Figure S1: Schematic for single cell cloning of donor MHC-II specific B cells and expression of BCRs as recombinant mIgG1.

Step 1: I-E^{d-}-binding B cells identified with decoy MHC tetramer approach	Step 2: Sort single I-E^d-binding B cells into 384-well plates	Step 3: Clone VDJ from heavy chain and VJ from light chain from single B cells

Step 4: Express paired heavy and lights chains as mIgG1/Kappa mAbs

Step 5: Test mIgG1/Kappa mAb for MHC specificity

Step 6: VDL Sequence analysis from heavy chain

Viability/ DUMP — CD19

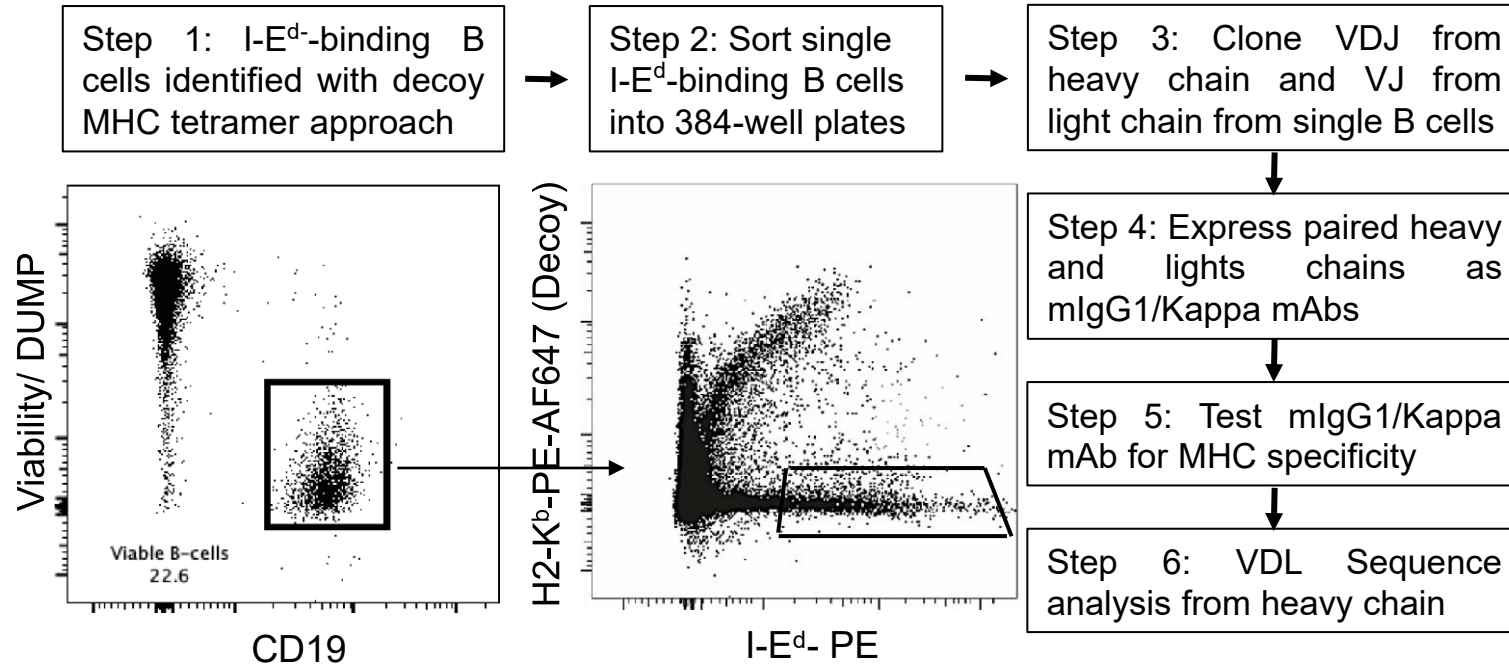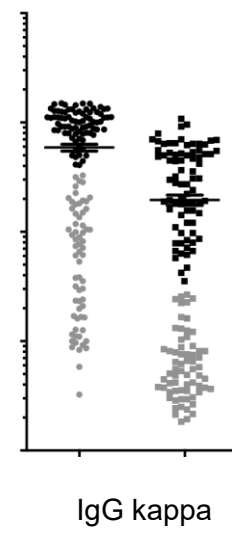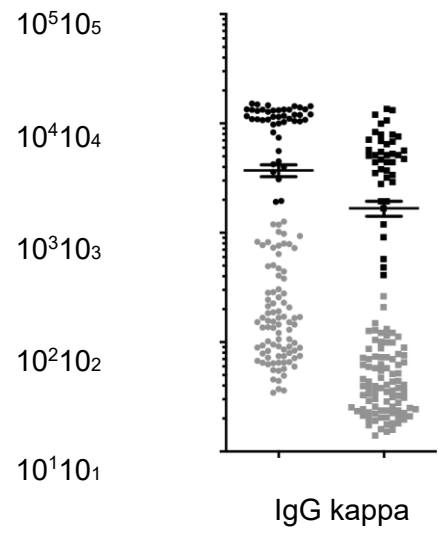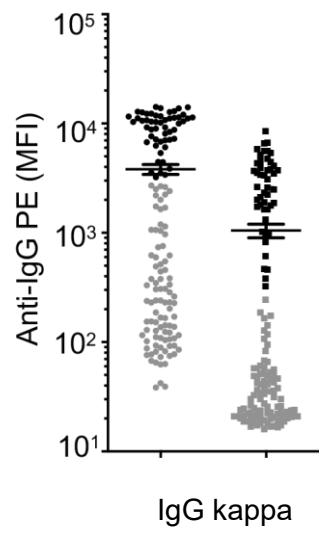Viable B-cells
22.6

