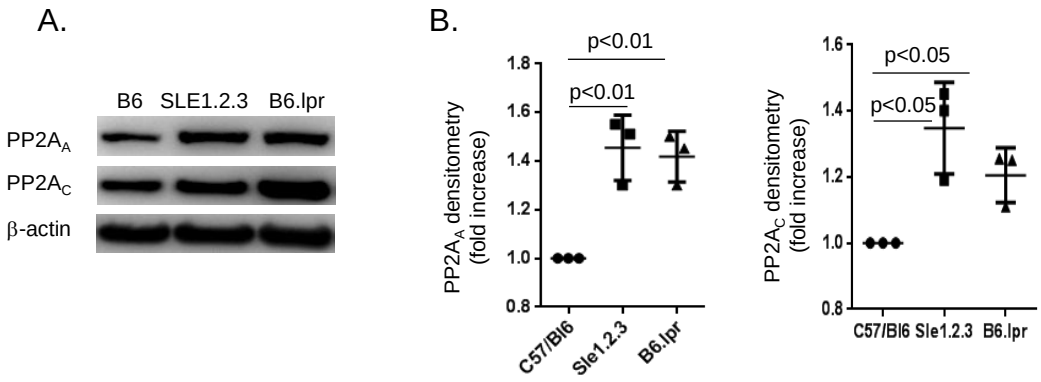
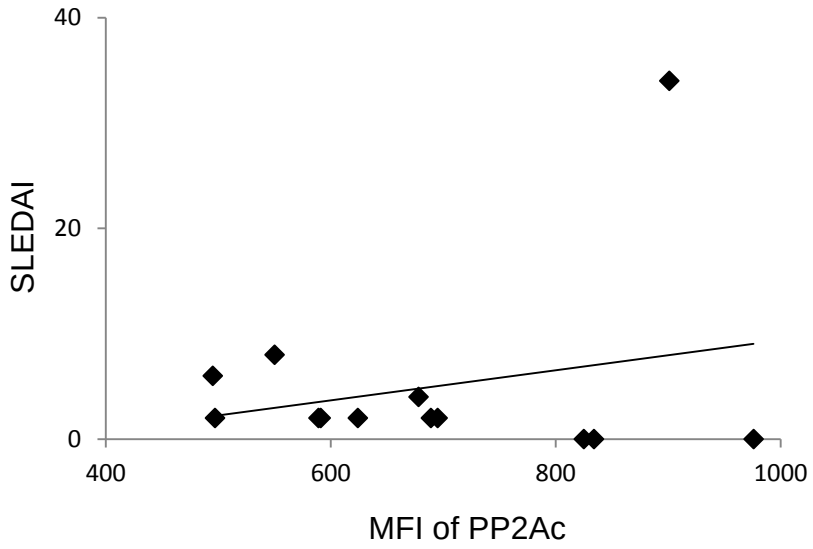
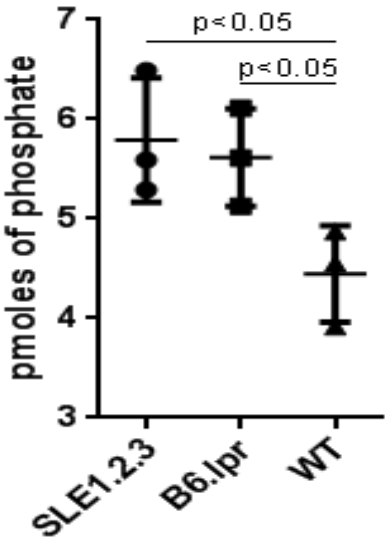


Supplementary Figure 1. Increased PP2A expression in B cells from lupus-prone mice.

A. Western blot analysis on the expression of both scaffold ($PP2A_A$) and catalytic ($PP2A_C$) subunits in splenic B cells from indicated mice.
B. Quantification of western blots (n=3).

