-} and *Paxx*^{-/-}*Mri*^{-/-} mice. *Dna-pkcs*^{-/-} mice were used as an immunodeficient control. *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+(-)/-} is a combination of *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+/-} and *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{-/-}.

Supplementary Table 4. Summary of splenic CD8+ T cells.

WT	<i>Xlf</i> ^{-/-}	<i>Mri</i> ^{-/-}	<i>Xlf</i> ^{-/-} <i>Mri</i> ^{-/-} <i>Trp53</i> ^{+/-}	<i>Paxx</i> ^{-/-}	<i>Xlf</i> ^{-/-} <i>Paxx</i> ^{-/-} <i>Trp53</i> ^{+(-)/-}		<i>Paxx</i> ^{-/-} <i>Mri</i> ^{-/-}	<i>Dna-pkcs</i> ^{-/-}
					<i>Trp53</i> ^{+/-}	<i>Trp53</i> ^{-/-}		
14.39	4.03	12.59	0.74	6.83	0.32	0.40	5.86	0.08
18.35	12.06	14.79	1.72	9.30	0.07	0.41	10.45	0.05
12.31	12.73	10.57	1.19	15.76	0.22	0.29	15.26	0.06
7.13	13.11	18.08	0.66	12.05	0.24		16.02	
9.70	9.67	15.62		14.11	0.02		5.60	
9.64	6.39	9.96			0.39		7.69	
7.96	14.92	12.09			0.20		7.16	
14.26							4.86	
12.96							7.28	
13.91							13.26	
11.62							14.87	
12.17							7.78	
10.88								
7.88								

CD8+ splenocytes (×10⁶) in WT, *Xlf*^{-/-}, *Mri*^{-/-}, *Xlf*^{-/-}*Mri*^{-/-}*Trp53*^{+/-}, *Paxx*^{-/-}, *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+(-)/-} and *Paxx*^{-/-}*Mri*^{-/-} mice. *Dna-pkcs*^{-/-} mice were used as an immunodeficient control. *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+(-)/-} is a combination of *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+/-} and *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{-/-}.

Supplementary Table 5. Summary of thymic CD4+ T cells.

WT	<i>Xlf</i> ^{-/-}	<i>Mri</i> ^{-/-}	<i>Xlf</i> ^{-/-} <i>Mri</i> ^{-/-} <i>Trp53</i> ^{+/-}	<i>Paxx</i> ^{-/-}	$\frac{Xlf^{-/-} Paxx^{-/-} Trp53^{+(-)/-}}{Trp53^{+/-} Trp53^{-/-}}$		<i>Paxx</i> ^{-/-} <i>Mri</i> ^{-/-}	<i>Dna-pkcs</i> ^{-/-}
9.88	8.45	8.63	1.32	6.01	0.66	0.13	5.53	0.02
9.06	3.41	10.16	0.48	8.77	0.07	0.06	8.40	0.001
10.48	11.88	6.74	0.89	12.88	0.07	0.19	4.31	0.01
16.33	7.05	7.95	0.65	11.10	0.11		6.77	0.02
7.50	6.67	15.23	0.50	9.80	0.40		6.85	
10.64	11.66	17.57			0.29		13.08	
7.12		15.94			0.19		9.52	
4.33		10.99			0.13		6.86	
2.55		15.88					12.67	
11.74		9.21					12.97	
13.15								
14.54								
14.41								
12.07								
11.39								
9.70								

CD4+ thymocytes ($\times 10^6$) in WT, *Xlf*^{-/-}, *Mri*^{-/-}, *Xlf*^{-/-}*Mri*^{-/-}*Trp53*^{+/-}, *Paxx*^{-/-}, *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+(-)/-} and *Paxx*^{-/-}*Mri*^{-/-} mice. *Dna-pkcs*^{-/-} mice were used as an immunodeficient control. *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+(-)/-} is a combination of *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+/-} and *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{-/-}.

Supplementary Table 6. Summary of thymic CD8+ T cells.

