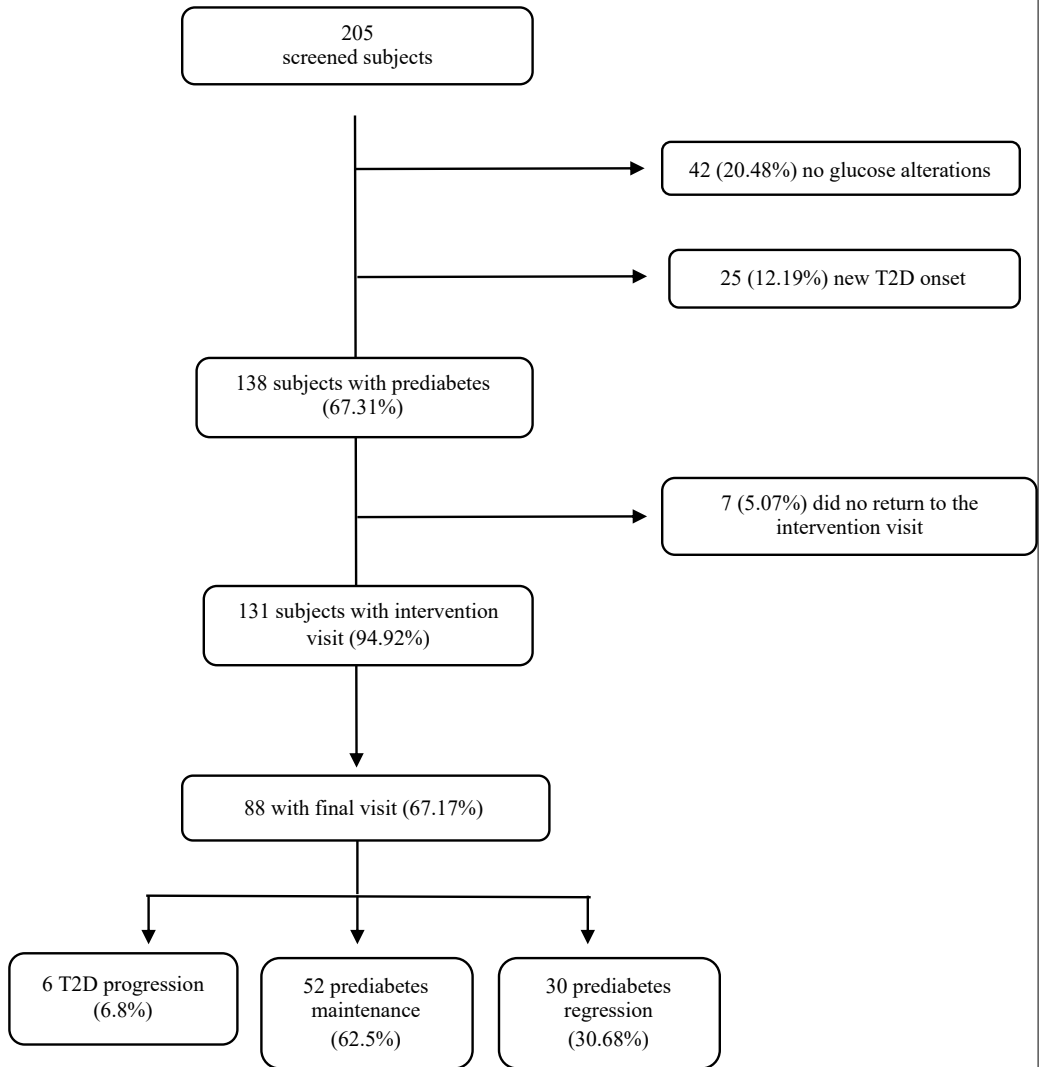


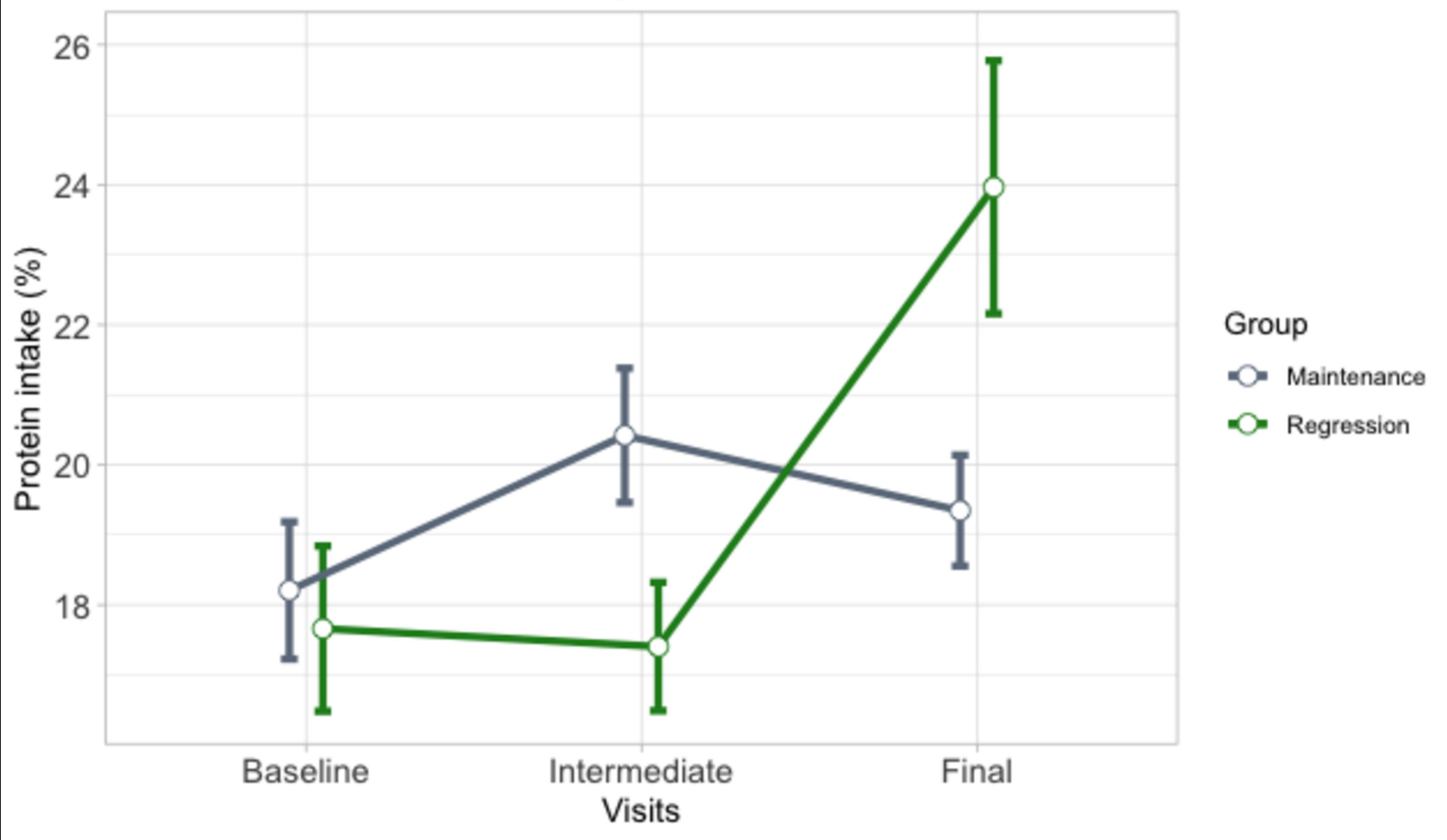
Supplementary figure 1. Flow chart of participants' selection process. T2D: Type 2 diabetes