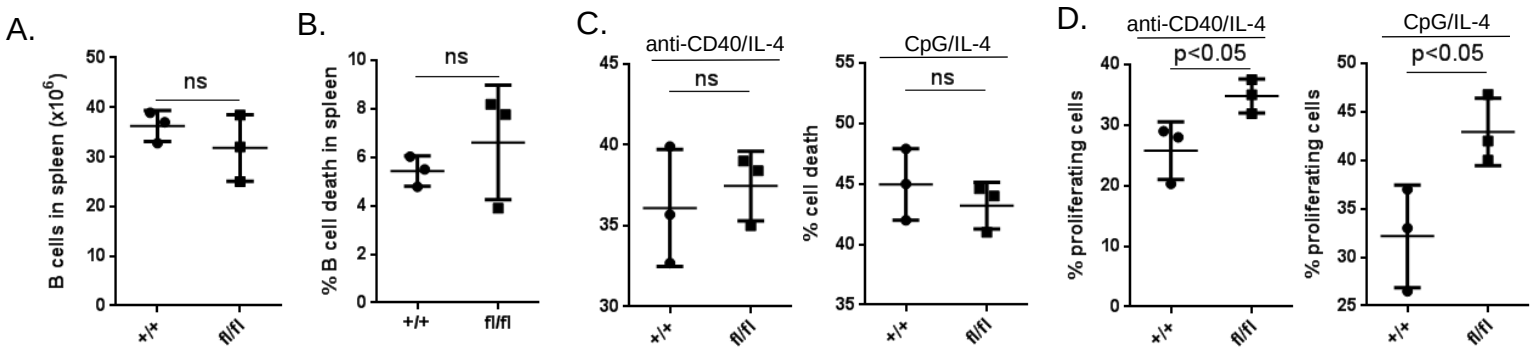


Supplementary Figure 2. Correlation between SLEDAI scores and mean fluorescence intensity (MFI) of PP2Ac in total circulating B cells from SLE patients.

