**Table S2.** **Genome-wide joint linkage and association analysis**. Shown are all SNPs yielding genome-wide significant *p*-values with either the quantitative and/or the qualitative antibody phenotype in the SAFHS. The regression coefficients refer to the estimated change in the phenotype for each dose of the rarer SNP allele. For the SAFHS all genome-wide significant results (*p* ≤ 5.29x10-8) are presented in bold lettering. After correcting for multiple testing during replication in the SAFDGS (we tested the entire HLA region, with 5689 available SNPs: *p* ≤ 0.05/5689 ≈ 8.79x10-6), 10 SNPs are significant for the replicate sample. When using the combined sample of both studies (SAFHS + SAFDGS), all SNPs originally significant in the SAFHS discovery sample are highly significant.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SNP | Location on chrom 6 (bp) | Nearest gene | This study (SAFHS) | | Replicate (SAFDGS) | | Combined (SAFHS + SAFDGS) | |
| Quantitative  *p*-value (ßSNP) | Discrete  *p*-value (ßSNP)a | Quantitative  *p*-value (ßSNP) | Discrete  *p*-value (ßSNP)a | Quantitative  *p*-value (ßSNP) | Discrete  *p*-value (ßSNP)a |
| rs3132451 | 31690004 | *AIF1* | 7.13x10-8 (-0.38) | **4.04x10-9 (0.59)** | 6.70x10-4 (0.05) | 2.62x10-3 (0.06) | **2.78x10-6 (-0.15)** | **4.75x10-6 (0.16)** |
| rs3130070 | 31699787 | *BAT2* | 2.71x10-7 (-0.37) | **6.87x10-9(0.59)** | 2.53x10-4 (-0.18) | 3.55x10-4 (0.36) | **1.39x10-9 (-0.32)** | **6.78x10-11 (0.48)** |
| rs3130622 | 31700503 | *BAT2* | 1.56x10-7 (-0.38) | **6.39x10-9 (0.60)** | 6.46x10-4 (0.05) | 2.66x10-3 (0.06) | **4.94x10-6 (-0.14)** | **7.08x10-6 (0.14)** |
| rs3130623 | 31705679 | *BAT2* | 3.36x10-6 (-0.32) | **1.74x10-8 (0.56)** | 1.31x10-4 (-0.22) | 1.56x10-4 (0.41) | **5.07x10-9 (-0.29)** | **4.37x10-11 (0.48)** |
| rs3130626 | 31706468 | *BAT2* | 2.71x10-7 (-0.37) | **6.87x10-9 (0.59)** | 2.18x10-4 (-0.19) | 2.56x10-4 (0.38) | **1.07x10-9 (-0.32)** | **3.51x10-11 (0.49)** |
| rs2736157 | 31708799 | *BAT2* | 2.71x10-7 (-0.37) | **6.87x10-9 (0.59)** | 2.18x10-4 (-0.19) | 2.56x10-4 (0.38) | **1.07x10-9 (-0.32)** | **3.51x10-11 (0.49)** |
| rs3115663 | 31709822 | *BAT2* | 2.71x10-7 (-0.37) | **6.87x10-9 (0.59)** | 2.16x10-4 (-0.20) | 2.52x10-4 (0.39) | **1.06x10-9 (-0.32)** | **3.43x10-11 (0.49)** |
| rs9267522 | 31711749 | *BAT2* | 2.71x10-7 (-0.37) | **6.87x10-9 (0.59)** | 2.18x10-4 (-0.19) | 2.56x10-4 (0.38) | **1.07x10-9 (-0.32)** | **3.51x10-11 (0.49)** |
| rs10885 | 31712570 | *BAT2* | 2.71x10-7 (-0.37) | **6.87x10-9 (0.59)** | 2.62x10-4 (-0.18) | 2.36x10-4 (0.38) | **1.57x10-9 (-0.31)** | **3.78x10-11 (0.49)** |