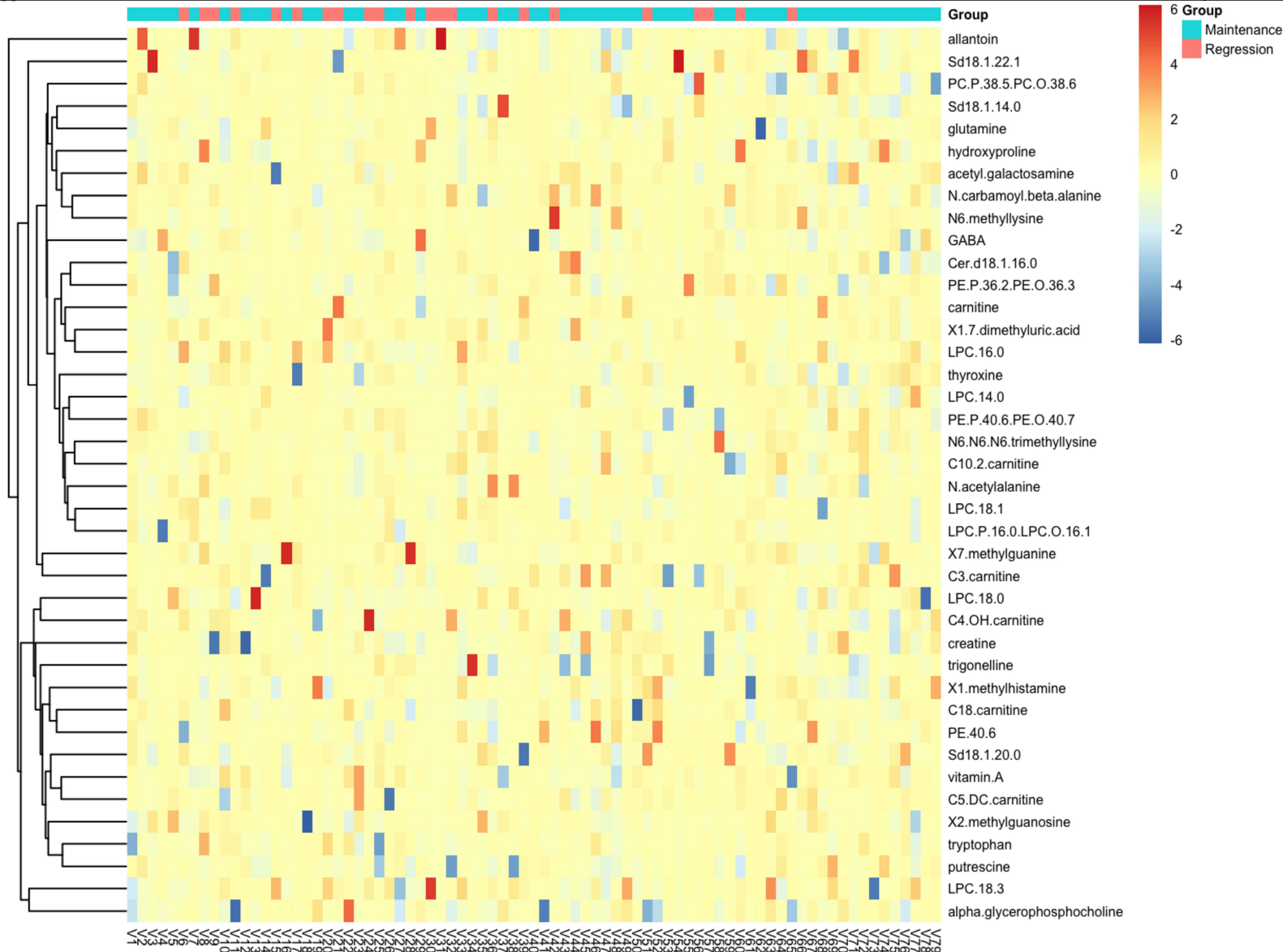
Supplementary figure 2. Changes in protein consumption across visits

Supplementary figure 3. Heatmap of Metabolites selected by LASSO at least 10 times for their association with regression to normoglycemia (RGNG).



Protein consumption across visits





Supplementary table 1. Metabolites panel studied

	Method	Compound ID	MZ	RT	HMDB_ID	Metabolite
1	HILIC-pos	QI7675	174.1363	6.85	internalstandard	phenylalanine_d8
2	HILIC-pos	QI4035	126.1367	7.54	internalstandard	valine_d8
3	HILIC-pos	QI2153	197.0669	3.75	HMDB0011103	1,7-dimethyluric_acid
6	HILIC-pos	QI4213	282.1193	7.82	HMDB0003331	1_methyladenosine
7	HILIC-pos	QI2873	166.0722	5.33	HMDB0003282	1_methylguanine
8	HILIC-pos	QI8555	298.1143	5.21	HMDB0001563	1_methylguanosine
9	HILIC-pos	QI6451	126.1027	9.89	HMDB0000898	1_methylhistamine
11	HILIC-pos	QI6850	137.0708	8.37	HMDB0000699	1_methylnicotinamide
14	HILIC-pos	QI7706	146.1174	6.8	HMDB0094649	2-aminoheptanoic_acid
15	HILIC-pos	TF1	104.0706	7.87	HMDB0001906	2-aminoisobutyric_acid
16	HILIC-pos	QI7791	160.1331	6.55	HMDB0000991	2-aminooctanoate
20	HILIC-pos	QI9472	196.0605	2.71	HMDB0000840	2-hydroxyhippurate
23	HILIC-pos	TF2	298.1146	5.38	HMDB0005862	2_methylguanosine
30	HILIC-pos	QI6419	170.0923	10.03	HMDB0000479	3_methylhistidine
31	HILIC-pos	QI9271	167.0562	3.44	HMDB0001886	3_methylxanthine
34	HILIC-pos	QI9260	146.081	3.53	HMDB0003681	4-acetamidobutanoate
35	HILIC-pos	QI1685	195.0765	2.44	HMDB0001867	4-aminohippuric_acid
37	HILIC-pos	QI7403	146.0921	7.45	HMDB0003464	4-guanidinobutanoic_acid
42	HILIC-pos	QI8464	199.0825	5.39	HMDB0004400	5-acetylamino_6-amino_3-methyluracil
47	HILIC-pos	QI7918	221.092	6.31	HMDB0000472	5-hydroxytryptophan
52	HILIC-pos	QI3176	258.1083	5.83	HMDB0000982	5-methylcytidine
58	HILIC-pos	QI8170	166.0722	5.89	HMDB0000897	7_methylguanine
59	HILIC-pos	QI2180	167.0562	3.81	HMDB0001991	7_methylxanthine
62	HILIC-pos	TF3	328.1027	5.49	HMDB0010316	acetaminophen_glucuronide