WT	<i>Xlf</i> ^{-/-}	<i>Mri</i> ^{-/-}	<i>Xlf</i> ^{-/-} <i>Mri</i> ^{-/-} <i>Trp53</i> ^{+/-}	<i>Paxx</i> ^{-/-}	$\frac{Xlf^{-/-} Paxx^{-/-} Trp53^{+(-)/-}}{Trp53^{+/-} Trp53^{-/-}}$		<i>Paxx</i> ^{-/-} <i>Mri</i> ^{-/-}	<i>Dna-pkcs</i> ^{-/-}
2.70	2.39	3.48	0.64	4.34	0.18	0.19	1.08	0.02
2.00	1.83	3.43	0.33	2.93	0.06	0.09	1.85	0.001
3.84	3.40	1.82	0.91	5.51	0.28	0.21	1.33	0.01
4.69	2.60	2.72	0.29	4.52	0.51		2.24	0.01
1.47	2.60	7.14	0.67	4.7	0.15		3.07	
2.11	3.59	6.40			0.23		6.2	
5.07		5.45			0.60		4.03	
3.26		4.28			0.49		3.16	
1.98							5.14	
3.91							5.11	
13.59								
11.68								
13.78								
3.47								
5.36								
4.90								
2.25								
4.56								

CD8+ thymocytes ($\times 10^6$) in WT, *Xlf*^{-/-}, *Mri*^{-/-}, *Xlf*^{-/-}*Mri*^{-/-}*Trp53*^{+/-}, *Paxx*^{-/-}, *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+(-)/-} and *Paxx*^{-/-}*Mri*^{-/-} mice. *Dna-pkcs*^{-/-} mice were used as an immunodeficient control. *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+(-)/-} is a combination of *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+/-} and *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{-/-}.

Supplementary Table 7. Summary of thymic CD4+CD8+ double positive T cells.

WT	<i>Xlf</i> ^{-/-}	<i>Mri</i> ^{-/-}	<i>Xlf</i> ^{-/-} <i>Mri</i> ^{-/-} <i>Trp53</i> ^{+/-}	<i>Paxx</i> ^{-/-}	<i>Xlf</i> ^{-/-} <i>Paxx</i> ^{-/-} <i>Trp53</i> ^{+(-)/-}		<i>Paxx</i> ^{-/-} <i>Mri</i> ^{-/-}	<i>Dna-pkcs</i> ^{-/-}
					<i>Trp53</i> ^{+/-}	<i>Trp53</i> ^{-/-}		
154.05	48.40	160.60	20.69	132.56	2.68	6.22	75.37	0.17
141.52	73.77	133.62	11.40	161.22	7.21	6.54	184.27	0.002
230.74	163.07	14.22	21.18	151.30	6.79	5.14	122.11	0.0002
147.74	95.47	165.78	17.78	208.39	3.39		105.44	0.001
138.62	115.71	154.74	17.71	202.99	3.72		88.37	0.002
98.78	115.77	193.15		161.06	4.43		168.00	
115.10	174.36	102.72		171.03	11.90		122.32	
66.71	144.88			100.87	5.18		87.20	
102.13	160.88			175.18			136.82	
162.51	105.29			197.59			153.47	
126.04	155.83						114.36	
79.43	90.46						136.39	
140.22	118.17						55.65	
146.71	183.46						96.22	
119.15	158.35							
	172.50							
	146.98							
	101.50							
	143.61							
	114.38							
	132.49							
	105.96							
	136.45							
	162.14							

CD4+CD8+ thymocytes ($\times 10^6$) in WT, *Xlf*^{-/-}, *Mri*^{-/-}, *Xlf*^{-/-}*Mri*^{-/-}*Trp53*^{+/-}, *Paxx*^{-/-}, *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+(-)/-} and *Paxx*^{-/-}*Mri*^{-/-} mice. *Dna-pkcs*^{-/-} mice were used as an immunodeficient control. *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+(-)/-} is a combination of *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+/-} and *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{-/-}.

Supplementary Table 8. Summary of IgM+ B cells in bone marrow.

