Table S1. Hematopoietic composition of older *mcl-1* transgenic mice

Organ / Cell type	6 mo C57BL/6J	6 mo *mcl-1*(33)	12 mo C57BL/6J	12 mo *mcl-1*(33)
Peripheral blood	4.60±0.71	**10.74±2.32****	3.66±1.24	**18.90±7.03****
$CD4^+CD8^-$	0.64±0.24	**1.39±0.13****	0.32±0.22	**1.34±0.46****
$CD4^-CD8^+$	0.49±0.22	**1.73±0.40****	0.38±0.17	**2.33±0.64****
$B220^+$ IgM/IgD$^-$	0.07±0.01	**0.42±0.23***	0.11±0.03	**1.02±0.56***
$B220^+$ IgM/IgD$^+$	1.69±0.55	**4.97±1.58****	1.59±1.02	**11.00±4.76****
$Mac1^+$	0.55±0.08	1.09±0.48	0.24±0.06	**1.45±0.91***
$Mac1^+$ $Gr1^+$	0.20±0.07	0.27±0.07	1.51±0.42	**6.15±2.18****
Spleen	78.84±25.91	**261.40±73.22****	88.34±36.63	**228.02±54.85****
$CD4^+CD8^-$	16.16±5.52	**30.23±4.9****	12.92±7.07	**41.56±10.88****
$CD4^-CD8^+$	11.31±3.93	**27.7±7.98***	6.36±3.09	**20.98±5.29****
$B220^+$ IgM/IgD$^-$	5.10±2.73	**21.19±9.11***	9.55±8.99	**34.49±14.33***
B220+ IgM/IgD$^+$	34.57±10.99	**111.97±23.37*****	41.27±13.82	**87.91±21.28***
$Mac1^+$	4.27±0.93	**9.62±2.58****	7.01±2.16	10.69±2.28
$Mac1^+Gr1^+$	1.02±0.41	1.60±1.03	5.29±1.99	5.74±1.91
$Ter-119^+$	5.87±5.91	**24.84±13.81***	12.42±7.87	**31.95±3.50****
LN	15.74±3.39	**46.52±14.14****	10.80±4.27	**26.07±1.84*****
$CD4^+CD8^-$	4.87±.95	**15.77±3.46*****	2.49±1.03	**6.94±1.00*****
$CD4^-CD8^+$	4.81±.80	**14.16±4.17****	1.90±0.93	**6.18±0.70*****
$B220^+$ IgM/IgD$^-$	0.62±0.09	**4.19±2.44***	0.43±0.16	**2.03±0.37*****
$B220^+$ IgM/IgD$^+$	4.83±1.78	**9.97±3.22***	5.65±2.46	**10.17±1.48***
BM	31.26±4.96	25.50±3.66	26.97±6.51	26.28±2.03
$Ter-119^+$	12.41±1.71	**8.30±1.55***	7.74±1.30	**5.16±1.35***
$Thy1^+$	1.67±0.16	**2.20±0.38***	1.67±0.52	2.07±0.39
$B220^+$ IgM/IgD$^-$	1.80±0.38	1.52±0.45	1.62±0.63	2.37±0.96
$B220^+$ IgM/IgD$^+$	2.05±0.24	**3.85±0.75****	1.98±0.28	**3.75±0.80****
$Mac1^+$	6.56±0.86	5.51±1.05	3.31±0.98	3.04±0.66
$Mac1^+Gr1^+$	0.42±0.04	**0.36±0.02***	11.67±2.20	9.71±0.56
Thymus	89.72±22.68	**170.28±26.13****	63.76±10.14	**82.89±8.27***
$CD4^-CD8^-$	5.90±1.21	7.89±1.53	13.97±15.07	9.11±3.78
$CD4^+CD8^+$	73.53±21.53	**147.05±21.18****	50.04±6.01	**62.77±3.24****
$CD4^+CD8^-$	5.73±1.33	**8.97±1.59***	4.81±1.88	6.41±2.53
$CD4^-CD8^+$	4.56±1.22	6.39±2.00	3.12±1.00	4.59±1.43

Nucleated cells x 10^6, except peripheral blood cells x 10^6/ml.