63	HILIC-pos	QI7126	146.1173	7.88	HMDB000089 5	acetylcholine
65	HILIC-pos	QI8342	222.0971	5.59	HMDB000021 2	acetyl_galactos amine
69	HILIC-pos	QI8264	185.1284	5.72	HMDB000158 4	acisoga
70	HILIC-pos	QI8587	268.1039	5.15	HMDB000005 0	adenosine
74	HILIC-pos	TF4	203.1502	9.92	HMDB000155 0	ADMA
78	HILIC-pos	QI7103	90.055	7.94	HMDB000016 1	alanine
79	HILIC-pos	QI9228	159.0511	3.72	HMDB000040 7	allantoin
84	HILIC-pos	QI5100	258.1099	10.7	HMDB000008 6	alpha_glycerop hosphocholine
93	HILIC-pos	QI4787	175.1188	9.33	HMDB000051 7	arginine
95	HILIC-pos	QI7015	133.0608	8.05	HMDB000010 8	asparagine
101	HILIC-pos	QI6640	118.0864	9.11	HMDB000004 2	betaine
102	HILIC-pos	QI10871	585.2705	1.74	HMDB000005 4	bilirubin
103	HILIC-pos	QI10050	583.255	2.05	HMDB000100 8	biliverdin
106	HILIC-pos	QI6671	146.1174	8.91	HMDB000590 0	butyrobetaine
110	HILIC-pos	QI1984	195.0877	2.96	HMDB000184 7	caffeine
113	HILIC-pos	QI6661	162.1122	8.98	HMDB000006 2	carnitine
114	HILIC-pos	QI6707	204.1228	8.8	HMDB000020 1	C2_carnitine
115	HILIC-pos	QI6841	218.1385	8.44	HMDB000082 4	C3_carnitine
117	HILIC-pos	QI4626	262.1283	8.69	HMDB001313 3	C3_DC_CH3_c arnitine
118	HILIC-pos	QI4407	232.1542	8.12	HMDB000201 3	C4_carnitine
119	HILIC-pos	QI6664	248.149	8.96	HMDB001312 7	C4_OH_carniti ne
120	HILIC-pos	QI4248	246.1698	7.88	HMDB000068 8	C5_carnitine
121	HILIC-pos	QI4299	244.1541	7.98	HMDB000250 6	C5_1_carnitine
122	HILIC-pos	QI4544	276.1439	8.46	HMDB001313 0	C5_DC_carniti ne
123	HILIC-pos	QI7270	260.1854	7.66	HMDB000070 5	C6_carnitine
124	HILIC-pos	QI4020	274.201	7.53	HMDB001525 8	C7_carnitine
125	HILIC-pos	QI7402	288.2166	7.45	HMDB000079 1	C8_carnitine
126	HILIC-pos	QI3884	302.2322	7.31	HMDB001528 8	C9_carnitine
127	HILIC-pos	QI7513	316.2478	7.24	HMDB000065 1	C10_carnitine
128	HILIC-pos	QI7464	312.2165	7.36	HMDB001332 5	C10_2_carnitin e
129	HILIC-pos	QI7580	344.2791	7.05	HMDB000225 0	C12_carnitine
130	HILIC-pos	QI3802	342.2634	7.08	HMDB001332 6	C12_1_carnitin e
131	HILIC-pos	QI3736	372.3103	6.91	HMDB000506 6	C14_carnitine
132	HILIC-pos	QI7638	370.2947	6.91	HMDB000201 4	C14_1_carnitin e
133	HILIC-pos	QI7611	368.2791	6.97	HMDB001333 1	C14_2_carnitin e

