

*Additional file*

## **Phenome-wide association study on miRNA-related sequence variants: the UK Biobank**

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Running title: Phenome-wide association study of genetic variants in microRNAs

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Table S1. The list of 346 genetic variants tested in PheWAS

| chr | bp        | rsid        | EA | EAF  | location  | pre_id        | mature_id        |
|-----|-----------|-------------|----|------|-----------|---------------|------------------|
| 1   | 1102563   | rs72563729  | A  | 0.99 | pre-miRNA | hsa-mir-200b  | NA               |
| 1   | 1231507   | rs619608    | A  | 0.95 | Seed      | hsa-mir-6726  | hsa-miR-6726-3p  |
| 1   | 12251808  | rs653667    | G  | 0.64 | pre-miRNA | hsa-mir-4632  | NA               |
| 1   | 12639018  | rs2275874   | T  | 0.46 | pre-miRNA | hsa-mir-6730  | NA               |
| 1   | 17604437  | rs72646786  | T  | 0.86 | pre-miRNA | hsa-mir-3972  | NA               |
| 1   | 20960230  | rs45530340  | T  | 0.80 | pre-miRNA | hsa-mir-6084  | NA               |
| 1   | 54519800  | rs74085143  | A  | 0.98 | Seed      | hsa-mir-4781  | hsa-miR-4781-3p  |
| 1   | 55691384  | rs17111728  | C  | 0.92 | pre-miRNA | hsa-mir-4422  | NA               |
| 1   | 65523519  | rs521188    | G  | 0.97 | pre-miRNA | hsa-mir-3671  | NA               |
| 1   | 67094171  | rs12402181  | A  | 0.84 | Seed      | hsa-mir-3117  | hsa-miR-3117-3p  |
| 1   | 98510847  | rs74904371  | T  | 0.98 | Seed      | hsa-mir-2682  | hsa-miR-2682-3p  |
| 1   | 117102649 | rs1414273   | T  | 0.88 | pre-miRNA | hsa-mir-548ac | NA               |
| 1   | 178646884 | rs56088671  | T  | 0.93 | pre-miRNA | hsa-mir-4424  | NA               |
| 1   | 206648147 | rs1953090   | G  | 0.74 | pre-miRNA | hsa-mir-6769b | NA               |
| 1   | 224585958 | rs7522956   | C  | 0.79 | pre-miRNA | hsa-mir-4742  | NA               |
| 1   | 228284991 | rs2070960   | T  | 0.92 | Seed      | hsa-mir-3620  | hsa-miR-3620-5p  |
| 1   | 233759918 | rs701213    | C  | 0.79 | pre-miRNA | hsa-mir-4427  | NA               |
| 1   | 233759939 | rs701214    | T  | 0.91 | pre-miRNA | hsa-mir-4427  | NA               |
| 1   | 234442257 | rs877722    | T  | 0.90 | pre-miRNA | hsa-mir-4671  | NA               |
| 2   | 6790537   | rs10192411  | G  | 0.58 | pre-miRNA | hsa-mir-7515  | NA               |
| 2   | 12877501  | rs5829384   | GA | 0.37 | pre-miRNA | hsa-mir-3125  | NA               |
| 2   | 35696519  | rs62143301  | A  | 0.89 | Mature    | hsa-mir-548ad | hsa-miR-548ad-3p |
| 2   | 47604856  | rs114803590 | C  | 0.99 | pre-miRNA | hsa-mir-559   | NA               |
| 2   | 47604866  | rs58450758  | T  | 0.92 | pre-miRNA | hsa-mir-559   | NA               |
| 2   | 52929680  | rs6726779   | C  | 0.65 | pre-miRNA | hsa-mir-4431  | NA               |
| 2   | 56210140  | rs41291173  | A  | 0.98 | Mature    | hsa-mir-217   | hsa-miR-217-3p   |
| 2   | 56216090  | rs41291179  | T  | 0.95 | pre-miRNA | hsa-mir-216a  | NA               |
| 2   | 60614572  | rs243080    | A  | 0.55 | pre-miRNA | hsa-mir-4432  | NA               |
| 2   | 60614577  | rs56239160  | G  | 0.95 | pre-miRNA | hsa-mir-4432  | NA               |

|   |           |             |   |      |           |                |                  |
|---|-----------|-------------|---|------|-----------|----------------|------------------|
| 2 | 64567916  | rs12473206  | G | 0.72 | Seed      | hsa-mir-4433b  | hsa-miR-4433b-3p |
| 2 | 64567916  | rs12473206  | G | 0.72 | Seed      | hsa-mir-4433a  | hsa-miR-4433a-5p |
| 2 | 103048780 | rs62154973  | T | 0.92 | Mature    | hsa-mir-4772   | hsa-miR-4772-5p  |
| 2 | 114478923 | rs113469098 | T | 0.99 | Mature    | hsa-mir-4782   | hsa-miR-4782-5p  |
| 2 | 134884700 | rs6430498   | A | 0.72 | pre-miRNA | hsa-mir-3679   | NA               |
| 2 | 141344200 | rs56148568  | C | 0.78 | Mature    | hsa-mir-7157   | hsa-miR-7157-3p  |
| 2 | 176032376 | rs79402775  | A | 0.98 | Mature    | hsa-mir-933    | hsa-miR-933      |
| 2 | 180725568 | rs146754630 | C | 0.97 | pre-miRNA | hsa-mir-1258   | NA               |
| 2 | 207647981 | rs2241347   | T | 0.83 | Mature    | hsa-mir-3130-1 | hsa-miR-3130-5p  |
| 2 | 207647981 | rs2241347   | T | 0.83 | Mature    | hsa-mir-3130-2 | hsa-miR-3130-5p  |
| 2 | 207647981 | rs2241347   | T | 0.83 | Mature    | hsa-mir-3130-2 | hsa-miR-3130-3p  |
| 2 | 207647981 | rs2241347   | T | 0.83 | Mature    | hsa-mir-3130-1 | hsa-miR-3130-3p  |
| 2 | 208031167 | rs6717413   | A | 0.34 | pre-miRNA | hsa-mir-7845   | NA               |
| 2 | 208134114 | rs116237969 | T | 0.98 | pre-miRNA | hsa-mir-1302-4 | NA               |
| 2 | 219206645 | rs62182086  | G | 0.86 | Seed      | hsa-mir-6810   | hsa-miR-6810-5p  |
| 2 | 220771223 | rs4674470   | T | 0.22 | pre-miRNA | hsa-mir-4268   | NA               |
| 2 | 238419611 | rs2292879   | G | 0.77 | Mature    | hsa-mir-6811   | hsa-miR-6811-3p  |
| 2 | 240007544 | rs12233076  | T | 0.69 | pre-miRNA | hsa-mir-4441   | NA               |
| 2 | 240882476 | rs78832554  | A | 0.97 | pre-miRNA | hsa-mir-4786   | NA               |
| 2 | 241395500 | rs71428439  | G | 0.87 | pre-miRNA | hsa-mir-149    | NA               |
| 2 | 241395503 | rs2292832   | C | 0.29 | pre-miRNA | hsa-mir-149    | NA               |
| 3 | 20179097  | rs6787734   | T | 0.90 | pre-miRNA | hsa-mir-3135a  | NA               |
| 3 | 20179130  | rs142342924 | A | 0.93 | pre-miRNA | hsa-mir-3135a  | NA               |
| 3 | 44903434  | rs2292181   | C | 0.95 | pre-miRNA | hsa-mir-564    | NA               |
| 3 | 48587408  | rs35452137  | C | 0.89 | Seed      | hsa-mir-6823   | hsa-miR-6823-3p  |
| 3 | 52880543  | rs4687672   | A | 0.77 | Mature    | hsa-mir-8064   | hsa-miR-8064     |
| 3 | 96078864  | rs1514422   | A | 0.95 | Mature    | hsa-mir-8060   | hsa-miR-8060     |
| 3 | 120768492 | rs9877402   | G | 0.97 | pre-miRNA | hsa-mir-5682   | NA               |
| 3 | 124093220 | rs78790512  | A | 0.83 | pre-miRNA | hsa-mir-6083   | NA               |
| 3 | 124451312 | rs10934682  | G | 0.82 | pre-miRNA | hsa-mir-544b   | NA               |
| 3 | 124870376 | rs11713052  | G | 0.97 | pre-miRNA | hsa-mir-5092   | NA               |
| 3 | 128990998 | rs6771809   | C | 0.90 | Seed      | hsa-mir-6826   | hsa-miR-6826-5p  |
| 3 | 151283691 | rs9842591   | A | 0.53 | pre-miRNA | hsa-mir-5186   | NA               |
| 3 | 175087408 | rs78831152  | T | 0.88 | pre-miRNA | hsa-mir-4789   | NA               |

|   |           |             |     |      |           |                 |                  |
|---|-----------|-------------|-----|------|-----------|-----------------|------------------|
| 3 | 189547735 | rs75715827  | C   | 0.94 | pre-miRNA | hsa-mir-944     | NA               |
| 3 | 197020780 | rs3836429   | GA  | 0.39 | pre-miRNA | hsa-mir-4797    | NA               |
| 4 | 1988184   | rs201953811 | ACC | 0.79 | pre-miRNA | hsa-mir-943     | NA               |
| 4 | 1988188   | rs3034718   | CCT | 0.79 | pre-miRNA | hsa-mir-943     | NA               |
| 4 | 1988193   | rs1077020   | C   | 0.78 | pre-miRNA | hsa-mir-943     | NA               |
| 4 | 5925054   | rs28645567  | A   | 0.97 | pre-miRNA | hsa-mir-378d-1  | NA               |
| 4 | 7461769   | rs12512664  | G   | 0.58 | pre-miRNA | hsa-mir-4274    | NA               |
| 4 | 36428048  | rs6841938   | A   | 0.92 | Mature    | hsa-mir-1255b-1 | hsa-miR-1255b-5p |
| 4 | 67142620  | rs73239138  | A   | 0.74 | Mature    | hsa-mir-1269a   | hsa-miR-1269a    |
| 4 | 102251501 | rs28664200  | C   | 0.71 | pre-miRNA | hsa-mir-1255a   | NA               |
| 4 | 110409933 | rs77639117  | T   | 0.96 | pre-miRNA | hsa-mir-576     | NA               |
| 4 | 115577997 | rs34115976  | G   | 0.82 | pre-miRNA | hsa-mir-577     | NA               |
| 5 | 1708983   | rs12523324  | A   | 0.35 | pre-miRNA | hsa-mir-4277    | NA               |
| 5 | 9053945   | rs257095    | T   | 0.13 | pre-miRNA | hsa-mir-4636    | NA               |
| 5 | 54466544  | rs10061133  | G   | 0.91 | Mature    | hsa-mir-449b    | hsa-miR-449b-5p  |
| 5 | 54468124  | rs35770269  | T   | 0.68 | Seed      | hsa-mir-449c    | hsa-miR-449c-3p  |
| 5 | 57825920  | rs10461441  | G   | 0.91 | Mature    | hsa-mir-548ae-2 | hsa-miR-548ae-5p |
| 5 | 71465361  | rs3112399   | A   | 0.59 | pre-miRNA | hsa-mir-4803    | NA               |
| 5 | 72174432  | rs266435    | G   | 0.14 | Seed      | hsa-mir-4804    | hsa-miR-4804-5p  |
| 5 | 82136024  | rs79512808  | G   | 0.98 | pre-miRNA | hsa-mir-3977    | NA               |
| 5 | 89312487  | rs75102645  | A   | 0.98 | pre-miRNA | hsa-mir-3660    | NA               |
| 5 | 115591460 | rs77613551  | CA  | 0.85 | pre-miRNA | hsa-mir-12130   | NA               |
| 5 | 131701279 | rs367805    | C   | 0.30 | pre-miRNA | hsa-mir-3936    | NA               |
| 5 | 143059433 | rs2042253   | C   | 0.76 | pre-miRNA | hsa-mir-5197    | NA               |
| 5 | 150901699 | rs3734050   | T   | 0.91 | Seed      | hsa-mir-6499    | hsa-miR-6499-5p  |
| 5 | 153726769 | rs13186787  | G   | 0.98 | pre-miRNA | hsa-mir-1294    | NA               |
| 5 | 153975576 | rs936581    | A   | 0.83 | pre-miRNA | hsa-mir-3141    | NA               |
| 5 | 154065348 | rs77055126  | C   | 0.98 | pre-miRNA | hsa-mir-1303    | NA               |
| 5 | 154065383 | rs75538180  | T   | 0.64 | pre-miRNA | hsa-mir-1303    | NA               |
| 5 | 154209024 | rs702742    | G   | 0.91 | pre-miRNA | hsa-mir-378h    | NA               |
| 5 | 159901483 | rs747499864 | CCT | 0.98 | pre-miRNA | hsa-mir-3142    | NA               |
| 5 | 159912418 | rs2910164   | G   | 0.23 | Seed      | hsa-mir-146a    | hsa-miR-146a-3p  |
| 5 | 168690612 | rs62376934  | G   | 0.36 | pre-miRNA | hsa-mir-585     | NA               |
| 5 | 168690635 | rs62376935  | T   | 0.94 | Seed      | hsa-mir-585     | hsa-miR-585-3p   |