Nucleated cells (mean ± SD), 4 female mice per genotype.

Significantly different to WT at same age * P< 0.05 ** P< 0.01 *** P< 0.001

(Student's T test)

Table S2. vavP-*mcl-1* tumor phenotype

Age(d)	Mouse	Immunophenotype
mcl-1(33)		
176	33#29	Primitive progenitor cell[a] (CD4$^+$ Thy1$^+$ Gr1$^-$)
312	33#37	Primitive progenitor cell[a] (CD4$^+$ Thy1$^+$ Gr1$^-$)
231	33#81	Primitive progenitor cell[a] (CD4$^+$ Thy1$^+$ Gr1$^-$)
247	33#90	Primitive progenitor cell[a] (CD4$^+$ Thy1$^+$ Gr1$^-$)
208	33#152	Primitive progenitor cell[a] (CD4$^+$ Thy1$^+$ Gr1^{lo})
359	33#30	Pre B cell[b]
204	33#106	Pre B cell[b]
537	33#48	B cell[c]
473	33#150	B cell[c]
498	33#18	Myeloid[d] (Mac1$^+$ Gr1$^+$ CD43$^+$ Sca1$^-$ B220$^-$ CD4$^-$)
mcl-1(4)		
525	4#34	Primitive progenitor cell[a] (CD4$^-$ Thy1^{lo+} Gr1$^+$ Mac1$^+$)
511	4#39	Primitive progenitor cell[a] (CD4$^+$ CD8$^+$ Thy1$^+$ Gr1$^-$)
511	4#40	Primitive progenitor cell[a] (CD4$^-$ Thy1$^+$ Gr1$^-$)
612	4#27	Pre B cell[b]
506	4#41	Pre B cell[b]
552	4#55	Pre B cell[b]
544	4#58	Pre B cell[b]
550	4#140	Pre B cell[b]
423	4#50	B-cell[c]
612	4#26	Myeloid[d] (Mac1$^+$ Gr1$^+$ Thy1$^+$ Sca1$^+$)
mcl-1(8)		
470	8#36	Primitive progenitor cell[a] (CD4$^+$ Thy1$^-$ Gr1$^-$)
505	8#51	Primitive progenitor cell[a] (CD4$^+$ Thy1$^+$ Gr1$^+$)
506	8#87	Primitive progenitor cell[a] (CD4$^+$ Thy1$^-$ Gr1$^-$)
456	8#9	Pre B cell[b]
571	8#70	Pre B cell[b]
499	8#94	Pre B cell[b]
mcl-1(37)		
493	37#45	Pre B cell[b]
526	37#46	Pre B cell[b]
582	37#37	Myeloid[d] (Mac1$^+$ Sca1$^+$)
556	37#56	CD4$^+$ T cell

[a] Primitive progenitor cell tumors were all Sca1$^+$B220$^+$CD19$^-$IgM$^-$IgD$^-$ and varied for CD4, Thy1, Gr1 and other markers as indicated.

[b] Pre-B cell tumors were B220$^+$CD19$^+$IgM$^-$IgD$^-$

[c] B cell tumors were B220$^+$Ig$^+$

[d] myeloid tumors were Mac1$^+$ and/or Gr1$^+$ and lacked any lymphoid markers.

