### Supplemental Table 1. Antibodies and reagents.

#### Flow Cytometry

| Antibody/Reagent | Supplier | Catalog Number | Clone |
|------------------|----------|----------------|-------|
| αμCD19-BV421™    | BD Biosciences | 562701 | 1D3  |
| αμCD19-APC       | TONBO Biosciences | 20-0193 | 1D3  |
| αμB220-FITC      | BioLegend | 103206 | RA3-6B2 |
| αμCD3-Pacific Blue™ | BioLegend | 100214 | 17A2 |
| αμCD3-APC-Cy7    | BioLegend | 100221 | 17A2 |
| αμCD4-APC        | BioLegend | 100412 | GK1.5 |
| αμCD4-PerCP-Cy5.5| eBioscience | 45-0042-82 | RM4-5 |
| αμCD8b-PE        | eBioscience | 12-0083-81 | H35-17.2 |
| αμCD11b-APC      | BioLegend | 101212 | M1/70 |
| αμCD11c-eFuor450 | eBioscience | 48-0114-82 | N418 |
| αμCD11c-APC-Cy7  | BioLegend | 117323 | N418 |
| αμIgM-PE         | BioLegend | 406508 | RMM-1 |
| αμIgD-APC        | BioLegend | 405714 | 11-26c.2a |
| αμIgG1-APC       | BioLegend | 406609 | RMG1-1 |
| αμIgG3-BV421™    | BD Biosciences | 565808 | R40-82 |
| αμc-Kit-PE-Cy7   | BioLegend | 105813 | 2B8 |
| αμCXCR5-APC      | BioLegend | 145506 | L138D7 |
| αμCD23-PE        | BioLegend | 101607 | B3B4 |
| αμCD45-BV650™    | BioLegend | 103151 | 30-F11 |
| αμCD45-PerCP     | BioLegend | 103130 | 30-F11 |
| αμCD45.1-BV510™  | BioLegend | 110471 | A20 |
| αμCD45.2-PerCP-Cy7 | BioLegend | 109830 | 104 |
| αμAA4.1-APC      | BioLegend | 136509 | AA4.1 |
| αμFAS-BV510™     | BD Biosciences | 563646 | Jo2 |
| αμGL-7-PE        | BioLegend | 144607 | GL7 |
| αμGL-7-PerCP-Cy5.5 | BioLegend | 144609 | GL7 |
| αμGr-1- Pacific Blue™ | BioLegend | 108430 | RB6-8C5 |
| αμSca-1-PerCP    | BioLegend | 108121 | D7 |
| αμLineage-BV421™ | BioLegend | 133311 | |
| αμPD-1-FITC      | eBioscience | 11-9985-85 | J43 |
| αCleaved caspase 3-PE | BD Biosciences | 561011 | C92-605 |
| αBrdU-APC        | BioLegend | 339808 | Bu20a |

#### Immunofluorescence staining

| Antibody/Reagent | Supplier | Catalog Number | Clone |
|------------------|----------|----------------|-------|
| αμB220-FITC      | BioLegend | 103206 | RA3-6B2 |
| αμGL7-PerCP-Cy5.5 | BioLegend | 144609 | GL7 |

#### ELISA/ELISPOT

| Antibody/Reagent | Supplier | Catalog Number |
|------------------|----------|----------------|
| αμIgM-UNLB       | SouthernBiotech | 1020-01 |
| αμIgG-UNLB       | SouthernBiotech | 1030-01 |
| Reagent                        | Supplier                  | Catalog Number |
|-------------------------------|---------------------------|----------------|
| αμIgA-UNLB                    | SouthernBiotech           | Cat. # 1040-01 |
| αμIgM-biotin                  | SouthernBiotech           | Cat. # 1020-08 |
| αμIgG1-biotin                 | SouthernBiotech           | Cat. # 1070-08 |
| αμIgG2a-biotin                | SouthernBiotech           | Cat. # 1080-08 |
| αμIgG2b-biotin                | SouthernBiotech           | Cat. # 1090-08 |
| αμIgG3-biotin                 | SouthernBiotech           | Cat. # 1100-08 |
| αμIgA-biotin                  | SouthernBiotech           | Cat. # 1040-08 |
| NPβ-BSA                       | Biosearch Technologies    | Cat. # N-5050L-10 |
| NPα-BSA                       | Biosearch Technologies    | Cat. # N-5050H-10 |

**Other flow cytometry reagents**

| Reagent                        | Supplier                  | Catalog Number |
|-------------------------------|---------------------------|----------------|
| Fixable Viability Dye eFlour™ 780 | eBioscience              | Cat. # 65-0865-14 |
| Ghost Dye™ Red 710            | TONBO Biosciences         | Cat. # 13-0871-T500 |
| 7–Aminoactinomycin D (7–AAD)  | Sigma Aldrich             | Cat. # A9400  |

