Table S1.Summary of all results in the discovery dataset

| exposure | GWAS Catalog ID | outcome | method | nsnp | b | se | or | or_lci95 | or_uci95 | pval |
|---|---|---|---|---|---|---|---|---|---|---|
| Sterol ester (27:1/14:0) levels | GCST90277238 | CRC | IVW | 2 | -0.24468 | 0.182939 | 0.782954 | 0.547035 | 1.120617 | 0.181059 |
| Sterol ester (27:1/16:0) levels | GCST90277240 | CRC | IVW | 8 | 0.072089 | 0.066605 | 1.074752 | 0.94322 | 1.224625 | 0.279099 |
| Sterol ester (27:1/16:1) levels | GCST90277241 | CRC | IVW | 3 | 0.007237 | 0.109858 | 1.007264 | 0.812138 | 1.24927 | 0.947475 |
| Sterol ester (27:1/17:0) levels | GCST90277242 | CRC | IVW | 2 | -0.06556 | 0.286027 | 0.936542 | 0.534634 | 1.640583 | 0.818705 |
| Sterol ester (27:1/17:1) levels | GCST90277243 | CRC | Wald ratio | 1 | -0.05262 | 0.197136 | 0.948744 | 0.64468 | 1.396222 | 0.789545 |
| Sterol ester (27:1/18:0) levels | GCST90277244 | CRC | IVW | 6 | 0.02033 | 0.076018 | 1.020538 | 0.879268 | 1.184505 | 0.789136 |
| Sterol ester (27:1/18:1) levels | GCST90277245 | CRC | IVW | 6 | 0.087143 | 0.078452 | 1.091052 | 0.935547 | 1.272405 | 0.266665 |
| Sterol ester (27:1/18:2) levels | GCST90277246 | CRC | IVW | 8 | 0.070101 | 0.06416 | 1.072616 | 0.945868 | 1.216349 | 0.274571 |
| Sterol ester (27:1/18:3) levels | GCST90277247 | CRC | IVW | 5 | 0.209759 | 0.124007 | 1.23338 | 0.967253 | 1.57273 | 0.090741 |
| Sterol ester (27:1/20:2) levels | GCST90277248 | CRC | IVW | 3 | -0.02215 | 0.120748 | 0.978094 | 0.771965 | 1.239264 | 0.854458 |
| Sterol ester (27:1/20:3) levels | GCST90277249 | CRC | IVW | 6 | 0.118341 | 0.080988 | 1.125627 | 0.960408 | 1.319269 | 0.143959 |
| Sterol ester (27:1/20:4) levels | GCST90277250 | CRC | IVW | 10 | 0.112198 | 0.024322 | 1.118734 | 1.066655 | 1.173356 | 3.97E-06 |
| Sterol ester (27:1/20:5) levels | GCST90277251 | CRC | IVW | 3 | 0.19416 | 0.041611 | 1.214291 | 1.119187 | 1.317476 | 3.07E-06 |
| Sterol ester (27:1/22:6) levels | GCST90277252 | CRC | IVW | 2 | 0.278724 | 0.163471 | 1.321443 | 0.959178 | 1.82053 | 0.088187 |
| Ceramide (d40:1) levels | GCST90277253 | CRC | IVW | 6 | -0.01633 | 0.053354 | 0.983804 | 0.886121 | 1.092256 | 0.759578 |
| Ceramide (d40:2) levels | GCST90277254 | CRC | IVW | 2 | 0.017311 | 0.079259 | 1.017461 | 0.871067 | 1.188459 | 0.827113 |
| Ceramide (d42:1) levels | GCST90277255 | CRC | IVW | 3 | -0.00204 | 0.066699 | 0.997958 | 0.875662 | 1.137333 | 0.975551 |
| Ceramide (d42:2) levels | GCST90277256 | CRC | IVW | 8 | -0.05282 | 0.04675 | 0.94855 | 0.865497 | 1.039572 | 0.258537 |
| Cholesterol levels | GCST90277257 | CRC | Wald ratio | 1 | 0.082553 | 0.182989 | 1.086057 | 0.758733 | 1.55459 | 0.65189 |
| Diacylglycerol (16:0_18:1) levels | GCST90277258 | CRC | Wald ratio | 1 | -0.07493 | 0.134388 | 0.927808 | 0.712959 | 1.207401 | 0.577139 |
| Diacylglycerol (16:0_18:2) levels | GCST90277259 | CRC | Wald ratio | 1 | -0.06201 | 0.111211 | 0.939876 | 0.755799 | 1.168786 | 0.577139 |
| Diacylglycerol (16:1_18:1) levels | GCST90277260 | CRC | IVW | 2 | -0.13741 | 0.112348 | 0.871615 | 0.699347 | 1.086318 | 0.221308 |
| Diacylglycerol (18:1_18:1) levels | GCST90277261 | CRC | IVW | 5 | -0.07103 | 0.065959 | 0.931434 | 0.818478 | 1.059979 | 0.281532 |
| Diacylglycerol (18:1_18:2) levels | GCST90277262 | CRC | IVW | 6 | -0.08354 | 0.061456 | 0.919851 | 0.815465 | 1.037599 | 0.174016 |
| Diacylglycerol (18:1_18:3) levels | GCST90277263 | CRC | Wald ratio | 1 | -0.08176 | 0.146636 | 0.921493 | 0.69131 | 1.22832 | 0.577139 |
| Phosphatidylcholine (16:0_0:0) levels | GCST90277264 | CRC | IVW | 2 | -0.08345 | 0.119585 | 0.91994 | 0.727724 | 1.162926 | 0.485299 |
| Phosphatidylcholine (18:1_0:0) levels | GCST90277266 | CRC | Wald ratio | 1 | 0.014366 | 0.165344 | 1.01447 | 0.733661 | 1.402759 | 0.930762 |
| Phosphatidylcholine (18:2_0:0) levels | GCST90277267 | CRC | IVW | 3 | -0.17323 | 0.295286 | 0.840944 | 0.471427 | 1.500097 | 0.557436 |
| Phosphatidylcholine (20:4_0:0) levels | GCST90277268 | CRC | IVW | 4 | 0.137572 | 0.032207 | 1.147485 | 1.077288 | 1.222256 | 1.94E-05 |
| Phosphatidylethanolamine (18:0_0:0) levels | GCST90277269 | CRC | IVW | 2 | 0.026055 | 0.108871 | 1.026398 | 0.829168 | 1.270541 | 0.810857 |
| Phosphatidylethanolamine (18:2_0:0) levels | GCST90277271 | CRC | IVW | 2 | -0.21874 | 0.047552 | 0.803534 | 0.732027 | 0.882026 | 4.23E-06 |
| Phosphatidylcholine (14:0_18:1) levels | GCST90277273 | CRC | IVW | 2 | -0.12805 | 0.108363 | 0.879811 | 0.711458 | 1.088002 | 0.23734 |
| Phosphatidylcholine (14:0_18:2) levels | GCST90277274 | CRC | IVW | 3 | -0.29276 | 0.115681 | 0.746204 | 0.594823 | 0.936111 | 0.011383 |
| Phosphatidylcholine (15:0_18:2) levels | GCST90277276 | CRC | IVW | 6 | -0.15113 | 0.059576 | 0.859739 | 0.764988 | 0.966226 | 0.01119 |
| Phosphatidylcholine (16:0_16:0) levels | GCST90277277 | CRC | IVW | 4 | 0.208085 | 0.128748 | 1.231318 | 0.956704 | 1.584758 | 0.106047 |
| Phosphatidylcholine (16:0_16:1) levels | GCST90277278 | CRC | Wald ratio | 1 | -0.20646 | 0.171863 | 0.81346 | 0.580823 | 1.139275 | 0.229634 |
| Phosphatidylcholine (16:0_18:0) levels | GCST90277280 | CRC | Wald ratio | 1 | -0.49197 | 0.122337 | 0.611421 | 0.481067 | 0.777098 | 5.78E-05 |
| Phosphatidylcholine (16:0_18:1) levels | GCST90277281 | CRC | IVW | 2 | -0.08434 | 0.135668 | 0.919114 | 0.704509 | 1.199091 | 0.534138 |
| Phosphatidylcholine (16:0_18:2) levels | GCST90277282 | CRC | IVW | 7 | -0.12712 | 0.056015 | 0.880625 | 0.789061 | 0.982815 | 0.023241 |
| Phosphatidylcholine (16:0_18:3) levels | GCST90277283 | CRC | IVW | 3 | -0.22337 | 0.212803 | 0.799819 | 0.527047 | 1.213762 | 0.293877 |
| Phosphatidylcholine (16:0_20:1) levels | GCST90277284 | CRC | Wald ratio | 1 | -0.65861 | 0.156282 | 0.517571 | 0.381013 | 0.703071 | 2.51E-05 |
| Phosphatidylcholine (16:0_20:2) levels | GCST90277285 | CRC | IVW | 6 | -0.19542 | 0.06242 | 0.822488 | 0.727775 | 0.929528 | 0.001744 |
| Phosphatidylcholine (16:0_20:3) levels | GCST90277286 | CRC | IVW | 2 | 0.010286 | 0.152362 | 1.010339 | 0.749504 | 1.361949 | 0.946174 |
| Phosphatidylcholine (16:0_20:4) levels | GCST90277287 | CRC | IVW | 4 | 0.12584 | 0.028774 | 1.134101 | 1.07191 | 1.1999 | 1.22E-05 |
| Phosphatidylcholine (16:0_20:5) levels | GCST90277288 | CRC | Wald ratio | 1 | 0.192537 | 0.048172 | 1.212322 | 1.103095 | 1.332364 | 6.42E-05 |
| Phosphatidylcholine (16:0_22:4) levels | GCST90277289 | CRC | IVW | 2 | 0.271775 | 0.058483 | 1.312292 | 1.170168 | 1.471677 | 3.37E-06 |
| Phosphatidylcholine (16:0_22:5) levels | GCST90277290 | CRC | IVW | 4 | 0.166546 | 0.039739 | 1.181218 | 1.092707 | 1.276898 | 2.78E-05 |
| Phosphatidylcholine (16:0_22:6) levels | GCST90277291 | CRC | Wald ratio | 1 | 0.619762 | 0.143265 | 1.858486 | 1.403491 | 2.460986 | 1.52E-05 |
| Phosphatidylcholine (16:1_18:0) levels | GCST90277292 | CRC | Wald ratio | 1 | -0.20699 | 0.172304 | 0.813029 | 0.580013 | 1.139656 | 0.229634 |
| Phosphatidylcholine (16:1_18:1) levels | GCST90277293 | CRC | IVW | 5 | -0.26356 | 0.093872 | 0.768313 | 0.639194 | 0.923513 | 0.00499 |
| Phosphatidylcholine (16:1_18:2) levels | GCST90277294 | CRC | IVW | 8 | -0.14629 | 0.044865 | 0.863903 | 0.791179 | 0.943312 | 0.001111 |
| Phosphatidylcholine (16:1_20:4) levels | GCST90277295 | CRC | Wald ratio | 1 | 0.227918 | 0.054736 | 1.255982 | 1.128214 | 1.39822 | 3.13E-05 |
| Phosphatidylcholine (17:0_18:1) levels | GCST90277296 | CRC | Wald ratio | 1 | 0.023817 | 0.160802 | 1.024103 | 0.74725 | 1.403528 | 0.882254 |
| Phosphatidylcholine (17:0_18:2) levels | GCST90277297 | CRC | IVW | 3 | -0.21718 | 0.099897 | 0.804783 | 0.661675 | 0.978843 | 0.029701 |
| Phosphatidylcholine (17:0_20:4) levels | GCST90277298 | CRC | IVW | 6 | 0.121906 | 0.037574 | 1.129648 | 1.049446 | 1.21598 | 0.001177 |
| Phosphatidylcholine (18:0_18:1) levels | GCST90277299 | CRC | IVW | 2 | 0.087234 | 0.253136 | 1.091152 | 0.664373 | 1.792085 | 0.730385 |
| Phosphatidylcholine (18:0_18:2) levels | GCST90277300 | CRC | IVW | 5 | -0.14802 | 0.095485 | 0.862412 | 0.715215 | 1.039904 | 0.121089 |
| Phosphatidylcholine (18:0_18:3) levels | GCST90277301 | CRC | Wald ratio | 1 | -0.30707 | 0.167582 | 0.735601 | 0.529656 | 1.021623 | 0.0669 |
| Phosphatidylcholine (18:0_20:2) levels | GCST90277302 | CRC | Wald ratio | 1 | -0.27 | 0.063576 | 0.763379 | 0.673943 | 0.864683 | 2.17E-05 |
| Phosphatidylcholine (18:0_20:3) levels | GCST90277303 | CRC | IVW | 3 | -0.00902 | 0.107866 | 0.991024 | 0.80217 | 1.224339 | 0.933379 |
| Phosphatidylcholine (18:0_20:4) levels | GCST90277304 | CRC | IVW | 7 | 0.103884 | 0.032103 | 1.109472 | 1.041812 | 1.181525 | 0.001213 |
| Phosphatidylcholine (18:0_20:5) levels | GCST90277305 | CRC | IVW | 2 | 0.180818 | 0.041682 | 1.198197 | 1.104201 | 1.300195 | 1.44E-05 |
| Phosphatidylcholine (18:0_22:5) levels | GCST90277306 | CRC | IVW | 2 | 0.211804 | 0.147992 | 1.235905 | 0.924723 | 1.651804 | 0.152378 |
| Phosphatidylcholine (18:0_22:6) levels | GCST90277307 | CRC | IVW | 2 | 0.297136 | 0.24239 | 1.345998 | 0.836985 | 2.164567 | 0.220253 |
| Phosphatidylcholine (18:1_18:1) levels | GCST90277308 | CRC | IVW | 4 | -0.19281 | 0.127627 | 0.824641 | 0.642136 | 1.059018 | 0.130863 |
| Phosphatidylcholine (18:1_18:2) levels | GCST90277309 | CRC | IVW | 5 | -0.13265 | 0.06438 | 0.875769 | 0.771948 | 0.993553 | 0.039354 |
| Phosphatidylcholine (18:1_20:2) levels | GCST90277311 | CRC | IVW | 3 | -0.1839 | 0.038795 | 0.832022 | 0.771103 | 0.897755 | 2.13E-06 |
| Phosphatidylcholine (18:1_20:3) levels | GCST90277312 | CRC | IVW | 3 | 0.000323 | 0.115324 | 1.000323 | 0.797947 | 1.254025 | 0.997765 |
| Phosphatidylcholine (18:1_20:4) levels | GCST90277313 | CRC | IVW | 7 | 0.124063 | 0.031718 | 1.132087 | 1.063852 | 1.2047 | 9.17E-05 |
| Phosphatidylcholine (18:2_18:2) levels | GCST90277314 | CRC | IVW | 3 | -0.21319 | 0.149261 | 0.807999 | 0.603055 | 1.082591 | 0.153196 |
| Phosphatidylcholine (18:2_20:3) levels | GCST90277316 | CRC | Wald ratio | 1 | -0.38988 | 0.086505 | 0.67714 | 0.571537 | 0.802256 | 6.57E-06 |
| Phosphatidylcholine (18:2_20:4) levels | GCST90277317 | CRC | IVW | 4 | 0.200423 | 0.125128 | 1.221919 | 0.956162 | 1.561541 | 0.109212 |
| Phosphatidylcholine (O-16:0_16:1) levels | GCST90277319 | CRC | IVW | 2 | 0.029732 | 0.134877 | 1.030178 | 0.790866 | 1.341904 | 0.825532 |
| Phosphatidylcholine (O-16:0_18:1) levels | GCST90277320 | CRC | IVW | 3 | 0.116109 | 0.096574 | 1.123118 | 0.929437 | 1.35716 | 0.229255 |
| Phosphatidylcholine (O-16:0_18:2) levels | GCST90277321 | CRC | IVW | 2 | -0.26053 | 0.260453 | 0.770643 | 0.462542 | 1.283973 | 0.317169 |
| Phosphatidylcholine (O-16:0_20:3) levels | GCST90277322 | CRC | IVW | 3 | -0.01294 | 0.106251 | 0.987148 | 0.801566 | 1.215695 | 0.9031 |
| Phosphatidylcholine (O-16:0_20:4) levels | GCST90277323 | CRC | IVW | 3 | 0.170552 | 0.058949 | 1.18596 | 1.056554 | 1.331215 | 0.003813 |
| Phosphatidylcholine (O-16:0_22:5) levels | GCST90277324 | CRC | Wald ratio | 1 | 0.486179 | 0.107872 | 1.626091 | 1.316202 | 2.008942 | 6.57E-06 |
| Phosphatidylcholine (O-16:1_16:0) levels | GCST90277325 | CRC | Wald ratio | 1 | -0.13815 | 0.097929 | 0.870969 | 0.71886 | 1.055265 | 0.158331 |
| Phosphatidylcholine (O-16:1_18:1) levels | GCST90277327 | CRC | IVW | 3 | 0.127911 | 0.099684 | 1.136452 | 0.934756 | 1.381669 | 0.199434 |
| Phosphatidylcholine (O-16:1_18:2) levels | GCST90277328 | CRC | IVW | 2 | 0.100468 | 0.108926 | 1.105688 | 0.893127 | 1.368838 | 0.356345 |
| Phosphatidylcholine (O-16:1_20:3) levels | GCST90277329 | CRC | IVW | 3 | -0.05597 | 0.131825 | 0.945568 | 0.730266 | 1.224347 | 0.671146 |
| Phosphatidylcholine (O-16:1_20:4) levels | GCST90277330 | CRC | IVW | 3 | 0.121704 | 0.086144 | 1.12942 | 0.953955 | 1.33716 | 0.157716 |
| Phosphatidylcholine (O-16:2_18:0) levels | GCST90277331 | CRC | IVW | 2 | 0.046521 | 0.075042 | 1.04762 | 0.904329 | 1.213615 | 0.535304 |
| Phosphatidylcholine (O-17:0_17:1) levels | GCST90277333 | CRC | Wald ratio | 1 | 0.157266 | 0.164036 | 1.170306 | 0.848534 | 1.614098 | 0.337697 |
| Phosphatidylcholine (O-18:0_16:1) levels | GCST90277335 | CRC | Wald ratio | 1 | -0.06178 | 0.152513 | 0.940089 | 0.697184 | 1.267624 | 0.685414 |
| Phosphatidylcholine (O-18:0_20:4) levels | GCST90277336 | CRC | IVW | 2 | 0.229877 | 0.055334 | 1.258445 | 1.129102 | 1.402604 | 3.26E-05 |
| Phosphatidylcholine (O-18:1_16:0) levels | GCST90277337 | CRC | IVW | 3 | 0.145971 | 0.094739 | 1.157163 | 0.961061 | 1.393278 | 0.123372 |
| Phosphatidylcholine (O-18:1_18:2) levels | GCST90277338 | CRC | Wald ratio | 1 | -0.32444 | 0.078332 | 0.722935 | 0.620043 | 0.842902 | 3.45E-05 |
| Phosphatidylcholine (O-18:1_20:3) levels | GCST90277339 | CRC | IVW | 2 | -0.23425 | 0.199425 | 0.791161 | 0.535194 | 1.16955 | 0.240136 |
| Phosphatidylcholine (O-18:1_20:4) levels | GCST90277340 | CRC | IVW | 4 | 0.2311 | 0.05402 | 1.259985 | 1.133397 | 1.400711 | 1.89E-05 |
| Phosphatidylcholine (O-18:2_16:0) levels | GCST90277341 | CRC | IVW | 2 | -0.29628 | 0.318226 | 0.743583 | 0.39852 | 1.387423 | 0.351843 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphatidylcholine (O-18:2_18:1) levels | GCST90277342 | CRC | Wald ratio | 1 | -0.53042 | 0.122387 | 0.588359 | 0.462876 | 0.74786 | 1.46E-05 |
| Phosphatidylcholine (O-18:2_18:2) levels | GCST90277343 | CRC | IVW | 2 | -0.27777 | 0.308814 | 0.757472 | 0.413522 | 1.387505 | 0.368403 |
| Phosphatidylcholine (O-18:2_20:4) levels | GCST90277344 | CRC | IVW | 2 | 0.228287 | 0.304049 | 1.256446 | 0.69236 | 2.280109 | 0.452759 |
| Phosphatidylethanolamine (16:0_18:2) levels | GCST90277345 | CRC | IVW | 4 | -0.08043 | 0.082393 | 0.922724 | 0.785123 | 1.084441 | 0.329005 |
| Phosphatidylethanolamine (16:0_20:4) levels | GCST90277346 | CRC | IVW | 5 | 0.018968 | 0.032885 | 1.01915 | 0.955533 | 1.087002 | 0.564065 |
| Phosphatidylethanolamine (18:0_18:2) levels | GCST90277347 | CRC | IVW | 9 | 0.011975 | 0.036581 | 1.012047 | 0.942025 | 1.087275 | 0.743391 |
| Phosphatidylethanolamine (18:0_20:4) levels | GCST90277348 | CRC | IVW | 8 | 0.05872 | 0.049923 | 1.060478 | 0.961627 | 1.16949 | 0.239511 |
| Phosphatidylethanolamine (18:1_18:1) levels | GCST90277349 | CRC | IVW | 5 | -0.08701 | 0.095681 | 0.916668 | 0.759918 | 1.105751 | 0.363151 |
| Phosphatidylethanolamine (O-16:1_18:2) levels | GCST90277350 | CRC | Wald ratio | 1 | -0.4959 | 0.120097 | 0.60902 | 0.481286 | 0.770656 | 3.64E-05 |
| Phosphatidylethanolamine (O-16:1_20:4) levels | GCST90277351 | CRC | IVW | 2 | 0.207859 | 0.228136 | 1.231039 | 0.787189 | 1.925152 | 0.362232 |
| Phosphatidylethanolamine (O-18:1_18:2) levels | GCST90277353 | CRC | Wald ratio | 1 | -0.39216 | 0.09234 | 0.675598 | 0.563751 | 0.809635 | 2.17E-05 |
| Phosphatidylethanolamine (O-18:1_20:4) levels | GCST90277354 | CRC | IVW | 2 | 0.253125 | 0.098549 | 1.288045 | 1.061803 | 1.562492 | 0.010214 |
| Phosphatidylethanolamine (O-18:2_18:2) levels | GCST90277356 | CRC | Wald ratio | 1 | -0.38465 | 0.113394 | 0.680691 | 0.545038 | 0.850107 | 0.000694 |
| Phosphatidylethanolamine (O-18:2_20:4) levels | GCST90277357 | CRC | IVW | 2 | 0.333222 | 0.183879 | 1.395457 | 0.973186 | 2.000954 | 0.069958 |
| Phosphatidylinositol (16:0_18:1) levels | GCST90277358 | CRC | IVW | 2 | -0.28625 | 0.427682 | 0.751073 | 0.324812 | 1.736731 | 0.503297 |
| Phosphatidylinositol (16:0_18:2) levels | GCST90277359 | CRC | IVW | 3 | -0.12459 | 0.162584 | 0.882859 | 0.641945 | 1.214186 | 0.443491 |
| Phosphatidylinositol (16:0_20:4) levels | GCST90277360 | CRC | IVW | 3 | 0.135114 | 0.248373 | 1.144667 | 0.703494 | 1.862509 | 0.586443 |
| Phosphatidylinositol (18:0_18:1) levels | GCST90277361 | CRC | IVW | 5 | -0.02503 | 0.049682 | 0.975279 | 0.884787 | 1.075027 | 0.614377 |
| Phosphatidylinositol (18:0_18:2) levels | GCST90277362 | CRC | IVW | 7 | -0.06712 | 0.054776 | 0.935079 | 0.839889 | 1.041057 | 0.220412 |
| Phosphatidylinositol (18:0_20:3) levels | GCST90277363 | CRC | IVW | 5 | -0.1355 | 0.06424 | 0.873283 | 0.769968 | 0.990461 | 0.034928 |
| Phosphatidylinositol (18:0_20:4) levels | GCST90277364 | CRC | IVW | 6 | -0.0221 | 0.043063 | 0.978144 | 0.898973 | 1.064287 | 0.607829 |
| Phosphatidylinositol (18:1_18:1) levels | GCST90277365 | CRC | IVW | 3 | -0.08408 | 0.077431 | 0.919355 | 0.789901 | 1.070025 | 0.277521 |
| Phosphatidylinositol (18:1_18:2) levels | GCST90277366 | CRC | IVW | 3 | -0.22394 | 0.169411 | 0.799363 | 0.573506 | 1.114166 | 0.18621 |
| Phosphatidylinositol (18:1_20:4) levels | GCST90277367 | CRC | IVW | 2 | -0.02085 | 0.1151 | 0.979364 | 0.781572 | 1.22721 | 0.856238 |
| Sphingomyelin (d32:1) levels | GCST90277368 | CRC | IVW | 3 | 0.063671 | 0.058622 | 1.065742 | 0.950061 | 1.195508 | 0.277426 |
| Sphingomyelin (d34:0) levels | GCST90277369 | CRC | IVW | 4 | 0.02834 | 0.078021 | 1.028745 | 0.882866 | 1.198728 | 0.716435 |
| Sphingomyelin (d34:1) levels | GCST90277370 | CRC | IVW | 7 | 0.090975 | 0.068755 | 1.095241 | 0.957159 | 1.253244 | 0.18578 |
| Sphingomyelin (d34:2) levels | GCST90277371 | CRC | IVW | 5 | 0.232115 | 0.112835 | 1.261265 | 1.011019 | 1.573452 | 0.039675 |
| Sphingomyelin (d36:1) levels | GCST90277372 | CRC | IVW | 9 | 0.072208 | 0.05782 | 1.074879 | 0.959715 | 1.203863 | 0.211723 |
| Sphingomyelin (d36:2) levels | GCST90277373 | CRC | IVW | 4 | 0.150893 | 0.155496 | 1.162872 | 0.857375 | 1.577223 | 0.33185 |
| Sphingomyelin (d38:1) levels | GCST90277374 | CRC | IVW | 10 | 0.066261 | 0.037337 | 1.068505 | 0.993104 | 1.149631 | 0.075953 |
| Sphingomyelin (d38:2) levels | GCST90277375 | CRC | IVW | 5 | 0.014278 | 0.057072 | 1.014381 | 0.907027 | 1.134441 | 0.80245 |
| Sphingomyelin (d40:1) levels | GCST90277376 | CRC | IVW | 8 | 0.07829 | 0.046216 | 1.081436 | 0.987781 | 1.18397 | 0.090267 |
| Sphingomyelin (d40:2) levels | GCST90277377 | CRC | IVW | 6 | 0.088826 | 0.063722 | 1.09289 | 0.964574 | 1.238276 | 0.163329 |
| Sphingomyelin (d42:2) levels | GCST90277378 | CRC | IVW | 9 | 0.095842 | 0.049429 | 1.100585 | 0.99896 | 1.212547 | 0.052506 |
| Triacylglycerol (46:2) levels | GCST90277380 | CRC | Wald ratio | 1 | -0.19636 | 0.163458 | 0.821715 | 0.596463 | 1.132033 | 0.229634 |
| Triacylglycerol (48:1) levels | GCST90277382 | CRC | IVW | 2 | -0.15639 | 0.121802 | 0.855223 | 0.673596 | 1.085823 | 0.199142 |
| Triacylglycerol (48:2) levels | GCST90277383 | CRC | IVW | 2 | -0.13801 | 0.106828 | 0.871092 | 0.70653 | 1.073983 | 0.196399 |
| Triacylglycerol (48:3) levels | GCST90277384 | CRC | IVW | 2 | -0.12738 | 0.09987 | 0.880396 | 0.723882 | 1.070752 | 0.202135 |
| Triacylglycerol (49:2) levels | GCST90277386 | CRC | IVW | 2 | -0.14002 | 0.111681 | 0.869343 | 0.698436 | 1.082072 | 0.209942 |
| Triacylglycerol (50:1) levels | GCST90277387 | CRC | IVW | 3 | -0.13197 | 0.096385 | 0.876369 | 0.725508 | 1.0586 | 0.170946 |
| Triacylglycerol (50:2) levels | GCST90277388 | CRC | IVW | 2 | -0.11894 | 0.095332 | 0.887865 | 0.736544 | 1.070274 | 0.21218 |
| Triacylglycerol (50:3) levels | GCST90277389 | CRC | IVW | 3 | -0.09301 | 0.074988 | 0.911189 | 0.786643 | 1.055454 | 0.214875 |
| Triacylglycerol (50:4) levels | GCST90277390 | CRC | IVW | 3 | -0.0927 | 0.073801 | 0.911469 | 0.788716 | 1.053326 | 0.2091 |
| Triacylglycerol (50:5) levels | GCST90277391 | CRC | IVW | 3 | -0.09547 | 0.077343 | 0.908948 | 0.781095 | 1.057729 | 0.217073 |
| Triacylglycerol (51:2) levels | GCST90277393 | CRC | IVW | 2 | -0.10887 | 0.091525 | 0.896849 | 0.749569 | 1.073067 | 0.234247 |
| Triacylglycerol (51:3) levels | GCST90277394 | CRC | IVW | 6 | -0.07837 | 0.060475 | 0.92462 | 0.82127 | 1.040975 | 0.194989 |
| Triacylglycerol (51:4) levels | GCST90277395 | CRC | IVW | 2 | -0.09707 | 0.083058 | 0.907489 | 0.771153 | 1.067928 | 0.242506 |
| Triacylglycerol (52:2) levels | GCST90277396 | CRC | IVW | 4 | -0.06631 | 0.071077 | 0.935839 | 0.81414 | 1.075729 | 0.35084 |
| Triacylglycerol (52:3) levels | GCST90277397 | CRC | IVW | 6 | -0.08981 | 0.054488 | 0.914107 | 0.821515 | 1.017135 | 0.099313 |
| Triacylglycerol (52:4) levels | GCST90277398 | CRC | IVW | 7 | -0.09542 | 0.054414 | 0.908988 | 0.817033 | 1.011292 | 0.079492 |
| Triacylglycerol (52:5) levels | GCST90277399 | CRC | IVW | 4 | -0.05617 | 0.06516 | 0.94538 | 0.832034 | 1.074166 | 0.388681 |
| Triacylglycerol (52:6) levels | GCST90277400 | CRC | IVW | 3 | -0.09599 | 0.078832 | 0.908477 | 0.778414 | 1.060273 | 0.22338 |
| Triacylglycerol (53:2) levels | GCST90277401 | CRC | IVW | 2 | -0.10092 | 0.08858 | 0.904003 | 0.759922 | 1.075402 | 0.254564 |
| Triacylglycerol (53:3) levels | GCST90277402 | CRC | IVW | 5 | -0.02043 | 0.076948 | 0.97978 | 0.842614 | 1.139274 | 0.790648 |
| Triacylglycerol (53:4) levels | GCST90277403 | CRC | IVW | 4 | -0.04526 | 0.065 | 0.955751 | 0.841426 | 1.08561 | 0.486258 |
| Triacylglycerol (54:3) levels | GCST90277404 | CRC | IVW | 3 | 0.027198 | 0.076847 | 1.027572 | 0.883892 | 1.194608 | 0.72339 |
| Triacylglycerol (54:4) levels | GCST90277405 | CRC | IVW | 6 | -0.07259 | 0.089337 | 0.929983 | 0.780602 | 1.10795 | 0.416486 |
| Triacylglycerol (54:5) levels | GCST90277406 | CRC | IVW | 4 | -0.01323 | 0.077998 | 0.986853 | 0.846953 | 1.149861 | 0.865265 |
| Triacylglycerol (54:6) levels | GCST90277407 | CRC | IVW | 3 | 0.078554 | 0.258085 | 1.081721 | 0.652273 | 1.793913 | 0.760845 |
| Triacylglycerol (54:7) levels | GCST90277408 | CRC | IVW | 3 | -0.1143 | 0.09573 | 0.891987 | 0.739387 | 1.076083 | 0.232471 |
| Triacylglycerol (56:3) levels | GCST90277409 | CRC | IVW | 2 | -0.04833 | 0.090289 | 0.952823 | 0.798282 | 1.137282 | 0.59249 |
| Triacylglycerol (56:4) levels | GCST90277410 | CRC | IVW | 3 | -0.1374 | 0.214272 | 0.871619 | 0.572709 | 1.326535 | 0.521357 |
| Triacylglycerol (56:5) levels | GCST90277411 | CRC | IVW | 3 | -0.01913 | 0.07826 | 0.981054 | 0.841544 | 1.143692 | 0.806913 |
| Triacylglycerol (56:6) levels | GCST90277412 | CRC | IVW | 6 | -0.04098 | 0.054832 | 0.959849 | 0.862043 | 1.06875 | 0.454838 |
| Triacylglycerol (56:7) levels | GCST90277413 | CRC | IVW | 4 | -0.05171 | 0.073824 | 0.949606 | 0.82168 | 1.097448 | 0.483666 |
| Triacylglycerol (56:8) levels | GCST90277414 | CRC | IVW | 4 | 0.021623 | 0.079102 | 1.021858 | 0.8751 | 1.193228 | 0.784581 |
| Triacylglycerol (58:7) levels | GCST90277415 | CRC | IVW | 5 | -0.02577 | 0.065425 | 0.974561 | 0.857272 | 1.107898 | 0.693687 |
| Triacylglycerol (58:8) levels | GCST90277416 | CRC | IVW | 2 | -0.07253 | 0.110767 | 0.930041 | 0.748542 | 1.15555 | 0.512618 |