Table S3. Phenotype of tumors arising in *bim*$^{+/-}$ vavP-*mcl-1* mice

Age (d)	*Mouse*	*Immunophenotype*
198	#64	Primitive progenitor cell[a] (CD4$^+$ Thy1$^+$ Gr1$^-$)
491	#81	Primitive progenitor cell[a] (CD4$^+$ Thy1$^+$ Gr1$^-$)
545	#62	Pre B[b]
400	#80	Pre B[b]
555	#84	Pre B[b]
555	#85	Pre B[b]
441	#115	Pre B[b]
546	#116	Pre B[b]
415	#122	Pre B[b]
390	#83	CD4$^+$ T cell

[a] Primitive progenitor cell tumors were all Sca1$^+$B220$^+$CD19$^-$IgM$^-$IgD$^-$ and varied for CD4, Thy1, Gr1 and other markers as indicated.

[b] Pre-B cell tumors were B220$^+$CD19$^+$IgM$^-$IgD$^-$

Table S4. Phenotype of tumors arising in vavP-*mcl-1*/ Eµ-*myc* mice

Age (d)	Mouse	Immunophenotype
34	#40	B-cell[a,c]
34	#52	B-cell[a,c]
30	#75	B-cell[a,c]
27	#126	B-cell[a,c]
31	#160	Pre-B[a,d]
25	#294	B-cell[a,c]
47	#773	Primitive progenitor cell[b,e] ($CD4^+$ $Thy1^+$ $Gr1^+$)
51	#774	Primitive progenitor cell[b,e] ($CD4^+$ $Thy1^+$ $Gr1^{lo}$)
47	#781	Primitive progenitor cell[b,e] ($CD4^+$ $Thy1^+$ $Gr1^+$)
51	#782	Primitive progenitor cell[b,e] ($CD4^+$ $Thy1^+$ $Gr1^-$)
51	#783	Primitive progenitor cell[b,e] ($CD4^+$ $Thy1^{lo}$ $Gr1^-$)
36	#816	Primitive progenitor cell[b,e] ($CD4^+$ $Thy1^+$ $Gr1^+$)
38	#817	Primitive progenitor cell[b,e] ($CD4^+$ $Thy1^+$ $Gr1^+$)
38	#818	Primitive progenitor cell[b,e] ($CD4^+$ $Thy1^+$ $Gr1^+$)
36	#819	Primitive progenitor cell[b,e] ($CD4^+$ $Thy1^+$ $Gr1^+$)
36	#820	Primitive progenitor cell[b,e] ($CD4^+$ $Thy1^+$ $Gr1^+$)
36	#821	Primitive progenitor cell[b,e] ($CD4^+$ $Thy1^+$ $Gr1^+$)
44	#837	Primitive progenitor cell[b,e] ($CD4^+$ $Thy1^+$ $Gr1^+$)

[a] Tumors arising in mice from conventional transgenic cross

[b] Tumors arising in mice reconstituted with vavP-*mcl-1*/Eµ-*myc* fetal liver cells

[c] B cell tumors were $B220^+CD19^+IgM^+/IgD^+$

[d] Pre-B cell tumors were $B220^+CD19^+IgM^-IgD^-$

[e] Primitive progenitor cell tumors were all $Sca1^+B220^+CD19^-IgM^-IgD^-$ and varied for CD4, Thy1, Gr1 and other markers as indicated.

