



Supplementary Figure 1 Forest plots for the Mendelian randomization leave-one-out analysis of the significant inverse variance weighted estimates.

Supplementary Table 1 List of the identification for each of the 486 blood metabolites

ID	Metabolites
M00053	glutamine
M00054	tryptophan
M00059	histidine
M00060	leucine
M00063	cholesterol
M00064	phenylalanine
M00513	creatinine
M00527	lactate
M00542	3-hydroxybutyrate (BHBA)
M00553	cotinine
M00569	caffeine
M00575	arabinose
M00577	fructose
M00584	mannose
M00599	pyruvate
M00606	uridine
M01105	linoleate (18:2n6)
M01107	allantoin
M01110	arachidonate (20:4n6)
M01114	deoxycholate
M01121	margarate (17:0)
M01123	inosine
M01125	isoleucine
M01284	threonine
M01299	tyrosine
M01301	lysine
M01302	methionine
M01303	malate
M01336	palmitate (16:0)
M01356	nonadecanoate (19:0)
M01358	stearate (18:0)
M01359	oleate (18:1n9)
M01361	pentadecanoate (15:0)
M01365	myristate (14:0)
M01444	pipecolate
M01493	ornithine
M01494	5-oxoproline
M01508	pantothenate
M01515	salicylate
M01558	4-acetamidobutanoate
M01561	alpha-tocopherol

M01564 citrate
M01572 glycerate
M01573 guanosine
M01585 N-acetylalanine
M01604 urate
M01605 ursodeoxycholate
M01638 arginine
M01640 ascorbate (Vitamin C)
M01644 heptanoate (7:0)
M01645 laurate (12:0)
M01649 valine
M01670 urea
M01712 cortisol
M01769 cortisone
M01898 proline
M02132 citrulline
M02137 biliverdin
M02342 serotonin (5HT)
M02730 gamma-glutamylglutamine
M02734 gamma-glutamyltyrosine
M03127 hypoxanthine
M03141 betaine
M03147 xanthine
M10642 caprate (10:0)
M11438 phosphate
M12017 3-methoxytyrosine
M12035 pelargonate (9:0)
M12067 undecanoate (11:0)
M12129 beta-hydroxyisovalerate
M12261 taurodeoxycholate
M12593 X-02973
M12626 X-03003
M12768 X-03088
M12774 X-03094
M15122 glycerol
M15140 kynurenine
M15335 mannitol
M15365 glycerol 3-phosphate (G3P)
M15488 acetylphosphate
M15500 carnitine
M15506 choline
M15630 N-acetyloronithine
M15650 N1-methyladenosine
M15676 3-methyl-2-oxovalerate

M15677 3-methylhistidine
M15749 3-phenylpropionate (hydrocinnamate)
M15753 hippurate
M15778 benzoate
M15958 phenylacetate
M15990 glycerophosphorylcholine (GPC)
M15996 aspartate
M16634 X-04357
M16816 X-04494
M16818 X-04495
M16821 X-04498
M16822 X-04499
M16823 X-04500
M17799 ibuprofen
M17805 dihomolimonoleate (20:2n6)
M17807 X-18601
M17945 2-hydroxystearate
M18254 paraxanthine
M18281 2-hydroxyhippurate (salicylurate)
M18283 X-05426
M18335 quinate
M18349 indolelactate
M18357 glycylvaline
M18369 gamma-glutamylleucine
M18392 theobromine
M18394 theophylline
M18467 eicosapentaenoate (EPA; 20:5n3)
M18474 estrone 3-sulfate
M18476 glycocholate
M18477 glycodeoxycholate
M18494 taurochenodeoxycholate
M18497 taurocholate
M18929 X-05907
M19323 docosahexaenoate (DHA; 22:6n3)
M19324 1-stearoylglycerophosphoinositol
M19362 X-06226
M19364 X-06246
M19368 X-06267
M19396 X-06307
M19414 X-06350
M19415 X-06351
M19934 myo-inositol
M20489 glucose
M20675 1,5-anhydroglucitol (1,5-AG)

M20699 erythritol
M21044 2-hydroxybutyrate (AHB)
M21047 3-methyl-2-oxobutyrate
M21049 1,6-anhydroglucose
M21127 1-palmitoylglycerol (1-monopalmitin)
M21151 saccharin
M21184 1-oleoylglycerol (1-monoolein)
M21188 1-stearoylglycerol (1-monostearin)
M21630 X-08402
M22030 2-hydroxyisobutyrate
M22032 X-08766
M22116 4-methyl-2-oxopentanoate
M22130 phenyllactate (PLA)
M22138 homocitrulline
M22175 aspartylphenylalanine
M22177 levulinate (4-oxovalerate)
M22189 palmitoylcarnitine
M22481 X-08988
M22548 X-09026
M22649 X-09108
M22842 cholate
M24074 X-09706
M25459 X-10395
M25599 X-10429
M27256 X-10500
M27273 X-10506
M27278 X-10510
M27447 1-linoleoylglycerol (1-monolinolein)
M27513 indoleacetate
M27531 hyodeoxycholate
M27672 3-indoxyl sulfate
M27710 N-acetylglycine
M27716 bilirubin (Z,Z)
M27718 creatine
M27722 erythrose
M27728 glycerol 2-phosphate
M27738 threonate
M30805 X-10810
M31453 cysteine
M31522 pyroglutamylglycine
M31536 N-(2-furoyl)glycine
M31548 DSGEGDFXAEGGGVR*
M31555 pyridoxate
M31591 androsterone sulfate

M31787 3-carboxy-4-methyl-5-propyl-2-furanpropanoate (CMPF)
M32197 3-(4-hydroxyphenyl)lactate
M32198 acetylcarnitine
M32315 serine
M32319 trans-4-hydroxyproline
M32322 glutamate
M32328 hexanoylcarnitine
M32338 glycine
M32339 alanine
M32346 glycochenodeoxycholate
M32348 2-aminobutyrate
M32379 scyllo-inositol
M32388 dodecanedioate
M32393 gamma-glutamylvaline
M32405 indolepropionate
M32412 butyrylcarnitine
M32418 myristoleate (14:1n5)
M32425 dehydroisoandrosterone sulfate (DHEA-S)
M32445 3-methylxanthine
M32452 propionylcarnitine
M32489 caproate (6:0)
M32492 caprylate (8:0)
M32497 10-undecenoate (11:1n1)
M32504 docosapentaenoate (n3 DPA; 22:5n3)
M32518 X-11204
M32549 X-02269
M32553 phenol sulfate
M32557 X-06126
M32560 X-07765
M32564 X-11247
M32578 X-11261
M32586 bilirubin (E,E)*
M32587 X-02249
M32593 heme*
M32616 X-11299
M32632 X-11315
M32634 X-11317
M32635 1-linoleoylglycerophosphoethanolamine*
M32644 X-11327
M32651 X-11334
M32654 3-dehydrocarnitine*
M32672 pyroglutamine*
M32675 C-glycosyltryptophan*
M32691 X-11374

M32698 X-11381
M32709 X-03056
M32729 X-11412
M32735 X-01911
M32739 X-11422
M32740 X-11423
M32753 X-09789
M32754 X-11437
M32755 X-11438
M32757 X-11440
M32758 X-11441
M32759 X-11442
M32761 X-11444
M32762 X-11445
M32769 X-11452
M32786 X-11469
M32787 X-11470
M32795 X-11478
M32800 X-11483
M32802 X-11485
M32808 X-11491
M32814 X-11497
M32836 HWESASXX*
M32838 X-11521
M32846 X-11529
M32847 X-11530
M32854 X-11537
M32855 X-11538
M32857 X-11540
M32863 X-11546
M32867 X-11550
M32869 X-11552
M32910 X-11593
M32980 adrenate (22:4n6)
M33009 homostachydrine*
M33084 ADSGEGDFXAEGGGVR*
M33131 X-11786
M33132 X-11787
M33137 X-11792
M33138 X-11793
M33140 X-11795
M33144 X-11799
M33150 X-11805
M33163 X-11818

M33165 X-11820
M33173 2-hydroxyacetaminophen sulfate*
M33178 2-methoxyacetaminophen sulfate*
M33188 X-11843
M33190 X-11845
M33192 X-11847
M33194 X-11849
M33195 X-11850
M33197 X-11852
M33203 X-11858
M33204 X-11859
M33221 X-11876
M33228 1-arachidonoylglycerophosphocholine*
M33230 1-palmitoleoylglycerophosphocholine*
M33250 X-11905
M33353 X-12007
M33359 X-12013
M33363 gamma-glutamylmethionine*
M33364 gamma-glutamylthreonine*
M33380 X-12029
M33384 salicyluric glucuronide*
M33389 X-12038
M33390 X-12039
M33391 X-12040
M33408 X-12056
M33415 X-12063
M33420 gamma-tocopherol
M33422 gamma-glutamylphenylalanine
M33423 p-acetamidophenylglucuronide
M33441 isobutyrylcarnitine
M33442 pseudouridine
M33443 valerate
M33447 palmitoleate (16:1n7)
M33453 alpha-ketoglutarate
M33477 erythronate*
M33488 lathosterol
M33507 X-12092
M33508 X-12093
M33509 X-12094
M33510 X-12095
M33515 X-12100
M33531 X-12116
M33587 eicosenoate (20:1n9 or 11)
M33609 X-12188

M33610 X-12189
M33627 X-12206
M33633 X-12212
M33637 X-12216
M33638 X-12217
M33652 X-12230
M33653 X-12231
M33658 X-12236
M33666 X-12244
M33675 X-12253
M33683 X-12261
M33751 X-12329
M33782 X-10346
M33801 ADpSGEGDFXAEGGGVR*
M33821 1-eicosatrienoylglycerophosphocholine*
M33822 1-docosahexaenoylglycerophosphocholine*
M33833 X-12405
M33835 X-12407
M33864 X-12428
M33871 1-eicosadienoylglycerophosphocholine*
M33877 X-12435
M33883 X-12441
M33884 X-12442
M33885 X-12443
M33892 X-12450
M33901 X-12456
M33910 X-12465
M33935 piperine
M33936 octanoylcarnitine
M33937 alpha-hydroxyisovalerate
M33939 N-acetylthreonine
M33941 decanoylcarnitine
M33955 1-palmitoylglycerophosphocholine
M33957 1-heptadecanoylglycerophosphocholine
M33960 1-oleoylglycerophosphocholine
M33961 1-stearoylglycerophosphocholine
M33968 5-dodecenoate (12:1n7)
M33969 stearidonate (18:4n3)
M33971 10-heptadecenoate (17:1n7)
M33972 10-nonadecenoate (19:1n9)
M33973 epiandrosterone sulfate
M34035 linolenate [alpha or gamma; (18:3n3 or 6)]
M34040 X-12510
M34062 X-12524

M34106 bilirubin (E,Z or Z,E)*
M34109 metoprolol acid metabolite*
M34112 X-12544
M34123 X-12556
M34214 1-arachidonoylglycerophosphoinositol*
M34221 X-12627
M34244 X-12644
M34245 X-12645
M34283 asparagine
M34289 X-12680
M34306 X-12696
M34314 X-12704
M34322 X-12712
M34327 X-12717
M34329 X-12719
M34336 X-12726
M34338 X-12728
M34339 X-12729
M34344 X-12734
M34350 X-12740
M34359 X-12749
M34365 3-(cystein-S-yl)acetaminophen*
M34384 stachydrine
M34389 1-methylxanthine
M34390 7-methylxanthine
M34395 1-methylurate
M34400 1,7-dimethylurate
M34404 1,3,7-trimethylurate
M34407 isovalerylcarnitine
M34409 stearoylcarnitine
M34416 1-stearoylglycerophosphoethanolamine
M34419 1-linoleoylglycerophosphocholine
M34420 bradykinin, des-arg(9)
M34441 X-12771
M34453 X-12776
M34456 gamma-glutamylisoleucine*
M34469 X-12786
M34481 X-12798
M34499 X-12816
M34513 X-12830
M34516 X-12833
M34527 X-12844
M34530 X-12847
M34533 X-12850

M34534 laurycarnitine
M34535 X-12851
M34539 X-12855
M34674 X-12990
M34732 isovalerate
M34761 X-13069
M34878 X-13183
M34912 X-13215
M35114 7-methylguanidine
M35126 phenylacetylglutamine
M35127 pro-hydroxy-pro
M35137 N2,N2-dimethylguanosine
M35159 cysteine-glutathione disulfide
M35160 oleoylcarnitine
M35186 1-arachidonoylglycerophosphoethanolamine*
M35187 X-13429
M35189 X-13431
M35193 X-13435
M35240 X-13477
M35253 2-palmitoylglycerophosphocholine*
M35254 2-oleoylglycerophosphocholine*
M35255 2-stearoylglycerophosphocholine*
M35257 2-linoleoylglycerophosphocholine*
M35270 X-13496
M35305 1-palmitoylglycerophosphoinositol*
M35320 catechol sulfate
M35322 hydroquinone sulfate
M35326 X-13548
M35327 X-13549
M35331 X-13553
M35397 X-13619
M35431 2-methylbutyroylcarnitine
M35433 hydroxyisovaleroyl carnitine
M35439 glutaroyl carnitine
M35451 X-13658
M35464 X-13671
M35472 2-tetradecenoyl carnitine
M35527 4-hydroxyhippurate
M35551 X-13741
M35626 1-myristoylglycerophosphocholine
M35628 1-oleoylglycerophosphoethanolamine
M35631 1-palmitoylglycerophosphoethanolamine
M35635 3-(3-hydroxyphenyl)propionate
M35669 tetradecanedioate

M35675 2-hydroxypalmitate
M35678 hexadecanedioate
M35718 dihomolinenate (20:3n3 or n6)
M35754 X-13859
M35854 threitol
M35977 X-14056
M35978 X-14057
M36009 X-14086
M36095 thymol sulfate
M36097 4-acetaminophen sulfate
M36098 4-vinylphenol sulfate
M36099 4-ethylphenylsulfate
M36103 p-cresol sulfate
M36115 X-14189
M36131 X-14205
M36134 X-14208
M36230 X-14304
M36300 X-14374
M36376 X-14450
M36399 X-14473
M36468 X-14541
M36515 X-14588
M36552 X-14625
M36553 X-14626
M36559 X-14632
M36585 X-14658
M36589 X-14662
M36673 X-14745
M36738 gamma-glutamylglutamate
M36754 octadecanedioate
M36756 leucylleucine
M36776 7-alpha-hydroxy-3-oxo-4-cholestenoate (7-Hoca)
M36802 n-Butyl Oleate
M36808 dimethylarginine (SDMA + ADMA)
M36850 taurothiocholate 3-sulfate
M37004 X-14977
M37058 succinylcarnitine
M37097 tryptophan betaine
M37104 cyclo(leu-pro)
M37112 chiro-inositol
M37190 5alpha-androstan-3beta,17beta-diol disulfate
M37202 4-androsten-3beta,17beta-diol disulfate 1*
M37203 4-androsten-3beta,17beta-diol disulfate 2*
M37253 2-hydroxyglutarate

