### Supplemental Table S1. Rare-Variant Analysis Using SNP-SKAT and Burden Test Using FARVAT

| CHR | Gene      | No. of variant | MAC | Start     | End       | P value  |
|-----|-----------|----------------|-----|-----------|-----------|----------|
|     |           |                |     |           |           |          |
|     | FARVAT-SKAT test |              |     |           |           |          |
| 1   | AGO4      | 2              | 34  | 35,828,470 | 35,858,557 | 0.00012  |
| 4   | ABCG2     | 25             | 2,338 | 88,099,351 | 88,255,662 | 0.00039  |
|     |           |                |     |           |           |          |
| FARVAT-Burden test |              |      |     |           |           |          |
| 10  | ECHDC3    | 11             | 2,368 | 11,750,665 | 11,808,191 | 0.00011  |
| 2   | ANTXR1    | 35             | 10,243 | 69,031,924 | 69,315,592 | 0.00016  |
| 1   | AGO4      | 2              | 34  | 35,828,470 | 35,858,557 | 0.00029  |
| 3   | ROBO2     | 79             | 9,125 | 77,048,001 | 78,014,395 | 0.00045  |

SNP, single nucleotide polymorphism; SKAT, Set (Sequence) Kernel Association Test; FARVAT, family-based rare variant association test; CHR, chromosome; MAC, minor allele count; AGO4, argonaute RISC component 4; ABCG2, ATP-binding cassette subfamily G member 2; ECHDC3, enoyl-CoA hydratase domain containing 3; ANTXR1, anthrax toxin receptor 1; ROBO2, roundabout guidance receptor 2.