134	HILIC-pos	QI7716	400.3417	6.79	HMDB000022 2	C16_carnitine
136	HILIC-pos	QI3625	428.3729	6.68	HMDB000084 8	C18_carnitine
137	HILIC-pos	QI3631	426.3573	6.7	HMDB000506 5	C18_1_carnitine
139	HILIC-pos	QI3646	424.3417	6.77	HMDB000646 9	C18_2_carnitine
141	HILIC-pos	QI3616	448.3417	6.65	HMDB000645 5	C20_4_carnitine
142	HILIC-pos	QI3493	540.4989	6.37	HMDB000634 7	C26_carnitine
150	HILIC-pos	QI4527	104.1069	8.4	HMDB000009 7	choline
152	HILIC-pos	QI9486	206.0812	2.68	HMDB001162 1	cinnamoylglycine
153	HILIC-pos	QI6816	176.1029	8.49	HMDB000090 4	citrulline
154	HILIC-pos	QI1496	363.2162	2.07	HMDB000006 3	cortisol
155	HILIC-pos	QI1454	361.2006	2.06	HMDB000280 2	cortisone
156	HILIC-pos	QI2788	177.1021	5.16	HMDB000104 6	cotinine
158	HILIC-pos	QI6837	132.0768	8.45	HMDB000006 4	creatine
159	HILIC-pos	QI7777	114.0663	6.6	HMDB000036 2	creatinine
160	HILIC-pos	QI3576	100.1121	6.54	HMDB003140 4	cyclohexylamine
163	HILIC-pos	QI4749	241.0309	9.19	HMDB000019 2	cystine
165	HILIC-pos	QI3462	112.0506	6.32	HMDB000063 0	cytosine
170	HILIC-pos	QI6291	287.2439	10.56	HMDB000217 2	diacetylspermine
173	HILIC-pos	QI4617	104.0706	8.67	HMDB000009 2	dimethylglycine
174	HILIC-pos	TF6	202.1186	8.1	HMDB024021 2	DMGV
180	HILIC-pos	QI6645	143.0813	9.06	NA	ectoine
182	HILIC-pos	TF7	104.0706	7.76	HMDB000011 2	GABA
183	HILIC-pos	QI3821	172.133	7.16	HMDB000030 5	gabapentin
186	HILIC-pos	QI7201	148.0602	7.74	HMDB000014 8	glutamate
187	HILIC-pos	QI4433	147.0762	8.17	HMDB000064 1	glutamine
190	HILIC-pos	QI4363	76.0393	8.06	HMDB000012 2	glycine
191	HILIC-pos	QI8458	466.3161	5.39	HMDB000013 8	glycocholate
193	HILIC-pos	QI2279	450.3211	4.23	HMDB000063 1	glycodeoxycholate_glycocholate deoxycholate
196	HILIC-pos	QI4308	118.0613	7.99	HMDB000012 8	guanidinoacetic _acid
203	HILIC-pos	QI1880	180.0654	2.66	HMDB000071 4	hippurate
206	HILIC-pos	QI6530	156.0767	9.54	HMDB000017 7	histidine
208	HILIC-pos	QI4797	189.1345	9.36	HMDB000067 0	homoarginine
209	HILIC-pos	QI6818	190.1185	8.47	HMDB000067 0	homocitrulline
210	HILIC-pos	QI3895	136.0424	7.33	HMDB000074 2	homocysteine

212	HILIC-pos	QI2758	193.0972	5.1	HMDB0001390	hydroxycotinine
214	HILIC-pos	QI4324	132.0656	8.01	HMDB0000725	hydroxyproline
215	HILIC-pos	TF8	110.027	8.13	HMDB0000965	hypotaurine
222	HILIC-pos	QI8657	269.0878	5.02	HMDB0000195	inosine
224	HILIC-pos	TF9	132.1019	7.21	HMDB0000172	isoleucine
227	HILIC-pos	QI8481	190.0498	5.35	HMDB0000715	kynurenic_acid
230	HILIC-pos	TF10	132.1019	7.08	HMDB0000687	leucine
233	HILIC-pos	QI10093	324.2894	2.05	HMDB0012252	linoleoyl_ethanolamide
235	HILIC-pos	QI4851	147.1126	9.56	HMDB0000182	lysine
239	HILIC-pos	QI3819	150.0582	7.16	HMDB0000696	methionine
240	HILIC-pos	QI6717	166.0532	8.78	HMDB0002005	methionine_sulfoxide
243	HILIC-pos	QI6655	141.0657	9.01	HMDB0002820	methylimidazoleacetic_acid
251	HILIC-pos	QI10914	227.2005	1.72	HMDB0002000	myristoleic_acid
252	HILIC-pos	QI6423	188.1757	10.01	HMDB0001276	N1_acetylspermidine
254	HILIC-pos	QI2375	153.0657	4.43	HMDB0004193	N1_methyl_2_pyridone_5_carboxamide
255	HILIC-pos	QI2967	312.1299	5.47	HMDB0004824	N2.N2_dimethylguanosine
256	HILIC-pos	QI2352	286.1031	4.39	HMDB0005923	N4_acetylcytidine
258	HILIC-pos	QI6453	161.1283	9.87	HMDB0002038	N6_methyllysine
259	HILIC-pos	QI6308	175.144	10.45	HMDB0013287	N6.N6_dimethyllysine
260	HILIC-pos	QI6174	189.1597	11.44	HMDB0001325	N6.N6.N6_trimethyllysine
261	HILIC-pos	QI6812	189.1233	8.5	HMDB0000206	N6_acetyllysine
262	HILIC-pos	QI2202	132.0656	3.92	HMDB0000766	N_acetylaniline
263	HILIC-pos	QI8888	176.0553	4.67	HMDB0000812	N_acetylaspartic_acid
266	HILIC-pos	QI4558	198.0849	8.49	HMDB0032055	N_acetylhistidine
270	HILIC-pos	QI4581	175.1076	8.54	HMDB0003357	N_acetylornithine
272	HILIC-pos	QI7034	131.118	8.03	HMDB0002064	N_acetylputrescine
276	HILIC-pos	QI4491	217.1294	8.29	HMDB0004620	N_alpha_acetylarginine
277	HILIC-pos	QI2280	133.0609	4.23	HMDB0000026	N_carbamoyl_beta_alanine