These are selected and significantly reduced contents. Showing results for the main method only. Readers may request the nonmodified whole contents by contacting the corresponding authors of the current study: weiguoli1987@163.com (G.W.); Huojiege@jsatcm.com (J. H.)

Table S2.Summary of all results in the replication dataset

| exposure | GWAS Catalog ID | outcome | method | nsnp | b | se | or | or_lci95 | or_uci95 | pval |
|---|---|---|---|---|---|---|---|---|---|---|
| Sterol ester (27:1/14:0) levels | GCST90277238 | CRC | IVW | 2 | 0.12224 | 0.06879 | 1.130025 | 0.987491 | 1.293133 | 0.075567 |
| Sterol ester (27:1/16:0) levels | GCST90277240 | CRC | IVW | 8 | 0.061863 | 0.033198 | 1.063817 | 0.996799 | 1.13534 | 0.062401 |
| Sterol ester (27:1/16:1) levels | GCST90277241 | CRC | IVW | 3 | 0.082276 | 0.114437 | 1.085756 | 0.867604 | 1.35876 | 0.472162 |
| Sterol ester (27:1/17:0) levels | GCST90277242 | CRC | IVW | 2 | 0.087512 | 0.055193 | 1.091455 | 0.979546 | 1.216149 | 0.112838 |
| Sterol ester (27:1/17:1) levels | GCST90277243 | CRC | Wald ratio | 1 | 0.268266 | 0.190929 | 1.307695 | 0.899465 | 1.901203 | 0.160005 |
| Sterol ester (27:1/18:0) levels | GCST90277244 | CRC | IVW | 7 | 0.048252 | 0.032274 | 1.049435 | 0.985107 | 1.117964 | 0.134892 |
| Sterol ester (27:1/18:1) levels | GCST90277245 | CRC | IVW | 6 | 0.110356 | 0.050562 | 1.116675 | 1.011317 | 1.233009 | 0.029067 |
| Sterol ester (27:1/18:2) levels | GCST90277246 | CRC | IVW | 6 | -0.03057 | 0.034994 | 0.969891 | 0.905598 | 1.038749 | 0.382321 |
| Sterol ester (27:1/18:3) levels | GCST90277247 | CRC | Wald ratio | 1 | 0.33979 | 0.159344 | 1.404652 | 1.027856 | 1.919576 | 0.032972 |
| Sterol ester (27:1/20:2) levels | GCST90277248 | CRC | IVW | 3 | 0.04343 | 0.024961 | 1.044387 | 0.994521 | 1.096754 | 0.08188 |
| Sterol ester (27:1/20:3) levels | GCST90277249 | CRC | IVW | 5 | 0.144932 | 0.053685 | 1.155961 | 1.040509 | 1.284223 | 0.00694 |
| Sterol ester (27:1/20:4) levels | GCST90277250 | CRC | IVW | 9 | 0.092943 | 0.032799 | 1.097399 | 1.029073 | 1.170263 | 0.0046 |
| Sterol ester (27:1/20:5) levels | GCST90277251 | CRC | IVW | 2 | 0.163804 | 0.066508 | 1.177983 | 1.034015 | 1.341997 | 0.013781 |
| Sterol ester (27:1/22:6) levels | GCST90277252 | CRC | Wald ratio | 1 | 0.100617 | 0.051633 | 1.105854 | 0.999418 | 1.223625 | 0.051329 |
| Ceramide (d40:1) levels | GCST90277253 | CRC | IVW | 6 | -0.04141 | 0.042402 | 0.959435 | 0.882921 | 1.042579 | 0.328755 |
| Ceramide (d40:2) levels | GCST90277254 | CRC | IVW | 2 | -0.02107 | 0.027802 | 0.979146 | 0.927218 | 1.033982 | 0.448437 |
| Ceramide (d42:1) levels | GCST90277255 | CRC | IVW | 3 | -0.02296 | 0.030214 | 0.9773 | 0.921106 | 1.036922 | 0.447261 |
| Ceramide (d42:2) levels | GCST90277256 | CRC | IVW | 8 | -0.03563 | 0.028646 | 0.964995 | 0.912308 | 1.020725 | 0.213536 |
| Cholesterol levels | GCST90277257 | CRC | Wald ratio | 1 | 0.227998 | 0.1552 | 1.256082 | 0.926636 | 1.702657 | 0.141818 |
| Diacylglycerol (16:0_18:1) levels | GCST90277258 | CRC | Wald ratio | 1 | 0.01006 | 0.057065 | 1.01011 | 0.903221 | 1.129649 | 0.860072 |
| Diacylglycerol (16:0_18:2) levels | GCST90277259 | CRC | Wald ratio | 1 | 0.008325 | 0.047223 | 1.008359 | 0.919217 | 1.106146 | 0.860072 |
| Diacylglycerol (16:1_18:1) levels | GCST90277260 | CRC | IVW | 2 | -0.12912 | 0.145735 | 0.878869 | 0.660499 | 1.169434 | 0.375621 |
| Diacylglycerol (18:1_18:1) levels | GCST90277261 | CRC | IVW | 4 | -0.00209 | 0.035936 | 0.997915 | 0.930045 | 1.070738 | 0.953684 |
| Diacylglycerol (18:1_18:2) levels | GCST90277262 | CRC | IVW | 4 | -0.04121 | 0.048023 | 0.95963 | 0.873426 | 1.054341 | 0.39084 |
| Diacylglycerol (18:1_18:3) levels | GCST90277263 | CRC | Wald ratio | 1 | 0.010976 | 0.062266 | 1.011037 | 0.894881 | 1.14227 | 0.860072 |
| Phosphatidylcholine (16:0_0:0) levels | GCST90277264 | CRC | IVW | 2 | -0.05672 | 0.215322 | 0.94486 | 0.619558 | 1.440965 | 0.792233 |
| Phosphatidylcholine (18:1_0:0) levels | GCST90277266 | CRC | Wald ratio | 1 | 0.129592 | 0.067004 | 1.138364 | 0.998266 | 1.298124 | 0.0531 |
| Phosphatidylcholine (18:2_0:0) levels | GCST90277267 | CRC | IVW | 2 | 0.1219 | 0.066054 | 1.129641 | 0.992463 | 1.285779 | 0.06497 |
| Phosphatidylcholine (20:4_0:0) levels | GCST90277268 | CRC | IVW | 3 | 0.080504 | 0.053417 | 1.083833 | 0.976097 | 1.20346 | 0.131789 |
| Phosphatidylethanolamine (18:0_0:0) levels | GCST90277269 | CRC | IVW | 2 | 0.092015 | 0.04483 | 1.096382 | 1.004157 | 1.197076 | 0.040117 |
| Phosphatidylethanolamine (18:2_0:0) levels | GCST90277271 | CRC | Wald ratio | 1 | -0.2734 | 0.065505 | 0.760792 | 0.669124 | 0.865017 | 3.00E-05 |
| Phosphatidylcholine (14:0_18:1) levels | GCST90277273 | CRC | Wald ratio | 1 | -0.29793 | 0.071384 | 0.742352 | 0.645427 | 0.853834 | 3.00E-05 |
| Phosphatidylcholine (14:0_18:2) levels | GCST90277274 | CRC | Wald ratio | 1 | -0.28518 | 0.066671 | 0.751877 | 0.659774 | 0.856838 | 1.89E-05 |
| Phosphatidylcholine (15:0_18:2) levels | GCST90277276 | CRC | IVW | 5 | 0.024758 | 0.048892 | 1.025067 | 0.931395 | 1.128159 | 0.612597 |
| Phosphatidylcholine (16:0_16:0) levels | GCST90277277 | CRC | IVW | 4 | 0.108648 | 0.038479 | 1.11477 | 1.033788 | 1.202096 | 0.004749 |
| Phosphatidylcholine (16:0_16:1) levels | GCST90277278 | CRC | Wald ratio | 1 | -0.28987 | 0.069452 | 0.748361 | 0.653119 | 0.857492 | 3.00E-05 |
| Phosphatidylcholine (16:0_18:0) levels | GCST90277280 | CRC | Wald ratio | 1 | -0.28562 | 0.052533 | 0.751551 | 0.678018 | 0.833059 | 5.42E-08 |
| Phosphatidylcholine (16:0_18:1) levels | GCST90277281 | CRC | IVW | 2 | -0.13013 | 0.187257 | 0.877984 | 0.608261 | 1.26731 | 0.48711 |
| Phosphatidylcholine (16:0_18:2) levels | GCST90277282 | CRC | IVW | 6 | 0.016626 | 0.038905 | 1.016765 | 0.942116 | 1.097329 | 0.669117 |
| Phosphatidylcholine (16:0_18:3) levels | GCST90277283 | CRC | IVW | 3 | -0.18146 | 0.144745 | 0.834053 | 0.628035 | 1.107651 | 0.209971 |
| Phosphatidylcholine (16:0_20:2) levels | GCST90277285 | CRC | IVW | 4 | -0.0106 | 0.039161 | 0.989452 | 0.916348 | 1.068389 | 0.786567 |
| Phosphatidylcholine (16:0_20:3) levels | GCST90277286 | CRC | IVW | 2 | 0.016724 | 0.088845 | 1.016865 | 0.854352 | 1.21029 | 0.850687 |
| Phosphatidylcholine (16:0_20:4) levels | GCST90277287 | CRC | IVW | 3 | -0.00836 | 0.05102 | 0.991674 | 0.897305 | 1.095968 | 0.869834 |
| Phosphatidylcholine (16:0_22:4) levels | GCST90277289 | CRC | IVW | 2 | 0.074063 | 0.123506 | 1.076875 | 0.845346 | 1.371815 | 0.548725 |
| Phosphatidylcholine (16:0_22:5) levels | GCST90277290 | CRC | IVW | 2 | 0.115339 | 0.068579 | 1.122254 | 0.981105 | 1.283709 | 0.0926 |
| Phosphatidylcholine (16:1_18:0) levels | GCST90277292 | CRC | Wald ratio | 1 | -0.29061 | 0.06963 | 0.747805 | 0.652406 | 0.857154 | 3.00E-05 |
| Phosphatidylcholine (16:1_18:1) levels | GCST90277293 | CRC | IVW | 4 | -0.07732 | 0.079965 | 0.925592 | 0.79132 | 1.082647 | 0.333569 |
| Phosphatidylcholine (16:1_18:2) levels | GCST90277294 | CRC | IVW | 4 | -0.03563 | 0.043811 | 0.964997 | 0.885592 | 1.051522 | 0.416061 |
| Phosphatidylcholine (17:0_18:1) levels | GCST90277296 | CRC | Wald ratio | 1 | 0.047293 | 0.068544 | 1.048429 | 0.916628 | 1.199181 | 0.490218 |
| Phosphatidylcholine (17:0_18:2) levels | GCST90277297 | CRC | IVW | 2 | -0.00756 | 0.051506 | 0.992471 | 0.897171 | 1.097894 | 0.88334 |
| Phosphatidylcholine (17:0_20:4) levels | GCST90277298 | CRC | IVW | 5 | 0.035355 | 0.042224 | 1.035987 | 0.953703 | 1.125371 | 0.402409 |
| Phosphatidylcholine (18:0_18:1) levels | GCST90277299 | CRC | IVW | 2 | 0.01868 | 0.05498 | 1.018856 | 0.914771 | 1.134783 | 0.734039 |
| Phosphatidylcholine (18:0_18:2) levels | GCST90277300 | CRC | IVW | 4 | 0.055633 | 0.037831 | 1.05721 | 0.981655 | 1.138579 | 0.141406 |
| Phosphatidylcholine (18:0_18:3) levels | GCST90277301 | CRC | Wald ratio | 1 | 0.033669 | 0.062141 | 1.034242 | 0.915644 | 1.168201 | 0.587951 |
| Phosphatidylcholine (18:0_20:3) levels | GCST90277303 | CRC | IVW | 3 | 0.014903 | 0.060911 | 1.015014 | 0.90079 | 1.143723 | 0.806715 |
| Phosphatidylcholine (18:0_20:4) levels | GCST90277304 | CRC | IVW | 6 | 0.013499 | 0.031548 | 1.01359 | 0.952814 | 1.078243 | 0.668742 |
| Phosphatidylcholine (18:0_20:5) levels | GCST90277305 | CRC | Wald ratio | 1 | 0.17523 | 0.083494 | 1.191521 | 1.01165 | 1.403373 | 0.035841 |
| Phosphatidylcholine (18:0_22:5) levels | GCST90277306 | CRC | Wald ratio | 1 | -0.30994 | 0.07426 | 0.733493 | 0.634139 | 0.848414 | 3.00E-05 |
| Phosphatidylcholine (18:0_22:6) levels | GCST90277307 | CRC | Wald ratio | 1 | 0.110179 | 0.072032 | 1.116478 | 0.969473 | 1.285775 | 0.126116 |
| Phosphatidylcholine (18:1_18:1) levels | GCST90277308 | CRC | IVW | 3 | 0.096344 | 0.040589 | 1.101138 | 1.016931 | 1.192317 | 0.017613 |
| Phosphatidylcholine (18:1_18:2) levels | GCST90277309 | CRC | IVW | 4 | 0.03423 | 0.047378 | 1.034823 | 0.943056 | 1.135519 | 0.469987 |
| Phosphatidylcholine (18:1_20:2) levels | GCST90277311 | CRC | IVW | 2 | -0.0751 | 0.044285 | 0.92765 | 0.850526 | 1.011766 | 0.089913 |
| Phosphatidylcholine (18:1_20:3) levels | GCST90277312 | CRC | IVW | 3 | 0.023091 | 0.086013 | 1.023359 | 0.864594 | 1.211279 | 0.788348 |
| Phosphatidylcholine (18:1_20:4) levels | GCST90277313 | CRC | IVW | 6 | -0.00932 | 0.033217 | 0.990722 | 0.928276 | 1.057368 | 0.779001 |
| Phosphatidylcholine (18:2_18:2) levels | GCST90277314 | CRC | IVW | 2 | -0.06336 | 0.056971 | 0.938609 | 0.83944 | 1.049493 | 0.266103 |
| Phosphatidylcholine (18:2_20:4) levels | GCST90277317 | CRC | IVW | 3 | -0.06307 | 0.05019 | 0.938878 | 0.850915 | 1.035933 | 0.20889 |
| Phosphatidylcholine (O-16:0_16:1) levels | GCST90277319 | CRC | IVW | 2 | 0.040328 | 0.061164 | 1.041152 | 0.923529 | 1.173756 | 0.509678 |
| Phosphatidylcholine (O-16:0_18:1) levels | GCST90277320 | CRC | IVW | 3 | 0.054151 | 0.040485 | 1.055644 | 0.975115 | 1.142823 | 0.181041 |
| Phosphatidylcholine (O-16:0_18:2) levels | GCST90277321 | CRC | Wald ratio | 1 | 0.111431 | 0.065028 | 1.117876 | 0.984103 | 1.269834 | 0.086608 |
| Phosphatidylcholine (O-16:0_20:3) levels | GCST90277322 | CRC | IVW | 3 | -0.01869 | 0.069952 | 0.981483 | 0.855733 | 1.125713 | 0.789324 |
| Phosphatidylcholine (O-16:0_20:4) levels | GCST90277323 | CRC | IVW | 2 | 0.020358 | 0.056835 | 1.020567 | 0.912982 | 1.140829 | 0.720195 |
| Phosphatidylcholine (O-16:1_16:0) levels | GCST90277325 | CRC | Wald ratio | 1 | 0.116384 | 0.043983 | 1.123427 | 1.030636 | 1.224572 | 0.008143 |
| Phosphatidylcholine (O-16:1_18:1) levels | GCST90277327 | CRC | IVW | 3 | 0.025511 | 0.043205 | 1.02584 | 0.942546 | 1.116494 | 0.554874 |
| Phosphatidylcholine (O-16:1_18:2) levels | GCST90277328 | CRC | IVW | 2 | 0.081943 | 0.044901 | 1.085394 | 0.993956 | 1.185244 | 0.068004 |
| Phosphatidylcholine (O-16:1_20:3) levels | GCST90277329 | CRC | IVW | 3 | 0.045802 | 0.085644 | 1.046867 | 0.885094 | 1.238207 | 0.592797 |
| Phosphatidylcholine (O-16:1_20:4) levels | GCST90277330 | CRC | IVW | 2 | 0.095197 | 0.036743 | 1.099876 | 1.023452 | 1.182006 | 0.009572 |
| Phosphatidylcholine (O-16:2_18:0) levels | GCST90277331 | CRC | IVW | 2 | 0.016858 | 0.031978 | 1.017001 | 0.955215 | 1.082783 | 0.598077 |
| Phosphatidylcholine (O-17:0_17:1) levels | GCST90277333 | CRC | Wald ratio | 1 | 0.113163 | 0.065674 | 1.119815 | 0.984563 | 1.273646 | 0.084868 |
| Phosphatidylcholine (O-18:0_16:1) levels | GCST90277335 | CRC | Wald ratio | 1 | -0.02095 | 0.052664 | 0.979272 | 0.883232 | 1.085756 | 0.69084 |
| Phosphatidylcholine (O-18:0_20:4) levels | GCST90277336 | CRC | Wald ratio | 1 | -0.04269 | 0.107935 | 0.95821 | 0.775505 | 1.183961 | 0.692477 |
| Phosphatidylcholine (O-18:1_16:0) levels | GCST90277337 | CRC | IVW | 3 | 0.042393 | 0.040238 | 1.043305 | 0.964185 | 1.128917 | 0.292078 |
| Phosphatidylcholine (O-18:1_18:2) levels | GCST90277338 | CRC | Wald ratio | 1 | -0.2056 | 0.064517 | 0.814156 | 0.717447 | 0.923901 | 0.001438 |
| Phosphatidylcholine (O-18:1_20:3) levels | GCST90277339 | CRC | Wald ratio | 1 | 0.200088 | 0.073452 | 1.22151 | 1.057726 | 1.410655 | 0.006449 |
| Phosphatidylcholine (O-18:1_20:4) levels | GCST90277340 | CRC | IVW | 3 | -0.00262 | 0.073439 | 0.997386 | 0.863675 | 1.151796 | 0.971565 |
| Phosphatidylcholine (O-18:2_16:0) levels | GCST90277341 | CRC | Wald ratio | 1 | 0.117567 | 0.071879 | 1.124757 | 0.976953 | 1.294922 | 0.101921 |
| Phosphatidylcholine (O-18:2_18:2) levels | GCST90277343 | CRC | Wald ratio | 1 | 0.115769 | 0.06756 | 1.122736 | 0.983489 | 1.281699 | 0.086608 |
| Phosphatidylcholine (O-18:2_20:4) levels | GCST90277344 | CRC | Wald ratio | 1 | 0.238113 | 0.078275 | 1.268853 | 1.088384 | 1.479247 | 0.00235 |
| Phosphatidylethanolamine (16:0_18:2) levels | GCST90277345 | CRC | IVW | 3 | -0.00798 | 0.020683 | 0.992055 | 0.952643 | 1.033098 | 0.699753 |
| Phosphatidylethanolamine (16:0_20:4) levels | GCST90277346 | CRC | IVW | 5 | -0.00608 | 0.014395 | 0.993934 | 0.966282 | 1.022377 | 0.672546 |
| Phosphatidylethanolamine (18:0_18:2) levels | GCST90277347 | CRC | IVW | 8 | -0.01165 | 0.017577 | 0.988418 | 0.954947 | 1.023063 | 0.507485 |
| Phosphatidylethanolamine (18:0_20:4) levels | GCST90277348 | CRC | IVW | 7 | 0.001814 | 0.02563 | 1.001815 | 0.952732 | 1.053428 | 0.943585 |
| Phosphatidylethanolamine (18:1_18:1) levels | GCST90277349 | CRC | IVW | 5 | -0.01629 | 0.023338 | 0.983846 | 0.939857 | 1.029895 | 0.485297 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphatidylethanolamine (O-16:1_20:4) levels | GCST90277351 | CRC | IVW | 2 | 0.136507 | 0.084814 | 1.146263 | 0.970708 | 1.353567 | 0.107512 |
| Phosphatidylethanolamine (O-18:1_20:4) levels | GCST90277354 | CRC | Wald ratio | 1 | 0.148119 | 0.080355 | 1.159651 | 0.990668 | 1.357459 | 0.065282 |
| Phosphatidylethanolamine (O-18:2_18:2) levels | GCST90277356 | CRC | Wald ratio | 1 | -0.31659 | 0.064454 | 0.728627 | 0.642156 | 0.826742 | 9.02E-07 |
| Phosphatidylethanolamine (O-18:2_20:4) levels | GCST90277357 | CRC | Wald ratio | 1 | 0.146502 | 0.080494 | 1.157777 | 0.988797 | 1.355636 | 0.068754 |
| Phosphatidylinositol (16:0_18:1) levels | GCST90277358 | CRC | Wald ratio | 1 | -0.11125 | 0.064056 | 0.894716 | 0.78915 | 1.014403 | 0.082432 |
| Phosphatidylinositol (16:0_18:2) levels | GCST90277359 | CRC | IVW | 2 | -0.02786 | 0.057208 | 0.972528 | 0.869373 | 1.087924 | 0.626309 |
| Phosphatidylinositol (16:0_20:4) levels | GCST90277360 | CRC | IVW | 2 | -0.20853 | 0.079526 | 0.81178 | 0.694615 | 0.948708 | 0.008739 |
| Phosphatidylinositol (18:0_18:1) levels | GCST90277361 | CRC | IVW | 5 | 0.003573 | 0.027248 | 1.00358 | 0.951388 | 1.058635 | 0.895667 |
| Phosphatidylinositol (18:0_18:2) levels | GCST90277362 | CRC | IVW | 6 | 0.00019 | 0.024634 | 1.00019 | 0.953046 | 1.049667 | 0.99384 |
| Phosphatidylinositol (18:0_20:3) levels | GCST90277363 | CRC | IVW | 4 | 0.068187 | 0.026887 | 1.070566 | 1.015608 | 1.128497 | 0.011212 |
| Phosphatidylinositol (18:0_20:4) levels | GCST90277364 | CRC | IVW | 5 | 0.041773 | 0.018593 | 1.042658 | 1.005344 | 1.081357 | 0.024661 |
| Phosphatidylinositol (18:1_18:1) levels | GCST90277365 | CRC | IVW | 4 | 0.009141 | 0.033558 | 1.009183 | 0.94494 | 1.077793 | 0.785317 |
| Phosphatidylinositol (18:1_18:2) levels | GCST90277366 | CRC | IVW | 2 | -0.00277 | 0.092379 | 0.997229 | 0.832071 | 1.19517 | 0.976041 |
| Phosphatidylinositol (18:1_20:4) levels | GCST90277367 | CRC | IVW | 2 | 0.016444 | 0.056593 | 1.01658 | 0.909848 | 1.135834 | 0.77138 |
| Sphingomyelin (d32:1) levels | GCST90277368 | CRC | IVW | 3 | -0.01796 | 0.019818 | 0.9822 | 0.944779 | 1.021103 | 0.364807 |
| Sphingomyelin (d34:0) levels | GCST90277369 | CRC | IVW | 4 | 0.014667 | 0.034954 | 1.014775 | 0.947581 | 1.086733 | 0.674781 |
| Sphingomyelin (d34:1) levels | GCST90277370 | CRC | IVW | 7 | 0.039035 | 0.030264 | 1.039806 | 0.979922 | 1.10335 | 0.197113 |
| Sphingomyelin (d34:2) levels | GCST90277371 | CRC | IVW | 4 | 0.041833 | 0.049347 | 1.042721 | 0.946592 | 1.148612 | 0.396589 |
| Sphingomyelin (d36:1) levels | GCST90277372 | CRC | IVW | 8 | 0.029633 | 0.031954 | 1.030077 | 0.967543 | 1.096652 | 0.353724 |
| Sphingomyelin (d36:2) levels | GCST90277373 | CRC | IVW | 3 | -0.05059 | 0.080852 | 0.950671 | 0.811349 | 1.113917 | 0.531527 |
| Sphingomyelin (d38:1) levels | GCST90277374 | CRC | IVW | 10 | -0.00602 | 0.017358 | 0.994002 | 0.960754 | 1.028402 | 0.728914 |
| Sphingomyelin (d38:2) levels | GCST90277375 | CRC | IVW | 4 | -0.03871 | 0.083423 | 0.962031 | 0.816917 | 1.132923 | 0.642647 |
| Sphingomyelin (d40:1) levels | GCST90277376 | CRC | IVW | 8 | 0.013003 | 0.029833 | 1.013088 | 0.955548 | 1.074092 | 0.662941 |
| Sphingomyelin (d40:2) levels | GCST90277377 | CRC | IVW | 6 | -0.01584 | 0.025089 | 0.984288 | 0.937057 | 1.033899 | 0.527879 |
| Sphingomyelin (d42:2) levels | GCST90277378 | CRC | IVW | 9 | 0.074983 | 0.028454 | 1.077866 | 1.019399 | 1.139687 | 0.008408 |
| Triacylglycerol (46:2) levels | GCST90277380 | CRC | Wald ratio | 1 | -0.27569 | 0.066056 | 0.759046 | 0.666869 | 0.863964 | 3.00E-05 |
| Triacylglycerol (48:1) levels | GCST90277382 | CRC | IVW | 2 | -0.16026 | 0.135059 | 0.85192 | 0.653784 | 1.110104 | 0.235382 |
| Triacylglycerol (48:2) levels | GCST90277383 | CRC | IVW | 2 | -0.14333 | 0.114728 | 0.866467 | 0.691979 | 1.084953 | 0.211551 |
| Triacylglycerol (48:3) levels | GCST90277384 | CRC | IVW | 2 | -0.12878 | 0.114092 | 0.879166 | 0.702997 | 1.099481 | 0.259002 |
| Triacylglycerol (49:2) levels | GCST90277386 | CRC | IVW | 2 | -0.13712 | 0.135708 | 0.871862 | 0.668238 | 1.137534 | 0.312285 |
| Triacylglycerol (50:1) levels | GCST90277387 | CRC | IVW | 3 | -0.03703 | 0.140216 | 0.963645 | 0.732087 | 1.268444 | 0.791695 |
| Triacylglycerol (50:2) levels | GCST90277388 | CRC | IVW | 2 | -0.11549 | 0.117554 | 0.890927 | 0.707583 | 1.121776 | 0.32587 |
| Triacylglycerol (50:3) levels | GCST90277389 | CRC | IVW | 3 | -0.08664 | 0.085021 | 0.917005 | 0.776248 | 1.083286 | 0.30817 |
| Triacylglycerol (50:4) levels | GCST90277390 | CRC | IVW | 3 | -0.09014 | 0.081477 | 0.913808 | 0.778934 | 1.072035 | 0.26861 |
| Triacylglycerol (50:5) levels | GCST90277391 | CRC | IVW | 3 | -0.0956 | 0.088739 | 0.908828 | 0.76374 | 1.08148 | 0.281345 |
| Triacylglycerol (51:2) levels | GCST90277393 | CRC | IVW | 2 | -0.09794 | 0.125385 | 0.906706 | 0.709147 | 1.159302 | 0.434751 |
| Triacylglycerol (51:3) levels | GCST90277394 | CRC | IVW | 5 | 0.007971 | 0.039471 | 1.008003 | 0.93296 | 1.089081 | 0.839966 |
| Triacylglycerol (51:4) levels | GCST90277395 | CRC | IVW | 2 | -0.08501 | 0.117004 | 0.918506 | 0.730274 | 1.155255 | 0.467512 |
| Triacylglycerol (52:2) levels | GCST90277396 | CRC | IVW | 2 | -0.01573 | 0.117926 | 0.984398 | 0.78125 | 1.24037 | 0.893919 |
| Triacylglycerol (52:3) levels | GCST90277397 | CRC | IVW | 5 | -0.00563 | 0.025235 | 0.994386 | 0.946398 | 1.044806 | 0.823451 |
| Triacylglycerol (52:4) levels | GCST90277398 | CRC | IVW | 6 | 0.004425 | 0.027952 | 1.004435 | 0.950887 | 1.060999 | 0.874209 |
| Triacylglycerol (52:5) levels | GCST90277399 | CRC | IVW | 4 | -0.05039 | 0.068139 | 0.950858 | 0.831984 | 1.086717 | 0.459585 |
| Triacylglycerol (52:6) levels | GCST90277400 | CRC | IVW | 3 | -0.07986 | 0.110473 | 0.923243 | 0.743498 | 1.146443 | 0.469733 |
| Triacylglycerol (53:2) levels | GCST90277401 | CRC | IVW | 2 | -0.08501 | 0.129096 | 0.918502 | 0.713167 | 1.182957 | 0.510208 |
| Triacylglycerol (53:3) levels | GCST90277402 | CRC | IVW | 4 | 0.009929 | 0.039292 | 1.009978 | 0.935118 | 1.090832 | 0.800501 |
| Triacylglycerol (53:4) levels | GCST90277403 | CRC | IVW | 4 | -0.05999 | 0.065991 | 0.941774 | 0.827512 | 1.071813 | 0.363314 |
| Triacylglycerol (54:3) levels | GCST90277404 | CRC | IVW | 3 | 0.033632 | 0.029454 | 1.034204 | 0.97619 | 1.095666 | 0.253518 |
| Triacylglycerol (54:4) levels | GCST90277405 | CRC | IVW | 4 | 0.03116 | 0.026611 | 1.031651 | 0.979222 | 1.086886 | 0.241611 |
| Triacylglycerol (54:5) levels | GCST90277406 | CRC | IVW | 3 | 0.028612 | 0.031443 | 1.029026 | 0.967523 | 1.094438 | 0.362838 |
| Triacylglycerol (54:6) levels | GCST90277407 | CRC | IVW | 2 | -0.09077 | 0.137036 | 0.913229 | 0.698123 | 1.194612 | 0.507732 |
| Triacylglycerol (54:7) levels | GCST90277408 | CRC | IVW | 3 | -0.09006 | 0.13695 | 0.913879 | 0.698738 | 1.195262 | 0.510801 |
| Triacylglycerol (56:3) levels | GCST90277409 | CRC | IVW | 3 | -0.01125 | 0.048566 | 0.988817 | 0.899034 | 1.087567 | 0.816882 |
| Triacylglycerol (56:4) levels | GCST90277410 | CRC | IVW | 2 | 0.0264 | 0.036702 | 1.026751 | 0.955486 | 1.103332 | 0.47195 |
| Triacylglycerol (56:5) levels | GCST90277411 | CRC | IVW | 2 | 0.050976 | 0.042613 | 1.052297 | 0.967978 | 1.143962 | 0.231602 |
| Triacylglycerol (56:6) levels | GCST90277412 | CRC | IVW | 5 | 0.011788 | 0.032049 | 1.011858 | 0.950253 | 1.077456 | 0.71301 |
| Triacylglycerol (56:7) levels | GCST90277413 | CRC | IVW | 2 | 0.03651 | 0.093958 | 1.037185 | 0.862735 | 1.24691 | 0.697588 |
| Triacylglycerol (56:8) levels | GCST90277414 | CRC | IVW | 4 | 0.085638 | 0.065483 | 1.089412 | 0.958191 | 1.238603 | 0.190943 |
| Triacylglycerol (58:7) levels | GCST90277415 | CRC | IVW | 4 | 0.005465 | 0.040449 | 1.00548 | 0.928843 | 1.08844 | 0.892523 |
| Triacylglycerol (58:8) levels | GCST90277416 | CRC | IVW | 2 | 0.049604 | 0.115426 | 1.050855 | 0.83809 | 1.317635 | 0.667377 |

