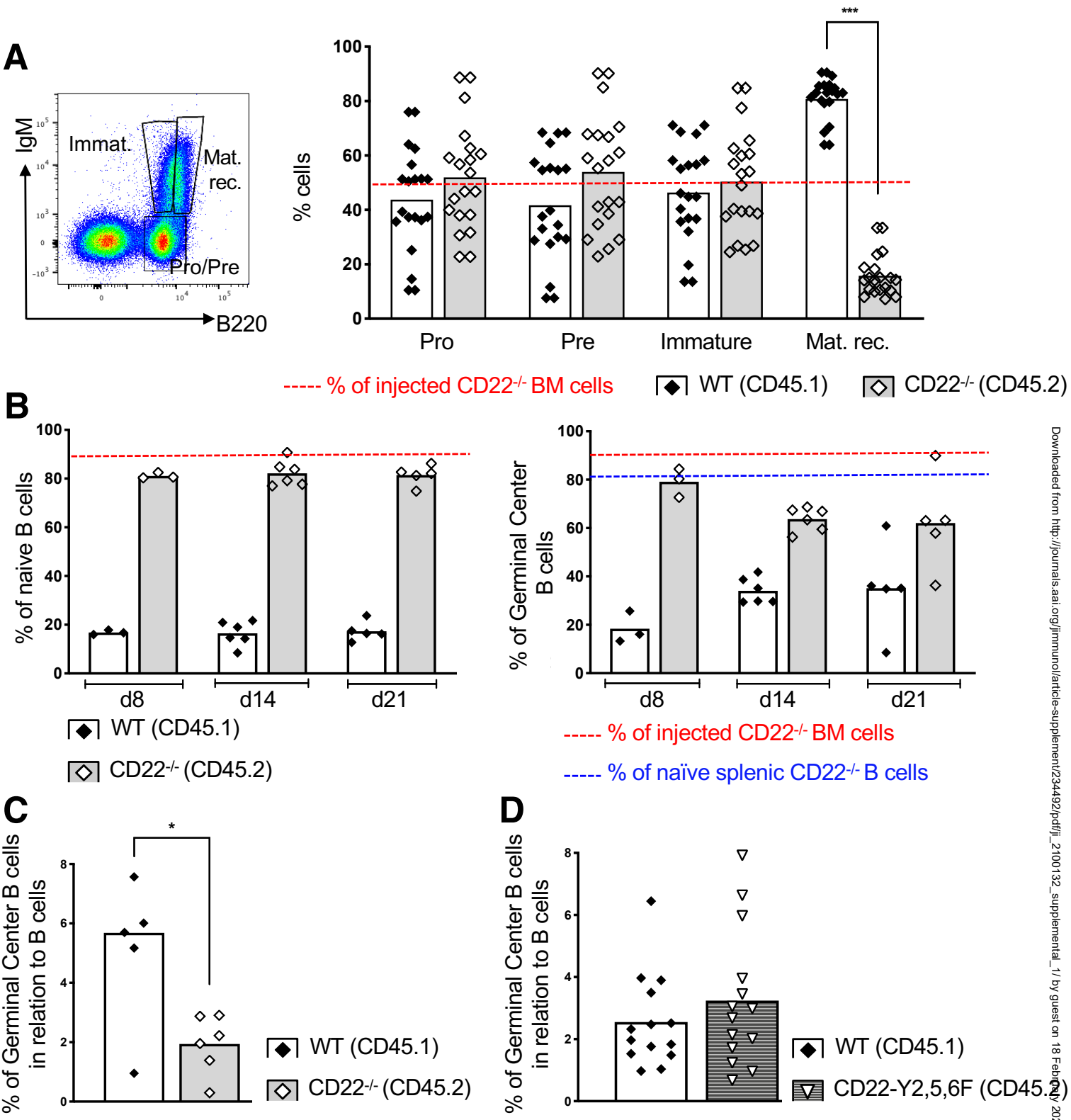


Supplementary Figure 1: Analysis of Germinal Center reaction in mixed bone marrow chimera, generated from 50 % CD22$^{-/-}$ + 50 % WT (CD45.1) (A), 90 % CD22$^{-/-}$ + 10 % WT (CD45.1) (B, C) or 50 –70 % CD22-Y2,5,6,F + 50-30 % WT (CD45.1) (D) bone marrow cells.

