

Table S4. Significant Enriched GO Terms of DEGs in *Rs1*-KO retina at P21-Biological Processes

(A-Annotated Count; S- Significant Count; FDR-False Detection Rate)

2 GO:0002376 immune system process A1311/ S124 FDR 8.19E-28

A2m,Adgre1,Aif1,Apobec1,B2m,Bcl3,Bcl6,Blnk,Bst2,C1qa,C1qb,C1qc,C1ra,C1s1,C3,C3ar1,C4b,Cd109,Cd180,Cd44,Cd47,Cd74,Cebpa,Cebpd,Cfi,Clec2d,Cmtm3,Col24a1,Csf1r,Ctss,Cx3cr1,Cyba,Cybb,Dab2,Dock2,Edn2,Fcaml,Fcer1g,Fcgr1,Fcgr2b,Fcgr3,Fli1,Fyb,Gbp2,Gbp3,Gbp6,Gbp7,Gbp9,Gpc3,H2-D1,H2-K1,H2-M3,H2-Q4,H2-Q7,H2-T23,Icam1,Ifih1,Ifitm3,Ighm,Ikzf1,Ill10rb,Ill17ra,Ill1r1,Inpp5d,Irf5,Irf8,Itgam,Itgb2,Jak3,Junb,Klhl6,Lcp1,Lgals9,Lif,Ltbr,Ly86,Lyn,Map3k8,Mif1,Mrc1,Msn,Myo1f,Ncf1,Nckap11,Nfatc1,Nfkb2,Nlrc5,Oasl2,P2ry12,Parp9,Pik3ap1,Pik3cd,Pik3cg,Plcg2,Pld4,Psm8,Ptpn6,Ptpnc,Pycard,Rab32,Rab7b,Rac2,Rtkn2,Serping1,Skap2,Spp1,Syk,Tgfb2,Tlr2,Tlr4,Tlr7,Tmem173,Tmem176a,Tnfrsf1a,Trem2,Trf,Tril,Trim30a,Tyrobp,Unc93b1,Vav1,Vcam1,Vsir,Zc3hav1

7 GO:0002252 immune effector process A 420/ S59 FDR 8.19E-28

A2m,Apobec1,B2m,Bcl3,Bcl6,Bst2,C1qa,C1qb,C1qc,C1ra,C1s1,C3,C4b,Cd180,Cd47,Cd74,Cfi,Clec2d,Cx3cr1,Dock2,Fcer1g,Fcgr1,Fcgr2b,Fcgr3,H2-D1,H2-K1,H2-M3,H2-T23,Icam1,Ifih1,Ifitm3,Ighm,Ill10rb,Inpp5d,Irf5,Jak3,Lcp1,Lgals9,Lyn,Myo1f,Ncf1,Oasl2,Plcg2,Ptpn6,Ptpnc,Pycard,Rac2,Serping1,Syk,Tlr2,Tlr4,Tlr7,Tmem173,Tril,Tyrobp,Unc93b1,Vav1,Vsir,Zc3hav1

17 GO:0051707 response to another organism A 431/ S 52 FDR 2.25E-22

Apobec1,B2m,Bcl3,Bst2,Cd180,Cd47,Cyba,Fcer1g,Fcgr1,Fcgr2b,Gbp2,Gbp3,Gbp6,Gbp7,Gbp9,H2-K1,H2-M3,H2-T23,Ifih1,Ifitm3,Ighm,Ill10rb,Ill17ra,Irf5,Irf8,Junb,Lgals9,Ltbr,Ly86,Lyn,Lyz2,Mrc1,Myo1f,Ncf1,Ncf2,Oasl2,Pik3cd,Plcg2,Ptgrf,Ptpnc,Pycard,Stab1,Syk,Tlr2,Tlr4,Tlr7,Tmem173,Tnfrsf1a,Trem2,Unc93b1,Wipf1,Zc3hav1

26 GO:0001775 cell activation A 530/ S53 FDR 3.69E-19

Aif1,Apoe,B2m,Bcl3,Bcl6,Blnk,Cd180,Cd44,Cd47,Cd74,Cx3cr1,Dock2,Edn2,Fcer1g,Fcgr2b,Fcgr3,Fn1,H2-M3,H2-T23,Icam1,Ighm,Ikzf1,Ill17ra,Inpp5d,Itgam,Itgb2,Jak3,Lcp1,Lgals9,Ltbr,Lyn,Myo1f,Nckap11,Nfatc1,Nfkb2,P2ry12,Pik3cd,Plcg2,Ptpn6,Ptpnc,Pycard,Rac2,Skap2,Syk,Tgfb2,Timp1,Tlr2,Tlr4,Tlr7,Tyrobp,Vav1,Vcam1,Vsir

32 GO:0016064 immunoglobulin mediated immune response A 62/ S20 FDR 1.68E-16

Bcl3,Bcl6,C1qa,C1qb,C1qc,C1ra,C1s1,C3,C4b,Cd74,Cfi,Fcer1g,Fcgr1,Fcgr2b,Fcgr3,Ighm,Inpp5d,Ptpn6,Ptpnc,Serping1

35 GO:0034097 response to cytokine A 349/ S40 FDR 3.58E-

16Bst2,Cd74,Cebpa,Csf1r,Csf2rb,Cx3cr1,Edn2,Fn1,Gbp2,Gbp3,Gbp6,Gbp7,Gbp9,H2-Q7,Ifitm3,Ill13ra1,Ill17ra,Ill1r1,Ill6ra,Irf5,Irgm2,Jak3,Junb,Mrc1,Nfkb2,Nlrc5,Osmr,Parp9,Ptpn6,Ptpnc,Pycard,Serpina3n,Socs3,Stat3,Syk,Timp1,Timp2,Tmem173,Tnfrsf1a,Trem2