M37459 ergothioneine
M37506 palmitoyl sphingomyelin
M38150 phenylalanylphenylalanine
M38178 cis-4-decenoyl carnitine
M38768 15-methylpalmitate (isobar with 2-methylpalmitate)

Supplementary Table 2 Detailed data of instrumental variables

exposure	SNP	effect_allele.exposure	other_allele.exposure	beta.exposure	eaf.exposure	se.exposure	pval.exposure	mr_keep.exposure	R2	F
M00054,tryptophan	rs1000137	T	C	-0.005	0.475	0.001	5.73E-07	TRUE	0.003185	25
M00054,tryptophan	rs1013667	A	G	-0.004	0.6087	9.00E-04	5.67E-06	TRUE	0.002645	20.75309
M00054,tryptophan	rs1015795	A	G	0.0043	0.5122	9.00E-04	2.26E-06	TRUE	0.002909	22.82716
M00054,tryptophan	rs1015993	T	C	0.0041	0.4684	9.00E-04	7.31E-06	TRUE	0.002645	20.75309
M00054,tryptophan	rs1016522	A	G	0.0058	0.5803	9.00E-04	1.59E-10	TRUE	0.00528	41.53086
M00054,tryptophan	rs10225863	T	C	-0.004	0.3949	9.00E-04	9.75E-06	TRUE	0.002518	19.75309
M00054,tryptophan	rs10495209	T	C	0.004	0.4862	9.00E-04	8.02E-06	TRUE	0.002518	19.75309
M00054,tryptophan	rs10498266	T	G	0.0043	0.4674	9.00E-04	2.35E-06	TRUE	0.002909	22.82716
M00054,tryptophan	rs10750415	T	G	0.0042	0.3959	9.00E-04	2.77E-06	TRUE	0.002776	21.77778
M00054,tryptophan	rs10784496	A	G	0.0045	0.5375	9.00E-04	5.09E-07	TRUE	0.003185	25

M00054,tryptophan	rs10807	A	T	0.0043	0.5866	9.00E-04	1.97E-06	TRUE	0.002	22.82716
M00054,tryptophan	rs10822	T	C	0.0042	0.5141	9.00E-04	2.65E-06	TRUE	0.002	21.77778
M00054,tryptophan	rs10836	T	C	0.005	0.607	0.001	5.73E-07	TRUE	0.003	25
M00054,tryptophan	rs10846	T	C	0.0045	0.4861	9.00E-04	1.65E-06	TRUE	0.003	25
M00054,tryptophan	rs10881	T	C	0.0041	0.4824	9.00E-04	3.39E-06	TRUE	0.002	20.75309
M00054,tryptophan	rs10900	A	C	-0.004	0.4158	9.00E-04	9.74E-07	TRUE	0.003	23.90123
M00054,tryptophan	rs10927	A	C	-0.005	0.3738	9.00E-04	2.72E-07	TRUE	0.003	26.12346
M00054,tryptophan	rs10931	T	C	-0.004	0.5756	9.00E-04	3.36E-06	TRUE	0.002	21.77778
M00054,tryptophan	rs11201	A	T	0.0043	0.6064	9.00E-04	1.89E-06	TRUE	0.002	22.82716
M00054,tryptophan	rs11678	T	C	0.0041	0.4138	9.00E-04	5.94E-06	TRUE	0.002	20.75309
M00054,tryptophan	rs11719	A	T	-0.004	0.3965	9.00E-04	5.12E-06	TRUE	0.002	20.75309
M00054,tryptophan	rs11720	T	G	-0.005	0.6034	9.00E-04	3.58E-07	TRUE	0.003	26.12346
M00054,tryptophan	rs11729	T	G	0.004	0.6133	9.00E-04	8.61E-06	TRUE	0.002	19.75309

M00054,tryptophan	rs11796	A	C	-0.005	0.5356	0.001	1.83E-06	TRUE	0.002	20.25
M00054,tryptophan	rs11802	T	C	-0.004	0.5816	9.00E-04	4.47E-06	TRUE	0.002	20.75309
M00054,tryptophan	rs11804	T	C	0.0041	0.4678	9.00E-04	4.61E-06	TRUE	0.002	20.75309
M00054,tryptophan	rs12206	A	G	-0.005	0.6312	9.00E-04	9.29E-07	TRUE	0.003	26.12346
M00054,tryptophan	rs12278	T	C	0.0043	0.5229	9.00E-04	1.56E-06	TRUE	0.002	22.82716
M00054,tryptophan	rs12468	T	C	-0.004	0.5436	9.00E-04	1.25E-06	TRUE	0.003	23.90123
M00054,tryptophan	rs12494	A	G	0.0042	0.3741	9.00E-04	3.68E-06	TRUE	0.002	21.77778
M00054,tryptophan	rs12533	A	T	0.0045	0.3887	9.00E-04	6.52E-07	TRUE	0.003	25
M00054,tryptophan	rs13001	T	C	-0.004	0.3823	9.00E-04	7.45E-06	TRUE	0.002	19.75309
M00054,tryptophan	rs13008	A	C	-0.004	0.4038	9.00E-04	3.32E-06	TRUE	0.002	21.77778
M00054,tryptophan	rs13056	T	C	0.0043	0.4376	9.00E-04	5.58E-06	TRUE	0.002	22.82716
M00054,tryptophan	rs13122	T	C	0.0062	0.5542	9.00E-04	8.95E-12	TRUE	0.006	47.45679
M00054,tryptophan	rs13309	A	C	0.0042	0.6132	9.00E-04	2.21E-06	TRUE	0.002	21.77778

M00054,tryptophan	rs1349704	A	G	0.0044	0.4611	9.00E-04	8.31E-07	TRUE	0.003046	23.90123
M00054,tryptophan	rs1373962	T	C	0.005	0.5973	9.00E-04	2.71E-08	TRUE	0.003929	30.8642
M00054,tryptophan	rs1418942	A	C	-0.004	0.5751	9.00E-04	7.13E-06	TRUE	0.002518	19.75309
M00054,tryptophan	rs1508513	C	G	0.0042	0.6354	9.00E-04	2.36E-06	TRUE	0.002776	21.77778
M00054,tryptophan	rs1519309	T	C	-0.004	0.6544	9.00E-04	1.21E-06	TRUE	0.003046	23.90123
M00054,tryptophan	rs154246	T	C	-0.005	0.6103	9.00E-04	6.70E-08	TRUE	0.003774	29.64198
M00054,tryptophan	rs1549225	T	C	0.0045	0.607	9.00E-04	6.06E-07	TRUE	0.003185	25
M00054,tryptophan	rs1559063	C	G	0.0052	0.6209	9.00E-04	7.82E-09	TRUE	0.004249	33.38272
M00054,tryptophan	rs1663501	A	G	-0.005	0.4634	9.00E-04	2.44E-07	TRUE	0.003474	27.2716
M00054,tryptophan	rs16823952	T	G	-0.008	0.9069	0.0018	5.08E-06	TRUE	0.00271	21.26235
M00054,tryptophan	rs16836288	A	C	0.0131	0.044	0.0029	5.60E-06	TRUE	0.002601	20.40547
M00054,tryptophan	rs1697901	A	G	0.0049	0.3501	9.00E-04	6.31E-08	TRUE	0.003774	29.64198
M00054,tryptophan	rs17114354	A	G	0.0248	0.9874	0.0053	3.52E-06	TRUE	0.002791	21.89534

M00054,tryptophan	rs17698	A	C	-0.004	0.5682	9.00E-04	5.50E-06	TRUE	0.002645	20.75309
M00054,tryptophan	rs17744	T	C	-0.004	0.4582	9.00E-04	4.16E-06	TRUE	0.002645	20.75309
M00054,tryptophan	rs17903	T	C	0.0048	0.5227	9.00E-04	5.79E-08	TRUE	0.003622	28.44444
M00054,tryptophan	rs19959	A	G	-0.005	0.5949	9.00E-04	1.63E-07	TRUE	0.003474	27.2716
M00054,tryptophan	rs19972	A	G	0.0045	0.5117	9.00E-04	6.07E-07	TRUE	0.003185	25
M00054,tryptophan	rs20126	T	G	0.0047	0.5563	9.00E-04	1.36E-07	TRUE	0.003474	27.2716
M00054,tryptophan	rs20636	A	C	-0.011	0.2487	0.0023	5.24E-06	TRUE	0.002759	21.64272
M00054,tryptophan	rs20912	A	G	0.0043	0.5943	9.00E-04	1.50E-06	TRUE	0.002909	22.82716
M00054,tryptophan	rs21782	T	C	0.0042	0.4251	9.00E-04	3.59E-06	TRUE	0.002776	21.77778
M00054,tryptophan	rs22160	A	C	0.0043	0.512	9.00E-04	2.21E-06	TRUE	0.002909	22.82716
M00054,tryptophan	rs22305	T	C	0.005	0.349	0.001	5.73E-07	TRUE	0.003185	25
M00054,tryptophan	rs23497	A	G	-0.004	0.5141	9.00E-04	6.45E-06	TRUE	0.002645	20.75309
M00054,tryptophan	rs23831	T	C	-0.004	0.4403	9.00E-04	3.05E-06	TRUE	0.002909	22.82716

M00054,tryptophan	rs2432	T	C	0.0046	0.4713	9.00E-04	4.28E-07	TRUE	0.003328	26.12346
M00054,tryptophan	rs2484178	T	C	0.0043	0.6063	9.00E-04	1.75E-06	TRUE	0.002909	22.82716
M00054,tryptophan	rs2520117	A	G	0.0045	0.4545	9.00E-04	5.06E-07	TRUE	0.003185	25
M00054,tryptophan	rs2580344	T	C	0.0044	0.6238	9.00E-04	7.98E-07	TRUE	0.003046	23.90123
M00054,tryptophan	rs2604365	T	G	0.0044	0.6371	9.00E-04	1.45E-06	TRUE	0.003046	23.90123
M00054,tryptophan	rs2658761	T	C	-0.005	0.4343	9.00E-04	6.75E-08	TRUE	0.003622	28.44444
M00054,tryptophan	rs2662269	A	C	0.0045	0.417	9.00E-04	7.12E-07	TRUE	0.003185	25
M00054,tryptophan	rs2688858	T	C	0.0043	0.5742	9.00E-04	2.84E-06	TRUE	0.002909	22.82716
M00054,tryptophan	rs2717586	A	G	0.0043	0.3962	9.00E-04	2.31E-06	TRUE	0.002909	22.82716
M00054,tryptophan	rs2722407	A	G	0.0041	0.587	9.00E-04	6.47E-06	TRUE	0.002645	20.75309
M00054,tryptophan	rs2769419	A	G	0.004	0.4777	9.00E-04	6.16E-06	TRUE	0.002518	19.75309
M00054,tryptophan	rs2798184	T	C	-0.005	0.4314	9.00E-04	6.37E-08	TRUE	0.003774	29.64198
M00054,tryptophan	rs2813760	A	G	0.0044	0.5775	9.00E-04	1.19E-06	TRUE	0.003046	23.90123

M00054,tryptophan	rs28419	A	G	-0.006	0.615	0.001	1.97E-09	TRUE	0.004	36
M00054,tryptophan	rs28680	A	G	0.004	0.4829	9.00E-04	9.04E-06	TRUE	0.002	19.75309
M00054,tryptophan	rs29514	A	G	-0.005	0.5909	9.00E-04	1.54E-07	TRUE	0.003	28.44444
M00054,tryptophan	rs29660	T	C	-0.004	0.5425	9.00E-04	2.53E-06	TRUE	0.002	21.77778
M00054,tryptophan	rs29703	A	C	0.0044	0.4039	9.00E-04	1.02E-06	TRUE	0.003	23.90123
M00054,tryptophan	rs29772	T	C	0.005	0.341	0.001	5.73E-07	TRUE	0.003	25
M00054,tryptophan	rs33980	C	G	-0.008	0.9071	0.0017	9.11E-06	TRUE	0.002	20.51557
M00054,tryptophan	rs34197	T	C	0.005	0.493	0.001	5.73E-07	TRUE	0.003	25
M00054,tryptophan	rs37429	T	C	-0.004	0.512	9.00E-04	1.01E-06	TRUE	0.003	23.90123
M00054,tryptophan	rs37511	A	G	0.0041	0.6085	9.00E-04	5.19E-06	TRUE	0.002	20.75309
M00054,tryptophan	rs37723	A	C	0.028	0.987	0.006	3.06E-06	TRUE	0.002	21.77778
M00054,tryptophan	rs37737	T	C	0.004	0.6291	9.00E-04	8.57E-06	TRUE	0.002	19.75309
M00054,tryptophan	rs37804	T	C	-0.023	0.9855	0.0051	7.02E-06	TRUE	0.002	20.33833

M00054,tryptophan	rs38271	A	G	-0.005	0.5925	9.00E-04	1.19E-08	TRUE	0.004087	32.11111
M00054,tryptophan	rs4063769	T	C	-0.004	0.5301	9.00E-04	1.30E-06	TRUE	0.002909	22.82716
M00054,tryptophan	rs4144737	A	G	0.004	0.5818	9.00E-04	9.86E-06	TRUE	0.002518	19.75309
M00054,tryptophan	rs42162	T	C	0.004	0.5492	9.00E-04	8.22E-06	TRUE	0.002518	19.75309
M00054,tryptophan	rs428185	T	C	-0.005	0.5851	9.00E-04	6.25E-07	TRUE	0.003185	25
M00054,tryptophan	rs4356783	C	G	-0.004	0.5863	9.00E-04	6.75E-06	TRUE	0.002645	20.75309
M00054,tryptophan	rs4611118	A	G	-0.004	0.609	9.00E-04	9.41E-07	TRUE	0.003046	23.90123
M00054,tryptophan	rs4684599	T	C	-0.004	0.6319	9.00E-04	2.89E-06	TRUE	0.002776	21.77778
M00054,tryptophan	rs4702007	A	G	-0.004	0.3929	9.00E-04	6.11E-06	TRUE	0.002645	20.75309
M00054,tryptophan	rs4751282	T	C	0.0045	0.5421	9.00E-04	7.41E-07	TRUE	0.003185	25
M00054,tryptophan	rs4755291	A	G	-0.004	0.4644	9.00E-04	5.25E-06	TRUE	0.002645	20.75309
M00054,tryptophan	rs4849291	C	G	0.0041	0.6092	9.00E-04	5.93E-06	TRUE	0.002645	20.75309
M00054,tryptophan	rs4880888	A	G	-0.005	0.4785	9.00E-04	3.24E-07	TRUE	0.003328	26.12346

