

SUPPLEMENTARY MATERIAL

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Table S1. Information on the GWAS data used in the present mendelian randomized analysis

Data Source	Population	Phenotype	Sample Size	No. of Cases	No. of Controls
Exposure					
Shin et al. (2014)	European	452 human blood metabolites	7,822	N.A.	N.A.
Ben Elsworth et al. (2018)		Alcohol intake frequency	462,346	N.A.	N.A.
		Processed meat intake	461,981	N.A.	N.A.
		Poultry intake	461,900	N.A.	N.A.
		Beef intake	461,053	N.A.	N.A.
		Non-oily fish intake	460,880	N.A.	N.A.
		Oily fish intake	460,443	N.A.	N.A.
		Pork intake	460,162	N.A.	N.A.
		Lamb/mutton intake	460,006	N.A.	N.A.
	European	Bread intake	452,236	N.A.	N.A.
		Cheese intake	451,486	N.A.	N.A.
		Cooked vegetable intake	448,651	N.A.	N.A.
		Tea intake	447,485	N.A.	N.A.
		Fresh fruit intake	446,462	N.A.	N.A.
		Cereal intake	441,640	N.A.	N.A.
		Salad/raw vegetable intake	435,435	N.A.	N.A.
		Coffee intake	428,860	N.A.	N.A.
		Dried fruit intake	421,764	N.A.	N.A.
Outcome					
Nalls MA et al. (2019)	European	Parkinson's disease	482,730	33,674	449,056

Abbreviation: GWAS, Genome-Wide Association Studies

Table S2. Results of heterogeneity test and inverse-variance-weighted model used in mendelian randomization analysis for 17 dietary habits as exposure and Parkinson's disease as outcome.

ID	Exposure	Outcome	Q value	P value	Model
ukb-b-5779	Alcohol intake frequency	Parkinson's disease	563.810	1.25E-18	multiplicative random effects
ukb-b-6324	Processed meat intake	Parkinson's disease	211.714	0.014	multiplicative random effects
ukb-b-8006	Poultry intake	Parkinson's disease	206.865	5.86E-09	multiplicative random effects
ukb-b-2862	Beef intake	Parkinson's disease	162.651	0.179	fixed effects
ukb-b-17627	Non-oily fish intake	Parkinson's disease	127.016	0.030	multiplicative random effects
ukb-b-2209	Oily fish intake	Parkinson's disease	334.491	1.7E-08	multiplicative random effects
ukb-b-5640	Pork intake	Parkinson's disease	113.392	0.318	fixed effects
ukb-b-14179	Lamb/mutton intake	Parkinson's disease	283.747	6.01E-09	multiplicative random effects
ukb-b-11348	Bread intake	Parkinson's disease	249.434	7.65E-06	multiplicative random effects
ukb-b-1489	Cheese intake	Parkinson's disease	345.441	4.96E-05	multiplicative random effects
ukb-b-8089	Cooked vegetable intake	Parkinson's disease	139.024	0.202	fixed effects
ukb-b-6066	Tea intake	Parkinson's disease	247.894	0.001	multiplicative random effects
ukb-b-3881	Fresh fruit intake	Parkinson's disease	206.662	0.077	fixed effects
ukb-b-15926	Cereal intake	Parkinson's disease	278.700	0.001	multiplicative random effects
ukb-b-1996	Salad / raw vegetable intake	Parkinson's disease	200.726	0.001	multiplicative random effects
ukb-b-5237	Coffee intake	Parkinson's disease	170.847	0.078	fixed effects
ukb-b-16576	Dried fruit intake	Parkinson's disease	318.210	2.71E-08	multiplicative random effects

Table S3. The associations of 17 dietary habits with the risk of Parkinson's disease using the inverse-variance weighted method.

ID	Exposure	nSNP	IVW	
			OR (95% CI)	P value
ukb-b-5779	Alcohol intake frequency	299	0.77 (0.65-0.92)	0.004
ukb-b-6324	Processed meat intake	170	0.80 (0.57-1.12)	0.197
ukb-b-8006	Poultry intake	104	0.99 (0.52-1.86)	0.965
ukb-b-2862	Beef intake	148	0.92 (0.62-1.36)	0.675
ukb-b-17627	Non-oily fish intake	100	0.71 (0.40-1.26)	0.246
ukb-b-2209	Oily fish intake	204	1.40 (0.99-1.96)	0.054
ukb-b-5640	Pork intake	108	1.53 (0.90-2.59)	0.117
ukb-b-14179	Lamb/mutton intake	161	1.52 (0.87-2.64)	0.139
ukb-b-11348	Bread intake	161	0.71 (0.48-1.04)	0.080
ukb-b-1489	Cheese intake	250	1.22 (0.94-1.57)	0.129
ukb-b-8089	Cooked vegetable intake	127	0.90 (0.57-1.44)	0.672
ukb-b-6066	Tea intake	182	1.06 (0.80-1.40)	0.697
ukb-b-3881	Fresh fruit intake	180	0.91 (0.59-1.41)	0.678
ukb-b-15926	Cereal intake	207	1.46 (1.03-2.06)	0.033
ukb-b-1996	Salad / raw vegetable intake	141	1.30 (0.73-2.33)	0.375
ukb-b-5237	Coffee intake	147	1.21 (0.88-1.66)	0.250
ukb-b-16576	Dried fruit intake	193	1.70 (1.13-2.56)	0.012

Abbreviations: SNP, single-nucleotide polymorphism; IVW, inverse-variance weighted; OR, odds ratio; 95% CI, 95% confidence interval.

Table S4. Results of heterogeneity test and inverse-variance-weighted model used in mendelian randomization analysis for 452 human blood metabolites as exposures and Parkinson's disease as outcome.

ID	Metabolites	Outcome	Q value	P value	Model
met-a-303	Glutamine	Parkinson's disease	27.622	2.57E-04	multiplicative random effects
met-a-304	Tryptophan	Parkinson's disease	172.098	0.077	fixed effects
met-a-305	Histidine	Parkinson's disease	10.308	0.112	fixed effects
met-a-306	Leucine	Parkinson's disease	170.190	0.223	fixed effects
met-a-307	Cholesterol	Parkinson's disease	39.432	0.627	fixed effects
met-a-308	Phenylalanine	Parkinson's disease	2.678	0.613	fixed effects
met-a-309	Creatinine	Parkinson's disease	23.412	0.437	fixed effects
met-a-310	Lactate	Parkinson's disease	27.786	0.003	multiplicative random effects
met-a-311	3-hydroxybutyrate (BHBA)	Parkinson's disease	2.554	0.979	fixed effects
met-a-312	Arabinose	Parkinson's disease	3.586	0.610	fixed effects
met-a-313	Fructose	Parkinson's disease	0.302	0.860	fixed effects
met-a-314	Mannose	Parkinson's disease	31.143	0.019	multiplicative random effects
met-a-315	Pyruvate	Parkinson's disease	12.608	0.558	fixed effects
met-a-316	Uridine	Parkinson's disease	17.200	0.576	fixed effects
met-a-317	Linoleate (18:2n6)	Parkinson's disease	13.686	0.549	fixed effects
met-a-318	Allantoin	Parkinson's disease	12.182	0.878	fixed effects
met-a-319	Arachidonate (20:4n6)	Parkinson's disease	27.752	0.115	fixed effects
met-a-320	Deoxycholate	Parkinson's disease	13.679	0.623	fixed effects
met-a-321	Margarate (17:0)	Parkinson's disease	3.499	0.744	fixed effects
met-a-322	Inosine	Parkinson's disease	10.425	0.317	fixed effects
met-a-323	Isoleucine	Parkinson's disease	25.970	0.075	fixed effects
met-a-324	Threonine	Parkinson's disease	38.234	0.002	multiplicative random effects
met-a-325	Tyrosine	Parkinson's	37.420	0.165	fixed effects

		disease			
met-a-326	Lysine	Parkinson's disease	14.958	0.825	fixed effects
met-a-327	Methionine	Parkinson's disease	26.114	0.127	fixed effects
met-a-328	Malate	Parkinson's disease	14.336	0.643	fixed effects
met-a-329	Palmitate (16:0)	Parkinson's disease	23.645	0.596	fixed effects
met-a-330	Nonadecanoate (19:0)	Parkinson's disease	21.160	0.098	fixed effects
met-a-331	Stearate (18:0)	Parkinson's disease	41.072	0.467	fixed effects
met-a-332	Oleate (18:1n9)	Parkinson's disease	20.651	0.356	fixed effects
met-a-333	Pentadecanoate (15:0)	Parkinson's disease	27.727	0.089	fixed effects
met-a-334	Myristate (14:0)	Parkinson's disease	17.473	0.682	fixed effects
met-a-335	Pipecolate	Parkinson's disease	22.162	0.053	fixed effects
met-a-336	Ornithine	Parkinson's disease	13.716	0.056	fixed effects
met-a-337	5-oxoproline	Parkinson's disease	21.645	0.420	fixed effects
met-a-338	Pantothenate	Parkinson's disease	28.662	0.233	fixed effects
met-a-339	4-acetamidobutanoate	Parkinson's disease	33.316	0.403	fixed effects
met-a-340	Alpha-tocopherol	Parkinson's disease	10.336	0.412	fixed effects
met-a-341	Citrate	Parkinson's disease	71.530	0.002	multiplicative random effects
met-a-342	Glycerate	Parkinson's disease	11.803	0.757	fixed effects
met-a-343	Guanosine	Parkinson's disease	6.411	0.894	fixed effects
met-a-344	N-acetylalanine	Parkinson's disease	18.595	0.548	fixed effects
met-a-345	Urate	Parkinson's disease	22.290	0.219	fixed effects
met-a-346	Ursodeoxycholate	Parkinson's disease	4.700	0.910	fixed effects
met-a-347	Arginine	Parkinson's disease	10.305	0.962	fixed effects
met-a-348	Ascorbate (Vitamin C)	Parkinson's disease	12.658	0.475	fixed effects
met-a-349	Heptanoate (7:0)	Parkinson's disease	32.086	0.512	fixed effects

met-a-350	Laurate (12:0)	Parkinson's disease	33.164	0.692	fixed effects
met-a-351	Valine	Parkinson's disease	6.457	0.264	fixed effects
met-a-352	Urea	Parkinson's disease	7.759	0.902	fixed effects
met-a-353	Cortisol	Parkinson's disease	8.104	0.777	fixed effects
met-a-354	Cortisone	Parkinson's disease	37.556	0.194	fixed effects
met-a-355	Proline	Parkinson's disease	40.035	0.186	fixed effects
met-a-356	Citrulline	Parkinson's disease	41.228	0.417	fixed effects
met-a-357	Biliverdin	Parkinson's disease	12.798	0.542	fixed effects
met-a-358	Serotonin (5HT)	Parkinson's disease	15.029	0.376	fixed effects
met-a-359	Gamma-glutamylglutamine	Parkinson's disease	32.186	0.041	multiplicative random effects
met-a-360	Gamma-glutamyltyrosine	Parkinson's disease	41.017	0.558	fixed effects
met-a-361	Hypoxanthine	Parkinson's disease	15.118	0.817	fixed effects
met-a-362	Betaine	Parkinson's disease	26.077	0.204	fixed effects
met-a-363	Xanthine	Parkinson's disease	0.848	0.654	fixed effects
met-a-364	Phosphate	Parkinson's disease	0.640	0.959	fixed effects
met-a-365	3-methoxytyrosine	Parkinson's disease	28.936	0.016	multiplicative random effects
met-a-366	Pelargonate (9:0)	Parkinson's disease	38.441	0.201	fixed effects
met-a-367	Undecanoate (11:0)	Parkinson's disease	43.250	0.018	multiplicative random effects
met-a-368	Beta-hydroxyisovalerate	Parkinson's disease	50.169	5.56E-04	multiplicative random effects
met-a-369	Taurodeoxycholate	Parkinson's disease	12.606	0.398	fixed effects
met-a-370	X-02973	Parkinson's disease	20.483	0.613	fixed effects
met-a-371	X-03003	Parkinson's disease	10.097	0.183	fixed effects
met-a-372	X-03088	Parkinson's disease	23.530	0.171	fixed effects
met-a-373	X-03094	Parkinson's disease	55.299	0.002	multiplicative random effects
met-a-374	Glycerol	Parkinson's	23.543	0.132	fixed effects

