**Supplementary Table 2.** Theoptimal set of test SNP-target SNP pairs from the two-SNP SAA results.

**Supplementary Table 2a**. The optimal set of test SNP-target SNP pairs from the two-SNP SAA results when *ABHD1* rs2304678 was the test SNP.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Rank of the Target SNP-Test SNP Pairs | Target SNP | Gene | Corrected *p*-value for Target SNP-Test SNP Pairs | *p*-value for the set of SNP pairs accumulating |
| 1 | rs429358 | *APOE* | 0.0001 | 0.0001 |
| 3 | rs8110972 | *IQCN* | 0.0046 | 0.0001 |
| 3 | rs3746186 | *IQCN* | 0.0046 | 0.0001 |
| 3 | rs8104533 | *IQCN* | 0.0046 | 0.0001 |
| 5 | rs7412 | *APOE* | 0.0048 | 0.0001 |
| 6 | rs10216063 | *MINDY4* | 0.0055 | 0.0001 |
| 7 | rs11640912 | *ADAMTS18* | 0.0113 | 0.0001 |
| 8 | rs2256111 | *IL10RA* | 0.0126 | 0.0001 |
| 9 | rs940611 | *PLAAT5* | 0.0292 | 0.0001 |
| 10 | rs910397 | *PXMP4* | 0.1582 | 0.0001 |

All three SNPs in *IQCN* were in complete linkage disequilibrium (). The global *p*-value for the optimal set of SNP pairs was 0.0007.

**Supplementary Table 2b.** Theoptimal set of test SNP-target SNP pairs from the two-SNP SAA results when *ADAMTS18* rs11640912 was the test SNP.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Rank of the Target SNP-Test SNP Pairs | Target SNP | Gene | Corrected *p*-value for Target SNP-Test SNP Pairs | *p*-value for the set of SNP pairs accumulating |
| 1 | rs429358 | *APOE* | 0.0001 | 0.0001 |
| 2 | rs2256111 | *IL10RA* | 0.0004 | 0.0001 |
| 3 | rs10216063 | *MINDY4* | 0.0108 | 0.0001 |
| 5 | rs8110972 | *IQCN* | 0.0216 | 0.0001 |
| 5 | rs3746186 | *IQCN* | 0.0216 | 0.0001 |
| 5 | rs8104533 | *IQCN* | 0.0216 | 0.0001 |
| 7 | rs7412 | *APOE* | 0.0986 | 0.0001 |
| 8 | rs940611 | *PLAAT5* | 0.2192 | 0.0001 |
| 9 | rs2304678 | *ABHD1* | 0.2279 | 0.0001 |
| 10 | rs910397 | *PXMP4* | 0.2523 | 0.0001 |

All three SNPs in *IQCN* were in complete linkage disequilibrium (). The global *p*-value for the optimal set of SNP pairs was 0.0004.

**Supplementary Table 2c.** Theoptimal set of test SNP-target SNP pairs from the two-SNP SAA results when *APOE* rs7412 was the test SNP.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Rank of the Target SNP-Test SNP Pairs | Target SNP | Gene | Corrected *p*-value for Target SNP-Test SNP Pairs | *p*-value for the set of SNP pairs accumulating |
| 1 | rs429358 | *APOE* | 0.0001 | 0.0001 |
| 2 | rs2304678 | *ABHD1* | 0.0003 | 0.0001 |
| 3 | rs910397 | *PXMP4* | 0.0008 | 0.0001 |
| 4 | rs10216063 | *MINDY4* | 0.0073 | 0.0001 |
| 5 | rs2256111 | *IL10RA* | 0.0073 | 0.0001 |
| 6 | rs940611 | *PLAAT5* | 0.0092 | 0.0001 |
| 7 | rs11640912 | *ADAMTS18* | 0.0111 | 0.0001 |
| 9 | rs8110972 | *IQCN* | 0.0275 | 0.0001 |
| 9 | rs3746186 | *IQCN* | 0.0275 | 0.0001 |
| 9 | rs8104533 | *IQCN* | 0.0275 | 0.0001 |

All three SNPs in *IQCN* were in complete linkage disequilibrium (). The global *p*-value for the optimal set of SNP pairs was 0.0004.

**Supplementary Table 2d**. Theoptimal set of test SNP-target SNP pairs from the two-SNP SAA results when *IL10RA* rs2256111 was the test SNP.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Rank of the Target SNP-Test SNP Pairs | Target SNP | Gene | Corrected *p*-value for Target SNP-Test SNP Pairs | *p*-value for the set of SNP pairs accumulating |
| 1 | rs429358 | *APOE* | 0.0001 | 0.0001 |
| 2 | rs10216063 | *MINDY4* | 0.0001 | 0.0001 |
| 3 | rs11640912 | *ADAMTS18* | 0.0031 | 0.0001 |
| 4 | rs910397 | *PXMP4* | 0.0142 | 0.0001 |
| 6 | rs8110972 | *IQCN* | 0.0188 | 0.0001 |
| 6 | rs3746186 | *IQCN* | 0.0188 | 0.0001 |
| 6 | rs8104533 | *IQCN* | 0.0188 | 0.0001 |
| 8 | rs2304678 | *ABHD1* | 0.0188 | 0.0001 |
| 9 | rs7412 | *APOE* | 0.0446 | 0.0001 |
| 10 | rs940611 | *PLAAT5* | 0.0739 | 0.0001 |

All three SNPs in *IQCN* were in complete linkage disequilibrium (). The global *p*-value for the optimal set of SNP pairs was 0.0007.