M00054,tryptophan	rs4926571	T	C	-0.005	0.5231	9.00E-04	9.03E-08	TRUE	0.003622	28.44444
M00054,tryptophan	rs4958379	A	G	-0.005	0.433	9.00E-04	2.18E-08	TRUE	0.003929	30.8642
M00054,tryptophan	rs4972588	A	G	-0.005	0.5138	9.00E-04	3.74E-07	TRUE	0.003328	26.12346
M00054,tryptophan	rs4989308	A	G	-0.005	0.3746	9.00E-04	8.43E-07	TRUE	0.003185	25
M00054,tryptophan	rs502654	T	C	-0.005	0.559	9.00E-04	2.60E-07	TRUE	0.003328	26.12346
M00054,tryptophan	rs575257	A	G	-0.004	0.6005	9.00E-04	3.51E-06	TRUE	0.002776	21.77778
M00054,tryptophan	rs6001129	T	C	-0.009	0.134	0.002	6.80E-06	TRUE	0.002582	20.25
M00054,tryptophan	rs603446	T	C	0.0051	0.4448	9.00E-04	1.38E-08	TRUE	0.004087	32.11111
M00054,tryptophan	rs6110544	T	C	0.004	0.4394	9.00E-04	7.01E-06	TRUE	0.002518	19.75309
M00054,tryptophan	rs6130271	T	C	-0.004	0.5352	9.00E-04	7.40E-06	TRUE	0.002518	19.75309
M00054,tryptophan	rs6435723	T	C	-0.008	0.8977	0.0018	6.91E-06	TRUE	0.002518	19.75309
M00054,tryptophan	rs6454864	T	C	0.004	0.3705	9.00E-04	8.87E-06	TRUE	0.002518	19.75309
M00054,tryptophan	rs6480970	A	G	-0.005	0.6159	9.00E-04	4.29E-08	TRUE	0.003774	29.64198

M00054,tryptophan	rs65172	T	C	-0.004	0.3971	9.00E-04	3.12E-06	TRUE	0.002776	21.77778
M00054,tryptophan	rs65346	C	G	-0.004	0.4186	9.00E-04	1.49E-06	TRUE	0.002909	22.82716
M00054,tryptophan	rs65862	A	C	0.0043	0.4598	9.00E-04	1.62E-06	TRUE	0.002909	22.82716
M00054,tryptophan	rs67476	A	G	-0.004	0.5825	9.00E-04	4.36E-06	TRUE	0.002645	20.75309
M00054,tryptophan	rs67599	T	G	0.0076	0.8623	0.0016	2.52E-06	TRUE	0.002875	22.5625
M00054,tryptophan	rs68195	A	G	-0.004	0.5862	9.00E-04	3.69E-06	TRUE	0.002909	22.82716
M00054,tryptophan	rs68235	T	G	0.0044	0.5812	9.00E-04	6.54E-07	TRUE	0.003046	23.90123
M00054,tryptophan	rs68262	T	C	0.0048	0.5071	9.00E-04	8.80E-08	TRUE	0.003622	28.44444
M00054,tryptophan	rs69107	A	G	0.0041	0.4497	9.00E-04	6.68E-06	TRUE	0.002645	20.75309
M00054,tryptophan	rs69359	A	G	-0.006	0.5578	9.00E-04	3.75E-10	TRUE	0.004924	38.71605
M00054,tryptophan	rs69985	T	C	0.004	0.3661	9.00E-04	8.01E-06	TRUE	0.002518	19.75309
M00054,tryptophan	rs70096	T	C	0.0041	0.6243	9.00E-04	6.17E-06	TRUE	0.002645	20.75309
M00054,tryptophan	rs71058	A	C	-0.005	0.3566	9.00E-04	3.57E-08	TRUE	0.003929	30.8642

M00054,tryptophan	rs7109477	A	G	-0.005	0.4588	9.00E-04	1.89E-07	TRUE	0.003474	27.2716
M00054,tryptophan	rs719564	A	G	0.0044	0.6101	9.00E-04	1.28E-06	TRUE	0.003046	23.90123
M00054,tryptophan	rs7198470	T	C	0.004	0.6081	9.00E-04	9.00E-06	TRUE	0.002518	19.75309
M00054,tryptophan	rs7230740	A	C	0.0044	0.6655	9.00E-04	1.56E-06	TRUE	0.003046	23.90123
M00054,tryptophan	rs7246393	A	G	0.0043	0.5222	9.00E-04	1.55E-06	TRUE	0.002909	22.82716
M00054,tryptophan	rs7463805	T	C	-0.005	0.5213	9.00E-04	4.60E-09	TRUE	0.004413	34.67901
M00054,tryptophan	rs7505177	T	G	-0.004	0.4132	9.00E-04	5.86E-06	TRUE	0.002909	22.82716
M00054,tryptophan	rs7584842	T	C	-0.005	0.5377	9.00E-04	4.15E-08	TRUE	0.003929	30.8642
M00054,tryptophan	rs7594598	A	C	0.004	0.4257	9.00E-04	9.50E-06	TRUE	0.002518	19.75309
M00054,tryptophan	rs7638383	A	G	0.0047	0.3984	9.00E-04	1.64E-07	TRUE	0.003474	27.2716
M00054,tryptophan	rs7810390	A	G	-0.005	0.5928	9.00E-04	5.61E-07	TRUE	0.003185	25
M00054,tryptophan	rs7843149	T	C	-0.004	0.3896	9.00E-04	6.55E-06	TRUE	0.002645	20.75309
M00054,tryptophan	rs8006663	A	G	-0.005	0.4556	9.00E-04	3.02E-07	TRUE	0.003328	26.12346

M00054,tryptophan	rs80212	T	C	0.0049	0.5899	9.00E-04	5.18E-08	TRUE	0.003	29.64198
M00054,tryptophan	rs81108	T	G	0.0045	0.4741	9.00E-04	7.51E-07	TRUE	0.003	25
M00054,tryptophan	rs86091	A	G	-0.005	0.4232	9.00E-04	1.51E-07	TRUE	0.003	27.2716
M00054,tryptophan	rs87518	T	C	-0.004	0.403	9.00E-04	5.69E-06	TRUE	0.002	20.75309
M00054,tryptophan	rs89392	A	G	0.0042	0.366	9.00E-04	3.95E-06	TRUE	0.002	21.77778
M00054,tryptophan	rs91528	T	C	-0.004	0.5076	9.00E-04	4.42E-06	TRUE	0.002	20.75309
M00054,tryptophan	rs92896	A	C	0.0042	0.3985	9.00E-04	3.62E-06	TRUE	0.002	21.77778
M00054,tryptophan	rs93154	A	G	0.0048	0.5843	9.00E-04	6.71E-08	TRUE	0.003	28.44444
M00054,tryptophan	rs93304	A	G	-0.007	0.4006	0.0015	6.04E-06	TRUE	0.002	19.36
M00054,tryptophan	rs93738	T	C	-0.005	0.4466	9.00E-04	2.31E-07	TRUE	0.003	26.12346
M00054,tryptophan	rs94641	A	C	0.0041	0.5592	9.00E-04	4.45E-06	TRUE	0.002	20.75309
M00054,tryptophan	rs95111	A	G	-0.005	0.559	9.00E-04	2.99E-08	TRUE	0.003	30.8642
M00054,tryptophan	rs95178	T	C	-0.005	0.3661	9.00E-04	3.46E-07	TRUE	0.003	26.12346

M00054,tryptophan	rs95412	T	C	-0.004	0.653	9.00E-04	3.80E-06	TRUE	0.002776	21.77778
M00054,tryptophan	rs95433	T	G	0.0041	0.3993	9.00E-04	6.39E-06	TRUE	0.002645	20.75309
M00054,tryptophan	rs96103	A	G	-0.004	0.5195	9.00E-04	1.12E-06	TRUE	0.002909	22.82716
M00054,tryptophan	rs96465	A	T	0.004	0.3795	9.00E-04	9.00E-06	TRUE	0.002518	19.75309
M00054,tryptophan	rs96499	T	C	0.0041	0.634	9.00E-04	5.84E-06	TRUE	0.002645	20.75309
M00054,tryptophan	rs97245	T	C	0.005	0.5787	9.00E-04	1.97E-08	TRUE	0.003929	30.8642
M00054,tryptophan	rs98785	A	G	0.0041	0.6016	9.00E-04	5.32E-06	TRUE	0.002645	20.75309
M00054,tryptophan	rs99489	A	G	0.004	0.3616	9.00E-04	9.58E-06	TRUE	0.002518	19.75309
M00054,tryptophan	rs99895	A	G	-0.004	0.5142	9.00E-04	3.10E-06	TRUE	0.002776	21.77778
M01358,stearate (18:0)	rs10021	T	C	0.0238	0.9663	0.005	1.81E-06	TRUE	0.002888	22.6576
M01358,stearate (18:0)	rs10160	A	G	0.0084	0.6329	0.0018	3.78E-06	TRUE	0.002776	21.77778
M01358,stearate	rs10242	A	G	-0.012	0.1356	0.0026	4.25E-06	TRUE	0.002715	21.30178

(18:0)

M01358,stearate (18:0) rs10498 606 A C -0.008 0.4534 0.0017 6.40E-06 TRUE 0.002615 20.51557

M01358,stearate (18:0) rs10757 839 T C 0.0079 0.6521 0.0017 4.74E-06 TRUE 0.002753 21.59516

M01358,stearate (18:0) rs11118 120 A C -0.012 0.8531 0.0025 1.18E-06 TRUE 0.002985 23.4256

M01358,stearate (18:0) rs12353 451 A G -0.022 0.0373 0.0049 6.06E-06 TRUE 0.00264 20.71179

M01358,stearate (18:0) rs13355 979 A G -0.008 0.5665 0.0017 6.23E-06 TRUE 0.002548 19.98616

M01358,stearate (18:0) rs13486 56 T C -0.014 0.798 0.0024 1.17E-08 TRUE 0.004147 32.58507

M01358,stearate (18:0) rs14770 25 T C 0.0087 0.6547 0.0017 4.83E-07 TRUE 0.003336 26.19031

M01358,stearate (18:0) rs15025 93 A G 0.0081 0.3909 0.0017 2.50E-06 TRUE 0.002893 22.70242

M01358,stearate (18:0)	rs166299	T	C	0.0079	0.6325	0.0017	4.21E-06	TRUE	0.002753	21.59516
M01358,stearate (18:0)	rs1922419	A	G	-0.018	0.7807	0.0039	3.37E-06	TRUE	0.002776	21.77778
M01358,stearate (18:0)	rs2100884	T	C	-0.008	0.4375	0.0017	8.60E-07	TRUE	0.003111	24.41522
M01358,stearate (18:0)	rs2115366	T	C	-0.008	0.4418	0.0017	3.93E-06	TRUE	0.002753	21.59516
M01358,stearate (18:0)	rs216283	A	C	0.008	0.4171	0.0017	2.63E-06	TRUE	0.002822	22.14533
M01358,stearate (18:0)	rs2280248	A	G	-0.008	0.4808	0.0017	5.55E-06	TRUE	0.002615	20.51557
M01358,stearate (18:0)	rs281216	T	G	0.0149	0.9187	0.0033	8.26E-06	TRUE	0.002599	20.38659
M01358,stearate (18:0)	rs3087751	A	C	0.0078	0.423	0.0017	5.23E-06	TRUE	0.002683	21.0519
M01358,stearate	rs3793900	A	C	-0.008	0.6337	0.0017	5.73E-06	TRUE	0.002683	21.0519

(18:0)

M01358,stearate (18:0)	rs3863373	A	C	-0.008	0.3335	0.0017	4.21E-06	TRUE	0.002822	22.14533
M01358,stearate (18:0)	rs4420815	A	G	-0.014	0.143	0.003	3.06E-06	TRUE	0.002776	21.77778
M01358,stearate (18:0)	rs4710948	A	G	-0.009	0.3382	0.0017	6.94E-07	TRUE	0.003185	25
M01358,stearate (18:0)	rs4750059	C	G	-0.013	0.7956	0.003	6.49E-06	TRUE	0.002544	19.95111
M01358,stearate (18:0)	rs603424	A	G	0.0225	0.1835	0.0024	6.06E-21	TRUE	0.011109	87.89063
M01358,stearate (18:0)	rs6733405	A	G	-0.008	0.3867	0.0017	2.42E-06	TRUE	0.002965	23.26644
M01358,stearate (18:0)	rs6883481	T	C	0.0077	0.4737	0.0017	6.17E-06	TRUE	0.002615	20.51557
M01358,stearate (18:0)	rs727892	A	G	0.0083	0.5021	0.0017	8.15E-07	TRUE	0.003037	23.83737

M01358,sterate (18:0)	rs7583745	T	C	-0.026	0.8839	0.0055	1.49E-06	TRUE	0.002892	22.69223
M01358,sterate (18:0)	rs954820	A	G	0.0083	0.5619	0.0018	2.57E-06	TRUE	0.00271	21.26235
M01358,sterate (18:0)	rs9809122	A	G	-0.009	0.5295	0.0017	3.92E-07	TRUE	0.003336	26.19031
M01573,guanidine	rs11141909	A	C	0.0808	0.0405	0.0182	9.02E-06	TRUE	0.002513	19.7097
M01573,guanidine	rs12052900	A	G	-0.112	0.9783	0.0242	4.27E-06	TRUE	0.002706	21.22849
M01573,guanidine	rs1577941	A	G	0.0531	0.1187	0.0114	3.49E-06	TRUE	0.002765	21.69598
M01573,guanidine	rs16887484	A	G	-0.099	0.9585	0.0201	8.82E-07	TRUE	0.003097	24.30833
M01573,guanidine	rs16933423	A	G	0.0891	0.9651	0.02	8.31E-06	TRUE	0.00253	19.84703
M01573,guanidine	rs17224277	A	G	0.0633	0.0789	0.0134	2.29E-06	TRUE	0.002844	22.31505
M01573,guanidine	rs2257243	A	G	0.0354	0.6612	0.0075	2.19E-06	TRUE	0.002839	22.2784
M01573,guanidine	rs2846365	A	G	0.0336	0.4476	0.0071	1.98E-06	TRUE	0.002854	22.39556

M01573,guanosine	rs4661299	T	G	0.0319	0.4551	0.0071	7.63E-06	TRUE	0.002573	20.18667
M01573,guanosine	rs4948051	T	C	0.0528	0.1328	0.0115	4.84E-06	TRUE	0.002687	21.08008
M01573,guanosine	rs9353315	A	G	-0.048	0.8731	0.0105	5.86E-06	TRUE	0.00262	20.55111
M01640,ascorbate (Vitamin C)	rs11167905	T	C	0.0804	0.8545	0.0164	9.83E-07	TRUE	0.003062	24.03391
M01640,ascorbate (Vitamin C)	rs1306990	T	C	-0.051	0.3781	0.011	4.44E-06	TRUE	0.002697	21.16
M01640,ascorbate (Vitamin C)	rs13103690	T	G	-0.047	0.5359	0.0104	5.20E-06	TRUE	0.002648	20.77256
M01640,ascorbate (Vitamin C)	rs2070006	T	C	0.0512	0.3713	0.0112	4.76E-06	TRUE	0.002664	20.89796
M01640,ascorbate (Vitamin C)	rs577596	A	G	-0.057	0.3267	0.0114	6.68E-07	TRUE	0.003152	24.73753