These are selected and significantly reduced contents. Showing results for the main method only. Readers may request the nonmodified whole contents by contacting the corresponding authors of the current study: weiguoli1987@163.com (G.W.); Huojiege@jsatcm.com (J. H.)

Table S3.Summary of all SNP-specific information in the discovery dataset(Red color represents excluded outliers)

| | | | | | Harmonization | | Exposure | | | | Outcome | | | | Steiger-test | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Exposure | Outcome | SNP | chr | pos | EFFECT ALLELE | OTHER ALLELE | beta.exposu | eaf.exposu | se.exposure | pval.exposure | beta.outcon | eaf.outcom | se.outcome | pval.outcome | steiger_dir | steiger_pval | R2 | F |
| Sterol ester (27:1/20:4) levels | CRC | rs113248417 | 11 | 62059462 | G | A | -0.267977 | 0.03689 | 0.044942 | 2.59E-09 | -0.036861 | 0.039346 | 0.046075 | 0.423695 | TRUE | 7.76E-09 | 0.005103 | 36.78508 |
| Sterol ester (27:1/20:4) levels | CRC | rs1135999 | 16 | 15038105 | G | A | -0.101484 | 0.315252 | 0.017797 | 1.23E-08 | -0.028741 | 0.315027 | 0.019039 | 0.131159 | TRUE | 6.24E-08 | 0.004446 | 32.0324 |
| Sterol ester (27:1/20:4) levels | CRC | rs11591147 | 1 | 55039974 | T | G | -0.297311 | 0.033215 | 0.046189 | 1.30E-10 | 0.060649 | 0.036156 | 0.048295 | 0.209192 | TRUE | 6.66E-10 | 0.005677 | 40.94812 |
| Sterol ester (27:1/20:4) levels | CRC | rs174528 | 11 | 61776027 | C | T | -0.64833 | 0.41439 | 0.015196 | 1.00E-200 | -0.075685 | 0.420675 | 0.017897 | 2.35E-05 | TRUE | 0 | 0.204005 | 1838.102 |
| Sterol ester (27:1/20:4) levels | CRC | rs182695896 | 4 | 73947510 | C | A | 0.295609 | 0.025305 | 0.052463 | 1.82E-08 | 0.072226 | 0.02586 | 0.056331 | 0.199783 | TRUE | 7.50E-08 | 0.004311 | 31.04966 |
| Sterol ester (27:1/20:4) levels | CRC | rs187429064 | 19 | 19269704 | G | A | -0.254328 | 0.053531 | 0.037458 | 1.21E-11 | 0.011076 | 0.05117 | 0.041499 | 0.789545 | TRUE | 2.59E-11 | 0.006554 | 47.31832 |
| Sterol ester (27:1/20:4) levels | CRC | rs2229738 | 11 | 68794860 | T | C | -0.15287 | 0.155986 | 0.023409 | 7.01E-11 | -0.037929 | 0.155795 | 0.024965 | 0.128696 | TRUE | 4.75E-10 | 0.006153 | 44.40488 |
| Sterol ester (27:1/20:4) levels | CRC | rs3741252 | 11 | 61744026 | T | C | 0.212004 | 0.133653 | 0.024519 | 6.46E-18 | 0.025172 | 0.129675 | 0.026893 | 0.349263 | TRUE | 4.54E-17 | 0.010409 | 75.43502 |
| Sterol ester (27:1/20:4) levels | CRC | rs4382917 | 11 | 62454004 | A | G | 0.146345 | 0.255777 | 0.019705 | 1.24E-13 | 0.02651 | 0.243412 | 0.020939 | 0.205476 | TRUE | 8.79E-13 | 0.008154 | 58.95847 |
| Sterol ester (27:1/20:4) levels | CRC | rs7412 | 19 | 44908822 | T | C | -0.309996 | 0.053066 | 0.036791 | 4.29E-17 | -0.004271 | 0.052525 | 0.03859 | 0.911869 | TRUE | 1.02E-16 | 0.009658 | 69.94122 |
| Sterol ester (27:1/20:5) levels | CRC | rs174581 | 11 | 61839211 | A | G | -0.4109 | 0.409733 | 0.01638 | 3.56E-133 | -0.079816 | 0.415508 | 0.017954 | 8.76E-06 | TRUE | 3.24E-125 | 0.081668 | 637.8114 |
| Sterol ester (27:1/20:5) levels | CRC | rs508049 | 11 | 68908029 | T | C | -0.15839 | 0.097967 | 0.028652 | 3.35E-08 | -0.024509 | 0.093124 | 0.03102 | 0.429468 | TRUE | 8.98E-08 | 0.004434 | 31.94172 |
| Sterol ester (27:1/20:5) levels | CRC | rs7936002 | 11 | 62451557 | G | A | 0.109709 | 0.257197 | 0.019671 | 2.53E-08 | 0.025198 | 0.245379 | 0.020852 | 0.226901 | TRUE | 9.67E-08 | 0.004599 | 33.13571 |
| Phosphatidylcholine (20:4_0:0) levels | CRC | rs174545 | 11 | 61801834 | G | C | -0.533953 | 0.407641 | 0.017005 | 1.00E-200 | -0.076117 | 0.414007 | 0.017945 | 2.22E-05 | TRUE | 1.99E-194 | 0.137689 | 995.2497 |
| Phosphatidylcholine (20:4_0:0) levels | CRC | rs58451960 | 11 | 62059600 | T | C | -0.169585 | 0.137195 | 0.026302 | 1.22E-10 | -0.035106 | 0.139923 | 0.025337 | 0.165872 | TRUE | 6.12E-10 | 0.006809 | 42.72873 |
| Phosphatidylcholine (20:4_0:0) levels | CRC | rs600626 | 11 | 75744264 | G | A | -0.120776 | 0.232311 | 0.021178 | 1.23E-08 | 0.018388 | 0.230625 | 0.020981 | 0.380803 | TRUE | 3.35E-08 | 0.005203 | 32.59935 |
| Phosphatidylcholine (20:4_0:0) levels | CRC | rs7936002 | 11 | 62451557 | G | A | 0.134077 | 0.257197 | 0.020945 | 1.65E-10 | 0.025198 | 0.245379 | 0.020852 | 0.226901 | TRUE | 7.00E-10 | 0.006869 | 43.10906 |
| Phosphatidylethanolamine (18:2_0:0) levels | CRC | rs1260326 | 2 | 27508073 | C | T | -0.114725 | 0.650878 | 0.017763 | 1.12E-10 | 0.02234 | 0.650148 | 0.018596 | 0.229635 | TRUE | 5.32E-10 | 0.005982 | 41.53999 |
| Phosphatidylethanolamine (18:2_0:0) levels | CRC | rs174560 | 11 | 61814292 | C | T | 0.364648 | 0.382915 | 0.01709 | 7.02E-98 | -0.080586 | 0.388646 | 0.018138 | 8.87E-06 | TRUE | 4.41E-91 | 0.062838 | 462.8587 |
| Phosphatidylcholine (14:0_18:2) levels | CRC | rs174548 | 11 | 61803876 | G | C | 0.184079 | 0.383631 | 0.017505 | 1.15E-25 | -0.081685 | 0.389804 | 0.018124 | 6.58E-06 | TRUE | 2.37E-22 | 0.016025 | 111.7857 |
| Phosphatidylcholine (14:0_18:2) levels | CRC | rs4665972 | 2 | 27375230 | C | T | -0.114678 | 0.620291 | 0.017513 | 6.24E-11 | 0.028131 | 0.624423 | 0.018277 | 0.123772 | TRUE | 4.12E-10 | 0.006195 | 42.78708 |
| Phosphatidylcholine (14:0_18:2) levels | CRC | rs571968630 | 18 | 20932590 | C | G | 0.590789 | 0.011389 | 0.080052 | 1.76E-13 | -0.042263 | 0.014027 | 0.075052 | 0.573352 | TRUE | 5.56E-13 | 0.007859 | 54.37397 |
| Phosphatidylcholine (15:0_18:2) levels | CRC | rs10468017 | 15 | 58386313 | T | C | 0.111867 | 0.337526 | 0.018143 | 7.41E-10 | 0.007439 | 0.331296 | 0.018788 | 0.692161 | TRUE | 1.53E-09 | 0.005596 | 37.35246 |
| Phosphatidylcholine (15:0_18:2) levels | CRC | rs1168036 | 1 | 62497063 | G | A | 0.106914 | 0.737927 | 0.019562 | 4.78E-08 | -0.012258 | 0.736587 | 0.020021 | 0.540375 | TRUE | 1.05E-07 | 0.004421 | 29.47345 |
| Phosphatidylcholine (15:0_18:2) levels | CRC | rs17231506 | 16 | 56960616 | T | C | 0.142778 | 0.27829 | 0.019212 | 1.20E-13 | 0.02011 | 0.278594 | 0.019666 | 0.306512 | TRUE | 6.03E-13 | 0.008189 | 54.79686 |
| Phosphatidylcholine (15:0_18:2) levels | CRC | rs174566 | 11 | 61824890 | G | A | 0.316974 | 0.408433 | 0.017255 | 1.46E-73 | -0.075641 | 0.413654 | 0.017944 | 2.49E-05 | TRUE | 4.76E-68 | 0.048551 | 338.6792 |
| Phosphatidylcholine (15:0_18:2) levels | CRC | rs55727637 | 16 | 15051395 | T | C | 0.110967 | 0.298983 | 0.018977 | 5.22E-09 | -0.011677 | 0.297998 | 0.01933 | 0.545775 | TRUE | 1.22E-08 | 0.005162 | 34.43595 |
| Phosphatidylcholine (15:0_18:2) levels | CRC | rs964184 | 11 | 1.17E+08 | C | G | -0.140695 | 0.848991 | 0.024077 | 5.34E-09 | 0.01394 | 0.855576 | 0.025002 | 0.577138 | TRUE | 1.20E-08 | 0.005076 | 33.85907 |
| Phosphatidylcholine (16:0_18:0) levels | CRC | rs174601 | 11 | 61855668 | T | C | 0.146355 | 0.419025 | 0.01691 | 6.00E-18 | -0.072002 | 0.426726 | 0.017905 | 5.78E-05 | TRUE | 1.85E-15 | 0.010429 | 75.37426 |
| Phosphatidylcholine (16:0_18:2) levels | CRC | rs1532085 | 15 | 58391167 | G | A | -0.110553 | 0.573441 | 0.016767 | 4.61E-11 | -0.004959 | 0.577767 | 0.017873 | 0.781444 | TRUE | 9.61E-11 | 0.005979 | 43.14035 |
| Phosphatidylcholine (16:0_18:2) levels | CRC | rs17231506 | 16 | 56960616 | T | C | 0.143843 | 0.27829 | 0.018493 | 8.35E-15 | 0.02011 | 0.278594 | 0.019666 | 0.306512 | TRUE | 5.06E-14 | 0.008311 | 60.10806 |
| Phosphatidylcholine (16:0_18:2) levels | CRC | rs174574 | 11 | 61832870 | C | A | -0.330699 | 0.590933 | 0.016603 | 5.66E-86 | 0.076186 | 0.585489 | 0.017942 | 2.17E-05 | TRUE | 1.29E-79 | 0.052872 | 400.3688 |
| Phosphatidylcholine (16:0_18:2) levels | CRC | rs1800588 | 15 | 58431476 | T | C | 0.137688 | 0.258046 | 0.019308 | 1.09E-12 | 0.014862 | 0.24873 | 0.020555 | 0.46967 | TRUE | 4.00E-12 | 0.007259 | 52.4446 |
| Phosphatidylcholine (16:0_18:2) levels | CRC | rs62039480 | 16 | 15043593 | A | G | 0.115988 | 0.332015 | 0.017732 | 6.52E-11 | -0.013739 | 0.328903 | 0.018801 | 0.464906 | TRUE | 2.09E-10 | 0.005967 | 43.05466 |
| Phosphatidylcholine (16:0_18:2) levels | CRC | rs9436221 | 1 | 62437688 | C | T | -0.126689 | 0.261404 | 0.018823 | 1.82E-11 | 0.010428 | 0.262815 | 0.020051 | 0.603004 | TRUE | 4.96E-11 | 0.006198 | 44.72674 |
| Phosphatidylcholine (16:0_18:2) levels | CRC | rs964184 | 11 | 1.17E+08 | C | G | -0.158038 | 0.848991 | 0.023159 | 9.56E-12 | 0.01394 | 0.855576 | 0.025002 | 0.577138 | TRUE | 2.76E-11 | 0.006404 | 46.22633 |
| Phosphatidylcholine (16:0_20:1) levels | CRC | rs174594 | 11 | 61852357 | A | C | -0.11459 | 0.5815 | 0.017281 | 3.58E-11 | 0.07547 | 0.574741 | 0.017908 | 2.51E-05 | TRUE | 2.80E-09 | 0.006391 | 44.25288 |
| Phosphatidylcholine (16:0_20:2) levels | CRC | rs10160784 | 11 | 75745010 | C | T | -0.10964 | 0.232378 | 0.01988 | 3.61E-08 | 0.018958 | 0.230715 | 0.020978 | 0.366146 | TRUE | 1.05E-07 | 0.004289 | 30.72198 |
| Phosphatidylcholine (16:0_20:2) levels | CRC | rs1260326 | 2 | 27508073 | C | T | -0.097152 | 0.650878 | 0.017513 | 3.00E-08 | 0.02234 | 0.650148 | 0.018596 | 0.229635 | TRUE | 1.12E-07 | 0.00429 | 30.7292 |
| Phosphatidylcholine (16:0_20:2) levels | CRC | rs1532085 | 15 | 58391167 | G | A | -0.093833 | 0.573441 | 0.016856 | 2.69E-08 | -0.004959 | 0.577767 | 0.017873 | 0.781444 | TRUE | 4.75E-08 | 0.004307 | 30.8569 |
| Phosphatidylcholine (16:0_20:2) levels | CRC | rs174592 | 11 | 61851136 | G | A | 0.261677 | 0.418474 | 0.016766 | 4.96E-54 | -0.075196 | 0.425184 | 0.017907 | 2.68E-05 | TRUE | 4.12E-49 | 0.033327 | 245.9186 |
| Phosphatidylcholine (16:0_20:2) levels | CRC | rs1800588 | 15 | 58431476 | T | C | 0.10685 | 0.258046 | 0.019416 | 3.85E-08 | 0.014862 | 0.24873 | 0.020555 | 0.46967 | TRUE | 9.70E-08 | 0.004372 | 31.32046 |
| Phosphatidylcholine (16:0_20:2) levels | CRC | rs62081852 | 18 | 26802732 | T | C | 0.389035 | 0.017663 | 0.067672 | 9.35E-09 | -0.033702 | 0.019994 | 0.063535 | 0.595808 | TRUE | 2.11E-08 | 0.005252 | 37.66118 |
| Phosphatidylcholine (16:0_20:4) levels | CRC | rs174528 | 11 | 61776027 | C | T | -0.58723 | 0.41439 | 0.015544 | 1.00E-200 | -0.075685 | 0.420675 | 0.017897 | 2.35E-05 | TRUE | 1.62E-277 | 0.167365 | 1441.617 |
| Phosphatidylcholine (16:0_20:4) levels | CRC | rs187429064 | 19 | 19269704 | G | A | -0.226182 | 0.053531 | 0.037687 | 2.04E-09 | 0.011076 | 0.05117 | 0.041499 | 0.789545 | TRUE | 3.84E-09 | 0.005184 | 37.37304 |
| Phosphatidylcholine (16:0_20:4) levels | CRC | rs2943813 | 11 | 61490996 | C | T | -0.139019 | 0.782953 | 0.020392 | 9.96E-12 | -0.025418 | 0.792124 | 0.021902 | 0.245834 | TRUE | 5.27E-11 | 0.006569 | 47.42094 |
| Phosphatidylcholine (16:0_20:4) levels | CRC | rs3741252 | 11 | 61744026 | T | C | 0.210427 | 0.133653 | 0.024533 | 1.17E-17 | 0.025172 | 0.129675 | 0.026893 | 0.349263 | TRUE | 8.10E-17 | 0.010254 | 74.30536 |
| Phosphatidylcholine (16:0_20:5) levels | CRC | rs102274 | 11 | 61790354 | C | T | -0.372594 | 0.408673 | 0.016501 | 4.34E-109 | -0.071738 | 0.415679 | 0.017949 | 6.42E-05 | TRUE | 2.23E-102 | 0.067097 | 515.7613 |
| Phosphatidylcholine (16:0_22:4) levels | CRC | rs174551 | 11 | 61806212 | C | T | -0.289752 | 0.406164 | 0.017095 | 3.67E-63 | -0.07436 | 0.412521 | 0.017954 | 3.45E-05 | TRUE | 5.21E-58 | 0.0405 | 290.0607 |
| Phosphatidylcholine (16:0_22:4) levels | CRC | rs61008604 | 2 | 1.02E+08 | T | G | -0.116042 | 0.248766 | 0.019847 | 5.24E-09 | -0.045881 | 0.248578 | 0.020544 | 0.0255252 | TRUE | 4.85E-08 | 0.005033 | 34.76171 |
| Phosphatidylcholine (16:0_22:5) levels | CRC | rs174533 | 11 | 61781553 | A | G | -0.41301 | 0.408601 | 0.016346 | 5.08E-135 | -0.073076 | 0.415098 | 0.01794 | 4.63E-05 | TRUE | 1.39E-127 | 0.082439 | 644.1918 |
| Phosphatidylcholine (16:0_22:5) levels | CRC | rs2236514 | 9 | 1.37E+08 | G | C | -0.123138 | 0.647094 | 0.017725 | 4.04E-12 | -0.011391 | 0.654132 | 0.0187 | 0.54244 | TRUE | 1.26E-11 | 0.006925 | 50.0009 |
| Phosphatidylcholine (16:0_22:5) levels | CRC | rs508049 | 11 | 68908029 | T | C | -0.16692 | 0.097967 | 0.028607 | 5.62E-09 | -0.024509 | 0.093124 | 0.03102 | 0.429468 | TRUE | 1.61E-08 | 0.004924 | 35.48236 |
| Phosphatidylcholine (16:0_22:5) levels | CRC | rs62229686 | 21 | 43971391 | T | C | -0.246348 | 0.039112 | 0.041965 | 4.54E-09 | -0.027281 | 0.041785 | 0.044311 | 0.538105 | TRUE | 1.13E-08 | 0.004561 | 32.85575 |
| Phosphatidylcholine (16:0_22:6) levels | CRC | rs174544 | 11 | 61800281 | A | C | -0.126716 | 0.379757 | 0.017255 | 2.30E-13 | -0.078534 | 0.386483 | 0.018154 | 1.52E-05 | TRUE | 3.74E-11 | 0.007564 | 54.63313 |
| Phosphatidylcholine (16:1_18:1) levels | CRC | rs1260326 | 2 | 27508073 | C | T | -0.110177 | 0.650878 | 0.017461 | 2.95E-10 | 0.02234 | 0.650148 | 0.018596 | 0.229635 | TRUE | 1.39E-09 | 0.005517 | 39.74174 |
| Phosphatidylcholine (16:1_18:1) levels | CRC | rs146934967 | 18 | 15033501 | T | C | 0.41533 | 0.013079 | 0.073728 | 1.83E-08 | -0.115575 | 0.014526 | 0.07391 | 0.117878 | TRUE | 9.51E-08 | 0.004453 | 32.04577 |
| Phosphatidylcholine (16:1_18:1) levels | CRC | rs1532085 | 15 | 58391167 | G | A | -0.092555 | 0.573441 | 0.016809 | 3.79E-08 | -0.004959 | 0.577767 | 0.017873 | 0.781444 | TRUE | 6.64E-08 | 0.004191 | 30.14922 |
| Phosphatidylcholine (16:1_18:1) levels | CRC | rs174560 | 11 | 61814292 | C | T | 0.175659 | 0.382915 | 0.017182 | 2.28E-24 | -0.080586 | 0.388646 | 0.018138 | 8.87E-06 | TRUE | 4.11E-21 | 0.014582 | 106.0116 |
| Phosphatidylcholine (16:1_18:1) levels | CRC | rs603424 | 10 | 1E+08 | A | G | -0.176374 | 0.121331 | 0.025975 | 1.21E-11 | 0.011204 | 0.116436 | 0.027658 | 0.685416 | TRUE | 2.97E-11 | 0.006633 | 47.83458 |
| Phosphatidylcholine (16:1_18:2) levels | CRC | rs1260326 | 2 | 27508073 | C | T | -0.09847 | 0.650878 | 0.017428 | 1.66E-08 | 0.02234 | 0.650148 | 0.018596 | 0.229635 | TRUE | 6.44E-08 | 0.004407 | 31.70467 |
| Phosphatidylcholine (16:1_18:2) levels | CRC | rs1532085 | 15 | 58391167 | G | A | -0.097216 | 0.573441 | 0.016768 | 7.02E-09 | -0.004959 | 0.577767 | 0.017873 | 0.781444 | TRUE | 1.28E-08 | 0.004624 | 33.27236 |
| Phosphatidylcholine (16:1_18:2) levels | CRC | rs174574 | 11 | 61832870 | C | A | -0.365719 | 0.590933 | 0.016496 | 2.11E-105 | 0.076186 | 0.585489 | 0.017942 | 2.17E-05 | TRUE | 2.07E-98 | 0.064663 | 495.2046 |
| Phosphatidylcholine (16:1_18:2) levels | CRC | rs1800588 | 15 | 58431476 | T | C | 0.115653 | 0.258046 | 0.019312 | 2.21E-09 | 0.014862 | 0.24873 | 0.020555 | 0.46967 | TRUE | 6.21E-09 | 0.005122 | 36.87593 |
| Phosphatidylcholine (16:1_18:2) levels | CRC | rs56156922 | 16 | 56953457 | C | T | 0.113979 | 0.278673 | 0.018542 | 8.30E-10 | 0.018911 | 0.278938 | 0.019696 | 0.336992 | TRUE | 2.99E-09 | 0.005223 | 37.60763 |