**Supplementary Table 2e**. Theoptimal set of test SNP-target SNP pairs from the two-SNP SAA results when *IQCN* rs8104533 was the test SNP. Similar results were obtained when *IQCN* rs3746186 or rs8110972 replaced *IQCN* rs8104533.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Rank of the Target SNP-Test SNP Pairs | Target SNP | Gene | Corrected *p*-value for Target SNP-Test SNP Pairs | *p*-value for the set of SNP pairs accumulating |
| 1 | rs429358 | *APOE* | 0.0001 | 0.0001 |
| 2 | rs2256111 | *IL10RA* | 0.0075 | 0.0001 |
| 3 | rs2304678 | *ABHD1* | 0.0110 | 0.0001 |
| 4 | rs10216063 | *MINDY4* | 0.0133 | 0.0001 |
| 5 | rs910397 | *PXMP4* | 0.0497 | 0.0001 |
| 6 | rs11640912 | *ADAMTS18* | 0.0588 | 0.0001 |
| 7 | rs7412 | *APOE* | 0.2094 | 0.0001 |
| 8 | rs940611 | *PLAAT5* | 0.3979 | 0.0001 |
| 9.5 | rs8110972 | *IQCN* | 1.0000 | 0.0001 |
| 9.5 | rs3746186 | *IQCN* | 1.0000 | 0.0001 |

All three SNPs in *IQCN* were in complete linkage disequilibrium (). The global *p*-value for the optimal set of SNP pairs was 0.0006.

**Supplementary Table 2f**. Theoptimal set of test SNP-target SNP pairs from the two-SNP SAA results when *MINDY4* rs10216063 was the test SNP.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Rank of the Target SNP-Test SNP Pairs | Target SNP | Gene | Corrected *p*-value for Target SNP-Test SNP Pairs | *p*-value for the set of SNP pairs accumulating |
| 1 | rs429358 | *APOE* | 0.0001 | 0.0001 |
| 2 | rs2256111 | *IL10RA* | 0.0033 | 0.0001 |
| 4 | rs8110972 | *IQCN* | 0.0044 | 0.0001 |
| 4 | rs3746186 | *IQCN* | 0.0044 | 0.0001 |
| 4 | rs8104533 | *IQCN* | 0.0044 | 0.0001 |
| 6 | rs2304678 | *ABHD1* | 0.0154 | 0.0001 |
| 7 | rs910397 | *PXMP4* | 0.0429 | 0.0001 |
| 8 | rs11640912 | *ADAMTS18* | 0.0925 | 0.0001 |
| 9 | rs940611 | *PLAAT5* | 0.1563 | 0.0001 |
| 10 | rs7412 | *APOE* | 0.4336 | 0.0001 |

All three SNPs in *IQCN* were in complete linkage disequilibrium (). The global *p*-value for the optimal set of SNP pairs was 0.0005.

**Supplementary Table 2g**. The optimal set of test SNP-target SNP pairs from the two-SNP SAA results when *PLAAT5* rs940611 was the test SNP.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Rank of the Target SNP-Test SNP Pairs | Target SNP | Gene | Corrected *p*-value for Target SNP-Test SNP Pairs | *p*-value for the set of SNP pairs accumulating |
| 1 | rs429358 | *APOE* | 0.0001 | 0.0001 |
| 2 | rs2256111 | *IL10RA* | 0.0003 | 0.0001 |
| 3 | rs11640912 | *ADAMTS18* | 0.0010 | 0.0001 |
| 4 | rs910397 | *PXMP4* | 0.0016 | 0.0001 |
| 5 | rs2304678 | *ABHD1* | 0.0037 | 0.0001 |
| 6 | rs10216063 | *MINDY4* | 0.0129 | 0.0001 |
| 7 | rs7412 | *APOE* | 0.0548 | 0.0001 |
| 9 | rs8110972 | *IQCN* | 0.0548 | 0.0001 |
| 9 | rs3746186 | *IQCN* | 0.0548 | 0.0001 |
| 9 | rs8104533 | *IQCN* | 0.0548 | 0.0001 |

All three SNPs in *IQCN* were in complete linkage disequilibrium (). The global *p*-value for the optimal set of SNP pairs was 0.0006.

**Supplementary Table 2h**. The optimal set of test SNP-target SNP pairs from the two-SNP SAA results when *PXMP4* rs910397 was the test SNP.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Rank of the Target SNP-Test SNP Pairs | Target SNP | Gene | Corrected *p*-value for Target SNP-Test SNP Pairs | *p*-value for the set of SNP pairs accumulating |
| 1 | rs429358 | *APOE* | 0.0001 | 0.0001 |
| 2 | rs2304678 | *ABHD1* | 0.0088 | 0.0001 |
| 3 | rs10216063 | *MINDY4* | 0.0161 | 0.0001 |
| 4 | rs2256111 | *IL10RA* | 0.0185 | 0.0001 |
| 5 | rs940611 | *PLAAT5* | 0.0278 | 0.0001 |
| 6 | rs11640912 | *ADAMTS18* | 0.0595 | 0.0001 |
| 7 | rs7412 | *APOE* | 0.1613 | 0.0001 |
| 9 | rs8110972 | *IQCN* | 0.2015 | 0.0001 |
| 9 | rs3746186 | *IQCN* | 0.2015 | 0.0001 |
| 9 | rs8104533 | *IQCN* | 0.2015 | 0.0001 |

All three SNPs in *IQCN* were in complete linkage disequilibrium (). The global *p*-value for the optimal set of SNP pairs was 0.0007.