M01640,ascorbate (Vitamin C)	rs6713914	T	C	0.0593	0.5741	0.0116	3.22E-07	TRUE	0.003329	26.13325
M01640,ascorbate (Vitamin C)	rs6826474	T	C	-0.138	0.0393	0.0288	1.56E-06	TRUE	0.002939	23.06
M01640,ascorbate (Vitamin C)	rs6834631	T	G	0.1306	0.9596	0.0267	1.03E-06	TRUE	0.003049	23.92565
M01640,ascorbate (Vitamin C)	rs7112460	T	C	0.1084	0.0658	0.0223	1.14E-06	TRUE	0.003011	23.62919
M01640,ascorbate (Vitamin C)	rs8057559	T	C	0.1395	0.0312	0.0314	9.10E-06	TRUE	0.002516	19.73736
M01640,ascorbate (Vitamin C)	rs808686	A	G	0.0598	0.6086	0.0128	3.01E-06	TRUE	0.002782	21.82642

M01640,ascorbate (Vitamin C)	rs8105491	T	G	-0.07	0.154	0.0148	2.30E-06	TRUE	0.002835	22.2427
M15140,kyurenine	rs10085935	T	C	-0.01	0.3782	0.0017	3.33E-09	TRUE	0.00467	36.70934
M15140,kyurenine	rs10857319	T	C	-0.009	0.3481	0.0017	9.45E-07	TRUE	0.00326	25.5917
M15140,kyurenine	rs10937762	A	G	0.0078	0.5679	0.0018	8.16E-06	TRUE	0.002394	18.77778
M15140,kyurenine	rs11057695	T	C	0.0206	0.0566	0.0046	8.03E-06	TRUE	0.002557	20.05482
M15140,kyurenine	rs11593042	A	T	0.0151	0.0919	0.0033	4.55E-06	TRUE	0.002669	20.93756
M15140,kyurenine	rs11646849	A	G	-0.009	0.5005	0.0017	6.40E-07	TRUE	0.00326	25.5917
M15140,kyurenine	rs12082398	T	C	0.0117	0.5855	0.0024	9.33E-07	TRUE	0.003028	23.76563
M15140,kyurenine	rs12802337	A	G	-0.016	0.0776	0.0036	5.95E-06	TRUE	0.00255	20.00077
M15140,kyurenine	rs1426134	C	G	-0.008	0.3715	0.0017	3.84E-06	TRUE	0.002893	22.70242
M15140,kyurenine	rs1496635	A	C	-0.009	0.3407	0.0018	2.12E-07	TRUE	0.003256	25.55864
M15140,kyurenine	rs16974854	T	C	-0.023	0.038	0.0048	1.15E-06	TRUE	0.003028	23.76563

M15140,k ynurenine	rs17630 235	A	G	0.0131	0.4183	0.0017	3.41E-14	TRUE	0.007 532	59.38062
M15140,k ynurenine	rs18005 0	T	G	0.008	0.5821	0.0018	7.65E-06	TRUE	0.002 518	19.75309
M15140,k ynurenine	rs21327	A	G	0.0095	0.286	0.0018	1.25E-07	TRUE	0.003 548	27.85494
M15140,k ynurenine	rs23205 36	T	C	0.0081	0.4131	0.0017	3.32E-06	TRUE	0.002 893	22.70242
M15140,k ynurenine	rs23754 75	T	C	-0.008	0.3236	0.0017	1.41E-06	TRUE	0.003 111	24.41522
M15140,k ynurenine	rs24912 94	A	G	-0.01	0.31	0.002	5.73E-07	TRUE	0.003 185	25
M15140,k ynurenine	rs37887 06	A	G	-0.012	0.1302	0.0026	6.10E-06	TRUE	0.002 582	20.25
M15140,k ynurenine	rs37899 78	A	G	0.0123	0.8469	0.0025	1.32E-06	TRUE	0.003 084	24.2064
M15140,k ynurenine	rs38091 98	A	C	0.0554	0.0199	0.012	4.28E-06	TRUE	0.002 717	21.31361
M15140,k ynurenine	rs48202 42	A	G	-0.009	0.6201	0.0017	9.03E-07	TRUE	0.003 185	25
M15140,k ynurenine	rs51179 7	A	C	0.012	0.1261	0.0026	3.77E-06	TRUE	0.002 715	21.30178
M15140,k ynurenine	rs65756 34	T	C	-0.016	0.6184	0.0035	4.85E-06	TRUE	0.002 598	20.37878
M15140,k ynurenine	rs67703 23	T	C	-0.008	0.4299	0.0017	3.33E-06	TRUE	0.002 822	22.14533

M15140,k ynurenine	rs69466 93	T	G	0.0102	0.7069	0.0023	9.18E-06	TRUE	0.002 507	19.6673
M15140,k ynurenine	rs75095 0	A	C	0.0144	0.6442	0.0018	2.34E-16	TRUE	0.008 114	64
M15140,k ynurenine	rs75480 08	A	G	0.016	0.504	0.0035	3.56E-06	TRUE	0.002 664	20.89796
M15140,k ynurenine	rs76190 96	A	C	0.008	0.6886	0.0017	4.92E-06	TRUE	0.002 822	22.14533
M15140,k ynurenine	rs76195 68	A	G	0.0177	0.94	0.004	9.53E-06	TRUE	0.002 496	19.58063
M15140,k ynurenine	rs78437 76	T	C	-0.008	0.4038	0.0019	7.41E-06	TRUE	0.002 492	19.54571
M15140,k ynurenine	rs79062 82	T	G	0.0094	0.3095	0.0018	8.10E-08	TRUE	0.003 474	27.2716
M15140,k ynurenine	rs80511 49	A	G	0.0258	0.2127	0.0025	9.07E-26	TRUE	0.013 429	106.5024
M15140,k ynurenine	rs95335 82	A	G	-0.022	0.0351	0.005	1.00E-05	TRUE	0.002 513	19.7136
M15140,k ynurenine	rs98572 68	A	G	0.008	0.411	0.0017	3.07E-06	TRUE	0.002 822	22.14533
M21127,1- palmitoyl glycerol (1-monop almitin)	rs10001 37	T	C	0.014	0.475	0.003	3.06E-06	TRUE	0.002 776	21.77778

M21127,1-palmitoyl glycerol (1-monopalmitin)	rs12145	T	C	0.0287	0.5511	0.0063	6.21E-06	TRUE	0.002645	20.75309
M21127,1-palmitoyl glycerol (1-monopalmitin)	rs12830	T	G	0.0124	0.3375	0.0027	5.88E-06	TRUE	0.002689	21.09191
M21127,1-palmitoyl glycerol (1-monopalmitin)	rs15445	A	C	0.0136	0.4642	0.0027	5.40E-07	TRUE	0.003232	25.37174
M21127,1-palmitoyl glycerol (1-monopalmitin)	rs23784	A	T	0.0127	0.3445	0.0027	3.98E-06	TRUE	0.00282	22.12483
M21127,1-palmitoyl glycerol (1-monopalmitin)	rs40051	T	C	0.0125	0.6391	0.0027	4.17E-06	TRUE	0.002732	21.43347

M21127,1-palmitoyl glycerol (1-monopalmitin)	rs430508	A	G	-0.012	0.4994	0.0027	7.02E-06	TRUE	0.002603	20.41701
M21127,1-palmitoyl glycerol (1-monopalmitin)	rs4774615	A	G	-0.018	0.8406	0.0036	4.07E-07	TRUE	0.003328	26.12346
M21127,1-palmitoyl glycerol (1-monopalmitin)	rs4821424	A	G	-0.013	0.5199	0.0027	3.97E-06	TRUE	0.002732	21.43347
M21127,1-palmitoyl glycerol (1-monopalmitin)	rs757717	T	C	0.0203	0.1121	0.0045	8.12E-06	TRUE	0.002594	20.35012
M21127,1-palmitoyl glycerol (1-monopalmitin)	rs954050	T	C	0.0121	0.5912	0.0027	7.68E-06	TRUE	0.00256	20.08368

M21188,1-stearoylglycerol (1-monostearin)	rs10783765	T	G	0.0135	0.7251	0.0027	6.63E-07	TRUE	0.003185	25
M21188,1-stearoylglycerol (1-monostearin)	rs10811336	A	C	0.0169	0.8554	0.0036	3.18E-06	TRUE	0.002809	22.03781
M21188,1-stearoylglycerol (1-monostearin)	rs10878631	A	G	-0.013	0.4509	0.0027	3.05E-06	TRUE	0.002732	21.43347
M21188,1-stearoylglycerol (1-monostearin)	rs12026398	T	C	-0.02	0.898	0.0043	4.10E-06	TRUE	0.002675	20.98918
M21188,1-stearoylglycerol (1-monostearin)	rs12641040	A	G	-0.017	0.8189	0.0035	2.38E-06	TRUE	0.002833	22.22449

M21188,1-stearoylglycerol (1-monostearin)	rs1456959	T	C	0.013	0.3972	0.0027	1.30E-06	TRUE	0.002954	23.18244
M21188,1-stearoylglycerol (1-monostearin)	rs17260153	T	C	-0.013	0.7525	0.0027	1.08E-06	TRUE	0.003092	24.26475
M21188,1-stearoylglycerol (1-monostearin)	rs17436977	T	C	-0.012	0.492	0.0027	8.10E-06	TRUE	0.002477	19.42524
M21188,1-stearoylglycerol (1-monostearin)	rs17595468	A	G	0.0163	0.864	0.0036	5.89E-06	TRUE	0.002613	20.50077
M21188,1-stearoylglycerol (1-monostearin)	rs2014576	A	G	-0.014	0.4568	0.0027	1.15E-07	TRUE	0.003523	27.65981

M21188,1-stearoylglycerol (1-monostearin)	rs2049974	A	G	-0.014	0.296	0.003	3.06E-06	TRUE	0.002776	21.77778
M21188,1-stearoylglycerol (1-monostearin)	rs2173635	T	C	-0.017	0.8642	0.0037	3.30E-06	TRUE	0.002691	21.1103
M21188,1-stearoylglycerol (1-monostearin)	rs2865986	A	G	-0.013	0.6566	0.0027	1.63E-06	TRUE	0.002909	22.82716
M21188,1-stearoylglycerol (1-monostearin)	rs4266604	T	C	-0.012	0.7099	0.0027	9.19E-06	TRUE	0.00256	20.08368
M21188,1-stearoylglycerol (1-monostearin)	rs6662425	C	G	0.0148	0.6385	0.0027	3.51E-08	TRUE	0.003826	30.04664

M21188,1-stearoylglycerol (1-monostearin)	rs71523	A	G	0.0124	0.2566	0.0027	5.26E-06	TRUE	0.002689	21.09191
M21188,1-stearoylglycerol (1-monostearin)	rs75042	A	G	-0.013	0.2945	0.0027	7.62E-07	TRUE	0.003138	24.631
M21188,1-stearoylglycerol (1-monostearin)	rs77465	T	C	0.0216	0.9206	0.0045	2.00E-06	TRUE	0.002936	23.04
M21188,1-stearoylglycerol (1-monostearin)	rs80949	A	C	-0.037	0.9697	0.0082	5.42E-06	TRUE	0.002609	20.47011
M21188,1-stearoylglycerol (1-monostearin)	rs99640	T	C	-0.012	0.6778	0.0027	9.33E-06	TRUE	0.002477	19.42524

M22177,le vulinate (4-oxovale rate)	rs10162 458	T	C	0.0087	0.7178	0.0019	8.50E-06	TRUE	0.002 673	20.96676
M22177,le vulinate (4-oxovale rate)	rs10514 491	T	C	0.0088	0.6719	0.002	7.29E-06	TRUE	0.002 468	19.36
M22177,le vulinate (4-oxovale rate)	rs10984 3	A	T	-0.009	0.5886	0.0019	7.15E-06	TRUE	0.002 673	20.96676
M22177,le vulinate (4-oxovale rate)	rs11152 903	T	G	-0.009	0.296	0.002	5.70E-06	TRUE	0.002 525	19.8025
M22177,le vulinate (4-oxovale rate)	rs11222 082	C	G	-0.014	0.8851	0.0029	2.73E-06	TRUE	0.002 844	22.31748
M22177,le vulinate (4-oxovale rate)	rs11776 902	A	G	-0.009	0.6567	0.0019	3.21E-06	TRUE	0.002 923	22.93906

M22177,le vulinate (4-oxovale rate)	rs12406 448	T	C	0.1301	0.983	0.0292	8.13E-06	TRUE	0.002 531	19.8513
M22177,le vulinate (4-oxovale rate)	rs12498 629	T	C	-0.009	0.2767	0.002	9.34E-06	TRUE	0.002 358	18.49
M22177,le vulinate (4-oxovale rate)	rs12616 207	A	G	0.0099	0.2818	0.002	4.16E-07	TRUE	0.003 122	24.5025
M22177,le vulinate (4-oxovale rate)	rs12787 323	T	G	0.0093	0.6649	0.002	1.65E-06	TRUE	0.002 756	21.6225
M22177,le vulinate (4-oxovale rate)	rs12996 267	C	G	-0.01	0.6148	0.0019	1.23E-07	TRUE	0.003 742	29.38781
M22177,le vulinate (4-oxovale rate)	rs13268 221	T	C	-0.009	0.5305	0.0019	6.22E-06	TRUE	0.002 734	21.45152

M22177,le vulinate (4-oxovale rate)	rs13278 849	A	G	-0.013	0.73	0.002	2.79E-11	TRUE	0.005 371	42.25
M22177,le vulinate (4-oxovale rate)	rs13395 555	T	C	0.0086	0.4714	0.0019	8.25E-06	TRUE	0.002 612	20.48753
M22177,le vulinate (4-oxovale rate)	rs13890 52	T	C	0.0087	0.7199	0.002	8.95E-06	TRUE	0.002 413	18.9225
M22177,le vulinate (4-oxovale rate)	rs14571 92	A	G	-0.009	0.272	0.002	6.80E-06	TRUE	0.002 582	20.25
M22177,le vulinate (4-oxovale rate)	rs16309 99	C	G	-0.01	0.4049	0.0019	1.93E-07	TRUE	0.003 599	28.25762
M22177,le vulinate (4-oxovale rate)	rs17118 209	T	C	-0.029	0.9694	0.0066	9.68E-06	TRUE	0.002 479	19.44008

M22177,le vulinate (4-oxovale rate)	rs17589 032	T	G	-0.034	0.0236	0.0076	8.70E-06	TRUE	0.002 522	19.77909
M22177,le vulinate (4-oxovale rate)	rs17695 82	A	G	0.0089	0.2711	0.002	5.58E-06	TRUE	0.002 525	19.8025
M22177,le vulinate (4-oxovale rate)	rs18760 88	A	C	-0.009	0.6596	0.0019	5.77E-06	TRUE	0.002 734	21.45152
M22177,le vulinate (4-oxovale rate)	rs19981 25	T	G	-0.009	0.5805	0.0019	5.75E-06	TRUE	0.002 734	21.45152
M22177,le vulinate (4-oxovale rate)	rs22867 07	T	G	-0.009	0.2687	0.002	9.50E-06	TRUE	0.002 413	18.9225
M22177,le vulinate (4-oxovale rate)	rs25145 87	A	G	0.01	0.6223	0.0019	3.00E-07	TRUE	0.003 528	27.70083