| rs3130628 | 31717251 | *BAT3* | 4.55x10-7 (-0.36) | **8.24x10-9 (0.58)** | 2.73x10-4 (-0.18) | 4.01x10-4 (0.34) | **2.61x10-9 (-0.31)** | **7.25x10-11 (0.48)** |
| rs3130048 | 31721718 | *BAT3* | **4.62x10-9 (-0.35)** | **2.18x10-9 (0.51)** | 3.14x10-5 (-0.24) | 4.54x10-4 (0.28) | **3.77x10-12 (-0.31)** | **3.11x10-11 (0.41)** |
| rs3117583 | 31727555 | *BAT3* | 2.71x10-7 (-0.37) | **6.87x10-9 (0.59)** | 2.18x10-4 (-0.19) | 2.56x10-4 (0.38) | **1.07x10-9 (-0.32)** | **3.51x10-11 (0.49)** |
| rs3130618 | 31740113 | *BAT4* | 3.91x10-7 (-0.36) | **6.87x10-9 (0.59)** | 2.18x10-4 (-0.19) | 2.56x10-4 (0.38) | **1.51x10-9 (-0.32)** | **3.51x10-11 (0.49)** |
| rs9267532 | 31747958 | *LY6G5B* | 4.68x10-6 (-0.41) | **4.54x10-8 (0.68)** | 7.36x10-4 (-0.10) | 1.04x10-3 (0.34) | **1.40x10-7 (-0.32)** | **2.37x10-10 (0.58)** |
| rs9267536 | 31759173 | *LY6G5C* | 2.00x10-6 (-0.43) | **4.85x10-8 (0.69)** | 7.90x10-4 (-0.09) | 9.57x10-4 (0.39) | **7.65x10-8 (-0.35)** | **1.70x10-10 (0.62)** |
| rs652888 | 31959213 | *EHMT2* | 1.53x10-7 (-0.36) | **1.02x10-9 (0.60)** | 1.65x10-5 (-0.33) | 1.00x10-4 (0.46) | **6.12x10-11 (-0.34)** | **8.41x10-13 (0.54)** |
| rs204999 | 32217957 | *PRRT1* | **8.68x10-9 (-0.30)** | **1.61x10-10 (0.48)** | **5.39x10-8 (-0.37)** | **1.56x10-7 (0.56)** | **6.30x10-15 (-0.32)** | **7.10x10-16 (0.48)** |
| rs204995 | 32262263 | *PBX2* | 2.60x10-7 (-0.30) | **5.44x10-9 (0.48)** | 9.81x10-5 (-0.18) | 4.69x10-5 (0.39) | **4.14x10-10 (-0.26)** | **3.41x10-11 (0.40)** |
| rs204994 | 32262976 | *PBX2* | 8.76x10-7 (-0.30) | **1.30x10-8 (0.49)** | 5.53x10-5 (-0.22) | 2.29x10-5 (0.43) | **6.28x10-10 (-0.27)** | **4.33x10-11 (0.41)** |
| rs204992 | 32264886 | *PBX2* | 2.60x10-6 (-0.28) | **1.85x10-8 (0.48)** | 3.54x10-5 (-0.23) | 1.50x10-5 (0.46) | **9.12x10-10 (-0.27)** | **3.23x10-11 (0.41)** |
| rs4248166 | 32474399 | *C6orf10* | **4.29x10-9 (0.29)** | **2.54x10-10(-0.45)** | **6.62x10-6 (0.22)** | 6.14x10-4 (-0.21) | **2.13x10-13 (0.27)** | **3.96x10-13 (-0.39)** |
| rs2294884 | 32475237 | *BTNL2* | 5.58x10-8 (0.26) | **1.71x10-9 (-0.42)** | 1.02x10-5 (0.21) | 9.68x10-4 (-0.18) | **3.44x10-12 (0.25)** | **6.07x10-12 (-0.36)** |
| rs2294882 | 32475493 | *BTNL2* | **2.61x10-8 (0.26)** | **1.73x10-10 (-0.44)** | 1.06x10-5 (0.21) | 8.38x10-4 (-0.18) | **1.83x10-12 (0.25)** | **6.37x10-13 (-0.38)** |
| rs2294881 | 32475582 | *BTNL2* | **2.61x10-8 (0.26)** | **1.73x10-10 (-0.44)** | 1.06x10-5 (0.21) | 8.38x10-4 (-0.18) | **1.83x10-12 (0.25)** | **6.37x10-13 (-0.38)** |
| rs28362680 | 32478794 | *BTNL2* | 1.23x10-7 (0.26) | **3.12x10-10 (-0.47)** | 2.90x10-5 (0.19) | 1.26x10-3 (-0.16) | **2.97x10-11 (0.24)** | **2.72x10-12 (-0.39)** |