		disease			
met-a-375	Kynurenine	Parkinson's disease	48.577	0.050	fixed effects
met-a-376	Mannitol	Parkinson's disease	16.770	0.080	fixed effects
met-a-377	Glycerol 3-phosphate (G3P)	Parkinson's disease	27.077	0.012	multiplicative random effects
met-a-378	Acetylphosphate	Parkinson's disease	26.995	0.058	fixed effects
met-a-379	Carnitine	Parkinson's disease	205.864	0.013	multiplicative random effects
met-a-380	Choline	Parkinson's disease	29.815	0.123	fixed effects
met-a-381	N-acetylmethionine	Parkinson's disease	14.160	0.363	fixed effects
met-a-382	N1-methyladenosine	Parkinson's disease	6.030	0.536	fixed effects
met-a-383	3-methyl-2-oxovalerate	Parkinson's disease	62.660	6.48E-04	multiplicative random effects
met-a-384	3-methylhistidine	Parkinson's disease	7.908	0.442	fixed effects
met-a-385	3-phenylpropionate (hydrocinnamate)	Parkinson's disease	14.247	0.285	fixed effects
met-a-386	Phenylacetate	Parkinson's disease	14.946	0.037	multiplicative random effects
met-a-387	Glycerophosphorylcholine (GPC)	Parkinson's disease	15.107	0.588	fixed effects
met-a-388	Aspartate	Parkinson's disease	1.107	0.775	fixed effects
met-a-389	X-04357	Parkinson's disease	5.535	0.785	fixed effects
met-a-390	X-04494	Parkinson's disease	6.019	0.945	fixed effects
met-a-391	X-04495	Parkinson's disease	8.366	0.593	fixed effects
met-a-392	X-04498	Parkinson's disease	16.230	0.702	fixed effects
met-a-393	X-04499--3,4-dihydroxybutyrate	Parkinson's disease	22.686	0.420	fixed effects
met-a-394	X-04500	Parkinson's disease	11.970	0.287	fixed effects
met-a-395	Dihomo-linoleate (20:2n6)	Parkinson's disease	3.000	0.885	fixed effects
met-a-396	X-18601	Parkinson's disease	17.611	0.613	fixed effects
met-a-397	2-hydroxystearate	Parkinson's disease	35.313	0.359	fixed effects
met-a-398	X-05426	Parkinson's disease	22.180	0.008	multiplicative random effects

met-a-399	Indolelactate	Parkinson's disease	15.982	0.454	fixed effects
met-a-400	Glycylvaline	Parkinson's disease	12.221	0.057	fixed effects
met-a-401	Gamma-glutamylleucine	Parkinson's disease	63.011	3.92E-04	multiplicative random effects
met-a-402	Eicosapentaenoate (EPA; 20:5n3)	Parkinson's disease	10.156	0.516	fixed effects
met-a-403	Estrone 3-sulfate	Parkinson's disease	15.697	0.153	fixed effects
met-a-404	Glycocholate	Parkinson's disease	5.284	0.727	fixed effects
met-a-405	Glycodeoxycholate	Parkinson's disease	8.756	0.188	fixed effects
met-a-406	Taurochenodeoxycholate	Parkinson's disease	19.705	0.073	fixed effects
met-a-407	Taurocholate	Parkinson's disease	18.097	0.258	fixed effects
met-a-408	X-05907	Parkinson's disease	16.412	0.127	fixed effects
met-a-409	Docosahexaenoate (DHA; 22:6n3)	Parkinson's disease	19.263	0.002	multiplicative random effects
met-a-410	1-stearoylglycerophosphoinositol	Parkinson's disease	5.146	0.525	fixed effects
met-a-411	X-06226	Parkinson's disease	27.498	0.193	fixed effects
met-a-412	X-06246	Parkinson's disease	28.732	0.070	fixed effects
met-a-413	X-06267	Parkinson's disease	8.354	0.681	fixed effects
met-a-414	X-06307	Parkinson's disease	7.937	0.338	fixed effects
met-a-415	X-06350	Parkinson's disease	9.938	0.699	fixed effects
met-a-416	X-06351	Parkinson's disease	7.457	0.114	fixed effects
met-a-417	Myo-inositol	Parkinson's disease	42.882	0.200	fixed effects
met-a-418	Glucose	Parkinson's disease	49.835	0.077	fixed effects
met-a-419	1,5-anhydroglucitol (1,5-AG)	Parkinson's disease	45.839	0.013	multiplicative random effects
met-a-420	2-hydroxybutyrate (AHB)	Parkinson's disease	25.191	0.033	multiplicative random effects
met-a-421	3-methyl-2-oxobutyrate	Parkinson's disease	8.214	0.942	fixed effects
met-a-422	1,6-anhydroglucose	Parkinson's disease	16.326	0.294	fixed effects

met-a-423	1-palmitoylglycerol (1-monopalmitin)	Parkinson's disease	24.989	0.023	multiplicative random effects
met-a-424	1-oleoylglycerol (1-monoolein)	Parkinson's disease	16.239	0.299	fixed effects
met-a-425	1-stearoylglycerol (1-monostearin)	Parkinson's disease	34.538	0.058	fixed effects
met-a-426	X-08402	Parkinson's disease	19.788	0.471	fixed effects
met-a-427	2-hydroxyisobutyrate	Parkinson's disease	15.683	0.546	fixed effects
met-a-428	X-08766	Parkinson's disease	21.755	0.084	fixed effects
met-a-429	4-methyl-2-oxopentanoate	Parkinson's disease	15.697	0.266	fixed effects
met-a-430	Phenyllactate (PLA)	Parkinson's disease	11.166	0.799	fixed effects
met-a-431	Homocitrulline	Parkinson's disease	8.402	0.210	fixed effects
met-a-432	Aspartylphenylalanine	Parkinson's disease	0.716	0.949	fixed effects
met-a-433	Levulinate (4-oxovalerate)	Parkinson's disease	44.876	0.714	fixed effects
met-a-434	Palmitoylcarnitine	Parkinson's disease	13.949	0.083	fixed effects
met-a-435	X-08988	Parkinson's disease	52.625	0.007	multiplicative random effects
met-a-436	X-09026	Parkinson's disease	14.645	0.403	fixed effects
met-a-437	X-09108	Parkinson's disease	12.450	0.410	fixed effects
met-a-438	Cholate	Parkinson's disease	6.982	0.431	fixed effects
met-a-439	X-09706	Parkinson's disease	22.897	0.349	fixed effects
met-a-440	X-10395	Parkinson's disease	33.505	0.218	fixed effects
met-a-441	X-10429	Parkinson's disease	28.365	0.101	fixed effects
met-a-442	X-10500	Parkinson's disease	31.059	0.514	fixed effects
met-a-443	X-10506	Parkinson's disease	13.874	0.309	fixed effects
met-a-444	X-10510	Parkinson's disease	14.880	0.829	fixed effects
met-a-445	1-linoleoylglycerol (1-monolinolein)	Parkinson's disease	10.507	0.724	fixed effects
met-a-446	Indoleacetate	Parkinson's disease	14.669	0.685	fixed effects
met-a-447	Hyodeoxycholate	Parkinson's	25.788	0.040	multiplicative random

		disease			effects
met-a-448	3-indoxyl sulfate	Parkinson's disease	5.256	0.262	fixed effects
met-a-449	N-acetylglycine	Parkinson's disease	4.222	0.979	fixed effects
met-a-450	Bilirubin (Z,Z)	Parkinson's disease	9.488	0.303	fixed effects
met-a-451	Creatine	Parkinson's disease	6.163	0.405	fixed effects
met-a-452	Erythrose	Parkinson's disease	6.869	0.443	fixed effects
met-a-453	Threonate	Parkinson's disease	18.795	0.223	fixed effects
met-a-454	X-10810	Parkinson's disease	19.304	0.200	fixed effects
met-a-455	Cysteine	Parkinson's disease	8.247	0.961	fixed effects
met-a-456	Pyroglutamylglycine	Parkinson's disease	2.299	0.513	fixed effects
met-a-457	N-(2-furoyl)glycine	Parkinson's disease	19.415	0.729	fixed effects
met-a-458	DSGEGDFXAEGGGVR*	Parkinson's disease	7.033	0.855	fixed effects
met-a-459	Pyridoxate	Parkinson's disease	11.999	0.285	fixed effects
met-a-460	Androsterone sulfate	Parkinson's disease	21.498	0.205	fixed effects
met-a-461	3-carboxy-4-methyl-5-propyl-2-furanpropanoate (CMPF)	Parkinson's disease	6.253	0.903	fixed effects
met-a-462	3-(4-hydroxyphenyl)lactate	Parkinson's disease	25.555	0.322	fixed effects
met-a-463	Acetylcarnitine	Parkinson's disease	30.766	0.014	multiplicative random effects
met-a-464	Serine	Parkinson's disease	27.080	0.567	fixed effects
met-a-465	Trans-4-hydroxyproline	Parkinson's disease	12.238	0.032	multiplicative random effects
met-a-466	Glutamate	Parkinson's disease	1.712	0.425	fixed effects
met-a-467	Hexanoylcarnitine	Parkinson's disease	12.395	0.649	fixed effects
met-a-468	Glycine	Parkinson's disease	27.978	0.217	fixed effects
met-a-469	Alanine	Parkinson's disease	43.876	0.120	fixed effects
met-a-470	Glycochenodeoxycholate	Parkinson's disease	26.919	0.013	multiplicative random effects
met-a-471	2-aminobutyrate	Parkinson's disease	26.079	0.929	fixed effects

met-a-472	Scyllo-inositol	Parkinson's disease	7.160	0.786	fixed effects
met-a-473	Dodecanedioate	Parkinson's disease	6.946	0.225	fixed effects
met-a-474	Gamma-glutamylvaline	Parkinson's disease	13.447	0.337	fixed effects
met-a-475	Indolepropionate	Parkinson's disease	11.452	0.720	fixed effects
met-a-476	Butyrylcarnitine	Parkinson's disease	24.446	0.379	fixed effects
met-a-477	Myristoleate (14:1n5)	Parkinson's disease	20.535	0.083	fixed effects
met-a-478	Dehydroisoandrosterone sulfate (DHEA-S)	Parkinson's disease	20.372	0.373	fixed effects
met-a-479	Propionylcarnitine	Parkinson's disease	27.663	0.482	fixed effects
met-a-480	Caproate (6:0)	Parkinson's disease	50.994	0.018	multiplicative random effects
met-a-481	Caprylate (8:0)	Parkinson's disease	28.091	0.922	fixed effects
met-a-482	10-undecenoate (11:1n1)	Parkinson's disease	45.369	0.005	multiplicative random effects
met-a-483	Docosapentaenoate (n3 DPA; 22:5n3)	Parkinson's disease	7.659	0.569	fixed effects
met-a-484	X-11204	Parkinson's disease	33.982	0.611	fixed effects
met-a-485	X-02269	Parkinson's disease	12.684	0.080	fixed effects
met-a-486	Phenol sulfate	Parkinson's disease	25.515	0.008	multiplicative random effects
met-a-487	X-06126	Parkinson's disease	10.055	0.611	fixed effects
met-a-488	X-07765	Parkinson's disease	5.795	0.926	fixed effects
met-a-489	X-11247	Parkinson's disease	11.358	0.837	fixed effects
met-a-490	X-11261	Parkinson's disease	12.367	0.498	fixed effects
met-a-491	Bilirubin (E,E)*	Parkinson's disease	10.065	0.185	fixed effects
met-a-492	X-02249	Parkinson's disease	9.975	0.443	fixed effects
met-a-493	Heme*	Parkinson's disease	18.451	0.103	fixed effects
met-a-494	X-11299	Parkinson's disease	15.421	0.117	fixed effects
met-a-495	X-11315	Parkinson's disease	59.713	1.15E-04	multiplicative random effects
met-a-496	X-11317	Parkinson's	50.614	0.121	fixed effects

		disease			
met-a-497	1-linoleoylglycerophosphoethanolamine*	Parkinson's disease	26.992	0.008	multiplicative random effects
met-a-498	X-11327	Parkinson's disease	47.244	0.024	multiplicative random effects
met-a-499	X-11334	Parkinson's disease	15.978	0.915	fixed effects
met-a-500	3-dehydrocarnitine*	Parkinson's disease	23.591	0.313	fixed effects
met-a-501	Pyroglutamine*	Parkinson's disease	20.741	0.189	fixed effects
met-a-502	C-glycosyltryptophan*	Parkinson's disease	34.315	0.034	multiplicative random effects
met-a-503	X-11374	Parkinson's disease	10.015	0.903	fixed effects
met-a-504	X-11381	Parkinson's disease	12.220	0.662	fixed effects
met-a-505	X-03056--N-[3-(2-Oxopyrrolidin-1-yl)propyl]acetamide	Parkinson's disease	32.124	0.269	fixed effects
met-a-506	X-11412	Parkinson's disease	30.789	0.877	fixed effects
met-a-507	X-01911	Parkinson's disease	11.501	0.778	fixed effects
met-a-508	X-11422--xanthine	Parkinson's disease	8.375	0.212	fixed effects
met-a-509	X-11423--O-sulfo-L-tyrosine	Parkinson's disease	87.221	2.33E-04	multiplicative random effects
met-a-510	X-09789	Parkinson's disease	7.136	0.713	fixed effects
met-a-511	X-11437	Parkinson's disease	17.278	0.242	fixed effects
met-a-512	X-11438	Parkinson's disease	43.432	0.006	multiplicative random effects
met-a-513	X-11440	Parkinson's disease	15.020	0.661	fixed effects
met-a-514	X-11441	Parkinson's disease	19.181	0.084	fixed effects
met-a-515	X-11442	Parkinson's disease	44.421	1.70E-04	multiplicative random effects
met-a-516	X-11444	Parkinson's disease	7.618	0.747	fixed effects
met-a-517	X-11445--5-alpha-pregnan-3beta,20alpha-disulfate	Parkinson's disease	12.809	0.617	fixed effects
met-a-518	X-11452	Parkinson's disease	3.563	0.614	fixed effects
met-a-519	X-11469	Parkinson's disease	24.534	0.078	fixed effects