37 GO:0019882 antigen processing and presentation A 68/ S 20 FDR 1.20E-15

B2m,Cd74,Ctss,Fcer1g,Fcgr1,Fcgr2b,Fcgr3,H2-D1,H2-K1,H2-M3,H2-Q4,H2-Q7,H2-T23,Icam1,Ighm,Psm8,Pycard,Rab32,Trem2,Unc93b1

39 GO:0048002 antigen processing and presentation of peptide antigen A38/ S 16 FDR 3.21E-15

B2m, Cd74,Ctss,Fcer1g,Fcgr1,Fcgr2b,Fcgr3,H2-D1,H2-K1,H2-M3,H2-Q4,H2-Q7,H2-T23,Pycard,Trem2,Unc93b1

40 GO:0002455 humoral immune response mediated by circulating immunoglobulin A 21/ S13 FDR 4.42E-15

Bcl3,C1qa,C1qb,C1qc,C1ra,C1s1,C3,Cfi,Fcgr2b,Ighm,Ptpn6,Ptpnc, Serping1

49 GO:0042127 regulation of cell proliferation A 1024/ S 65 FDR 7.37E-14

Aif1,Apobec1,Apoe,Atf3,Bcl6,Btc,C3ar1,Cd109,Cd44,Cd47,Cd74,Cebpa,Csf1r,Cx3cr1,Cyba,Cyr61,Dab2,Edn2,Fcgr2b,Fgf2,Fn1,Gfap,Gpc3,Grn,H19,H2-M3,H2-T23,Hpgds,Hpse,Ifitm3,Ighm,Il6ra,Inpp5d,Jak3,Junb,Lgals9,Lif,Ltbr,Lyn,Marveld3,Muc2,Nckap11,Nfatc1,Osmr,Ptgr,Ptgs1,Ptpn6,Ptpnc,Pycard,Rac2,Rtkn2,Skap2,Stat3,Syk,Tgfb2,Tgm2,Timp1,Timp2,Tlr2,Tlr4,Tnfrsf1a,Trf,Vcam1,Vsir,Wwtr1

62 GO:0002757 immune response-activating signal transduction A147 S 24 FDR 7.14E-13

C3ar1,Cd180,Cmtm3,Cyba,Fcer1g,Ifih1,Ighm,Klhl6,Lgals9,Lyn,Nckap11,Pik3ap1,Plcg2,Ptpn6,Ptpnc,Rab7b,Skap2,Syk,Tlr2,Tlr4,Tlr7,Tril,Trim30a,Unc93b1

63 GO:0032103 positive regulation of response to external stimulus A147 S 24 FDR 7.14E-13

Aif1,C3,C3ar1,Cd180,Cd47,Cd74,Ctss,Cyba,Edn2,Fcer1g,Fcgr1,Fcgr3,Fgf2,Fn1,Il17ra,Lgals9,Ly86,Nckap11,Pik3cg,Rac2,Tgm2,Tlr2,Tlr4,Tnfrsf1a

67 GO:0050727 regulation of inflammatory response A 168 S 25 FDR 1.65E-12

A2m,Apoe,Bcl6,C3,Cd44,Cd47,Ctss,Cx3cr1,Fcer1g,Fcgr1,Fcgr2b,Fcgr3,Il17ra,Il1r1,Lgals9,Lyn,Pik3ap1,Pik3cg,Pycard,Serping1,Socs3,Tgm2,Tlr2,Tlr4,Tnfrsf1a

71 GO:0006909 phagocytosis A 116 S 21 FDR 3.89E-12

Aif1,Bin2,C3,Cd47,Cyba,Dock2,Fcer1g,Fcgr1,Fcgr2b,Fcgr3,Ighm,Irf8,Itgb2,Nckap11,Pld4,Pros1,Pycard,Syk,Tgm2,Trem2,Vav1

81 GO:0071310 cellular response to organic substance A 1250 S 68 FDR 1.73E-11

Atf3,B2m,Calca,Cd109,Cd180,Cd44,Cd68,Cd74,Cebpa,Csf1r,Csf2rb,Cx3cr1,Cyba,Cyr61,Dab2,Edn2,Fcer1g,Fgf2,Fn1,Gbp2,Gbp3,Gbp6,Gbp7,Gbp9,Gpc3,H2-Q7,Icam1,Ifitm3,Il13ra1,Il17ra,Il1r1,Il6ra,Irf5,Irf8,Irgm2,Itgb2,Jak3,Junb,Ly86,Lyn,Mrc1,Msn,Myof,Ncf2,Nlrc5,Osmr,P2ry12,P2ry13,Pik3cg,Ptgr,Ptpn6,Ptpnc,Pycard,Socs3,Spidr,Stat3,Syk,Tgfb2,Timp2,Tlr2,Tlr4,Tmem173,Tnfrsf1a,Trem2,Ucp2,Vcam1,Vsir,Zc3hav1