|   |           |             |                          |      |           |                |                 |
|---|-----------|-------------|--------------------------|------|-----------|----------------|-----------------|
| 5 | 168690664 | rs140379047 | G                        | 0.99 | Mature    | hsa-mir-585    | hsa-miR-585-5p  |
| 5 | 174178774 | rs7709117   | A                        | 0.40 | pre-miRNA | hsa-mir-4634   | NA              |
| 5 | 179225324 | rs2291418   | A                        | 0.96 | Mature    | hsa-mir-1229   | hsa-miR-1229-5p |
| 5 | 180649616 | rs146528803 | A                        | 0.98 | Mature    | hsa-mir-4638   | hsa-miR-4638-5p |
| 6 | 6169656   | rs7769202   | C                        | 0.66 | pre-miRNA | hsa-mir-7853   | NA              |
| 6 | 10439968  | rs9295535   | C                        | 0.79 | Mature    | hsa-mir-5689   | hsa-miR-5689    |
| 6 | 18572056  | rs12197631  | G                        | 0.95 | pre-miRNA | hsa-mir-548a-1 | NA              |
| 6 | 31323012  | rs2854001   | A                        | 0.77 | Mature    | hsa-mir-6891   | hsa-miR-6891-3p |
| 6 | 31323020  | rs2276448   | C                        | 0.86 | Seed      | hsa-mir-6891   | hsa-miR-6891-3p |
| 6 | 31323027  | rs3819276   | T                        | 0.99 | pre-miRNA | hsa-mir-6891   | NA              |
| 6 | 31323039  | rs70990234  | TGA<br>AGG<br>GCT<br>CCA | 0.65 | pre-miRNA | hsa-mir-6891   | NA              |
| 6 | 31323065  | rs17881225  | C                        | 0.90 | pre-miRNA | hsa-mir-6891   | NA              |
| 6 | 32717702  | rs4285314   | A                        | 0.54 | pre-miRNA | hsa-mir-3135b  | NA              |
| 6 | 32717722  | rs4351242   | T                        | 0.92 | pre-miRNA | hsa-mir-3135b  | NA              |
| 6 | 44403438  | rs67182313  | G                        | 0.85 | pre-miRNA | hsa-mir-4642   | NA              |
| 6 | 76138146  | rs5877455   | CAG                      | 0.33 | pre-miRNA | hsa-mir-4463   | NA              |
| 6 | 98472445  | rs117428639 | T                        | 0.98 | pre-miRNA | hsa-mir-2113   | NA              |
| 6 | 120336327 | rs68035463  | A                        | 0.76 | pre-miRNA | hsa-mir-3144   | NA              |
| 6 | 120336384 | rs67106263  | A                        | 0.76 | Mature    | hsa-mir-3144   | hsa-miR-3144-3p |
| 6 | 167411321 | rs368791729 | G                        | 0.62 | Mature    | hsa-mir-3939   | hsa-miR-3939    |
| 6 | 167411322 | rs370955537 | C                        | 0.62 | Mature    | hsa-mir-3939   | hsa-miR-3939    |
| 7 | 2297212   | rs62442513  | T                        | 0.83 | pre-miRNA | hsa-mir-6836   | NA              |
| 7 | 7106600   | rs6943868   | A                        | 0.97 | pre-miRNA | hsa-mir-3683   | NA              |
| 7 | 7106636   | rs6977967   | G                        | 0.86 | pre-miRNA | hsa-mir-3683   | NA              |
| 7 | 64139463  | rs7804972   | A                        | 0.60 | Mature    | hsa-mir-6839   | hsa-miR-6839-5p |
| 7 | 64139524  | rs35559940  | A                        | 0.07 | pre-miRNA | hsa-mir-6839   | NA              |
| 7 | 100802786 | rs11983381  | G                        | 0.84 | pre-miRNA | hsa-mir-4653   | NA              |
| 7 | 102106201 | rs3823658   | A                        | 0.87 | Seed      | hsa-mir-5090   | hsa-miR-5090    |
| 7 | 102111925 | rs374409015 | T                        | 0.96 | Seed      | hsa-mir-4467   | hsa-miR-4467    |
| 7 | 102111936 | rs60871950  | A                        | 0.55 | Mature    | hsa-mir-4467   | hsa-miR-4467    |
| 7 | 129410227 | rs76481776  | T                        | 0.91 | pre-miRNA | hsa-mir-182    | NA              |
| 7 | 142157358 | rs361399    | G                        | 0.29 | pre-miRNA | hsa-mir-11400  | NA              |

|   |           |             |     |      |           |                |                  |
|---|-----------|-------------|-----|------|-----------|----------------|------------------|
| 7 | 142157371 | rs361398    | G   | 0.29 | pre-miRNA | hsa-mir-11400  | NA               |
| 7 | 142157389 | rs361397    | A   | 0.71 | Mature    | hsa-mir-11400  | hsa-miR-11400    |
| 7 | 143079806 | rs6464546   | A   | 0.40 | pre-miRNA | hsa-mir-6892   | NA               |
| 7 | 158325503 | rs4909237   | T   | 0.85 | pre-miRNA | hsa-mir-595    | NA               |
| 7 | 158384368 | rs80128580  | A   | 0.96 | pre-miRNA | hsa-mir-5707   | NA               |
| 8 | 1765425   | rs61388742  | C   | 0.89 | Mature    | hsa-mir-596    | hsa-miR-596      |
| 8 | 9599276   | rs79397096  | A   | 0.99 | pre-miRNA | hsa-mir-597    | NA               |
| 8 | 24811322  | rs76347846  | G   | 0.92 | Mature    | hsa-mir-6841   | hsa-miR-6841-3p  |
| 8 | 26906402  | rs73235381  | T   | 0.98 | Mature    | hsa-mir-548h-4 | hsa-miR-548h-3p  |
| 8 | 26906437  | rs184537764 | G   | 0.97 | pre-miRNA | hsa-mir-548h-4 | NA               |
| 8 | 27559214  | rs66683138  | A   | 0.78 | Seed      | hsa-mir-3622b  | hsa-miR-3622b-3p |
| 8 | 27559214  | rs66683138  | A   | 0.78 | Seed      | hsa-mir-3622a  | hsa-miR-3622a-5p |
| 8 | 94041998  | rs404337    | A   | 0.18 | Mature    | hsa-mir-8084   | hsa-miR-8084     |
| 8 | 99405919  | rs78979347  | A   | 0.99 | pre-miRNA | hsa-mir-9903   | NA               |
| 8 | 103137663 | rs12549434  | C   | 0.96 | pre-miRNA | hsa-mir-5680   | NA               |
| 8 | 103137693 | rs487571    | C   | 0.39 | pre-miRNA | hsa-mir-5680   | NA               |
| 8 | 113655752 | rs10505168  | C   | 0.71 | pre-miRNA | hsa-mir-2053   | NA               |
| 8 | 120337452 | rs764337957 | T   | 0.32 | pre-miRNA | hsa-mir-548az  | NA               |
| 8 | 129021179 | rs2114358   | A   | 0.42 | pre-miRNA | hsa-mir-1206   | NA               |
| 8 | 130496365 | rs6997249   | A   | 0.68 | pre-miRNA | hsa-mir-3686   | NA               |
| 8 | 143257760 | rs28655823  | C   | 0.90 | Seed      | hsa-mir-4472-1 | hsa-miR-4472     |
| 8 | 145625537 | rs554633373 | G   | 0.98 | pre-miRNA | hsa-mir-1234   | NA               |
| 9 | 18573360  | rs13299349  | A   | 0.68 | Mature    | hsa-mir-3152   | hsa-miR-3152-3p  |
| 9 | 20502274  | rs74428911  | T   | 0.99 | pre-miRNA | hsa-mir-4474   | NA               |
| 9 | 91360776  | rs540869781 | A   | 0.99 | pre-miRNA | hsa-mir-4289   | NA               |
| 9 | 94398581  | rs67339585  | C   | 0.89 | pre-miRNA | hsa-mir-3910-2 | NA               |
| 9 | 94398581  | rs67339585  | C   | 0.89 | pre-miRNA | hsa-mir-3910-1 | NA               |
| 9 | 97572244  | rs356125    | A   | 0.95 | pre-miRNA | hsa-mir-2278   | NA               |
| 9 | 126247833 | rs58605477  | G   | 0.78 | pre-miRNA | hsa-mir-7150   | NA               |
| 9 | 126247896 | rs140297188 | ACC | 0.79 | pre-miRNA | hsa-mir-7150   | NA               |
|   |           |             | GTG |      |           |                |                  |
|   |           |             | TGT |      |           |                |                  |
|   |           |             | GTG |      |           |                |                  |
|   |           |             | TGT |      |           |                |                  |
| 9 | 131007001 | rs146892675 | GC  | 0.99 | pre-miRNA | hsa-mir-199b   | NA               |
|   |           |             | GC  |      |           |                |                  |
|   |           |             | T   |      |           |                |                  |

|    |           |             |    |      |           |                 |                 |
|----|-----------|-------------|----|------|-----------|-----------------|-----------------|
| 9  | 135821099 | rs56195815  | T  | 0.77 | pre-miRNA | hsa-mir-548aw   | NA              |
| 9  | 137271318 | rs35196866  | A  | 0.24 | pre-miRNA | hsa-mir-4669    | NA              |
| 9  | 137741480 | rs113454901 | A  | 0.19 | pre-miRNA | hsa-mir-3689d-1 | NA              |
| 9  | 137741993 | rs34933499  | A  | 0.97 | pre-miRNA | hsa-mir-3689b   | NA              |
| 9  | 137742597 | rs72502717  | G  | 0.85 | pre-miRNA | hsa-mir-3689f   | NA              |
| 9  | 139641414 | rs138511229 | G  | 0.98 | pre-miRNA | hsa-mir-6722    | NA              |
| 9  | 139781193 | rs116932476 | A  | 0.99 | pre-miRNA | hsa-mir-4479    | NA              |
| 10 | 12172775  | rs7070684   | A  | 0.55 | pre-miRNA | hsa-mir-548ak   | NA              |
| 10 | 12695177  | rs7896283   | G  | 0.53 | pre-miRNA | hsa-mir-4481    | NA              |
| 10 | 14425204  | rs12780876  | A  | 0.71 | pre-miRNA | hsa-mir-4293    | NA              |
| 10 | 14478618  | rs11259096  | C  | 0.95 | pre-miRNA | hsa-mir-1265    | NA              |
| 10 | 24564653  | rs11014002  | T  | 0.94 | pre-miRNA | hsa-mir-603     | NA              |
| 10 | 28578229  | rs11436116  | CA | 0.91 | pre-miRNA | hsa-mir-8086    | NA              |
| 10 | 29833998  | rs2368393   | G  | 0.74 | pre-miRNA | hsa-mir-604     | NA              |
| 10 | 29834003  | rs2368392   | A  | 0.74 | pre-miRNA | hsa-mir-604     | NA              |
| 10 | 29891260  | rs12416605  | T  | 0.73 | Seed      | hsa-mir-938     | hsa-miR-938     |
| 10 | 53059406  | rs2043556   | C  | 0.80 | pre-miRNA | hsa-mir-605     | NA              |
| 10 | 90823139  | rs72810954  | A  | 0.98 | Mature    | hsa-mir-4679-2  | hsa-miR-4679    |
| 10 | 90823139  | rs72810954  | A  | 0.98 | Mature    | hsa-mir-4679-1  | hsa-miR-4679    |
| 10 | 102734778 | rs4919510   | G  | 0.80 | Mature    | hsa-mir-608     | hsa-miR-608     |
| 10 | 105154089 | rs7911488   | G  | 0.68 | pre-miRNA | hsa-mir-1307    | NA              |
| 10 | 106028154 | rs45596840  | A  | 0.69 | Seed      | hsa-mir-4482    | hsa-miR-4482-5p |
| 10 | 106028157 | rs641071    | T  | 0.64 | pre-miRNA | hsa-mir-4482    | NA              |
| 10 | 115933905 | rs17091403  | T  | 0.90 | pre-miRNA | hsa-mir-2110    | NA              |
| 11 | 1277894   | rs56310773  | T  | 0.97 | Mature    | hsa-mir-6744    | hsa-miR-6744-3p |
| 11 | 1880730   | rs75966923  | A  | 0.95 | pre-miRNA | hsa-mir-4298    | NA              |
| 11 | 10529822  | rs7350542   | G  | 0.85 | pre-miRNA | hsa-mir-4485    | NA              |
| 11 | 11804698  | rs112932356 | A  | 0.85 | pre-miRNA | hsa-mir-8070    | NA              |
| 11 | 11804757  | rs138552125 | T  | 0.97 | Seed      | hsa-mir-8070    | hsa-miR-8070    |
| 11 | 19781594  | rs77717467  | A  | 0.99 | pre-miRNA | hsa-mir-4694    | NA              |
| 11 | 34963416  | rs2986407   | C  | 0.20 | Mature    | hsa-mir-1343    | hsa-miR-1343-5p |
| 11 | 34963459  | rs11032942  | C  | 0.89 | pre-miRNA | hsa-mir-1343    | NA              |
| 11 | 48118347  | rs11382316  | TA | 0.21 | Seed      | hsa-mir-3161    | hsa-miR-3161    |
| 11 | 56511354  | rs67042258  | A  | 0.74 | pre-miRNA | hsa-mir-6128    | NA              |