| Phosphatidylcholine (16:1_18:2) levels | CRC | rs571968630 | 18 | 20932590 | C | G | 0.493926 | 0.011389 | 0.079177 | 4.67E-10 | -0.042263 | 0.014027 | 0.075052 | 0.573352 | TRUE | 1.20E-09 | 0.005493 | 39.56701 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phosphatidylcholine (16:1_18:2) levels | CRC | rs603424 | 10 | 1E+08 | A | G | -0.161319 | 0.121331 | 0.025924 | 5.15E-10 | 0.011204 | 0.116436 | 0.027658 | 0.685416 | TRUE | 1.14E-09 | 0.005549 | 39.96774 |
| Phosphatidylcholine (16:1_18:2) levels | CRC | rs7936002 | 11 | 62451557 | G | A | -0.115471 | 0.257197 | 0.01963 | 4.22E-09 | 0.025198 | 0.245379 | 0.020852 | 0.226901 | TRUE | 1.76E-08 | 0.005095 | 36.67994 |
| Phosphatidylcholine (16:1_20:4) levels | CRC | rs174535 | 11 | 61783884 | C | T | -0.327652 | 0.409133 | 0.019152 | 5.33E-64 | -0.074678 | 0.415943 | 0.017934 | 3.13E-05 | TRUE | 1.57E-59 | 0.051905 | 304.5012 |
| Phosphatidylcholine (17:0_18:2) levels | CRC | rs174566 | 11 | 61824890 | G | A | 0.258705 | 0.408433 | 0.016784 | 9.03E-53 | -0.075641 | 0.413654 | 0.017944 | 2.49E-05 | TRUE | 6.95E-48 | 0.032342 | 239.5744 |
| Phosphatidylcholine (17:0_18:2) levels | CRC | rs1800588 | 15 | 58431476 | T | C | 0.114618 | 0.258046 | 0.019352 | 3.31E-09 | 0.014862 | 0.24873 | 0.020555 | 0.46967 | TRUE | 9.16E-09 | 0.00503 | 36.24082 |
| Phosphatidylcholine (17:0_18:2) levels | CRC | rs964184 | 11 | 1.17E+08 | C | G | -0.154483 | 0.848991 | 0.023164 | 2.76E-11 | 0.01394 | 0.855576 | 0.025002 | 0.577138 | TRUE | 7.71E-11 | 0.006119 | 44.13275 |
| Phosphatidylcholine (17:0_20:4) levels | CRC | rs12417747 | 11 | 62060922 | A | G | -0.145567 | 0.114819 | 0.026603 | 4.60E-08 | -0.045169 | 0.114902 | 0.027589 | 0.101584 | TRUE | 2.38E-07 | 0.004307 | 30.73119 |
| Phosphatidylcholine (17:0_20:4) levels | CRC | rs174528 | 11 | 61776027 | C | T | -0.534586 | 0.41439 | 0.015932 | 1.00E-200 | -0.075685 | 0.420675 | 0.017897 | 2.35E-05 | TRUE | 3.79E-221 | 0.138702 | 1144.017 |
| Phosphatidylcholine (17:0_20:4) levels | CRC | rs187429064 | 19 | 19269704 | G | A | -0.23955 | 0.053531 | 0.038035 | 3.18E-10 | 0.011076 | 0.05117 | 0.041499 | 0.789545 | TRUE | 6.25E-10 | 0.005815 | 41.55017 |
| Phosphatidylcholine (17:0_20:4) levels | CRC | rs3741252 | 11 | 61744026 | T | C | 0.206133 | 0.133653 | 0.024645 | 7.20E-17 | 0.025172 | 0.129675 | 0.026893 | 0.349263 | TRUE | 4.61E-16 | 0.00984 | 70.59813 |
| Phosphatidylcholine (17:0_20:4) levels | CRC | rs58983615 | 11 | 62053609 | T | A | -0.328615 | 0.02083 | 0.059204 | 2.95E-08 | 0.066953 | 0.020833 | 0.062772 | 0.286146 | TRUE | 9.88E-08 | 0.004405 | 31.43232 |
| Phosphatidylcholine (17:0_20:4) levels | CRC | rs600518 | 11 | 75744328 | T | A | -0.113042 | 0.2323 | 0.01991 | 1.42E-08 | 0.018456 | 0.230538 | 0.02098 | 0.379026 | TRUE | 4.21E-08 | 0.004558 | 32.5265 |
| Phosphatidylcholine (18:0_20:2) levels | CRC | rs174547 | 11 | 61803311 | C | T | 0.282264 | 0.407429 | 0.018586 | 4.05E-51 | -0.076212 | 0.413977 | 0.017945 | 2.17E-05 | TRUE | 6.13E-47 | 0.038471 | 231.099 |
| Phosphatidylcholine (18:0_20:4) levels | CRC | rs147549994 | 16 | 1939264 | T | G | 0.255782 | 0.035936 | 0.044991 | 1.35E-08 | -0.104787 | 0.034779 | 0.048866 | 0.0320052 | TRUE | 1.15E-07 | 0.004533 | 32.66022 |
| Phosphatidylcholine (18:0_20:4) levels | CRC | rs174528 | 11 | 61776027 | C | T | -0.666205 | 0.41439 | 0.015102 | 1.00E-200 | -0.075685 | 0.420675 | 0.017897 | 2.35E-05 | TRUE | 0 | 0.215409 | 1969.067 |
| Phosphatidylcholine (18:0_20:4) levels | CRC | rs2797620 | 1 | 94975736 | T | C | -0.101178 | 0.332583 | 0.017383 | 6.11E-09 | 0.017692 | 0.328894 | 0.018786 | 0.346321 | TRUE | 2.00E-08 | 0.004545 | 32.74296 |
| Phosphatidylcholine (18:0_20:4) levels | CRC | rs3019200 | 11 | 61481911 | A | C | -0.162646 | 0.803119 | 0.021306 | 2.57E-14 | -0.028803 | 0.808536 | 0.022587 | 0.202241 | TRUE | 1.97E-13 | 0.008366 | 60.50471 |
| Phosphatidylcholine (18:0_20:4) levels | CRC | rs3741252 | 11 | 61744026 | T | C | 0.242617 | 0.133653 | 0.024494 | 5.54E-23 | 0.025172 | 0.129675 | 0.026893 | 0.349263 | TRUE | 5.69E-22 | 0.013631 | 99.11608 |
| Phosphatidylcholine (18:0_20:4) levels | CRC | rs4382917 | 11 | 62454004 | A | G | 0.148945 | 0.255777 | 0.019714 | 4.68E-14 | 0.02651 | 0.243412 | 0.020939 | 0.205476 | TRUE | 3.47E-13 | 0.008446 | 61.09002 |
| Phosphatidylcholine (18:0_20:4) levels | CRC | rs79136768 | 11 | 61594967 | G | A | -0.249044 | 0.036937 | 0.044747 | 2.71E-08 | -0.036748 | 0.036049 | 0.04853 | 0.448917 | TRUE | 7.12E-08 | 0.004413 | 31.78772 |
| Phosphatidylcholine (18:0_20:5) levels | CRC | rs102275 | 11 | 61790331 | C | T | -0.419506 | 0.410377 | 0.016455 | 3.30E-137 | -0.07484 | 0.416098 | 0.017929 | 2.99E-05 | TRUE | 1.06E-129 | 0.085166 | 662.7355 |
| Phosphatidylcholine (18:0_20:5) levels | CRC | rs7936002 | 11 | 62451557 | G | A | 0.110547 | 0.257197 | 0.019742 | 2.22E-08 | 0.025198 | 0.245379 | 0.020852 | 0.226901 | TRUE | 8.50E-08 | 0.004669 | 33.39759 |
| Phosphatidylcholine (18:1_18:2) levels | CRC | rs1077835 | 15 | 58431227 | G | A | 0.12469 | 0.266329 | 0.01915 | 7.94E-11 | 0.012205 | 0.257918 | 0.020326 | 0.548192 | TRUE | 2.23E-10 | 0.006076 | 43.84299 |
| Phosphatidylcholine (18:1_18:2) levels | CRC | rs10889352 | 1 | 62633352 | C | T | -0.126365 | 0.262366 | 0.018758 | 1.75E-11 | 0.011748 | 0.263349 | 0.020028 | 0.557485 | TRUE | 5.08E-11 | 0.006181 | 44.60309 |
| Phosphatidylcholine (18:1_18:2) levels | CRC | rs1601935 | 15 | 58379566 | T | G | -0.105723 | 0.611241 | 0.017002 | 5.31E-10 | -0.014351 | 0.616613 | 0.018206 | 0.430549 | TRUE | 1.66E-09 | 0.005312 | 38.30146 |
| Phosphatidylcholine (18:1_18:2) levels | CRC | rs17231506 | 16 | 56960616 | T | C | 0.119523 | 0.27829 | 0.01848 | 1.06E-10 | 0.02011 | 0.278594 | 0.019666 | 0.306512 | TRUE | 4.41E-10 | 0.005738 | 41.39357 |
| Phosphatidylcholine (18:1_18:2) levels | CRC | rs174574 | 11 | 61832870 | C | A | -0.380135 | 0.590933 | 0.016431 | 2.79E-114 | 0.076186 | 0.585489 | 0.017942 | 2.17E-05 | TRUE | 4.79E-107 | 0.069862 | 538.6803 |
| Phosphatidylcholine (18:1_20:2) levels | CRC | rs12417747 | 11 | 62060922 | A | G | 0.18995 | 0.114819 | 0.02896 | 5.83E-11 | -0.045169 | 0.114902 | 0.027589 | 0.101584 | TRUE | 3.55E-10 | 0.007334 | 43.22224 |
| Phosphatidylcholine (18:1_20:2) levels | CRC | rs174580 | 11 | 61839170 | G | A | 0.431366 | 0.409729 | 0.017898 | 1.49E-122 | -0.078801 | 0.415508 | 0.017921 | 1.10E-05 | TRUE | 3.19E-116 | 0.090006 | 578.6116 |
| Phosphatidylcholine (18:1_20:2) levels | CRC | rs656095 | 11 | 75734293 | G | A | -0.130437 | 0.226939 | 0.022171 | 4.24E-09 | 0.017584 | 0.221616 | 0.021256 | 0.408109 | TRUE | 1.11E-08 | 0.00597 | 35.13264 |
| Phosphatidylcholine (18:1_20:4) levels | CRC | rs147797702 | 18 | 52743009 | C | T | -0.489187 | 0.009355 | 0.089017 | 4.03E-08 | 0.007042 | 0.010022 | 0.087242 | 0.935665 | TRUE | 5.99E-08 | 0.004435 | 31.94847 |
| Phosphatidylcholine (18:1_20:4) levels | CRC | rs174528 | 11 | 61776027 | C | T | -0.499162 | 0.41439 | 0.015979 | 1.00E-200 | -0.075685 | 0.420675 | 0.017897 | 2.35E-05 | TRUE | 1.18E-192 | 0.120929 | 986.4762 |
| Phosphatidylcholine (18:1_20:4) levels | CRC | rs187429064 | 19 | 19269704 | G | A | -0.276291 | 0.053531 | 0.037729 | 2.68E-13 | 0.011076 | 0.05117 | 0.041499 | 0.789545 | TRUE | 6.31E-13 | 0.007735 | 55.9024 |
| Phosphatidylcholine (18:1_20:4) levels | CRC | rs2943813 | 11 | 61490996 | C | T | -0.129638 | 0.782953 | 0.020413 | 2.26E-10 | -0.025418 | 0.792124 | 0.021902 | 0.245834 | TRUE | 1.04E-09 | 0.005712 | 41.19567 |
| Phosphatidylcholine (18:1_20:4) levels | CRC | rs3741252 | 11 | 61744026 | T | C | 0.186126 | 0.133653 | 0.024573 | 4.05E-14 | 0.025172 | 0.129675 | 0.026893 | 0.349263 | TRUE | 2.10E-13 | 0.008023 | 57.99527 |
| Phosphatidylcholine (18:1_20:4) levels | CRC | rs531117 | 11 | 75745089 | T | C | -0.113887 | 0.232379 | 0.019845 | 9.96E-09 | 0.018962 | 0.230715 | 0.020978 | 0.366049 | TRUE | 3.07E-08 | 0.004627 | 33.33619 |
| Phosphatidylcholine (18:1_20:4) levels | CRC | rs8107974 | 19 | 19277691 | T | A | -0.190759 | 0.062468 | 0.034384 | 3.00E-08 | 0.005684 | 0.063828 | 0.036071 | 0.874785 | TRUE | 4.78E-08 | 0.004262 | 30.69568 |
| Phosphatidylcholine (18:2_20:3) levels | CRC | rs174548 | 11 | 61803876 | G | C | 0.209516 | 0.383631 | 0.017827 | 1.40E-31 | -0.081685 | 0.389804 | 0.018124 | 6.58E-06 | TRUE | 6.47E-28 | 0.02076 | 140.1936 |
| Phosphatidylcholine (O-16:0_20:4) levels | CRC | rs174568 | 11 | 61826344 | T | C | -0.381503 | 0.40512 | 0.016461 | 1.16E-114 | -0.075982 | 0.411924 | 0.017972 | 2.36E-05 | TRUE | 1.92E-107 | 0.070152 | 541.0871 |
| Phosphatidylcholine (O-16:0_20:4) levels | CRC | rs3017103 | 11 | 62406721 | G | A | 0.115568 | 0.803552 | 0.021159 | 4.87E-08 | -0.003202 | 0.809459 | 0.022559 | 0.887146 | TRUE | 7.59E-08 | 0.004217 | 30.36982 |
| Phosphatidylcholine (O-16:0_20:4) levels | CRC | rs6709442 | 2 | 1.24E+08 | A | G | 0.094665 | 0.41602 | 0.017066 | 3.00E-08 | -0.009812 | 0.427154 | 0.017876 | 0.583073 | TRUE | 6.64E-08 | 0.004354 | 31.36594 |
| Phosphatidylcholine (O-16:0_22:5) levels | CRC | rs174548 | 11 | 61803876 | G | C | -0.168015 | 0.383631 | 0.018886 | 7.57E-19 | -0.081685 | 0.389804 | 0.018124 | 6.58E-06 | TRUE | 2.73E-16 | 0.01335 | 80.99425 |
| Phosphatidylcholine (O-18:0_20:4) levels | CRC | rs174536 | 11 | 61784455 | C | A | -0.308417 | 0.408477 | 0.016945 | 2.28E-72 | -0.072915 | 0.414519 | 0.017942 | 4.83E-05 | TRUE | 7.37E-67 | 0.045967 | 335.0558 |
| Phosphatidylcholine (O-18:0_20:4) levels | CRC | rs3741252 | 11 | 61744026 | T | C | 0.150025 | 0.133653 | 0.024979 | 1.99E-09 | 0.025172 | 0.129675 | 0.026893 | 0.349263 | TRUE | 6.63E-09 | 0.005212 | 36.43612 |
| Phosphatidylcholine (O-18:1_18:2) levels | CRC | rs174551 | 11 | 61806212 | C | T | 0.229198 | 0.406164 | 0.017393 | 3.59E-39 | -0.07436 | 0.412521 | 0.017954 | 3.45E-05 | TRUE | 2.88E-35 | 0.025341 | 174.6134 |
| Phosphatidylcholine (O-18:1_20:4) levels | CRC | rs11057853 | 12 | 1.25E+08 | C | T | -0.094005 | 0.453524 | 0.016839 | 2.45E-08 | -0.017683 | 0.451049 | 0.017838 | 0.321535 | TRUE | 7.86E-08 | 0.00438 | 31.54955 |
| Phosphatidylcholine (O-18:1_20:4) levels | CRC | rs173539 | 16 | 56954132 | T | C | 0.120675 | 0.282691 | 0.018459 | 6.68E-11 | 0.019012 | 0.283156 | 0.019617 | 0.332446 | TRUE | 2.69E-10 | 0.005906 | 42.6025 |
| Phosphatidylcholine (O-18:1_20:4) levels | CRC | rs174536 | 11 | 61784455 | C | A | -0.283584 | 0.408477 | 0.016741 | 3.74E-63 | -0.072915 | 0.414519 | 0.017942 | 4.83E-05 | TRUE | 6.48E-58 | 0.038863 | 289.9526 |
| Phosphatidylcholine (O-18:1_20:4) levels | CRC | rs1800588 | 15 | 58431476 | T | C | 0.107292 | 0.258046 | 0.01936 | 3.09E-08 | 0.014862 | 0.24873 | 0.020555 | 0.46967 | TRUE | 7.87E-08 | 0.004408 | 31.74952 |
| Phosphatidylcholine (O-18:2_18:1) levels | CRC | rs174564 | 11 | 61820833 | G | A | 0.146557 | 0.409161 | 0.017529 | 7.47E-17 | -0.077736 | 0.414913 | 0.017937 | 1.46E-05 | TRUE | 2.14E-14 | 0.010385 | 70.04732 |
| Phosphatidylethanolamine (18:2_0:0) levels | CRC | rs1260326 | 2 | 27508073 | C | T | -0.114725 | 0.650878 | 0.017763 | 1.12E-10 | 0.02234 | 0.650148 | 0.018596 | 0.229635 | TRUE | 5.32E-10 | 0.005982 | 41.53999 |
| Phosphatidylethanolamine (18:2_0:0) levels | CRC | rs174560 | 11 | 61814292 | C | T | 0.364648 | 0.382915 | 0.01709 | 7.02E-98 | -0.080586 | 0.388646 | 0.018138 | 8.87E-06 | TRUE | 4.41E-91 | 0.062838 | 462.8587 |
| Phosphatidylethanolamine (O-16:1_18:2) levels | CRC | rs174530 | 11 | 61779120 | G | A | 0.148929 | 0.414119 | 0.019284 | 1.33E-14 | -0.073854 | 0.422885 | 0.017886 | 3.64E-05 | TRUE | 1.15E-12 | 0.010763 | 59.05579 |
| Phosphatidylethanolamine (O-18:1_18:2) levels | CRC | rs174547 | 11 | 61803311 | C | T | 0.194339 | 0.407429 | 0.017256 | 3.60E-29 | -0.076212 | 0.413977 | 0.017945 | 2.17E-05 | TRUE | 9.20E-26 | 0.018237 | 127.575 |
| Phosphatidylethanolamine (O-18:1_20:4) levels | CRC | rs174536 | 11 | 61784455 | C | A | -0.251165 | 0.408477 | 0.016818 | 1.09E-49 | -0.072915 | 0.414519 | 0.017942 | 4.83E-05 | TRUE | 4.19E-45 | 0.030485 | 225.451 |
| Phosphatidylethanolamine (O-18:1_20:4) levels | CRC | rs204468 | 19 | 44987378 | C | T | -0.095273 | 0.594995 | 0.017043 | 2.35E-08 | 0.00077 | 0.593866 | 0.018039 | 0.965957 | TRUE | 3.43E-08 | 0.004375 | 31.5042 |
| Phosphatidylethanolamine (O-18:2_18:2) levels | CRC | rs2727270 | 11 | 61835765 | T | C | 0.176894 | 0.2576 | 0.02019 | 2.43E-18 | -0.068042 | 0.269346 | 0.020059 | 0.00069357 | TRUE | 2.70E-16 | 0.011969 | 76.73895 |
| Phosphatidylinositol (18:0_20:3) levels | CRC | rs1168104 | 1 | 62662654 | G | A | 0.151178 | 0.737655 | 0.019359 | 6.66E-15 | -0.012495 | 0.736517 | 0.020026 | 0.532655 | TRUE | 2.42E-14 | 0.008846 | 60.52709 |
| Phosphatidylinositol (18:0_20:3) levels | CRC | rs28456 | 11 | 61822009 | G | A | 0.34925 | 0.383508 | 0.017256 | 1.70E-88 | -0.081239 | 0.389903 | 0.018121 | 7.36E-06 | TRUE | 4.78E-82 | 0.057677 | 415.1096 |
| Phosphatidylinositol (18:0_20:3) levels | CRC | rs6498540 | 16 | 15036737 | G | A | -0.125793 | 0.334003 | 0.018203 | 5.24E-12 | -0.027963 | 0.333744 | 0.018795 | 0.136818 | TRUE | 3.68E-11 | 0.00704 | 48.083 |
| Phosphatidylinositol (18:0_20:3) levels | CRC | rs8736 | 19 | 54173495 | C | T | 0.222428 | 0.594967 | 0.017378 | 4.35E-37 | -0.008012 | 0.605367 | 0.018137 | 0.658685 | TRUE | 3.91E-36 | 0.023845 | 165.6651 |
| Phosphatidylinositol (18:0_20:3) levels | CRC | rs964184 | 11 | 1.17E+08 | C | G | -0.161961 | 0.848991 | 0.02378 | 1.05E-11 | 0.01394 | 0.855576 | 0.025002 | 0.577138 | TRUE | 2.90E-11 | 0.006726 | 45.92462 |
| Sphingomyelin (d34:2) levels | CRC | rs113127305 | 10 | 70837164 | A | G | -0.217065 | 0.049798 | 0.038265 | 1.46E-08 | 0.040535 | 0.04467 | 0.042531 | 0.340554 | TRUE | 4.63E-08 | 0.004459 | 32.12294 |
| Sphingomyelin (d34:2) levels | CRC | rs113722226 | 19 | 11078596 | C | T | -0.186339 | 0.094288 | 0.028124 | 3.70E-11 | -0.015204 | 0.101685 | 0.029552 | 0.606911 | TRUE | 9.82E-11 | 0.00593 | 42.7865 |
| Sphingomyelin (d34:2) levels | CRC | rs116302332 | 4 | 74505174 | T | C | 0.29779 | 0.028116 | 0.050794 | 4.74E-09 | 0.109952 | 0.032989 | 0.049573 | 0.0265546 | TRUE | 4.62E-08 | 0.004846 | 34.92696 |
| Sphingomyelin (d34:2) levels | CRC | rs1532085 | 15 | 58391167 | G | A | -0.109151 | 0.573441 | 0.016744 | 7.57E-11 | -0.004959 | 0.577767 | 0.017873 | 0.781444 | TRUE | 1.56E-10 | 0.005828 | 42.04673 |
| Sphingomyelin (d34:2) levels | CRC | rs174561 | 11 | 61815236 | C | T | -0.169628 | 0.381331 | 0.017171 | 7.26E-23 | -0.076071 | 0.387761 | 0.018144 | 2.76E-05 | TRUE | 7.00E-20 | 0.013576 | 98.71028 |

These are selected and significantly reduced contents. SNPs showing only positive results. Readers may request the nonmodified whole contents by contacting the corresponding authors of the current study: weiguoli1987@163.com (G.W.); Huojiege@jsatcm.com (J. H.)