93 GO:0007166 cell surface receptor signaling pathway A 1537 S 74 FDR 4.44E-10

Adgre1,Adgrg6,Atf3,Bag3,Bcl6,Btc,C3ar1,Cd109,Cd180,Cd22,Cd44,Cd53,Cd74,Cebpa,Cmtm3,Csf1r,Csf2rb,Cx3cr1,Cyr61,Dab2,Edn2,Fcer1g,Fcgr1,Fcgr2b,Fcgr3,Fgf2,Gpc3,Gpr34,H2-M3,Icam1,Ifitm3,Ighm,Il13ra1,Il1r1,Il6ra,Irf5,Itgam,Itgb2,Jak3,Klhl6,Kremen1,Lgals9,Lif,Ltbr,Ly86,Lyn,Myof,Nckap11,Nlrc5,Osmr,P2ry12,Pik3cd,Plcg2,Plxnd1,Ptpn6,Ptpnc,Pycard,S1pr2,Scube1,Siglec1,Socs3,Stat3,Syk,Tgfb2,Timp1,Tlr2,Tlr4,Tnfrsf1a,Trem2,Trf,Tyrobp,Vav1,Vsir,Wwtr1

104 GO:0008284 positive regulation of cell proliferation A 570 S 40 FDR 1.63E-09

Aif1,Atf3,Bcl6,Btc,C3ar1,Cd47,Cd74,Csf1r,Cx3cr1,Cyba,Cyr61,Edn2,Fgf2,Fn1,Gfap,Grn,H2-T23,Hpse,Ighm,Il6ra,Jak3,Lif,Lyn,Nckap11,Osmr,Ptgr,Ptpn6,Ptpnc,Pycard,Rac2,Rtkn2,Stat3,Syk,Tgfb2,Tgm2,Timp1,Tlr4,Trf,Vcam1,Wwtr1

107 GO:0042113 B cell activation A145 S 20 FDR 2.07E-09

Bcl3,Bcl6,Blnk,Cd180,Cd74,Fcgr2b,Ighm,Ikzf1,Inpp5d,Jak3,Lyn,Nckap11,Nfatc1,Pik3cd,Plcg2,Ptpn6,Ptprc,Skap2,Syk,Tlr4

111 GO:0045785 positive regulation of cell adhesion A 239 S 25 FDR 3.12E-09

Aif1,Calca,Cd44,Cd47,Cd74,Cyr61,Dab2,Fn1,H2-M3,H2-T23,Icam1,Ikzf1,Jak3,Lgals9,Myo10,Nckap11,Ptpn6,Ptprc,Pycard,Spp1,Syk,Tgfb2,Tgm2,Vav1,Vcam1

114 GO:0002821 positive regulation of adaptive immune response A 53 S 13 FDR 3.49E-09

B2m,C3,Cd44,Cd74,Fcer1g,Fcgr1,Fcgr3,H2-D1,H2-K1,H2-M3,H2-T23,Ptprc,Pycard

116 GO:0002218 activation of innate immune response A 78 S 15 FDR 4.77E-09

Cd180,Cyba,Ifih1,Lgals9,Lyn,Pik3ap1,Pycard,Rab7b,Tlr2,Tlr4,Tlr7,Tmem173,Tril,Trim30a,Unc93b1

125 GO:1903039 positive regulation of leukocyte cell-cell adhesion A 96 S 16 FDR 9.44E-09

Aif1,Cd44,Cd47,Cd74,H2-M3,H2-T23,Icam1,Ikzf1,Jak3,Lgals9,Nckap11,Ptprc,Pycard,Syk,Tgfb2,Vcam1

127 GO:0030099 myeloid cell differentiation A 254 S 25 FDR 9.87E-09

B2m,Bcl6,C1qc,Cd109,Cebpa,Clec2d,Csf1r,Dab2,Fli1,Gpc3,Ikzf1,Inpp5d,Irf8,Itgam,Junb,Lif,Ltbr,Lyn,Nckap11,Nfatc1,Ptpn6,Rab7b,Tgfb2,Trf,Tyrobp

134 GO:0034341 response to interferon-gamma A 38 S 11 FDR 1.32E-08

Bst2,Gbp2,Gbp3,Gbp6,Gbp7,Gbp9,H2-Q7,Ifitm3,Mrc1,Nlrc5,Parp9

151 GO:0070372 regulation of ERK1 and ERK2 cascade A 160 S 19 FDR 6.35E-08

Atf3,C3,Cd44,Cd74,Csf1r,Cyr61,Dab2,Fgf2,Fn1,Glipr2,Icam1,Lif,Lyn,Ptpn6,Pycard,Syk,Tlr2,Tlr4,Trem2

156 GO:0032496 response to lipopolysaccharide A 146 S 18 FDR 8.98E-08

B2m,Cd180,Gbp2,Gbp6,Irf8,Junb,Lgals9,Ltbr,Ly86,Lyn,Mrc1,Ncf2,Plcg2,Ptgrf,Pycard,Tlr4,Tnfrsf1a,Trem2

180 GO:0007155 cell adhesion A 1059 S 52 FDR 3.56E-07

Aif1,B2m,Bag3,Bcl3,Bcl6,Calca,Cd22,Cd33,Cd44,Cd47,Cd74,Cx3cr1,Cyr61,Dab2,Dock2,Fblim1,Fcer1g,Fn1,Gpmb,H2-M3,H2-T23,Hpse,Icam1,Ikzf1,Itgam,Itgb2,Jak3,Lad1,Lcp1,Lgals3bp,Lgals9,Lyn,Micall2,Myo10,Myo1f,Nckap11,P2ry12,Ptpn6,Ptprc,Pycard,Rac2,Siglec1,Spp1,Stab1,Syk,Tagln2,Tgfb2,Tgm2,Vav1,Vcam1,Vsir,Zc3hav1