met-a-520	X-11470	Parkinson's disease	16.007	0.067	fixed effects
met-a-521	X-11478	Parkinson's disease	5.237	0.875	fixed effects
met-a-522	X-11483	Parkinson's disease	4.985	0.892	fixed effects
met-a-523	X-11485	Parkinson's disease	6.319	0.276	fixed effects
met-a-524	X-11491	Parkinson's disease	11.807	0.461	fixed effects
met-a-525	X-11497	Parkinson's disease	15.373	0.353	fixed effects
met-a-526	HWESASXX*	Parkinson's disease	6.025	0.304	fixed effects
met-a-527	X-11521	Parkinson's disease	14.049	0.121	fixed effects
met-a-528	X-11529	Parkinson's disease	18.782	0.065	fixed effects
met-a-529	X-11530	Parkinson's disease	4.200	0.964	fixed effects
met-a-530	X-11537	Parkinson's disease	3.511	0.622	fixed effects
met-a-531	X-11538	Parkinson's disease	13.310	0.424	fixed effects
met-a-532	X-11540	Parkinson's disease	2.848	0.899	fixed effects
met-a-533	X-11546	Parkinson's disease	30.901	0.006	multiplicative random effects
met-a-534	X-11550	Parkinson's disease	14.144	0.823	fixed effects
met-a-535	X-11552	Parkinson's disease	10.865	0.697	fixed effects
met-a-536	X-11593--O-methylascorbate*	Parkinson's disease	50.997	0.218	fixed effects
met-a-537	Adrenate (22:4n6)	Parkinson's disease	16.699	0.081	fixed effects
met-a-538	Homostachydrine*	Parkinson's disease	0.864	0.930	fixed effects
met-a-539	ADSGEGDFXAEGGGVR*	Parkinson's disease	13.663	0.189	fixed effects
met-a-540	X-11786--methylcysteine	Parkinson's disease	20.102	0.065	fixed effects
met-a-541	X-11787	Parkinson's disease	26.032	0.299	fixed effects
met-a-542	X-11792	Parkinson's disease	14.357	0.423	fixed effects
met-a-543	X-11793--oxidized bilirubin*	Parkinson's disease	5.798	0.953	fixed effects
met-a-544	X-11795	Parkinson's	11.341	0.415	fixed effects

		disease			
met-a-545	X-11799	Parkinson's disease	8.978	0.175	fixed effects
met-a-546	X-11805	Parkinson's disease	8.517	0.385	fixed effects
met-a-547	X-11818	Parkinson's disease	23.028	0.190	fixed effects
met-a-548	X-11820	Parkinson's disease	16.006	0.191	fixed effects
met-a-549	X-11843	Parkinson's disease	1.544	0.462	fixed effects
met-a-550	X-11845	Parkinson's disease	20.538	0.303	fixed effects
met-a-551	X-11847	Parkinson's disease	7.840	0.728	fixed effects
met-a-552	X-11849	Parkinson's disease	15.136	0.234	fixed effects
met-a-553	X-11850	Parkinson's disease	5.943	0.546	fixed effects
met-a-554	X-11852	Parkinson's disease	23.067	0.003	multiplicative random effects
met-a-555	X-11858	Parkinson's disease	16.800	0.209	fixed effects
met-a-556	X-11859	Parkinson's disease	5.998	0.916	fixed effects
met-a-557	X-11876	Parkinson's disease	9.858	0.772	fixed effects
met-a-558	1-arachidonoylglycerophosphocholine*	Parkinson's disease	34.870	0.029	multiplicative random effects
met-a-559	1-palmitoleoylglycerophosphocholine*	Parkinson's disease	6.629	0.920	fixed effects
met-a-560	X-11905	Parkinson's disease	6.029	0.979	fixed effects
met-a-561	X-12007	Parkinson's disease	19.387	0.307	fixed effects
met-a-562	X-12013	Parkinson's disease	8.511	0.385	fixed effects
met-a-563	Gamma-glutamylmethionine*	Parkinson's disease	5.451	0.709	fixed effects
met-a-564	Gamma-glutamylthreonine*	Parkinson's disease	8.049	0.529	fixed effects
met-a-565	X-12029	Parkinson's disease	56.079	0.018	multiplicative random effects
met-a-566	X-12038	Parkinson's disease	70.817	0.042	multiplicative random effects
met-a-567	X-12039	Parkinson's disease	16.410	0.228	fixed effects

met-a-568	X-12040	Parkinson's disease	9.190	0.819	fixed effects
met-a-569	X-12056	Parkinson's disease	16.265	0.235	fixed effects
met-a-570	X-12063	Parkinson's disease	13.044	0.599	fixed effects
met-a-571	Gamma-tocopherol	Parkinson's disease	11.545	0.483	fixed effects
met-a-572	Gamma-glutamylphenylalanine	Parkinson's disease	38.598	0.269	fixed effects
met-a-573	Isobutyrylcarnitine	Parkinson's disease	5.371	0.717	fixed effects
met-a-574	Pseudouridine	Parkinson's disease	22.408	0.612	fixed effects
met-a-575	Valerate	Parkinson's disease	11.464	0.245	fixed effects
met-a-576	Palmitoleate (16:1n7)	Parkinson's disease	5.418	0.712	fixed effects
met-a-577	Alpha-ketoglutarate	Parkinson's disease	9.496	0.892	fixed effects
met-a-578	Erythronate*	Parkinson's disease	51.987	0.191	fixed effects
met-a-579	Lathosterol	Parkinson's disease	12.090	0.795	fixed effects
met-a-580	X-12092	Parkinson's disease	21.502	0.368	fixed effects
met-a-581	X-12093	Parkinson's disease	9.729	0.555	fixed effects
met-a-582	X-12094	Parkinson's disease	25.537	0.001	multiplicative random effects
met-a-583	X-12095--N1-methyl-3-pyridone-4-carboxamide	Parkinson's disease	37.622	0.028	multiplicative random effects
met-a-584	X-12100--hydroxytryptophan*	Parkinson's disease	44.730	0.280	fixed effects
met-a-585	X-12116	Parkinson's disease	17.877	0.022	multiplicative random effects
met-a-586	Eicosenoate (20:1n9 or 11)	Parkinson's disease	8.320	0.684	fixed effects
met-a-587	X-12188	Parkinson's disease	25.837	0.213	fixed effects
met-a-588	X-12189	Parkinson's disease	31.775	0.201	fixed effects
met-a-589	X-12206	Parkinson's disease	13.045	0.221	fixed effects
met-a-590	X-12212	Parkinson's disease	10.120	0.605	fixed effects
met-a-591	X-12216	Parkinson's disease	9.347	0.406	fixed effects
met-a-592	X-12217	Parkinson's	7.858	0.447	fixed effects

		disease			
met-a-593	X-12230	Parkinson's disease	15.309	0.053	fixed effects
met-a-594	X-12231	Parkinson's disease	22.720	0.030	multiplicative random effects
met-a-595	X-12236	Parkinson's disease	18.246	0.019	multiplicative random effects
met-a-596	X-12244--N-acetylcarnosine	Parkinson's disease	17.941	0.709	fixed effects
met-a-597	X-12253	Parkinson's disease	11.011	0.138	fixed effects
met-a-598	X-12261	Parkinson's disease	12.054	0.360	fixed effects
met-a-599	X-12329	Parkinson's disease	21.275	0.728	fixed effects
met-a-600	X-10346	Parkinson's disease	14.064	0.663	fixed effects
met-a-601	ADpSGEGDFXAEGGGVR*	Parkinson's disease	2.398	0.663	fixed effects
met-a-602	1- eicosatrienoylglycerophosphocholine*	Parkinson's disease	22.307	0.269	fixed effects
met-a-603	1- docosahexaenoylglycerophosphocholine*	Parkinson's disease	7.585	0.270	fixed effects
met-a-604	X-12405	Parkinson's disease	2.035	0.958	fixed effects
met-a-605	X-12407	Parkinson's disease	5.737	0.677	fixed effects
met-a-606	X-12428	Parkinson's disease	11.393	0.180	fixed effects
met-a-607	1- eicosadienoylglycerophosphocholine*	Parkinson's disease	5.128	0.925	fixed effects
met-a-608	X-12435	Parkinson's disease	18.160	0.836	fixed effects
met-a-609	X-12441--12- hydroxyeicosatetraenoate (12-HETE)	Parkinson's disease	14.703	0.326	fixed effects
met-a-610	X-12442--5,8- tetradecadienoate	Parkinson's disease	8.358	0.757	fixed effects
met-a-611	X-12443	Parkinson's disease	20.807	0.053	fixed effects
met-a-612	X-12450	Parkinson's disease	35.232	0.197	fixed effects
met-a-613	X-12456	Parkinson's disease	17.589	0.614	fixed effects
met-a-614	X-12465	Parkinson's disease	12.906	0.300	fixed effects

met-a-615	Octanoylcarnitine	Parkinson's disease	18.636	0.179	fixed effects
met-a-616	Alpha-hydroxyisovalerate	Parkinson's disease	13.163	0.435	fixed effects
met-a-617	N-acetylthreonine	Parkinson's disease	10.563	0.481	fixed effects
met-a-618	Decanoylcarnitine	Parkinson's disease	7.345	0.884	fixed effects
met-a-619	1-palmitoylglycerophosphocholine	Parkinson's disease	33.934	0.374	fixed effects
met-a-620	1-heptadecanoylglycerophosphocholine	Parkinson's disease	17.715	0.060	fixed effects
met-a-621	1-oleoylglycerophosphocholine	Parkinson's disease	17.668	0.281	fixed effects
met-a-622	1-stearoylglycerophosphocholine	Parkinson's disease	11.387	0.411	fixed effects
met-a-623	5-dodecenoate (12:1n7)	Parkinson's disease	41.787	0.001	multiplicative random effects
met-a-624	Stearidonate (18:4n3)	Parkinson's disease	6.419	0.779	fixed effects
met-a-625	10-heptadecenoate (17:1n7)	Parkinson's disease	1.458	0.918	fixed effects
met-a-626	10-nonadecenoate (19:1n9)	Parkinson's disease	9.470	0.149	fixed effects
met-a-627	Epiandrosterone sulfate	Parkinson's disease	6.428	0.843	fixed effects
met-a-628	Linolenate [alpha or gamma; (18:3n3 or 6)]	Parkinson's disease	4.484	0.344	fixed effects
met-a-629	X-12510--2-aminooctanoic acid	Parkinson's disease	9.925	0.768	fixed effects
met-a-630	X-12524	Parkinson's disease	19.177	0.863	fixed effects
met-a-631	Bilirubin (E,Z or Z,E)*	Parkinson's disease	17.690	0.342	fixed effects
met-a-632	X-12544	Parkinson's disease	6.997	0.984	fixed effects
met-a-633	X-12556	Parkinson's disease	29.983	0.070	fixed effects
met-a-634	1-arachidonoylglycerophosphoinositol*	Parkinson's disease	29.079	0.023	multiplicative random effects
met-a-635	X-12627	Parkinson's disease	10.223	0.421	fixed effects
met-a-636	X-12644	Parkinson's disease	18.047	0.584	fixed effects
met-a-637	X-12645	Parkinson's	23.940	0.157	fixed effects

		disease			
met-a-638	Asparagine	Parkinson's disease	52.038	0.064	fixed effects
met-a-639	X-12680	Parkinson's disease	14.194	0.288	fixed effects
met-a-640	X-12696	Parkinson's disease	37.571	0.014	multiplicative random effects
met-a-641	X-12704	Parkinson's disease	7.781	0.733	fixed effects
met-a-642	X-12712	Parkinson's disease	35.030	0.608	fixed effects
met-a-643	X-12717	Parkinson's disease	7.224	0.513	fixed effects
met-a-644	X-12719	Parkinson's disease	17.306	0.099	fixed effects
met-a-645	X-12726	Parkinson's disease	25.732	0.217	fixed effects
met-a-646	X-12728	Parkinson's disease	37.027	0.514	fixed effects
met-a-647	X-12729	Parkinson's disease	8.668	0.950	fixed effects
met-a-648	X-12734	Parkinson's disease	4.067	0.944	fixed effects
met-a-649	X-12740	Parkinson's disease	11.271	0.506	fixed effects
met-a-650	X-12749	Parkinson's disease	74.332	0.001	multiplicative random effects
met-a-651	Stachydrine	Parkinson's disease	1.934	0.858	fixed effects
met-a-652	Isovalerylcarnitine	Parkinson's disease	9.867	0.936	fixed effects
met-a-653	Stearoylcarnitine	Parkinson's disease	7.222	0.205	fixed effects
met-a-654	1-stearoylglycerophosphoethanolamine	Parkinson's disease	25.225	0.003	multiplicative random effects
met-a-655	1-linoleoylglycerophosphocholine	Parkinson's disease	17.364	0.237	fixed effects
met-a-656	Bradykinin, des-arg(9)	Parkinson's disease	14.582	0.749	fixed effects
met-a-657	X-12771	Parkinson's disease	17.130	0.249	fixed effects
met-a-658	X-12776	Parkinson's disease	0.712	0.701	fixed effects
met-a-659	Gamma-glutamylisoleucine*	Parkinson's disease	19.724	0.658	fixed effects
met-a-660	X-12786	Parkinson's disease	13.914	0.238	fixed effects