280	HILIC-pos	QI2193	123.0557	3.88	HMDB000140 6	niacinamide
283	HILIC-pos	QI1731	258.2062	2.45	HMDB001327 2	N_lauroylglyci ne
285	HILIC-pos	QI6731	130.0863	8.74	NA	N_methylprolin e
287	HILIC-pos	QI6533	189.1345	9.54	HMDB002941 6	NMMA
292	HILIC-pos	QI4840	133.0972	9.54	HMDB000021 4	ornithine
295	HILIC-pos	QI2040	220.1178	3.17	HMDB000021 0	pantothenate
298	HILIC-pos	QI2534	265.118	4.73	HMDB000634 4	phenylacetylglu tamine
300	HILIC-pos	TF11	166.0863	6.83	HMDB000015 0	phenylalanine
305	HILIC-pos	QI4395	130.0863	8.1	HMDB000007 0	pipecolic_acid
306	HILIC-pos	QI1180	286.1435	2.02	HMDB002957 7	piperine
308	HILIC-pos	QI6768	173.092	8.61	HMDB001117 8	pro_gly
309	HILIC-pos	QI4460	116.0708	8.23	HMDB000016 7	proline
310	HILIC-pos	QI4799	144.1017	9.36	HMDB000482 7	proline_betaine
311	HILIC-pos	QI2329	245.0767	4.34	HMDB000070 7	pseudouridine
313	HILIC-pos	QI6515	89.1073	9.58	HMDB000141 4	putrescine
319	HILIC-pos	QI2027	259.0923	3.12	HMDB000088 4	ribothymidine
324	HILIC-pos	TF12	203.1502	9.82	HMDB000535 4	SDMA
325	HILIC-pos	QI4205	106.0499	7.8	HMDB000018 7	serine
326	HILIC-pos	QI7862	177.1021	6.4	HMDB000025 0	serotonin
336	HILIC-pos	QI3402	126.0222	6.22	HMDB000025 1	taurine
337	HILIC-pos	QI6460	265.1115	9.84	HMDB000025 5	thiamine
338	HILIC-pos	QI4177	120.066	7.75	HMDB000016 7	threonine
340	HILIC-pos	QI3152	777.6926	5.79	HMDB000024 8	thyroxine
341	HILIC-pos	QI4723	138.0548	9.03	HMDB000087 5	trigonelline
343	HILIC-pos	QI6911	76.0757	8.23	HMDB000092 5	trimethylamine _N_oxide
344	HILIC-pos	QI716	121.1016	1.8	HMDB001373 3	trimethylbenze ne
347	HILIC-pos	TF13	205.0972	6.63	HMDB000092 0	tryptophan
349	HILIC-pos	TF14	182.0812	6.94	HMDB000015 8	tyrosine
350	HILIC-pos	QI2362	169.0354	4.41	HMDB000028 0	urate
353	HILIC-pos	QI2452	139.05	4.61	HMDB000030 1	urocanic_acid
354	HILIC-pos	TF15	118.0863	7.53	HMDB000088 2	valine
355	HILIC-pos	QI1391	436.2328	2.06	HMDB001452 2	valsartan
357	HILIC-pos	QI328	269.2262	1.61	HMDB000030 5	vitamin_A
359	HILIC-pos	QI9174	153.0406	3.91	HMDB000029 7	xanthine
361	HILIC-pos	QI2348	285.0794	4.38	HMDB000029 0	xanthosine
364	HILIC-pos	QI7037	468.3082	8.03	HMDB001057 0	LPC_14_0
365	HILIC-pos	QI7091	494.3241	7.95	HMDB001058 2	LPC_16_1
366	HILIC-pos	QI4252	496.3395	7.89	HMDB001058 7	LPC_16_0