| rs28362683 | 32480941 | *BTNL2* | 1.50x10-7 (0.27) | **1.78x10-9 (-0.46)** | 3.49x10-5 (0.19) | 1.38x10-3 (-0.16) | **4.56x10-11 (0.24)** | **1.40x10-11 (-0.38)** |
| rs10947261 | 32481210 | *BTNL2* | 1.01x10-7 (0.27) | **2.77x10-10 (-0.48)** | 2.87x10-5 (0.19) | 1.30x10-3 (-0.16) | **2.37x10-11 (0.25)** | **2.65x10-12 (-0.39)** |
| rs10947262 | 32481290 | *BTNL2* | 2.39x10-7 (0.26) | **5.38x10-10 (-0.46)** | 2.90x10-5 (0.19) | 1.26x10-3 (-0.16) | **5.41x10-11 (0.24)** | **4.38x10-12 (-0.38)** |
| rs9268658 | 32518694 | *HLA-DRA* | 4.51x10-6 (0.18) | **1.68x10-8 (-0.33)** | 7.77x10-5 (0.14) | 1.34x10-3 (-0.13) | **3.02x10-9 (0.17)** | **5.52x10-11 (-0.29)** |
| rs8084 | 32519013 | *HLA-DRA* | 1.50x10-6 (0.20) | **3.37x10-9 (-0.37)** | 1.29x10-4 (0.13) | 2.32x10-3 (-0.08) | **2.64x10-9 (0.18)** | **2.09x10-10 (-0.28)** |
| rs2239804 | 32519501 | *HLA-DRA* | 6.20x10-6 (0.18) | **2.41x10-8 (-0.32)** | 7.77x10-5 (0.14) | 1.34x10-3 (-0.13) | **4.05x10-9 (0.17)** | **7.74x10-11 (-0.28)** |
| rs7192 | 32519624 | *HLA-DRA* | 1.71x10-7 (0.22) | **3.04x10-10 (-0.40)** | 3.04x10-5 (0.17) | 1.15x10-3 (-0.15) | **6.10x10-11 (0.20)** | **4.14x10-12 (-0.32)** |
| rs3129888 | 32519704 | *HLA-DRA* | 1.79x10-5 (0.22) | **2.53x10-8 (-0.43)** | 2.27x10-4 (0.13) | 8.20x10-4 (-0.20) | **4.32x10-8 (0.19)** | **1.08x10-10 (-0.36)** |
| rs2239803 | 32519811 | *HLA-DRA* | 4.38x10-7 (0.21) | **1.78x10-9 (-0.36)** | 4.87x10-5 (0.16) | 1.53x10-3 (-0.12) | **1.93x10-10 (0.19)** | **1.97x10-11 (-0.30)** |
| rs2239802 | 32519824 | *HLA-DRA* | 1.10x10-5 (0.22) | **1.38x10-8 (-0.42)** | 1.13x10-4 (0.15) | 8.34x10-4 (-0.19) | **3.15x10-8 (0.18)** | **2.03x10-13 (-0.42)** |
| rs4935356 | 32520366 | *HLA-DRA* | 4.51x10-6 (0.18) | **1.68x10-8 (-0.33)** | 7.77x10-5 (0.14) | 1.34x10-3 (-0.13) | **3.02x10-9 (0.17)** | **5.52x10-11 (-0.29)** |
| rs7194 | 32520458 | *HLA-DRA* | 1.16x10-7 (0.22) | **1.96x10-10 (-0.40)** | 3.04x10-5 (0.17) | 1.15x10-3 (-0.15) | **4.27x10-11 (0.21)** | **2.81x10-12 (-0.33)** |
| rs7195 | 32520517 | *HLA-DRA* | 1.16x10-7 (0.22) | **1.96x10-10 (-0.40)** | 3.04x10-5 (0.17) | 1.15x10-3 (-0.15) | **4.27x10-11 (0.21)** | **2.81x10-12 (-0.33)** |
| rs2213586 | 32521072 | *HLA-DRA* | 1.16x10-7 (0.22) | **1.96x10-10 (-0.40)** | 3.04x10-5 (0.17) | 1.15x10-3 (-0.15) | **4.27x10-11 (0.21)** | **2.81x10-12 (-0.33)** |
| rs2213585 | 32521128 | *HLA-DRA* | 1.16x10-7 (0.22) | **1.96x10-10 (-0.40)** | 3.04x10-5 (0.17) | 1.15x10-3 (-0.15) | **4.27x10-11 (0.21)** | **2.81x10-12 (-0.33)** |
| rs2395182 | 32521295 | *HLA-DRA* | 3.43x10-6 (0.23) | **6.32x10-9 (-0.43)** | 1.21x10-4 (0.15) | 6.86x10-4 (-0.21) | **3.41x10-9 (0.21)** | **3.46x10-11 (-0.36)** |
