**Supplemental Material**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **p<0.001** | | | | **p<0.00001** | | | |
|  | **Phenotype** | N+ | N- | **Total** | SNPs | HLA\* alleles | HLA\* AAs | **Total** | SNPs | HLA\* alleles | HLA\* AAs |
| **auto- antibodies** | **SSB** | 281 | 2200 | **2738** | 2477 | 11 | 250 | **1805** | 1616 | 6 | 183 |
| **SSA** | 681 | 1803 | **2574** | 2269 | 15 | 290 | **1646** | 1425 | 10 | 211 |
| **dsDNA** | 1072 | 1471 | **105** | 102 | 0 | 3 | **1** | 1 | 0 | 0 |
| **RNP** | 282 | 1640 | **56** | 38 | 1 | 17 | **0** | 0 | 0 | 0 |
| **ACL IgG** | 496 | 1051 | **11** | 10 | 1 | 0 | **0** | 0 | 0 | 0 |
| **ACL** | 876 | 1489 | **21** | 19 | 0 | 2 | **0** | 0 | 0 | 0 |
| **SM** | 188 | 1864 | **0** | 0 | 0 | 0 | **0** | 0 | 0 | 0 |
| **ACL IgM** | 268 | 1254 | **7** | 2 | 1 | 4 | **0** | 0 | 0 | 0 |
| **ACR criteria** | **Hematologic** | 1389 | 905 | **165** | 107 | 1 | 57 | **0** | 0 | 0 | 0 |
| **Immunologic** | 1987 | 940 | **119** | 86 | 1 | 32 | **17** | 15 | 0 | 2 |
| **Renal** | 960 | 2101 | **126** | 113 | 1 | 12 | **18** | 16 | 0 | 2 |
| **ANA** | 2219 | 182 | **36** | 36 | 0 | 0 | **0** | 0 | 0 | 0 |
| **Malar** | 1158 | 1108 | **40** | 39 | 0 | 1 | **0** | 0 | 0 | 0 |
| **Skin†** | 1797 | 1099 | **7** | 7 | 0 | 0 | **0** | 0 | 0 | 0 |
| **Discoid** | 233 | 2035 | **17** | 14 | 0 | 3 | **0** | 0 | 0 | 0 |
| **Arthritis** | 2249 | 681 | **9** | 9 | 0 | 0 | **0** | 0 | 0 | 0 |
| **Photo** | 1843 | 801 | **0** | 0 | 0 | 0 | **0** | 0 | 0 | 0 |
| **Serositis** | 1091 | 1835 | **1** | 1 | 0 | 0 | **0** | 0 | 0 | 0 |
| **OralUlcers** | 1103 | 1461 | **0** | 0 | 0 | 0 | **0** | 0 | 0 | 0 |
| **Neurologic** | 372 | 2517 | **2** | 2 | 0 | 0 | **0** | 0 | 0 | 0 |

**Supplemental Table 1. Number of single-marker associations at p<0.001 and p<0.00001 for each tested sub-phenotype. \*HLA alleles A, B, C, DRB1, DQA1, DQB1, DPB1; AA=amino acids \*\*total variants tested = 8573 (7119 SNPs, 1255 HLA amino acids (in 338 positions), 199 HLA alleles) †Skin = skin manifestations (malar or discoid), for Illumina custom panel this was available instead of malar or discoid specifically.**