a.

SSC | FSC

SSC | Lin

c-kit | Sca-1

HSC   MPP
SSC | CD93

IL-7Rα | Lin

% of max | c-kit — CLP

b.

Mature B cells — IgD | IgM

Immature B cells — IgD | IgM

B220 | CD24

Pre B cells — IgD | IgM

SSC | FSC

B220 | CD19

B220 | CD93

B220 | CD43

B220 | CD24

Pro B cells — IgD | IgM

B220 | CD43

B220 | CD93

IgD | IgM

Pre-pro B cells — B220 | CD24

c.

SSC | FSC

B220 | CD19
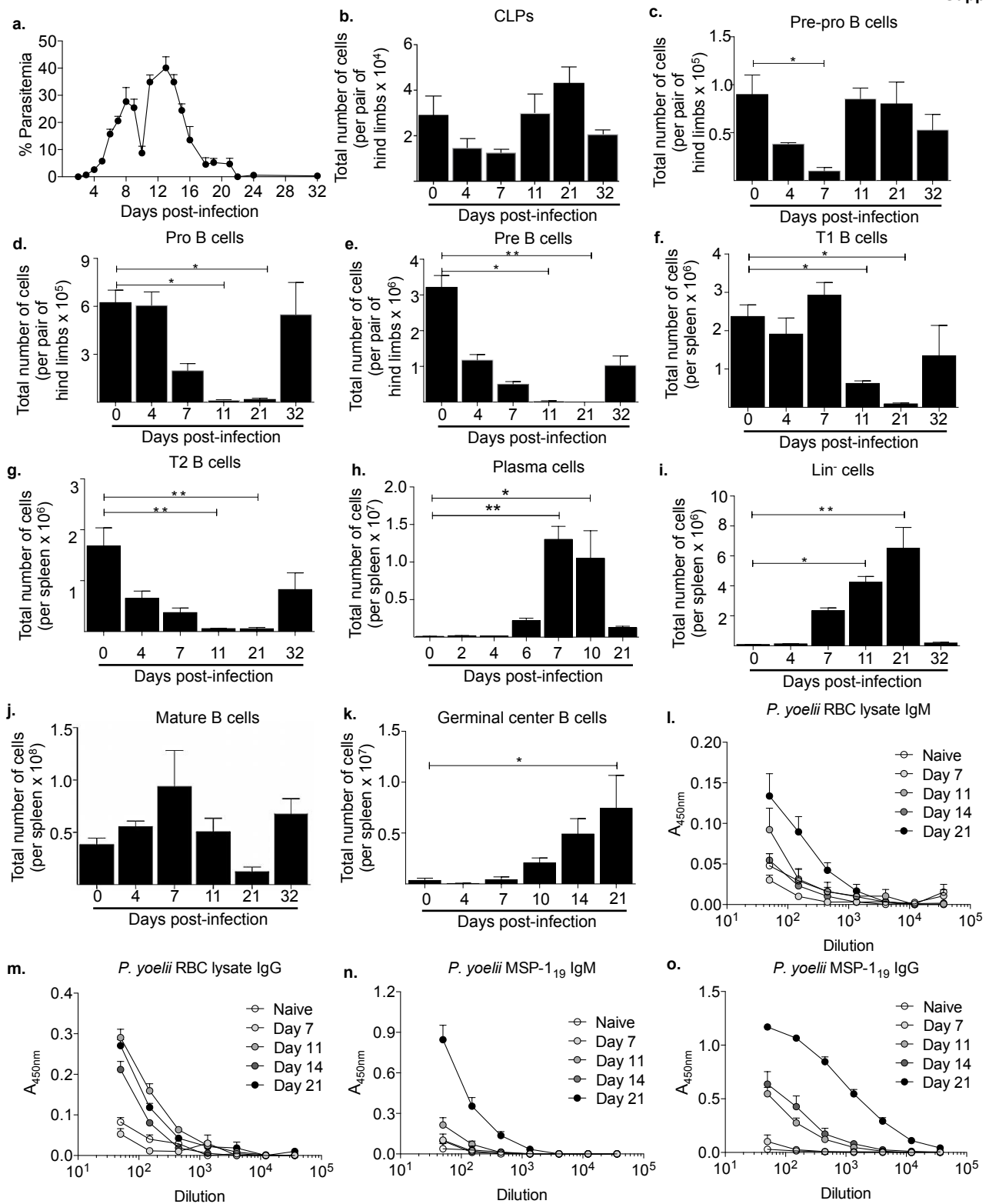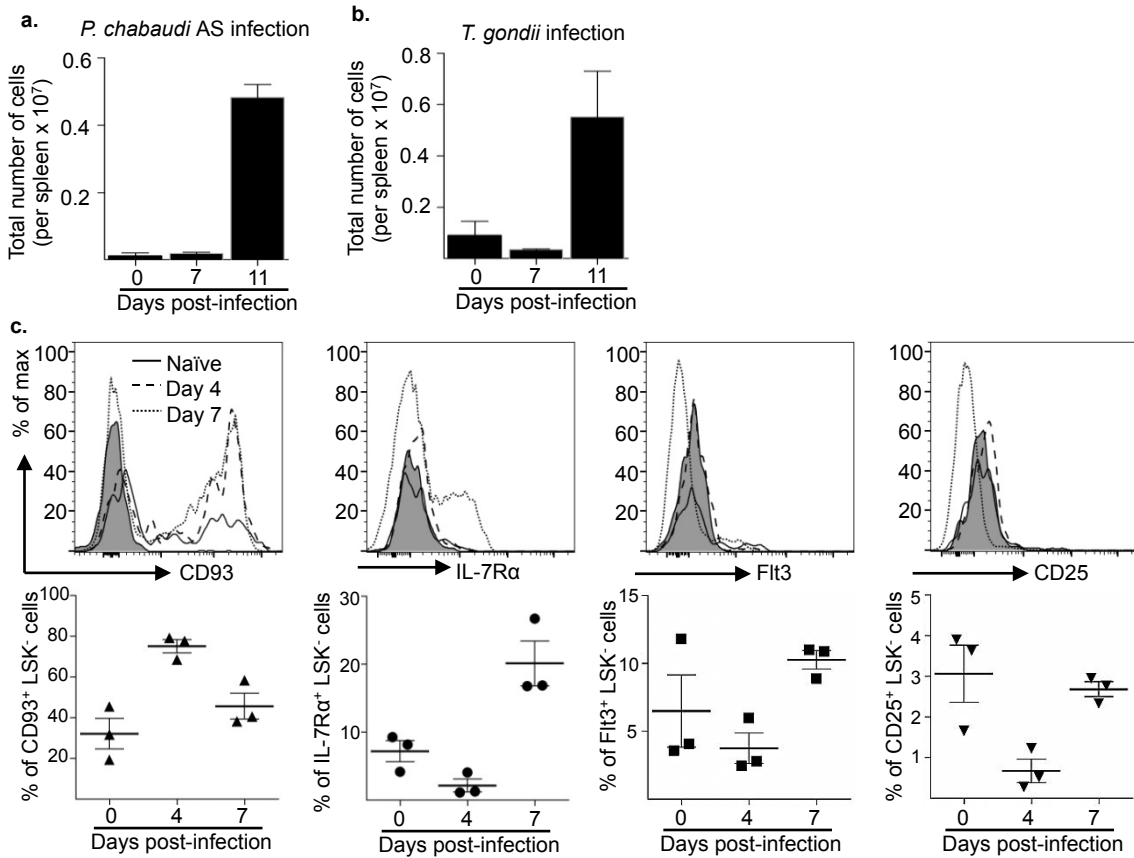
CD19 | CD93