Table S4.Summary of all SNP-specific information in the replication dataset(Red color represents excluded outliers)

| | | | | | | Harmonization | | Exposure | | | | Outcome | | | | Steiger-test | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Exposure | GWAS Catalog ID | Outcome | SNP | chr | pos | EFFECT ALLELE | OTHER ALLELE | beta.exposu | eaf.exposu | se.exposure | pval.exposure | beta.outcon | eaf.outcom | se.outcome | pval.outcome | steiger_dir | steiger_pval | R2 | F |
| Sterol ester (27:1/18:1) levels | GCST90277245 | CRC | rs11591147 | 1 | 55039974 | T | G | -0.298324 | 0.033215 | 0.046602 | 1.63E-10 | 0.03165 | 0.02147 | 0.029231 | 0.278927 | TRUE | 1.31E-09 | 0.005716 | 41.22924 |
| Sterol ester (27:1/18:1) levels | GCST90277245 | CRC | rs118068660 | 19 | 11079868 | T | C | -0.171924 | 0.094615 | 0.028154 | 1.07E-09 | -0.036794 | 0.1115 | 0.025046 | 0.141818 | TRUE | 1.18E-08 | 0.005064 | 36.50419 |
| Sterol ester (27:1/18:1) levels | GCST90277245 | CRC | rs1800961 | 20 | 44413724 | T | C | -0.21016 | 0.052411 | 0.037228 | 1.71E-08 | -0.070484 | 0.03681 | 0.021734 | 0.00118252 | TRUE | 9.14E-07 | 0.004387 | 31.60251 |
| Sterol ester (27:1/18:1) levels | GCST90277245 | CRC | rs182695896 | 4 | 73947510 | C | A | 0.338302 | 0.025305 | 0.052958 | 1.78E-10 | 0.021062 | 0.01431 | 0.057675 | 0.714974 | TRUE | 5.97E-10 | 0.005646 | 40.72052 |
| Sterol ester (27:1/18:1) levels | GCST90277245 | CRC | rs7412 | 19 | 44908822 | T | C | -0.281493 | 0.053066 | 0.037156 | 4.01E-14 | -0.027034 | 0.06442 | 0.013873 | 0.0513296 | TRUE | 1.82E-12 | 0.007963 | 57.57234 |
| Sterol ester (27:1/18:1) levels | GCST90277245 | CRC | rs74915447 | 4 | 72899760 | A | G | 0.26344 | 0.037786 | 0.044273 | 2.80E-09 | 0.03789 | 0.02658 | 0.023604 | 0.108438 | TRUE | 3.32E-08 | 0.005047 | 36.37747 |
| Sterol ester (27:1/18:3) levels | GCST90277247 | CRC | rs1260326 | 2 | 27508073 | C | T | -0.105379 | 0.650878 | 0.017453 | 1.64E-09 | 0.031365 | 0.5859 | 0.007515 | 3.00E-05 | TRUE | 3.15E-07 | 0.005047 | 36.37915 |
| Sterol ester (27:1/18:3) levels | GCST90277247 | CRC | rs1800961 | 20 | 44413724 | T | C | -0.239553 | 0.052411 | 0.037219 | 1.30E-10 | -0.070484 | 0.03681 | 0.021734 | 0.00118252 | TRUE | 1.32E-08 | 0.0057 | 41.11476 |
| Sterol ester (27:1/18:3) levels | GCST90277247 | CRC | rs182611493 | 19 | 19347579 | G | A | -0.282368 | 0.053801 | 0.037768 | 8.55E-14 | -0.095946 | 0.01329 | 0.044994 | 0.032972 | TRUE | 4.69E-12 | 0.008118 | 58.69704 |
| Sterol ester (27:1/18:3) levels | GCST90277247 | CRC | rs2255531 | 12 | 1.21E+08 | A | G | 0.093397 | 0.394936 | 0.017025 | 4.25E-08 | 0.021774 | 0.3681 | 0.007642 | 0.00438008 | TRUE | 1.37E-06 | 0.004169 | 30.02482 |
| Sterol ester (27:1/20:3) levels | GCST90277249 | CRC | rs1135999 | 16 | 15038105 | G | A | -0.22595 | 0.315252 | 0.017821 | 1.90E-36 | -0.021152 | 0.3037 | 0.008037 | 0.00849732 | TRUE | 1.39E-32 | 0.022042 | 161.5777 |
| Sterol ester (27:1/20:3) levels | GCST90277249 | CRC | rs1800961 | 20 | 44413724 | T | C | -0.23874 | 0.052411 | 0.037247 | 1.55E-10 | -0.070484 | 0.03681 | 0.021734 | 0.00118252 | TRUE | 1.54E-08 | 0.005661 | 40.81749 |
| Sterol ester (27:1/20:3) levels | GCST90277249 | CRC | rs187429064 | 19 | 19269704 | G | A | -0.235892 | 0.053531 | 0.037864 | 4.92E-10 | -0.056472 | 0.01329 | 0.040192 | 0.160005 | TRUE | 5.34E-09 | 0.005639 | 40.65234 |
| Sterol ester (27:1/20:3) levels | GCST90277249 | CRC | rs2727271 | 11 | 61835886 | T | A | -0.170476 | 0.257859 | 0.019021 | 3.98E-19 | -0.056187 | 0.1462 | 0.011409 | 8.44E-07 | TRUE | 4.97E-15 | 0.011123 | 80.63833 |
| Sterol ester (27:1/20:3) levels | GCST90277249 | CRC | rs56374730 | 16 | 15773795 | G | T | 0.11198 | 0.296257 | 0.018371 | 1.15E-09 | 0.002168 | 0.2618 | 0.008449 | 0.79749 | TRUE | 3.10E-09 | 0.005229 | 37.68157 |
| Sterol ester (27:1/20:4) levels | GCST90277250 | CRC | rs113248417 | 11 | 62059462 | G | A | -0.267977 | 0.03689 | 0.044942 | 2.59E-09 | -0.025174 | 0.02761 | 0.02473 | 0.308696 | TRUE | 1.61E-08 | 0.005103 | 36.78508 |
| Sterol ester (27:1/20:4) levels | GCST90277250 | CRC | rs1135999 | 16 | 15038105 | G | A | -0.101484 | 0.315252 | 0.017797 | 1.23E-08 | -0.021152 | 0.3037 | 0.008037 | 0.00849732 | TRUE | 3.72E-07 | 0.004446 | 32.0324 |
| Sterol ester (27:1/20:4) levels | GCST90277250 | CRC | rs11591147 | 1 | 55039974 | T | G | -0.297311 | 0.033215 | 0.046189 | 1.30E-10 | 0.03165 | 0.02147 | 0.029231 | 0.278927 | TRUE | 1.06E-09 | 0.005677 | 40.94812 |
| Sterol ester (27:1/20:4) levels | GCST90277250 | CRC | rs182695896 | 4 | 73947510 | C | A | 0.295609 | 0.025305 | 0.052463 | 1.82E-08 | 0.021062 | 0.01431 | 0.057675 | 0.714974 | TRUE | 4.93E-08 | 0.004311 | 31.04966 |
| Sterol ester (27:1/20:4) levels | GCST90277250 | CRC | rs187429064 | 19 | 19269704 | G | A | -0.254328 | 0.053531 | 0.037458 | 1.21E-11 | -0.056472 | 0.01329 | 0.040192 | 0.160005 | TRUE | 1.73E-10 | 0.006554 | 47.31832 |
| Sterol ester (27:1/20:4) levels | GCST90277250 | CRC | rs2229738 | 11 | 68794860 | T | C | -0.15287 | 0.155986 | 0.023409 | 7.01E-11 | -0.040976 | 0.08691 | 0.015618 | 0.00870106 | TRUE | 3.75E-09 | 0.006153 | 44.40488 |
| Sterol ester (27:1/20:4) levels | GCST90277250 | CRC | rs3741252 | 11 | 61744026 | T | C | 0.212004 | 0.133653 | 0.024519 | 6.46E-18 | -0.006404 | 0.09714 | 0.016193 | 0.692477 | TRUE | 4.75E-17 | 0.010409 | 75.43502 |
| Sterol ester (27:1/20:4) levels | GCST90277250 | CRC | rs4382917 | 11 | 62454004 | A | G | 0.146345 | 0.255777 | 0.019705 | 1.24E-13 | 0.016391 | 0.2464 | 0.009321 | 0.0786528 | TRUE | 3.96E-12 | 0.008154 | 58.95847 |
| Sterol ester (27:1/20:4) levels | GCST90277250 | CRC | rs7412 | 19 | 44908822 | T | C | -0.309996 | 0.053066 | 0.036791 | 4.29E-17 | -0.027034 | 0.06442 | 0.013873 | 0.0513296 | TRUE | 3.33E-15 | 0.009658 | 69.94122 |
| Sterol ester (27:1/20:5) levels | GCST90277251 | CRC | rs508049 | 11 | 68908029 | T | C | -0.15839 | 0.097967 | 0.028652 | 3.35E-08 | -0.022576 | 0.06748 | 0.0172 | 0.189335 | TRUE | 2.38E-07 | 0.004434 | 31.94172 |
| Sterol ester (27:1/20:5) levels | GCST90277251 | CRC | rs7936002 | 11 | 62451557 | G | A | 0.109709 | 0.257197 | 0.019671 | 2.53E-08 | 0.019371 | 0.2474 | 0.00923 | 0.0358416 | TRUE | 4.12E-07 | 0.004599 | 33.13571 |
| Phosphatidylethanolamine (18:0_0:0) levels | GCST90277269 | CRC | rs1532085 | 15 | 58391167 | G | A | -0.101106 | 0.573441 | 0.017974 | 1.93E-08 | -0.006364 | 0.6319 | 0.007563 | 0.400141 | TRUE | 7.63E-08 | 0.005001 | 31.44313 |
| Phosphatidylethanolamine (18:0_0:0) levels | GCST90277269 | CRC | rs7529794 | 1 | 39937698 | T | G | 0.150648 | 0.249805 | 0.020699 | 3.79E-13 | 0.016317 | 0.2352 | 0.008436 | 0.0531005 | TRUE | 1.06E-11 | 0.008506 | 53.67088 |
| Phosphatidylethanolamine (18:2_0:0) levels | GCST90277271 | CRC | rs1260326 | 2 | 27508073 | C | T | -0.114725 | 0.650878 | 0.017763 | 1.12E-10 | 0.031365 | 0.5859 | 0.007515 | 3.00E-05 | TRUE | 2.94E-08 | 0.005982 | 41.53999 |
| Phosphatidylcholine (14:0_18:1) levels | GCST90277273 | CRC | rs1260326 | 2 | 27508073 | C | T | -0.105277 | 0.650878 | 0.017615 | 2.39E-09 | 0.031365 | 0.5859 | 0.007515 | 3.00E-05 | TRUE | 4.16E-07 | 0.005037 | 35.75153 |
| Phosphatidylcholine (14:0_18:2) levels | GCST90277274 | CRC | rs4665972 | 2 | 27375230 | C | T | -0.114678 | 0.620291 | 0.017513 | 6.24E-11 | 0.032704 | 0.5818 | 0.007646 | 1.89E-05 | TRUE | 1.96E-08 | 0.006195 | 42.78708 |
| Phosphatidylcholine (16:0_16:0) levels | GCST90277277 | CRC | rs17231506 | 16 | 56960616 | T | C | 0.142323 | 0.27829 | 0.018485 | 1.54E-14 | 0.013557 | 0.2955 | 0.007912 | 0.0866071 | TRUE | 5.46E-13 | 0.008137 | 58.83407 |
| Phosphatidylcholine (16:0_16:0) levels | GCST90277277 | CRC | rs261290 | 15 | 58386521 | C | T | -0.138985 | 0.612243 | 0.016905 | 2.37E-16 | -0.004702 | 0.6748 | 0.007805 | 0.546855 | TRUE | 2.06E-15 | 0.009172 | 66.38825 |
| Phosphatidylcholine (16:0_16:0) levels | GCST90277277 | CRC | rs3134950 | 6 | 32159700 | A | C | 0.096672 | 0.583482 | 0.016848 | 9.96E-09 | 0.02137 | 0.6268 | 0.0077 | 0.00551414 | TRUE | 3.57E-07 | 0.004542 | 32.72737 |
| Phosphatidylcholine (16:0_16:0) levels | GCST90277277 | CRC | rs73015021 | 19 | 11082239 | G | A | -0.158246 | 0.092126 | 0.028665 | 3.49E-08 | -0.025822 | 0.1104 | 0.011493 | 0.024654 | TRUE | 6.38E-07 | 0.004189 | 30.16948 |
| Phosphatidylcholine (16:0_16:1) levels | GCST90277278 | CRC | rs1260326 | 2 | 27508073 | C | T | -0.108205 | 0.650878 | 0.017465 | 6.12E-10 | 0.031365 | 0.5859 | 0.007515 | 3.00E-05 | TRUE | 1.37E-07 | 0.005321 | 38.35639 |
| Phosphatidylcholine (16:0_18:0) levels | GCST90277280 | CRC | rs174601 | 11 | 61855668 | T | C | 0.146355 | 0.419025 | 0.01691 | 6.00E-18 | -0.041801 | 0.3947 | 0.007689 | 5.42E-08 | TRUE | 1.08E-13 | 0.010429 | 75.37426 |
| Phosphatidylcholine (16:1_18:0) levels | GCST90277292 | CRC | rs1260326 | 2 | 27508073 | C | T | -0.107928 | 0.650878 | 0.018284 | 3.75E-09 | 0.031365 | 0.5859 | 0.007515 | 3.00E-05 | TRUE | 4.97E-07 | 0.005294 | 34.71052 |
| Phosphatidylcholine (18:0_20:5) levels | GCST90277305 | CRC | rs7936002 | 11 | 62451557 | G | A | 0.110547 | 0.257197 | 0.019742 | 2.22E-08 | 0.019371 | 0.2474 | 0.00923 | 0.0358416 | TRUE | 3.63E-07 | 0.004669 | 33.39759 |
| Phosphatidylcholine (18:0_22:5) levels | GCST90277306 | CRC | rs1260326 | 2 | 27508073 | C | T | -0.101199 | 0.650878 | 0.017903 | 1.64E-08 | 0.031365 | 0.5859 | 0.007515 | 3.00E-05 | TRUE | 1.91E-06 | 0.004654 | 31.81162 |
| Phosphatidylcholine (18:1_18:1) levels | GCST90277308 | CRC | rs10889352 | 1 | 62633352 | C | T | -0.112327 | 0.262366 | 0.018843 | 2.61E-09 | -0.012324 | 0.2986 | 0.007825 | 0.115259 | TRUE | 3.02E-08 | 0.004884 | 35.19761 |
| Phosphatidylcholine (18:1_18:1) levels | GCST90277308 | CRC | rs1532085 | 15 | 58391167 | G | A | -0.109594 | 0.573441 | 0.016805 | 7.42E-11 | -0.006364 | 0.6319 | 0.007563 | 0.400141 | TRUE | 4.67E-10 | 0.005876 | 42.39075 |
| Phosphatidylcholine (18:1_18:1) levels | GCST90277308 | CRC | rs17231506 | 16 | 56960616 | T | C | 0.10933 | 0.27829 | 0.018562 | 4.04E-09 | 0.013557 | 0.2955 | 0.007912 | 0.0866071 | TRUE | 5.21E-08 | 0.004801 | 34.60187 |
| Phosphatidylcholine (O-16:1_16:0) levels | GCST90277325 | CRC | rs1077989 | 14 | 67509105 | C | A | -0.182775 | 0.467505 | 0.018317 | 2.91E-23 | -0.021272 | 0.4468 | 0.008039 | 0.00814285 | TRUE | 1.03E-20 | 0.016633 | 99.21828 |
| Phosphatidylcholine (O-16:1_20:4) levels | GCST90277330 | CRC | rs1077989 | 14 | 67509105 | C | A | -0.191986 | 0.467505 | 0.01805 | 3.43E-26 | -0.021272 | 0.4468 | 0.008039 | 0.00814285 | TRUE | 2.16E-23 | 0.018351 | 112.5972 |
| Phosphatidylcholine (O-16:1_20:4) levels | GCST90277330 | CRC | rs2043085 | 15 | 58388755 | C | T | -0.09993 | 0.576127 | 0.018277 | 4.75E-08 | -0.004294 | 0.6288 | 0.007655 | 0.574846 | TRUE | 1.32E-07 | 0.004877 | 29.5194 |
| Phosphatidylcholine (O-18:1_18:2) levels | GCST90277338 | CRC | rs174551 | 11 | 61806212 | C | T | 0.229198 | 0.406164 | 0.017393 | 3.59E-39 | -0.047124 | 0.3528 | 0.014787 | 0.00143841 | TRUE | 9.80E-35 | 0.025341 | 174.6134 |
| Phosphatidylcholine (O-18:1_20:3) levels | GCST90277339 | CRC | rs6498540 | 16 | 15036737 | G | A | -0.109283 | 0.334003 | 0.018179 | 1.93E-09 | -0.021866 | 0.3098 | 0.008027 | 0.00644843 | TRUE | 7.24E-08 | 0.005313 | 36.50451 |
| Phosphatidylcholine (O-18:2_20:4) levels | GCST90277344 | CRC | rs1980615 | 14 | 67491655 | C | A | -0.103279 | 0.455123 | 0.018056 | 1.12E-08 | -0.024592 | 0.4141 | 0.008084 | 0.00235018 | TRUE | 3.80E-07 | 0.00529 | 32.5755 |
| ıosphatidylethanolamine (O-18:2_18:2) leve | GCST90277356 | CRC | rs2727270 | 11 | 61835765 | T | C | 0.176894 | 0.2576 | 0.02019 | 2.43E-18 | -0.056003 | 0.1462 | 0.011402 | 9.02E-07 | TRUE | 1.31E-14 | 0.011969 | 76.73895 |
| Phosphatidylinositol (16:0_20:4) levels | GCST90277360 | CRC | rs1260326 | 2 | 27508073 | C | T | -0.109504 | 0.650878 | 0.019913 | 3.99E-08 | 0.031365 | 0.5859 | 0.007515 | 3.00E-05 | TRUE | 2.54E-06 | 0.00545 | 30.23034 |
| Phosphatidylinositol (16:0_20:4) levels | GCST90277360 | CRC | rs9653945 | 3 | 1.43E+08 | A | G | -0.110791 | 0.364111 | 0.019903 | 2.72E-08 | 0.014109 | 0.3916 | 0.007762 | 0.0691052 | TRUE | 2.33E-07 | 0.005684 | 31.53789 |
| Phosphatidylinositol (18:0_20:3) levels | GCST90277363 | CRC | rs1168104 | 1 | 62662654 | G | A | 0.151178 | 0.737655 | 0.019359 | 6.66E-15 | 0.01127 | 0.6963 | 0.007816 | 0.149329 | TRUE | 1.50E-13 | 0.008846 | 60.52709 |
| Phosphatidylinositol (18:0_20:3) levels | GCST90277363 | CRC | rs6498540 | 16 | 15036737 | G | A | -0.125793 | 0.334003 | 0.018203 | 5.24E-12 | -0.021866 | 0.3098 | 0.008027 | 0.00644843 | TRUE | 3.66E-10 | 0.00704 | 48.083 |
| Phosphatidylinositol (18:0_20:3) levels | GCST90277363 | CRC | rs8736 | 19 | 54173495 | C | T | 0.222428 | 0.594967 | 0.017378 | 4.35E-37 | 0.011349 | 0.5644 | 0.007489 | 0.129657 | TRUE | 1.99E-34 | 0.023845 | 165.6651 |
| Phosphatidylinositol (18:0_20:3) levels | GCST90277363 | CRC | rs964184 | 11 | 1.17E+08 | C | G | -0.161961 | 0.848991 | 0.02378 | 1.05E-11 | -0.001871 | 0.8364 | 0.010616 | 0.860073 | TRUE | 2.96E-11 | 0.006726 | 45.92462 |
| Phosphatidylinositol (18:0_20:4) levels | GCST90277364 | CRC | rs1168104 | 1 | 62662654 | G | A | 0.193608 | 0.737655 | 0.018705 | 6.30E-25 | 0.01127 | 0.6963 | 0.007816 | 0.149329 | TRUE | 6.68E-23 | 0.014508 | 105.582 |
| Phosphatidylinositol (18:0_20:4) levels | GCST90277364 | CRC | rs1260326 | 2 | 27508073 | C | T | -0.096388 | 0.650878 | 0.017386 | 3.06E-08 | 0.031365 | 0.5859 | 0.007515 | 3.00E-05 | TRUE | 3.64E-06 | 0.004222 | 30.411 |
| Phosphatidylinositol (18:0_20:4) levels | GCST90277364 | CRC | rs17699030 | 19 | 11220266 | G | A | -0.23075 | 0.046946 | 0.039296 | 4.48E-09 | -0.017314 | 0.03885 | 0.020008 | 0.386826 | TRUE | 2.27E-08 | 0.004765 | 34.33548 |
| Phosphatidylinositol (18:0_20:4) levels | GCST90277364 | CRC | rs56339947 | 18 | 49628409 | C | T | 0.18819 | 0.114435 | 0.026504 | 1.36E-12 | 0.017425 | 0.08691 | 0.014789 | 0.238709 | TRUE | 1.68E-11 | 0.007178 | 51.85269 |
| Phosphatidylinositol (18:0_20:4) levels | GCST90277364 | CRC | rs8736 | 19 | 54173495 | C | T | 0.275272 | 0.594967 | 0.016748 | 1.26E-59 | 0.011349 | 0.5644 | 0.007489 | 0.129657 | TRUE | 8.74E-56 | 0.036521 | 271.8537 |
| Phosphatidylinositol (18:0_20:4) levels | GCST90277364 | CRC | rs964184 | 11 | 1.17E+08 | C | G | -0.267072 | 0.848991 | 0.022979 | 5.97E-31 | -0.001871 | 0.8364 | 0.010616 | 0.860073 | TRUE | 8.91E-30 | 0.018289 | 133.6132 |
| Sphingomyelin (d42:2) levels | GCST90277378 | CRC | rs112585713 | 4 | 72876701 | A | G | 0.28818 | 0.03164 | 0.047895 | 1.86E-09 | 0.046229 | 0.0184 | 0.029435 | 0.116296 | TRUE | 2.20E-08 | 0.005089 | 36.68476 |
| Sphingomyelin (d42:2) levels | GCST90277378 | CRC | rs114483871 | 4 | 73124451 | T | C | 0.279372 | 0.038097 | 0.044809 | 4.78E-10 | 0.014991 | 0.02454 | 0.020379 | 0.461973 | TRUE | 2.37E-09 | 0.00572 | 41.26203 |
| Sphingomyelin (d42:2) levels | GCST90277378 | CRC | rs11591147 | 1 | 55039974 | T | G | -0.361828 | 0.033215 | 0.04651 | 8.29E-15 | 0.03165 | 0.02147 | 0.029231 | 0.278927 | TRUE | 1.23E-13 | 0.008408 | 60.81503 |
| Sphingomyelin (d42:2) levels | GCST90277378 | CRC | rs118068660 | 19 | 11079868 | T | C | -0.21909 | 0.094615 | 0.02807 | 6.77E-15 | -0.036794 | 0.1115 | 0.025046 | 0.141818 | TRUE | 1.79E-13 | 0.008224 | 59.46976 |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sphingomyelin (d42:2) levels | GCST90277378 | CRC | rs146331166 | 17 | 5464230 | C | T | -0.218616 | 0.059584 | 0.034523 | 2.56E-10 | -0.025819 | 0.02147 | 0.027391 | 0.345867 | TRUE | 1.68E-09 | 0.005356 | 38.62041 |
| Sphingomyelin (d42:2) levels | GCST90277378 | CRC | rs17145750 | 7 | 73612048 | T | C | 0.132228 | 0.140658 | 0.023854 | 3.07E-08 | 0.01722 | 0.1472 | 0.010134 | 0.0892651 | TRUE | 3.27E-07 | 0.004227 | 30.44298 |
| Sphingomyelin (d42:2) levels | GCST90277378 | CRC | rs182695896 | 4 | 73947510 | C | A | 0.38203 | 0.025305 | 0.052847 | 5.36E-13 | 0.021062 | 0.01431 | 0.057675 | 0.714974 | TRUE | 2.32E-12 | 0.007199 | 52.00897 |
| Sphingomyelin (d42:2) levels | GCST90277378 | CRC | rs7412 | 19 | 44908822 | T | C | -0.210972 | 0.053066 | 0.037185 | 1.45E-08 | -0.027034 | 0.06442 | 0.013873 | 0.0513296 | TRUE | 2.14E-07 | 0.004473 | 32.22575 |
| Sphingomyelin (d42:2) levels | GCST90277378 | CRC | rs75679663 | 17 | 4764677 | A | C | -0.537754 | 0.025788 | 0.05341 | 1.09E-23 | -0.015069 | 0.01636 | 0.03689 | 0.68292 | TRUE | 1.42E-22 | 0.01453 | 105.7467 |
| Triacylglycerol (46:2) levels | GCST90277380 | CRC | rs1260326 | 2 | 27508073 | C | T | -0.113769 | 0.650878 | 0.020003 | 1.35E-08 | 0.031365 | 0.5859 | 0.007515 | 3.00E-05 | TRUE | 9.81E-07 | 0.005882 | 32.22512 |

These are selected and significantly reduced contents. SNPs showing only positive results. Readers may request the nonmodified whole contents by contacting the corresponding authors of the current study: weiguoli1987@163.com (G.W.); Huojiege@jsatcm.com (J. H.)