|    |           |             |          |      |           |                |                 |
|----|-----------|-------------|----------|------|-----------|----------------|-----------------|
| 11 | 61582708  | rs174561    | C        | 0.69 | pre-miRNA | hsa-mir-1908   | NA              |
| 11 | 64646034  | rs12801172  | C        | 0.94 | pre-miRNA | hsa-mir-10392  | NA              |
| 11 | 65211940  | rs550894    | A        | 0.89 | pre-miRNA | hsa-mir-612    | NA              |
| 11 | 65211979  | rs12803915  | A        | 0.78 | pre-miRNA | hsa-mir-612    | NA              |
| 11 | 74110353  | rs515924    | G        | 0.85 | Seed      | hsa-mir-548al  | hsa-miR-548al   |
| 11 | 79133220  | rs11237828  | C        | 0.81 | Mature    | hsa-mir-5579   | hsa-miR-5579-3p |
| 11 | 87909673  | rs35854553  | A        | 0.91 | pre-miRNA | hsa-mir-3166   | NA              |
| 11 | 94199710  | rs11020790  | T        | 0.99 | pre-miRNA | hsa-mir-548l   | NA              |
| 11 | 126858392 | rs670637    | G        | 0.77 | pre-miRNA | hsa-mir-3167   | NA              |
| 11 | 126858406 | rs634171    | T        | 0.77 | pre-miRNA | hsa-mir-3167   | NA              |
| 12 | 1769533   | rs117723462 | G        | 0.98 | pre-miRNA | hsa-mir-3649   | NA              |
| 12 | 47581629  | rs832733    | C        | 0.32 | pre-miRNA | hsa-mir-4698   | NA              |
| 12 | 47758032  | rs215383    | G        | 0.15 | pre-miRNA | hsa-mir-4494   | NA              |
| 12 | 54385599  | rs11614913  | T        | 0.58 | Mature    | hsa-mir-196a-2 | hsa-miR-196a-3p |
| 12 | 66417482  | rs11176006  | A        | 0.72 | pre-miRNA | hsa-mir-6074   | NA              |
| 12 | 66417493  | rs10878362  | A        | 0.69 | pre-miRNA | hsa-mir-6074   | NA              |
| 12 | 81329536  | rs2682818   | C        | 0.14 | pre-miRNA | hsa-mir-618    | NA              |
| 12 | 94955585  | rs12314280  | C        | 0.91 | Mature    | hsa-mir-5700   | hsa-miR-5700    |
| 12 | 94955603  | rs17022749  | T        | 0.95 | pre-miRNA | hsa-mir-5700   | NA              |
| 12 | 94955607  | rs75258105  | T        | 0.92 | pre-miRNA | hsa-mir-5700   | NA              |
| 12 | 94965058  | rs1290910   | C        | 0.33 | pre-miRNA | hsa-mir-7844   | NA              |
| 12 | 95228286  | rs2289030   | C        | 0.94 | pre-miRNA | hsa-mir-492    | NA              |
| 12 | 104324266 | rs17797090  | A        | 0.91 | pre-miRNA | hsa-mir-3652   | NA              |
| 12 | 104985443 | rs61938575  | A        | 0.72 | Mature    | hsa-mir-3922   | hsa-miR-3922-5p |
| 12 | 116866114 | rs11068023  | C        | 0.61 | Seed      | hsa-mir-4472-2 | hsa-miR-4472    |
| 12 | 120151493 | rs7311975   | C        | 0.96 | Seed      | hsa-mir-1178   | hsa-miR-1178-5p |
| 12 | 120151501 | rs74614893  | A        | 0.97 | pre-miRNA | hsa-mir-1178   | NA              |
| 12 | 121161048 | rs1055070   | G        | 0.95 | Mature    | hsa-mir-4700   | hsa-miR-4700-3p |
| 12 | 121882098 | rs3817551   | G        | 0.61 | Mature    | hsa-mir-7107   | hsa-miR-7107-3p |
| 12 | 121882141 | rs55671311  | G        | 0.92 | Mature    | hsa-mir-7107   | hsa-miR-7107-5p |
| 12 | 123849347 | rs370987290 | AGC<br>G | 0.94 | pre-miRNA | hsa-mir-8072   | NA              |
| 12 | 128778703 | rs1683709   | A        | 0.82 | pre-miRNA | hsa-mir-3612   | NA              |
| 12 | 133158632 | rs3751304   | T        | 0.29 | Seed      | hsa-mir-6763   | hsa-miR-6763-3p |
| 13 | 40238175  | rs67976778  | T        | 0.62 | pre-miRNA | hsa-mir-4305   | NA              |

|    |           |             |          |      |           |                |                  |
|----|-----------|-------------|----------|------|-----------|----------------|------------------|
| 13 | 40238256  | rs138201016 | T        | 0.98 | Seed      | hsa-mir-4305   | hsa-miR-4305     |
| 13 | 55748673  | rs1572687   | C        | 0.45 | pre-miRNA | hsa-mir-5007   | NA               |
| 13 | 66792439  | rs76595065  | C        | 0.97 | Mature    | hsa-mir-4704   | hsa-miR-4704-3p  |
| 13 | 78272233  | rs557214778 | TGC<br>C | 0.79 | pre-miRNA | hsa-mir-3665   | NA               |
| 14 | 21491532  | rs117650137 | A        | 0.96 | Seed      | hsa-mir-6717   | hsa-miR-6717-5p  |
| 14 | 23426182  | rs2273626   | A        | 0.47 | Seed      | hsa-mir-4707   | hsa-miR-4707-3p  |
| 14 | 50433227  | rs35650931  | C        | 0.91 | pre-miRNA | hsa-mir-6076   | NA               |
| 14 | 55344901  | rs28477407  | T        | 0.88 | pre-miRNA | hsa-mir-4308   | NA               |
| 14 | 65511421  | rs72728267  | T        | 0.98 | Seed      | hsa-mir-4706   | hsa-miR-4706     |
| 14 | 100774203 | rs72631832  | T        | 0.98 | pre-miRNA | hsa-mir-345    | NA               |
| 14 | 101280856 | rs73347569  | G        | 0.98 | pre-miRNA | hsa-mir-2392   | NA               |
| 14 | 101489703 | rs111906529 | C        | 0.98 | pre-miRNA | hsa-mir-411    | NA               |
| 14 | 101507727 | rs12894467  | T        | 0.61 | pre-miRNA | hsa-mir-300    | NA               |
| 14 | 101522556 | rs56103835  | C        | 0.80 | pre-miRNA | hsa-mir-323b   | NA               |
| 14 | 101531854 | rs61992671  | G        | 0.51 | Mature    | hsa-mir-412    | hsa-miR-412-3p   |
| 14 | 101533093 | rs58834075  | T        | 0.97 | pre-miRNA | hsa-mir-656    | NA               |
| 14 | 103006047 | rs12879262  | C        | 0.88 | pre-miRNA | hsa-mir-4309   | NA               |
| 15 | 66011630  | rs2060455   | G        | 0.82 | pre-miRNA | hsa-mir-4511   | NA               |
| 15 | 66011662  | rs370142994 | CT       | 0.84 | pre-miRNA | hsa-mir-4511   | NA               |
| 15 | 70371777  | rs78212770  | G        | 0.99 | Mature    | hsa-mir-629    | hsa-miR-629-5p   |
| 15 | 75081078  | rs2168518   | A        | 0.32 | Seed      | hsa-mir-4513   | hsa-miR-4513     |
| 15 | 75645965  | rs766523130 | C        | 0.92 | pre-miRNA | hsa-mir-631    | NA               |
| 15 | 79502168  | rs41280052  | T        | 0.98 | pre-miRNA | hsa-mir-184    | NA               |
| 15 | 86368898  | rs4414449   | A        | 0.37 | Mature    | hsa-mir-548ap  | hsa-miR-548ap-5p |
| 15 | 86368922  | rs76468441  | T        | 0.96 | pre-miRNA | hsa-mir-548ap  | NA               |
| 15 | 86368959  | rs4577031   | T        | 0.37 | pre-miRNA | hsa-mir-548ap  | NA               |
| 15 | 90393949  | rs11435035  | CT       | 0.30 | pre-miRNA | hsa-mir-5094   | NA               |
| 15 | 93447631  | rs1439619   | G        | 0.54 | pre-miRNA | hsa-mir-3175   | NA               |
| 16 | 593277    | rs8054514   | G        | 0.85 | pre-miRNA | hsa-mir-3176   | NA               |
| 16 | 593362    | rs141861277 | A        | 0.99 | pre-miRNA | hsa-mir-3176   | NA               |
| 16 | 2140262   | rs547611708 | TC       | 0.99 | pre-miRNA | hsa-mir-1225   | NA               |
| 16 | 15248720  | rs75000738  | A        | 0.19 | pre-miRNA | hsa-mir-3180-4 | NA               |
| 16 | 30886643  | rs897984    | C        | 0.39 | pre-miRNA | hsa-mir-4519   | NA               |
| 16 | 56938244  | rs12708966  | A        | 0.99 | Seed      | hsa-mir-6863   | hsa-miR-6863     |