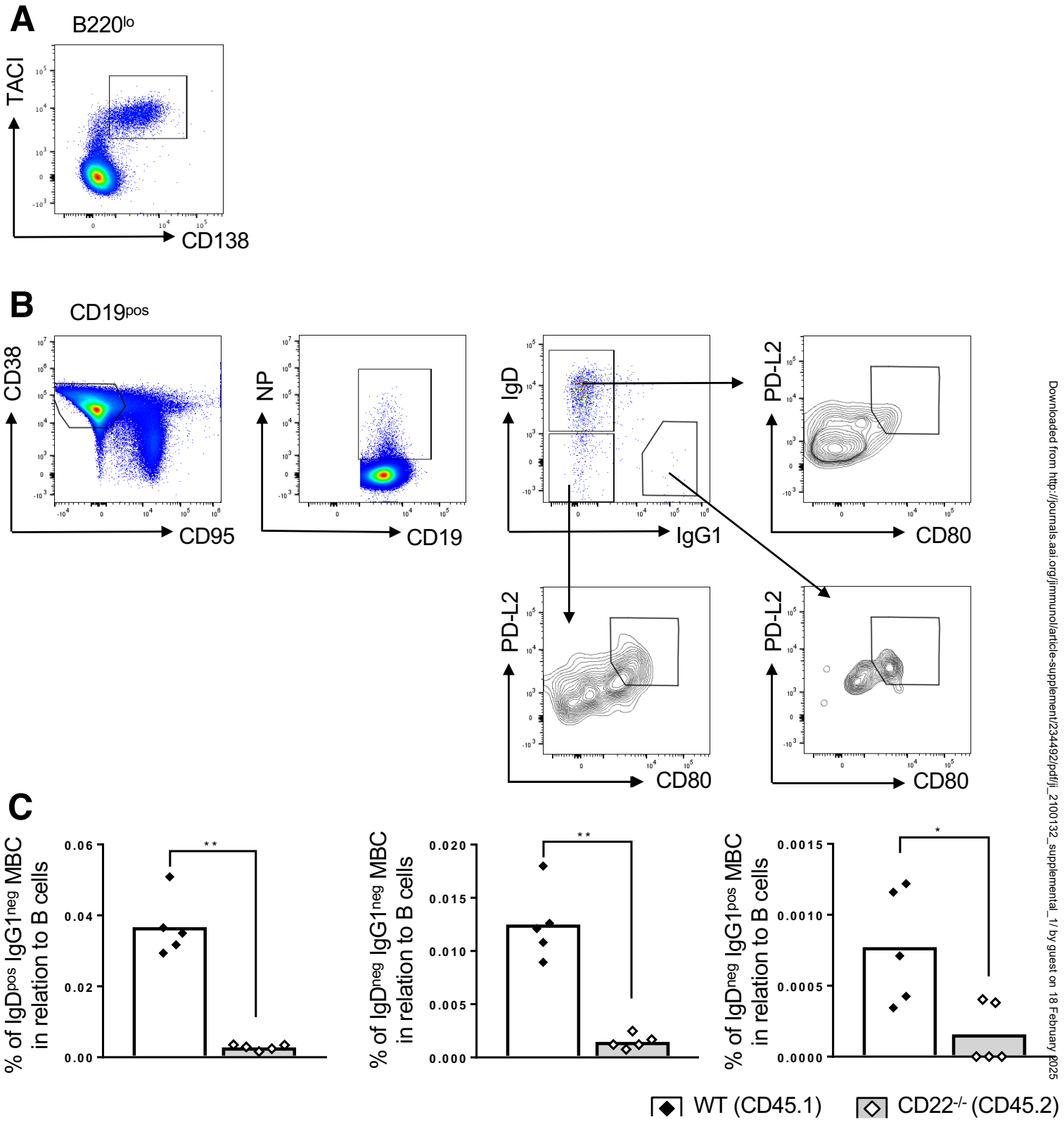
A) Bone marrow single cell suspensions from mixed bone marrow chimera were stained with indicated antibodies and analyzed by flow cytometry. Dot plot shows gating strategy for indicated bone marrow B cell subsets. Bar Chart shows percentage of CD22$^{-/-}$ (CD45.2^{pos}) and WT (CD45.1^{pos}) Pro-B cells (B220^{pos} IgM^{neg}, c-kit^{pos}, CD25^{neg}) Pre-B cells (B220^{pos} IgM^{neg}, c-kit^{neg}, CD25^{pos}), immature B cells (B220^{pos} IgM^{pos}) and mature recirculating B cells (B220^{hi} IgM^{pos}). Pro = Pro-B cells, Pre = Pre-B cells, Imm. = Immature B cells, Mat. Rec. = Mature recirculating B cells

B) Bar chart shows percentage of CD22$^{-/-}$ (CD45.2^{pos}) and WT (CD45.1^{pos}) naïve splenic B cells (left) or Germinal Center B cells (right) from mixed bone marrow chimera. Analyses were performed 8, 14 and 21 days after NP-KLH immunization. The red dotted line represents the percentage of originally injected CD22$^{-/-}$ (CD45.2^{pos}) bone marrow cells at reconstituting of irradiated recipients to generate mixed bone marrow chimera. The blue dotted line shows the average percentage of CD22$^{-/-}$ (CD45.2^{pos}) naïve B cells at day of analysis. BM = Bone marrow.

