S3 Table Significance thresholds in stage 1

Significance thresholds for each region are presented for SNPs and indels for the single variant analysis and for SNPs for the collapsing methods (no indels were included in the collapsing methods analyses).The column “GWAS gene” presents the gene reported in the lung function GWAS [[5](#_ENREF_5)] for each region. Abbreviations: Chr=chromosome, N=number, UK10K+1000G=joint 1000 Genomes Project and UK10K reference panel.

| **Chr: start-end** | **GWAS gene** | **Variant type** | **Collapsing methods thresholds** | **N variants** | **N variants in UK10K+****1000G** | **N tests in** **UK10K+1000G** | **N tests****final** | **Single variant thresholds** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gene based** | **Exon based** | **Slide** **window** |
| chr1:17238444-17455948 |  *MFAP2* | SNP | 1.25x$10^{-2}$ | 1.67x$10^{-2}$ | 1.72x$10^{-3}$ | 338 | 291 | 99 | 146 | 3.43x$10^{-4}$ |
| indel | - | - | - | 9 | 5 | 5 | 9 | 5.56x$10^{-3}$ |
| chr1:218508675-218885482 |  *TGFB2* | SNP | 5x$10^{-2}$ | 5x$10^{-2}$ | 4.24x$10^{-4}$ | 691 | 612 | 248 | 327 | 1.53x$10^{-4}$ |
| indel | - | - | - | 36 | 23 | 18 | 31 | 1.61x$10^{-3}$ |
| chr2:218627794-218818796 |  *TNS1* | SNP | 5x$10^{-2}$ | 5x$10^{-2}$ | 1.09x$10^{-3}$ | 337 | 309 | 146 | 174 | 2.87x$10^{-4}$ |
| indel | - | - | - | 5 | 5 | 5 | 5 | 1x$10^{-2}$ |
| chr2:239839616-240332643 |  *HDAC4* | SNP | 5x$10^{-2}$ | 5x$10^{-2}$ | 3.68x$10^{-4}$ | 1243 | 1159 | 396 | 480 | 1.04x$10^{-4}$ |
| indel | - | - | - | 34 | 26 | 21 | 29 | 1.72x$10^{-3}$ |
| chr3:25459833-25649422 |  *RARB* | SNP | 2.5x$10^{-2}$ | 2.5x$10^{-2}$ | 5.81x$10^{-4}$ | 471 | 414 | 200 | 257 | 1.95x$10^{-4}$ |
| indel | - | - | - | 24 | 18 | 14 | 20 | 2.5x$10^{-3}$ |
| chr3:168791286-169391563 |  *MECOM* | SNP | 5x$10^{-2}$ | 5x$10^{-2}$ | 1.87x$10^{-4}$ | 1326 | 1152 | 460 | 634 | 7.89x$10^{-5}$ |
| indel | - | - | - | 54 | 37 | 29 | 46 | 1.09x$10^{-3}$ |
| chr4:89637105-90077431 |  *FAM13A*  | SNP | 5x$10^{-2}$ | 5x$10^{-2}$ | 5x$10^{-4}$ | 666 | 591 | 200 | 275 | 1.82x$10^{-4}$ |
| indel | - | - | - | 31 | 24 | 18 | 25 | 2x$10^{-3}$ |
| chr4:106280233-106902828 |  *GSTCD* | SNP | 1x$10^{-2}$ | 1.25x$10^{-2}$ | 2.69x$10^{-4}$ | 1031 | 922 | 328 | 437 | 1.14x$10^{-4}$ |
| indel | - | - | - | 58 | 37 | 20 | 41 | 1.22x$10^{-3}$ |
| chr4:145227600-145669881 |  *HHIP* | SNP | 5x$10^{-2}$ | 5x$10^{-2}$ | 2.76x$10^{-4}$ | 802 | 686 | 248 | 364 | 1.37x$10^{-4}$ |
| indel | - | - | - | 25 | 15 | 12 | 22 | 2.27x$10^{-3}$ |
| chr5:94984019-95038027 |  *SPATA9* | SNP | 2.5x$10^{-2}$ | - | 2.5x$10^{-3}$ | 77 | 69 | 42 | 50 | 1x$10^{-3}$ |
| indel | - | - | - | 2 | 2 | 2 | 2 | 2.5x$10^{-2}$ |
| chr5:147682118-148026624 |  *HTR4*  | SNP | 1.25x$10^{-2}$ | 1.67x$10^{-2}$ | 4.9x$10^{-4}$ | 468 | 414 | 197 | 251 | 1.99x$10^{-4}$ |
| indel | - | - | - | 17 | 13 | 7 | 11 | 4.55x$10^{-3}$ |