Table S5. Summary of positive results in both datasets

| exposure | outcome | method | nsnp | b | se | pval | or | or_lci95 | or_uci95 |
|---|---|---|---|---|---|---|---|---|---|
| **Discovery Dataset** | | | | | | | | | |
| Sterol ester (27:1/20:4) levels | CRC | IVW | 10 | 0.112198 | 0.024322 | 3.97E-06 | 1.118734 | 1.066655 | 1.173356 |
| Sterol ester (27:1/20:5) levels | CRC | IVW | 3 | 0.19416 | 0.041611 | 3.07E-06 | 1.214291 | 1.119187 | 1.317476 |
| Phosphatidylcholine (20:4_0:0) levels | CRC | IVW | 4 | 0.137572 | 0.032207 | 1.94E-05 | 1.147485 | 1.077288 | 1.222256 |
| Phosphatidylethanolamine (18:2_0:0) levels | CRC | IVW | 2 | -0.218736 | 0.047552 | 4.23E-06 | 0.803534 | 0.732027 | 0.882026 |
| Phosphatidylcholine (14:0_18:2) levels | CRC | IVW | 3 | -0.292757 | 0.115681 | 0.011383 | 0.746204 | 0.594823 | 0.936111 |
| Phosphatidylcholine (15:0_18:2) levels | CRC | IVW | 6 | -0.151126 | 0.059576 | 0.01119 | 0.859739 | 0.764988 | 0.966226 |
| Phosphatidylcholine (16:0_18:0) levels | CRC | Wald ratio | 1 | -0.491969 | 0.122337 | 5.78E-05 | 0.611421 | 0.481067 | 0.777098 |
| Phosphatidylcholine (16:0_18:2) levels | CRC | IVW | 7 | -0.127123 | 0.056015 | 0.023241 | 0.880625 | 0.789061 | 0.982815 |
| Phosphatidylcholine (16:0_20:1) levels | CRC | Wald ratio | 1 | -0.658609 | 0.156282 | 2.51E-05 | 0.517571 | 0.381013 | 0.703071 |
| Phosphatidylcholine (16:0_20:2) levels | CRC | IVW | 6 | -0.195421 | 0.06242 | 0.001744 | 0.822488 | 0.727775 | 0.929528 |
| Phosphatidylcholine (16:0_20:4) levels | CRC | IVW | 4 | 0.12584 | 0.028774 | 1.22E-05 | 1.134101 | 1.07191 | 1.1999 |
| Phosphatidylcholine (16:0_20:5) levels | CRC | Wald ratio | 1 | 0.192537 | 0.048172 | 6.42E-05 | 1.212322 | 1.103095 | 1.332364 |
| Phosphatidylcholine (16:0_22:4) levels | CRC | IVW | 2 | 0.271775 | 0.058483 | 3.37E-06 | 1.312292 | 1.170168 | 1.471677 |
| Phosphatidylcholine (16:0_22:5) levels | CRC | IVW | 4 | 0.166546 | 0.039739 | 2.78E-05 | 1.181218 | 1.092707 | 1.276898 |
| Phosphatidylcholine (16:0_22:6) levels | CRC | Wald ratio | 1 | 0.619762 | 0.143265 | 1.52E-05 | 1.858486 | 1.403491 | 2.460986 |
| Phosphatidylcholine (16:1_18:1) levels | CRC | IVW | 5 | -0.263559 | 0.093872 | 0.00499 | 0.768313 | 0.639194 | 0.923513 |
| Phosphatidylcholine (16:1_18:2) levels | CRC | IVW | 8 | -0.146295 | 0.044865 | 0.001111 | 0.863903 | 0.791179 | 0.943312 |
| Phosphatidylcholine (16:1_20:4) levels | CRC | Wald ratio | 1 | 0.227918 | 0.054736 | 3.13E-05 | 1.255982 | 1.128214 | 1.39822 |
| Phosphatidylcholine (17:0_18:2) levels | CRC | IVW | 3 | -0.217182 | 0.099897 | 0.029701 | 0.804783 | 0.661675 | 0.978843 |
| Phosphatidylcholine (17:0_20:4) levels | CRC | IVW | 6 | 0.121906 | 0.037574 | 0.001177 | 1.129648 | 1.049446 | 1.21598 |
| Phosphatidylcholine (18:0_20:2) levels | CRC | Wald ratio | 1 | -0.270001 | 0.063576 | 2.17E-05 | 0.763379 | 0.673943 | 0.864683 |
| Phosphatidylcholine (18:0_20:4) levels | CRC | IVW | 7 | 0.103884 | 0.032103 | 0.001213 | 1.109472 | 1.041812 | 1.181525 |
| Phosphatidylcholine (18:0_20:5) levels | CRC | IVW | 2 | 0.180818 | 0.041682 | 1.44E-05 | 1.198197 | 1.104201 | 1.300195 |
| Phosphatidylcholine (18:1_18:2) levels | CRC | IVW | 5 | -0.132653 | 0.06438 | 0.039354 | 0.875769 | 0.771948 | 0.993553 |
| Phosphatidylcholine (18:1_20:2) levels | CRC | IVW | 3 | -0.183896 | 0.038795 | 2.13E-06 | 0.832022 | 0.771103 | 0.897755 |
| Phosphatidylcholine (18:1_20:4) levels | CRC | IVW | 7 | 0.124063 | 0.031718 | 9.17E-05 | 1.132087 | 1.063852 | 1.2047 |
| Phosphatidylcholine (18:2_20:3) levels | CRC | Wald ratio | 1 | -0.389877 | 0.086505 | 6.57E-06 | 0.67714 | 0.571537 | 0.802256 |
| Phosphatidylcholine (O-16:0_20:4) levels | CRC | IVW | 3 | 0.170552 | 0.058949 | 0.003813 | 1.18596 | 1.056554 | 1.331215 |
| Phosphatidylcholine (O-16:0_22:5) levels | CRC | Wald ratio | 1 | 0.486179 | 0.107872 | 6.57E-06 | 1.626091 | 1.316202 | 2.008942 |
| Phosphatidylcholine (O-18:0_20:4) levels | CRC | IVW | 2 | 0.229877 | 0.055334 | 3.26E-05 | 1.258445 | 1.129102 | 1.402604 |
| Phosphatidylcholine (O-18:1_18:2) levels | CRC | Wald ratio | 1 | -0.324436 | 0.078332 | 3.45E-05 | 0.722935 | 0.620043 | 0.842902 |
| Phosphatidylcholine (O-18:1_20:4) levels | CRC | IVW | 4 | 0.2311 | 0.05402 | 1.89E-05 | 1.259985 | 1.133397 | 1.400711 |
| Phosphatidylcholine (O-18:2_18:1) levels | CRC | Wald ratio | 1 | -0.530418 | 0.122387 | 1.46E-05 | 0.588359 | 0.462876 | 0.74786 |
| Phosphatidylethanolamine (O-16:1_18:2) levels | CRC | Wald ratio | 1 | -0.495903 | 0.120097 | 3.64E-05 | 0.60902 | 0.481286 | 0.770656 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Phosphatidylethanolamine (O-18:1_18:2) levels | CRC | Wald ratio | 1 | -0.392158 | 0.09234 | 2.17E-05 | 0.675598 | 0.563751 | 0.809635 |
| Phosphatidylethanolamine (O-18:1_20:4) levels | CRC | IVW | 2 | 0.253125 | 0.098549 | 0.010214 | 1.288045 | 1.061803 | 1.562492 |
| Phosphatidylethanolamine (O-18:2_18:2) levels | CRC | Wald ratio | 1 | -0.384647 | 0.113394 | 0.000694 | 0.680691 | 0.545038 | 0.850107 |
| Phosphatidylinositol (18:0_20:3) levels | CRC | IVW | 5 | -0.135495 | 0.06424 | 0.034928 | 0.873283 | 0.769968 | 0.990461 |
| Sphingomyelin (d34:2) levels | CRC | IVW | 5 | 0.232115 | 0.112835 | 0.039675 | 1.261265 | 1.011019 | 1.573452 |
| **Replication Dataset** | | | | | | | | | |
| Sterol ester (27:1/18:1) levels | CRC | IVW | 6 | 0.110356 | 0.050562 | 0.029067 | 1.116675 | 1.011317 | 1.233009 |
| Sterol ester (27:1/18:3) levels | CRC | Wald ratio | 1 | 0.33979 | 0.159344 | 0.032972 | 1.404652 | 1.027856 | 1.919576 |
| Sterol ester (27:1/20:3) levels | CRC | IVW | 5 | 0.144932 | 0.053685 | 0.00694 | 1.155961 | 1.040509 | 1.284223 |
| Sterol ester (27:1/20:4) levels | CRC | IVW | 9 | 0.092943 | 0.032799 | 0.0046 | 1.097399 | 1.029073 | 1.170263 |
| Sterol ester (27:1/20:5) levels | CRC | IVW | 2 | 0.163804 | 0.066508 | 0.013781 | 1.177983 | 1.034015 | 1.341997 |
| Phosphatidylethanolamine (18:0_0:0) levels | CRC | IVW | 2 | 0.092015 | 0.04483 | 0.040117 | 1.096382 | 1.004157 | 1.197076 |
| Phosphatidylethanolamine (18:2_0:0) levels | CRC | Wald ratio | 1 | -0.273396 | 0.065505 | 3.00E-05 | 0.760792 | 0.669124 | 0.865017 |
| Phosphatidylcholine (14:0_18:1) levels | CRC | Wald ratio | 1 | -0.297931 | 0.071384 | 3.00E-05 | 0.742352 | 0.645427 | 0.853834 |
| Phosphatidylcholine (14:0_18:2) levels | CRC | Wald ratio | 1 | -0.285182 | 0.066671 | 1.89E-05 | 0.751877 | 0.659774 | 0.856838 |
| Phosphatidylcholine (16:0_16:0) levels | CRC | IVW | 4 | 0.108648 | 0.038479 | 0.004749 | 1.11477 | 1.033788 | 1.202096 |
| Phosphatidylcholine (16:0_16:1) levels | CRC | Wald ratio | 1 | -0.289869 | 0.069452 | 3.00E-05 | 0.748361 | 0.653119 | 0.857492 |
| Phosphatidylcholine (16:0_18:0) levels | CRC | Wald ratio | 1 | -0.285616 | 0.052533 | 5.42E-08 | 0.751551 | 0.678018 | 0.833059 |
| Phosphatidylcholine (16:1_18:0) levels | CRC | Wald ratio | 1 | -0.290613 | 0.06963 | 3.00E-05 | 0.747805 | 0.652406 | 0.857154 |
| Phosphatidylcholine (18:0_20:5) levels | CRC | Wald ratio | 1 | 0.17523 | 0.083494 | 0.035841 | 1.191521 | 1.01165 | 1.403373 |
| Phosphatidylcholine (18:0_22:5) levels | CRC | Wald ratio | 1 | -0.309937 | 0.07426 | 3.00E-05 | 0.733493 | 0.634139 | 0.848414 |
| Phosphatidylcholine (18:1_18:1) levels | CRC | IVW | 3 | 0.096344 | 0.040589 | 0.017613 | 1.101138 | 1.016931 | 1.192317 |
| Phosphatidylcholine (O-16:1_16:0) levels | CRC | Wald ratio | 1 | 0.116384 | 0.043983 | 0.008143 | 1.123427 | 1.030636 | 1.224572 |
| Phosphatidylcholine (O-16:1_20:4) levels | CRC | IVW | 2 | 0.095197 | 0.036743 | 0.009572 | 1.099876 | 1.023452 | 1.182006 |
| Phosphatidylcholine (O-18:1_18:2) levels | CRC | Wald ratio | 1 | -0.205603 | 0.064517 | 0.001438 | 0.814156 | 0.717447 | 0.923901 |
| Phosphatidylcholine (O-18:1_20:3) levels | CRC | Wald ratio | 1 | 0.200088 | 0.073452 | 0.006449 | 1.22151 | 1.057726 | 1.410655 |
| Phosphatidylcholine (O-18:2_20:4) levels | CRC | Wald ratio | 1 | 0.238113 | 0.078275 | 0.00235 | 1.268853 | 1.088384 | 1.479247 |
| Phosphatidylethanolamine (O-18:2_18:2) levels | CRC | Wald ratio | 1 | -0.316593 | 0.064454 | 9.02E-07 | 0.728627 | 0.642156 | 0.826742 |
| Phosphatidylinositol (16:0_20:4) levels | CRC | IVW | 2 | -0.208526 | 0.079526 | 0.008739 | 0.81178 | 0.694615 | 0.948708 |
| Phosphatidylinositol (18:0_20:3) levels | CRC | IVW | 4 | 0.068187 | 0.026887 | 0.011212 | 1.070566 | 1.015608 | 1.128497 |
| Phosphatidylinositol (18:0_20:4) levels | CRC | IVW | 5 | 0.041773 | 0.018593 | 0.024661 | 1.042658 | 1.005344 | 1.081357 |
| Sphingomyelin (d42:2) levels | CRC | IVW | 9 | 0.074983 | 0.028454 | 0.008408 | 1.077866 | 1.019399 | 1.139687 |
| Triacylglycerol (46:2) levels | CRC | Wald ratio | 1 | -0.275693 | 0.066056 | 3.00E-05 | 0.759046 | 0.666869 | 0.863964 |

**Table. S6** Summary of meta-analysis results for replication and discovery datasets(Red represents the discovery of significant causal evidence in the dataset)

| Phenotype | Discovery dataset | | Replication dataset | | Meta-analysis | | | | Whether evidence of causation is established | |
|---|---|---|---|---|---|---|---|---|---|---|
| | $OR_{IVW/Wald\ ratio}$(95%CI) | Pval | $OR_{IVW/Wald\ ratio}$(95%CI) | Pval | $I^2$(%) | Model | OR (95% CI) | Pval | | |
| Sterol ester (27:1/20:4) levels | 1.119 (1.067, 1.173) | 3.97E-06 | 1.097 (1.029, 1.170) | 0.0046 | 0 | Fixed | 1.111 (1.070, 1.154) | 5.88E-08 | YES | Significant |
| Sterol ester (27:1/20:5) levels | 1.214 (1.119, 1.317) | 3.07E-06 | 1.178 (1.034, 1.342) | 0.01378 | 0 | Fixed | 1.204 (1.123, 1.290) | 1.42E-07 | YES | Significant |
| Phosphatidylcholine (20:4_0:0) levels | 1.147 (1.077, 1.222) | 1.94E-05 | 1.084 (0.976, 1.203) | 0.13179 | 0 | Fixed | 1.130 (1.070, 1.193) | 9.64E-06 | YES | Significant |
| Phosphatidylcholine (14:0_18:2) levels | 0.746 (0.595, 0.936) | 0.011 | 0.752 (0.660, 0.857) | 1.89E-05 | 0 | Fixed | 0.750 (0.670, 0.840) | 6.62E-07 | YES | Suggestive |
| Phosphatidylcholine (15:0_18:2) levels | 0.860 (0.765, 0.966) | 0.01119 | 1.025 (0.931, 1.128) | 0.6126 | 81 | Random | 0.942 (0.793, 1.119) | 0.495 | NO | exclude |
| Phosphatidylcholine (16:0_18:0) levels | 0.611 (0.481, 0.777) | 5.78E-05 | 0.752 (0.678, 0.833) | 5.42E-08 | 59 | Random | 0.698 (0.574, 0.848) | 3.06E-04 | YES | Significant |
| Phosphatidylcholine (16:0_18:2) levels | 0.881 (0.789, 0.983) | 0.02324 | 1.017 (0.942, 1.097) | 0.66912 | 77 | Random | 0.952 (0.827, 1.095) | 0.491 | NO | exclude |
| Phosphatidylcholine (16:0_20:1) levels | 0.518 (0.381, 0.703) | 2.51E-05 | NA | NA | NA | NA | NA | NA | YES | Suggestive |
| Phosphatidylcholine (16:0_20:2) levels | 0.822 (0.728, 0.930) | 0.00174 | 0.989 (0.916, 1.068) | 0.78657 | 84 | Random | 0.907 (0.757, 1.087) | 0.292 | NO | exclude |
| Phosphatidylcholine (16:0_20:4) levels | 1.134 (1.072, 1.200) | 1.22E-05 | 0.992 (0.897, 1.096) | 0.86983 | 81 | Random | 1.068 (0.973, 1.217) | 0.325 | NO | exclude |
| Phosphatidylcholine (16:0_20:5) levels | 1.212 (1.103, 1.332) | 6.42E-05 | NA | NA | NA | NA | NA | NA | YES | Suggestive |
| Phosphatidylcholine (16:0_22:4) levels | 1.312 (1.170, 1.472) | 3.37E-06 | 1.077 (0.845, 1.372) | 0.54873 | 52 | Random | 1.225 (1.019, 1.473) | 0.031 | YES | Significant |
| Phosphatidylcholine (16:0_22:5) levels | 1.181 (1.093, 1.277) | 2.78E-05 | 1.122 (0.981, 1.284) | 0.0926 | 0 | Fixed | 1.166 (1.090, 1.247) | 7.90E-06 | YES | Significant |
| Phosphatidylcholine (16:0_22:6) levels | 1.858 (1.403, 2.461) | 1.52E-05 | NA | NA | NA | NA | NA | NA | YES | Suggestive |
| Phosphatidylcholine (16:1_18:1) levels | 0.768 (0.639, 0.924) | 0.00499 | 0.926 (0.791, 1.083) | 0.33357 | 56 | Random | 0.849 (0.707, 1.019) | 0.079 | NO | exclude |
| Phosphatidylcholine (16:1_18:2) levels | 0.864 (0.791, 0.943) | 0.00111 | 0.965 (0.886, 1.052) | 0.41606 | 68 | Random | 0.913 (0.820, 1.018) | 0.102 | NO | exclude |
| Phosphatidylcholine (16:1_20:4) levels | 1.256 (1.128, 1.398) | 3.13E-05 | NA | NA | NA | NA | NA | NA | YES | Suggestive |
| Phosphatidylcholine (17:0_18:2) levels | 0.805 (0.662, 0.979) | 0.0297 | 0.992 (0.897, 1.098) | 0.88334 | 71 | Random | 0.909 (0.743, 1.113) | 0.356 | NO | exclude |
| Phosphatidylcholine (17:0_20:4) levels | 1.130 (1.049, 1.216) | 0.00118 | 1.036 (0.954, 1.125) | 0.40241 | 58 | Random | 1.084 (0.996, 1.180) | 0.063 | NO | exclude |
| Phosphatidylcholine (18:0_20:2) levels | 0.763 (0.674, 0.865) | 2.17E-05 | NA | NA | NA | NA | NA | NA | YES | Suggestive |
| Phosphatidylcholine (18:0_20:4) levels | 1.109 (1.042, 1.182) | 0.00121 | 1.014 (0.953, 1.078) | 0.66874 | 75 | Random | 1.060 (0.971, 1.157) | 0.192 | NO | exclude |
| Phosphatidylcholine (18:0_20:5) levels | 1.198 (1.104, 1.300) | 1.44E-05 | 1.192 (1.012, 1.403) | 0.03584 | 0 | Fixed | 1.197 (1.112, 1.288) | 1.45E-06 | YES | Significant |
| Phosphatidylcholine (18:1_18:2) levels | 0.876 (0.772, 0.994) | 0.03935 | 1.035 (0.943, 1.136) | 0.46999 | 77 | Random | 0.958 (0.814, 1.127) | 0.603 | NO | exclude |
| Phosphatidylcholine (18:1_20:2) levels | 0.832 (0.771, 0.898) | 2.13E-06 | 0.928 (0.851, 1.012) | 0.08991 | 71 | Random | 0.877 (0.788, 0.976) | 0.016 | YES | Significant |
| Phosphatidylcholine (18:1_20:4) levels | 1.132 (1.064, 1.205) | 9.17E-05 | 0.991 (0.928, 1.057) | 0.779 | 88 | Random | 1.060 (0.930, 1.207) | 0.385 | NO | exclude |
| Phosphatidylcholine (18:2_20:3) levels | 0.677 (0.572, 0.802) | 6.57E-06 | NA | NA | NA | NA | NA | NA | YES | Suggestive |
| Phosphatidylcholine (O-16:0_20:4) levels | 1.186 (1.057, 1.331) | 0.00381 | 1.021 (0.913, 1.141) | 0.72019 | 70 | Random | 1.100 (0.949, 1.273) | 0.205 | NO | exclude |
| Phosphatidylcholine (O-16:0_22:5) levels | 1.626 (1.316, 2.009) | 6.57E-06 | NA | NA | NA | NA | NA | NA | YES | Suggestive |
| Phosphatidylcholine (O-18:0_20:4) levels | 1.258 (1.129, 1.403) | 3.26E-05 | 0.958 (0.776, 1.184) | 0.69248 | 80 | Random | 1.115 (0.855, 1.454) | 0.421 | NO | exclude |
| Phosphatidylcholine (O-18:1_18:2) levels | 0.723 (0.620, 0.843) | 3.45E-05 | 0.814 (0.717, 0.924) | 0.00144 | 27 | Fixed | 0.776 (0.704, 0.856) | 3.63E-07 | YES | Significant |
| Phosphatidylcholine (O-18:1_20:4) levels | 1.260 (1.133, 1.401) | 1.89E-05 | 0.997 (0.864, 1.152) | 0.97157 | 85 | Random | 1.127 (0.896, 1.417) | 0.308 | NO | exclude |
| Phosphatidylcholine (O-18:2_18:1) levels | 0.588 (0.463, 0.748) | 1.46E-05 | NA | NA | NA | NA | NA | NA | YES | Suggestive |
| Phosphatidylethanolamine (18:2_0:0) levels | 0.804 (0.732, 0.882) | 4.23E-06 | 0.761 (0.669, 0.865) | 3.00E-05 | 0 | Fixed | 0.789 (0.732, 0.851) | 7.27E-10 | YES | Significant |
| Phosphatidylethanolamine (O-16:1_18:2) levels | 0.609 (0.481, 0.771) | 3.64E-05 | NA | NA | NA | NA | NA | NA | YES | Suggestive |
| Phosphatidylethanolamine (O-18:1_18:2) levels | 0.676 (0.564, 0.810) | 2.17E-05 | NA | NA | NA | NA | NA | NA | YES | Suggestive |
| Phosphatidylethanolamine (O-18:1_20:4) levels | 1.288 (1.062, 1.562) | 0.01021 | 1.160 (0.991, 1.357) | 0.06528 | 0 | Fixed | 1.209 (1.071, 1.366) | 0.002 | YES | Suggestive |
| Phosphatidylethanolamine (O-18:2_18:2) levels | 0.681 (0.545, 0.850) | 0.00069 | 0.729 (0.642, 0.827) | 9.02E-07 | 0 | Fixed | 0.717 (0.642, 0.800) | 3.05E-09 | YES | Suggestive |
| Phosphatidylinositol (18:0_20:3) levels | 0.873 (0.770, 0.990) | 0.03493 | 1.071 (1.016, 1.128) | 0.01121 | 88 | Random | 0.975 (0.799, 1.190) | 0.804 | NO | exclude |
| Sphingomyelin (d34:2) levels | 1.261 (1.011, 1.573) | 0.03967 | 1.043 (0.947, 1.149) | 0.39659 | 58 | Random | 1.116 (0.934, 1.334) | 0.227 | NO | exclude |