**Figure S1. Frequency of RBCs, circulating platelets and marrow megakaryocytes in *mcl-1* transgenic mice**
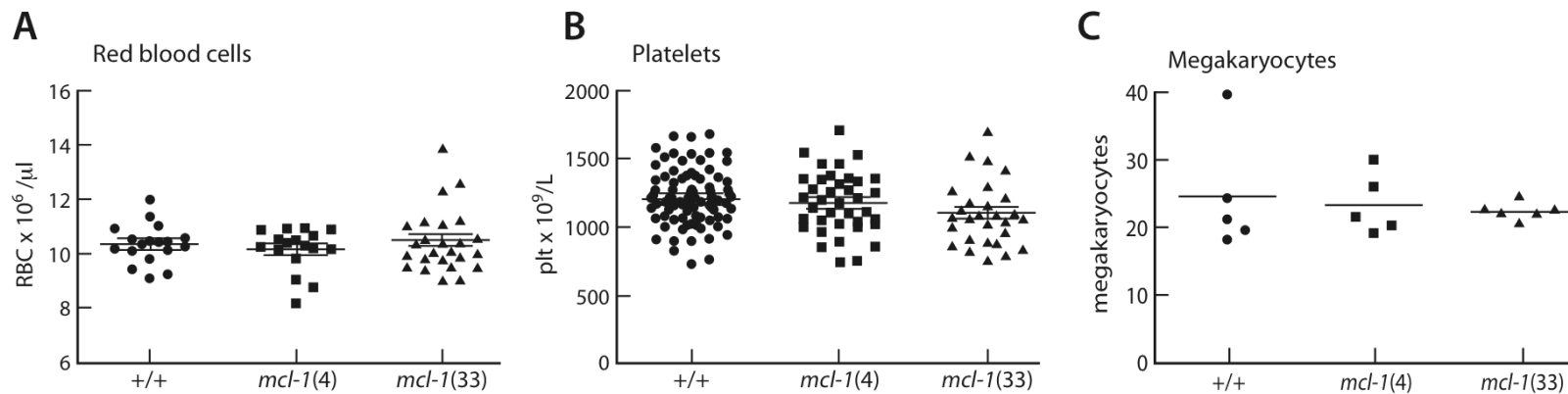
(A, B) Peripheral blood cells from 6-8 wk old mice were quantified using an ADVIA hematology analyzer. (A) Red blood cell count: WT 10.37 x 10^6/µl ± 0.17, n=18; *mcl-1*(4) 10.17 ± 0.19, n=17; *mcl-1*(33) 10.48 ± 0.23, n=25. (B) Platelet count: WT 1218 x 10^9/L ± 21.82, n=86; *mcl-1*(4) 1187 ± 36.12, n=38; *mcl-1*(33) 1100 ± 43.94, n=28; WT versus *mcl-1*(33) *P=0.01 (Student T Test). (C) Sternum megakaryocytes from 6-8 wk old male mice, expressed as counts per 3 fields (x 200 magnification): WT 24.7 ± 3.8, n=5; *mcl-1*(4) 23.5 ± 2, n=5; *mcl-1*(33) 22.4 ± 0.5, n=6. Values represent mean ± SEM.