met-a-661	X-12798	Parkinson's disease	8.265	0.408	fixed effects
met-a-662	X-12816	Parkinson's disease	4.734	0.578	fixed effects
met-a-663	X-12830	Parkinson's disease	7.062	0.853	fixed effects
met-a-664	X-12833	Parkinson's disease	11.290	0.914	fixed effects
met-a-665	X-12844	Parkinson's disease	12.631	0.477	fixed effects
met-a-666	X-12847	Parkinson's disease	2.710	0.975	fixed effects
met-a-667	X-12850	Parkinson's disease	17.007	0.318	fixed effects
met-a-668	Laurylcarnitine	Parkinson's disease	10.845	0.542	fixed effects
met-a-669	X-12851	Parkinson's disease	7.589	0.370	fixed effects
met-a-670	X-12855	Parkinson's disease	11.491	0.830	fixed effects
met-a-671	X-12990--docosapentaenoic acid (n6-DPA)	Parkinson's disease	15.793	0.201	fixed effects
met-a-672	Isovalerate	Parkinson's disease	1.529	0.676	fixed effects
met-a-673	X-13069	Parkinson's disease	12.267	0.725	fixed effects
met-a-674	X-13183--stearamide	Parkinson's disease	5.540	0.852	fixed effects
met-a-675	X-13215	Parkinson's disease	38.568	0.579	fixed effects
met-a-676	7-methylguanane	Parkinson's disease	2.564	0.990	fixed effects
met-a-677	Phenylacetylglutamine	Parkinson's disease	21.299	0.213	fixed effects
met-a-678	Pro-hydroxy-pro	Parkinson's disease	37.312	0.005	multiplicative random effects
met-a-679	N2,N2-dimethylguanosine	Parkinson's disease	54.061	0.396	fixed effects
met-a-680	Cysteine-glutathione disulfide	Parkinson's disease	13.283	0.065	fixed effects
met-a-681	Oleoylcarnitine	Parkinson's disease	11.274	0.421	fixed effects
met-a-682	1-arachidonoylglycerophosphoethanolamine*	Parkinson's disease	20.700	0.415	fixed effects
met-a-683	X-13429	Parkinson's disease	6.298	0.391	fixed effects
met-a-684	X-13431--nonanoylcarnitine*	Parkinson's disease	15.611	0.210	fixed effects

met-a-685	X-13435	Parkinson's disease	24.291	0.230	fixed effects
met-a-686	X-13477	Parkinson's disease	10.975	0.140	fixed effects
met-a-687	2-palmitoylglycerophosphocholine*	Parkinson's disease	36.354	0.010	multiplicative random effects
met-a-688	2-oleoylglycerophosphocholine*	Parkinson's disease	20.063	0.271	fixed effects
met-a-689	2-stearoylglycerophosphocholine*	Parkinson's disease	10.694	0.469	fixed effects
met-a-690	2-linoleoylglycerophosphocholine*	Parkinson's disease	19.147	0.383	fixed effects
met-a-691	X-13496	Parkinson's disease	28.718	0.833	fixed effects
met-a-692	1-palmitoylglycerophosphoinositol*	Parkinson's disease	21.327	0.011	multiplicative random effects
met-a-693	X-13548	Parkinson's disease	40.734	0.570	fixed effects
met-a-694	X-13549	Parkinson's disease	15.266	0.505	fixed effects
met-a-695	X-13553	Parkinson's disease	3.860	0.796	fixed effects
met-a-696	X-13619	Parkinson's disease	28.694	0.534	fixed effects
met-a-697	2-methylbutyrylcarnitine	Parkinson's disease	31.234	0.070	fixed effects
met-a-698	Hydroxyisovaleroyl carnitine	Parkinson's disease	33.166	2.47E-05	multiplicative random effects
met-a-699	Glutaroyl carnitine	Parkinson's disease	27.766	0.477	fixed effects
met-a-700	X-13658	Parkinson's disease	20.642	0.243	fixed effects
met-a-701	X-13671	Parkinson's disease	16.732	0.271	fixed effects
met-a-702	2-tetradecenoyl carnitine	Parkinson's disease	14.395	0.639	fixed effects
met-a-703	4-hydroxyhippurate	Parkinson's disease	11.916	0.103	fixed effects
met-a-704	X-13741	Parkinson's disease	15.144	0.176	fixed effects
met-a-705	1-myristoylglycerophosphocholine	Parkinson's disease	17.296	0.004	multiplicative random effects
met-a-706	1-	Parkinson's	22.928	0.003	multiplicative random

	oleoylglycerophosphoethanol amine	disease			effects
met-a-707	1-palmitoylglycerophosphoethanolamine	Parkinson's disease	29.384	0.206	fixed effects
met-a-708	3-(3-hydroxyphenyl)propionate	Parkinson's disease	9.441	0.398	fixed effects
met-a-709	Tetradecanedioate	Parkinson's disease	22.066	0.281	fixed effects
met-a-710	2-hydroxypalmitate	Parkinson's disease	40.434	0.625	fixed effects
met-a-711	Hexadecanedioate	Parkinson's disease	26.164	0.293	fixed effects
met-a-712	Dihomo-linolenate (20:3n3 or n6)	Parkinson's disease	30.575	0.081	fixed effects
met-a-713	X-13859	Parkinson's disease	40.303	0.369	fixed effects
met-a-714	Threitol	Parkinson's disease	6.612	0.882	fixed effects
met-a-715	X-14056	Parkinson's disease	5.393	0.612	fixed effects
met-a-716	X-14057	Parkinson's disease	22.928	0.086	fixed effects
met-a-717	X-14086	Parkinson's disease	15.210	0.230	fixed effects
met-a-718	P-cresol sulfate	Parkinson's disease	19.728	0.139	fixed effects
met-a-719	X-14189--leucylalanine	Parkinson's disease	4.996	0.891	fixed effects
met-a-720	X-14205--alpha-glutamyltyrosine	Parkinson's disease	19.418	0.150	fixed effects
met-a-721	X-14208--phenylalanylserine	Parkinson's disease	20.191	0.064	fixed effects
met-a-722	X-14304--leucylalanine	Parkinson's disease	8.545	0.953	fixed effects
met-a-723	X-14374	Parkinson's disease	8.634	0.280	fixed effects
met-a-724	X-14450--phenylalanylleucine	Parkinson's disease	3.869	0.424	fixed effects
met-a-725	X-14473	Parkinson's disease	10.249	0.419	fixed effects
met-a-726	X-14541	Parkinson's disease	21.239	0.096	fixed effects
met-a-727	X-14588	Parkinson's disease	12.861	0.117	fixed effects
met-a-728	X-14625	Parkinson's disease	18.640	0.231	fixed effects
met-a-729	X-14626	Parkinson's disease	18.696	0.285	fixed effects

met-a-730	X-14632	Parkinson's disease	16.699	0.475	fixed effects
met-a-731	X-14658	Parkinson's disease	30.971	5.93E-04	multiplicative random effects
met-a-732	X-14662	Parkinson's disease	10.048	0.930	fixed effects
met-a-733	X-14745	Parkinson's disease	21.553	0.043	multiplicative random effects
met-a-734	Gamma-glutamylglutamate	Parkinson's disease	11.435	0.247	fixed effects
met-a-735	Octadecanedioate	Parkinson's disease	13.872	0.085	fixed effects
met-a-736	Leucylleucine	Parkinson's disease	4.741	0.856	fixed effects
met-a-737	7-alpha-hydroxy-3-oxo-4-cholestenoate (7-Hoca)	Parkinson's disease	12.666	0.553	fixed effects
met-a-738	N-Butyl Oleate	Parkinson's disease	14.748	0.098	fixed effects
met-a-739	Dimethylarginine (SDMA + ADMA)	Parkinson's disease	38.234	0.207	fixed effects
met-a-740	Taurolithocholate 3-sulfate	Parkinson's disease	7.065	0.630	fixed effects
met-a-741	X-14977--vanillin	Parkinson's disease	4.780	0.853	fixed effects
met-a-742	Succinylcarnitine	Parkinson's disease	34.914	0.657	fixed effects
met-a-743	Tryptophan betaine	Parkinson's disease	16.510	0.057	fixed effects
met-a-744	Cyclo(leu-pro)	Parkinson's disease	13.544	0.633	fixed effects
met-a-745	Chiro-inositol	Parkinson's disease	11.536	0.566	fixed effects
met-a-746	5alpha-androstan-3beta,17beta-diol disulfate	Parkinson's disease	8.078	0.921	fixed effects
met-a-747	4-androsten-3beta,17beta-diol disulfate 1*	Parkinson's disease	13.367	0.769	fixed effects
met-a-748	4-androsten-3beta,17beta-diol disulfate 2*	Parkinson's disease	13.743	0.618	fixed effects
met-a-749	2-hydroxyglutarate	Parkinson's disease	13.748	0.317	fixed effects
met-a-750	Ergothioneine	Parkinson's disease	0.556	0.757	fixed effects
met-a-751	Palmitoyl sphingomyelin	Parkinson's disease	44.596	0.323	fixed effects
met-a-752	Phenylalanylphenylalanine	Parkinson's disease	2.514	0.473	fixed effects
met-a-753	Cis-4-decenoyl carnitine	Parkinson's disease	3.952	0.861	fixed effects
met-a-754	15-methylpalmitate (isobar	Parkinson's	11.857	0.539	fixed effects

	with 2-methylpalmitate)	disease			
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Table S5. The associations of 452 human blood metabolites with the risk of Parkinson's disease using the inverse-variance weighted mendelian randomization analysis.

ID	Exposure	nSNP	IVW	
			OR (95% CI)	P value
met-a-303	Glutamine	8	1.57 (0.05-46.41)	0.795
met-a-304	Tryptophan	148	0.65 (0.31-1.36)	0.249
met-a-305	Histidine	7	1.44 (0.19-11.02)	0.727
met-a-306	Leucine	158	0.92 (0.46-1.81)	0.803
met-a-307	Cholesterol	44	0.69 (0.34-1.38)	0.294
met-a-308	Phenylalanine	5	8.99 (0.58-138.50)	0.115
met-a-309	Creatinine	24	1.22 (0.36-4.09)	0.752
met-a-310	Lactate	12	0.34 (0.07-1.62)	0.175
met-a-311	3-hydroxybutyrate (BHBA)	10	1.05 (0.85-1.29)	0.638
met-a-312	Arabinose	6	1.42 (1.05-1.91)	0.021
met-a-313	Fructose	3	2.27 (0.62-8.27)	0.213
met-a-314	Mannose	18	2.66 (1.28-5.53)	0.009
met-a-315	Pyruvate	15	1.10 (0.65-1.87)	0.732
met-a-316	Uridine	20	1.19 (0.39-3.61)	0.763
met-a-317	Linoleate (18:2n6)	16	0.88 (0.34-2.30)	0.799
met-a-318	Allantoin	20	0.85 (0.58-1.23)	0.385
met-a-319	Arachidonate (20:4n6)	21	0.83 (0.49-1.42)	0.503
met-a-320	Deoxycholate	17	1.03 (0.78-1.35)	0.852
met-a-321	Margarate (17:0)	7	0.60 (0.23-1.54)	0.285
met-a-322	Inosine	10	0.79 (0.69-0.91)	0.001
met-a-323	Isoleucine	18	0.94 (0.26-3.48)	0.929
met-a-324	Threonine	18	1.27 (0.38-4.26)	0.698
met-a-325	Tyrosine	31	0.76 (0.29-1.98)	0.581
met-a-326	Lysine	22	0.75 (0.22-2.51)	0.636
met-a-327	Methionine	20	1.41 (0.30-6.58)	0.663
met-a-328	Malate	18	0.74 (0.38-1.48)	0.400
met-a-329	Palmitate (16:0)	27	0.56 (0.23-1.38)	0.209
met-a-330	Nonadecanoate (19:0)	15	0.88 (0.48-1.62)	0.688
met-a-331	Stearate (18:0)	42	0.59 (0.30-1.18)	0.137
met-a-332	Oleate (18:1n9)	20	0.62 (0.25-1.53)	0.304
met-a-333	Pentadecanoate (15:0)	20	0.69 (0.32-1.49)	0.346
met-a-334	Myristate (14:0)	22	0.70 (0.38-1.31)	0.265
met-a-335	Pipecolate	14	1.64 (0.96-2.79)	0.070
met-a-336	Ornithine	8	1.25 (0.39-3.97)	0.711
met-a-337	5-oxoproline	22	0.93 (0.45-1.93)	0.849
met-a-338	Pantothenate	25	0.61 (0.35-1.06)	0.079