**Immunoblotting**

| Reagent                        | Supplier                  | Catalog Number |
|-------------------------------|---------------------------|----------------|
| αM1 linear ubiquitin          | Millipore-Sigma           | Cat. # MABS451 (Clone LUB9) |
| αK48-linkage Polyubiquitin    | Cell Signaling Technology | Cat. # 12805 |
| αUbiquitin                    | Cell Signaling Technology | Cat. # 3933 |
| αCaspase-3 (D3R6Y)            | Cell Signaling Technology | Cat. # 14220 |
| αCleaved Caspase-3 (Asp175)   | Cell Signaling Technology | Cat. # 9661T |
| αCleaved Caspase-9 (Asp353)   | Cell Signaling Technology | Cat. # 9509T |
| αBIM (C34C5)                  | Cell Signaling Technology | Cat. # 2933T |
| αBCL-2 (D17C4)                | Cell Signaling Technology | Cat. # 3498T |
| αCaspase-8 (1C12)             | Cell Signaling Technology | Cat. # 9746 |
| αCaspase-9 (C9)               | Cell Signaling Technology | Cat. # 9508 |
| αPARP                         | Cell Signaling Technology | Cat. # 9542 |
| αFLIP (D5J1E)                 | Cell Signaling Technology | Cat. # 56343 |
| αBCL-XL (54H6)                | Cell Signaling Technology | Cat. # 2764T |
| αBAX (D3R2M)                  | Cell Signaling Technology | Cat. # 14796S |
| αBAD (D24A9)                  | Cell Signaling Technology | Cat. # 9239 |
| αPhospho-BAD (Ser136)         | Cell Signaling Technology | Cat. # 4366 |
| αCytochrome C (D18C7)         | Cell Signaling Technology | Cat. # 11940 |
| αPhospho-NF-κB p65 (Ser536)   | Cell Signaling Technology | Cat. # 3033 |
| αNF-κB p65 (D14E12)           | Cell Signaling Technology | Cat. # 8242 |
| αXIAP                        | Cell Signaling Technology | Cat. # 2042 |
| αPhospho-STAT3 (Tyr705)       | Cell Signaling Technology | Cat. # 9145 |
| α Phospho-STAT5 (Tyr694)      | Cell Signaling Technology | Cat. # 4322 |
| αSTAT3 (79D7)                 | Cell Signaling Technology | Cat. # 4904 |
| αSTAT5 (D2O6Y)                | Cell Signaling Technology | Cat. # 94205 |
| α-β-actin (13E5)              | Cell Signaling Technology | Cat. # 4970S |
## Supplemental Table 2. Oligonucleotide sequences.

| Gene       | Forward primer | Reverse primer |
|------------|----------------|----------------|
| Aicda      | 5'-AGAAAGTCACGCTGGAGACC-3' | 5'-CTCCTTTCCACCACGTAGCA-3' |
| Prdm1      | 5'-TTCTCTTTGGAAGACCTGTC-3' | 5'-GGAGCCGGAGCTAGACTTTG-3' |
| Iγ1-γδ1    | 5'-TCGAGAAGCCTGAGGATG-3' | 5'-ATGGAGTTAGTTGGGCAGCA-3' |
| Iγ2-γδ2a   | 5'-GCTGTACCTACCCAGAAA-3' | 5'-GGACGGCACTGAGTTGGGAA-3' |
| Cflar      | 5'-GCTCCAGAATGGGCGAAGTAA-3' | 5'-ACGGATGTGCGGAGGTAAAA-3' |
| Bcl2       | 5'-GACAAGGAGATGCGGTTTTG-3' | 5'-TCCCCGTAAGAGGACAAAGT-3' |
| Mcl1       | 5'-AACGGGGTTTCGCAATGTC-3' | 5'-TGGCGGTATAGGTCGTCCT-3' |
| Bcl211     | 5'-TGGGCGATACGGATTGCA-3' | 5'-GCCCTCGGAATCATTGCC-3' |
| Bad        | 5'-CCCGGCAATTGGAGATGAA-3' | 5'-GAGGGACGATGGGACATATT-3' |
| Cd79b      | 5'-TGTTGGAATCTGCAAATGGA-3' | 5'-TAGGCTTTGGTTGATCTTG-3' |
| Gapdh      | 5'-AGGTCGAGTGGACATGAATG-3' | 5'-TGAGACCTAGTGGTGGTCC-3' |
| Genotyping |               |                |
| Sharpin++  | 5'-TTAAGGGACGCTGCTGGG-3' | 5'-TGGGCGGTATAGGTCGTCCT-3' |
| Sharpin++dm| 5'-TTAAGGGACGCTGCTGGG-3' | 5'-TGGGCGGTATAGGTCGTCCT-3' |
| Igh+       | 5'-CGGCGAGCTCCTGGGAGA-3' | 5'-GAGGGACGATGGGACATATT-3' |
| Ighdelta   | 5'-CGGCGAGCTCCTGGGAGA-3' | 5'-GAGGGACGATGGGACATATT-3' |

### V186.2 amplicon

| Gene       | Forward primer | Reverse primer |
|------------|----------------|----------------|
| V186.2DJH-μCμ | 5'-CATGTCTCTTCTGGCAACAGC-3' | 5'-CTGCCTCTCAGGTTGGGAA-3' |
| V186.2DJH-γδ1 | 5'-CATGTCTCTTCTGGCAACAGC-3' | 5'-GTCACACCAGGTGGACAGGATCC-3' |
| V186.2DJH-μCμ with adaptor R2 | 5'-CATGTCTCTTCTGGCAACAGC-3' | 5'-GTCACACCAGGTGGACAGGATCC-3' |
| V186.2DJH-γδ1 with adaptor R2 | 5'-CATGTCTCTTCTGGCAACAGC-3' | 5'-GTCACACCAGGTGGACAGGATCC-3' |