Figure S2. Elevated Mcl-1 protects peripheral T cells against apoptosis *in vitro*
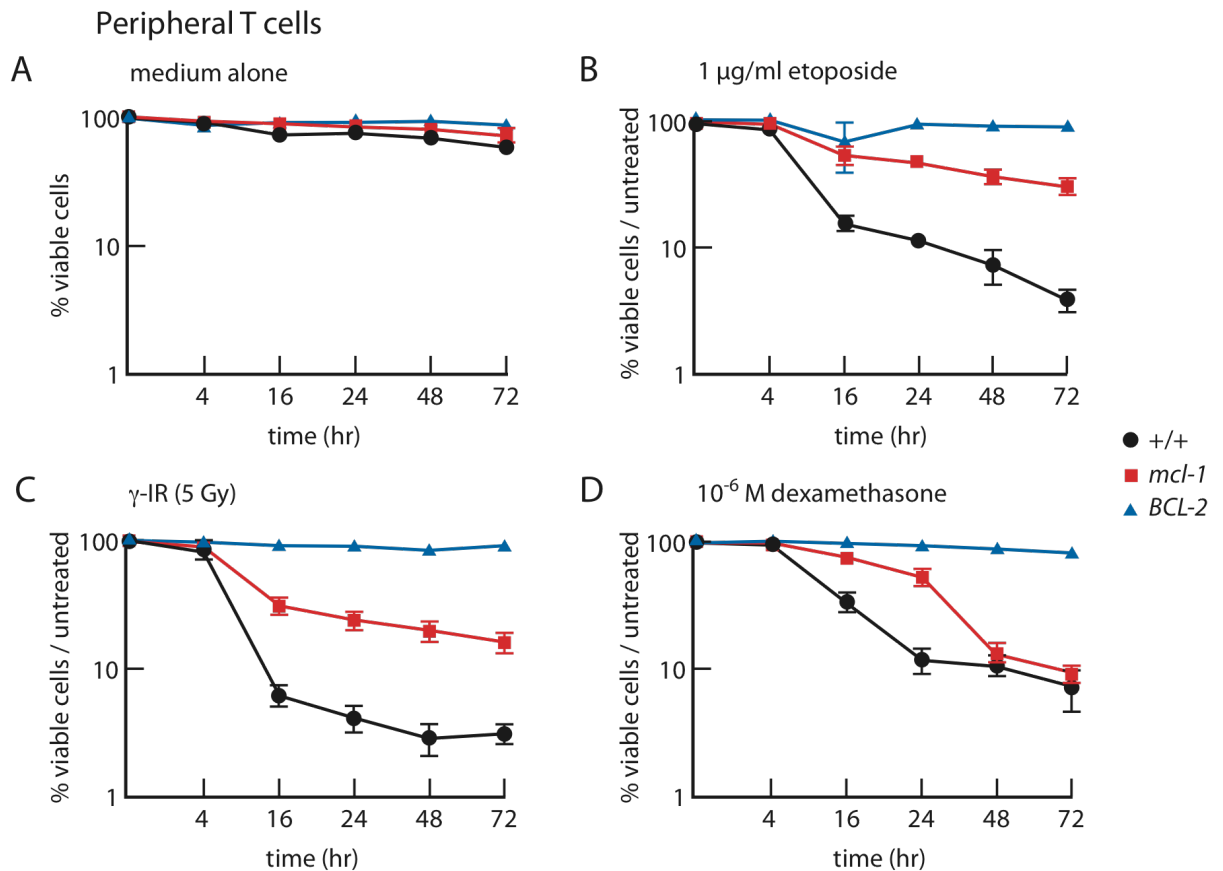

Thy1+ T cells sorted from LNs of individual WT (black, n=7-9), vavP-*mcl-1*(33) (red, n=7-9) and vavP-*BCL-2* mice (blue, n=4) were cultured *in vitro* for 3 d without cytokines (A) or after exposure to γ-irradiation (5 Gy) (C) or in the presence of 1 μg/ml etoposide (B) or 10^{-6}M dexamethasone (D) and viability was assayed by flow cytometry (cells negative for propidium iodide uptake and annexin V surface staining) at the indicated intervals. In B, C and D, values have been normalized to viability in untreated cultures (A) to show stimuli-specific apoptosis. Values represent mean ± SEM