194 GO:0002718 regulation of cytokine production involved in immune response A 32 S 9 FDR 5.32E-07

B2m,Bcl6,Cd74,Fcer1g,Jak3,Tlr2,Tlr4,Tril,Vsir

196 GO:0046633 alpha-beta T cell proliferation A 16 S 7 FDR 6.70E-07

Cd44,Dock2,H2-T23,Lgals9,Ptprc,Syk,Vsir

204 GO:0032760 positive regulation of tumor necrosis factor production A 45 S 10 FDR 9.76E-07

Cyba,Cybb,Fcer1g,Fcgr3,H2-T23,Lgals9,Pycard,Tlr2,Tlr4,Tnfrsf1a

213 GO:0002495 antigen processing and presentation of peptide antigen via MHC class II

A 11 S 6 FDR 1.28E-06 Cd74,Fcer1g,Fcgr2b,Pycard,Trem2,Unc93b1

225 GO:0008285 negative regulation of cell proliferation A 440 S29 FDR 2.10E-06

Aif1,Apoe,Bcl6,Cd109,Cd44,Cebpa,Csf1r,Dab2,Fcgr2b,Fgf2,Gpc3,H19,H2-M3,Hpgds,Ifitm3,Inpp5d,Lgals9,Lif,Lyn,Marveld3,Muc2,Nfatc1,Ptpn6,Skap2,Stat3,Tgfb2,Timp2,Tlr2,Vsir

227 GO:0002429 immune response-activating cell surface receptor signaling pathway A 77 S 12

FDR 2.34E-06 C3ar1,Cmtm3,Fcer1g,Ighm,Klhl6,Lyn,Nckap11,Plcg2,Ptpn6,Ptpnc,Syk,Tlr2

228 GO:0030183 B cell differentiation A 77 S 12 FDR 2.34E-06

Bcl3,Bcl6,Ighm,Ikzf1,Inpp5d,Jak3,Nckap11,Nfatc1,Plcg2,Ptpn6,Ptpnc,Syk

234 GO:0045597 positive regulation of cell differentiation A 695 S 38 FDR 2.46E-06

Apoe,Bcl6,Btc,Cd53,Cd74,Cebpa,Cebpd,Csf1r,Cx3cr1,Cyr61,Dab2,Fgf2,Fn1,Gfap,Glipr2,Grn,H2-M3,Ikzf1,Il1r1,Inpp5d,Junb,Lgals9,Lif,Lyn,Nckap11,Ptpnc,Rab7b,S1pr2,Socs3,Syk,Tgfb2,Timp2,Tlr2,Trf,Vsir,Wwtr1,Xlr3b,Zbtb7c

266 GO:1902106 negative regulation of leukocyte differentiation A 59 S10 FDR 1.11E-05

Bcl6,C1qc,Cd44,Cd74,Clec2d,H2-M3,Inpp5d,Jak3,Lyn,Tmem176a

276 GO:0002275 myeloid cell activation involved in immune response A 48 S 9 FDR 1.70E-05

Cx3cr1,Dock2,Fcer1g,Lyn,Myo1f,Pycard,Rac2,Syk,Tyrobp

279 GO:0050731 positive regulation of peptidyl-tyrosine phosphorylation A 112 S 13 FDR 1.90E-05

Agri,Cd44,Cd74,Csf1r,Icam1,Ighm,Il6ra,Lif,Lyn,Syk,Tlr4,Tnfrsfla,Trem2

283 GO:0030335 positive regulation of cell migration A 312 S 22 FDR 2.29E-05

Aif1,C3ar1,Cd74,Csf1r,Cyr61,Dab2,Edn2,Fgf2,Fn1,Glipr2,Icam1,Il1r1,Lgals9,Lyn,Myo1f,Nckap11,Pik3cd,Ptpnc,Pycard,Rac2,Tgfb2,Tlr2

308 GO:0035456 response to interferon-beta A 29 S 7 FDR 4.53E-05

Bst2,Gbp2,Gbp3,Gbp6,Ifitm3,Irgm2,Tmem173

311 GO:0071222 cellular response to lipopolysaccharide A 87 S 11 FDR 5.21E-05

B2m,Cd180,Gbp2,Gbp6,Irf8,Ly86,Lyn,Mrc1,Pycard,Tlr4,Trem2

313 GO:0097028 dendritic cell differentiation A 20 S 6 FDR 6.12E-05

H2-M3,Ltbr,Lyn,Tgfb2,Tmem176a,Trem2

314 GO:0050707 regulation of cytokine secretion A 72 S 10 FDR 6.34E-05

Csf1r,Fn1,Il17ra,Lgals9,Lyn,Pycard,Syk,Tlr2,Tlr4,Unc93b1

321 GO:0042108 positive regulation of cytokine biosynthetic process A 31 S 7 FDR 7.08E-05

Bcl3,Cybb,Fcgr3,Syk,Tlr2,Tlr4,Tlr7

335 GO:0045582 positive regulation of T cell differentiation A 45 S 8 FDR 9.02E-05

Cd74, H2-M3, Ikzf1, Lgals9, Nckap11, Ptpnc, Syk, Tgfb2

341 GO:0042102 positive regulation of T cell proliferation A 46 S 8 FDR 0.000105932

Aif1, H2-T23, Jak3, Nckap11, Ptpnc, Pycard, Syk, Vcam1

345 GO:0015850 organic hydroxy compound transport A 115 S 12 FDR 0.000128209

Abcc3, Apoe, Dab2, Fcer1g, Fcgr3, Ly6e, P2ry12, Ptgs1, Slc6a2, Slco2b1, Syk, Tlr2