|    |          |             |    |      |           |                |                  |
|----|----------|-------------|----|------|-----------|----------------|------------------|
| 16 | 70064261 | rs57629257  | T  | 0.90 | pre-miRNA | hsa-mir-1972-2 | NA               |
| 16 | 76902842 | rs58353328  | G  | 0.97 | pre-miRNA | hsa-mir-4719   | NA               |
| 16 | 76902847 | rs7500280   | C  | 0.37 | pre-miRNA | hsa-mir-4719   | NA               |
| 16 | 76902850 | rs7499278   | A  | 0.25 | pre-miRNA | hsa-mir-4719   | NA               |
| 16 | 81567554 | rs2925980   | G  | 0.67 | Seed      | hsa-mir-7854   | hsa-miR-7854-3p  |
| 16 | 81644970 | rs74469188  | C  | 0.89 | Mature    | hsa-mir-6504   | hsa-miR-6504-5p  |
| 16 | 82722537 | rs16958290  | C  | 0.99 | pre-miRNA | hsa-mir-8058   | NA               |
| 16 | 87887560 | rs77250474  | A  | 0.80 | pre-miRNA | hsa-mir-11401  | NA               |
| 16 | 88535341 | rs56292801  | A  | 0.73 | pre-miRNA | hsa-mir-5189   | NA               |
| 16 | 88535407 | rs35613341  | G  | 0.67 | Mature    | hsa-mir-5189   | hsa-miR-5189-3p  |
| 17 | 925742   | rs72812091  | A  | 0.92 | pre-miRNA | hsa-mir-3183   | NA               |
| 17 | 925764   | rs2663345   | G  | 0.69 | pre-miRNA | hsa-mir-3183   | NA               |
| 17 | 2596180  | rs111246591 | A  | 0.97 | pre-miRNA | hsa-mir-6776   | NA               |
| 17 | 6558768  | rs8078913   | T  | 0.52 | Mature    | hsa-mir-4520-1 | hsa-miR-4520-5p  |
| 17 | 6558768  | rs8078913   | T  | 0.52 | Mature    | hsa-mir-4520-2 | hsa-miR-4520-5p  |
| 17 | 6558768  | rs8078913   | T  | 0.52 | Mature    | hsa-mir-4520-1 | hsa-miR-4520-3p  |
| 17 | 8090294  | rs76800617  | G  | 0.98 | pre-miRNA | hsa-mir-4521   | NA               |
| 17 | 12820632 | rs12451747  | C  | 0.43 | Mature    | hsa-mir-1269b  | hsa-miR-1269b    |
| 17 | 12820646 | rs7210937   | C  | 0.92 | Seed      | hsa-mir-1269b  | hsa-miR-1269b    |
| 17 | 13446924 | rs9913045   | A  | 0.62 | Mature    | hsa-mir-548h-3 | hsa-miR-548h-5p  |
| 17 | 15154966 | rs66507245  | A  | 0.49 | Seed      | hsa-mir-4731   | hsa-miR-4731-3p  |
| 17 | 28444183 | rs6505162   | C  | 0.56 | pre-miRNA | hsa-mir-423    | NA               |
| 17 | 29421443 | rs17885221  | T  | 0.97 | pre-miRNA | hsa-mir-4733   | NA               |
| 17 | 37453674 | rs620301    | A  | 0.42 | pre-miRNA | hsa-mir-548bc  | NA               |
| 17 | 40646803 | rs11651671  | A  | 0.72 | Mature    | hsa-mir-548at  | hsa-miR-548at-5p |
| 17 | 41522213 | rs7207008   | A  | 0.52 | pre-miRNA | hsa-mir-2117   | NA               |
| 17 | 58120418 | rs200376243 | GC | 0.95 | pre-miRNA | hsa-mir-4737   | NA               |
| 17 | 61021611 | rs17759989  | G  | 0.97 | pre-miRNA | hsa-mir-633    | NA               |
| 17 | 72744798 | rs745666    | C  | 0.56 | pre-miRNA | hsa-mir-3615   | NA               |
| 17 | 74094105 | rs7208391   | G  | 0.55 | Mature    | hsa-mir-6868   | hsa-miR-6868-3p  |
| 17 | 77681036 | rs73410309  | C  | 0.83 | Mature    | hsa-mir-4739   | hsa-miR-4739     |
| 17 | 78072676 | rs111756476 | T  | 0.98 | pre-miRNA | hsa-mir-1268b  | NA               |
| 17 | 79107017 | rs559410963 | C  | 0.92 | pre-miRNA | hsa-mir-1250   | NA               |
| 18 | 5840810  | rs72855836  | A  | 0.95 | pre-miRNA | hsa-mir-3976   | NA               |

|    |          |             |            |      |           |                |                 |
|----|----------|-------------|------------|------|-----------|----------------|-----------------|
| 18 | 20513374 | rs7227168   | T          | 0.88 | Seed      | hsa-mir-4741   | hsa-miR-4741    |
| 18 | 33484792 | rs41274312  | A          | 0.98 | pre-miRNA | hsa-mir-187    | NA              |
| 18 | 46196971 | rs78396863  | C          | 0.98 | pre-miRNA | hsa-mir-4743   | NA              |
| 18 | 46196998 | rs7235219   | G          | 0.99 | pre-miRNA | hsa-mir-4743   | NA              |
| 18 | 46576058 | rs12456845  | C          | 0.95 | pre-miRNA | hsa-mir-4744   | NA              |
| 18 | 56118358 | rs41292412  | T          | 0.99 | Seed      | hsa-mir-122    | hsa-miR-122-3p  |
| 19 | 804959   | rs10422347  | T          | 0.91 | Mature    | hsa-mir-4745   | hsa-miR-4745-5p |
| 19 | 2434941  | rs62122269  | T          | 0.82 | pre-miRNA | hsa-mir-7108   | NA              |
| 19 | 6389699  | rs78293125  | G          | 0.90 | Mature    | hsa-mir-6885   | hsa-miR-6885-5p |
| 19 | 6416443  | rs146253337 | GT         | 0.95 | pre-miRNA | hsa-mir-3940   | NA              |
| 19 | 8454236  | rs72996752  | G          | 0.70 | Mature    | hsa-mir-4999   | hsa-miR-4999-5p |
| 19 | 11224181 | rs1003723   | T          | 0.54 | pre-miRNA | hsa-mir-6886   | NA              |
| 19 | 13031210 | rs2967897   | C          | 0.37 | pre-miRNA | hsa-mir-5695   | NA              |
| 19 | 13947292 | rs895819    | C          | 0.66 | pre-miRNA | hsa-mir-27a    | NA              |
| 19 | 13947296 | rs11671784  | A          | 0.99 | pre-miRNA | hsa-mir-27a    | NA              |
| 19 | 15290125 | rs56061231  | A          | 0.28 | pre-miRNA | hsa-mir-6795   | NA              |
| 19 | 18392894 | rs7247237   | T          | 0.73 | pre-miRNA | hsa-mir-3188   | NA              |
| 19 | 18392913 | rs7247767   | G          | 0.73 | pre-miRNA | hsa-mir-3188   | NA              |
| 19 | 35613623 | rs1688017   | A          | 0.65 | Mature    | hsa-mir-6887   | hsa-miR-6887-5p |
| 19 | 35836530 | rs10406069  | A          | 0.80 | pre-miRNA | hsa-mir-5196   | NA              |
| 19 | 40875800 | rs3745198   | G          | 0.57 | Seed      | hsa-mir-6796   | hsa-miR-6796-3p |
| 19 | 40875810 | rs3745199   | G          | 0.57 | Mature    | hsa-mir-6796   | hsa-miR-6796-3p |
| 19 | 47212593 | rs10423365  | G          | 0.45 | pre-miRNA | hsa-mir-320e   | NA              |
| 19 | 50436371 | rs8667      | A          | 0.66 | pre-miRNA | hsa-mir-4751   | NA              |
| 19 | 52725338 | rs10412196  | C          | 0.88 | Mature    | hsa-mir-6801   | hsa-miR-6801-3p |
| 19 | 54185492 | rs75598818  | A          | 0.96 | pre-miRNA | hsa-mir-520f   | NA              |
| 19 | 54191743 | rs57111412  | G          | 0.93 | pre-miRNA | hsa-mir-1283-1 | NA              |
| 19 | 54228742 | rs10670323  | GAA<br>AGA | 0.91 | pre-miRNA | hsa-mir-516b-2 | NA              |
| 19 | 54238208 | rs74704964  | T          | 0.95 | pre-miRNA | hsa-mir-518d   | NA              |
| 19 | 54245788 | rs56013413  | A          | 0.97 | pre-miRNA | hsa-mir-520h   | NA              |
| 19 | 54261549 | rs71363366  | G          | 0.98 | pre-miRNA | hsa-mir-1283-2 | NA              |
| 19 | 54786022 | rs41112253  | C          | 0.63 | pre-miRNA | hsa-mir-4752   | NA              |
| 19 | 55899602 | rs56312243  | T          | 0.94 | Mature    | hsa-mir-6805   | hsa-miR-6805-3p |
| 19 | 58898176 | rs138578962 | T          | 0.98 | pre-miRNA | hsa-mir-4754   | NA              |

|    |          |             |   |      |           |                |                 |
|----|----------|-------------|---|------|-----------|----------------|-----------------|
| 19 | 58898193 | rs975947    | T | 0.51 | pre-miRNA | hsa-mir-4754   | NA              |
| 20 | 7352262  | rs73080647  | G | 0.99 | pre-miRNA | hsa-mir-8062   | NA              |
| 20 | 18451325 | rs11907020  | C | 0.99 | Mature    | hsa-mir-3192   | hsa-miR-3192-3p |
| 20 | 33578251 | rs3746444   | G | 0.82 | Seed      | hsa-mir-499a   | hsa-miR-499a-3p |
| 20 | 57392686 | rs117258475 | A | 0.99 | Mature    | hsa-mir-296    | hsa-miR-296-3p  |
| 20 | 58883534 | rs6513496   | C | 0.77 | pre-miRNA | hsa-mir-646    | NA              |
| 20 | 58883605 | rs6513497   | G | 0.92 | Mature    | hsa-mir-646    | hsa-miR-646     |
| 20 | 60639909 | rs560652437 | G | 0.90 | pre-miRNA | hsa-mir-3195   | NA              |
| 20 | 61870141 | rs113297757 | A | 0.98 | Seed      | hsa-mir-3196   | hsa-miR-3196    |
| 20 | 61870167 | rs744591    | A | 0.53 | pre-miRNA | hsa-mir-3196   | NA              |
| 20 | 62550824 | rs2427556   | A | 0.79 | pre-miRNA | hsa-mir-941-1  | NA              |
| 20 | 62550965 | rs574724312 | A | 0.99 | Seed      | hsa-mir-941-3  | hsa-miR-941     |
| 20 | 62574006 | rs73147065  | G | 0.83 | pre-miRNA | hsa-mir-647    | NA              |
| 21 | 44371114 | rs451887    | C | 0.12 | Seed      | hsa-mir-5692b  | hsa-miR-5692b   |
| 22 | 23165340 | rs5996397   | G | 0.83 | pre-miRNA | hsa-mir-650    | NA              |
| 22 | 26951185 | rs4822739   | G | 0.96 | pre-miRNA | hsa-mir-548j   | NA              |
| 22 | 28316554 | rs576250744 | T | 0.95 | pre-miRNA | hsa-mir-3199-2 | NA              |

|    |          |             |    |      |           |                |                 |
|----|----------|-------------|----|------|-----------|----------------|-----------------|
| 22 | 28316554 | rs576250744 | T  | 0.95 | pre-miRNA | hsa-mir-3199-1 | NA              |
| 22 | 28316560 | rs564707204 | C  | 0.95 | pre-miRNA | hsa-mir-3199-2 | NA              |
| 22 | 28316560 | rs564707204 | C  | 0.95 | pre-miRNA | hsa-mir-3199-1 | NA              |
| 22 | 28316561 | rs532189082 | A  | 0.95 | pre-miRNA | hsa-mir-3199-2 | NA              |
| 22 | 28316561 | rs532189082 | A  | 0.95 | pre-miRNA | hsa-mir-3199-1 | NA              |
| 22 | 28316591 | rs75321888  | TG | 0.90 | Mature    | hsa-mir-3199-2 | hsa-miR-3199    |
| 22 | 28316591 | rs75321888  | TG | 0.90 | Mature    | hsa-mir-3199-1 | hsa-miR-3199    |
| 22 | 31556103 | rs5997893   | G  | 0.35 | Mature    | hsa-mir-3928   | hsa-miR-3928-5p |
| 22 | 35731697 | rs9607265   | A  | 0.97 | pre-miRNA | hsa-mir-3909   | NA              |
| 22 | 38240368 | rs141002682 | C  | 0.94 | pre-miRNA | hsa-mir-658    | NA              |
| 22 | 46156446 | rs60308683  | A  | 0.88 | pre-miRNA | hsa-mir-4762   | NA              |
| 22 | 50356555 | rs4078443   | C  | 0.25 | pre-miRNA | hsa-mir-6821   | NA              |