Figure S3. Elevated Mcl-1 protects peripheral B cells against apoptosis *in vitro*
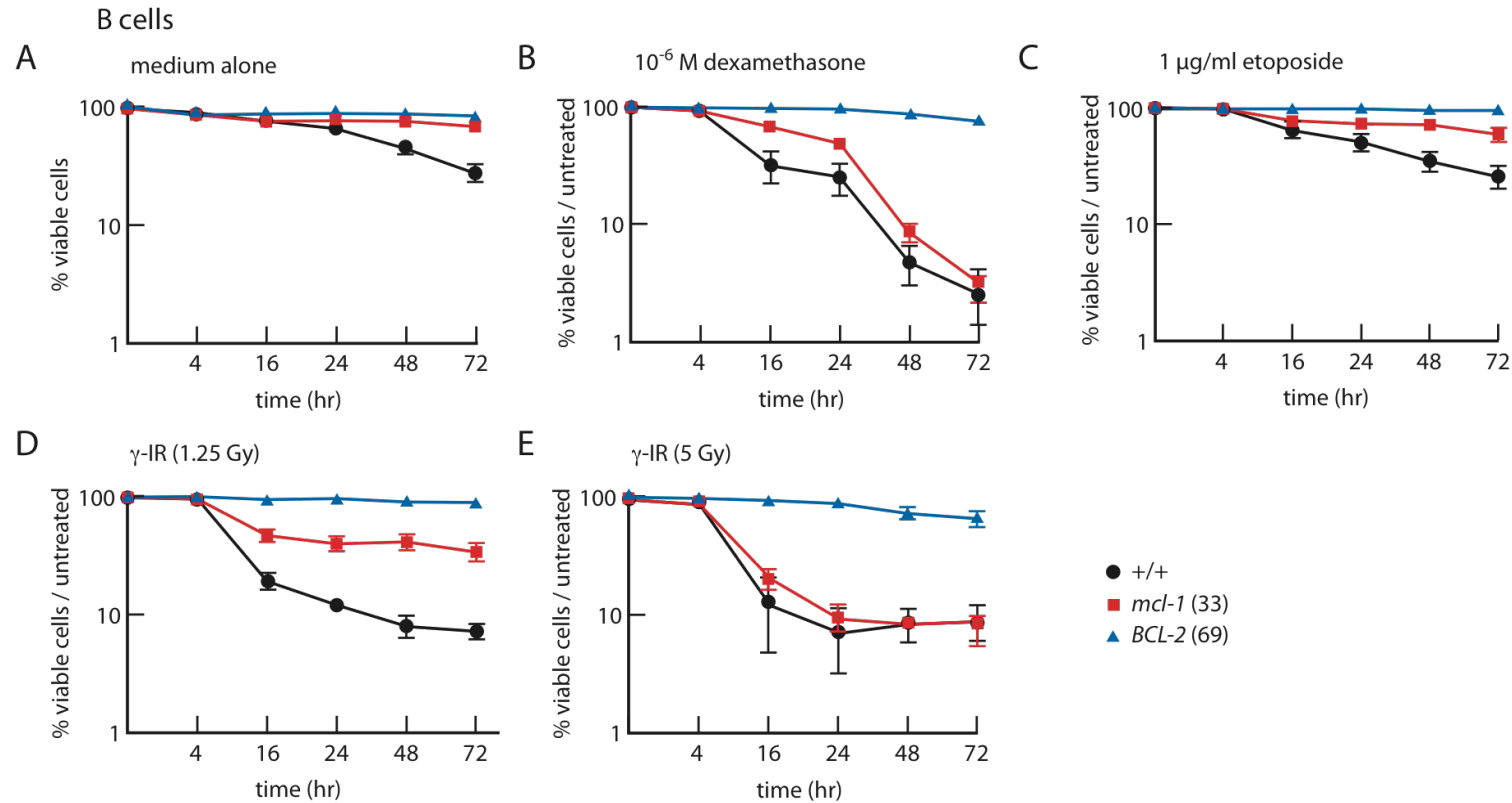
B cells (B220$^+$) cells sorted from the LNs of individual WT (black, n=6-7), vavP-*mcl-1*(33) (red, n=7) and vavP-*BCL-2* mice (blue, n=4) were cultured *in vitro* for 3 d without cytokines (A) or after exposure to γ-irradiation (1.25 or 5 Gy) (D, E respectively) or in the presence of 10^{-6}M dexamethasone (B) or 1 μg/ml etoposide (C) and viability was assayed by flow cytometry (cells negative for propidium iodide uptake and annexin V surface staining) at the indicated intervals. In B to E, values have been normalized to viability in untreated cultures (A) to show stimuli-specific apoptosis. Values represent mean ± SEM.