H2-K^b-PE-AF647 (Decoy) — I-E^d- PE

Figure S2: (A-C)Relative concentrations of IgG and Kappa in the culture supernatants of single BCR clones presented as MFI of the detection PE anti-mouse IgG. Each symbol represents one rIgG1 from naïve, tolerant or acute rejection mice. (D-E) Relative MFI of supernatants with high kappa concentrations binding to beads coated with donor I-E^d or I-A^d, or self I-A^b antigen.
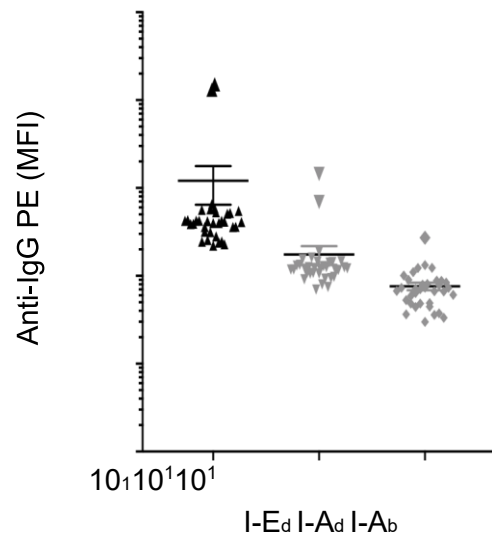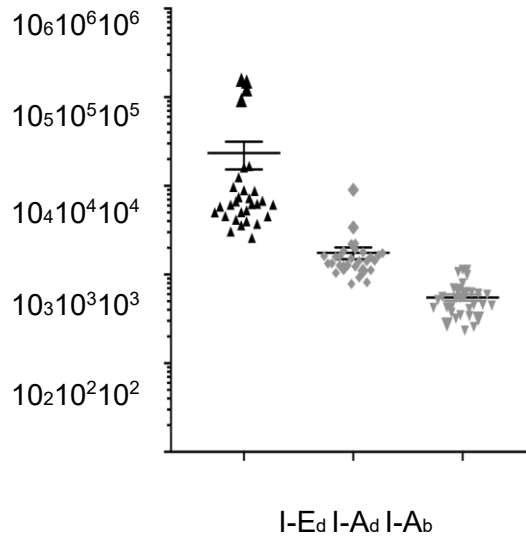
A. Naïve   B. Tolerant   C. Rejection