met-a-339	4-acetamidobutanoate	33	1.20 (0.59-2.43)	0.610
met-a-340	Alpha-tocopherol	11	0.78 (0.38-1.61)	0.499
met-a-341	Citrate	42	0.96 (0.40-2.32)	0.927
met-a-342	Glycerate	17	0.43 (0.18-1.06)	0.066
met-a-343	Guanosine	13	0.91 (0.66-1.25)	0.552
met-a-344	N-acetylalanine	21	1.69 (0.42-6.74)	0.457
met-a-345	Urate	19	0.93 (0.39-2.22)	0.864
met-a-346	Ursodeoxycholate	11	1.12 (0.82-1.52)	0.485
met-a-347	Arginine	21	0.58 (0.28-1.22)	0.151
met-a-348	Ascorbate (Vitamin C)	14	0.85 (0.73-0.98)	0.022
met-a-349	Heptanoate (7:0)	34	0.60 (0.28-1.27)	0.181
met-a-350	Laurate (12:0)	39	0.54 (0.27-1.12)	0.098
met-a-351	Valine	6	0.46 (0.09-2.36)	0.352
met-a-352	Urea	15	1.97 (0.74-5.24)	0.172
met-a-353	Cortisol	13	0.82 (0.44-1.56)	0.555
met-a-354	Cortisone	32	0.81 (0.39-1.70)	0.583
met-a-355	Proline	34	0.86 (0.51-1.46)	0.584
met-a-356	Citrulline	41	0.66 (0.33-1.33)	0.249
met-a-357	Biliverdin	15	0.98 (0.76-1.27)	0.899
met-a-358	Serotonin (5HT)	15	0.54 (0.30-0.96)	0.036
met-a-359	Gamma-glutamylglutamine	21	1.38 (0.52-3.66)	0.523
met-a-360	Gamma-glutamyltyrosine	44	2.06 (1.07-3.99)	0.031
met-a-361	Hypoxanthine	22	1.63 (0.85-3.10)	0.139
met-a-362	Betaine	22	0.76 (0.39-1.46)	0.404
met-a-363	Xanthine	3	0.73 (0.16-3.22)	0.673
met-a-364	Phosphate	5	1.17 (0.21-6.52)	0.856
met-a-365	3-methoxytyrosine	16	1.76 (0.73-4.27)	0.212
met-a-366	Pelargonate (9:0)	33	1.06 (0.50-2.25)	0.874
met-a-367	Undecanoate (11:0)	27	1.16 (0.33-4.01)	0.819
met-a-368	Beta-hydroxyisovalerate	23	0.67 (0.27-1.65)	0.388
met-a-369	Taurodeoxycholate	13	1.07 (0.85-1.35)	0.553
met-a-370	X-02973	24	0.46 (0.16-1.36)	0.163
met-a-371	X-03003	8	2.30 (0.62-8.57)	0.215
met-a-372	X-03088	19	1.33 (0.74-2.41)	0.342
met-a-373	X-03094	29	0.94 (0.37-2.42)	0.905
met-a-374	Glycerol	18	1.30 (0.66-2.57)	0.454
met-a-375	Kynurenine	35	1.06 (0.56-1.99)	0.858
met-a-376	Mannitol	11	1.02 (0.83-1.26)	0.829
met-a-377	Glycerol 3-phosphate (G3P)	14	1.50 (0.40-5.66)	0.548
met-a-378	Acetylphosphate	18	1.63 (0.43-6.22)	0.473
met-a-379	Carnitine	164	0.82 (0.41-1.65)	0.575
met-a-380	Choline	23	0.56 (0.15-2.14)	0.396
met-a-381	N-acetylorithine	14	1.11 (0.87-1.41)	0.402

met-a-382	N1-methyladenosine	8	0.54 (0.05-5.26)	0.594
met-a-383	3-methyl-2-oxovalerate	32	0.40 (0.14-1.10)	0.076
met-a-384	3-methylhistidine	9	1.16 (0.82-1.63)	0.398
met-a-385	3-phenylpropionate (hydrocinnamate)	13	1.76 (1.12-2.76)	0.013
met-a-386	Phenylacetate	8	0.89 (0.38-2.08)	0.791
met-a-387	Glycerophosphorylcholine (GPC)	18	0.93 (0.66-1.29)	0.651
met-a-388	Aspartate	4	1.18 (0.46-3.04)	0.738
met-a-389	X-04357	10	0.94 (0.57-1.55)	0.811
met-a-390	X-04494	14	1.07 (0.52-2.21)	0.856
met-a-391	X-04495	11	1.51 (0.76-2.98)	0.238
met-a-392	X-04498	21	1.54 (0.87-2.72)	0.139
met-a-393	X-04499--3,4-dihydroxybutyrate	23	0.80 (0.40-1.62)	0.536
met-a-394	X-04500	11	0.97 (0.82-1.16)	0.774
met-a-395	Dihomo-linoleate (20:2n6)	8	0.60 (0.26-1.37)	0.222
met-a-396	X-18601	21	0.98 (0.72-1.35)	0.923
met-a-397	2-hydroxystearate	34	0.54 (0.26-1.11)	0.093
met-a-398	X-05426	10	0.75 (0.38-1.47)	0.401
met-a-399	Indolelactate	17	1.02 (0.51-2.04)	0.948
met-a-400	Glycylvaline	7	0.89 (0.60-1.32)	0.548
met-a-401	Gamma-glutamylleucine	31	0.86 (0.27-2.77)	0.800
met-a-402	Eicosapentaenoate (EPA; 20:5n3)	12	1.30 (0.77-2.19)	0.320
met-a-403	Estrone 3-sulfate	12	0.96 (0.85-1.10)	0.578
met-a-404	Glycocholate	9	1.00 (0.76-1.33)	0.977
met-a-405	Glycodeoxycholate	7	0.93 (0.75-1.15)	0.511
met-a-406	Taurochenodeoxycholate	13	1.01 (0.78-1.30)	0.969
met-a-407	Taurocholate	16	1.11 (0.94-1.31)	0.222
met-a-408	X-05907	12	1.44 (0.59-3.48)	0.423
met-a-409	Docosahexaenoate (DHA; 22:6n3)	6	0.73 (0.15-3.45)	0.690
met-a-410	1-stearoylglycerophosphoinositol	7	0.53 (0.31-0.90)	0.020
met-a-411	X-06226	23	1.81 (0.70-4.65)	0.220
met-a-412	X-06246	20	0.83 (0.44-1.59)	0.578
met-a-413	X-06267	12	1.07 (0.47-2.45)	0.879
met-a-414	X-06307	8	1.52 (0.79-2.93)	0.214
met-a-415	X-06350	14	0.91 (0.48-1.73)	0.770
met-a-416	X-06351	5	1.12 (0.58-2.15)	0.743
met-a-417	Myo-inositol	37	1.01 (0.56-1.83)	0.962
met-a-418	Glucose	38	0.49 (0.21-1.10)	0.084
met-a-419	1,5-anhydroglucitol (1,5-AG)	28	1.05 (0.56-1.97)	0.882
met-a-420	2-hydroxybutyrate (AHB)	15	0.73 (0.33-1.63)	0.446
met-a-421	3-methyl-2-oxobutyrate	17	1.03 (0.38-2.81)	0.956
met-a-422	1,6-anhydroglucose	15	1.16 (0.92-1.46)	0.221
met-a-423	1-palmitoylglycerol (1-monopalmitin)	14	0.52 (0.19-1.40)	0.196
met-a-424	1-oleoylglycerol (1-monoolein)	15	1.19 (0.77-1.83)	0.435

met-a-425	1-stearoylglycerol (1-monostearin)	24	2.19 (1.24-3.87)	0.007
met-a-426	X-08402	21	0.92 (0.58-1.45)	0.714
met-a-427	2-hydroxyisobutyrate	18	1.12 (0.55-2.26)	0.763
met-a-428	X-08766	15	0.59 (0.33-1.06)	0.076
met-a-429	4-methyl-2-oxopentanoate	14	1.28 (0.49-3.35)	0.610
met-a-430	Phenyllactate (PLA)	17	0.78 (0.40-1.54)	0.470
met-a-431	Homocitrulline	7	0.88 (0.46-1.67)	0.700
met-a-432	Aspartylphenylalanine	5	1.28 (0.74-2.24)	0.379
met-a-433	Levulinate (4-oxovalerate)	52	0.76 (0.41-1.39)	0.374
met-a-434	Palmitoylcarnitine	9	0.70 (0.31-1.57)	0.386
met-a-435	X-08988	31	0.73 (0.35-1.51)	0.392
met-a-436	X-09026	15	0.78 (0.36-1.69)	0.523
met-a-437	X-09108	13	0.35 (0.13-0.97)	0.044
met-a-438	Cholate	8	1.11 (0.88-1.40)	0.386
met-a-439	X-09706	22	0.80 (0.41-1.55)	0.505
met-a-440	X-10395	29	0.90 (0.58-1.41)	0.656
met-a-441	X-10429	21	0.78 (0.46-1.33)	0.358
met-a-442	X-10500	33	0.77 (0.33-1.81)	0.553
met-a-443	X-10506	13	0.77 (0.29-2.04)	0.606
met-a-444	X-10510	22	1.28 (0.73-2.25)	0.384
met-a-445	1-linoleoylglycerol (1-monolinolein)	15	0.95 (0.68-1.31)	0.739
met-a-446	Indoleacetate	19	0.67 (0.39-1.16)	0.153
met-a-447	Hyodeoxycholate	16	1.06 (0.78-1.44)	0.727
met-a-448	3-indoxyl sulfate	5	0.95 (0.52-1.76)	0.877
met-a-449	N-acetylglycine	13	1.14 (0.76-1.71)	0.532
met-a-450	Bilirubin (Z,Z)	9	0.94 (0.79-1.13)	0.501
met-a-451	Creatine	7	0.87 (0.45-1.66)	0.669
met-a-452	Erythrose	8	0.75 (0.37-1.55)	0.444
met-a-453	Threonate	16	0.79 (0.48-1.30)	0.344
met-a-454	X-10810	16	1.33 (0.84-2.10)	0.218
met-a-455	Cysteine	18	0.74 (0.40-1.35)	0.320
met-a-456	Pyroglutamylglycine	4	1.07 (0.67-1.73)	0.767
met-a-457	N-(2-furoyl)glycine	25	0.96 (0.89-1.04)	0.333
met-a-458	DSGEGDFXAEGGGVR*	13	1.16 (0.80-1.67)	0.433
met-a-459	Pyridoxate	11	0.94 (0.57-1.56)	0.820
met-a-460	Androsterone sulfate	18	0.86 (0.74-1.00)	0.055
met-a-461	3-carboxy-4-methyl-5-propyl-2-furanpropanoate (CMPF)	13	0.75 (0.59-0.94)	0.014
met-a-462	3-(4-hydroxyphenyl)lactate	24	0.86 (0.48-1.55)	0.625
met-a-463	Acetylcarnitine	17	0.80 (0.31-2.05)	0.640
met-a-464	Serine	30	2.17 (1.06-4.46)	0.034
met-a-465	Trans-4-hydroxyproline	6	1.54 (0.57-4.18)	0.397
met-a-466	Glutamate	3	1.18 (0.31-4.55)	0.806

met-a-467	Hexanoylcarnitine	16	0.86 (0.58-1.26)	0.436
met-a-468	Glycine	24	0.86 (0.43-1.68)	0.653
met-a-469	Alanine	35	0.56 (0.26-1.22)	0.143
met-a-470	Glycochenodeoxycholate	14	0.92 (0.64-1.32)	0.656
met-a-471	2-aminobutyrate	39	0.93 (0.47-1.84)	0.840
met-a-472	Scyllo-inositol	12	0.88 (0.57-1.35)	0.550
met-a-473	Dodecanedioate	6	1.61 (0.88-2.92)	0.119
met-a-474	Gamma-glutamylvaline	13	0.32 (0.10-1.02)	0.054
met-a-475	Indolepropionate	16	1.16 (0.76-1.77)	0.501
met-a-476	Butyrylcarnitine	24	0.90 (0.73-1.10)	0.306
met-a-477	Myristoleate (14:1n5)	14	0.88 (0.53-1.47)	0.628
met-a-478	Dehydroisoandrosterone sulfate (DHEA-S)	20	0.85 (0.60-1.21)	0.372
met-a-479	Propionylcarnitine	29	0.79 (0.46-1.37)	0.402
met-a-480	Caproate (6:0)	33	0.55 (0.21-1.46)	0.230
met-a-481	Caprylate (8:0)	41	0.98 (0.52-1.88)	0.962
met-a-482	10-undecenoate (11:1n1)	25	0.90 (0.58-1.39)	0.620
met-a-483	Docosapentaenoate (n3 DPA; 22:5n3)	10	0.70 (0.39-1.27)	0.242
met-a-484	X-11204	38	1.00 (0.44-2.24)	0.992
met-a-485	X-02269	8	0.81 (0.56-1.15)	0.239
met-a-486	Phenol sulfate	12	1.09 (0.59-2.02)	0.781
met-a-487	X-06126	13	1.06 (0.67-1.68)	0.805
met-a-488	X-07765	13	0.89 (0.70-1.11)	0.297
met-a-489	X-11247	18	0.94 (0.73-1.20)	0.597
met-a-490	X-11261	14	0.83 (0.57-1.22)	0.355
met-a-491	Bilirubin (E,E)*	8	0.98 (0.77-1.25)	0.901
met-a-492	X-02249	11	0.92 (0.48-1.76)	0.794
met-a-493	Heme*	13	1.45 (0.90-2.32)	0.126
met-a-494	X-11299	11	0.93 (0.70-1.24)	0.628
met-a-495	X-11315	26	1.33 (0.68-2.59)	0.403
met-a-496	X-11317	41	1.11 (0.55-2.21)	0.772
met-a-497	1-linoleoylglycerophosphoethanolamine*	13	0.89 (0.41-1.94)	0.777
met-a-498	X-11327	31	1.01 (0.42-2.46)	0.978
met-a-499	X-11334	26	0.88 (0.49-1.56)	0.652
met-a-500	3-dehydrocarnitine*	22	0.93 (0.50-1.72)	0.806
met-a-501	Pyroglutamine*	17	1.17 (0.80-1.72)	0.411
met-a-502	C-glycosyltryptophan*	22	0.57 (0.13-2.44)	0.447
met-a-503	X-11374	18	0.89 (0.67-1.18)	0.400
met-a-504	X-11381	16	2.03 (0.89-4.60)	0.091
met-a-505	X-03056--N-[3-(2-Oxopyrrolidin-1-yl)propyl]acetamide	29	0.72 (0.48-1.09)	0.119
met-a-506	X-11412	42	1.25 (0.67-2.32)	0.489
met-a-507	X-01911	17	1.52 (1.14-2.03)	0.004
met-a-508	X-11422--xanthine	7	0.48 (0.15-1.58)	0.228