T1   T2
T3
IgM | CD23

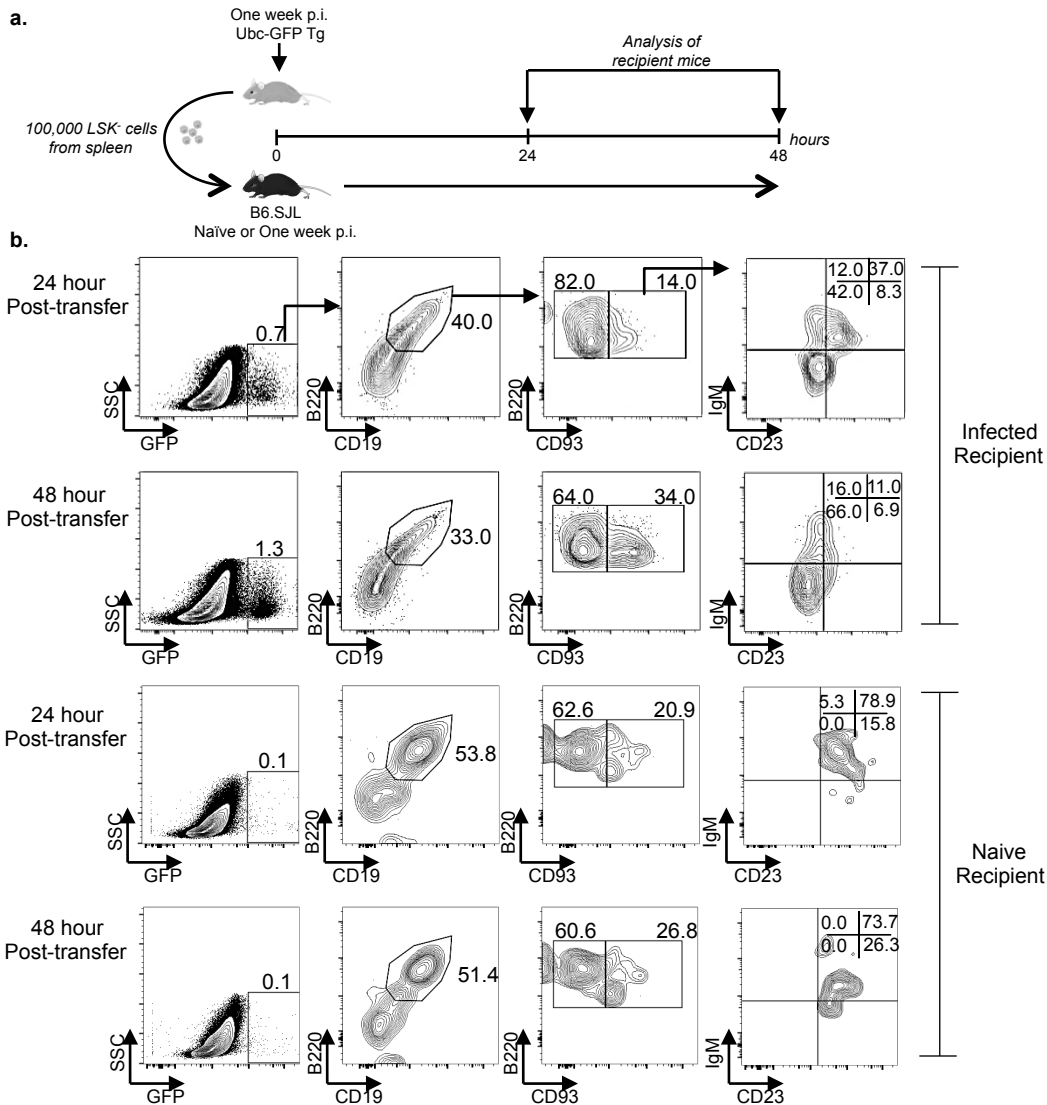**Supplemental Figure 1. Gating strategies to identify progenitor cell and B cell precursor populations. a.** Live bone marrow cells stained with Lin markers (CD3e, CD4, CD5, CD8, B220, NK1.1, CD11b, CD11c, Gr-1, and Ter-119), Sca-1, c-kit, CD93, IL-7Rα; lymphocytes were gated based on FSC-A and SSC-A. Lin$^-$ population was gated based on the FMO control. LSK$^-$cells (Lin$^-$Sca-1$^+$c-kit$^-$), HSCs (Lin$^-$Sca-1$^+$c-kit$^+$CD93$^-$), MPPs (Lin$^-$Sca-1$^+$c-kit$^+$CD93$^+$), and CLPs (Lin$^-$Sca-1^{lo}c-kit^{lo}IL-7Rα$^+$) were selected based on the gating strategy shown. **b.** Live bone marrow cells were stained with Lin markers (CD3e, CD4, CD5, CD8, NK1.1, CD11b, CD11c, Gr-1, and Ter-119), CD19, B220, CD93, IgM, CD43, and CD24. Lymphocytes were gated based on characteristic FSC-A and SSC-A morphology. Gating strategy for selecting pre-pro B cells (Lin$^-$B220$^+$CD19$^-$CD43$^+$CD93$^+$IgM$^-$IgD$^-$CD24$^+$), pro-B cells (CD19$^+$B220$^+$CD93$^+$CD43^{hi} CD24^{int}IgM$^-$IgD$^-$), pre-B cells (CD19$^+$B220$^+$CD93$^+$CD43^{int}CD24^{hi}IgM$^-$IgD$^-$), immature B cells (CD19$^+$B220$^+$CD93$^+$IgM$^+$IgD$^-$) and mature B cells (CD19$^+$B220$^+$CD93$^-$IgM$^+$IgD$^+$) is shown. **c.** Lymphocytes in the spleen were gated based on FSC-A and SSC-A morphology. T1 B cells (CD19$^+$B220$^+$CD93$^+$IgM$^+$CD23$^-$), T2 B cells (CD19$^+$B220$^+$CD93$^+$IgM$^+$CD23$^+$), and T3 B cells (CD19$^+$B220$^+$CD93$^+$IgM$^-$CD23$^+$) were gated as shown based on the indicated phenotypes.