M22177,levulinate (4-oxovale rate)	rs28709 25	C	G	-0.009	0.6398	0.0019	5.84E-06	TRUE	0.002 734	21.45152
M22177,levulinate (4-oxovale rate)	rs30214 9	A	G	0.0258	0.9691	0.0058	9.34E-06	TRUE	0.002 523	19.78716
M22177,levulinate (4-oxovale rate)	rs32837 0	T	G	0.0098	0.722	0.0019	5.30E-07	TRUE	0.003 389	26.60388
M22177,levulinate (4-oxovale rate)	rs37427 66	A	G	-0.022	0.0394	0.0048	8.44E-06	TRUE	0.002 558	20.06293
M22177,levulinate (4-oxovale rate)	rs38456 71	C	G	-0.009	0.4044	0.0019	7.34E-06	TRUE	0.002 673	20.96676
M22177,levulinate (4-oxovale rate)	rs41473 31	A	G	0.0087	0.393	0.0019	7.47E-06	TRUE	0.002 673	20.96676

M22177,le vulinate (4-oxovale rate)	rs42984 77	T	C	0.0087	0.534	0.0019	8.40E-06	TRUE	0.002 673	20.96676
M22177,le vulinate (4-oxovale rate)	rs44344 79	A	G	0.0096	0.2901	0.0019	8.84E-07	TRUE	0.003 252	25.52909
M22177,le vulinate (4-oxovale rate)	rs44612 5	T	G	-0.013	0.1991	0.0029	9.27E-06	TRUE	0.002 484	19.48157
M22177,le vulinate (4-oxovale rate)	rs48786 28	T	C	0.0106	0.2753	0.002	6.18E-08	TRUE	0.003 577	28.09
M22177,le vulinate (4-oxovale rate)	rs53440 8	T	G	0.0088	0.7263	0.0019	6.07E-06	TRUE	0.002 734	21.45152
M22177,le vulinate (4-oxovale rate)	rs57113 9	A	G	0.0093	0.3354	0.0019	1.62E-06	TRUE	0.003 053	23.95845

M22177,le vulinate (4-oxovale rate)	rs59823 6	T	C	-0.009	0.7138	0.0019	2.28E-06	TRUE	0.002 988	23.44598
M22177,le vulinate (4-oxovale rate)	rs62567 6	T	C	-0.009	0.6649	0.0019	3.67E-06	TRUE	0.002 86	22.43767
M22177,le vulinate (4-oxovale rate)	rs64411 04	A	G	0.0139	0.1267	0.0029	1.73E-06	TRUE	0.002 928	22.97384
M22177,le vulinate (4-oxovale rate)	rs64763 17	T	C	0.0186	0.0729	0.0039	1.68E-06	TRUE	0.002 899	22.74556
M22177,le vulinate (4-oxovale rate)	rs65135 45	A	G	0.0088	0.6085	0.0019	5.25E-06	TRUE	0.002 734	21.45152
M22177,le vulinate (4-oxovale rate)	rs67382 12	A	G	-0.009	0.3037	0.0019	4.29E-06	TRUE	0.002 797	21.94183

M22177,le vulinate (4-oxovale rate)	rs68747 23	T	C	0.0091	0.3661	0.0019	3.17E-06	TRUE	0.002 923	22.93906
M22177,le vulinate (4-oxovale rate)	rs69198 34	T	C	0.0144	0.1237	0.0029	8.27E-07	TRUE	0.003 141	24.65636
M22177,le vulinate (4-oxovale rate)	rs71199 5	T	C	0.0108	0.4481	0.0019	2.70E-08	TRUE	0.004 113	32.31025
M22177,le vulinate (4-oxovale rate)	rs71942 77	C	G	-0.009	0.6775	0.0019	8.33E-06	TRUE	0.002 673	20.96676
M22177,le vulinate (4-oxovale rate)	rs72723 3	A	G	-0.009	0.7351	0.002	6.49E-06	TRUE	0.002 525	19.8025
M22177,le vulinate (4-oxovale rate)	rs75412 35	T	G	-0.01	0.6521	0.0019	1.15E-07	TRUE	0.003 742	29.38781

M22177,levulinate (4-oxovale rate)	rs7677906	T	C	0.0087	0.5094	0.0019	7.07E-06	TRUE	0.002673	20.96676
M22177,levulinate (4-oxovale rate)	rs7800932	T	G	0.0088	0.4133	0.0019	5.52E-06	TRUE	0.002734	21.45152
M22177,levulinate (4-oxovale rate)	rs8180794	A	G	0.0092	0.4133	0.0019	2.02E-06	TRUE	0.002988	23.44598
M22177,levulinate (4-oxovale rate)	rs892857	T	C	-0.009	0.6572	0.0019	2.83E-06	TRUE	0.002923	22.93906
M22649,X-09108	rs10810813	A	G	-0.012	0.1837	0.0027	5.20E-06	TRUE	0.00256	20.08368
M22649,X-09108	rs11776015	T	C	0.0125	0.8309	0.0027	3.52E-06	TRUE	0.002732	21.43347
M22649,X-09108	rs13163520	A	G	0.0121	0.8339	0.0027	8.11E-06	TRUE	0.00256	20.08368
M22649,X-09108	rs1929842	C	G	0.013	0.2049	0.0027	1.94E-06	TRUE	0.002954	23.18244
M22649,X-09108	rs2186912	A	G	0.023	0.0475	0.0052	8.72E-06	TRUE	0.002494	19.56361

M22649,X-09108	rs2280289	A	G	-0.013	0.8397	0.0027	1.38E-06	TRUE	0.003	23.54047
M22649,X-09108	rs2818310	T	C	0.012	0.8108	0.0027	6.45E-06	TRUE	0.002518	19.75309
M22649,X-09108	rs603424	A	G	-0.012	0.1806	0.0027	5.30E-06	TRUE	0.00256	20.08368
M22649,X-09108	rs774211	T	C	0.0137	0.8303	0.0027	5.19E-07	TRUE	0.00328	25.74623
M22649,X-09108	rs9477741	C	G	-0.085	0.0113	0.0189	6.89E-06	TRUE	0.002585	20.27382
M27513,indoleacetate	rs1013612	A	G	-0.013	0.4965	0.0027	4.48E-06	TRUE	0.002732	21.43347
M27513,indoleacetate	rs11043286	T	C	0.057	0.0188	0.0116	8.02E-07	TRUE	0.003077	24.14536
M27513,indoleacetate	rs11242955	A	G	-0.013	0.5528	0.0027	1.67E-06	TRUE	0.002954	23.18244
M27513,indoleacetate	rs12591854	A	G	0.1135	0.02	0.0256	8.89E-06	TRUE	0.002506	19.65675
M27513,indoleacetate	rs16994074	T	C	0.0199	0.8549	0.0045	7.86E-06	TRUE	0.002493	19.55605

M27513,indoleacetate	rs17788495	A	G	0.0234	0.9087	0.0053	9.29E-06	TRUE	0.002485	19.49306
M27513,indoleacetate	rs1886152	A	G	0.0122	0.3789	0.0027	8.34E-06	TRUE	0.002603	20.41701
M27513,indoleacetate	rs2166764	T	C	0.0123	0.4647	0.0028	9.65E-06	TRUE	0.00246	19.29719
M27513,indoleacetate	rs2494523	T	C	-0.014	0.492	0.003	3.06E-06	TRUE	0.002776	21.77778
M27513,indoleacetate	rs289999	T	C	-0.018	0.6577	0.0035	1.91E-07	TRUE	0.003369	26.44898
M27513,indoleacetate	rs404632	T	C	-0.02	0.1335	0.0044	5.36E-06	TRUE	0.002687	21.07645
M27513,indoleacetate	rs4144140	T	C	0.0125	0.4524	0.0027	4.75E-06	TRUE	0.002732	21.43347
M27513,indoleacetate	rs4324578	C	G	0.013	0.6112	0.0027	1.99E-06	TRUE	0.002954	23.18244
M27513,indoleacetate	rs7197091	A	G	-0.018	0.3026	0.0036	5.77E-07	TRUE	0.003115	24.44753

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M27513,indoleacetate	rs7809234	A	T	0.0285	0.8755	0.0045	1.60E-10	TRUE	0.005101	40.11111
M27513,indoleacetate	rs792935	A	C	-0.017	0.2048	0.0037	6.86E-06	TRUE	0.002535	19.88678
M32412, butyrylcarnitine	rs10849832	T	C	0.0499	0.9124	0.0067	1.06E-13	TRUE	0.00704	55.46915
M32412, butyrylcarnitine	rs10849846	T	C	0.0511	0.9597	0.0097	1.34E-07	TRUE	0.003535	27.75226
M32412, butyrylcarnitine	rs11065202	T	C	-0.13	0.5822	0.004	1.00E-200	TRUE	0.11846	1051.381
M32412, butyrylcarnitine	rs11065208	A	G	-0.068	0.0336	0.0106	1.17E-10	TRUE	0.005278	41.51735
M32412, butyrylcarnitine	rs11065270	T	C	0.0603	0.9195	0.0069	1.65E-18	TRUE	0.009667	76.3724
M32412, butyrylcarnitine	rs1109732	A	G	-0.061	0.9753	0.014	1.47E-05	TRUE	0.002389	18.73653

M32412,b utyrylcarn itine	rs11716 17	T	G	0.0358	0.7771	0.0047	1.61E-14	TRUE	0.007 361	58.01901
M32412,b utyrylcarn itine	rs11860 55	A	C	-0.034	0.2939	0.0043	1.30E-15	TRUE	0.008 114	64
M32412,b utyrylcarn itine	rs12025 912	T	C	0.0228	0.8498	0.0053	1.76E-05	TRUE	0.002 36	18.50623
M32412,b utyrylcarn itine	rs12255 141	A	G	-0.027	0.907	0.0062	1.15E-05	TRUE	0.002 454	19.24662
M32412,b utyrylcarn itine	rs12257 526	T	C	0.0248	0.8739	0.0058	1.74E-05	TRUE	0.002 331	18.283
M32412,b utyrylcarn itine	rs12368 199	A	G	0.1211	0.1462	0.0052	1.67E-121	TRUE	0.064 825	542.3524
M32412,b utyrylcarn itine	rs12562 686	A	C	-0.036	0.9454	0.0084	1.74E-05	TRUE	0.002 342	18.36735
M32412,b utyrylcarn itine	rs13365 84	T	C	-0.018	0.4071	0.0042	1.91E-05	TRUE	0.002 342	18.36735
M32412,b utyrylcarn	rs14692 31	A	G	-0.019	0.2917	0.0043	1.00E-05	TRUE	0.002 437	19.1152

itine

M32412,b utyrylcarn itine	rs15578 52	A	G	-0.018	0.3251	0.0042	1.53E-05	TRUE	0.002 368	18.572
M32412,b utyrylcarn itine	rs17050 084	T	C	-0.041	0.9582	0.0096	1.90E-05	TRUE	0.002 36	18.50792
M32412,b utyrylcarn itine	rs17507 671	T	C	-0.051	0.9538	0.0096	1.03E-07	TRUE	0.003 622	28.44444
M32412,b utyrylcarn itine	rs17686 203	T	C	-0.052	0.9707	0.0118	1.06E-05	TRUE	0.002 457	19.27061
M32412,b utyrylcarn itine	rs18737 45	A	G	-0.02	0.7904	0.0044	1.01E-05	TRUE	0.002 504	19.64101
M32412,b utyrylcarn itine	rs19559 19	A	G	-0.047	0.9663	0.0106	1.13E-05	TRUE	0.002 475	19.40984
M32412,b utyrylcarn itine	rs19579 10	A	G	0.0376	0.9466	0.0088	1.96E-05	TRUE	0.002 328	18.2562
M32412,b utyrylcarn itine	rs20829 4	T	C	0.0315	0.4348	0.0036	1.08E-18	TRUE	0.009 691	76.5625

M32412,br/>utyrylcarn itine	rs26316 93	C	G	-0.023	0.8664	0.0053	1.14E-05	TRUE	0.002 464	19.32681
M32412,br/>utyrylcarn itine	rs27391 4	A	T	0.0236	0.3673	0.0041	1.17E-08	TRUE	0.004 217	33.13266
M32412,br/>utyrylcarn itine	rs27813 6	T	C	-0.026	0.234	0.0043	1.96E-09	TRUE	0.004 616	36.27961
M32412,br/>utyrylcarn itine	rs37675 12	A	G	0.0625	0.0178	0.0146	1.91E-05	TRUE	0.002 337	18.32544
M32412,br/>utyrylcarn itine	rs38171 90	A	T	0.0249	0.3957	0.0047	1.14E-07	TRUE	0.003 575	28.06745
M32412,br/>utyrylcarn itine	rs41463 82	T	C	-0.019	0.6883	0.0043	1.25E-05	TRUE	0.002 386	18.71065
M32412,br/>utyrylcarn itine	rs47669 62	A	T	0.0516	0.6544	0.0043	1.70E-33	TRUE	0.018 072	144
M32412,br/>utyrylcarn itine	rs48708 83	A	T	-0.026	0.2248	0.006	1.41E-05	TRUE	0.002 431	19.06778
M32412,br/>utyrylcarn	rs49435 08	T	C	0.0153	0.5497	0.0035	1.38E-05	TRUE	0.002 436	19.10939

itine

M32412,b utyrylcarn itine	rs64645 4	T	C	0.0257	0.8827	0.0059	1.17E-05	TRUE	0.002 419	18.97415
M32412,b utyrylcarn itine	rs64687 65	T	C	0.0156	0.5426	0.0035	1.02E-05	TRUE	0.002 533	19.86612
M32412,b utyrylcarn itine	rs64969 96	A	G	0.0197	0.2007	0.0045	1.05E-05	TRUE	0.002 444	19.16494
M32412,b utyrylcarn itine	rs72951 93	T	C	-0.029	0.0835	0.0067	1.58E-05	TRUE	0.002 356	18.47717
M32412,b utyrylcarn itine	rs73034 01	A	T	-0.069	0.1111	0.006	1.38E-30	TRUE	0.016 717	133.0178
M32412,b utyrylcarn itine	rs79547 72	A	T	0.0182	0.3805	0.0042	1.22E-05	TRUE	0.002 394	18.77778
M32412,b utyrylcarn itine	rs79794 73	A	G	0.0184	0.3832	0.0042	1.20E-05	TRUE	0.002 447	19.19274
M32564,X- 11247	rs10044 059	A	G	0.0646	0.0711	0.0143	6.59E-06	TRUE	0.002 602	20.40765