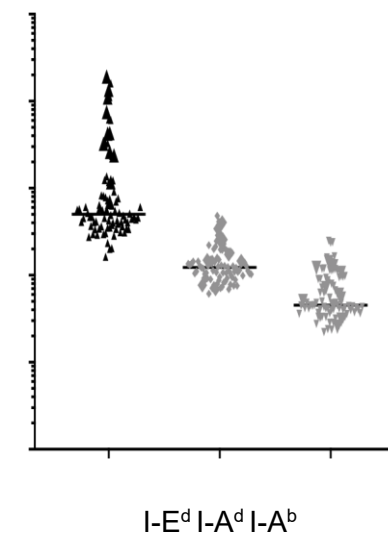
Figure S3: (A,B) Representative dilution series to determine $K_D 50$ for high and low avidity clones selected based on N-MFI.
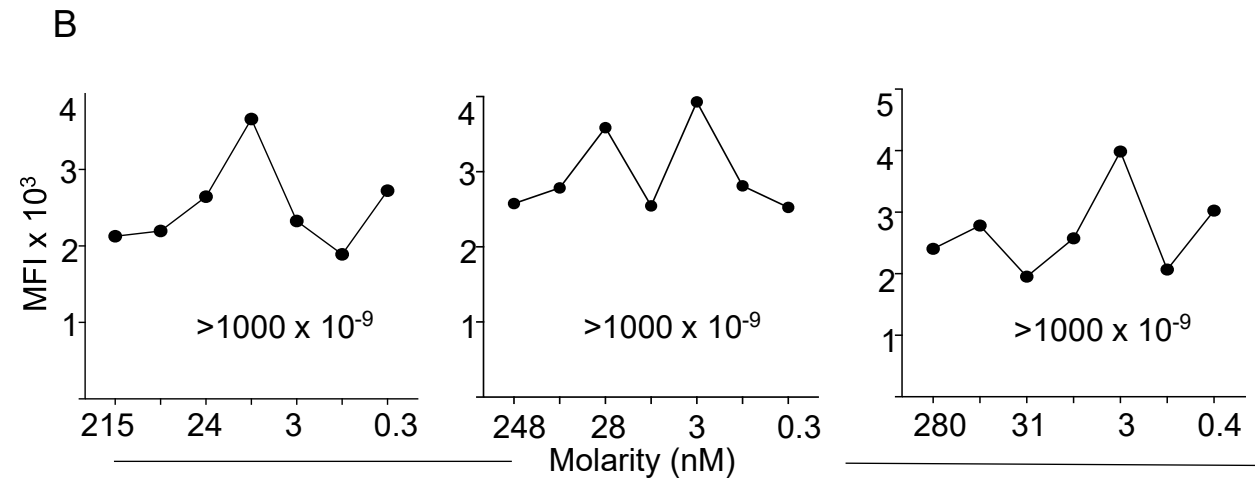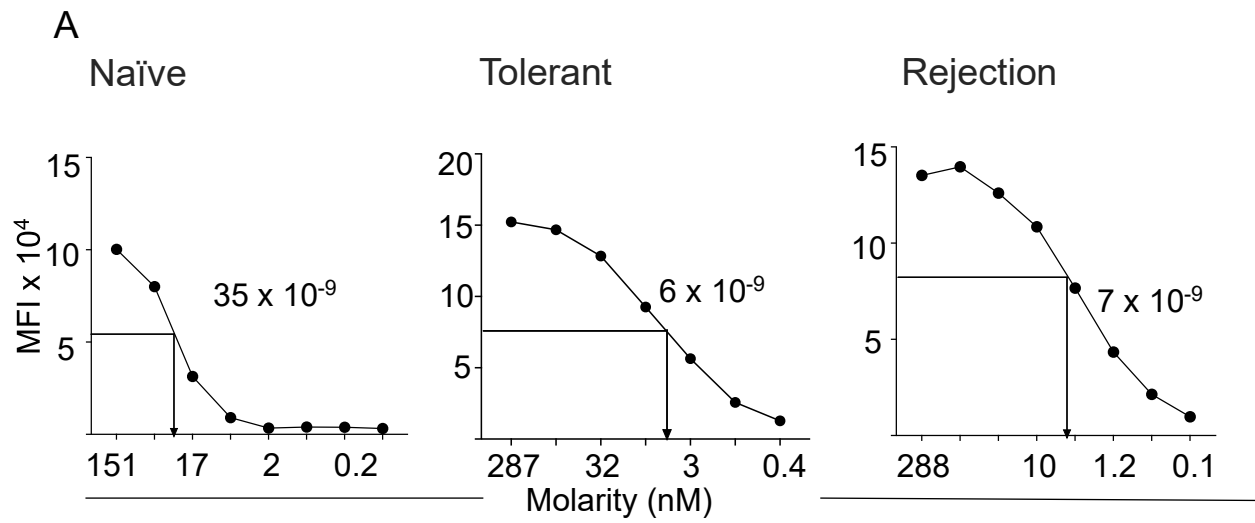
Figure S4: BCR avidity in naïve, tolerant, and acute rejection determined by SPR. (A-D) Sample SPR plots illustrating high and low avidity rIgG1

Naïve
K_D: 217 x 10^{-9}

1nM
2.5nM
5nM
10nM
15nM

Tolerant
K_D: 7 x 10^{-9}

C.

Rejection
K_D: 43 x 10^{-9}

D.

Rejection
K_D: 4 x 10^{-6}