Supplemental Figure 2. Effect of *Plasmodium yoelii* 17X infection on lymphoid progenitors and B-cell precursors in the bone marrow and spleen of C57BL/6 mice a. Representative parasitemia curve following i.p. infection of 10^5 pRBC into WT C57BL/6 mice. Total number of **b.** CLPs, **c.** Pre-pro B cells, **d.** Pro B cells, and **e.** Pre B cells, from the bone marrow of naïve (day 0) or *P. yoelii* 17X infected mice based on the gating strategy shown in Supplemental Figure 1. Total number of splenic **f.** T1 B cells, **g.** T2 B cells, **h.** Plasma cells. **i.** Lineage negative (Lin-) cells, **j.** Mature B cells, and **k.** Germinal center B cells from naïve (day 0) or *P. yoelii* 17X infected mice based on the gating strategy shown in Supplemental Figure 1. Relative **(l, m)** *P. yoelii* 17X infected RBC lysate **(n, o)** or MSP-1$_{19}$ –specific antibody response as measured by ELISA at days 0, 7, 11, 14 and 21 p.i. Data are representative of two independent experiments, with n = 3-5 mice per group/ time point; Error bars **(a-o)** S.E.M.

Supplemental Figure 3. LSK⁻ cell phenotype with different parasite infections. Total number of LSK⁻ cells in the spleen of naïve or C57BL/6 mice after days 7 and 11 of **a.** *Plasmodium chabaudi* AS infection or **b.** *Toxoplasma gondii* infection. **c.** Representative histogram plots and percentage of bone marrow derived LSK⁻ cells showing expression of CD93 (triangle), IL-7Rα (circle), Flt3 (square), and CD25 (inverted triangle) in naïve (solid line) and C57BL/6 mice after 4 (dashed line), and 7 (dotted line) days of *P. yoelii* 17X infection. The FMO (fluorescent minus one) controls are shown as grey filled histograms. Data are representative of two independent experiments (**c**), with n = 3-5 mice per group/ time point; Error bars (**a-c**) S.E.M.

Supplemental Figure 4. Splenic LSK⁻ cells differentiate into B cells within 24 hours during *Plasmodium* infection. a. LSK⁻ cells were sorted from the spleen of Ubc-GFP Tg mice, one week post *P. yoelii* 17X infection, and 100,000 cells (GFP⁺CD45.2⁺) were transferred into naïve congenic (CD45.1) mice or at the same stage of infection (day 7 p.i.). The spleens of recipient mice were harvested 24 and 48 hour post-transfer. **b.** The splenocytes were enriched for donor (CD45.2⁺) cells and fluorochrome conjugated antibodies were used to sub-analyze the donor (GFP⁺) cell population based on the gating strategy displayed.