349 GO:0045577 regulation of B cell differentiation A 23 S 6 FDR 0.000137301

Ikzf1, Inpp5d, Nckap11, Ptpn6, Ptpnc, Syk

363 GO:0045824 negative regulation of innate immune response A 25 S 6 FDR 0.00022278

A2m, Clec2d, H2-T23, Lgals9, Nlrc5, Serping1

377 GO:0045453 bone resorption A 39 S 7 FDR 0.000312042

Csflr, Ctss, Inpp5d, Rac2, Spp1, Syk, Trf

384 GO:0009620 response to fungus A 17 S 5 FDR 0.000402109

Il17ra, Ncf1, Pik3cd, Syk, Tlr2

385 GO:0042554 superoxide anion generation A 17 S 5 FDR 0.000402109

Cyba, Cybb, Ncf1, Ncf2, Syk

387 GO:0007229 integrin-mediated signaling pathway A 56 S 8 FDR 0.000416925

Dab2, Fcer1g, Itgam, Itgb2, Syk, Timp1, Tyrobp, Vav1

391 GO:0002921 negative regulation of humoral immune response A 9 S 4 FDR 0.000430345

A2m, Fcgr2b, Ptpn6, Serping1

393 GO:0050855 regulation of B cell receptor signaling pathway A 9 S 4 FDR 0.000430345

Cmtm3, Lyn, Ptpn6, Ptpnc

394 GO:0061081 positive regulation of myeloid leukocyte cytokine production involved in immune response

A 9 S 4 FDR 0.000430345 Cd74, Fcer1g, Tlr2, Tlr4

397 GO:0002286 T cell activation involved in immune response A 42 S 7 FDR 0.000482801

Bcl3, Bcl6, Fcer1g, H2-M3, Icam1, Jak3, Lcp1

400 GO:0032729 positive regulation of interferon-gamma production A 29 S 6 FDR 0.000514753

Bcl3, H2-M3, Irf8, Pycard, Tlr4, Tlr7

401 GO:0032845 negative regulation of homeostatic process A 134 S 12 FDR 0.000514753

Cd44, Cd74, Cyba, Fcer1g, Fcgr2b, Fgf2, Inpp5d, Lyn, Plcg2, Ptpn6, Ptpnc, Ucp2

419 GO:0002283 neutrophil activation involved in immune response A 10 S 4 FDR 0.00066226

Fcer1g, Myo1f, Syk, Tyrobp

420 GO:0034134 toll-like receptor 2 signaling pathway A 10 S 4 FDR 0.00066226

Cyba, Lyn, Pik3ap1, Tlr2

421 GO:0034142 toll-like receptor 4 signaling pathway A 19 S 5 FDR 0.00066226

Lyn, Pik3ap1, Rab7b, Tlr4, Tril

427 GO:0007186 G-protein coupled receptor signaling pathway A 400 S 22 FDR 0.000794173

Adgre1, Adgrg6, Apoe, C3, C3ar1, Calca, Cx3cr1, Edn2, Gna14, Gnb3, Gpr34, Kctd12, P2ry12, P2ry13, Pik3cg, Ptgr, Rac2, Rgs10, S1pr2, Syk, Tgm2, Vav1

434 GO:0032735 positive regulation of interleukin-12 production A 21 B 5 FDR 0.001099037

H2-M3, Irf8, Tlr2, Tlr4, Unc93b1

440 GO:0050715 positive regulation of cytokine secretion A 49 S 7 FDR 0.001223082

Csf1r, Il17ra, Lgals9, Pycard, Syk, Tlr2, Unc93b1

446 GO:0001911 negative regulation of leukocyte mediated cytotoxicity A 12 S 4 FDR 0.001431616

Clec2d, H2-T23, Lgals9, Ptprc

447 GO:0002507 tolerance induction A 12 S 4 FDR 0.001431616 C3ar1, H2-M3, Lyn, Tgfbr2

460 GO:0002833 positive regulation of response to biotic stimulus A 23 S 5 FDR 0.001599132

Cd180, Cyba, Lgals9, Ly86, Tlr2

461 GO:0035458 cellular response to interferon-beta A 23 S 5 FDR 0.001599132

Gbp2, Gbp3, Gbp6, Irgm2, Tmem173

462 GO:0007204 positive regulation of cytosolic calcium ion concentration A 154 S 12

FDR 0.001747672 C3ar1, Cyba, Edn2, Fgf2, Jak3, Lyn, Pik3cg, Plcg2, Ptgr, Ptpn6, Ptprc, Tgm2