Table S7.Sensitivity analysis summary in the discovery dataset

| Exposure | GWAS Catalog ID | MR-Egger intercept | | | Cochrane's Q-IVW | | | MR-PRESSO global test | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Intercept | SE | *Pval* | *Q* | *Q_df* | *Q_pval* | $RSS_{obs}$ | *P-value* | *Outlier* |
| Sterol ester (27:1/14:0) levels | GCST90277238 | NA | NA | NA | 2.302 | 1 | 0.129 | NA | NA | NA |
| Sterol ester (27:1/16:0) levels | GCST90277240 | -0.003 | 0.039 | 0.940 | 11.855 | 7 | 0.105 | 15.434 | 0.123 | rs174547 |
| Sterol ester (27:1/16:1) levels | GCST90277241 | -0.059 | 0.133 | 0.733 | 1.004 | 2 | 0.605 | NA | NA | NA |
| Sterol ester (27:1/17:0) levels | GCST90277242 | NA | NA | NA | 6.975 | 1 | 0.008 | NA | NA | NA |
| Sterol ester (27:1/18:0) levels | GCST90277244 | 0.016 | 0.029 | 0.607 | 7.189 | 5 | 0.207 | 9.888 | 0.278 | rs4246215,rs429358 |
| Sterol ester (27:1/18:1) levels | GCST90277245 | 0.018 | 0.092 | 0.854 | 6.659 | 5 | 0.247 | 9.533 | 0.288 | NA |
| Sterol ester (27:1/18:2) levels | GCST90277246 | 0.005 | 0.031 | 0.869 | 11.874 | 7 | 0.105 | 15.345 | 0.159 | rs2524299 |
| Sterol ester (27:1/18:3) levels | GCST90277247 | 0.005 | 0.060 | 0.938 | 14.867 | 4 | 0.005 | 27.480 | 0.054 | NA |
| Sterol ester (27:1/20:2) levels | GCST90277248 | -0.189 | 0.073 | 0.234 | 7.125 | 2 | 0.028 | NA | NA | NA |
| Sterol ester (27:1/20:3) levels | GCST90277249 | -0.006 | 0.064 | 0.926 | 11.249 | 5 | 0.047 | 15.927 | 0.080 | NA |
| Sterol ester (27:1/20:4) levels | GCST90277250 | 0.010 | 0.015 | 0.513 | 7.613 | 9 | 0.574 | 8.486 | 0.718 | NA |
| Sterol ester (27:1/20:5) levels | GCST90277251 | 0.002 | 0.026 | 0.957 | 0.075 | 2 | 0.963 | NA | NA | NA |
| Sterol ester (27:1/22:6) levels | GCST90277252 | NA | NA | NA | 4.644 | 1 | 0.031 | NA | NA | NA |
| Ceramide (d40:1) levels | GCST90277253 | -0.004 | 0.027 | 0.884 | 3.393 | 5 | 0.640 | 4.076 | 0.737 | NA |
| Ceramide (d40:2) levels | GCST90277254 | NA | NA | NA | 1.373 | 1 | 0.241 | NA | NA | NA |
| Ceramide (d42:1) levels | GCST90277255 | 0.041 | 0.073 | 0.678 | 0.419 | 2 | 0.811 | NA | NA | NA |
| Ceramide (d42:2) levels | GCST90277256 | -0.028 | 0.022 | 0.247 | 3.311 | 7 | 0.855 | 4.311 | 0.867 | NA |
| Diacylglycerol (16:1_18:1) levels | GCST90277260 | NA | NA | NA | 0.258 | 1 | 0.611 | NA | NA | NA |
| Diacylglycerol (18:1_18:1) levels | GCST90277261 | -0.013 | 0.033 | 0.730 | 4.162 | 4 | 0.385 | 5.501 | 0.512 | NA |
| Diacylglycerol (18:1_18:2) levels | GCST90277262 | -0.049 | 0.025 | 0.120 | 6.045 | 5 | 0.302 | 7.834 | 0.398 | NA |
| Phosphatidylcholine (16:0_0:0) levels | GCST90277264 | NA | NA | NA | 0.964 | 1 | 0.326 | NA | NA | NA |
| Phosphatidylcholine (18:2_0:0) levels | GCST90277267 | -0.175 | 0.247 | 0.608 | 20.280 | 2 | 0.000 | NA | NA | NA |
| Phosphatidylcholine (20:4_0:0) levels | GCST90277268 | -0.013 | 0.021 | 0.613 | 3.126 | 3 | 0.373 | 4.886 | 0.627 | NA |
| Phosphatidylethanolamine (18:0_0:0) levels | GCST90277269 | NA | NA | NA | 0.027 | 1 | 0.869 | NA | NA | NA |
| Phosphatidylethanolamine (18:2_0:0) levels | GCST90277271 | NA | NA | NA | 0.024 | 1 | 0.877 | NA | NA | NA |
| Phosphatidylcholine (14:0_18:1) levels | GCST90277273 | NA | NA | NA | 0.364 | 1 | 0.546 | NA | NA | NA |
| Phosphatidylcholine (14:0_18:2) levels | GCST90277274 | -0.036 | 0.056 | 0.631 | 5.473 | 2 | 0.065 | NA | NA | NA |
| Phosphatidylcholine (15:0_18:2) levels | GCST90277276 | 0.041 | 0.018 | 0.085 | 8.755 | 5 | 0.119 | 25.495 | 0.252 | NA |
| Phosphatidylcholine (16:0_16:0) levels | GCST90277277 | -0.122 | 0.100 | 0.348 | 10.391 | 3 | 0.016 | 20.469 | 0.079 | NA |
| Phosphatidylcholine (16:0_18:1) levels | GCST90277281 | NA | NA | NA | 1.096 | 1 | 0.295 | NA | NA | NA |
| Phosphatidylcholine (16:0_18:2) levels | GCST90277282 | 0.047 | 0.017 | 0.042 | 11.188 | 6 | 0.083 | 28.704 | 0.168 | NA |
| Phosphatidylcholine (16:0_18:3) levels | GCST90277283 | 0.550 | 0.882 | 0.645 | 9.389 | 2 | 0.009 | NA | NA | NA |
| Phosphatidylcholine (16:0_20:2) levels | GCST90277285 | 0.029 | 0.019 | 0.200 | 7.018 | 5 | 0.219 | 17.019 | 0.279 | NA |
| Phosphatidylcholine (16:0_20:3) levels | GCST90277286 | NA | NA | NA | 4.342 | 1 | 0.037 | NA | NA | NA |
| Phosphatidylcholine (16:0_20:4) levels | GCST90277287 | -0.001 | 0.024 | 0.956 | 1.051 | 3 | 0.789 | 1.942 | 0.869 | NA |
| Phosphatidylcholine (16:0_22:4) levels | GCST90277289 | NA | NA | NA | 0.547 | 1 | 0.459 | NA | NA | NA |
| Phosphatidylcholine (16:0_22:5) levels | GCST90277290 | -0.014 | 0.025 | 0.622 | 0.402 | 3 | 0.940 | 2.545 | 0.793 | NA |
| Phosphatidylcholine (16:1_18:1) levels | GCST90277293 | 0.039 | 0.039 | 0.390 | 8.035 | 4 | 0.090 | 16.383 | 0.161 | NA |
| Phosphatidylcholine (16:1_18:2) levels | GCST90277294 | 0.026 | 0.014 | 0.109 | 9.106 | 7 | 0.245 | 20.857 | 0.292 | NA |
| Phosphatidylcholine (17:0_18:2) levels | GCST90277297 | 0.085 | 0.036 | 0.256 | 5.531 | 2 | 0.063 | NA | NA | NA |
| Phosphatidylcholine (17:0_20:4) levels | GCST90277298 | -0.022 | 0.025 | 0.430 | 7.543 | 5 | 0.183 | 20.275 | 0.394 | NA |
| Phosphatidylcholine (18:0_18:1) levels | GCST90277299 | NA | NA | NA | 3.908 | 1 | 0.048 | NA | NA | NA |
| Phosphatidylcholine (18:0_18:2) levels | GCST90277300 | 0.089 | 0.031 | 0.062 | 12.278 | 4 | 0.015 | 34.633 | 0.146 | NA |
| Phosphatidylcholine (18:0_20:3) levels | GCST90277303 | -0.021 | 0.099 | 0.864 | 5.123 | 2 | 0.077 | NA | NA | NA |
| Phosphatidylcholine (18:0_20:4) levels | GCST90277304 | -0.013 | 0.020 | 0.541 | 10.217 | 6 | 0.116 | 15.481 | 0.362 | NA |
| Phosphatidylcholine (18:0_20:5) levels | GCST90277305 | NA | NA | NA | 0.066 | 1 | 0.798 | NA | NA | NA |
| Phosphatidylcholine (18:0_22:5) levels | GCST90277306 | NA | NA | NA | 6.189 | 1 | 0.013 | NA | NA | NA |
| Phosphatidylcholine (18:0_22:6) levels | GCST90277307 | NA | NA | NA | 6.960 | 1 | 0.008 | NA | NA | NA |
| Phosphatidylcholine (18:1_18:1) levels | GCST90277308 | 0.103 | 0.033 | 0.087 | 11.074 | 3 | 0.011 | 31.435 | 0.144 | NA |
| Phosphatidylcholine (18:1_18:2) levels | GCST90277309 | 0.048 | 0.016 | 0.060 | 9.898 | 4 | 0.042 | 42.378 | 0.303 | NA |
| Phosphatidylcholine (18:1_20:2) levels | GCST90277311 | 0.002 | 0.028 | 0.959 | 0.229 | 2 | 0.892 | NA | NA | NA |
| Phosphatidylcholine (18:1_20:3) levels | GCST90277312 | 0.131 | 0.079 | 0.344 | 4.390 | 2 | 0.111 | NA | NA | NA |
| Phosphatidylcholine (18:1_20:4) levels | GCST90277313 | -0.023 | 0.019 | 0.266 | 5.726 | 6 | 0.455 | 17.993 | 0.433 | NA |
| Phosphatidylcholine (18:2_18:2) levels | GCST90277314 | 0.089 | 0.030 | 0.203 | 9.412 | 2 | 0.009 | NA | NA | NA |
| Phosphatidylcholine (18:2_20:4) levels | GCST90277317 | -0.118 | 0.044 | 0.115 | 9.053 | 3 | 0.029 | 22.996 | 0.158 | NA |
| Phosphatidylcholine (O-16:0_16:1) levels | GCST90277319 | NA | NA | NA | 1.503 | 1 | 0.220 | NA | NA | NA |
| Phosphatidylcholine (O-16:0_18:1) levels | GCST90277320 | -0.043 | 0.096 | 0.732 | 0.200 | 2 | 0.905 | NA | NA | NA |
| Phosphatidylcholine (O-16:0_18:2) levels | GCST90277321 | NA | NA | NA | 9.536 | 1 | 0.002 | NA | NA | NA |
| Phosphatidylcholine (O-16:0_20:3) levels | GCST90277322 | 0.118 | 0.057 | 0.286 | 4.342 | 2 | 0.114 | NA | NA | NA |
| Phosphatidylcholine (O-16:0_20:4) levels | GCST90277323 | -0.038 | 0.020 | 0.312 | 3.509 | 2 | 0.173 | NA | NA | NA |
| Phosphatidylcholine (O-16:1_18:1) levels | GCST90277327 | -0.007 | 0.062 | 0.927 | 0.576 | 2 | 0.750 | NA | NA | NA |
| Phosphatidylcholine (O-16:1_18:2) levels | GCST90277328 | NA | NA | NA | 0.272 | 1 | 0.602 | NA | NA | NA |
| Phosphatidylcholine (O-16:1_20:3) levels | GCST90277329 | 0.021 | 0.123 | 0.890 | 5.846 | 2 | 0.054 | NA | NA | NA |
| Phosphatidylcholine (O-16:1_20:4) levels | GCST90277330 | -0.047 | 0.048 | 0.504 | 9.686 | 2 | 0.008 | NA | NA | NA |
| Phosphatidylcholine (O-16:2_18:0) levels | GCST90277331 | NA | NA | NA | 0.067 | 1 | 0.795 | NA | NA | NA |
| Phosphatidylcholine (O-18:0_20:4) levels | GCST90277336 | NA | NA | NA | 0.133 | 1 | 0.716 | NA | NA | NA |
| Phosphatidylcholine (O-18:1_16:0) levels | GCST90277337 | 0.009 | 0.080 | 0.926 | 0.040 | 2 | 0.980 | NA | NA | NA |
| Phosphatidylcholine (O-18:1_20:3) levels | GCST90277339 | NA | NA | NA | 9.466 | 1 | 0.002 | NA | NA | NA |
| Phosphatidylcholine (O-18:1_20:4) levels | GCST90277340 | -0.016 | 0.021 | 0.531 | 0.659 | 3 | 0.883 | 2.898 | 0.748 | NA |
| Phosphatidylcholine (O-18:2_16:0) levels | GCST90277341 | NA | NA | NA | 10.022 | 1 | 0.002 | NA | NA | NA |
| Phosphatidylcholine (O-18:2_18:2) levels | GCST90277343 | NA | NA | NA | 10.546 | 1 | 0.001 | NA | NA | NA |
| Phosphatidylcholine (O-18:2_20:4) levels | GCST90277344 | NA | NA | NA | 11.943 | 1 | 0.001 | NA | NA | NA |
| Phosphatidylethanolamine (16:0_18:2) levels | GCST90277345 | -0.067 | 0.041 | 0.239 | 7.362 | 3 | 0.061 | 17.933 | 0.253 | rs1077834,rs174564 |
| Phosphatidylethanolamine (16:0_20:4) levels | GCST90277346 | 0.003 | 0.022 | 0.883 | 2.104 | 4 | 0.717 | 2.697 | 0.790 | NA |
| Phosphatidylethanolamine (18:0_18:2) levels | GCST90277347 | -0.022 | 0.020 | 0.302 | 3.726 | 8 | 0.881 | 4.507 | 0.891 | rs174567 |
| Phosphatidylethanolamine (18:0_20:4) levels | GCST90277348 | 0.003 | 0.039 | 0.946 | 16.612 | 7 | 0.020 | 20.915 | 0.051 | NA |
| Phosphatidylethanolamine (18:1_18:1) levels | GCST90277349 | -0.037 | 0.056 | 0.555 | 9.475 | 4 | 0.050 | 17.225 | 0.154 | rs174548,rs2070895 |
| Phosphatidylethanolamine (O-16:1_20:4) levels | GCST90277351 | NA | NA | NA | 9.930 | 1 | 0.002 | NA | NA | NA |
| Phosphatidylethanolamine (O-18:1_20:4) levels | GCST90277354 | NA | NA | NA | 2.174 | 1 | 0.140 | NA | NA | NA |
| Phosphatidylethanolamine (O-18:2_20:4) levels | GCST90277357 | NA | NA | NA | 4.366 | 1 | 0.037 | NA | NA | NA |
| Phosphatidylinositol (16:0_18:1) levels | GCST90277358 | NA | NA | NA | 13.090 | 1 | 2.97E-04 | NA | NA | NA |
| Phosphatidylinositol (16:0_18:2) levels | GCST90277359 | -0.081 | 0.126 | 0.637 | 15.492 | 2 | 4.33E-04 | NA | NA | NA |
| Phosphatidylinositol (16:0_20:4) levels | GCST90277360 | -0.404 | 0.101 | 0.156 | 15.915 | 2 | 3.50E-04 | NA | NA | NA |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphatidylinositol (18:0_18:1) levels | GCST90277361 | -0.050 | 0.054 | 0.418 | 1.257 | 4 | 0.869 | 2.537 | 0.835 | rs174556 |
| Phosphatidylinositol (18:0_18:2) levels | GCST90277362 | 0.016 | 0.038 | 0.684 | 17.614 | 6 | 0.007 | 33.089 | 0.069 | NA |
| Phosphatidylinositol (18:0_20:3) levels | GCST90277363 | 0.069 | 0.024 | 0.061 | 10.987 | 4 | 0.027 | 27.320 | 0.179 | NA |
| Phosphatidylinositol (18:0_20:4) levels | GCST90277364 | -0.020 | 0.028 | 0.526 | 4.455 | 5 | 0.486 | 5.257 | 0.625 | rs174533 |
| Phosphatidylinositol (18:1_18:1) levels | GCST90277365 | 0.027 | 0.373 | 0.954 | 0.008 | 2 | 0.996 | NA | NA | rs174568,rs36634 |
| Phosphatidylinositol (18:1_18:2) levels | GCST90277366 | 0.269 | 0.123 | 0.272 | 9.827 | 2 | 0.007 | NA | NA | NA |
| Phosphatidylinositol (18:1_20:4) levels | GCST90277367 | NA | NA | NA | 0.182 | 1 | 0.670 | NA | NA | NA |
| Sphingomyelin (d32:1) levels | GCST90277368 | 0.002 | 0.041 | 0.976 | 3.127 | 2 | 0.209 | NA | NA | NA |
| Sphingomyelin (d34:0) levels | GCST90277369 | 0.016 | 0.088 | 0.876 | 6.848 | 3 | 0.077 | 13.293 | 0.261 | NA |
| Sphingomyelin (d34:1) levels | GCST90277370 | -0.005 | 0.039 | 0.900 | 9.611 | 6 | 0.142 | 14.177 | 0.146 | NA |
| Sphingomyelin (d34:2) levels | GCST90277371 | -0.027 | 0.074 | 0.742 | 11.540 | 4 | 0.021 | 20.824 | 0.073 | NA |
| Sphingomyelin (d36:1) levels | GCST90277372 | -0.043 | 0.025 | 0.132 | 10.393 | 8 | 0.239 | 12.586 | 0.270 | NA |
| Sphingomyelin (d36:2) levels | GCST90277373 | -0.094 | 0.090 | 0.406 | 17.936 | 3 | 0.000 | 37.872 | 0.054 | NA |
| Sphingomyelin (d38:1) levels | GCST90277374 | -0.036 | 0.023 | 0.158 | 8.664 | 9 | 0.469 | 9.831 | 0.557 | NA |
| Sphingomyelin (d38:2) levels | GCST90277375 | -0.053 | 0.028 | 0.154 | 4.988 | 4 | 0.288 | 8.148 | 0.384 | rs174556 |
| Sphingomyelin (d40:1) levels | GCST90277376 | -0.018 | 0.030 | 0.573 | 7.665 | 7 | 0.363 | 9.316 | 0.424 | NA |
| Sphingomyelin (d40:2) levels | GCST90277377 | -0.018 | 0.039 | 0.673 | 6.943 | 5 | 0.225 | 8.492 | 0.370 | rs174561 |
| Sphingomyelin (d42:2) levels | GCST90277378 | 0.007 | 0.033 | 0.844 | 7.448 | 8 | 0.489 | 9.496 | 0.519 | NA |
| Triacylglycerol (48:1) levels | GCST90277382 | NA | NA | NA | 0.105 | 1 | 0.745 | NA | NA | NA |
| Triacylglycerol (48:2) levels | GCST90277383 | NA | NA | NA | 0.085 | 1 | 0.771 | NA | NA | NA |
| Triacylglycerol (48:3) levels | GCST90277384 | NA | NA | NA | 0.127 | 1 | 0.721 | NA | NA | NA |
| Triacylglycerol (49:2) levels | GCST90277386 | NA | NA | NA | 0.182 | 1 | 0.670 | NA | NA | NA |
| Triacylglycerol (50:1) levels | GCST90277387 | -0.017 | 0.057 | 0.816 | 0.280 | 2 | 0.869 | NA | NA | NA |
| Triacylglycerol (50:2) levels | GCST90277388 | NA | NA | NA | 0.198 | 1 | 0.657 | NA | NA | NA |
| Triacylglycerol (50:3) levels | GCST90277389 | -0.047 | 0.087 | 0.687 | 0.287 | 2 | 0.866 | NA | NA | NA |
| Triacylglycerol (50:4) levels | GCST90277390 | -0.050 | 0.103 | 0.712 | 0.248 | 2 | 0.884 | NA | NA | NA |
| Triacylglycerol (50:5) levels | GCST90277391 | -0.038 | 0.073 | 0.696 | 0.302 | 2 | 0.860 | NA | NA | NA |
| Triacylglycerol (51:2) levels | GCST90277393 | NA | NA | NA | 0.339 | 1 | 0.560 | NA | NA | NA |
| Triacylglycerol (51:3) levels | GCST90277394 | 0.001 | 0.029 | 0.976 | 2.885 | 5 | 0.718 | 3.771 | 0.766 | NA |
| Triacylglycerol (51:4) levels | GCST90277395 | NA | NA | NA | 0.388 | 1 | 0.533 | NA | NA | NA |
| Triacylglycerol (52:2) levels | GCST90277396 | 0.008 | 0.037 | 0.850 | 2.599 | 3 | 0.458 | 3.708 | 0.570 | NA |
| Triacylglycerol (52:3) levels | GCST90277397 | -0.018 | 0.024 | 0.486 | 3.617 | 5 | 0.606 | 5.081 | 0.631 | NA |
| Triacylglycerol (52:4) levels | GCST90277398 | -0.021 | 0.025 | 0.443 | 4.261 | 6 | 0.641 | 5.724 | 0.682 | NA |
| Triacylglycerol (52:5) levels | GCST90277399 | 0.017 | 0.037 | 0.682 | 1.552 | 3 | 0.670 | 2.432 | 0.740 | NA |
| Triacylglycerol (52:6) levels | GCST90277400 | -0.031 | 0.051 | 0.649 | 0.398 | 2 | 0.820 | NA | NA | rs102274 |
| Triacylglycerol (53:2) levels | GCST90277401 | NA | NA | NA | 0.456 | 1 | 0.500 | NA | NA | NA |
| Triacylglycerol (53:3) levels | GCST90277402 | 0.027 | 0.038 | 0.535 | 6.457 | 4 | 0.168 | 8.670 | 0.271 | rs174560 |
| Triacylglycerol (53:4) levels | GCST90277403 | 0.010 | 0.030 | 0.757 | 1.742 | 3 | 0.628 | 2.588 | 0.720 | NA |
| Triacylglycerol (54:3) levels | GCST90277404 | 0.042 | 0.029 | 0.382 | 2.357 | 2 | 0.308 | NA | NA | rs174560 |
| Triacylglycerol (54:4) levels | GCST90277405 | -0.022 | 0.032 | 0.543 | 12.309 | 5 | 0.031 | 15.597 | 0.091 | NA |
| Triacylglycerol (54:5) levels | GCST90277406 | 0.016 | 0.041 | 0.729 | 3.987 | 3 | 0.263 | 6.088 | 0.400 | NA |
| Triacylglycerol (54:6) levels | GCST90277407 | 0.083 | 0.121 | 0.616 | 19.006 | 2 | 7.46E-05 | NA | NA | NA |
| Triacylglycerol (54:7) levels | GCST90277408 | -0.030 | 0.046 | 0.627 | 0.455 | 2 | 0.797 | NA | NA | rs174584 |
| Triacylglycerol (56:3) levels | GCST90277409 | NA | NA | NA | 0.037 | 1 | 0.848 | NA | NA | rs174560,rs1759614 |
| Triacylglycerol (56:4) levels | GCST90277410 | -0.079 | 0.185 | 0.743 | 17.456 | 2 | 1.62E-04 | NA | NA | NA |
| Triacylglycerol (56:5) levels | GCST90277411 | 0.044 | 0.064 | 0.616 | 1.114 | 2 | 0.573 | NA | NA | rs97384 |
| Triacylglycerol (56:6) levels | GCST90277412 | -0.004 | 0.032 | 0.917 | 2.054 | 5 | 0.842 | 2.698 | 0.872 | rs174533 |
| Triacylglycerol (56:7) levels | GCST90277413 | -0.007 | 0.032 | 0.844 | 1.818 | 3 | 0.611 | 2.736 | 0.701 | rs174554 |
| Triacylglycerol (56:8) levels | GCST90277414 | 0.044 | 0.043 | 0.407 | 2.762 | 3 | 0.430 | 4.786 | 0.500 | rs174530 |
| Triacylglycerol (58:7) levels | GCST90277415 | -0.001 | 0.035 | 0.978 | 2.583 | 4 | 0.630 | 3.807 | 0.694 | rs102275 |
| Triacylglycerol (58:8) levels | GCST90277416 | NA | NA | NA | 0.009 | 1 | 0.926 | NA | NA | NA |