| chr5:156597906-157139503 |  *ADAM19* | SNP | 8.33x$10^{-3}$ | 1.25x$10^{-2}$ | 5.88x$10^{-4}$ | 670 | 615 | 236 | 291 | 1.72x$10^{-4}$ |
| indel | - | - | - | 25 | 20 | 17 | 22 | 2.27x$10^{-3}$ |
| chr6:27982152-28415572 | *ZKSCAN3* | SNP | 3.85x$10^{-3}$ | 1x$10^{-2}$ | 4.39x$10^{-4}$ | 520 | 459 | 162 | 223 | 2.24x$10^{-4}$ |
| indel | - | - | - | 26 | 23 | 10 | 13 | 3.85x$10^{-3}$ |
| chr6:30584612-31959223 |  *NCR3* | SNP | 1.22x$10^{-3}$ | 3.13x$10^{-3}$ | 2.79x$10^{-4}$ | 3507 | 3307 | 647 | 847 | 5.9x$10^{-5}$ |
| indel | - | - | - | 115 | 98 | 54 | 71 | 7.04x$10^{-4}$ |
| chr6:31996092-32205942 |  *AGER* | SNP | 7.14x$10^{-3}$ | 2.5x$10^{-2}$ | 2.17x$10^{-3}$ | 283 | 270 | 87 | 100 | 5x$10^{-4}$ |
| indel | - | - | - | 14 | 11 | 10 | 13 | 3.85x$10^{-3}$ |
| chr6:109159618-109305352 |  *ARMC2* | SNP | 5x$10^{-2}$ | 5x$10^{-2}$ | 1.11x$10^{-3}$ | 213 | 189 | 97 | 121 | 4.13x$10^{-4}$ |
| indel | - | - | - | 9 | 7 | 6 | 8 | 6.25x$10^{-3}$ |
| chr6:142613055-142968973 | *GPR126* | SNP | 2.5x$10^{-2}$ | 5x$10^{-2}$ | 4.27x$10^{-4}$ | 443 | 388 | 196 | 251 | 1.99x$10^{-4}$ |
| indel | - | - | - | 20 | 9 | 6 | 17 | 2.94x$10^{-3}$ |
| chr9:98153197-98313032 |  *PTCH1* | SNP | 5x$10^{-2}$ | - | 9.8x$10^{-4}$ | 226 | 200 | 96 | 122 | 4.1x$10^{-4}$ |
| indel | - | - | - | 13 | 8 | 6 | 11 | 4.55x$10^{-3}$ |
| chr10:12170174-12335588 |  *CDC123* | SNP | 1.67x$10^{-2}$ | 5x$10^{-2}$ | 1.09x$10^{-3}$ | 226 | 192 | 91 | 125 | 4x$10^{-4}$ |
| indel | - | - | - | 11 | 4 | 4 | 11 | 4.55x$10^{-3}$ |
| chr10:77532518-78643886 |  *C10orf11* | SNP | 5x$10^{-2}$ | - | 1.71x$10^{-4}$ | 1513 | 1336 | 535 | 712 | 7.02x$10^{-5}$ |
| indel | - | - | - | 31 | 17 | 15 | 29 | 1.72x$10^{-3}$ |
| chr12:57472676-57617125 |  *LRP1* | SNP | 1.25x$10^{-2}$ | 2.5x$10^{-2}$ | 1.56x$10^{-3}$ | 169 | 155 | 87 | 101 | 4.95x$10^{-4}$ |
| indel | - | - | - | 2 | 2 | 2 | 2 | 2.5x$10^{-2}$ |
| chr12:96041582-96400071 |  *CCDC38* | SNP | 8.33x$10^{-3}$ | 1.67x$10^{-2}$ | 5.05x$10^{-4}$ | 651 | 586 | 216 | 281 | 1.78x$10^{-4}$ |
| indel | - | - | - | 26 | 21 | 18 | 23 | 2.17x$10^{-3}$ |
| chr15:71423787-72085722 |  *THSD4*  | SNP | 5x$10^{-2}$ | 5x$10^{-2}$ | 2.66x$10^{-4}$ | 1266 | 1151 | 446 | 561 | 8.91x$10^{-5}$ |
| indel | - | - | - | 32 | 19 | 18 | 31 | 1.61x$10^{-3}$ |
| chr16:57906243-58143392 |  *MMP15* | SNP | 1x$10^{-2}$ | 1.67x$10^{-2}$ | 1.61x$10^{-3}$ | 310 | 288 | 130 | 152 | 3.29x$10^{-4}$ |
| indel | - | - | - | 9 | 4 | 4 | 9 | 5.56x$10^{-3}$ |
| chr16:75252927-75538926 |  *CFDP1* | SNP | 1x$10^{-2}$ | 2.5x$10^{-2}$ | 5.88x$10^{-4}$ | 517 | 481 | 177 | 213 | 2.35x$10^{-4}$ |
| indel | - | - | - | 7 | 2 | 2 | 7 | 7.14x$10^{-3}$ |
| chr21:35595821-35753440 |  *KCNE2* | SNP | 2.5x$10^{-2}$ | 5x$10^{-2}$ | 1.25x$10^{-3}$ | 213 | 190 | 108 | 131 | 3.82x$10^{-4}$ |
| indel | - | - | - | 8 | 6 | 6 | 8 | 6.25x$10^{-3}$ |