M32564,X-11247	rs10183 528	C	G	0.0896	0.9442	0.0178	5.09E-07	TRUE	0.003 228	25.33821
M32564,X-11247	rs10508 243	A	G	0.0519	0.1246	0.0109	1.92E-06	TRUE	0.002 889	22.67158
M32564,X-11247	rs11258 53	C	G	0.045	0.1705	0.0095	2.08E-06	TRUE	0.002 86	22.43767
M32564,X-11247	rs12820 694	A	G	-0.037	0.2682	0.0084	9.32E-06	TRUE	0.002 487	19.50694
M32564,X-11247	rs13129 658	C	G	0.0437	0.8162	0.0095	4.02E-06	TRUE	0.002 697	21.16
M32564,X-11247	rs13411 46	T	G	-0.041	0.734	0.0085	1.66E-06	TRUE	0.002 908	22.81467
M32564,X-11247	rs18846 46	C	G	-0.087	0.1687	0.0188	3.81E-06	TRUE	0.002 73	21.41523
M32564,X-11247	rs19008 04	T	C	0.0377	0.2616	0.0085	8.07E-06	TRUE	0.002 508	19.67183
M32564,X-11247	rs20516 74	T	C	0.0434	0.8325	0.0096	5.89E-06	TRUE	0.002 605	20.43793
M32564,X-11247	rs26798 91	T	G	0.0719	0.0672	0.0158	5.05E-06	TRUE	0.002 64	20.70826
M32564,X-11247	rs27226 39	T	C	-0.032	0.5475	0.0069	4.43E-06	TRUE	0.002 707	21.24008
M32564,X-11247	rs28846 92	T	C	-0.035	0.3823	0.0077	6.34E-06	TRUE	0.002 619	20.54326
M32564,X-11247	rs38467 14	A	G	0.0672	0.065	0.0149	6.46E-06	TRUE	0.002 593	20.34071

M32564,X-11247	rs4750519	T	G	-0.032	0.4178	0.007	4.10E-06	TRUE	0.002731	21.42367
M32564,X-11247	rs603677	A	C	0.12	0.9724	0.0258	3.35E-06	TRUE	0.002757	21.63332
M32564,X-11247	rs644396	T	C	-0.033	0.5465	0.0071	4.45E-06	TRUE	0.002704	21.21186
M32564,X-11247	rs751903	A	G	0.0647	0.0733	0.0143	6.22E-06	TRUE	0.00261	20.47088
M32635,1-linoleoylglycerophosphoethanolamine*	rs10758151	T	C	-0.022	0.1408	0.0049	6.21E-06	TRUE	0.002617	20.52645
M32635,1-linoleoylglycerophosphoethanolamine*	rs10924919	T	C	-0.016	0.3733	0.0035	5.48E-06	TRUE	0.002598	20.37878
M32635,1-linoleoylglycerophosphoethanolamine*	rs11045907	A	T	0.0165	0.7489	0.0036	4.27E-06	TRUE	0.002678	21.00694

M32635,1-linoleoylglycerophosphoethanolamine*	rs1260326	T	C	0.0179	0.4078	0.0034	1.64E-07	TRUE	0.00353	27.71713
M32635,1-linoleoylglycerophosphoethanolamine*	rs174535	T	C	-0.044	0.6677	0.0035	2.82E-36	TRUE	0.0198	158.0408
M32635,1-linoleoylglycerophosphoethanolamine*	rs17764324	T	G	0.0262	0.087	0.0059	9.46E-06	TRUE	0.002514	19.71962
M32635,1-linoleoylglycerophosphoethanolamine*	rs2070895	A	G	0.0257	0.21	0.0042	1.22E-09	TRUE	0.004763	37.44274
M32635,1-linoleoylglycerophosphoethanolamine*	rs2199680	A	T	-0.022	0.8328	0.0043	5.88E-07	TRUE	0.003185	25

M32635,1- linoleoylgl lycerophos phoethano lamine*	rs28282 09	T	C	-0.036	0.051	0.0076	1.78E-06	TRUE	0.002 875	22.5625
M32635,1- linoleoylgl lycerophos phoethano lamine*	rs55148 8	T	C	0.0157	0.7412	0.0035	7.41E-06	TRUE	0.002 565	20.12163
M32635,1- linoleoylgl lycerophos phoethano lamine*	rs72109 33	A	T	0.0163	0.7569	0.0036	8.17E-06	TRUE	0.002 613	20.50077
M32635,1- linoleoylgl lycerophos phoethano lamine*	rs75294 62	C	G	0.0164	0.7318	0.0036	4.93E-06	TRUE	0.002 645	20.75309
M32635,1- linoleoylgl lycerophos phoethano lamine*	rs95700 44	A	C	0.0246	0.1057	0.0052	2.38E-06	TRUE	0.002 852	22.38018

M32769,X-11452	rs12598784	C	G	0.0278	0.599	0.0061	4.89E-06	TRUE	0.002648	20.76969
M32769,X-11452	rs1562716	T	G	0.0457	0.4098	0.0103	8.86E-06	TRUE	0.00251	19.68602
M32769,X-11452	rs300250	A	G	0.0276	0.635	0.0058	2.25E-06	TRUE	0.002886	22.64447
M32769,X-11452	rs4633	T	C	0.0307	0.5168	0.0059	1.84E-07	TRUE	0.003449	27.07527
M32769,X-11452	rs824764	T	C	0.0709	0.9563	0.0151	2.73E-06	TRUE	0.00281	22.04645
M32980,a drenate (22:4n6)	rs11206335	A	G	-0.027	0.9237	0.006	6.72E-06	TRUE	0.002544	19.95111
M32980,a drenate (22:4n6)	rs11620434	A	C	0.033	0.9383	0.0074	7.31E-06	TRUE	0.002535	19.88678
M32980,a drenate (22:4n6)	rs12359572	T	G	0.0177	0.2419	0.0036	6.26E-07	TRUE	0.00308	24.17361
M32980,a drenate (22:4n6)	rs12531203	T	C	-0.016	0.2025	0.0036	7.24E-06	TRUE	0.002582	20.25
M32980,a drenate (22:4n6)	rs13192201	A	T	0.0165	0.7555	0.0035	2.34E-06	TRUE	0.002833	22.22449

M32980,a drenate (22:4n6)	rs17203 317	T	G	-0.074	0.9652	0.0166	8.81E-06	TRUE	0.002 527	19.81859
M32980,a drenate (22:4n6)	rs17455 0	T	C	0.0347	0.6676	0.0034	6.79E-24	TRUE	0.013 138	104.16
M32980,a drenate (22:4n6)	rs25215 67	A	G	-0.015	0.3879	0.0034	6.50E-06	TRUE	0.002 615	20.51557
M32980,a drenate (22:4n6)	rs60062 50	T	C	-0.053	0.0613	0.0118	6.49E-06	TRUE	0.002 591	20.32634
M32980,a drenate (22:4n6)	rs69871 21	A	G	-0.026	0.9067	0.0053	7.59E-07	TRUE	0.003 137	24.62407
M32980,a drenate (22:4n6)	rs83147 1	A	G	-0.016	0.4088	0.0036	6.44E-06	TRUE	0.002 582	20.25
M33132,X- 11787	rs10206 899	T	C	0.0399	0.78	0.0017	7.74E-123	TRUE	0.065 776	550.8685
M33132,X- 11787	rs10476 724	T	C	0.0078	0.8453	0.0018	9.43E-06	TRUE	0.002 394	18.77778
M33132,X- 11787	rs11073 472	A	G	-0.009	0.1492	0.0018	5.55E-07	TRUE	0.003 328	26.12346
M33132,X- 11787	rs11188 044	A	G	-0.01	0.8337	0.0018	6.87E-08	TRUE	0.003 548	27.85494

M33132,X-11787	rs11598738	A	G	0.0085	0.212	0.0017	7.22E-07	TRUE	0.003185	25
M33132,X-11787	rs11813961	A	G	-0.012	0.0801	0.0027	9.12E-06	TRUE	0.002477	19.42524
M33132,X-11787	rs12104774	T	G	-0.018	0.0562	0.0033	5.71E-08	TRUE	0.003705	29.09458
M33132,X-11787	rs12902975	T	C	-0.012	0.9093	0.0025	4.19E-06	TRUE	0.002697	21.16
M33132,X-11787	rs17009399	C	G	-0.036	0.0582	0.0027	2.80E-41	TRUE	0.022097	176.7915
M33132,X-11787	rs17044007	T	G	-0.014	0.074	0.003	3.06E-06	TRUE	0.002776	21.77778
M33132,X-11787	rs17110031	T	C	0.035	0.9615	0.0034	1.10E-24	TRUE	0.013363	105.9689
M33132,X-11787	rs17168815	T	G	-0.008	0.134	0.0018	3.68E-06	TRUE	0.002776	21.77778
M33132,X-11787	rs17423838	A	G	0.0086	0.8836	0.0018	3.06E-06	TRUE	0.002909	22.82716
M33132,X-11787	rs17490468	A	G	-0.017	0.0364	0.0036	1.22E-06	TRUE	0.002943	23.09336
M33132,X-11787	rs17595027	T	C	-0.008	0.1176	0.0017	4.76E-06	TRUE	0.002822	22.14533
M33132,X-11787	rs17718517	T	C	0.009	0.77	0.002	6.80E-06	TRUE	0.002582	20.25
M33132,X-11787	rs17725971	A	G	0.0145	0.8492	0.0018	3.68E-16	TRUE	0.008226	64.89198

M33132,X-11787	rs1927544	T	C	0.0078	0.8475	0.0018	9.67E-06	TRUE	0.002394	18.77778
M33132,X-11787	rs1934963	T	C	0.0293	0.8021	0.0017	8.69E-65	TRUE	0.036578	297.0554
M33132,X-11787	rs2009767	T	C	0.0092	0.8814	0.0018	4.14E-07	TRUE	0.003328	26.12346
M33132,X-11787	rs2160166	T	C	0.0077	0.1848	0.0017	8.01E-06	TRUE	0.002615	20.51557
M33132,X-11787	rs2298037	T	C	0.01	0.1673	0.0018	1.20E-08	TRUE	0.003929	30.8642
M33132,X-11787	rs2924762	T	C	0.0086	0.8777	0.0018	2.25E-06	TRUE	0.002909	22.82716
M33132,X-11787	rs4521827	A	T	0.0085	0.1344	0.0018	2.17E-06	TRUE	0.002842	22.29938
M33132,X-11787	rs4900819	T	C	-0.01	0.8744	0.0018	6.88E-08	TRUE	0.003698	29.04012
M33132,X-11787	rs6507259	T	C	-0.008	0.1333	0.0018	9.52E-06	TRUE	0.002394	18.77778
M33132,X-11787	rs666276	T	C	-0.009	0.1213	0.0018	2.19E-07	TRUE	0.003474	27.2716
M33132,X-11787	rs6969691	A	G	-0.008	0.8775	0.0018	5.29E-06	TRUE	0.00271	21.26235
M33132,X-11787	rs7921420	A	G	-0.008	0.716	0.0017	7.21E-07	TRUE	0.003111	24.41522
M33132,X-11787	rs869927	A	G	-0.011	0.1385	0.0018	3.51E-10	TRUE	0.004924	38.71605

M33132,X-11787	rs932748	T	G	0.009	0.878	0.002	6.80E-06	TRUE	0.002582	20.25
M33132,X-11787	rs9686531	T	C	0.0081	0.119	0.0018	7.74E-06	TRUE	0.002582	20.25
M33132,X-11787	rs994713	T	C	-0.02	0.0245	0.0045	6.37E-06	TRUE	0.00262	20.55111
M33353,X-12007	rs10089042	A	C	-0.201	0.9474	0.0435	3.84E-06	TRUE	0.002716	21.3083
M33353,X-12007	rs11151898	A	G	0.0407	0.3841	0.0092	9.23E-06	TRUE	0.002495	19.57101
M33353,X-12007	rs11782826	T	C	-0.058	0.1295	0.0131	9.76E-06	TRUE	0.002491	19.53505
M33353,X-12007	rs12050440	A	T	-0.044	0.656	0.0087	4.10E-07	TRUE	0.003259	25.57802
M33353,X-12007	rs12051797	A	G	-0.081	0.923	0.0176	4.01E-06	TRUE	0.002713	21.28564
M33353,X-12007	rs12544916	C	G	-0.108	0.0372	0.0225	1.72E-06	TRUE	0.002931	22.99735
M33353,X-12007	rs13054961	A	G	0.05	0.2239	0.0102	9.07E-07	TRUE	0.003062	24.02922
M33353,X-12007	rs130798	A	T	0.0578	0.1603	0.0124	2.99E-06	TRUE	0.002769	21.72763
M33353,X-12007	rs1343863	A	G	-0.06	0.7954	0.0118	3.80E-07	TRUE	0.003305	25.94089
M33353,X-12007	rs1681855	T	C	0.0507	0.2032	0.0109	3.43E-06	TRUE	0.002758	21.6353

M33353,X-12007	rs17279 964	A	G	-0.114	0.9618	0.0249	4.96E-06	TRUE	0.002 658	20.85078
M33353,X-12007	rs18368 45	T	G	-0.04	0.6005	0.0085	2.73E-06	TRUE	0.002 808	22.03474
M33353,X-12007	rs23201 73	T	C	-0.049	0.3067	0.0094	1.35E-07	TRUE	0.003 503	27.50668
M33353,X-12007	rs43256 04	T	C	0.0771	0.0727	0.0161	1.63E-06	TRUE	0.002 923	22.9328
M33353,X-12007	rs65658 87	T	C	-0.077	0.927	0.0165	2.90E-06	TRUE	0.002 797	21.94781
M33353,X-12007	rs67609 34	T	C	-0.192	0.9725	0.0385	5.91E-07	TRUE	0.003 172	24.89621
M33353,X-12007	rs74252 98	A	T	-0.229	0.9846	0.0489	2.88E-06	TRUE	0.002 785	21.85419
M33353,X-12007	rs91168 5	T	G	-0.077	0.9276	0.0166	3.20E-06	TRUE	0.002 75	21.57211
M33415,X-12063	rs10242 455	A	G	0.2212	0.9335	0.0099	1.67E-109	TRUE	0.059 98	499.2291
M33415,X-12063	rs11045 825	T	C	0.0641	0.834	0.0067	1.62E-21	TRUE	0.011 563	91.53063
M33415,X-12063	rs11591 344	A	T	-0.045	0.0643	0.0099	5.05E-06	TRUE	0.002 634	20.66116
M33415,X-12063	rs11644 920	A	T	-0.023	0.6891	0.0052	6.85E-06	TRUE	0.002 56	20.07729
M33415,X-12063	rs13174 155	T	G	-0.024	0.4549	0.005	1.82E-06	TRUE	0.002 936	23.04

M33415,X-12063	rs13230554	T	C	-0.17	0.016	0.0209	4.31E-16	TRUE	0.008395	66.23935
M33415,X-12063	rs1883349	A	G	-0.032	0.1609	0.0068	2.48E-06	TRUE	0.002787	21.86938
M33415,X-12063	rs2267282	A	G	0.0227	0.2957	0.0051	9.85E-06	TRUE	0.002526	19.81123
M33415,X-12063	rs2291073	T	G	0.0546	0.9198	0.0092	2.57E-09	TRUE	0.004482	35.22164
M33415,X-12063	rs2857468	A	T	-0.059	0.0946	0.01	2.45E-09	TRUE	0.004489	35.2836
M33415,X-12063	rs296396	T	C	-0.041	0.1628	0.0067	1.06E-09	TRUE	0.00474	37.26465
M33415,X-12063	rs4110517	A	G	-0.029	0.2043	0.0065	8.63E-06	TRUE	0.002538	19.90533
M33415,X-12063	rs4149056	T	C	-0.118	0.8379	0.0065	1.26E-73	TRUE	0.040157	327.3316
M33415,X-12063	rs4917639	A	C	-0.036	0.8015	0.006	1.39E-09	TRUE	0.004631	36.40111
M33415,X-12063	rs4968836	A	C	0.0536	0.594	0.0105	3.55E-07	TRUE	0.00332	26.05859
M33415,X-12063	rs6465760	A	G	0.0416	0.3009	0.0052	9.50E-16	TRUE	0.008114	64
M33415,X-12063	rs6544713	T	C	-0.031	0.3211	0.0051	8.97E-10	TRUE	0.004822	37.90696
M33415,X-12063	rs6719679	A	G	0.0276	0.7751	0.0058	2.20E-06	TRUE	0.002886	22.64447