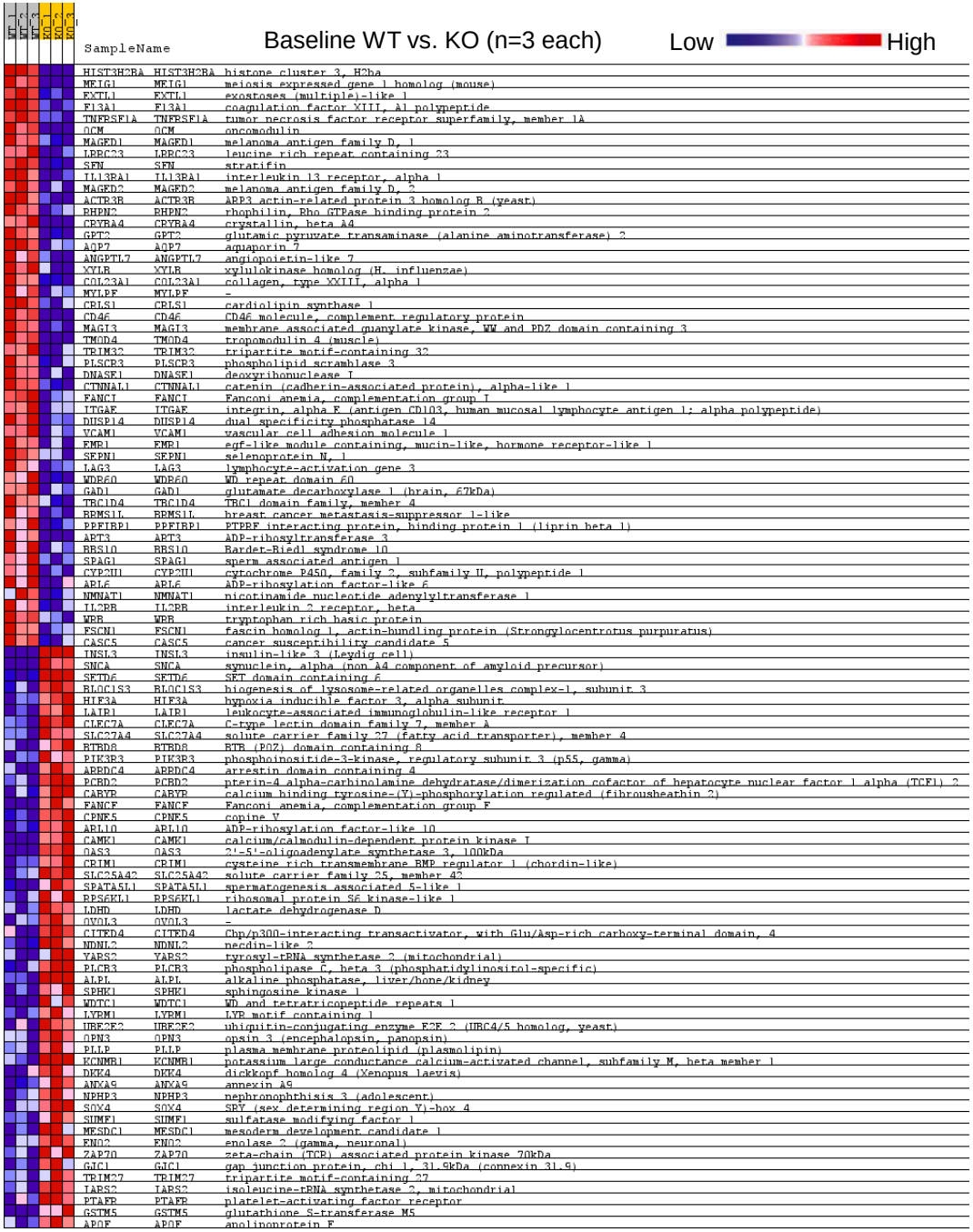


Supplementary Figure 3. Increased PP2A activity in B cells from lupus-prone mice.

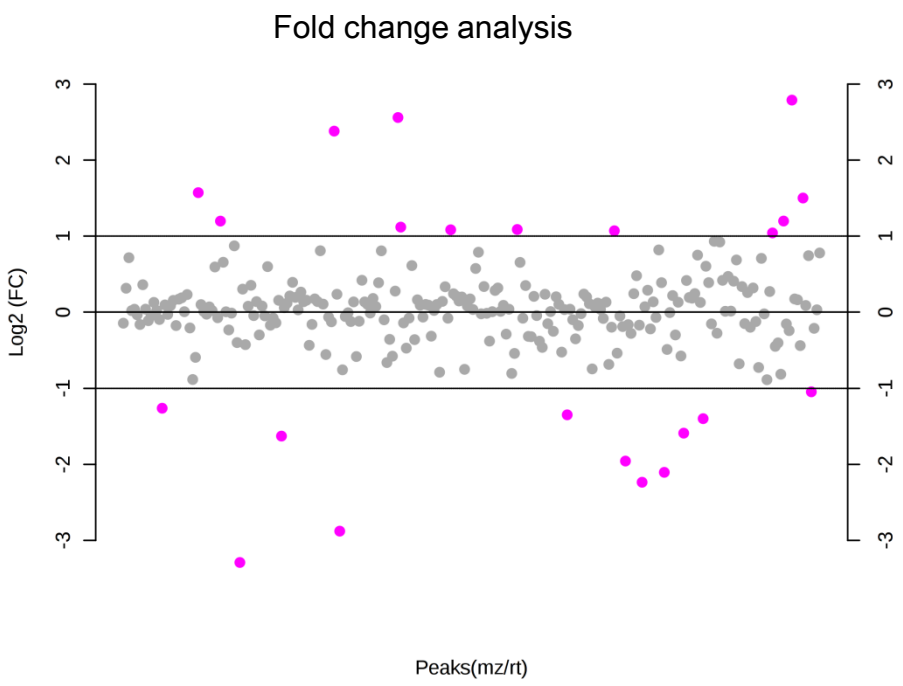
PP2A phosphatase activity was quantified using a kit from R&D. The activity of PP2A is presented as the rate of phosphate release (pmol x 10^2).