Table S8.Summary of the results of the reverse Mendelian randomization analysis

| outcome | exposure | method | nsnp | b | se | pval | lo_ci | up_ci |
|---|---|---|---|---|---|---|---|---|
| Sterol ester (27:1/14:0) levels | CRC | IVW | 6 | 0.011449 | 0.056447 | 0.839268 | -0.099187 | 0.122085 |
| Sterol ester (27:1/15:0) levels | CRC | IVW | 6 | -0.03347 | 0.057499 | 0.560496 | -0.146168 | 0.079227 |
| Sterol ester (27:1/16:0) levels | CRC | IVW | 7 | 0.009265 | 0.050192 | 0.853545 | -0.08911 | 0.107641 |
| Sterol ester (27:1/16:1) levels | CRC | IVW | 8 | -0.028445 | 0.049513 | 0.565634 | -0.12549 | 0.068601 |
| Sterol ester (27:1/17:0) levels | CRC | IVW | 7 | 0.001804 | 0.051314 | 0.971948 | -0.09877 | 0.102379 |
| Sterol ester (27:1/17:1) levels | CRC | IVW | 7 | 0.011419 | 0.05287 | 0.829001 | -0.092207 | 0.115045 |
| Sterol ester (27:1/18:0) levels | CRC | IVW | 8 | 0.022927 | 0.04795 | 0.632555 | -0.071056 | 0.116909 |
| Sterol ester (27:1/18:1) levels | CRC | IVW | 6 | 0.01583 | 0.05607 | 0.777693 | -0.094067 | 0.125727 |
| Sterol ester (27:1/18:2) levels | CRC | IVW | 7 | 0.029567 | 0.050306 | 0.556709 | -0.069034 | 0.128168 |
| Sterol ester (27:1/18:3) levels | CRC | IVW | 5 | -0.010464 | 0.061959 | 0.865882 | -0.131904 | 0.110975 |
| Sterol ester (27:1/20:2) levels | CRC | IVW | 8 | -0.013781 | 0.053579 | 0.797015 | -0.118795 | 0.091233 |
| Sterol ester (27:1/20:3) levels | CRC | IVW | 6 | -0.016873 | 0.05199 | 0.745524 | -0.118773 | 0.085027 |
| Sterol ester (27:1/20:4) levels | CRC | IVW | 9 | -0.011502 | 0.044569 | 0.796361 | -0.098857 | 0.075854 |
| Sterol ester (27:1/20:5) levels | CRC | IVW | 6 | 0.016254 | 0.052961 | 0.758911 | -0.08755 | 0.120059 |
| Sterol ester (27:1/22:6) levels | CRC | IVW | 6 | 0.02035 | 0.052921 | 0.700587 | -0.083376 | 0.124075 |
| Ceramide (d40:1) levels | CRC | IVW | 7 | 0.048267 | 0.052463 | 0.357567 | -0.054561 | 0.151095 |
| Ceramide (d40:2) levels | CRC | IVW | 4 | 0.021552 | 0.069943 | 0.757981 | -0.115536 | 0.158639 |
| Ceramide (d42:1) levels | CRC | IVW | 7 | 0.026186 | 0.0498 | 0.599011 | -0.071422 | 0.123794 |
| Ceramide (d42:2) levels | CRC | IVW | 8 | -0.028099 | 0.050115 | 0.575013 | -0.126325 | 0.070127 |
| Cholesterol levels | CRC | IVW | 9 | 0.015042 | 0.045117 | 0.73884 | -0.073388 | 0.103471 |
| Diacylglycerol (16:0_18:1) levels | CRC | IVW | 6 | -0.026629 | 0.05801 | 0.646209 | -0.140329 | 0.087071 |
| Diacylglycerol (16:0_18:2) levels | CRC | IVW | 6 | -0.018454 | 0.060957 | 0.76209 | -0.137931 | 0.101023 |
| Diacylglycerol (16:1_18:1) levels | CRC | IVW | 7 | -0.033499 | 0.05439 | 0.537956 | -0.140104 | 0.073105 |
| Diacylglycerol (18:1_18:1) levels | CRC | IVW | 6 | -0.044538 | 0.055347 | 0.420983 | -0.153018 | 0.063941 |
| Diacylglycerol (18:1_18:2) levels | CRC | IVW | 5 | -0.087809 | 0.063754 | 0.168413 | -0.212766 | 0.037148 |
| Diacylglycerol (18:1_18:3) levels | CRC | IVW | 8 | 0.002613 | 0.05038 | 0.95864 | -0.096132 | 0.101357 |
| Phosphatidylcholine (16:0_0:0) levels | CRC | IVW | 7 | -0.027091 | 0.052124 | 0.603241 | -0.129254 | 0.075072 |
| Phosphatidylcholine (18:0_0:0) levels | CRC | IVW | 6 | 0.049922 | 0.056965 | 0.380836 | -0.06173 | 0.161573 |
| Phosphatidylcholine (18:1_0:0) levels | CRC | IVW | 8 | -0.012832 | 0.047497 | 0.787026 | -0.105926 | 0.080261 |
| Phosphatidylcholine (18:2_0:0) levels | CRC | IVW | 7 | -0.004468 | 0.052236 | 0.931833 | -0.106852 | 0.097915 |
| Phosphatidylcholine (20:4_0:0) levels | CRC | IVW | 10 | -0.016565 | 0.04595 | 0.718466 | -0.106626 | 0.073496 |
| Phosphatidylethanolamine (18:0_0:0) levels | CRC | IVW | 8 | -0.000632 | 0.053365 | 0.990552 | -0.105228 | 0.103964 |
| Phosphatidylethanolamine (18:1_0:0) levels | CRC | IVW | 7 | 0.013755 | 0.057736 | 0.811702 | -0.099408 | 0.126917 |
| Phosphatidylethanolamine (18:2_0:0) levels | CRC | IVW | 9 | -0.008651 | 0.045848 | 0.850339 | -0.098513 | 0.081211 |
| Phosphatidylcholine (14:0_16:0) levels | CRC | IVW | 8 | 0.046783 | 0.054178 | 0.387863 | -0.059406 | 0.152972 |
| Phosphatidylcholine (14:0_18:1) levels | CRC | IVW | 8 | -0.028468 | 0.049632 | 0.566251 | -0.125746 | 0.068811 |
| Phosphatidylcholine (14:0_18:2) levels | CRC | IVW | 7 | -0.044022 | 0.051641 | 0.39396 | -0.145238 | 0.057194 |
| Phosphatidylcholine (15:0_18:1) levels | CRC | IVW | 8 | -0.009351 | 0.049606 | 0.85048 | -0.106578 | 0.087876 |
| Phosphatidylcholine (15:0_18:2) levels | CRC | IVW | 6 | 0.099849 | 0.053841 | 0.063666 | -0.00568 | 0.205377 |
| Phosphatidylcholine (16:0_16:0) levels | CRC | IVW | 10 | 0.034884 | 0.042976 | 0.41696 | -0.04935 | 0.119118 |
| Phosphatidylcholine (16:0_16:1) levels | CRC | IVW | 8 | -0.029756 | 0.047142 | 0.527913 | -0.122154 | 0.062642 |
| Phosphatidylcholine (16:0_17:1) levels | CRC | IVW | 10 | -0.00373 | 0.043317 | 0.931378 | -0.088631 | 0.081171 |
| Phosphatidylcholine (16:0_18:0) levels | CRC | IVW | 8 | 0.039372 | 0.046865 | 0.400845 | -0.052483 | 0.131226 |
| Phosphatidylcholine (16:0_18:1) levels | CRC | IVW | 9 | -0.036235 | 0.045398 | 0.424776 | -0.125216 | 0.052745 |
| Phosphatidylcholine (16:0_18:2) levels | CRC | IVW | 6 | 0.076497 | 0.052127 | 0.142236 | -0.025672 | 0.178665 |
| Phosphatidylcholine (16:0_18:3) levels | CRC | IVW | 7 | -0.048124 | 0.049863 | 0.334485 | -0.145856 | 0.049608 |
| Phosphatidylcholine (16:0_20:1) levels | CRC | IVW | 7 | 0.03796 | 0.052189 | 0.467 | -0.064329 | 0.14025 |
| Phosphatidylcholine (16:0_20:2) levels | CRC | IVW | 7 | -0.019211 | 0.049768 | 0.699482 | -0.116756 | 0.078333 |
| Phosphatidylcholine (16:0_20:3) levels | CRC | IVW | 4 | 0.019306 | 0.063452 | 0.760923 | -0.105059 | 0.143672 |
| Phosphatidylcholine (16:0_20:4) levels | CRC | IVW | 7 | 0.02721 | 0.052018 | 0.600915 | -0.074745 | 0.129165 |
| Phosphatidylcholine (16:0_20:5) levels | CRC | IVW | 5 | 0.02086 | 0.060928 | 0.732067 | -0.098559 | 0.14028 |
| Phosphatidylcholine (16:0_22:4) levels | CRC | IVW | 7 | -0.049647 | 0.050172 | 0.3224 | -0.147985 | 0.04869 |
| Phosphatidylcholine (16:0_22:5) levels | CRC | IVW | 7 | -0.021958 | 0.052388 | 0.675106 | -0.124638 | 0.080721 |
| Phosphatidylcholine (16:0_22:6) levels | CRC | IVW | 9 | 0.030649 | 0.044822 | 0.4941 | -0.057201 | 0.118499 |
| Phosphatidylcholine (16:1_18:0) levels | CRC | IVW | 7 | 0.009966 | 0.05188 | 0.847662 | -0.091719 | 0.111651 |
| Phosphatidylcholine (16:1_18:1) levels | CRC | IVW | 9 | -0.027247 | 0.045117 | 0.545899 | -0.115675 | 0.061182 |
| Phosphatidylcholine (16:1_18:2) levels | CRC | IVW | 8 | 0.016194 | 0.047033 | 0.730622 | -0.075992 | 0.108379 |
| Phosphatidylcholine (16:1_20:4) levels | CRC | IVW | 7 | 0.010815 | 0.05603 | 0.846942 | -0.099003 | 0.120633 |
| Phosphatidylcholine (17:0_18:1) levels | CRC | IVW | 8 | -0.002443 | 0.047832 | 0.959264 | -0.096194 | 0.091308 |
| Phosphatidylcholine (17:0_18:2) levels | CRC | IVW | 5 | 0.045802 | 0.05688 | 0.420678 | -0.065683 | 0.157287 |
| Phosphatidylcholine (17:0_20:4) levels | CRC | IVW | 8 | 0.037539 | 0.047078 | 0.425226 | -0.054733 | 0.129811 |
| Phosphatidylcholine (18:0_18:1) levels | CRC | IVW | 9 | 0.023022 | 0.045789 | 0.615124 | -0.066725 | 0.112768 |
| Phosphatidylcholine (18:0_18:2) levels | CRC | IVW | 4 | 0.01445 | 0.073965 | 0.845108 | -0.13052 | 0.15942 |
| Phosphatidylcholine (18:0_18:3) levels | CRC | IVW | 8 | 0.03244 | 0.048089 | 0.499946 | -0.061815 | 0.126695 |
| Phosphatidylcholine (18:0_20:2) levels | CRC | IVW | 6 | 0.007867 | 0.058881 | 0.893711 | -0.107539 | 0.123273 |
| Phosphatidylcholine (18:0_20:3) levels | CRC | IVW | 7 | 0.026345 | 0.049027 | 0.591019 | -0.069748 | 0.122439 |
| Phosphatidylcholine (18:0_20:4) levels | CRC | IVW | 9 | 0.031288 | 0.044392 | 0.480929 | -0.055721 | 0.118297 |
| Phosphatidylcholine (18:0_20:5) levels | CRC | IVW | 7 | 0.036466 | 0.050103 | 0.466719 | -0.061735 | 0.134668 |
| Phosphatidylcholine (18:0_22:5) levels | CRC | IVW | 10 | 0.00225 | 0.044113 | 0.95933 | -0.084213 | 0.088712 |
| Phosphatidylcholine (18:0_22:6) levels | CRC | IVW | 8 | -0.004253 | 0.048458 | 0.930068 | -0.09923 | 0.090724 |
| Phosphatidylcholine (18:1_18:1) levels | CRC | IVW | 8 | -0.006253 | 0.046812 | 0.893739 | -0.098004 | 0.085498 |
| Phosphatidylcholine (18:1_18:2) levels | CRC | IVW | 7 | 0.057255 | 0.048917 | 0.241826 | -0.038623 | 0.153133 |
| Phosphatidylcholine (18:1_18:3) levels | CRC | IVW | 5 | 0.015322 | 0.060591 | 0.800362 | -0.103436 | 0.13408 |
| Phosphatidylcholine (18:1_20:2) levels | CRC | IVW | 8 | -0.018363 | 0.053388 | 0.730878 | -0.123004 | 0.086278 |
| Phosphatidylcholine (18:1_20:3) levels | CRC | IVW | 7 | 0.004837 | 0.049102 | 0.921524 | -0.091404 | 0.101078 |
| Phosphatidylcholine (18:1_20:4) levels | CRC | IVW | 9 | 0.015446 | 0.04472 | 0.729805 | -0.072205 | 0.103096 |
| Phosphatidylcholine (18:2_18:2) levels | CRC | IVW | 5 | 0.045533 | 0.057485 | 0.428308 | -0.067137 | 0.158203 |
| Phosphatidylcholine (18:2_20:1) levels | CRC | IVW | 6 | 0.028432 | 0.063801 | 0.655855 | -0.096617 | 0.153482 |
| Phosphatidylcholine (18:2_20:3) levels | CRC | IVW | 7 | 0.043221 | 0.050893 | 0.395735 | -0.056528 | 0.142971 |
| Phosphatidylcholine (18:2_20:4) levels | CRC | IVW | 7 | 0.046231 | 0.049188 | 0.347285 | -0.050179 | 0.14264 |
| Phosphatidylcholine (O-16:0_16:0) levels | CRC | IVW | 6 | -0.054525 | 0.053501 | 0.308132 | -0.159387 | 0.050336 |
| Phosphatidylcholine (O-16:0_16:1) levels | CRC | IVW | 6 | -0.026653 | 0.065607 | 0.684561 | -0.155241 | 0.101936 |
| Phosphatidylcholine (O-16:0_18:1) levels | CRC | IVW | 7 | 0.003717 | 0.051544 | 0.942508 | -0.09731 | 0.104744 |
| Phosphatidylcholine (O-16:0_18:2) levels | CRC | IVW | 7 | 0.046367 | 0.05287 | 0.380489 | -0.057258 | 0.149992 |
| Phosphatidylcholine (O-16:0_20:3) levels | CRC | IVW | 8 | 0.025335 | 0.048204 | 0.599175 | -0.069144 | 0.119815 |
| Phosphatidylcholine (O-16:0_20:4) levels | CRC | IVW | 9 | 0.052658 | 0.044917 | 0.241057 | -0.035379 | 0.140694 |
| Phosphatidylcholine (O-16:0_22:5) levels | CRC | IVW | 8 | -0.015861 | 0.051814 | 0.759525 | -0.117417 | 0.085695 |
| Phosphatidylcholine (O-16:1_16:0) levels | CRC | IVW | 7 | -0.013964 | 0.059128 | 0.813307 | -0.129854 | 0.101926 |
| Phosphatidylcholine (O-16:1_18:0) levels | CRC | IVW | 7 | -0.019741 | 0.054668 | 0.718017 | -0.126891 | 0.087409 |
| Phosphatidylcholine (O-16:1_18:1) levels | CRC | IVW | 8 | 0.020616 | 0.050008 | 0.680151 | -0.077399 | 0.118631 |
| Phosphatidylcholine (O-16:1_18:2) levels | CRC | IVW | 7 | 0.012673 | 0.053551 | 0.812931 | -0.092288 | 0.117633 |
| Phosphatidylcholine (O-16:1_20:3) levels | CRC | IVW | 6 | -0.013945 | 0.052681 | 0.79124 | -0.1172 | 0.08931 |
| Phosphatidylcholine (O-16:1_20:4) levels | CRC | IVW | 8 | 0.060847 | 0.050592 | 0.229095 | -0.038314 | 0.160007 |
| Phosphatidylcholine (O-16:2_18:0) levels | CRC | IVW | 9 | 0.029422 | 0.046476 | 0.526692 | -0.06167 | 0.120514 |
| Phosphatidylcholine (O-17:0_15:0) levels | CRC | IVW | 6 | 0.040107 | 0.056413 | 0.477106 | -0.070461 | 0.150676 |
| Phosphatidylcholine (O-17:0_17:1) levels | CRC | IVW | 5 | -0.046999 | 0.059028 | 0.425908 | -0.162695 | 0.068696 |
| Phosphatidylcholine (O-18:0_14:0) levels | CRC | IVW | 8 | 0.019555 | 0.049503 | 0.692829 | -0.077472 | 0.116581 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Phosphatidylcholine (O-18:0_16:1) levels | CRC | IVW | 7 | 0.003226 | 0.053962 | 0.952328 | -0.102539 | 0.108991 |
| Phosphatidylcholine (O-18:0_20:4) levels | CRC | IVW | 9 | 0.022008 | 0.045557 | 0.629044 | -0.067285 | 0.1113 |
| Phosphatidylcholine (O-18:1_16:0) levels | CRC | IVW | 7 | 0.002552 | 0.052657 | 0.961351 | -0.100657 | 0.10576 |
| Phosphatidylcholine (O-18:1_18:2) levels | CRC | IVW | 7 | -0.009593 | 0.054892 | 0.861263 | -0.117182 | 0.097995 |
| Phosphatidylcholine (O-18:1_20:3) levels | CRC | IVW | 8 | 0.02041 | 0.048379 | 0.673107 | -0.074412 | 0.115233 |
| Phosphatidylcholine (O-18:1_20:4) levels | CRC | IVW | 8 | 0.025159 | 0.046652 | 0.589689 | -0.066279 | 0.116597 |
| Phosphatidylcholine (O-18:2_16:0) levels | CRC | IVW | 7 | 0.005184 | 0.055445 | 0.925507 | -0.103488 | 0.113856 |
| Phosphatidylcholine (O-18:2_18:1) levels | CRC | IVW | 7 | 0.04907 | 0.051512 | 0.3408 | -0.051894 | 0.150034 |
| Phosphatidylcholine (O-18:2_18:2) levels | CRC | IVW | 6 | 0.009825 | 0.053541 | 0.854403 | -0.095116 | 0.114765 |
| Phosphatidylcholine (O-18:2_20:4) levels | CRC | IVW | 5 | 0.001564 | 0.06115 | 0.979596 | -0.118289 | 0.121417 |
| Phosphatidylethanolamine (16:0_18:2) levels | CRC | IVW | 6 | -0.007349 | 0.064411 | 0.909159 | -0.133594 | 0.118896 |
| Phosphatidylethanolamine (16:0_20:4) levels | CRC | IVW | 5 | 0.058386 | 0.063574 | 0.358409 | -0.066218 | 0.18299 |
| Phosphatidylethanolamine (18:0_18:2) levels | CRC | IVW | 6 | 0.001873 | 0.052729 | 0.971659 | -0.101476 | 0.105223 |
| Phosphatidylethanolamine (18:0_20:4) levels | CRC | IVW | 5 | -0.002029 | 0.061209 | 0.973556 | -0.122 | 0.117942 |
| Phosphatidylethanolamine (18:1_18:1) levels | CRC | IVW | 8 | -0.029063 | 0.04912 | 0.554065 | -0.125339 | 0.067212 |
| Phosphatidylethanolamine (O-16:1_18:2) leve | CRC | IVW | 7 | 0.033988 | 0.062823 | 0.588502 | -0.089145 | 0.15712 |
| Phosphatidylethanolamine (O-16:1_20:4) leve | CRC | IVW | 4 | 0.064906 | 0.063232 | 0.30467 | -0.059029 | 0.188841 |
| Phosphatidylethanolamine (O-16:1_22:5) leve | CRC | IVW | 6 | -0.00329 | 0.064447 | 0.959284 | -0.129606 | 0.123026 |
| Phosphatidylethanolamine (O-18:1_18:2) leve | CRC | IVW | 9 | 0.027695 | 0.046815 | 0.554123 | -0.064062 | 0.119453 |
| Phosphatidylethanolamine (O-18:1_20:4) leve | CRC | IVW | 8 | 0.005815 | 0.04997 | 0.907365 | -0.092126 | 0.103755 |
| Phosphatidylethanolamine (O-18:2_18:1) leve | CRC | IVW | 5 | -0.048458 | 0.06231 | 0.436752 | -0.170585 | 0.07367 |
| Phosphatidylethanolamine (O-18:2_18:2) leve | CRC | IVW | 7 | 0.026388 | 0.05283 | 0.617442 | -0.07716 | 0.129935 |
| Phosphatidylethanolamine (O-18:2_20:4) leve | CRC | IVW | 7 | 0.011629 | 0.050601 | 0.818235 | -0.08755 | 0.110808 |
| Phosphatidylinositol (16:0_18:1) levels | CRC | IVW | 7 | 0.042791 | 0.054697 | 0.434016 | -0.064414 | 0.149997 |
| Phosphatidylinositol (16:0_18:2) levels | CRC | IVW | 5 | 0.063142 | 0.066002 | 0.338737 | -0.066222 | 0.192506 |
| Phosphatidylinositol (16:0_20:4) levels | CRC | IVW | 8 | 0.056352 | 0.052717 | 0.285092 | -0.046974 | 0.159678 |
| Phosphatidylinositol (18:0_18:1) levels | CRC | IVW | 9 | 0.021745 | 0.047444 | 0.646711 | -0.071245 | 0.114736 |
| Phosphatidylinositol (18:0_18:2) levels | CRC | IVW | 5 | 0.018381 | 0.066612 | 0.782599 | -0.112179 | 0.148941 |
| Phosphatidylinositol (18:0_20:3) levels | CRC | IVW | 8 | -0.012419 | 0.048326 | 0.797193 | -0.107138 | 0.0823 |
| Phosphatidylinositol (18:0_20:4) levels | CRC | IVW | 6 | 0.035701 | 0.054359 | 0.511336 | -0.070843 | 0.142245 |
| Phosphatidylinositol (18:1_18:1) levels | CRC | IVW | 8 | 0.011008 | 0.050185 | 0.826375 | -0.087355 | 0.109371 |
| Phosphatidylinositol (18:1_18:2) levels | CRC | IVW | 9 | 0.033391 | 0.046954 | 0.476993 | -0.058639 | 0.125422 |
| Phosphatidylinositol (18:1_20:4) levels | CRC | IVW | 6 | 0.044187 | 0.062192 | 0.477402 | -0.07771 | 0.166083 |
| Sphingomyelin (d32:1) levels | CRC | IVW | 6 | 0.025492 | 0.058677 | 0.663967 | -0.089515 | 0.140499 |
| Sphingomyelin (d34:0) levels | CRC | IVW | 7 | 0.056643 | 0.053147 | 0.286529 | -0.047526 | 0.160812 |
| Sphingomyelin (d34:1) levels | CRC | IVW | 7 | 0.028225 | 0.051021 | 0.580126 | -0.071776 | 0.128226 |
| Sphingomyelin (d34:2) levels | CRC | IVW | 8 | -0.001663 | 0.050436 | 0.973692 | -0.100518 | 0.097192 |
| Sphingomyelin (d36:1) levels | CRC | IVW | 4 | -0.022145 | 0.062968 | 0.725077 | -0.145563 | 0.101273 |
| Sphingomyelin (d36:2) levels | CRC | IVW | 6 | 0.028836 | 0.055673 | 0.604492 | -0.080284 | 0.137956 |
| Sphingomyelin (d38:1) levels | CRC | IVW | 7 | -0.020304 | 0.050968 | 0.690356 | -0.120201 | 0.079593 |
| Sphingomyelin (d38:2) levels | CRC | IVW | 4 | -0.016205 | 0.063089 | 0.797282 | -0.139859 | 0.107449 |
| Sphingomyelin (d40:1) levels | CRC | IVW | 5 | -0.044746 | 0.057311 | 0.434943 | -0.157077 | 0.067584 |
| Sphingomyelin (d40:2) levels | CRC | IVW | 7 | 0.032378 | 0.051001 | 0.525518 | -0.067583 | 0.13234 |
| Sphingomyelin (d42:2) levels | CRC | IVW | 5 | 0.049246 | 0.057315 | 0.390215 | -0.06309 | 0.161583 |
| Triacylglycerol (46:1) levels | CRC | IVW | 4 | -0.016025 | 0.068135 | 0.814054 | -0.149569 | 0.117519 |
| Triacylglycerol (46:2) levels | CRC | IVW | 6 | 0.045123 | 0.064328 | 0.483022 | -0.08096 | 0.171205 |
| Triacylglycerol (48:0) levels | CRC | IVW | 4 | 0.058987 | 0.075062 | 0.431963 | -0.088135 | 0.206108 |
| Triacylglycerol (48:1) levels | CRC | IVW | 4 | -0.043356 | 0.062606 | 0.488612 | -0.166064 | 0.079352 |
| Triacylglycerol (48:2) levels | CRC | IVW | 6 | -0.065665 | 0.054323 | 0.226742 | -0.172138 | 0.040808 |
| Triacylglycerol (48:3) levels | CRC | IVW | 6 | -0.022737 | 0.054383 | 0.675884 | -0.129327 | 0.083853 |
| Triacylglycerol (49:1) levels | CRC | IVW | 7 | -0.028303 | 0.056854 | 0.618617 | -0.139736 | 0.083131 |
| Triacylglycerol (49:2) levels | CRC | IVW | 6 | 0.010903 | 0.062949 | 0.862485 | -0.112476 | 0.134283 |
| Triacylglycerol (50:1) levels | CRC | IVW | 6 | -0.03044 | 0.053293 | 0.567875 | -0.134893 | 0.074014 |
| Triacylglycerol (50:2) levels | CRC | IVW | 6 | -0.045648 | 0.053167 | 0.390578 | -0.149856 | 0.05856 |
| Triacylglycerol (50:3) levels | CRC | IVW | 5 | -0.007671 | 0.060212 | 0.898628 | -0.125685 | 0.110344 |
| Triacylglycerol (50:4) levels | CRC | IVW | 5 | 0.004347 | 0.060254 | 0.94249 | -0.113751 | 0.122444 |
| Triacylglycerol (50:5) levels | CRC | IVW | 4 | -0.020601 | 0.070146 | 0.769 | -0.158086 | 0.116885 |
| Triacylglycerol (51:1) levels | CRC | IVW | 5 | 0.020214 | 0.066891 | 0.762501 | -0.110892 | 0.151321 |
| Triacylglycerol (51:2) levels | CRC | IVW | 6 | -0.059993 | 0.053237 | 0.259784 | -0.164338 | 0.044352 |
| Triacylglycerol (51:3) levels | CRC | IVW | 7 | -0.056709 | 0.050825 | 0.264524 | -0.156327 | 0.042909 |
| Triacylglycerol (51:4) levels | CRC | IVW | 7 | 0.05106 | 0.056323 | 0.364635 | -0.059332 | 0.161453 |
| Triacylglycerol (52:2) levels | CRC | IVW | 6 | -0.043088 | 0.053172 | 0.41774 | -0.147306 | 0.06113 |
| Triacylglycerol (52:3) levels | CRC | IVW | 6 | -0.041246 | 0.053117 | 0.437445 | -0.145356 | 0.062864 |
| Triacylglycerol (52:4) levels | CRC | IVW | 5 | -0.00602 | 0.060118 | 0.92024 | -0.123852 | 0.111812 |
| Triacylglycerol (52:5) levels | CRC | IVW | 4 | -0.008273 | 0.065199 | 0.899027 | -0.136062 | 0.119516 |
| Triacylglycerol (52:6) levels | CRC | IVW | 5 | 0.069933 | 0.061359 | 0.254398 | -0.050331 | 0.190196 |
| Triacylglycerol (53:2) levels | CRC | IVW | 5 | -0.061911 | 0.05799 | 0.285694 | -0.17557 | 0.051749 |
| Triacylglycerol (53:3) levels | CRC | IVW | 5 | -0.025205 | 0.060318 | 0.676043 | -0.143429 | 0.093019 |
| Triacylglycerol (53:4) levels | CRC | IVW | 7 | -0.029566 | 0.053355 | 0.579483 | -0.134143 | 0.07501 |
| Triacylglycerol (54:3) levels | CRC | IVW | 7 | -0.002145 | 0.053717 | 0.968149 | -0.107429 | 0.10314 |
| Triacylglycerol (54:4) levels | CRC | IVW | 8 | 0.000488 | 0.047478 | 0.991791 | -0.092569 | 0.093546 |
| Triacylglycerol (54:5) levels | CRC | IVW | 7 | 0.017476 | 0.052328 | 0.738402 | -0.085087 | 0.120038 |
| Triacylglycerol (54:6) levels | CRC | IVW | 6 | -0.014557 | 0.052581 | 0.781895 | -0.117615 | 0.088501 |
| Triacylglycerol (54:7) levels | CRC | IVW | 8 | -0.027391 | 0.04758 | 0.564829 | -0.120649 | 0.065866 |
| Triacylglycerol (56:3) levels | CRC | IVW | 6 | 0.01944 | 0.057633 | 0.735884 | -0.093521 | 0.132401 |
| Triacylglycerol (56:4) levels | CRC | IVW | 5 | 0.011419 | 0.062745 | 0.855585 | -0.111561 | 0.1344 |
| Triacylglycerol (56:5) levels | CRC | IVW | 6 | -0.004733 | 0.064605 | 0.941593 | -0.13136 | 0.121893 |
| Triacylglycerol (56:6) levels | CRC | IVW | 6 | -0.007388 | 0.055204 | 0.893539 | -0.115588 | 0.100812 |
| Triacylglycerol (56:7) levels | CRC | IVW | 6 | -0.038413 | 0.055098 | 0.485688 | -0.146404 | 0.069578 |
| Triacylglycerol (56:8) levels | CRC | IVW | 6 | -0.032778 | 0.056511 | 0.561893 | -0.14354 | 0.077984 |
| Triacylglycerol (58:7) levels | CRC | IVW | 5 | -0.018134 | 0.069637 | 0.794552 | -0.154623 | 0.118355 |
| Triacylglycerol (58:8) levels | CRC | IVW | 4 | -0.023398 | 0.06718 | 0.727625 | -0.15507 | 0.108274 |

These are selected and significantly reduced contents. Showing results for the main method only. Readers may request the nonmodified whole contents by contacting the corresponding authors of the current study: weiguoli1987@163.com (G.W.); Huojiege@jsatcm.com (J. H.)

Table S9. Summary of co-localization analysis results

| phenotype | nsnps | PP.H0.abf | PP.H1.abf | PP.H2.abf | PP.H3.abf | PP.H4.abf |
|---|---|---|---|---|---|---|
| Sterol ester (27:1/20:4) levels | 210 | 2.17E-253 | 0.230656 | 9.52E-255 | 0.00937 | 76.00% |
| Sterol ester (27:1/20:5) levels | 298 | 7.15E-128 | 0.010232 | 2.15E-127 | 0.029828 | 95.99% |
| Phosphatidylcholine (20:4_0:0) levels | 269 | 4.71E-195 | 0.014161 | 1.56E-194 | 0.045902 | 93.99% |
| Phosphatidylcholine (16:0_18:0) levels | 320 | 5.48E-14 | 0.020803 | 1.22E-13 | 0.045351 | 93.38% |
| Phosphatidylcholine (16:0_22:4) levels | 258 | 9.24E-59 | 0.017916 | 3.02E-58 | 0.057584 | 92.45% |
| Phosphatidylcholine (16:0_22:5) levels | 244 | 1.70E-129 | 0.017907 | 4.09E-129 | 0.042247 | 93.98% |
| Phosphatidylcholine (18:0_20:5) levels | 256 | 1.38E-131 | 0.012185 | 4.11E-131 | 0.035355 | 95.25% |
| Phosphatidylcholine (18:1_20:2) levels | 298 | 4.20E-117 | 0.009734 | 1.27E-116 | 0.028512 | 96.18% |
| Phosphatidylcholine (O-18:1_18:2) levels | 258 | 3.64E-35 | 0.0162 | 1.19E-34 | 0.051973 | 93.18% |
| Phosphatidylethanolamine (18:2_0:0) levels | 275 | 8.44E-93 | 0.007631 | 2.79E-92 | 0.024285 | 96.81% |