| rs2227139 | 32521437 | *HLA-DRA* | 1.16x10-7 (0.22) | **1.96x10-10 (-0.40)** | 3.04x10-5 (0.17) | 1.15 x10-3 (-0.15) | **4.27x10-11 (0.21)** | **2.81x10-12 (-0.33)** |
| rs7754768 | 32528157 | *HLA-DRA* | 1.13x10-7 (0.22) | **2.20x10-10 (-0.40)** | 3.13x10-5 (0.17) | 1.00x10-3 (-0.16) | **3.82x10-11 (0.21)** | **2.99x10-12 (-0.32)** |
| rs9268832 | 32535767 | *HLA-DRB9* | **2.25 x10-8 (0.24)** | **8.33x10-11 (-0.41)** | 8.03x10-5 (0.14) | 1.32x10-3 (-0.14) | **3.11x10-11 (0.21)** | **1.97x10-12 (-0.33)** |
| rs9268853 | 32537621 | *HLA-DRB9* | 6.79x10-8 (-0.23) | **2.99x10-8 (0.33)** | **4.13x10-8 (-0.30)** | **1.83x10-7 (0.48)** | **3.32x10-14 (-0.25)** | **1.32x10-13 (0.35)** |
| rs2395185 | 32541145 | *HLA-DRB9* | 1.03x10-7 (-0.22) | **4.54x10-8 (0.32)** | **4.13x10-8 (-0.30)** | **1.83x10-7 (0.48)** | **5.30x10-14 (-0.25)** | **2.12x10-13 (0.35)** |
| rs9368726 | 32546520 | *HLA-DRB5* | 6.79x10-8 (-0.23) | **2.99x10-8 (0.33)** | **4.13x10-8 (-0.30)** | **1.83x10-7 (0.48)** | **3.32x10-14 (-0.25)** | **1.32x10-13 (0.35)** |
| rs9405108 | 32546626 | *HLA-DRB5* | 6.79x10-8 (-0.23) | **2.99x10-8 (0.33)** | **4.13x10-8 (-0.30)** | **1.83x10-7 (0.48)** | **3.32x10-14 (-0.25)** | **1.32x10-13 (0.35)** |
| rs6901541 | 32550239 | *HLA-DRB* | 4.12x10-7 (0.23) | **2.49x10-9 (-0.40)** | 6.37x10-5 (0.16) | 1.51x10-3 (-0.13) | **2.77x10-10 (0.21)** | **3.83x10-11 (-0.32)** |
| rs28366298 | 32668837 | *HLA-DRB1* | **1.39x10-8 (-0.25)** | **9.46x10-9 (0.36)** | **1.07x10-7 (-0.31)** | **1.75x10-7 (0.52)** | **1.08x10-14 (-0.27)** | **3.87x10-14 (0.39)** |
| rs477515 | 32677669 | *HLA-DRB1* | **3.32x10-9 (-0.26)** | **5.17x10-9 (0.37)** | **5.66x10-8 (-0.32)** | **4.73x10-8 (0.55)** | **1.37x10-15 (-0.28)** | **8.34x10-15 (0.40)** |
| rs2516049 | 32678378 | *HLA-DRB1* | **3.32x10-9 (-0.26)** | **5.17x10-9 (0.37)** | **5.66x10-8 (-0.32)** | **4.73x10-8 (0.55)** | **1.37x10-15 (-0.28)** | **8.34x10-15 (0.40)** |
| rs9271488 | 32696978 | *HLA-DQA1* | 1.11x10-7 (-0.23) | **4.37x10-8 (0.34)** | **7.45x10-8 (-0.32)** | **1.37x10-8 (0.59)** | **7.54x10-14 (-0.26)** | **6.66x10-14 (0.38)** |
| rs3104369 | 32710460 | *HLA-DQA1* | 1.89x10-6 (0.22) | **1.49x10-8 (-0.40)** | 3.75x10-4 (0.14) | 2.31x10-4 (-0.33) | **7.03x10-9 (0.20)** | **1.10x10-11 (-0.38)** |

aSince we used a liability threshold model for analysis of the dichotomous trait (see methods section), the direction of effect on EBNA-1 discrete serostatus is opposite of the sign of the regression coefficient, but is in the same direction as the regression coefficient for the quantitative trait.