Supplementary Figure 4. Equal proliferation and surviving rates of B cells from *flox/flox* mice and control mice with or without indicated stimulations.



Supplementary Table. Expression pattern of indicated genes in B cells from WT vs KO



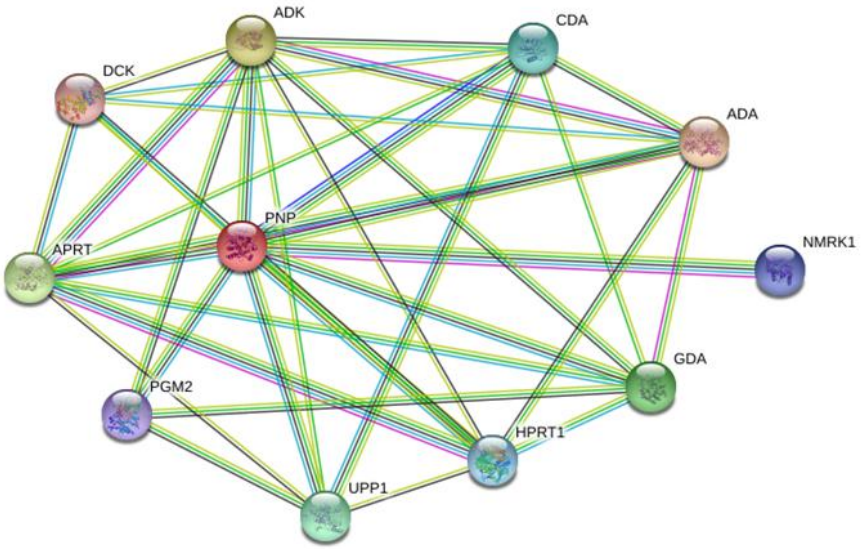
Pink dots represent >2 fold change metabolites (WT/KO).

	Fold Change
phenylpyruvate	0.10216
deoxyinosine	0.13593
putrescine	6.9171
dCDP-nega	5.9015
thymidine	5.2131
N-carbamoyl-L-aspartate	0.21229
N-acetyl-glutamate	0.23237
Pyridoxamine	0.25751
glucono--lactone	0.32335
cystathionine	0.33212
acetylphosphate	2.9753
Nicotinamide Riboside	2.8328
acadesine	0.3791
N-Acetylputrescine	0.3925
nicotinate	0.41686
FAD	2.2966
Hydroxyphenylacetic acid	2.2955
5-phosphoribosyl-1-pyrophosphate	2.173
4-aminobutyrate	2.1266
dATP-nega	2.1208
2-Aminooctanoic acid	2.1019
phosphocreatine	0.48406
NAD posi	2.0606

Supplementary Figure 5. Targeted metabolomics analysis

Metabolites were extracted from cells and polar metabolomics profiling (303 metabolites) was performed by using Liquid Chromatography-Tandem Mass Spectroscopy (LC/MS). Metabolomics data was analyzed using MetaboAnalyst 4.0. Metabolites with ≥2-fold changes between groups were shown.

A



B

Name	p.value	FDR
Adenine phosphoribosyltransferase	0.00014769	0.023926
Adenosine kinase	4.67E-12	8.55E-10
Deoxycytidine kinase	0.00029112	0.046675
Phosphoglucomutase-2	7.12E-13	1.26E-10
Purine nucleoside phosphorylase	3.46E-13	8.93E-11

Supplementary Figure 6. Alteration of PNP pathway in B cells with PP2Aa deficiency.

A. Predicted proteins directly interacting with PNP on STRING database.
B. Genes on PNP pathways with significant alterations (P<0.05, *t*-test) obtained from RNA-seq data. FDR: false discovery rate.