465 GO:0045576 mast cell activation A 37 S 6 FDR 0.001894304 Fcer1g, Fcgr3, Lyn, Rac2, Syk, Tlr4

466 GO:0002467 germinal center formation A 13 S 4 FDR 0.001894304 Bcl3, Bcl6, Khlh6, Nfkb2

477 GO:0032715 negative regulation of interleukin-6 production A 25 S 5 FDR 0.002462463

Inpp5d, Nckap1l, Tlr4, Tnfrsf1a, Trim30a

484 GO:0002576 platelet degranulation A 6 S 3 FDR 0.002708082 Fcer1g, Lyn, Syk

486 GO:0002890 negative regulation of immunoglobulin mediated immune response A 6 S 3

FDR 0.002708082 Bcl6, Fcgr2b, Ptpn6

487 GO:0002923 regulation of humoral immune response mediated by circulating immunoglobulin

A 6 S 3 FDR 0.002708082 Fcgr2b, Ptpn6, Ptprc

488 GO:0034162 toll-like receptor 9 signaling pathway A 6 S 3 FDR 0.002708082

Pik3ap1, Rab7b, Unc93b1

490 GO:0032608interferon-beta production A 40 S 6 FDR 0.002708082
 Ifih1, Pycard, Tlr2, Tlr4, Tlr7, Tmem173

499 GO:0001773myeloid dendritic cell activation A 15 S 4 FDR 0.003357545
 Dock2, Ltbr, Pycard, Tgfb2

500 GO:0045579 positive regulation of B cell differentiation A 15 S 4 FDR 0.003357545
 Ikzf1, Inpp5d, Nckap11, Syk

502 GO:0001782B cell homeostasis A 27 S 5 FDR 0.003357545 Cd44, Cd74, Lyn, Nckap11, Pik3cd

503 GO:0010543regulation of platelet activation A 27 S 5 FDR 0.003357545
 Apoe, Fcgr1g, Lyn, Syk, Tlr4

505 GO:0045123cellular extravasation A 27 S 5 FDR 0.003357545 Icam1, Il1r1, Itgam, Itgb2, Vcam1

511 GO:0048535lymph node development A 16 S 4 FDR 0.004302724 Ikzf1, Jak3, Ltbr, Nfkb2

516 GO:0032490detection of molecule of bacterial origin A 7 S 3 FDR 0.004394846
 Tlr2, Tlr4, Trem2

519 GO:0060907positive regulation of macrophage cytokine production A 7 S 3 FDR 0.004394846
 Cd74, Tlr2, Tlr4

528 GO:0002312B cell activation involved in immune response A 45 S 6 FDR 0.004997966
 Bcl3, Bcl6, Cd180, Plcg2, Ptprc, Tlr4

530 GO:0043066negative regulation of apoptotic process A 623 S 27 FDR 0.004997966
 Aif1, Apoe, Bag3, Bcl3, Bcl6, Btc, Cd44, Cd74, Csf1r, Cx3cr1, Cyr61, Dab2, Fcgr1g, Fcgr2b, Fn1, Icam1, Jak3, Mt1, Nckap11, Pik3cg, Ptgfr, Socs3, Spp1, Stat3, Timp1, Tnfrsf1a, Ucp2

532 GO:0045766positive regulation of angiogenesis A 83 S 8 FDR 0.005236187
 C3, C3ar1, Cx3cr1, Cybb, Fgf2, Itgb2, Tgfb2, Tnfrsf1a

535 GO:0045730respiratory burst A 17 S 4 FDR 0.005236187 Cyba, Cybb, Ncf1, Rac2

542 GO:0070304 positive regulation of stress-activated protein kinase signaling cascade A 105 S 9
 FDR 0.00544059 Dab2, Fgd2, Gadd45b, Ltbr, Lyn, Pycard, Syk, Tlr4, Trf

550 GO:0048661positive regulation of smooth muscle cell proliferation A 66 S 7 FDR 0.006427544
 Aif1, C3ar1, Cyba, Fgf2, Il6ra, Tgfb2, Tgm2

552 GO:0001820serotonin secretion A 8 S 3 FDR 0.006427544 Fcgr1g, Fcgr3, Syk

553 GO:0006968cellular defense response A 8 S 3 FDR 0.006427544 B2m, Clec2d, Ncf1

554 GO:0032494response to peptidoglycan A 8 S 3 FDR 0.006427544 Irf5, Tlr2, Trem2

555 GO:0032736 positive regulation of interleukin-13 production A 8 S 3 FDR 0.00642
 H2-T23, Il17ra, Tlr4

557 GO:0045060negative thymic T cell selection A 8 S 3 FDR 0.006427544 Cd74,Dock2,Ptprc
558 GO:0050832defense response to fungus A 8 S 3 FDR 0.006427544 Il17ra,Ncf1,Pik3cd
561 GO:0071404cellular response to low-density lipoprotein particle stimulus A 8 S 3 FDR 0.006427544
 Fcer1g,Itgb2,Syk
562 GO:0097459iron ion import into cell A 8 S 3 FDR 0.006427544 B2m,Steap4,Trf
567 GO:0050728 negative regulation of inflammatory response A 68 S 7 FDR 0.007671041
 Apoe,Cd44,Cx3cr1,Fcgr2b,Lgals9,Socs3,Tnfrsf1a
568 GO:0046330positive regulation of JNK cascade A 89 S 8 FDR 0.007787324
 Dab2, Fgd2, Gadd45b, Ltbr, Pycard, Syk, Tlr4, Trf
569 GO:0002532production of molecular mediator involved in inflammatory response A 33 S FDR 0.0078617
 Fcer1g, Il17ra, Lyn, Syk, Tlr4
578 GO:0007565female pregnancy A 70 S 7 FDR 0.008928028 A2m, Grn, H2-Q7, Junb, Lgals9, Lif, Timp1
579 GO:0031663lipopolysaccharide-mediated signaling pathway A 34 S 5 0.72 FDR 0.009024345
 Cd180, Ly86, Lyn, Tlr4, Trem2
580 GO:2001238positive regulation of extrinsic apoptotic signaling pathway A 51 S 6 FDR 0.009024345
 Atf3, Jak3, Ltbr, Ptprc, Pycard, Siglec1
582 GO:0032700negative regulation of interleukin-17 production A 9 S 3 FDR 0.009152313
 Nckap1l, Tlr2, Tlr4
585 GO:0046641positive regulation of alpha-beta T cell proliferation A 9 S 3 FDR 0.009152313
 H2-T23, Ptprc, Syk
590 GO:0001516prostaglandin biosynthetic process A 20 S 4 FDR 0.009215
 Cd74, Edn2, Hpgds, Ptgs1
595 GO:0042771intrinsic apoptotic signaling pathway in response to DNA damage by p53 class mediator
 A 35 S 5 FDR 0.009985485 Bcl3, Cd44, Cd74, Phlda3, Pycard
596 GO:0061045negative regulation of wound healing A 35 S 5 FDR 0.009985485
 Apoe, Cd109, Fgf2, Prosl, Serping1
597 GO:2000107negative regulation of leukocyte apoptotic process A 35 S 5 FDR 0.009985485
 Cd44, Cd74, Fcer1g, Fcgr2b, Jak3
604 GO:0043065positive regulation of apoptotic process A 431 S 20 FDR 0.011210314
 Agrn, Atf3, Bcl6, Cd44, Cyr61, Gadd45b, Inpp5d, Irf5, Jak3, Ltbr, Lyn, Muc2, Ncf2, Phlda3, Ptprc, Pycard, Siglec1, Tgm2, Tlr4, Tnfrsf1a
610 GO:0002281macrophage activation involved in immune response A 10 S 3 FDR 0.012147722

