### Supplement Table 2

| ID                                          | SetSize | Enrichment | NES    | p value | FDR   |
|----------------------------------------------|---------|------------|--------|---------|-------|
| REACTOME_FCERI_MEDIATED_CAPLUS2_MOBILIZATION | 84      | 0.883      | 3.943  | 0.012   | 0.028 |
| REACTOME_FCGR_ACTIVATION                     | 67      | 0.918      | 3.926  | 0.011   | 0.028 |
| REACTOME_INITIALIZATION_OF_COMPLEMENT         | 77      | 0.886      | 3.898  | 0.011   | 0.028 |
| REACTOME_ANTIGEN_ACTIVATES_B_CELL_RECEPTOR_BCR_LEADING_TO_GENERATION | 83      | 0.868      | 3.897  | 0.011   | 0.028 |
| REACTOME_FCERI_MEDIATED_MAPK_ACTIVATION      | 85      | 0.871      | 3.894  | 0.012   | 0.028 |
| REACTOME_CD22_MEDIATED_BCR_REGULATION        | 59      | 0.919      | 3.873  | 0.009   | 0.028 |
| REACTOME_CREATION_OF_C4_AND_C2_ACTIVATORS   | 69      | 0.908      | 3.847  | 0.011   | 0.028 |
| REACTOME_ROLE_OF_LAT2_NTAL_LAB_ON_CALCIUM_MOBILIZATION | 69      | 0.894      | 3.833  | 0.011   | 0.028 |
| REACTOME_ROLE_OF_PHOSPHOLIPIDS_IN_PHAGOCYTOSIS | 78     | 0.869      | 3.815  | 0.011   | 0.028 |
| REACTOME_SCAVENGING_OFHEME_FROM_PLASMA       | 66      | 0.876      | 3.748  | 0.011   | 0.028 |
| KEGG_LEISHMANIA_INFECTION                    | 70      | 0.831      | 3.586  | 0.011   | 0.028 |
| KEGG.HEMATOPOIETIC_CELL_LINEAGE             | 84      | 0.801      | 3.576  | 0.012   | 0.028 |
| KEGG.GRAFT_VERSUS_HOST_DISEASE               | 37      | 0.934      | 3.526  | 0.006   | 0.028 |
| KEGG_ANTIGEN_PROCESSING_AND_PRESENTATION    | 81      | 0.799      | 3.526  | 0.012   | 0.028 |
| PID_IL12_2PATHWAY                           | 61      | 0.828      | 3.522  | 0.009   | 0.028 |
| REACTOME_COSSTIMULATION_BY_THE_CD28_FAMILY  | 69      | 0.815      | 3.491  | 0.011   | 0.028 |
| REACTOME_CHEMOKINE_RECEPTORS_BIND_CHEMOKINES | 46      | 0.859      | 3.428  | 0.007   | 0.028 |
| KEGG_ALLOGRAFT_REJECTION                    | 35      | 0.922      | 3.407  | 0.006   | 0.028 |
| KEGG.INTESTINAL_IMMUNE_NETWORK_FOR_IGA_PRODUCTION | 45      | 0.849      | 3.377  | 0.007   | 0.028 |
| REACTOME_INTERLEUKIN_10_SIGNALING           | 41      | 0.873      | 3.35   | 0.007   | 0.028 |
| PID.CD8_TCR_DOWNSTREAM_PATHWAY              | 65      | 0.743      | 3.22   | 0.01    | 0.028 |
| KEGG.TYPE_1_DIABETES_MELLITUS               | 41      | 0.837      | 3.21   | 0.007   | 0.028 |
| PID.CD8_TCR_PATHWAY                         | 52      | 0.789      | 3.206  | 0.009   | 0.028 |
| REACTOME_INTERLEUKIN_2_FAMILY_SIGNALING     | 44      | 0.808      | 3.191  | 0.007   | 0.028 |
| PID.NFAT_TFPATHWAY                          | 44      | 0.801      | 3.164  | 0.007   | 0.028 |
| REACTOME_PD_1_SIGNALING                     | 23      | 0.959      | 3.109  | 0.005   | 0.028 |
| KEGG_ASTHMA                                 | 28      | 0.9        | 3.1    | 0.005   | 0.028 |
| REACTOME_DAP12_INTERACTIONS                 | 39      | 0.812      | 3.085  | 0.007   | 0.028 |
| PID.FCER1_PATHWAY                           | 59      | 0.731      | 3.084  | 0.009   | 0.028 |
| PID.IL23_PATHWAY                            | 37      | 0.817      | 3.083  | 0.006   | 0.028 |
| REACTOME_PHOSPHORYLATION_OF_CD3_AND_TCR_ZETA_CHAINS | 22    | 0.949      | 3.078  | 0.005   | 0.028 |
| REACTOME_ANTIGEN_PROCESSING_CROSS_PRESENTATION | 96     | 0.684      | 3.063  | 0.014   | 0.031 |
| PID.BCR_SPATHWAY                            | 63      | 0.719      | 3.04   | 0.009   | 0.028 |
| REACTOME_TRANSLOCATION_OF_ZAP_70_TO_IMMUNOLOGICAL_SYNAPSE | 19      | 0.977      | 3.029  | 0.005   | 0.028 |
| KEGG.PRIMARY_IMMUNODEFICIENCY               | 38      | 0.813      | 3.006  | 0.006   | 0.028 |
| KEGG.B_CELL_RECEPTOR_SIGNALING_PATHWAY      | 75      | 0.692      | 3.006  | 0.011   | 0.028 |
| REACTOME_TNFS_BIND_THEIR_PHYSIOLOGICAL_RECEPTORS | 27      | 0.878      | 3.003  | 0.005   | 0.028 |