EA: effect allele, EAF: effect allele frequency

Table S2. 122 FDR-significant hits in PheWAS

| group                | description                                | phenotype | snp         | location  | pre_id        | mature_id       | EA               | EAF  | n_cases | OR(95%CI)       | p        |
|----------------------|--------------------------------------------|-----------|-------------|-----------|---------------|-----------------|------------------|------|---------|-----------------|----------|
| circulatory system   | Hypertension                               | 401       | rs2168518   | Seed      | hsa-mir-4513  | hsa-miR-4513    | A                | 0.68 | 91878   | 0.96(0.95-0.98) | 8.47E-10 |
| circulatory system   | Essential hypertension                     | 401.1     | rs2168518   | Seed      | hsa-mir-4513  | hsa-miR-4513    | A                | 0.68 | 91605   | 0.96(0.95-0.98) | 1.06E-09 |
| circulatory system   | Atrial fibrillation and flutter            | 427.2     | rs547611708 | pre-miRNA | hsa-mir-1225  | NA              | TC               | 0.01 | 18289   | 1.32(1.2-1.45)  | 3.61E-09 |
| circulatory system   | Essential hypertension                     | 401.1     | rs367805    | pre-miRNA | hsa-mir-3936  | NA              | C                | 0.7  | 91605   | 0.97(0.96-0.98) | 1.76E-07 |
| circulatory system   | Hypertension                               | 401       | rs367805    | pre-miRNA | hsa-mir-3936  | NA              | C                | 0.7  | 91878   | 0.97(0.96-0.98) | 1.92E-07 |
| circulatory system   | Hypertension                               | 401       | rs2070960   | Seed      | hsa-mir-3620  | hsa-miR-3620-5p | T                | 0.08 | 91878   | 0.95(0.93-0.97) | 3.70E-07 |
| circulatory system   | Essential hypertension                     | 401.1     | rs2070960   | Seed      | hsa-mir-3620  | hsa-miR-3620-5p | T                | 0.08 | 91605   | 0.95(0.93-0.97) | 5.01E-07 |
| circulatory system   | Essential hypertension                     | 401.1     | rs3817551   | Mature    | hsa-mir-7107  | hsa-miR-7107-3p | G                | 0.4  | 91605   | 0.97(0.96-0.98) | 7.38E-07 |
| circulatory system   | Hypertension                               | 401       | rs3817551   | Mature    | hsa-mir-7107  | hsa-miR-7107-3p | G                | 0.4  | 91878   | 0.97(0.96-0.98) | 1.14E-06 |
| circulatory system   | Hypertension                               | 401       | rs11382316  | Seed      | hsa-mir-3161  | hsa-miR-3161    | TA               | 0.79 | 91878   | 1.03(1.02-1.05) | 1.66E-06 |
| circulatory system   | Essential hypertension                     | 401.1     | rs11382316  | Seed      | hsa-mir-3161  | hsa-miR-3161    | TA               | 0.79 | 91605   | 1.03(1.02-1.05) | 1.77E-06 |
| circulatory system   | Essential hypertension                     | 401.1     | rs4687672   | Mature    | hsa-mir-8064  | hsa-miR-8064    | A                | 0.23 | 91605   | 1.03(1.02-1.04) | 2.65E-06 |
| circulatory system   | Hypertension                               | 401       | rs4687672   | Mature    | hsa-mir-8064  | hsa-miR-8064    | A                | 0.23 | 91878   | 1.03(1.02-1.04) | 2.91E-06 |
| circulatory system   | Essential hypertension                     | 401.1     | rs2925980   | Seed      | hsa-mir-7854  | hsa-miR-7854-3p | G                | 0.33 | 91605   | 0.97(0.96-0.99) | 7.03E-06 |
| circulatory system   | Varicose veins                             | 454       | rs70990234  | pre-miRNA | hsa-mir-6891  | NA              | TGAAGGGCTC<br>CA | 0.35 | 12342   | 0.94(0.91-0.97) | 7.22E-06 |
| circulatory system   | Hypertension                               | 401       | rs2925980   | Seed      | hsa-mir-7854  | hsa-miR-7854-3p | G                | 0.33 | 91878   | 0.97(0.96-0.99) | 7.40E-06 |
| circulatory system   | Ischemic Heart Disease                     | 411       | rs12456845  | pre-miRNA | hsa-mir-4744  | NA              | C                | 0.05 | 35220   | 1.09(1.05-1.13) | 8.39E-06 |
| circulatory system   | Varicose veins of lower extremity          | 454.1     | rs70990234  | pre-miRNA | hsa-mir-6891  | NA              | TGAAGGGCTC<br>CA | 0.35 | 11809   | 0.94(0.91-0.97) | 8.98E-06 |
| circulatory system   | Essential hypertension                     | 401.1     | rs2427556   | pre-miRNA | hsa-mir-941-1 | NA              | A                | 0.21 | 91605   | 1.03(1.02-1.04) | 1.01E-05 |
| circulatory system   | Hypertension                               | 401       | rs2427556   | pre-miRNA | hsa-mir-941-1 | NA              | A                | 0.21 | 91878   | 1.03(1.02-1.04) | 1.05E-05 |
| circulatory system   | Raynaud's syndrome                         | 443.1     | rs67976778  | pre-miRNA | hsa-mir-4305  | NA              | T                | 0.39 | 1404    | 1.18(1.09-1.27) | 1.70E-05 |
| congenital anomalies | Other and unspecified congenital anomalies | 759       | rs374409015 | Seed      | hsa-mir-4467  | hsa-miR-4467    | T                | 0.04 | 217     | 2.27(1.58-3.26) | 9.34E-06 |
| dermatologic         | Psoriasis                                  | 696.4     | rs70990234  | pre-miRNA | hsa-mir-6891  | NA              | TGAAGGGCTC<br>CA | 0.35 | 2733    | 1.47(1.39-1.55) | 1.28E-43 |
| dermatologic         | Psoriasis and related disorders            | 696       | rs70990234  | pre-miRNA | hsa-mir-6891  | NA              | TGAAGGGCTC<br>CA | 0.35 | 2798    | 1.45(1.38-1.53) | 3.05E-42 |
| dermatologic         | Psoriasis vulgaris                         | 696.41    | rs70990234  | pre-miRNA | hsa-mir-6891  | NA              | TGAAGGGCTC<br>CA | 0.35 | 2062    | 1.53(1.44-1.63) | 1.56E-41 |

|              |                                  |        |            |           |                |                 |                  |      |       |                 |           |
|--------------|----------------------------------|--------|------------|-----------|----------------|-----------------|------------------|------|-------|-----------------|-----------|
| dermatologic | Psoriasis vulgaris               | 696.41 | rs3819276  | pre-miRNA | hsa-mir-6891   | NA              | T                | 0.01 | 2062  | 2.45(2.06-2.91) | 2.41E-24  |
| dermatologic | Psoriasis and related disorders  | 696    | rs3819276  | pre-miRNA | hsa-mir-6891   | NA              | T                | 0.01 | 2798  | 2.2(1.88-2.57)  | 4.34E-23  |
| dermatologic | Psoriasis                        | 696.4  | rs3819276  | pre-miRNA | hsa-mir-6891   | NA              | T                | 0.01 | 2733  | 2.2(1.88-2.58)  | 9.26E-23  |
| dermatologic | Psoriasis and related disorders  | 696    | rs4285314  | pre-miRNA | hsa-mir-3135b  | NA              | A                | 0.46 | 2798  | 1.23(1.16-1.29) | 3.43E-14  |
| dermatologic | Psoriasis                        | 696.4  | rs4285314  | pre-miRNA | hsa-mir-3135b  | NA              | A                | 0.46 | 2733  | 1.22(1.16-1.29) | 1.50E-13  |
| dermatologic | Psoriatic arthropathy            | 696.42 | rs4285314  | pre-miRNA | hsa-mir-3135b  | NA              | A                | 0.46 | 849   | 1.32(1.2-1.45)  | 1.66E-08  |
| dermatologic | Psoriasis vulgaris               | 696.41 | rs4285314  | pre-miRNA | hsa-mir-3135b  | NA              | A                | 0.46 | 2062  | 1.19(1.12-1.26) | 3.58E-08  |
| dermatologic | Psoriatic arthropathy            | 696.42 | rs70990234 | pre-miRNA | hsa-mir-6891   | NA              | TGAAGGGCTC<br>CA | 0.35 | 849   | 1.31(1.18-1.44) | 8.39E-08  |
| dermatologic | Psoriasis vulgaris               | 696.41 | rs2854001  | Mature    | hsa-mir-6891   | hsa-miR-6891-3p | A                | 0.23 | 2062  | 0.81(0.75-0.88) | 9.89E-08  |
| dermatologic | Psoriasis                        | 696.4  | rs2854001  | Mature    | hsa-mir-6891   | hsa-miR-6891-3p | A                | 0.23 | 2733  | 0.84(0.78-0.9)  | 1.96E-07  |
| dermatologic | Psoriasis and related disorders  | 696    | rs2854001  | Mature    | hsa-mir-6891   | hsa-miR-6891-3p | A                | 0.23 | 2798  | 0.85(0.8-0.91)  | 1.06E-06  |
| dermatologic | Actinic keratosis                | 702.1  | rs4285314  | pre-miRNA | hsa-mir-3135b  | NA              | A                | 0.46 | 2644  | 1.14(1.08-1.21) | 1.59E-06  |
| dermatologic | Psoriasis and related disorders  | 696    | rs2276448  | Seed      | hsa-mir-6891   | hsa-miR-6891-3p | C                | 0.14 | 2798  | 0.83(0.77-0.9)  | 6.95E-06  |
| dermatologic | Pruritus and related conditions  | 698    | rs2276448  | Seed      | hsa-mir-6891   | hsa-miR-6891-3p | C                | 0.14 | 864   | 1.32(1.17-1.5)  | 9.51E-06  |
| dermatologic | Circumscribed scleroderma        | 701.3  | rs17881225 | pre-miRNA | hsa-mir-6891   | NA              | C                | 0.1  | 568   | 1.45(1.23-1.72) | 1.45E-05  |
| digestive    | Celiac disease                   | 557.1  | rs4285314  | pre-miRNA | hsa-mir-3135b  | NA              | A                | 0.46 | 2079  | 0.37(0.35-0.4)  | 1.80E-162 |
| digestive    | Celiac disease                   | 557.1  | rs70990234 | pre-miRNA | hsa-mir-6891   | NA              | TGAAGGGCTC<br>CA | 0.35 | 2079  | 0.5(0.47-0.54)  | 3.59E-72  |
| digestive    | Celiac disease                   | 557.1  | rs2276448  | Seed      | hsa-mir-6891   | hsa-miR-6891-3p | C                | 0.14 | 2079  | 0.5(0.44-0.56)  | 1.73E-32  |
| digestive    | Celiac disease                   | 557.1  | rs2854001  | Mature    | hsa-mir-6891   | hsa-miR-6891-3p | A                | 0.23 | 2079  | 0.69(0.64-0.75) | 2.09E-19  |
| digestive    | Celiac disease                   | 557.1  | rs4351242  | pre-miRNA | hsa-mir-3135b  | NA              | T                | 0.08 | 2079  | 1.52(1.38-1.66) | 5.39E-18  |
| digestive    | Celiac disease                   | 557.1  | rs17881225 | pre-miRNA | hsa-mir-6891   | NA              | C                | 0.1  | 2079  | 0.64(0.57-0.72) | 1.23E-12  |
| digestive    | Cholelithiasis                   | 574.1  | rs174561   | pre-miRNA | hsa-mir-1908   | NA              | C                | 0.31 | 15056 | 1.07(1.04-1.1)  | 4.93E-08  |
| digestive    | Cholelithiasis and cholecystitis | 574    | rs174561   | pre-miRNA | hsa-mir-1908   | NA              | C                | 0.31 | 16867 | 1.06(1.04-1.09) | 8.37E-07  |
| digestive    | Reflux esophagitis               | 530.14 | rs11614913 | Mature    | hsa-mir-196a-2 | hsa-miR-196a-3p | T                | 0.42 | 12091 | 1.06(1.04-1.09) | 3.32E-06  |
| digestive    | Hepatomegaly                     | 573.3  | rs72563729 | pre-miRNA | hsa-mir-200b   | NA              | A                | 0.01 | 305   | 2.9(1.83-4.59)  | 6.06E-06  |
| digestive    | Celiac disease                   | 557.1  | rs3819276  | pre-miRNA | hsa-mir-6891   | NA              | T                | 0.01 | 2079  | 0.4(0.27-0.61)  | 1.41E-05  |

