

Table S3. The sphingomyelin metabolism related differentially expressed metabolites in serum.

| ID | Formula | Compounds | Class I | Class II | VIP | Log2FC | Type |
|--------------|------------|-----------------|---------|----------|------|--------|------|
| LIPID-P-0131 | C40H79NO3 | Cer(d16:1/24:0) | SL | Cer | 1.71 | 1.04 | up |
| MEDP1686 | C20H42NO7P | LPE(15:0/0:0) | GP | LPC | 2.25 | 1.67 | up |
| MEDP1697 | C22H44NO7P | LPC(14:1/0:0) | GP | LPC | 2.40 | 1.77 | up |
| MEDP1699 | C24H48NO7P | LPC(0:0/16:1) | GP | LPC | 1.76 | 1.14 | up |
| MEDP1779 | C21H44NO7P | LPC(13:0/0:0) | GP | LPC | 2.27 | 1.14 | up |
| LIPID-N-0119 | C24H48NO7P | LPC(16:1/0:0) | GP | LPC | 1.72 | 1.10 | up |
| LIPID-N-0132 | C28H52NO7P | LPC(20:3/0:0) | GP | LPC | 1.70 | 1.25 | up |
| LIPID-P-0351 | C23H48NO7P | LPC(0:0/15:0) | GP | LPC | 2.39 | 1.62 | up |
| LIPID-P-0352 | C23H48NO7P | LPC(15:0/0:0) | GP | LPC | 2.23 | 1.39 | up |
| LIPID-P-0355 | C25H52NO7P | LPC(0:0/17:0) | GP | LPC | 2.11 | 1.37 | up |
| LIPID-P-0387 | C30H54NO7P | LPC(0:0/22:4) | GP | LPC | 1.93 | 1.49 | up |
| LIPID-P-0388 | C30H54NO7P | LPC(22:4/0:0) | GP | LPC | 1.74 | 1.30 | up |
| LIPID-P-0391 | C30H52NO7P | LPC(22:5/0:0) | GP | LPC | 1.84 | 1.42 | up |
| LIPID-P-0363 | C30H62NO7P | LPC(22:0/0:0) | GP | LPC | 1.26 | -1.03 | down |
| MEDN1264 | C27H48NO7P | LPE(0:0/22:4) | GP | LPE | 2.09 | 1.63 | up |
| MEDN1267 | C27H46NO7P | LPE(0:0/22:5) | GP | LPE | 2.28 | 2.32 | up |
| MEDN1269 | C27H44NO7P | LPE(0:0/22:6) | GP | LPE | 2.01 | 1.14 | up |
| MEDN1287 | C21H42NO7P | LPE(0:0/16:1) | GP | LPE | 2.22 | 1.55 | up |
| MEDP1875 | C22H44NO7P | LPE(17:1/0:0) | GP | LPE | 1.93 | 1.03 | up |
| LIPID-N-0161 | C25H44NO7P | LPE(20:4/0:0) | GP | LPE | 2.21 | 1.03 | up |
| LIPID-N-0165 | C27H44NO7P | LPE(22:6/0:0) | GP | LPE | 2.30 | 1.05 | up |

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|--------------|-------------|-----------------|----|------|------|-------|------|
| LIPID-P-0429 | C25H46NO7P | LPE(0:0/20:3) | GP | LPE | 1.76 | 1.07 | up |
| LIPID-P-0430 | C27H50NO7P | LPE(20:3/0:0) | GP | LPE | 1.94 | 1.31 | up |
| LIPID-P-0433 | C27H48NO7P | LPE(22:4/0:0) | GP | LPE | 1.87 | 1.47 | up |
| LIPID-P-0436 | C27H46NO7P | LPE(22:5/0:0) | GP | LPE | 2.19 | 2.54 | up |
| LIPID-N-0229 | C40H76NO8P | PC(14:0_18:2) | GP | PC | 1.73 | 1.01 | up |
| LIPID-N-0250 | C42H78NO8P | PC(16:1_18:2) | GP | PC | 1.74 | 1.33 | up |
| LIPID-N-0276 | C46H84NO8P | PC(22:4_16:0) | GP | PC | 1.29 | 1.03 | up |
| LIPID-P-0480 | C39H76NO8P | PC(15:0_16:1) | GP | PC | 2.36 | 1.54 | up |
| LIPID-P-0481 | C40H78NO8P | PC(16:0_16:1) | GP | PC | 1.28 | 1.01 | up |
| LIPID-P-0491 | C43H82NO8P | PC(17:1_18:1) | GP | PC | 1.78 | 2.06 | up |
| LIPID-P-0506 | C43H78NO8P | PC(15:0_20:4) | GP | PC | 1.83 | 1.26 | up |
| LIPID-P-0508 | C45H80NO8P | PC(20:4_17:0) | GP | PC | 1.82 | 1.80 | up |
| LIPID-P-0521 | C45H78NO8P | PC(15:1_22:5) | GP | PC | 1.63 | 1.73 | up |
| LIPID-P-0495 | C48H92NO8P | PC(18:1_22:1) | GP | PC | 1.75 | -1.28 | down |
| LIPID-P-0550 | C44H84NO7P | PC(O-18:1_18:2) | GP | PC-O | 1.48 | -1.06 | down |
| LIPID-N-0413 | C43H74NO8P | PE(22:6_16:0) | GP | PE | 1.72 | 1.08 | up |
| LIPID-N-0426 | C45H76NO8P | PE(22:6_18:1) | GP | PE | 2.35 | 1.30 | up |
| LIPID-P-0628 | C47H80NO8P | PE(22:6_20:1) | GP | PE | 1.17 | -1.01 | down |
| LIPID-P-0759 | C48H95N2O6P | SM(d18:1/25:1) | SL | SM | 1.91 | 1.86 | up |