WT	<i>Xlf</i> ^{-/-}	<i>Mri</i> ^{-/-}	<i>Xlf</i> ^{-/-} <i>Mri</i> ^{-/-} <i>Trp53</i> ^{+/-}	<i>Paxx</i> ^{-/-}	<i>Xlf</i> ^{-/-} <i>Paxx</i> ^{-/-} <i>Trp53</i> ^{+(-)/-}		<i>Paxx</i> ^{-/-} <i>Mri</i> ^{-/-}
					<i>Trp53</i> ^{+/-}	<i>Trp53</i> ^{-/-}	
19.80	7.82	17.10	3.04	17.8	2.19	3.26	15.90
16.70	11.00	16.30	1.47	14.3	2.53	4.01	16.70
18.60	8.47	16.00	1.42	15.9	4.09	3.55	14.30
10.10	6.04	15.80	1.10	11.9	0.37		14.00
14.10	7.68	13.80	1.57		4.60		10.10
11.60	6.06	11.50			4.35		9.82
12.40	12.40	14.90			1.50		7.34
13.90	10.60	13.00			3.76		8.22
14.10	5.79				5.19		14.60
14.50					6.20		14.10
13.70							
10.10							
12.10							

Frequencies (%) of B220+CD43-IgM+ B cells in WT, *Xlf*^{-/-}, *Mri*^{-/-}, *Xlf*^{-/-}*Mri*^{-/-}*Trp53*^{+/-}, *Paxx*^{-/-}, *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+(-)/-} and *Paxx*^{-/-}*Mri*^{-/-} mice. *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+(-)/-} is a combination of *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+/-} and *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{-/-}.

Supplementary Table 9. Summary of progenitor B cells in bone marrow.

WT	<i>Xlf</i> ^{-/-}	<i>Mri</i> ^{-/-}	<i>Xlf</i> ^{-/-} <i>Mri</i> ^{-/-} <i>Trp53</i> ^{+/-}	<i>Paxx</i> ^{-/-}	<i>Xlf</i> ^{-/-} <i>Paxx</i> ^{-/-} <i>Trp53</i> ^{+(-)/-}		<i>Paxx</i> ^{-/-} <i>Mri</i> ^{-/-}
					<i>Trp53</i> ^{+/-}	<i>Trp53</i> ^{-/-}	
6.00	21.6	3.74	24.90	8.92	33.70	20.10	7.53
7.47	8.73	4.31	14.50	4.40	28.40	24.00	7.04
3.38	17.5	9.53	17.20	4.07	23.20	25.60	8.64
6.96	10.9	7.03	14.90	3.81	21.90		10.9
5.02	9.61	6.73	19.00		26.80		9.00
5.49	7.99	6.58			27.10		6.28
2.75	5.31	4.17			25.10		6.76
4.25	7.16	4.28			17.30		6.20
7.58	6.08				22.20		3.32
7.47					25.50		4.06
5.03							
7.72							
8.29							

Frequencies (%) of B220+CD43-IgM- pro-B cells in WT, *Xlf*^{-/-}, *Mri*^{-/-}, *Xlf*^{-/-}*Mri*^{-/-}*Trp53*^{+/-}, *Paxx*^{-/-}, *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+(-)/-} and *Paxx*^{-/-}*Mri*^{-/-} mice. *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+(-)/-} is a combination of *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{+/-} and *Xlf*^{-/-}*Paxx*^{-/-}*Trp53*^{-/-}.

Supplementary Table 10. Lymphocytic development in the *Xlf*^{-/-}*Mri*^{-/-}*Trp53*^{+/-} mouse.

CD19+ B cells	Splenocytes (×10 ⁶)			Thymocytes (×10 ⁶)			Cell populations (%) in bone marrow	
	CD3+ T cells	CD4+ T cells	CD8+ T cells	CD4+ T cells	CD8+ T cells	CD4+CD8+ T cells	IgM+ B cells	Pro-B cells
0.11	0.80	0.53	0.41	0.42	0.41	15.70	2.71	19.40

Summary of splenic (×10⁶) B- and T cells; and T cell subpopulations in the thymus (×10⁶). Frequencies (%) in bone marrow of B220+CD43-IgM+ B cells and B220+CD43-IgM- pro-B cells.