met-a-509	X-11423--O-sulfo-L-tyrosine	47	0.67 (0.27-1.69)	0.400
met-a-510	X-09789	11	1.08 (0.75-1.57)	0.674
met-a-511	X-11437	15	1.15 (0.93-1.41)	0.192
met-a-512	X-11438	24	1.18 (0.71-1.98)	0.520
met-a-513	X-11440	19	0.87 (0.67-1.12)	0.266
met-a-514	X-11441	13	0.97 (0.74-1.26)	0.796
met-a-515	X-11442	17	0.88 (0.57-1.35)	0.556
met-a-516	X-11444	12	0.70 (0.38-1.30)	0.260
met-a-517	X-11445--5-alpha-pregnan-3beta,20alpha-disulfate	16	1.02 (0.82-1.28)	0.831
met-a-518	X-11452	6	0.63 (0.38-1.05)	0.079
met-a-519	X-11469	17	0.83 (0.63-1.11)	0.206
met-a-520	X-11470	10	0.87 (0.49-1.53)	0.632
met-a-521	X-11478	11	0.80 (0.53-1.23)	0.313
met-a-522	X-11483	11	1.12 (0.89-1.41)	0.320
met-a-523	X-11485	6	0.71 (0.41-1.25)	0.238
met-a-524	X-11491	13	1.05 (0.79-1.39)	0.738
met-a-525	X-11497	15	0.60 (0.26-1.38)	0.230
met-a-526	HWESASXX*	6	0.89 (0.58-1.36)	0.587
met-a-527	X-11521	10	1.27 (0.73-2.22)	0.391
met-a-528	X-11529	12	1.04 (0.91-1.19)	0.585
met-a-529	X-11530	12	0.96 (0.73-1.27)	0.784
met-a-530	X-11537	6	0.89 (0.54-1.46)	0.643
met-a-531	X-11538	14	0.78 (0.58-1.06)	0.110
met-a-532	X-11540	8	0.94 (0.60-1.50)	0.810
met-a-533	X-11546	15	0.96 (0.74-1.24)	0.735
met-a-534	X-11550	21	2.58 (0.64-10.39)	0.184
met-a-535	X-11552	15	0.99 (0.63-1.56)	0.969
met-a-536	X-11593--O-methylascorbate*	45	0.97 (0.59-1.59)	0.912
met-a-537	Adrenate (22:4n6)	11	0.61 (0.35-1.09)	0.096
met-a-538	Homostachydrine*	5	1.01 (0.54-1.86)	0.985
met-a-539	ADSGEGDFXAEGGGVR*	11	0.86 (0.64-1.17)	0.343
met-a-540	X-11786--methylcysteine	13	0.95 (0.63-1.45)	0.821
met-a-541	X-11787	24	1.44 (0.71-2.93)	0.318
met-a-542	X-11792	15	0.90 (0.75-1.07)	0.221
met-a-543	X-11793--oxidized bilirubin*	14	0.98 (0.71-1.35)	0.895
met-a-544	X-11795	12	1.95 (0.94-4.04)	0.073
met-a-545	X-11799	7	1.06 (0.83-1.36)	0.630
met-a-546	X-11805	9	1.04 (0.86-1.26)	0.694
met-a-547	X-11818	19	1.00 (0.54-1.83)	0.987
met-a-548	X-11820	13	1.87 (1.28-2.73)	0.001
met-a-549	X-11843	3	0.79 (0.55-1.15)	0.217
met-a-550	X-11845	19	0.97 (0.82-1.14)	0.702

met-a-551	X-11847	12	1.41 (1.12-1.78)	0.004
met-a-552	X-11849	13	1.03 (0.85-1.24)	0.771
met-a-553	X-11850	8	1.18 (0.93-1.49)	0.180
met-a-554	X-11852	9	0.92 (0.62-1.37)	0.687
met-a-555	X-11858	14	0.95 (0.82-1.11)	0.532
met-a-556	X-11859	13	0.55 (0.28-1.08)	0.082
met-a-557	X-11876	15	1.41 (0.93-2.14)	0.107
met-a-558	1-arachidonoylglycerophosphocholine*	22	0.57 (0.33-1.00)	0.051
met-a-559	1-palmitoleoylglycerophosphocholine*	14	1.02 (0.48-2.13)	0.966
met-a-560	X-11905	16	0.96 (0.75-1.23)	0.726
met-a-561	X-12007	18	0.94 (0.81-1.10)	0.466
met-a-562	X-12013	9	1.11 (0.90-1.36)	0.325
met-a-563	Gamma-glutamylmethionine*	9	1.28 (0.69-2.38)	0.437
met-a-564	Gamma-glutamylthreonine*	10	0.77 (0.38-1.57)	0.476
met-a-565	X-12029	37	0.43 (0.19-0.95)	0.038
met-a-566	X-12038	53	0.86 (0.41-1.80)	0.696
met-a-567	X-12039	14	1.04 (0.79-1.36)	0.806
met-a-568	X-12040	15	1.02 (0.93-1.11)	0.666
met-a-569	X-12056	14	1.14 (0.87-1.48)	0.343
met-a-570	X-12063	16	1.10 (0.90-1.34)	0.367
met-a-571	Gamma-tocopherol	13	0.93 (0.66-1.31)	0.680
met-a-572	Gamma-glutamylphenylalanine	35	0.55 (0.27-1.14)	0.107
met-a-573	Isobutyrylcarnitine	9	0.68 (0.45-1.04)	0.076
met-a-574	Pseudouridine	26	0.53 (0.16-1.75)	0.295
met-a-575	Valerate	10	1.32 (0.56-3.08)	0.525
met-a-576	Palmitoleate (16:1n7)	9	0.90 (0.46-1.75)	0.747
met-a-577	Alpha-ketoglutarate	17	0.80 (0.48-1.34)	0.397
met-a-578	Erythronate*	45	1.28 (0.64-2.54)	0.488
met-a-579	Lathosterol	18	1.00 (0.72-1.38)	0.979
met-a-580	X-12092	21	0.94 (0.83-1.07)	0.352
met-a-581	X-12093	12	0.83 (0.68-1.01)	0.065
met-a-582	X-12094	9	1.68 (0.55-5.10)	0.360
met-a-583	X-12095--N1-methyl-3-pyridone-4-carboxamide	24	1.41 (0.77-2.57)	0.262
met-a-584	X-12100--hydroxytryptophan*	41	0.95 (0.47-1.91)	0.883
met-a-585	X-12116	9	0.76 (0.41-1.43)	0.396
met-a-586	Eicosenoate (20:1n9 or 11)	12	1.25 (0.69-2.28)	0.456
met-a-587	X-12188	22	0.98 (0.89-1.07)	0.602
met-a-588	X-12189	27	0.99 (0.92-1.07)	0.860
met-a-589	X-12206	11	0.89 (0.44-1.80)	0.749
met-a-590	X-12212	13	0.94 (0.69-1.28)	0.696
met-a-591	X-12216	10	0.93 (0.65-1.33)	0.696
met-a-592	X-12217	9	0.99 (0.59-1.68)	0.982
met-a-593	X-12230	9	0.68 (0.45-1.02)	0.062

met-a-594	X-12231	13	1.13 (0.66-1.93)	0.665
met-a-595	X-12236	9	1.57 (0.95-2.58)	0.077
met-a-596	X-12244--N-acetylcarnosine	23	0.76 (0.40-1.44)	0.399
met-a-597	X-12253	8	0.94 (0.62-1.43)	0.781
met-a-598	X-12261	12	1.08 (0.92-1.27)	0.358
met-a-599	X-12329	27	0.99 (0.93-1.04)	0.614
met-a-600	X-10346	18	0.97 (0.84-1.12)	0.659
met-a-601	ADpSGEGDFXAEGGGVR*	5	0.94 (0.55-1.60)	0.812
met-a-602	1-eicosatrienoylglycerophosphocholine*	20	1.08 (0.68-1.71)	0.759
met-a-603	1-docosahexaenoylglycerophosphocholine*	7	0.93 (0.41-2.12)	0.858
met-a-604	X-12405	8	0.73 (0.44-1.22)	0.233
met-a-605	X-12407	9	1.13 (0.88-1.45)	0.346
met-a-606	X-12428	9	1.03 (0.73-1.45)	0.876
met-a-607	1-eicosadienoylglycerophosphocholine*	12	0.97 (0.60-1.58)	0.907
met-a-608	X-12435	26	1.08 (1.01-1.16)	0.031
met-a-609	X-12441--12-hydroxyeicosatetraenoate (12-HETE)	14	1.06 (0.88-1.26)	0.540
met-a-610	X-12442--5,8-tetradecadienoate	13	1.30 (0.86-1.98)	0.212
met-a-611	X-12443	13	0.95 (0.76-1.20)	0.688
met-a-612	X-12450	30	0.54 (0.34-0.86)	0.009
met-a-613	X-12456	21	0.99 (0.73-1.32)	0.925
met-a-614	X-12465	12	0.73 (0.49-1.09)	0.127
met-a-615	Octanoylcarnitine	15	1.03 (0.73-1.45)	0.865
met-a-616	Alpha-hydroxyisovalerate	14	0.66 (0.41-1.05)	0.078
met-a-617	N-acetylthreonine	12	1.39 (0.55-3.52)	0.486
met-a-618	Decanoylcarnitine	14	1.14 (0.80-1.61)	0.478
met-a-619	1-palmitoylglycerophosphocholine	33	1.11 (0.44-2.81)	0.825
met-a-620	1-heptadecanoylglycerophosphocholine	11	0.98 (0.53-1.80)	0.946
met-a-621	1-oleoylglycerophosphocholine	16	1.18 (0.53-2.67)	0.682
met-a-622	1-stearoylglycerophosphocholine	12	0.52 (0.25-1.08)	0.081
met-a-623	5-dodecenoate (12:1n7)	19	0.95 (0.51-1.78)	0.872
met-a-624	Stearidonate (18:4n3)	11	0.71 (0.43-1.19)	0.194
met-a-625	10-heptadecenoate (17:1n7)	6	0.42 (0.14-1.24)	0.116
met-a-626	10-nonadecenoate (19:1n9)	7	0.47 (0.21-1.07)	0.073
met-a-627	Epiandrosterone sulfate	12	0.72 (0.60-0.87)	7.67E-04
met-a-628	Linolenate [alpha or gamma; (18:3n3 or 6)]	5	1.07 (0.44-2.59)	0.886
met-a-629	X-12510--2-aminooctanoic acid	15	1.03 (0.77-1.38)	0.839
met-a-630	X-12524	28	0.95 (0.34-2.65)	0.924
met-a-631	Bilirubin (E,Z or Z,E)*	17	1.06 (0.81-1.40)	0.679
met-a-632	X-12544	18	1.02 (0.74-1.41)	0.885
met-a-633	X-12556	21	0.90 (0.50-1.65)	0.743
met-a-634	1-arachidonoylglycerophosphoinositol*	17	0.63 (0.31-1.29)	0.209
met-a-635	X-12627	11	0.78 (0.46-1.30)	0.336