372	HILIC-pos	QI7118	518.322	7.91	HMDB001038 7	LPC_18_3
375	HILIC-pos	QI7129	520.3397	7.87	HMDB001038 6	LPC_18_2
377	HILIC-pos	QI7161	522.3554	7.82	HMDB000281 5	LPC_18_1
381	HILIC-pos	QI4189	524.3711	7.77	HMDB001038 4	LPC_18_0
383	HILIC-pos	QI7131	542.3221	7.87	HMDB001039 7	LPC_20_5
384	HILIC-pos	QI7169	544.3396	7.8	HMDB001039 5	LPC_20_4
387	HILIC-pos	QI7282	546.354	7.64	HMDB001039 4	LPC_20_3
389	HILIC-pos	QI7260	550.3871	7.67	HMDB001039 1	LPC_20_1
390	HILIC-pos	QI7193	568.3391	7.76	HMDB001040 4	LPC_22_6
391	HILIC-pos	QI4190	570.3552	7.77	HMDB001040 2	LPC_22_5
394	HILIC-pos	QI7200	480.3446	7.74	HMDB001040 7	LPC_P_16_0_ LPC_O_16_1
395	HILIC-pos	QI7102	508.376	7.94	HMDB001312 2	LPC_P_18_0_ LPC_O_18_1
401	HILIC-pos	QI7855	454.2926	6.42	HMDB001130 3	LPE_16_0
403	HILIC-pos	QI7849	476.2763	6.43	HMDB001147 8	LPE_18_3
404	HILIC-pos	QI3516	478.2926	6.41	HMDB001130 7	LPE_18_2
405	HILIC-pos	QI3499	480.3083	6.37	HMDB001130 6	LPE_18_1
407	HILIC-pos	QI7893	482.3239	6.35	HMDB001113 0	LPE_18_0
409	HILIC-pos	QI3484	502.2927	6.36	HMDB001131 7	LPE_20_4
410	HILIC-pos	QI7128	508.3398	7.87	HMDB001131 2	LPE_20_1
411	HILIC-pos	QI7153	510.3554	7.83	HMDB001131 1	LPE_20_0
412	HILIC-pos	QI7902	526.293	6.33	HMDB001132 6	LPE_22_6
413	HILIC-pos	QI7703	706.5372	6.81	HMDB000780 0	PC_30_0
414	HILIC-pos	QI3651	730.5374	6.79	HMDB000787 4	PC_32_2
415	HILIC-pos	QI3628	754.5366	6.69	HMDB000788 3	PC_34_4
416	HILIC-pos	QI7732	756.5524	6.76	HMDB000800 6	PC_34_3
422	HILIC-pos	TF5	786.5984	6.68	HMDB000803 0	PC_36_2
423	HILIC-pos	QI3624	742.5739	6.68	HMDB001121 1	PC_P_34_2_P C_O_34_3
424	HILIC-pos	QI7781	766.573	6.59	HMDB001122 0	PC_P_36_4_P C_O_36_5
425	HILIC-pos	QI3585	790.5733	6.57	HMDB001122 9	PC_P_38_6_P C_O_38_7
426	HILIC-pos	QI3584	792.5889	6.56	HMDB001131 9	PC_P_38_5_P C_O_38_6
427	HILIC-pos	QI3059	716.5217	5.64	HMDB000892 8	PE_34_2
428	HILIC-pos	QI3658	720.5532	6.79	HMDB000892 5	PE_34_0
429	HILIC-pos	QI8353	740.5219	5.58	HMDB000893 7	PE_36_4
430	HILIC-pos	QI3037	744.5533	5.61	HMDB000899 4	PE_36_2
431	HILIC-pos	QI8361	764.521	5.56	HMDB000910 2	PE_38_6
432	HILIC-pos	QI8370	768.5524	5.54	HMDB000900 3	PE_38_4
433	HILIC-pos	QI2995	792.5527	5.52	HMDB000901 2	PE_40_6