|                     |                                                 |        |             |           |               |                 |                  |      |       |                 |          |
|---------------------|-------------------------------------------------|--------|-------------|-----------|---------------|-----------------|------------------|------|-------|-----------------|----------|
| endocrine/metabolic | Hypothyroidism NOS                              | 244.4  | rs17881225  | pre-miRNA | hsa-mir-6891  | NA              | C                | 0.1  | 17127 | 0.83(0.8-0.86)  | 2.99E-21 |
| endocrine/metabolic | Hypothyroidism                                  | 244    | rs17881225  | pre-miRNA | hsa-mir-6891  | NA              | C                | 0.1  | 17960 | 0.83(0.8-0.86)  | 3.43E-21 |
| endocrine/metabolic | Type 1 diabetes                                 | 250.1  | rs4285314   | pre-miRNA | hsa-mir-3135b | NA              | A                | 0.46 | 2840  | 0.78(0.74-0.82) | 2.50E-20 |
| endocrine/metabolic | Type 1 diabetes                                 | 250.1  | rs2276448   | Seed      | hsa-mir-6891  | hsa-miR-6891-3p | C                | 0.14 | 2840  | 0.74(0.68-0.81) | 3.55E-12 |
| endocrine/metabolic | Type 1 diabetes with ketoacidosis               | 250.11 | rs4285314   | pre-miRNA | hsa-mir-3135b | NA              | A                | 0.46 | 271   | 0.52(0.44-0.63) | 4.62E-12 |
| endocrine/metabolic | Type 1 diabetes                                 | 250.1  | rs17881225  | pre-miRNA | hsa-mir-6891  | NA              | C                | 0.1  | 2840  | 1.3(1.21-1.41)  | 3.90E-11 |
| endocrine/metabolic | Hypothyroidism                                  | 244    | rs368791729 | Mature    | hsa-mir-3939  | hsa-miR-3939    | G                | 0.38 | 17960 | 1.08(1.06-1.11) | 8.06E-11 |
| endocrine/metabolic | Hypothyroidism                                  | 244    | rs370955537 | Mature    | hsa-mir-3939  | hsa-miR-3939    | C                | 0.38 | 17960 | 1.08(1.06-1.11) | 8.06E-11 |
| endocrine/metabolic | Hypothyroidism NOS                              | 244.4  | rs368791729 | Mature    | hsa-mir-3939  | hsa-miR-3939    | G                | 0.38 | 17127 | 1.08(1.05-1.11) | 4.17E-10 |
| endocrine/metabolic | Hypothyroidism NOS                              | 244.4  | rs370955537 | Mature    | hsa-mir-3939  | hsa-miR-3939    | C                | 0.38 | 17127 | 1.08(1.05-1.11) | 4.17E-10 |
| endocrine/metabolic | Diabetes mellitus                               | 250    | rs11435035  | pre-miRNA | hsa-mir-5094  | NA              | CT               | 0.7  | 22996 | 0.94(0.92-0.96) | 8.60E-09 |
| endocrine/metabolic | Type 2 diabetes                                 | 250.2  | rs11435035  | pre-miRNA | hsa-mir-5094  | NA              | CT               | 0.7  | 21947 | 0.94(0.92-0.96) | 1.20E-08 |
| endocrine/metabolic | Hypothyroidism NOS                              | 244.4  | rs70990234  | pre-miRNA | hsa-mir-6891  | NA              | TGAAGGGCTC<br>CA | 0.35 | 17127 | 0.94(0.91-0.96) | 3.11E-08 |
| endocrine/metabolic | Hypothyroidism                                  | 244    | rs70990234  | pre-miRNA | hsa-mir-6891  | NA              | TGAAGGGCTC<br>CA | 0.35 | 17960 | 0.94(0.92-0.96) | 1.17E-07 |
| endocrine/metabolic | Hypoglycemia                                    | 251.1  | rs4285314   | pre-miRNA | hsa-mir-3135b | NA              | A                | 0.46 | 1151  | 0.8(0.74-0.87)  | 1.78E-07 |
| endocrine/metabolic | Diabetes mellitus                               | 250    | rs243080    | pre-miRNA | hsa-mir-4432  | NA              | A                | 0.45 | 22996 | 0.95(0.93-0.97) | 5.68E-07 |
| endocrine/metabolic | Hypercholesterolemia                            | 272.11 | rs1003723   | pre-miRNA | hsa-mir-6886  | NA              | T                | 0.46 | 39763 | 1.04(1.02-1.05) | 6.65E-07 |
| endocrine/metabolic | Hypothyroidism                                  | 244    | rs174561    | pre-miRNA | hsa-mir-1908  | NA              | C                | 0.31 | 17960 | 0.94(0.92-0.96) | 6.75E-07 |
| endocrine/metabolic | Disorders of lipoid metabolism                  | 272    | rs1003723   | pre-miRNA | hsa-mir-6886  | NA              | T                | 0.46 | 42979 | 1.04(1.02-1.05) | 9.05E-07 |
| endocrine/metabolic | Hyperlipidemia                                  | 272.1  | rs1003723   | pre-miRNA | hsa-mir-6886  | NA              | T                | 0.46 | 42854 | 1.04(1.02-1.05) | 1.01E-06 |
| endocrine/metabolic | Hypothyroidism NOS                              | 244.4  | rs174561    | pre-miRNA | hsa-mir-1908  | NA              | C                | 0.31 | 17127 | 0.94(0.92-0.97) | 1.58E-06 |
| endocrine/metabolic | Obesity                                         | 278.1  | rs897984    | pre-miRNA | hsa-mir-4519  | NA              | C                | 0.61 | 15317 | 0.95(0.92-0.97) | 2.03E-06 |
| endocrine/metabolic | Diabetes mellitus                               | 250    | rs4687672   | Mature    | hsa-mir-8064  | hsa-miR-8064    | A                | 0.23 | 22996 | 1.06(1.03-1.08) | 2.14E-06 |
| endocrine/metabolic | Thyrototoxicosis with or without goiter         | 242    | rs2854001   | Mature    | hsa-mir-6891  | hsa-miR-6891-3p | A                | 0.23 | 2163  | 0.83(0.77-0.9)  | 2.45E-06 |
| endocrine/metabolic | Type 2 diabetes                                 | 250.2  | rs243080    | pre-miRNA | hsa-mir-4432  | NA              | A                | 0.45 | 21947 | 0.95(0.94-0.97) | 3.07E-06 |
| endocrine/metabolic | Hypoglycemia                                    | 251.1  | rs117428639 | pre-miRNA | hsa-mir-2113  | NA              | T                | 0.02 | 1151  | 1.73(1.37-2.19) | 3.44E-06 |
| endocrine/metabolic | Overweight, obesity and other hyperalimentation | 278    | rs897984    | pre-miRNA | hsa-mir-4519  | NA              | C                | 0.61 | 15480 | 0.95(0.92-0.97) | 3.56E-06 |
| endocrine/metabolic | Type 2 diabetes                                 | 250.2  | rs4687672   | Mature    | hsa-mir-8064  | hsa-miR-8064    | A                | 0.23 | 21947 | 1.05(1.03-1.08) | 4.78E-06 |
| endocrine/metabolic | Hyperlipidemia                                  | 272.1  | rs2276448   | Seed      | hsa-mir-6891  | hsa-miR-6891-3p | C                | 0.14 | 42854 | 1.05(1.03-1.07) | 1.01E-05 |

|                       |                                                               |        |            |           |               |                 |                  |      |       |                 |          |
|-----------------------|---------------------------------------------------------------|--------|------------|-----------|---------------|-----------------|------------------|------|-------|-----------------|----------|
| endocrine/metabolic   | Hypercholesterolemia                                          | 272.11 | rs2276448  | Seed      | hsa-mir-6891  | hsa-miR-6891-3p | C                | 0.14 | 39763 | 1.05(1.03-1.07) | 1.29E-05 |
| endocrine/metabolic   | Diabetes mellitus                                             | 250    | rs4078443  | pre-miRNA | hsa-mir-6821  | NA              | C                | 0.75 | 22996 | 0.95(0.93-0.97) | 1.53E-05 |
| endocrine/metabolic   | Disorders of lipid metabolism                                 | 272    | rs2276448  | Seed      | hsa-mir-6891  | hsa-miR-6891-3p | C                | 0.14 | 42979 | 1.05(1.02-1.07) | 1.69E-05 |
| endocrine/metabolic   | Vitamin B-complex deficiencies                                | 261.2  | rs2276448  | Seed      | hsa-mir-6891  | hsa-miR-6891-3p | C                | 0.14 | 1049  | 0.74(0.64-0.85) | 1.77E-05 |
| endocrine/metabolic   | Type 2 diabetes                                               | 250.2  | rs4078443  | pre-miRNA | hsa-mir-6821  | NA              | C                | 0.75 | 21947 | 0.95(0.93-0.97) | 1.90E-05 |
| genitourinary         | Hematuria                                                     | 593    | rs70990234 | pre-miRNA | hsa-mir-6891  | NA              | TGAAGGGCTC<br>CA | 0.35 | 16317 | 1.07(1.05-1.1)  | 5.71E-09 |
| genitourinary         | Hematuria                                                     | 593    | rs4285314  | pre-miRNA | hsa-mir-3135b | NA              | A                | 0.46 | 16317 | 1.06(1.04-1.08) | 2.36E-07 |
| infectious diseases   | Dermatophytosis                                               | 110.1  | rs35854553 | pre-miRNA | hsa-mir-3166  | NA              | A                | 0.09 | 297   | 1.71(1.37-2.14) | 2.56E-06 |
| injuries & poisonings | Allergy/adverse effect of penicillin                          | 960.2  | rs2276448  | Seed      | hsa-mir-6891  | hsa-miR-6891-3p | C                | 0.14 | 18091 | 1.08(1.05-1.12) | 1.20E-07 |
| injuries & poisonings | Poisoning by antibiotics                                      | 960    | rs2276448  | Seed      | hsa-mir-6891  | hsa-miR-6891-3p | C                | 0.14 | 20790 | 1.08(1.05-1.11) | 1.54E-07 |
| mental disorders      | Aphasia/speech disturbance                                    | 292.1  | rs11713052 | pre-miRNA | hsa-mir-5092  | NA              | G                | 0.03 | 1016  | 1.84(1.49-2.27) | 1.33E-08 |
| mental disorders      | Anxiety disorders                                             | 300    | rs67106263 | Mature    | hsa-mir-3144  | hsa-miR-3144-3p | A                | 0.24 | 8627  | 0.92(0.89-0.95) | 5.38E-06 |
| mental disorders      | Anxiety disorders                                             | 300    | rs68035463 | pre-miRNA | hsa-mir-3144  | NA              | A                | 0.24 | 8627  | 0.92(0.89-0.95) | 5.57E-06 |
| mental disorders      | Anxiety disorder                                              | 300.1  | rs67106263 | Mature    | hsa-mir-3144  | hsa-miR-3144-3p | A                | 0.24 | 7962  | 0.92(0.89-0.96) | 1.57E-05 |
| mental disorders      | Anxiety disorder                                              | 300.1  | rs68035463 | pre-miRNA | hsa-mir-3144  | NA              | A                | 0.24 | 7962  | 0.92(0.89-0.96) | 1.60E-05 |
| musculoskeletal       | Ankylosing spondylitis                                        | 715.2  | rs2854001  | Mature    | hsa-mir-6891  | hsa-miR-6891-3p | A                | 0.23 | 467   | 3.23(2.84-3.67) | 2.53E-71 |
| musculoskeletal       | Other inflammatory spondylopathies                            | 715    | rs2854001  | Mature    | hsa-mir-6891  | hsa-miR-6891-3p | A                | 0.23 | 1821  | 1.49(1.39-1.6)  | 3.46E-28 |
| musculoskeletal       | Rheumatoid arthritis                                          | 714.1  | rs4351242  | pre-miRNA | hsa-mir-3135b | NA              | T                | 0.08 | 4863  | 0.71(0.65-0.77) | 1.26E-15 |
| musculoskeletal       | Rheumatoid arthritis and other inflammatory polyarthropathies | 714    | rs4351242  | pre-miRNA | hsa-mir-3135b | NA              | T                | 0.08 | 5494  | 0.73(0.68-0.79) | 7.24E-15 |
| musculoskeletal       | Ankylosing spondylitis                                        | 715.2  | rs70990234 | pre-miRNA | hsa-mir-6891  | NA              | TGAAGGGCTC<br>CA | 0.35 | 467   | 0.57(0.49-0.67) | 7.22E-13 |
| musculoskeletal       | Rheumatoid arthritis and other inflammatory polyarthropathies | 714    | rs4285314  | pre-miRNA | hsa-mir-3135b | NA              | A                | 0.46 | 5494  | 1.13(1.09-1.17) | 2.45E-10 |
| musculoskeletal       | Rheumatoid arthritis                                          | 714.1  | rs4285314  | pre-miRNA | hsa-mir-3135b | NA              | A                | 0.46 | 4863  | 1.13(1.09-1.18) | 7.21E-10 |
| musculoskeletal       | Contracture of palmar fascia [Dupuytren's disease]            | 728.71 | rs60308683 | pre-miRNA | hsa-mir-4762  | NA              | A                | 0.12 | 3900  | 1.21(1.13-1.29) | 1.96E-08 |
| musculoskeletal       | Fasciitis                                                     | 728.7  | rs60308683 | pre-miRNA | hsa-mir-4762  | NA              | A                | 0.12 | 4276  | 1.19(1.12-1.27) | 4.14E-08 |