M33415,X-12063	rs7138177	A	G	-0.058	0.8933	0.0084	4.97E-12	TRUE	0.006036	47.51148
M33415,X-12063	rs7795644	T	C	-0.107	0.0648	0.0127	4.76E-17	TRUE	0.008908	70.32209
M33415,X-12063	rs7797978	T	G	0.0413	0.7356	0.0058	7.53E-13	TRUE	0.006439	50.70422
M33423,p-acetamido phenylglucuronide	rs10118205	C	G	-0.738	0.0667	0.1517	1.14E-06	TRUE	0.003017	23.67332
M33423,p-acetamido phenylglucuronide	rs11569035	T	C	-0.928	0.05	0.1968	2.39E-06	TRUE	0.002836	22.25461
M33423,p-acetamido phenylglucuronide	rs11697457	A	G	1.2995	0.974	0.2699	1.47E-06	TRUE	0.002954	23.18178
M33423,p-acetamido phenylglucuronide	rs12417185	A	T	-0.288	0.0796	0.0613	2.71E-06	TRUE	0.002807	22.02717
M33423,p-acetamido phenylglucuronide	rs1515977	A	G	-0.911	0.0594	0.1799	4.06E-07	TRUE	0.003268	25.65459

M33423,p-acetamido phenylglucuronide	rs16834 824	T	C	-1.557	0.0179	0.3291	2.23E-06	TRUE	0.002 853	22.38316
M33423,p-acetamido phenylglucuronide	rs16848 159	A	G	-1.8	0.0199	0.3054	3.79E-09	TRUE	0.004 42	34.73431
M33423,p-acetamido phenylglucuronide	rs16891 501	A	G	-0.695	0.0932	0.155	7.44E-06	TRUE	0.002 56	20.08196
M33423,p-acetamido phenylglucuronide	rs16962 580	T	C	-1.267	0.0271	0.2697	2.62E-06	TRUE	0.002 815	22.08338
M33423,p-acetamido phenylglucuronide	rs17421 736	A	G	-1.56	0.0176	0.3448	6.09E-06	TRUE	0.002 608	20.45673
M33423,p-acetamido phenylglucuronide	rs19370 53	A	T	0.9018	0.9239	0.1864	1.31E-06	TRUE	0.002 983	23.40608

M33423,p-acetamido phenylglucuronide	rs197623	A	C	-0.982	0.0417	0.2157	5.32E-06	TRUE	0.002642	20.72634
M33423,p-acetamido phenylglucuronide	rs2287296	T	C	-1.263	0.025	0.2721	3.44E-06	TRUE	0.002748	21.5588
M33423,p-acetamido phenylglucuronide	rs2494014	A	G	-0.179	0.8251	0.0372	1.56E-06	TRUE	0.002944	23.10198
M33423,p-acetamido phenylglucuronide	rs2503005	T	C	0.4363	0.7917	0.0977	7.92E-06	TRUE	0.002542	19.94258
M33423,p-acetamido phenylglucuronide	rs355924	A	G	-0.795	0.0661	0.1752	5.70E-06	TRUE	0.002626	20.60082
M33423,p-acetamido phenylglucuronide	rs4516063	T	G	0.8886	0.9154	0.1617	3.92E-08	TRUE	0.003845	30.199

M33423,p-acetamido phenylglucuronide	rs4527784	A	G	1.0631	0.9569	0.2119	5.25E-07	TRUE	0.003207	25.17018
M33423,p-acetamido phenylglucuronide	rs4663518	C	G	-1.004	0.0508	0.1905	1.39E-07	TRUE	0.003534	27.74884
M33423,p-acetamido phenylglucuronide	rs4767452	T	C	-0.769	0.0834	0.1668	3.99E-06	TRUE	0.002711	21.27156
M33423,p-acetamido phenylglucuronide	rs6818342	T	C	-0.849	0.0593	0.1515	2.12E-08	TRUE	0.003998	31.40437
M33423,p-acetamido phenylglucuronide	rs6940545	A	C	1.6279	0.9822	0.3448	2.35E-06	TRUE	0.002841	22.29056
M33423,p-acetamido phenylglucuronide	rs7123491	A	C	-1.715	0.016	0.3637	2.40E-06	TRUE	0.002835	22.24042

M33423,p-acetamido phenylglucuronide	rs7231643	A	G	-0.508	0.0297	0.1149	9.97E-06	TRUE	0.002487	19.50887
M33423,p-acetamido phenylglucuronide	rs7279663	T	G	1.5318	0.9746	0.3275	2.90E-06	TRUE	0.002788	21.87669
M33423,p-acetamido phenylglucuronide	rs7510709	C	G	1.7567	0.9829	0.3275	8.13E-08	TRUE	0.003664	28.77217
M33423,p-acetamido phenylglucuronide	rs7520433	C	G	-0.868	0.0583	0.1889	4.38E-06	TRUE	0.002688	21.08993
M33423,p-acetamido phenylglucuronide	rs7628540	T	G	-0.63	0.1273	0.1251	4.67E-07	TRUE	0.003234	25.38517
M33423,p-acetamido phenylglucuronide	rs7672448	A	G	-1.601	0.0196	0.3587	8.12E-06	TRUE	0.002538	19.91145

M33423,p-acetamido phenylglucuronide	rs8013127	A	G	-1.53	0.0184	0.3325	4.16E-06	TRUE	0.0027	21.18491
M33423,p-acetamido phenylglucuronide	rs9921315	A	G	0.7395	0.8729	0.1281	7.82E-09	TRUE	0.004241	33.32561
M33423,p-acetamido phenylglucuronide	rs9959639	T	C	-0.784	0.0678	0.1768	9.27E-06	TRUE	0.002507	19.66381
M33901,X-12456	rs10177768	A	G	-0.02	0.6419	0.0044	8.01E-06	TRUE	0.002556	20.04597
M33901,X-12456	rs10505870	A	G	0.0251	0.2702	0.0053	2.10E-06	TRUE	0.002858	22.42827
M33901,X-12456	rs12829704	A	G	-0.056	0.1892	0.0061	1.47E-20	TRUE	0.010808	85.4867
M33901,X-12456	rs12867367	A	C	-0.024	0.7789	0.0052	5.44E-06	TRUE	0.002626	20.59763
M33901,X-12456	rs13054841	A	T	0.0293	0.8357	0.0061	1.27E-06	TRUE	0.00294	23.07149
M33901,X-12456	rs16853746	T	C	0.0739	0.9739	0.0155	1.98E-06	TRUE	0.002897	22.73136
M33901,X-12456	rs17057341	A	G	0.0771	0.0187	0.0174	9.62E-06	TRUE	0.002503	19.63407

M33901,X-12456	rs17192023	A	G	-0.033	0.1157	0.0075	9.13E-06	TRUE	0.002528	19.83218
M33901,X-12456	rs1854521	A	G	0.0213	0.4968	0.0044	1.17E-06	TRUE	0.002986	23.4344
M33901,X-12456	rs2291073	T	G	0.0428	0.9215	0.0086	5.81E-07	TRUE	0.003156	24.76798
M33901,X-12456	rs2432026	A	G	-0.045	0.0587	0.0097	3.49E-06	TRUE	0.002755	21.61771
M33901,X-12456	rs2547231	A	C	0.0409	0.833	0.0061	2.82E-11	TRUE	0.005713	44.95593
M33901,X-12456	rs2867882	A	G	0.0215	0.4696	0.0044	9.66E-07	TRUE	0.003042	23.87655
M33901,X-12456	rs4149056	T	C	-0.081	0.832	0.0058	9.49E-44	TRUE	0.024029	192.6353
M33901,X-12456	rs4402594	T	C	-0.045	0.4067	0.0091	7.99E-07	TRUE	0.00313	24.56237
M33901,X-12456	rs4953276	A	C	-0.032	0.1272	0.0068	2.42E-06	TRUE	0.002822	22.14533
M33901,X-12456	rs5758873	A	G	0.0196	0.4519	0.0044	6.90E-06	TRUE	0.00253	19.84298
M33901,X-12456	rs6565488	A	C	0.0331	0.1172	0.007	1.98E-06	TRUE	0.00285	22.35939
M33901,X-12456	rs6584331	T	C	0.0204	0.4873	0.0043	2.55E-06	TRUE	0.002868	22.5073
M33901,X-12456	rs6987078	A	G	0.0237	0.2224	0.0052	5.33E-06	TRUE	0.002648	20.77256

M33901,X-12456	rs9864709	T	G	-0.024	0.2158	0.0053	5.74E-06	TRUE	0.002571	20.16518
M33961,1-stearoylglycerophosphocholine	rs11100892	A	G	0.0161	0.4863	0.0034	2.61E-06	TRUE	0.002858	22.42301
M33961,1-stearoylglycerophosphocholine	rs12412179	T	G	-0.025	0.0972	0.0056	8.75E-06	TRUE	0.002541	19.92985
M33961,1-stearoylglycerophosphocholine	rs1397264	T	C	-0.023	0.8746	0.0051	5.66E-06	TRUE	0.002593	20.33833
M33961,1-stearoylglycerophosphocholine	rs1489866	T	G	0.0205	0.8208	0.0043	1.72E-06	TRUE	0.002897	22.7285
M33961,1-stearoylglycerophosphocholine	rs1595416	A	G	0.0164	0.2639	0.0036	6.93E-06	TRUE	0.002645	20.75309

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M33961,1-stearoylglycerophosphocholine	rs38440	A	C	0.0182	0.2257	0.0041	7.96E-06	TRUE	0.002512	19.70494
M33961,1-stearoylglycerophosphocholine	rs73057	A	G	0.0338	0.8905	0.0074	4.30E-06	TRUE	0.002659	20.86267
M33961,1-stearoylglycerophosphocholine	rs74819	T	G	0.0152	0.4608	0.0034	8.15E-06	TRUE	0.002548	19.98616
M33961,1-stearoylglycerophosphocholine	rs80046	A	G	-0.077	0.9877	0.0172	8.56E-06	TRUE	0.002529	19.83356
M33972,10-nonadecanoate	rs10004	A	G	0.017	0.5629	0.0034	5.58E-07	TRUE	0.003185	25

(19:1n9)

M33972,10 -nonadece noate (19:1n9)	rs10098 688	A	C	0.0263	0.337	0.0059	8.25E-06	TRUE	0.002 533	19.87044
M33972,10 -nonadece noate (19:1n9)	rs13486 56	T	C	-0.023	0.798	0.0042	3.46E-08	TRUE	0.003 885	30.51247
M33972,10 -nonadece noate (19:1n9)	rs35350	A	G	0.0621	0.9681	0.0131	2.16E-06	TRUE	0.002 864	22.47194
M33972,10 -nonadece noate (19:1n9)	rs53094 2	A	G	-0.037	0.86	0.0081	4.69E-06	TRUE	0.002 703	21.20546
M33972,10 -nonadece noate (19:1n9)	rs70313 8	T	G	0.0152	0.3743	0.0034	8.62E-06	TRUE	0.002 548	19.98616
M33972,10 -nonadece noate	rs76777 30	T	C	0.0151	0.4936	0.0034	7.58E-06	TRUE	0.002 515	19.72405

(19:1n9)

M34469,X-12786	rs10275746	T	C	0.0191	0.4335	0.0042	4.95E-06	TRUE	0.002636	20.68084
M34469,X-12786	rs10756216	T	C	0.0268	0.2358	0.005	6.63E-08	TRUE	0.003659	28.7296
M34469,X-12786	rs11905798	A	G	-0.1	0.0405	0.0212	2.50E-06	TRUE	0.002819	22.11661
M34469,X-12786	rs1195892	T	C	-0.019	0.5662	0.0042	6.16E-06	TRUE	0.002554	20.03628
M34469,X-12786	rs1235385	T	C	0.0257	0.167	0.0057	5.66E-06	TRUE	0.002592	20.32902
M34469,X-12786	rs12580426	A	G	0.0431	0.9345	0.0083	2.20E-07	TRUE	0.003435	26.96487
M34469,X-12786	rs12640478	C	G	-0.02	0.413	0.0042	1.46E-06	TRUE	0.003006	23.59184
M34469,X-12786	rs12810144	T	C	0.0754	0.079	0.0162	3.35E-06	TRUE	0.002761	21.6627
M34469,X-12786	rs133565	A	G	-0.019	0.3318	0.0042	8.51E-06	TRUE	0.002582	20.25
M34469,X-12786	rs4630827	T	C	0.0226	0.201	0.005	7.34E-06	TRUE	0.002604	20.4304
M34469,X-12786	rs8086010	A	C	-0.019	0.6663	0.0042	5.48E-06	TRUE	0.002664	20.89796

M34469,X-12786	rs9635567	T	C	0.0227	0.7787	0.005	5.73E-06	TRUE	0.002627	20.6116
M35253,2-palmitoyl glycerophosphocholine*	rs10019315	T	C	0.0134	0.4833	0.0026	3.23E-07	TRUE	0.003383	26.56213
M35253,2-palmitoyl glycerophosphocholine*	rs10951614	C	G	-0.013	0.3777	0.0027	1.02E-06	TRUE	0.002954	23.18244
M35253,2-palmitoyl glycerophosphocholine*	rs11078257	A	G	0.0124	0.3384	0.0027	3.09E-06	TRUE	0.002689	21.09191
M35253,2-palmitoyl glycerophosphocholine*	rs11949991	C	G	0.0159	0.8327	0.0035	5.61E-06	TRUE	0.002631	20.63755
M35253,2-palmitoyl glycerophosphocholine*	rs12588013	T	G	0.0117	0.3744	0.0026	8.57E-06	TRUE	0.002582	20.25

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M35253,2-palmitoyl glycerophosphocholine*	rs12726916	T	G	-0.016	0.1774	0.0035	4.04E-06	TRUE	0.002631	20.63755
M35253,2-palmitoyl glycerophosphocholine*	rs17176375	A	G	0.0211	0.1078	0.0043	8.44E-07	TRUE	0.003068	24.07842
M35253,2-palmitoyl glycerophosphocholine*	rs1745299	T	G	0.1406	0.0125	0.0311	6.09E-06	TRUE	0.002605	20.43854
M35253,2-palmitoyl glycerophosphocholine*	rs1954482	A	G	-0.012	0.3157	0.0027	4.43E-06	TRUE	0.002603	20.41701