C) Bar charts show percentage of CD22$^{-/-}$ (CD45.2^{pos}) and WT (CD45.1^{pos}) Germinal Center B cells of all B220^{pos} cells in relation to the genotype specific (CD45.1^{pos} or CD45.2^{pos}) B220^{pos} B cell population in mixed bone marrow chimera (based on data from B). Analyses were performed at day 14 after NP-KLH immunization.

D) Bar charts show percentage of CD22-Y2,5,6F (CD45.2^{pos}) and WT (CD45.1^{pos}) Germinal Center B cells of all B220^{pos} cells in relation to the genotype specific (CD45.1^{pos} or CD45.2^{pos}) B220^{pos} B cell population in mixed bone marrow chimera. Analyses were performed at day 14 after NP-KLH immunization.

Data information: In (A-D), data are presented as mean. Each dot represents one mouse. Data in (A) were collected from 6, in (B,C) from 1 per time point and in (D) from 2 independent experiments. Graphs show data from (A) 20 mice, (B) 3-6 mice per time point, (C) 6 mice and (D) 14 mice. *p < 0.05, ***p < 0.001 (Mann-Whitney test).



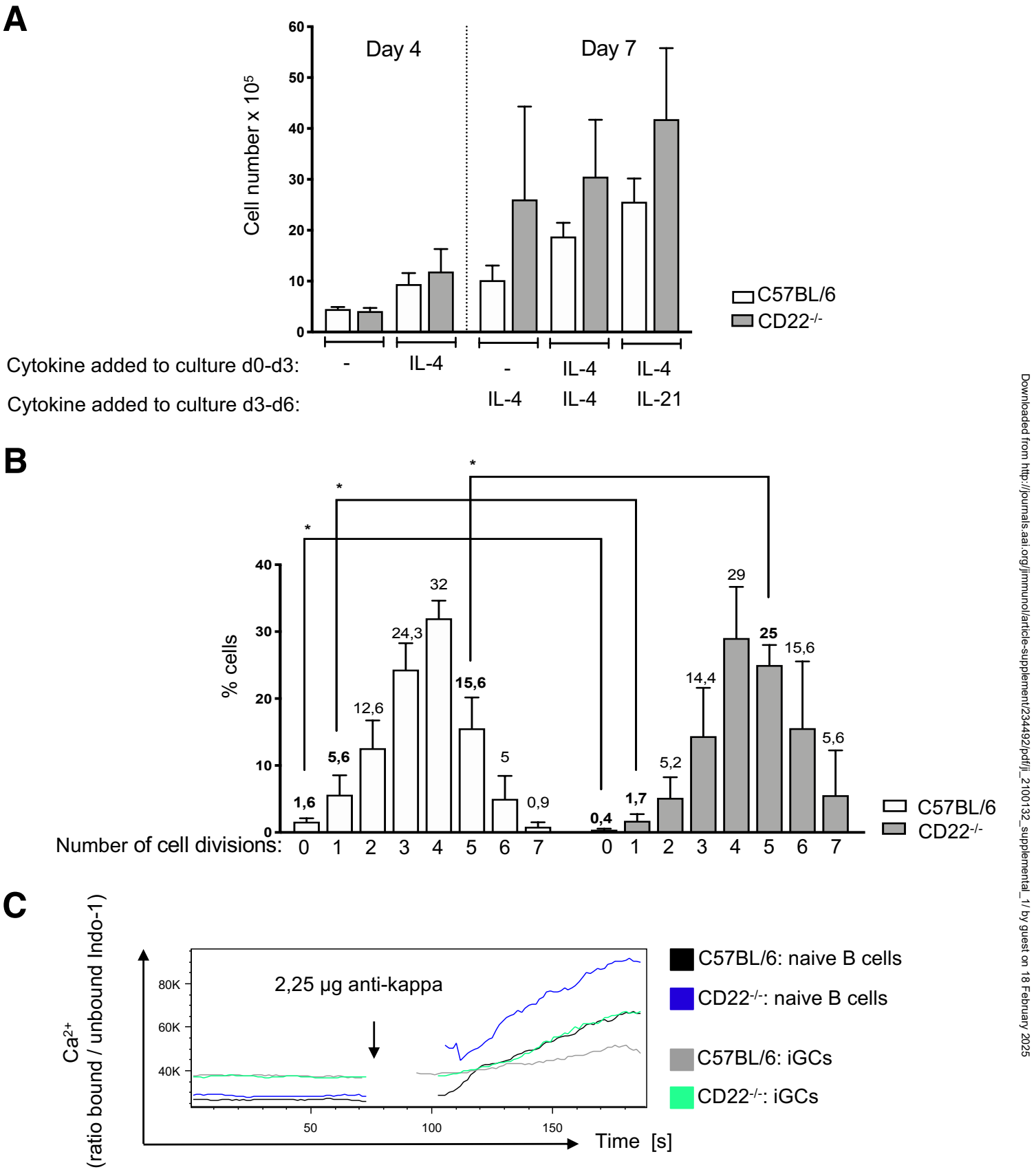
Supplementary Figure 2: Analysis of plasma cells (A) and memory B cells (C,D) in NP-KLH immunized mixed bone marrow chimeras, generated from CD22$^{-/-}$ and WT (CD45.1) bone marrow cells.