met-a-636	X-12644	21	0.79 (0.45-1.38)	0.404
met-a-637	X-12645	19	0.98 (0.67-1.45)	0.932
met-a-638	Asparagine	39	0.64 (0.33-1.24)	0.183
met-a-639	X-12680	13	1.08 (0.67-1.74)	0.745
met-a-640	X-12696	22	2.12 (0.90-4.99)	0.084
met-a-641	X-12704	12	1.03 (0.77-1.38)	0.833
met-a-642	X-12712	39	0.99 (0.93-1.06)	0.806
met-a-643	X-12717	9	1.42 (1.12-1.79)	0.004
met-a-644	X-12719	12	0.91 (0.72-1.15)	0.422
met-a-645	X-12726	22	1.00 (0.78-1.28)	0.996
met-a-646	X-12728	39	0.99 (0.96-1.02)	0.457
met-a-647	X-12729	18	1.12 (0.97-1.31)	0.129
met-a-648	X-12734	11	1.03 (0.85-1.24)	0.771
met-a-649	X-12740	13	0.90 (0.74-1.08)	0.248
met-a-650	X-12749	42	0.83 (0.38-1.84)	0.647
met-a-651	Stachydrine	6	0.90 (0.66-1.21)	0.477
met-a-652	Isovalerylcarnitine	19	0.93 (0.61-1.43)	0.752
met-a-653	Stearoylcarnitine	6	2.05 (0.76-5.50)	0.154
met-a-654	1-stearoylglycerophosphoethanolamine	10	0.82 (0.33-2.04)	0.671
met-a-655	1-linoleoylglycerophosphocholine	15	1.26 (0.56-2.84)	0.574
met-a-656	Bradykinin, des-arg(9)	20	0.89 (0.78-1.01)	0.065
met-a-657	X-12771	15	1.25 (0.84-1.84)	0.268
met-a-658	X-12776	3	3.10 (0.11-88.76)	0.509
met-a-659	Gamma-glutamylisoleucine*	24	1.04 (0.59-1.84)	0.894
met-a-660	X-12786	12	0.79 (0.50-1.23)	0.297
met-a-661	X-12798	9	0.93 (0.71-1.22)	0.591
met-a-662	X-12816	7	1.11 (0.81-1.54)	0.518
met-a-663	X-12830	13	1.06 (0.77-1.47)	0.708
met-a-664	X-12833	20	1.02 (0.94-1.09)	0.686
met-a-665	X-12844	14	0.89 (0.49-1.63)	0.709
met-a-666	X-12847	10	1.16 (0.90-1.51)	0.254
met-a-667	X-12850	16	0.90 (0.66-1.24)	0.523
met-a-668	Laurylcarnitine	13	1.17 (0.73-1.86)	0.519
met-a-669	X-12851	8	1.04 (0.93-1.15)	0.508
met-a-670	X-12855	18	1.10 (0.70-1.72)	0.686
met-a-671	X-12990--docosapentaenoic acid (n6-DPA)	13	1.44 (0.96-2.16)	0.078
met-a-672	Isovalerate	4	0.92 (0.26-3.31)	0.899
met-a-673	X-13069	17	0.72 (0.46-1.14)	0.167
met-a-674	X-13183--stearamide	11	0.91 (0.63-1.31)	0.609
met-a-675	X-13215	42	1.26 (0.71-2.26)	0.428
met-a-676	7-methylguanaine	11	1.10 (0.57-2.11)	0.776
met-a-677	Phenylacetylglutamine	18	0.69 (0.49-0.98)	0.040

met-a-678	Pro-hydroxy-pro	19	0.47 (0.18-1.19)	0.112
met-a-679	N2,N2-dimethylguanosine	53	1.02 (0.61-1.71)	0.935
met-a-680	Cysteine-glutathione disulfide	8	0.67 (0.45-0.99)	0.045
met-a-681	Oleoylcarnitine	12	0.66 (0.34-1.27)	0.213
met-a-682	1-arachidonoylglycerophosphoethanolamine*	21	1.12 (0.65-1.93)	0.693
met-a-683	X-13429	7	0.90 (0.71-1.13)	0.364
met-a-684	X-13431--nonanoylcarnitine*	13	1.15 (0.88-1.51)	0.301
met-a-685	X-13435	21	0.89 (0.54-1.45)	0.631
met-a-686	X-13477	8	1.26 (0.47-3.34)	0.649
met-a-687	2-palmitoylglycerophosphocholine*	20	1.07 (0.45-2.53)	0.883
met-a-688	2-oleoylglycerophosphocholine*	18	1.69 (0.76-3.74)	0.196
met-a-689	2-stearoylglycerophosphocholine*	12	0.70 (0.39-1.27)	0.238
met-a-690	2-linoleoylglycerophosphocholine*	19	0.60 (0.30-1.21)	0.153
met-a-691	X-13496	38	0.81 (0.38-1.74)	0.589
met-a-692	1-palmitoylglycerophosphoinositol*	10	1.07 (0.46-2.47)	0.880
met-a-693	X-13548	44	1.32 (0.64-2.70)	0.453
met-a-694	X-13549	17	1.02 (0.30-3.48)	0.974
met-a-695	X-13553	8	1.27 (0.64-2.55)	0.494
met-a-696	X-13619	31	1.54 (0.61-3.91)	0.361
met-a-697	2-methylbutyrylcarnitine	22	0.87 (0.42-1.80)	0.704
met-a-698	Hydroxyisovaleroyl carnitine	8	0.48 (0.12-1.89)	0.294
met-a-699	Glutaroyl carnitine	29	0.87 (0.57-1.34)	0.532
met-a-700	X-13658	18	0.98 (0.91-1.04)	0.474
met-a-701	X-13671	15	0.57 (0.25-1.29)	0.179
met-a-702	2-tetradecenoyl carnitine	18	1.20 (0.81-1.78)	0.355
met-a-703	4-hydroxyhippurate	8	1.02 (0.66-1.59)	0.920
met-a-704	X-13741	12	0.96 (0.68-1.34)	0.791
met-a-705	1-myristoylglycerophosphocholine	6	0.70 (0.20-2.42)	0.575
met-a-706	1-oleoylglycerophosphoethanolamine	9	0.71 (0.20-2.55)	0.601
met-a-707	1-palmitoylglycerophosphoethanolamine	25	0.67 (0.39-1.15)	0.148
met-a-708	3-(3-hydroxyphenyl)propionate	10	1.08 (0.87-1.35)	0.489
met-a-709	Tetradecanedioate	20	0.87 (0.69-1.11)	0.273
met-a-710	2-hydroxypalmitate	45	1.18 (0.63-2.20)	0.613
met-a-711	Hexadecanedioate	24	0.86 (0.64-1.14)	0.288
met-a-712	Dihomo-linolenate (20:3n3 or n6)	22	0.93 (0.50-1.71)	0.809
met-a-713	X-13859	39	0.92 (0.53-1.57)	0.748
met-a-714	Threitol	13	0.92 (0.52-1.62)	0.764
met-a-715	X-14056	8	0.51 (0.24-1.08)	0.079
met-a-716	X-14057	16	1.13 (0.72-1.77)	0.595
met-a-717	X-14086	13	0.75 (0.51-1.12)	0.158
met-a-718	P-cresol sulfate	15	0.87 (0.63-1.19)	0.382
met-a-719	X-14189--leucylalanine	11	1.12 (0.89-1.40)	0.351
met-a-720	X-14205--alpha-glutamyltyrosine	15	1.04 (0.73-1.48)	0.811

met-a-721	X-14208--phenylalanylserine	13	1.25 (0.95-1.64)	0.105
met-a-722	X-14304--leucylalanine	18	1.39 (1.05-1.85)	0.021
met-a-723	X-14374	8	0.98 (0.47-2.05)	0.955
met-a-724	X-14450--phenylalanylleucine	5	1.45 (0.88-2.40)	0.145
met-a-725	X-14473	11	1.20 (0.78-1.87)	0.404
met-a-726	X-14541	15	0.77 (0.57-1.04)	0.091
met-a-727	X-14588	9	0.09 (0.01-1.40)	0.086
met-a-728	X-14625	16	0.66 (0.25-1.79)	0.417
met-a-729	X-14626	17	0.95 (0.61-1.47)	0.813
met-a-730	X-14632	18	0.89 (0.68-1.17)	0.418
met-a-731	X-14658	11	0.86 (0.41-1.78)	0.680
met-a-732	X-14662	19	0.91 (0.75-1.11)	0.363
met-a-733	X-14745	13	1.75 (0.72-4.25)	0.214
met-a-734	Gamma-glutamylglutamate	10	1.35 (0.94-1.94)	0.099
met-a-735	Octadecanedioate	9	1.44 (0.81-2.57)	0.218
met-a-736	Leucylleucine	10	1.23 (0.71-2.12)	0.463
met-a-737	7-alpha-hydroxy-3-oxo-4-cholestenoate (7-Hoca)	15	0.47 (0.17-1.31)	0.151
met-a-738	N-Butyl Oleate	10	0.72 (0.31-1.67)	0.441
met-a-739	Dimethylarginine (SDMA + ADMA)	33	1.57 (0.63-3.89)	0.330
met-a-740	Taurolithocholate 3-sulfate	10	1.00 (0.72-1.39)	0.999
met-a-741	X-14977--vanillin	10	1.32 (0.73-2.40)	0.361
met-a-742	Succinylcarnitine	40	1.13 (0.66-1.94)	0.644
met-a-743	Tryptophan betaine	10	1.04 (0.86-1.26)	0.691
met-a-744	Cyclo(leu-pro)	17	0.93 (0.70-1.25)	0.647
met-a-745	Chiro-inositol	14	0.98 (0.86-1.12)	0.821
met-a-746	5alpha-androstan-3beta,17beta-diol disulfate	16	0.98 (0.79-1.23)	0.892
met-a-747	4-androsten-3beta,17beta-diol disulfate 1*	19	0.93 (0.76-1.15)	0.525
met-a-748	4-androsten-3beta,17beta-diol disulfate 2*	17	1.07 (0.71-1.61)	0.745
met-a-749	2-hydroxyglutarate	13	0.74 (0.39-1.41)	0.363
met-a-750	Ergothioneine	3	1.47 (0.93-2.34)	0.103
met-a-751	Palmitoyl sphingomyelin	42	0.80 (0.40-1.63)	0.542
met-a-752	Phenylalanylphenylalanine	4	0.85 (0.39-1.86)	0.685
met-a-753	Cis-4-decenoyl carnitine	9	0.83 (0.52-1.34)	0.450
met-a-754	15-methylpalmitate (isobar with 2-methylpalmitate)	14	0.59 (0.26-1.30)	0.191

Abbreviations: SNP, single-nucleotide polymorphism; IVW, inverse-variance weighted; OR, odds ratio; 95% CI, 95% confidence interval.

Table S6. Sensitivity analysis for the association of significant dietary habits with the risk of Parkinson's disease via the Maximum likelihood, MR-RAPS, Penalized IVW, and MR-Egger approaches.

ID	Exposure	Maximum likelihood		MR-RAPS		Penalized IVW		MR-Egger		MR-Egger Intercept		MR-PRESSO OR (95% CI)		Outlier_n
		OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value	
ukb-b-5779	Alcohol intake frequency	0.769 (0.675-0.876)	7.67E-05	0.769 (0.678-0.874)	5.21E-05	0.799 (0.689-0.925)	0.003	1.045 (0.711-1.536)	0.825	0.993 (0.985-1.001)	0.098	0.78 (0.66–0.93)	0.005	0
ukb-b-15926	Cereal intake	1.479 (1.090-2.006)	0.012	1.506 (1.122-2.023)	0.006	1.542 (1.118-2.127)	0.008	1.137 (0.335-3.861)	0.836	1.003 (0.989-1.017)	0.663	1.48 (1.06–2.06)	0.023	0
ukb-b-16576	Dried fruit intake	1.740 (1.251-2.421)	0.001	1.753 (1.270-2.421)	6.45E-04	1.645 (1.175-2.302)	0.004	1.324 (0.282-6.204)	0.722	1.003 (0.987-1.019)	0.748	1.69 (1.13–2.53)	0.012	0

Abbreviations: MR-RAPS, mendelian randomization robust adjusted profile score; Penalized IVW, Penalized inverse-variance weighted; OR, odds ratio; 95% CI, 95% confidence interval.

Table S7. Sensitivity analysis for the association of significant human blood metabolites with the risk of Parkinson's disease via the Maximum likelihood, MR-RAPS, Penalized IVW, and MR-Egger approaches.