|                 |                                                               |        |             |           |               |                 |    |      |       |                 |          |
|-----------------|---------------------------------------------------------------|--------|-------------|-----------|---------------|-----------------|----|------|-------|-----------------|----------|
| musculoskeletal | Ankylosing spondylitis                                        | 715.2  | rs2276448   | Seed      | hsa-mir-6891  | hsa-miR-6891-3p | C  | 0.14 | 467   | 0.57(0.45-0.71) | 1.23E-06 |
| musculoskeletal | Intervertebral disc disorders                                 | 722    | rs2168518   | Seed      | hsa-mir-4513  | hsa-miR-4513    | A  | 0.68 | 1189  | 1.25(1.14-1.37) | 1.56E-06 |
| musculoskeletal | Polymyalgia Rheumatica                                        | 717    | rs4351242   | pre-miRNA | hsa-mir-3135b | NA              | T  | 0.08 | 1535  | 0.7(0.6-0.81)   | 2.93E-06 |
| musculoskeletal | Spinal stenosis                                               | 720    | rs13299349  | Mature    | hsa-mir-3152  | hsa-miR-3152-3p | A  | 0.32 | 4713  | 0.9(0.86-0.94)  | 7.62E-06 |
| musculoskeletal | Osteoarthritis; localized                                     | 740.1  | rs2168518   | Seed      | hsa-mir-4513  | hsa-miR-4513    | A  | 0.68 | 36573 | 1.04(1.02-1.06) | 1.08E-05 |
| musculoskeletal | Other and unspecified disc disorder                           | 722.9  | rs2168518   | Seed      | hsa-mir-4513  | hsa-miR-4513    | A  | 0.68 | 907   | 1.26(1.14-1.4)  | 1.21E-05 |
| neoplasms       | Benign neoplasm of colon                                      | 208    | rs174561    | pre-miRNA | hsa-mir-1908  | NA              | C  | 0.31 | 25561 | 0.95(0.93-0.96) | 3.19E-08 |
| neoplasms       | Nodular lymphoma                                              | 202.21 | rs11435035  | pre-miRNA | hsa-mir-5094  | NA              | CT | 0.7  | 439   | 0.73(0.63-0.84) | 7.75E-06 |
| neoplasms       | Malignant neoplasm of rectum, rectosigmoid junction, and anus | 153.3  | rs2276448   | Seed      | hsa-mir-6891  | hsa-miR-6891-3p | C  | 0.14 | 2528  | 0.83(0.76-0.9)  | 1.48E-05 |
| neurological    | Multiple sclerosis                                            | 335    | rs4285314   | pre-miRNA | hsa-mir-3135b | NA              | A  | 0.46 | 1462  | 0.75(0.69-0.8)  | 1.63E-14 |
| neurological    | Multiple sclerosis                                            | 335    | rs2854001   | Mature    | hsa-mir-6891  | hsa-miR-6891-3p | A  | 0.23 | 1462  | 0.69(0.63-0.76) | 1.23E-13 |
| neurological    | Anterior horn cell disease                                    | 334.2  | rs117723462 | pre-miRNA | hsa-mir-3649  | NA              | G  | 0.02 | 310   | 2.49(1.66-3.71) | 8.61E-06 |
| respiratory     | Influenza                                                     | 481    | rs140379047 | Mature    | hsa-mir-585   | hsa-miR-585-5p  | G  | 0.01 | 361   | 2.6(1.75-3.85)  | 2.11E-06 |
| respiratory     | Nasal polyps                                                  | 471    | rs174561    | pre-miRNA | hsa-mir-1908  | NA              | C  | 0.31 | 3501  | 0.88(0.84-0.93) | 3.43E-06 |
| respiratory     | Chronic tonsillitis and adenoiditis                           | 474.2  | rs5996397   | pre-miRNA | hsa-mir-650   | NA              | G  | 0.17 | 1176  | 1.26(1.14-1.39) | 6.88E-06 |
| respiratory     | Pneumonitis due to inhalation of food or vomitus              | 501    | rs146892675 | pre-miRNA | hsa-mir-199b  | NA              | T  | 0.01 | 809   | 2.17(1.52-3.09) | 1.72E-05 |
| sense organs    | Myopia                                                        | 367.1  | rs35196866  | pre-miRNA | hsa-mir-4669  | NA              | A  | 0.76 | 1739  | 1.21(1.11-1.31) | 7.69E-06 |
| sense organs    | Hearing loss                                                  | 389    | rs12803915  | pre-miRNA | hsa-mir-612   | NA              | A  | 0.22 | 5736  | 0.9(0.86-0.94)  | 8.84E-06 |

EA: effect allele, EAF: effect allele frequency, OR: odds ratio, CI: confidence interval.

**Table S3.** Candidate target genes whose interaction might be implicated by the presence of SNPs in seed region of miRNAs.

| <b>Gene_name</b> | <b>trait</b> | <b>miRNA</b>    | <b>MTI</b> |
|------------------|--------------|-----------------|------------|
| <i>PHF19</i>     | PP           | hsa-miR-3620-5p | validated  |
| <i>SLC7A1</i>    | DBP          | hsa-miR-3620-5p | validated  |
| <i>SLC7A1</i>    | SBP          | hsa-miR-3620-5p | validated  |
| <i>RELA</i>      | SBP          | hsa-miR-3161    | validated  |
| <i>SLC8A1</i>    | SBP          | hsa-miR-3161    | validated  |
| <i>TERT</i>      | SBP          | hsa-miR-3161    | validated  |
| <i>CELF1</i>     | SBP          | hsa-miR-7854-3p | validated  |
| <i>HOXB6</i>     | SBP          | hsa-miR-7854-3p | validated  |
| <i>HOXB6</i>     | PP           | hsa-miR-7854-3p | validated  |
| <i>MAPKAPK5</i>  | SBP          | hsa-miR-7854-3p | validated  |
| <i>MAPKAPK5</i>  | DBP          | hsa-miR-7854-3p | validated  |
| <i>OTUB1</i>     | PP           | hsa-miR-7854-3p | validated  |
| <i>OVOL1</i>     | SBP          | hsa-miR-7854-3p | validated  |
| <i>PHACTR4</i>   | SBP          | hsa-miR-7854-3p | validated  |
| <i>VLDLR</i>     | LDL          | hsa-miR-6891-3p | validated  |
| <i>VLDLR</i>     | TC           | hsa-miR-6891-3p | validated  |

MTI: miRNA and target gene interaction

PP: pulse pressure

DBP: diastolic blood pressure

SBP: systolic blood pressure

LDL: low density lipoprotein cholesterol

TC: total cholesterol

**Table S4.** Genetic variants in miRNAs that affect plasma levels of corresponding mature miRNAs (P<0.05).

| SNP         | miRNA       | location  | EA | EAF  | beta  | SE   | P        | Study |
|-------------|-------------|-----------|----|------|-------|------|----------|-------|
| rs10934682  | miR-544b    | pre-miRNA | G  | 0.18 | 0.09  | 0.03 | 1.72E-03 | (25)  |
| rs117650137 | miR-6717-5p | Seed      | G  | 0.97 | 0.26  | 0.10 | 1.15E-02 | (24)  |
| rs12416605  | miR-938     | Seed      | C  | 0.74 | 0.11  | 0.05 | 2.79E-02 | (24)  |
| rs12512664  | miR-4274    | pre-miRNA | A  | 0.58 | -0.02 | 0.01 | 2.17E-02 | (24)  |
| rs12803915  | miR-612     | pre-miRNA | G  | 0.77 | 0.07  | 0.03 | 3.87E-02 | (24)  |
| rs138552125 | miR-8070    | Seed      | C  | 0.98 | 0.27  | 0.12 | 2.34E-02 | (24)  |
| rs1514422   | miR-8060    | Mature    | G  | 0.95 | 0.21  | 0.08 | 5.54E-03 | (24)  |
| rs17091403  | miR-2110    | pre-miRNA | C  | 0.88 | 0.14  | 0.03 | 6.60E-07 | (24)  |
| rs17091403  | miR-2110    | pre-miRNA | T  | 0.07 | -0.10 | 0.02 | 9.90E-06 | (25)  |
| rs174561    | miR-1908-5p | pre-miRNA | T  | 0.70 | -0.10 | 0.02 | 7.66E-08 | (24)  |
| rs174561    | miR-1908-5p | pre-miRNA | C  | 0.30 | 0.15  | 0.01 | 4.76E-31 | (25)  |
| rs2114358   | miR-1206    | pre-miRNA | G  | 0.38 | -0.10 | 0.04 | 2.93E-02 | (24)  |
| rs2168518   | miR-4513    | Seed      | G  | 0.32 | 0.08  | 0.04 | 4.36E-02 | (24)  |
| rs2241347   | miR-3130-3p | Mature    | C  | 0.84 | -0.27 | 0.03 | 5.49E-16 | (24)  |
| rs2241347   | miR-3130-3p | Mature    | T  | 0.18 | 0.17  | 0.03 | 1.18E-07 | (25)  |
| rs2273626   | miR-4707-3p | Seed      | A  | 0.49 | 0.09  | 0.01 | 3.41E-11 | (24)  |
| rs2276448   | miR-6891-3p | Seed      | T  | 0.75 | 0.13  | 0.03 | 2.39E-06 | (24)  |
| rs257095    | miR-4636    | pre-miRNA | C  | 0.13 | 0.13  | 0.06 | 3.32E-02 | (24)  |
| rs2682818   | miR-618     | pre-miRNA | A  | 0.13 | -0.23 | 0.05 | 1.35E-05 | (24)  |
| rs2854001   | miR-6891-3p | Mature    | G  | 0.85 | 0.17  | 0.04 | 1.12E-05 | (24)  |
| rs2925980   | miR-7854-3p | Seed      | G  | 0.32 | -0.06 | 0.02 | 1.62E-02 | (25)  |
| rs2967897   | miR-5695    | pre-miRNA | T  | 0.38 | 0.09  | 0.03 | 1.60E-03 | (25)  |
| rs4078443   | miR-6821-5p | pre-miRNA | T  | 0.27 | -0.05 | 0.01 | 7.30E-04 | (25)  |
| rs41291179  | miR-216a-5p | pre-miRNA | A  | 0.95 | -0.15 | 0.06 | 6.84E-03 | (24)  |
| rs45596840  | miR-4482-5p | Seed      | G  | 0.69 | 0.21  | 0.04 | 9.33E-07 | (24)  |
| rs550894    | miR-612     | pre-miRNA | C  | 0.91 | 0.11  | 0.05 | 2.71E-02 | (24)  |
| rs56103835  | miR-323b-3p | pre-miRNA | T  | 0.79 | 0.17  | 0.03 | 5.90E-07 | (24)  |
| rs56103835  | miR-323b-3p | pre-miRNA | C  | 0.22 | -0.26 | 0.02 | 1.20E-26 | (25)  |
| rs56148568  | miR-7157-3p | Mature    | T  | 0.78 | 0.14  | 0.05 | 1.81E-03 | (24)  |
| rs56195815  | miR-548aw   | pre-miRNA | T  | 0.21 | -0.05 | 0.03 | 4.18E-02 | (25)  |
| rs58605477  | miR-7150    | pre-miRNA | A  | 0.78 | 0.04  | 0.02 | 1.22E-02 | (24)  |
| rs619608    | miR-6726-3p | Seed      | A  | 0.04 | -0.14 | 0.05 | 6.52E-03 | (25)  |
| rs62154973  | miR-4772-5p | Mature    | C  | 0.90 | 0.19  | 0.06 | 2.63E-03 | (24)  |
| rs641071    | miR-4482-5p | pre-miRNA | G  | 0.64 | 0.16  | 0.04 | 1.23E-04 | (24)  |
| rs6943868   | miR-3683    | pre-miRNA | A  | 0.03 | -0.21 | 0.09 | 1.76E-02 | (25)  |
| rs7207008   | miR-2117    | pre-miRNA | A  | 0.54 | 0.06  | 0.03 | 4.13E-02 | (24)  |
| rs7208391   | miR-6868-3p | Mature    | C  | 0.57 | 0.15  | 0.04 | 1.88E-04 | (24)  |
| rs72502717  | miR-3689f   | pre-miRNA | A  | 0.84 | -0.11 | 0.05 | 2.07E-02 | (24)  |
| rs72810954  | miR-4679    | Mature    | G  | 0.98 | -0.39 | 0.15 | 1.23E-02 | (24)  |
| rs73239138  | miR-1269a   | Mature    | G  | 0.76 | 0.07  | 0.04 | 4.87E-02 | (24)  |
| rs74469188  | miR-6504-5p | Mature    | C  | 0.12 | -0.08 | 0.04 | 3.04E-02 | (25)  |
| rs76347846  | miR-6841-3p | Mature    | A  | 0.94 | 0.16  | 0.05 | 6.04E-04 | (24)  |