Cx3cr1, Syk, Tyrobp

612 GO:0002719 negative regulation of cytokine production involved in immune response A 10 S 3 FDR 0.012147722 Bcl6, Jak3, Vsig3

613 GO:0006953 acute-phase response A 10 S 3 FDR 0.012147722 Fn1, Serpina3n, Stat3

619 GO:2000778 positive regulation of interleukin-6 secretion A 10 S 3 0.01214 Lgals9, Pycard, Unc93b1

622 GO:0032757 positive regulation of interleukin-8 production A 22 S 4 FDR 0.012738816

Pycard, Tlr2, Tlr4, Tlr

625 GO:2000108 positive regulation of leukocyte apoptotic process A 22 S 4 FDR 0.012738816

Cd44, Jak3, Lyn, Siglec1

633 GO:0001961 positive regulation of cytokine-mediated signaling pathway A 23 S 4 FDR 0.01492

Cd74, Il1r1, Nlrp5, Trem2

637 GO:0043304 regulation of mast cell degranulation A 23 S 4 FDR 0.014929168

Fcer1g, Lyn, Rac2, Syk

642 GO:0002755 MyD88-dependent toll-like receptor signaling pathway A 11 S 3 FDR 0.015651323

Tlr2, Tlr4, Tlr7

646 GO:0042346 positive regulation of NF-kappaB import into nucleus A 11 S 3 FDR 0.015651323

Tlr2, Tlr4, Tlr7

647 GO:0045059 positive thymic T cell selection A 11 S 3 FDR 0.015651323

Cd74, Dock2, Ptpnc

648 GO:0045589 regulation of regulatory T cell differentiation A 11 S 3 FDR 0.015651323

Cd44, H2-M3, Lgals9

658 GO:0030225 macrophage differentiation A 24 S 4 FDR 0.016926647 C1qc, Cebpa, Itgam, Lif

660 GO:0045581 negative regulation of T cell differentiation A 24 S 4 FDR 0.016926647

Bcl6, Cd44, Cd74, Jak3

661 GO:0050798 activated T cell proliferation A 24 S 4 FDR 0.0169 Itgam, Itgb2, Jak3, Pycard

664 GO:0000187 activation of MAPK activity A 80 S 7 FDR 0.017097711 Cd74, Dab2, Ighm, Ptpnc, Syk, Tlr4, Trf

670 GO:0048260 positive regulation of receptor-mediated endocytosis A 41 S 5 FDR 0.018485015

B2m, Dab2, Plcg2, Syk, Trf

676 GO:0045058 T cell selection A 25 S 4 FDR 0.019277356 Cd74, Dock2, Ptpnc, Syk

678 GO:0051353 positive regulation of oxidoreductase activity A 25 S 4 FDR 0.019277356

Apoe, Cyba, Edn2, Lgals9

- 682 GO:0002717positive regulation of natural killer cell mediated immunity** A 12 S 3 FDR 0.0192 H2-M3,H2-T23,Vav1
- 684 GO:0006910phagocytosis, recognition** A 12 S 3 FDR 0.019277356 Fcgr1, Fcgr3,Ighm
- 685 GO:0007252I-kappaB phosphorylation** A 12 S 3 FDR 0.019277356 Tlr2, Tlr4, Tlr7
- 686 GO:0007263nitric oxide mediated signal transduction** A 12 S 3 FDR 0.019277 Apoe,Mt1,Mt2
- 687 GO:0015682ferric iron transport** A 12 S 3 FDR 0.019277356 B2m,Steap4,Trf
- 690 GO:0030889negative regulation of B cell proliferation** A 12 S 3 FDR 0.0192 Fcgr2b,Inpp5d,Lyn
- 691 GO:0032727positive regulation of interferon-alpha production** A 12 S 3 FDR 0.0193 Ifih1,Tlr4,Tlr7
- 692 GO:0033630positive regulation of cell adhesion mediated by integrin** A 12 S 3 FDR 0.0193 Nckap1l,Ptpn6,Syk
- 694 GO:0045780positive regulation of bone resorption** A 12 S 3 FDR 0.01928 Spp1,Syk,Trf
- 699 GO:0010466negative regulation of peptidase activity** A 106 S 8 FDR 0.0199044
A2m, Cd109,Cd44,Gpc3,Serpina3n,Serping1,Timp1,Timp2
- 712 GO:0015874norepinephrine transport** A 13 S 3 FDR 0.023853612 P2ry12, Ptgs1, Slc6a2
- 713 GO:0019730antimicrobial humoral response** A 13 S 3 FDR 0.02385 B2m, Bcl3, H2-T23