A) Splenic single cell suspensions from mixed bone marrow chimera were stained with indicated antibodies and analyzed by flow cytometry. Dot plot shows gating strategy for Plasma cells (B220^{lo} CD138^{pos} TACI ^{pos}).

B) Splenic single cell suspensions from mixed bone marrow chimera were stained with indicated antibodies and analyzed by flow cytometry. Dot plots show gating strategy for IgD^{pos} IgG1^{neg} NP-specific memory B cells (CD19^{pos} CD38^{pos} CD95^{neg} NP^{pos} IgD^{pos} IgG1^{neg} CD80^{pos} PD-L2^{pos}), IgD^{neg} IgG1^{neg} memory B cells (CD19^{pos} CD38^{pos} CD95^{neg} NP^{pos} IgD^{neg} IgG1^{neg} CD80^{pos} PD-L2^{pos}) and IgD^{neg} IgG1^{pos} memory B cells (CD19^{pos} CD38^{pos} CD95^{neg} NP^{pos} IgD^{neg} IgG1^{pos} CD80^{pos} PD-L2^{pos}).

C) Bar charts shows percentage of CD22$^{-/-}$ (CD45.2^{pos}) and WT (CD45.1^{pos}) IgD^{pos} IgG1^{neg} NP-specific memory B cells, IgD^{neg} IgG1^{neg} NP-specific memory B cells and IgD^{neg} IgG1^{pos} NP-specific memory B cells in relation to genotype specific (CD45.1^{pos} or CD45.2^{pos}) CD19^{pos} B cells from mixed bone marrow chimera. Analyses were performed at day 14 after NP-KLH immunization. MBC = Memory B cells.

Data information: In (C), data are presented as mean. Each dot represents one mouse. Data were collected from 5 mice in 1 experiment.
*p < 0.05, **p < 0.01 (Mann-Whitney test).



Supplementary Figure 3: Proliferation and signaling analysis of *in vitro* generated Germinal Center B cells (iGCs) from C57BL/6 and CD22$^{-/-}$ mice.

A) Germinal center cultures were generated *in vitro*. Therefore splenic naïve B cells were isolated from C57BL/6 and CD22$^{-/-}$ mice and cultivated on inactivated 40LB feeder cells in the presence of indicated cytokines (1 ng/ml IL-4 or 10 ng/ml IL-21) for 3-76 days. At day 3 and 6 cells were counted by hemocytometer and total cell number was calculated.

B) Proliferation analyses of C57BL/6 and CD22$^{-/-}$ iGCs were performed. Therefore splenic naïve B cells were isolated from C57BL/6 and CD22$^{-/-}$ mice, labeled with CTV and cultivated on inactivated 40LB feeder cells in the presence of IL-4 or for 3 days. Cells were analyzed via flow cytometry. Bar chart shows percentage of cells that underwent a certain number of cell divisions.

C) 2x10^6 splenic cells or iGCs of the indicated genotype were loaded with Indo-1. Ca^{2+} baseline was measured under unstimulated conditions for 50 sec, afterwards BCR was stimulated. Ca^{2+} mobilization was continued to 3 min. Curves show nBCs (B220^{pos} GL7^{neg} PNA^{neg}) and iGCs (B220^{pos} GL7^{pod} PNA^{pos}). Data shown are representative of 5 independent experiments. iGC BC = *In vitro* induced germinal center B cells.

Data information: In (A,B), data are presented as mean ± SD and show the results of 4 independent experiments. (C) shows a representative example of 5 independent experiments *p < 0.01 (Mann-Whitney test).