|            |             |           |   |      |       |      |          |      |
|------------|-------------|-----------|---|------|-------|------|----------|------|
| rs76481776 | miR-182-5p  | pre-miRNA | C | 0.89 | -0.10 | 0.04 | 7.95E-03 | (24) |
| rs7804972  | miR-6839-5p | Mature    | G | 0.60 | 0.14  | 0.04 | 5.53E-05 | (24) |
| rs78212770 | miR-629-5p  | Mature    | C | 0.99 | 0.36  | 0.10 | 3.75E-04 | (24) |
| rs7911488  | miR-1307-5p | pre-miRNA | A | 0.68 | 0.04  | 0.02 | 1.63E-02 | (24) |
| rs7911488  | miR-1307-3p | pre-miRNA | G | 0.32 | -0.04 | 0.01 | 4.08E-04 | (25) |
| rs7911488  | miR-1307-5p | pre-miRNA | G | 0.32 | -0.07 | 0.01 | 6.98E-12 | (25) |
| rs79512808 | miR-3977    | pre-miRNA | T | 0.99 | 0.97  | 0.32 | 1.99E-03 | (24) |
| rs80128580 | miR-5707    | pre-miRNA | G | 0.96 | -0.35 | 0.12 | 2.53E-03 | (24) |
| rs895819   | miR-27a-5p  | pre-miRNA | T | 0.67 | 0.12  | 0.03 | 2.04E-05 | (24) |
| rs2910164  | miR-146a-3p | Seed      | C | 0.24 | 0.07  | 0.02 | 1.14E-03 | (25) |

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EA: effect allele, EAF: effect allele frequency, SE: standard error

Table S5. Results of colocalisation analysis

| nsnps       | PP H0                 | PP H1                   | PP H2                  | PP H3                  | PP H4 | trait | shared variant | SNP PP H4 |
|-------------|-----------------------|-------------------------|------------------------|------------------------|-------|-------|----------------|-----------|
| miR-6891-3p |                       |                         |                        |                        |       |       |                |           |
| 73          | 3.33x10 <sup>-7</sup> | 4.94 x10 <sup>-7</sup>  | 3.47 x10 <sup>-3</sup> | 4.15 x10 <sup>-3</sup> | 0.99  | TC    | rs2596501      | 0.99      |
| 73          | 1.03x10 <sup>-8</sup> | 1.53 x10 <sup>-8</sup>  | 1.38 x10 <sup>-1</sup> | 2.04 x10 <sup>-1</sup> | 0.66  | TG    | rs3130614      | 0.99      |
| 73          | 1.54x10 <sup>-1</sup> | 2.29 x10 <sup>-1</sup>  | 3.09 x10 <sup>-3</sup> | 3.97 x10 <sup>-3</sup> | 0.61  | HDL-C | rs2596501      | 0.99      |
| 73          | 2.43x10 <sup>-2</sup> | 3.60 x10 <sup>-2</sup>  | 2.21 x10 <sup>-1</sup> | 3.28 x10 <sup>-1</sup> | 0.39  | LDL-C | rs2596501      | 0.99      |
| 199         | 9.8x10 <sup>-97</sup> | 1.57 x10 <sup>-96</sup> | 3.74 x10 <sup>-1</sup> | 5.97 x10 <sup>-1</sup> | 0.03  | T1D   | rs2855812      | 0.99      |
| miR-6821-5p |                       |                         |                        |                        |       |       |                |           |
| 826         | 7.12x10 <sup>-5</sup> | 1.23x10 <sup>-6</sup>   | 9.71x10 <sup>-1</sup>  | 1.67x10 <sup>-2</sup>  | 0.01  | T2D   | rs36155743     | 0.15      |

nsnps: number of SNPs in the region used for colocalisation

TC: total cholesterol; TG: triglycerides; HDL-C: high-density lipoprotein cholesterol; LDL-C: low density lipoprotein cholesterol;

T1D: type 1 diabetes; T2D: type 2 diabetes

PP: posterior probability of H0-H4 being true

H0: neither trait has a genetic association in the region; H1: only miRNA has a genetic association in the region; H2: only the disease has a genetic association in the region; H3: both traits are associated, but with different causal variants; H4: both traits are associated and share a single causal variant; SNP.PP.H4: posterior probability that the SNP being causal conditional on H4 being true. Shared variant corresponds to SNP with the highest PP H4.

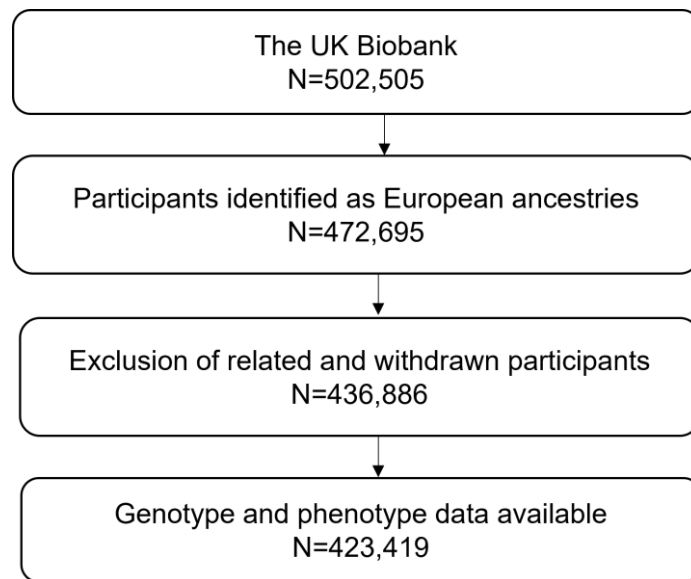
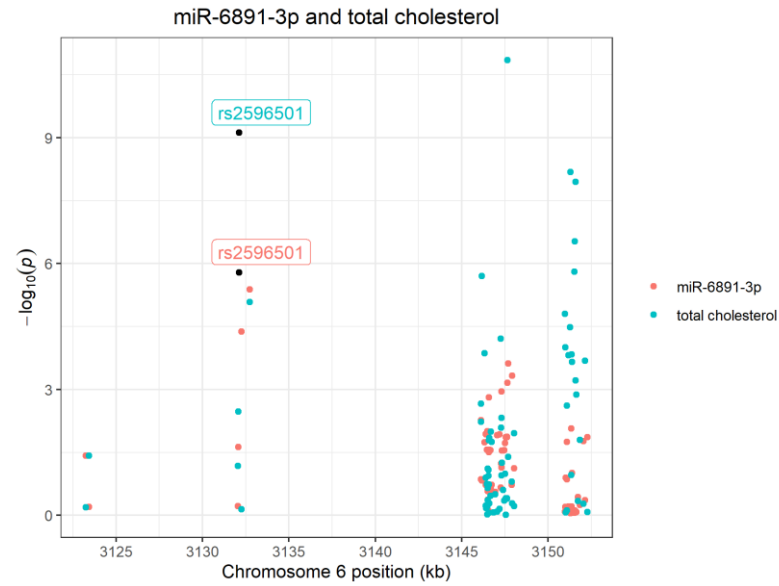


Fig. S1. Selection of study participants.

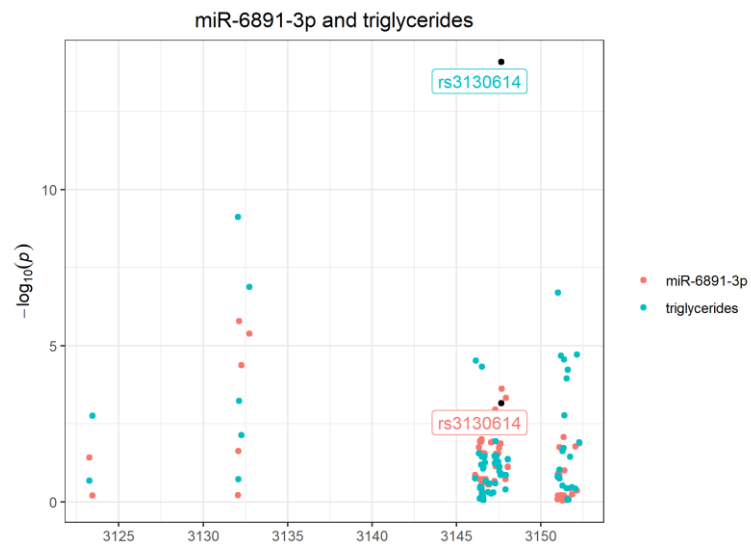


Fig. S2. Each tested variant in MHC is associated with multiple disease groups.

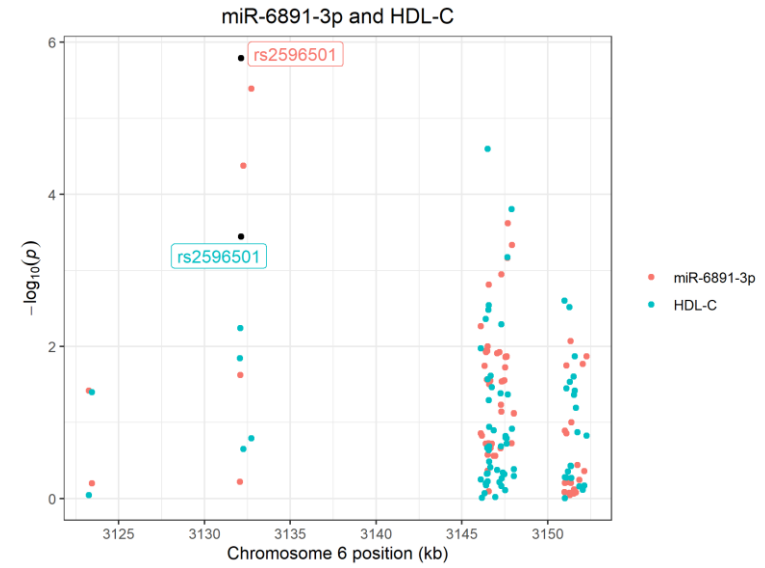
a.



b.



c.



**Fig. S3.** Regional plot for colocalisation analysis between miR-6891-3p and total cholesterol (a), triglycerides (b), and high-density lipoprotein cholesterol (HDL-C). Variants were filtered based on imputation quality ( $R_{sq} > 0.7$ ). The most likely shared causal variant is labelled.