- 717 GO:2000406positive regulation of T cell migration** A 13 S 3 FDR 0.02385 Aif1,Lgals9,Pycard
- 718 GO:0007566embryo implantation** A 27 S 4 FDR 0.024504979 Grn,H2-Q7,Lif,Timp1
- 727 GO:0010575positive regulation of vascular endothelial growth factor production** A 14 S 3 FDR 0.029
C3, C3ar1, Hpse
- 730 GO:0034122negative regulation of toll-like receptor signaling pathway** A 14 S 3 FDR 0.029
Lyn, Rab7b,Trim30a
- 732 GO:0051209release of sequestered calcium ion into cytosol** A 67 S 6 FDR 0.029769604
Cyba,Fgf2,Lyn,Plcg2,Ptpn6,Ptprc
- 734 GO:0002287alpha-beta T cell activation involved in immune response** A 29 S 4 FDR 0.031393687
Bcl3, Bcl6,H2-M3,Jak3
- 739 GO:0045944positive regulation of transcription from RNA polymerase II promoter** A 759 S 28 FDR
0.0318223Agrn,Atf3,Bcl3,Cebpa,Cebpd,Cyr61,Dab2,Fgf2,Fli1,Fosb,Hexb,Ikzf1,Irf5,Irf8,Jak3,Junb,Lif,Lpin3,Nfatc
1,Nfkb2,Nlrc5,Stat3,Tlr2,Tlr4,Tmem173,Tnfrsf1a,Wwtr1,Zbtb7c
- 741 GO:0008360regulation of cell shape** A 116 S 8 FDR 0.033029744 Csf1r,
Fblim1,Fn1,Hexb,Icam1,Msn,Myo10,Wipfl
- 747 GO:0032720negative regulation of tumor necrosis factor production** A 30 S 4 FDR 0.034
Bcl3,Gpmb,Tlr4,Trim30a
- 753 GO:0051043regulation of membrane protein ectodomain proteolysis** A 15 S 3 FDR 0.035
Apoe,Timp1,Timp2

760 GO:0010718positive regulation of epithelial to mesenchymal transition A 31 S 4 FDR 0.038744063
 Dab2, Glipr2,Tgfr2,Wwtr1

767 GO:0001778 plasma membrane repair A 5 S 2 FDR 0.040466379 Dysf, Myof

769 GO:0002645positive regulation of tolerance induction A 5 S 2 FDR 0.0405 H2-M3, Tgfr2

770 GO:0002664regulation of T cell tolerance induction A 5 S 2 FDR 0.040466379 H2-M3,Tgfr2

772 GO:0032667regulation of interleukin-23 production A 5 S 2 FDR 0.0404664 Il17ra,Tlr4

773 GO:0032762mast cell cytokine production A 5 S 2 FDR 0.040466379 Bcl6,Fcer1g

774 GO:0034135regulation of toll-like receptor 2 signaling pathway A 5 S 2 FDR 0.0405 Cyba,Lyn

775 GO:0042270protection from natural killer cell mediated cytotoxicity A 5 S 2 FDR 0.04047 Clec2d,
 H2-T23

776 GO:0045359positive regulation of interferon-beta biosynthetic process A 5 S 2 FDR 0.0405 Tlr4,Tlr7

777 GO:0046689response to mercury ion A 5 S 2 FDR 0.0405 Fn1, Gatm

778 GO:0050861positive regulation of B cell receptor signaling pathway A 5 S 2 FDR 0.0405 Cmtm3,Lyn

779 GO:0060100positive regulation of phagocytosis, engulfment A 5 S 2 0.0405 Fcgr1, Nckap11

780 GO:0061687detoxification of inorganic compound A 5 S 2 FDR 0.0405 Mt1, Mt2

781 GO:0070627ferrous iron import A 5 S 2 FDR 0.0405 B2m, Trf

785 GO:2000668regulation of dendritic cell apoptotic process A 5 S 2 FDR 0.0405 Jak3,Lyn

786 GO:2001179regulation of interleukin-10 secretion A 5 S 2 FDR 0.0405 Lgals9, Pycard

787 GO:2001198regulation of dendritic cell differentiation A 5 S 2 FDR 0.0405 H2-M3, Tmem176a

789 GO:0042517positive regulation of tyrosine phosphorylation of Stat3 protein A 16 S 3 FDR 0.0405
 Csf1r,Il6ra,Lif

793 GO:0070373negative regulation of ERK1 and ERK2 cascade A 51 S 5 FDR 0.041275763
 Atf3,Dab2,Lif,Lyn,Tlr4

800 GO:0045646regulation of erythrocyte differentiation A 33 S 4 FDR 0.04653575
 B2m, Inpp5d,Lyn,Nckap11

805 GO:0048246macrophage chemotaxis A 17 S 3 FDR 0.047528795 C3ar1,Cx3cr1,Edn2