M35253,2-palmitoyl glycerophosphocholine*	rs2122506	A	G	0.0118	0.3253	0.0026	9.05E-06	TRUE	0.002626	20.59763
M35253,2-palmitoyl glycerophosphocholine*	rs2236434	C	G	-0.012	0.6878	0.0027	3.71E-06	TRUE	0.002689	21.09191
M35253,2-palmitoyl glycerophosphocholine*	rs2479415	T	C	0.0121	0.5265	0.0027	8.98E-06	TRUE	0.00256	20.08368
M35253,2-palmitoyl glycerophosphocholine*	rs329498	T	G	-0.012	0.3106	0.0027	5.67E-06	TRUE	0.00256	20.08368
M35253,2-palmitoyl glycerophosphocholine*	rs4507280	A	T	0.0161	0.1488	0.0035	3.49E-06	TRUE	0.002697	21.16

M35253,2-palmitoyl glycerophosphocholine*	rs485868	A	G	-0.014	0.7155	0.0027	4.36E-07	TRUE	0.003185	25
M35253,2-palmitoyl glycerophosphocholine*	rs4895424	A	G	0.0124	0.3837	0.0026	2.94E-06	TRUE	0.002899	22.74556
M35253,2-palmitoyl glycerophosphocholine*	rs4905	A	G	0.0124	0.7122	0.0027	2.92E-06	TRUE	0.002689	21.09191
M35253,2-palmitoyl glycerophosphocholine*	rs736396	T	C	-0.012	0.3554	0.0027	4.68E-06	TRUE	0.002603	20.41701
M35253,2-palmitoyl glycerophosphocholine*	rs748196	T	G	0.0117	0.4604	0.0026	7.34E-06	TRUE	0.002582	20.25

M35253,2-palmitoyl glycerophosphocholine*	rs7767262	T	C	0.0324	0.9628	0.0069	2.64E-06	TRUE	0.00281	22.04915
M35253,2-palmitoyl glycerophosphocholine*	rs7987737	T	C	-0.058	0.986	0.0126	4.48E-06	TRUE	0.002682	21.04334
M35253,2-palmitoyl glycerophosphocholine*	rs9293713	A	G	-0.024	0.0653	0.0052	3.39E-06	TRUE	0.002761	21.65828
M36776,7-alpha-hydroxy-3-oxo-4-cholestenate (7-Hoca)	rs10064153	A	C	-0.012	0.7322	0.0026	3.78E-06	TRUE	0.00267	20.94822
M36776,7-alpha-hydroxy-3-oxo-4-cholestenate	rs10501675	A	C	-0.035	0.0254	0.007	7.05E-07	TRUE	0.003113	24.43184

(7-Hoca)

M36776,7-alpha-hydroxy-3-oxo-4-cholestenate (7-Hoca)	rs11627 218	A	T	0.013	0.7766	0.0026	6.46E-07	TRUE	0.003 185	25
M36776,7-alpha-hydroxy-3-oxo-4-cholestenate (7-Hoca)	rs12509 356	C	G	0.018	0.161	0.004	6.80E-06	TRUE	0.002 582	20.25
M36776,7-alpha-hydroxy-3-oxo-4-cholestenate (7-Hoca)	rs14283 65	T	C	-0.019	0.9228	0.0042	4.52E-06	TRUE	0.002 664	20.89796
M36776,7-alpha-hydroxy-3-oxo-4-choles	rs26255 30	A	G	0.0123	0.2039	0.0026	2.41E-06	TRUE	0.002 852	22.38018

tenoate (7-Hoca)											
M36776,7-alpha-hydroxy-3-oxo-4-cholestenate (7-Hoca)	rs67553	A	G	0.0357	0.9729	0.0075	2.03E-06	TRUE	0.002888	22.6576	
M36776,7-alpha-hydroxy-3-oxo-4-cholestenate (7-Hoca)	rs93693	T	C	0.0118	0.7183	0.0026	4.15E-06	TRUE	0.002626	20.59763	
M36776,7-alpha-hydroxy-3-oxo-4-cholestenate (7-Hoca)	rs98305	T	C	-0.035	0.9753	0.0076	5.70E-06	TRUE	0.002642	20.72645	
M36776,7-alpha-hydroxy-3-oxo-4-cholestenate (7-Hoca)	rs99536	T	C	0.0118	0.8128	0.0026	6.93E-06	TRUE	0.002626	20.59763	

tenoate
(7-Hoca)

M36776,7- alpha-hyd roxy-3-ox o-4-choles tenoate (7-Hoca)	rs99546	A	T	0.0121	0.7848	0.0027	5.36E-06	TRUE	0.002 56	20.08368
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Supplementary Table 3 Outliers identified by radial Mendelian randomization

Exposure	Outliers	Q statistic	p value
tryptophan	rs1000770	4.87289035	0.02728176
	4	3	9
tryptophan	rs1017138	5.74049737	0.01657809
	7	6	7
tryptophan	rs1080550	12.1176606	0.00049946
	3	7	5
tryptophan	rs1871053	5.81550445	0.01588549
		8	6
tryptophan	rs207938	8.42112438	0.00370886
		2	4
tryptophan	rs2111118	7.66638122	0.00562591
		7	8
tryptophan	rs2126498	7.47299521	0.00626312
		8	7
tryptophan	rs2510595	5.52104721	0.01878900
		2	8
tryptophan	rs258763	5.5741624	0.01822738
			1
tryptophan	rs3851229	3.98496252	0.04590812
		9	2
tryptophan	rs4306882	6.76466100	0.00929805
		3	8
tryptophan	rs430727	4.47131890	0.03446837
		4	5
tryptophan	rs5997110	5.75243903	0.01646578
		3	
tryptophan	rs6077611	4.51949032	0.03351081
		1	3
tryptophan	rs6537156	5.57686585	0.01819926
		4	4
tryptophan	rs6730726	4.51689233	0.03356174
		6	
tryptophan	rs688627	5.34117276	0.02082745
		4	7
tryptophan	rs8046426	4.68042483	0.03050820
		4	3
tryptophan	rs875283	5.75253356	0.01646489
		4	4
tryptophan	rs938040	5.13087316	0.02350390
		4	1
tryptophan	rs993927	10.9922151	0.00091495

tryptophan	rs9950125	6 16.0694324	4 6.11E-05
stearate (18:0)	rs1194003	6 6.30067429	0.01206920
stearate (18:0)	rs1426441	7 6.56580202	6 0.01039568
stearate (18:0)	rs2929381	5 5.49469822	8 0.01907421
stearate (18:0)	rs4961155	6 6.03210164	9 0.01404799
stearate (18:0)	rs6453594	8 10.4911680	7 0.00119946
stearate (18:0)	rs7681360	5 4.71250542	5 0.02994398
stearate (18:0)	rs7996008	2 12.9784481	1 0.00031509
stearate (18:0)	rs9568232	3 9.91138768	7 0.00164259
guanosine	rs7438272	2 5.51680015	2 0.01883468
kynurenine	rs1293763	4 6.41417014	4 0.01132132
kynurenine	rs1692489	4 7.19343646	8 0.00731707
kynurenine	rs2651516	4 8.41778704	2 0.00371567
kynurenine	rs3184504	1 6.33453356	8 0.01184092
kynurenine	rs669764	8 6.25984730	5 0.01235048
kynurenine	rs739744	1 3.99178493	5 0.04572260
kynurenine	rs759507	6 9.20444873	4 0.00241427
kynurenine	rs886125	7 6.30674826	7 0.01202792
1-palmitoylglycerol (1-monopalmitin)	rs6089908	6 7.58416339	4 0.00588832
1-stearoylglycerol (1-monostearin)	rs1073964	2 7.08705091	8 0.00776429
1-stearoylglycerol (1-monostearin)	rs3741298	7 4.43415644	3 0.03522662
1-stearoylglycerol (1-monostearin)	rs4711151	4 12.4464082	4 0.00041879

1-stearoylglycerol (1-monostearin)	rs7032741	6.69236154	0.00968268
		1	6
levulinate (4-oxovalerate)	rs2256490	8.17545505	0.00424610
		3	6
levulinate (4-oxovalerate)	rs227375	5.46607858	0.01938908
		9	2
levulinate (4-oxovalerate)	rs2434210	4.56163664	0.03269581
		7	3
levulinate (4-oxovalerate)	rs2781537	10.5850113	0.00114008
		9	4
levulinate (4-oxovalerate)	rs3789299	5.50195691	0.01899520
		8	2
levulinate (4-oxovalerate)	rs7776725	5.94103966	0.01479229
		7	5
levulinate (4-oxovalerate)	rs922048	4.34552557	0.03710631
		4	1
levulinate (4-oxovalerate)	rs9539356	5.08816549	0.02408966
		4	3
X-09108	rs1020807	4.86120454	0.02746715
		3	2
X-09108	rs1106530	5.28368230	0.02152617
		1	4
indoleacetate	rs1165019	8.20124693	0.00418616
		1	3
indoleacetate	rs2002614	6.43754040	0.01117332
		4	6
indoleacetate	rs6705705	4.27177971	0.03875032
		5	5
butyrylcarnitine	rs1076210	9.99539553	0.00156932
		4	5
butyrylcarnitine	rs1151874	6.18189101	0.01290642
		1	9
butyrylcarnitine	rs1161131	4.37984216	0.03636636
		3	7
butyrylcarnitine	rs1562204	7.53358205	0.00605593
		1	5
butyrylcarnitine	rs1695005	10.3830227	0.00127179
		9	8
butyrylcarnitine	rs1701010	9.53587691	0.00201493
		8	6
butyrylcarnitine	rs217272	16.3294122	5.32E-05
		9	3
butyrylcarnitine	rs2469211	4.84141445	0.02778409
		9	9
		4	7

butyrylcarnitine	rs9657933	6.13154962	0.01327904
		3	3
X-11247	rs1853207	7.24923813	0.00709311
		8	
X-11787	rs1092071	4.13922637	0.04190031
	6	3	4
X-11787	rs1891071	6.17439048	0.01296125
		7	6
X-11787	rs739626	7.19621499	0.00730575
		7	1
X-11787	rs7794651	7.14488820	0.00751779
		3	6
X-11787	rs7992587	5.08862908	0.02408322
		4	3
X-12063	rs1176293	4.91505912	0.02662355
	2	6	2
X-12063	rs1176828	6.11252128	0.01342275
	3	1	2
X-12063	rs335124	4.35890255	0.03681601
		8	5
X-12063	rs952319	5.69636895	0.01700004
		7	7
p-acetamidophenylglucuronide	rs1122815	5.99322730	0.01436090
	8	5	5
p-acetamidophenylglucuronide	rs1761630	5.57617288	0.01820646
	8	6	7
p-acetamidophenylglucuronide	rs2028039	6.01568871	0.01417924
		1	4
p-acetamidophenylglucuronide	rs7663974	11.7046787	0.00062343
		4	1
p-acetamidophenylglucuronide	rs9892632	4.27958054	0.03857286
			6
1-stearoylglycerophosphocholine	rs1405992	4.46934935	0.03450813
		7	
1-stearoylglycerophosphocholine	rs4082919	5.73759328	0.01660553
		1	1
10-nonadecenoate (19:1n9)	rs1870912	13.8630371	0.00019662
		8	8
7-alpha-hydroxy-3-oxo-4-cholestenoate (7-Hoca)	rs1159305	7.79929143	0.00522667
	4		3
7-alpha-hydroxy-3-oxo-4-cholestenoate (7-Hoca)	rs16750	4.32732077	0.03750523
		6	7
2-palmitoylglycerophosphocholine*	rs6817243	5.477032	0.01926795

Supplementary Table 4 Metabolic pathways with significant enrichment of blood metabolites

Metabolic pathways	Involved metabolites	<i>p</i> value	Impact	Details
Glycerolipid metabolism	1-linoleoylglycerophosphoethanolamine*	0.040694	0.01246	KEGG SMP
Phosphatidylinositol signaling system	1-linoleoylglycerophosphoethanolamine*	0.07039	0.00152	KEGG
Biosynthesis of unsaturated fatty acids	stearate (18:0)	0.0898	0	KEGG
Glycerophospholipid metabolism	1-linoleoylglycerophosphoethanolamine*	0.0898	0.13987	KEGG
Tryptophan metabolism	kynurenine	0.10178	0.09417	KEGG SMP
Purine metabolism	Guanosine	0.15763	0	KEGG SMP

Supplementary Table 5 Confounders identified from Phenoscanner

Metabolites	SNP	Trait	PMID	Beta	<i>P</i> value
tryptophan	rs1260326	Alcohol consumption	28937693	-0.028	1.00E-21
tryptophan	rs1260326	Type II diabetes	26551672	0.07696	3.70E-09
tryptophan	rs1412972	Body mass index	UKBB	0.01605	2.45E-11
tryptophan	rs4870304	Smoking status: current	UKBB	-0.00334	7.60E-06
2-palmitoylglycerophosphocholine*	rs4507280	Body mass index	UKBB	-0.01639	7.83E-07
1-stearoylglycerophosphocholine	rs2267922	Body mass index	UKBB	0.01115	4.12E-06
X-12007	rs12441436	Body mass index	28892062	-0.02381	4.09E-08
indoleacetate	rs1458095	Body mass index	19851299	0.19	7.00E-06
indoleacetate	rs426434	Body mass index	28892062	-0.02292	8.21E-07
1-stearoylglycerol (1-monostearin)	rs12713384	Body mass index	UKBB	0.01218	8.30E-06

1-palmitoylglycerol(1-monopalmitin)	rs1260326	Alcohol consumption	28937693	-0.028	1.00E-21
kynurenine	rs17630235	Smoking status: previous	UKBB	0.00673	1.33E-08
kynurenine	rs17630235	Body mass index	25673413	-0.0153	5.16E-07
stearate (18:0)	rs1075227	Body mass index	UKBB	-0.01407	6.06E-09
stearate (18:0)	rs10853932	Body mass index	23754948	0.03023	5.86E-08
stearate (18:0)	rs2489020	Body mass index	28892062	0.01677	8.10E-06
stearate (18:0)	rs4507103	Alcohol intake frequency	UKBB	-0.01621	7.94E-06

Supplementary Table 6 Estimation of the Steiger direction test from 14 blood metabolites to gastroesophageal reflux disease

Exposure	SNP_r2. exposure	SNP_r2. outcome	Direction	Steiger <i>p</i>
stearate (18:0)	0.0966477	7.14E-05	TRUE	1.36E-166
levulinate (4-oxovalerate)	0.1511722	8.04E-05	TRUE	1.54E-272
guanosine	0.0300503	1.98E-05	TRUE	8.23E-51
kynurenine	0.1197822	5.44E-05	TRUE	7.31E-212
1-linoleoylglycerophosphoethanolamine*	0.05541946	1.80E-05	TRUE	3.25E-95
adrenate (22:4n6)	0.04010553	3.31E-05	TRUE	2.91E-67
p-acetamidophenylglucuronide	0.09666159	7.64E-05	TRUE	3.14E-166
butyrylcarnitine	0.4489213	0.000113625	TRUE	0
X-09108	0.02738909	2.27E-05	TRUE	4.19E-46
X-11247	0.04896503	3.84E-05	TRUE	2.46E-82
X-11452	0.01727964	1.42E-05	TRUE	1.57E-29

X-12063	0.197801	5.52E-05	TRUE	0
	4			
X-12456	0.091464	3.74E-05	TRUE	3.08E-159
	41			
X-12786	0.033982	3.40E-02	TRUE	1.04765E-
	96			57