Figure S4. Histopathology of vavP-*mcl-1* mice
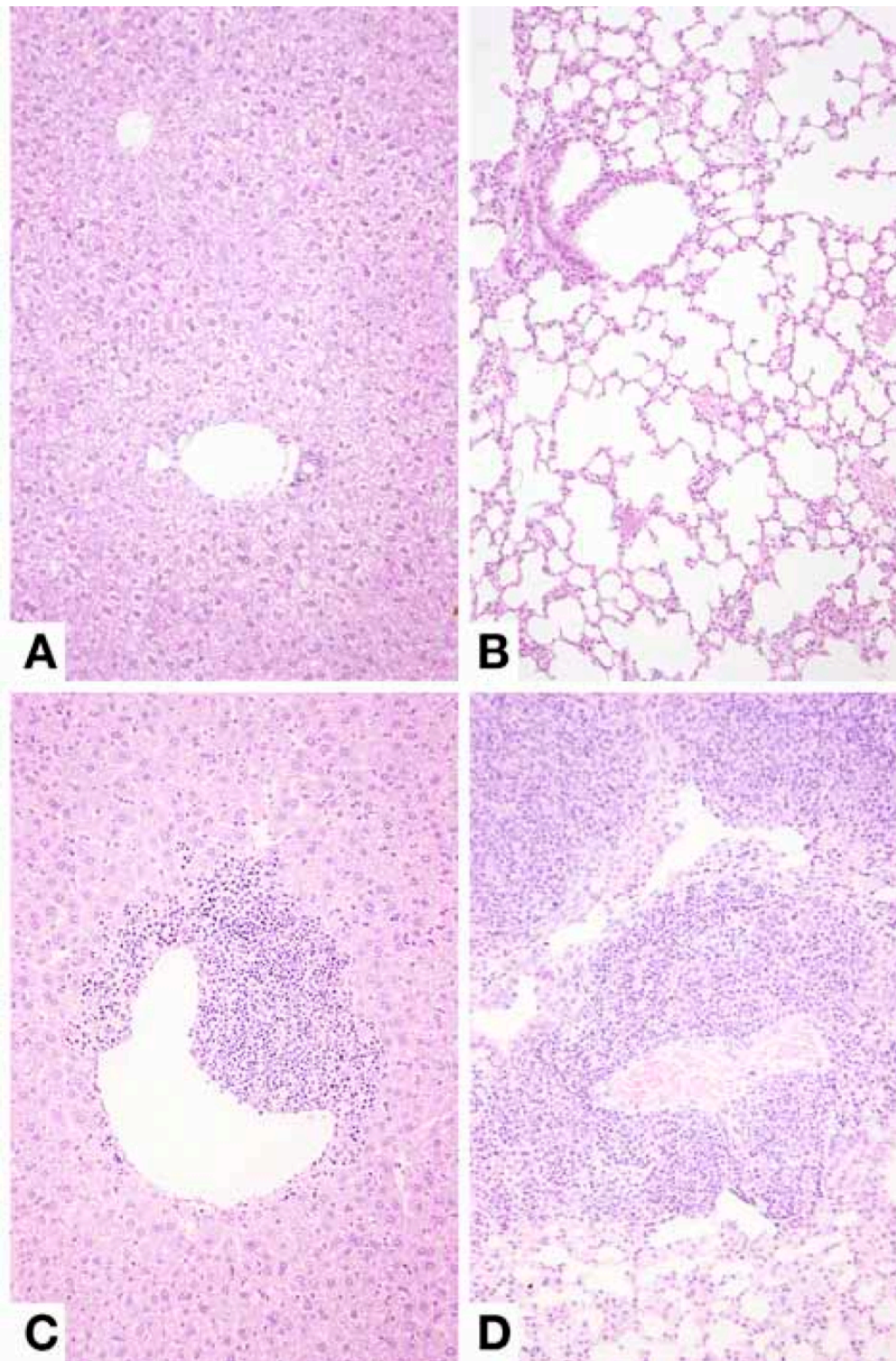
(A, B) Young (6-8 wk old) vavP-*mcl-1* transgenic mice exhibit normal histopathology in (A) liver and (B) lung. (C, D) Aged (>12 mo old) vavP-*mcl-1* transgenic mice accumulate lymphoid cells in (C) liver and (D) lung. Sections were stained with haematoxylin/eosin. Magnification X 10.