ID	Exposure	Maximum likelihood		MR-RAPS		Penalized IVW		MR-Egger		MR-Egger Intercept		MR-PRESSO method		
		OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value	Outlier_n
met-a-314	Mannose	2.789 (1.585-4.905)	3.72E-04	2.799 (1.601-4.894)	3.04E-04	2.663 (1.281-5.533)	0.009	10.891 (2.950-40.214)	3.40E-04	0.962 (0.932-0.993)	0.015	1.42 (1.10-1.82)	0.041	0
met-a-312	Arabinose	1.460 (1.018-2.094)	0.040	1.460 (1.022-2.085)	0.037	1.829 (1.085-3.085)	0.024	1.079 (0.633-1.839)	0.780	1.026 (0.984-1.069)	0.226	2.66 (1.28-5.53)	0.018	0
met-a-322	Inosine	0.783 (0.663-0.925)	0.004	0.779 (0.658-0.923)	0.004	0.791 (0.678-0.923)	0.003	0.847 (0.677-1.060)	0.147	0.988 (0.961-1.016)	0.399	0.79 (0.68-0.92)	0.015	0
met-a-348	Ascorbate (Vitamin C)	0.845 (0.726-0.984)	0.030	0.842 (0.719-0.986)	0.032	0.847 (0.735-0.976)	0.022	0.793 (0.617-1.021)	0.072	1.008 (0.983-1.033)	0.538	0.85 (0.74-0.97)	0.037	0
met-a-358	Serotonin (5HT)	0.549 (0.302-0.995)	0.048	0.524 (0.283-0.969)	0.039	0.537 (0.295-0.979)	0.042	0.668 (0.178-2.508)	0.550	0.995 (0.966-1.024)	0.714	0.54 (0.29-0.98)	0.062	0
met-a-360	Gamma-glutamyltyrosine	2.174 (1.103-4.285)	0.025	2.281 (1.152-4.519)	0.018	2.028 (1.055-3.901)	0.034	0.986 (0.119-8.170)	0.989	1.009 (0.987-1.030)	0.435	2.20 (1.16-4.15)	0.019	0
met-a-385	3-phenylpropionate (hydrocinn)	1.804 (1.134-2.867)	0.013	1.703 (1.070-2.712)	0.025	1.671 (1.034-2.700)	0.036	2.352 (0.948-5.839)	0.065	0.986 (0.957-1.017)	0.384	1.67 (1.03-2.70)	0.056	0

	amate)													
met-a-410	1-stearoyl glycerophosphoinositol	0.512 (0.291-0.902)	0.020	0.512 (0.287-0.913)	0.023	0.527 (0.308-0.903)	0.020	0.432 (0.174-1.072)	0.070	1.012 (0.969-1.056)	0.594	0.53 (0.32-0.87)	0.045	0
met-a-425	1-stearoyl glycerol (1-monostearin)	2.259 (1.258-4.056)	0.006	2.339 (1.299-4.212)	0.005	1.987 (1.066-3.704)	0.031	2.833 (0.461-17.419)	0.261	0.996 (0.967-1.026)	0.790	2.25 (1.15-4.43)	0.027	0
met-a-437	X-09108	0.340 (0.119-0.969)	0.043	0.340 (0.115-1.006)	0.051	0.353 (0.126-0.991)	0.048	0.521 (0.040-6.741)	0.618	0.994 (0.958-1.031)	0.743	0.35 (0.13-0.99)	0.071	0
met-a-461	3-carboxy-4-methyl-5-propyl-2-furanpropanoate (CMPF)	0.751 (0.592-0.951)	0.017	0.740 (0.582-0.941)	0.014	0.743 (0.594-0.929)	0.009	0.974 (0.535-1.772)	0.931	0.983 (0.949-1.018)	0.340	0.74 (0.64-0.87)	0.002	0
met-a-464	Serine	2.225 (1.074-4.611)	0.031	2.280 (1.088-4.774)	0.029	2.221 (1.093-4.515)	0.027	4.274 (0.618-29.576)	0.141	0.992 (0.970-1.014)	0.476	2.22 (1.13-4.37)	0.028	0
met-a-507	X-01911	1.543 (1.147-2.076)	0.004	1.544 (1.135-2.100)	0.006	1.525 (1.143-2.034)	0.004	1.056 (0.417-2.680)	0.908	1.015 (0.979-1.053)	0.416	1.52 (1.19-1.95)	0.004	0
met-a-548	X-11820	1.926 (1.290-	0.001	1.887 (1.265-	0.002	1.837 (1.210-	0.004	1.462 (0.611-	0.393	1.008 (0.981-	0.556	1.84 (1.21-2.79)	0.014	0

		2.875)		2.815)		2.789)		3.496)		1.037)				
met-a-551	X-11847	1.422 (1.120-1.806)	0.004	1.420 (1.104-1.825)	0.006	1.410 (1.116-1.782)	0.004	1.670 (0.942-2.963)	0.079	0.988 (0.951-1.026)	0.525	1.41 (1.16-1.72)	0.006	0
met-a-565	X-12029	0.397 (0.194-0.811)	0.011	0.364 (0.183-0.727)	0.004	0.349 (0.179-0.680)	0.002	0.783 (0.205-2.984)	0.720	0.989 (0.971-1.007)	0.231	0.40 (0.18-0.87)	0.027	0
met-a-608	X-12435	1.084 (1.007-1.167)	0.032	1.085 (1.005-1.172)	0.037	1.083 (1.007-1.164)	0.031	1.024 (0.909-1.154)	0.695	1.017 (0.989-1.045)	0.249	1.08 (1.02-1.15)	0.018	0
met-a-612	X-12450	0.534 (0.329-0.865)	0.011	0.577 (0.357-0.931)	0.024	0.595 (0.356-0.994)	0.048	0.699 (0.292-1.673)	0.421	0.996 (0.979-1.013)	0.651	0.59 (0.36-0.99)	0.057	0
met-a-627	Epiandrosterone sulfate	0.723 (0.598-0.874)	8.19E-04	0.723 (0.597-0.876)	9.39E-04	0.725 (0.601-0.874)	7.67E-04	0.731 (0.540-0.989)	0.042	0.999 (0.977-1.022)	0.944	0.72 (0.63-0.84)	0.001	0
met-a-643	X-12717	1.431 (1.120-1.829)	0.004	1.432 (1.110-1.848)	0.006	1.416 (1.117-1.795)	0.004	1.393 (0.479-4.049)	0.542	1.001 (0.923-1.086)	0.976	1.42 (1.13-1.77)	0.017	0
met-a-677	Phenylacetamide	0.700 (0.487-1.004)	0.053	0.682 (0.470-0.989)	0.043	0.784 (0.548-1.122)	0.184	0.714 (0.326-1.562)	0.399	0.999 (0.973-1.026)	0.929	0.69 (0.47-1.02)	0.083	0
met-a-680	Cysteine-glutathione disulfide	0.657 (0.437-0.987)	0.043	0.653 (0.436-0.978)	0.039	0.671 (0.392-1.148)	0.145	4.382 (0.460-41.744)	0.199	0.929 (0.853-1.013)	0.095	0.67 (0.39-1.15)	0.189	0
met-a-722	X-14304--leucylalanine	1.410 (1.058-1.879)	0.019	1.402 (1.039-1.893)	0.027	1.394 (1.051-1.850)	0.021	1.193 (0.502-2.832)	0.690	1.007 (0.971-1.044)	0.708	1.39 (1.14-1.70)	0.005	0

Abbreviations: MR-RAPS, mendelian randomization robust adjusted profile score; Penalized IVW, Penalized inverse-variance weighted; OR,

odds ratio; 95% CI, 95% confidence interval.

Table S8. The associations of processed alcohol intake frequency as exposure and 19 human blood metabolites as outcome using the inverse-variance weighted method.

ID	Outcome	nSNP	IVW	
			OR (95% CI)	P value
met-a-312	Arabinose	216	1.02 (0.99-1.05)	0.150
met-a-322	Inosine	215	0.96 (0.88-1.05)	0.396
met-a-348	Ascorbate (Vitamin C)	214	1.05 (0.97-1.15)	0.235
met-a-358	Serotonin (5HT)	216	1.01 (0.98-1.04)	0.366
met-a-360	Gamma-glutamyltyrosine	216	1.00 (0.99-1.02)	0.883
met-a-385	3-phenylpropionate (hydrocinnamate)	216	0.97 (0.93-1.00)	0.084
met-a-410	1-stearoylglycerophosphoinositol	216	0.98 (0.96-1.01)	0.261
met-a-425	1-stearoylglycerol (1-monostearin)	216	0.99 (0.97-1.01)	0.520
met-a-461	3-carboxy-4-methyl-5-propyl-2-furanpropanoate (CMPF)	216	0.91 (0.86-0.97)	0.004
met-a-464	Serine	216	1.00 (0.98-1.01)	0.647
met-a-507	X-01911	216	0.92 (0.87-0.96)	8.04E-04
met-a-548	X-11820	216	1.01 (0.98-1.04)	0.608
met-a-551	X-11847	216	0.97 (0.89-1.05)	0.417
met-a-565	X-12029	216	1.01 (1.00-1.02)	0.166
met-a-608	X-12435	215	0.92 (0.79-1.08)	0.319
met-a-612	X-12450	216	1.01 (0.98-1.04)	0.478
met-a-627	Epiandrosterone sulfate	216	0.93 (0.89-0.98)	0.003
met-a-643	X-12717	216	1.03 (0.94-1.13)	0.467
met-a-722	X-14304--leucylalanine	216	0.99 (0.94-1.05)	0.802

Abbreviations: SNP, single-nucleotide polymorphism; IVW, inverse-variance weighted; OR, odds ratio; 95% CI, 95% confidence interval.

Table S9. The associations of processed dried fruit intake as exposure and 19 human blood metabolites as outcome using the inverse-variance weighted method.

ID	Outcome	nSNP	IVW	
			OR (95% CI)	<i>P</i> value
met-a-312	Arabinose	147	0.94 (0.88-1.00)	0.064
met-a-322	Inosine	145	1.00 (0.82-1.22)	0.991
met-a-348	Ascorbate (Vitamin C)	145	1.05 (0.85-1.28)	0.659
met-a-358	Serotonin (5HT)	147	0.97 (0.90-1.03)	0.308
met-a-360	Gamma-glutamyltyrosine	147	1.00 (0.96-1.04)	0.995
met-a-385	3-phenylpropionate (hydrocinnamate)	147	1.11 (1.02-1.21)	0.017
met-a-410	1-stearoylglycerophosphoinositol	147	1.02 (0.96-1.09)	0.528
met-a-425	1-stearoylglycerol (1-monostearin)	147	1.00 (0.95-1.06)	0.854
met-a-461	3-carboxy-4-methyl-5-propyl-2-furanpropanoate (CMPF)	147	1.28 (1.10-1.48)	0.001
met-a-464	Serine	147	0.99 (0.95-1.03)	0.698
met-a-507	X-01911	147	1.04 (0.92-1.17)	0.564
met-a-548	X-11820	147	1.12 (1.04-1.20)	0.004
met-a-551	X-11847	147	1.12 (0.93-1.35)	0.241
met-a-565	X-12029	147	0.98 (0.95-1.01)	0.129
met-a-608	X-12435	146	0.93 (0.64-1.36)	0.714
met-a-612	X-12450	147	0.97 (0.91-1.03)	0.359
met-a-627	Epiandrosterone sulfate	147	1.14 (1.02-1.28)	0.018
met-a-643	X-12717	146	1.26 (1.02-1.56)	0.033
met-a-722	X-14304--leucylalanine	146	1.05 (0.93-1.19)	0.410

Abbreviations: SNP, single-nucleotide polymorphism; IVW, inverse-variance weighted; OR, odds ratio; 95% CI, 95% confidence interval.

Table S10. The associations of processed cereal intake as exposure and 19 human blood metabolites as outcome using the inverse-variance weighted method.

ID	Outcome	nSNP	IVW	
			OR (95% CI)	<i>P</i> value
met-a-312	Arabinose	153	1.01 (0.95-1.07)	0.749
met-a-322	Inosine	153	1.15 (0.96-1.37)	0.137
met-a-348	Ascorbate (Vitamin C)	153	1.08 (0.90-1.30)	0.382
met-a-358	Serotonin (5HT)	153	1.02 (0.96-1.08)	0.484
met-a-360	Gamma-glutamyltyrosine	153	0.98 (0.95-1.01)	0.182
met-a-385	3-phenylpropionate (hydrocinnamate)	153	1.08 (1.00-1.16)	0.055
met-a-410	1-stearoylglycerophosphoinositol	153	1.03 (0.97-1.09)	0.333
met-a-425	1-stearoylglycerol (1-monostearin)	153	0.99 (0.94-1.04)	0.621
met-a-461	3-carboxy-4-methyl-5-propyl-2-furanpropanoate (CMPF)	153	0.93 (0.81-1.06)	0.267
met-a-464	Serine	153	1.01 (0.97-1.04)	0.701
met-a-507	X-01911	153	0.89 (0.80-0.99)	0.033
met-a-548	X-11820	153	1.02 (0.96-1.09)	0.512
met-a-551	X-11847	153	0.99 (0.84-1.17)	0.918
met-a-565	X-12029	153	1.02 (1.00-1.05)	0.104
met-a-608	X-12435	153	0.93 (0.66-1.29)	0.650
met-a-612	X-12450	153	1.00 (0.95-1.06)	0.918
met-a-627	Epiandrosterone sulfate	153	1.11 (1.00-1.22)	0.049
met-a-643	X-12717	153	0.95 (0.76-1.19)	0.643
met-a-722	X-14304--leucylalanine	153	0.96 (0.85-1.08)	0.511

Abbreviations: SNP, single-nucleotide polymorphism; IVW, inverse-variance weighted; OR, odds ratio; 95% CI, 95% confidence interval.