434	HILIC-pos	QI3031	700.5266	5.59	HMDB001134	PE_P_34_2_P 3 E_O_34_3
435	HILIC-pos	QI3029	702.5433	5.59	HMDB000895	PE_P_34_1_P 2 E_O_34_2
436	HILIC-pos	QI8379	724.5268	5.52	HMDB001141	PE_P_36_4_P 0 E_O_36_5
437	HILIC-pos	QI3015	728.5586	5.56	HMDB001144	PE_P_36_2_P 1 E_O_36_3
438	HILIC-pos	QI8386	748.526	5.5	HMDB001142	PE_P_38_6_P 0 E_O_38_7
439	HILIC-pos	QI2983	750.5417	5.5	HMDB001138	PE_P_38_5_P 7 E_O_38_6
441	HILIC-pos	QI8393	752.5574	5.49	HMDB001138	PE_P_38_4_P 6 E_O_38_5
443	HILIC-pos	QI2966	776.5578	5.47	HMDB001139	PE_P_40_6_P 4 E_O_40_7
444	HILIC-pos	QI3692	772.5472	6.83	NA	PS_P_36_2_PS _O_36_3
445	HILIC-pos	QI7669	774.5632	6.86	NA	PS_P_36_1_PS _O_36_2
446	HILIC-pos	QI3909	675.5423	7.36	HMDB001209	SM_d18_1_14 7 _0
447	HILIC-pos	QI3891	701.5583	7.33	HMDB024061	SM_d18_1_16 3 _1
449	HILIC-pos	QI7488	703.5733	7.31	HMDB001016	SM_d18_1_16 9 _0
453	HILIC-pos	QI7508	729.5897	7.25	HMDB001210	SM_d18_1_18 1 _1
454	HILIC-pos	QI3856	731.6054	7.24	HMDB000134	SM_d18_1_18 8 _0
456	HILIC-pos	QI7554	759.636	7.16	HMDB001210	SM_d18_1_20 2 _0
457	HILIC-pos	QI7567	785.6517	7.12	HMDB001210	SM_d18_1_22 4 _1
458	HILIC-pos	QI3807	787.6675	7.12	HMDB001210	SM_d18_1_22 3 _0
462	HILIC-pos	QI8162	300.2893	5.9	HMDB000025	sphingosine
465	HILIC-pos	QI8149	302.305	5.92	HMDB000026	sphinganine
466	HILIC-pos	QI963	538.5196	1.92	HMDB000494	Cer_d18_1_16 9 _0
467	HILIC-pos	QI867	648.6285	1.87	HMDB000495	Cer_d18_1_24 3 _1
469	HILIC-pos	QI11015	612.5558	1.64	HMDB000710	C34_1_DAG_o 2 r_TAG_NH4_a dduct

Supplementary table 2. Surrogat

	Overall	Prediabetes maintenance (PDM)
	(n=82)	(n=52)
Matsuda index (ISI)	0.91 (0.52 – 1.41)	0.95 (0.55 -1.38)
OGIS	381.45 ± 79.01	384.66 + 84.77
Oral disposition index	0.11 (0.06- 0.20)	0.11 (0.05 -0.15)
Early insulin response 30'	1.06 (0.53 -1.61)	0.92 (0.49 -1.49)
HOMA-IR	2.15 (1.50 -3.48)	1.95 (1.40 -3.00)
HOMA-B	29.14 (19.79 -43.75)	29.31 (19.24 – 36.67)
tAUC glucose	24351.45 ± 4459	24637.50 ± 4386.86
iAUC glucose	1413.04 ± 1845	1479.18 ± 1823.80
tAUC insulin	11707.5 (7215.00 - 18720.00)	10528.5 (6891 – 18795)
iAUC insulin	9511.5 (6304 – 16020)	8982 (5955 – 15157)

Data are presented as mean and standard deviation, and median and interquartile range according to the ROC Curve. Differences between the two groups were computed with Chi2 for qualitative

tes of insulin secretion and sensitivity

Prediabetes regression	<i>p value</i>	<i>P value adjusted by age, sex, age² and BMI</i>
(n=30)		
0.78 (0.52 – 1.41)	0.564	0.414
375.71 ± 68.63	0.757	0.879
0.11 (0.08 -0.25)	0.174	0.131
1.36 (0.74 -2.34)	0.047	0.338
2.40 (1.52 -3.68)	0.378	0.281
28.87 (21.38 -46.68)	0.488	0.281
24329 ± 4688.62	0.646	0.844
1283.40 ± 1917.49	0.37	0.645
13382.25 (8683 – 18432)	0.362	0.504
11436 (7113.38 – 16399)	0.393	0.552

o distribution. HOMA-IR. Homeostasis Model Assessment. TG. Triglycerides. AUC. Area Under the e variables, t-test for parametric variables, and Wilcoxon for non-parametric variables.

Supplementary Table 3. Changes in metabolic par

	Overall (N=82)	Prediabetes Maintenance (PDM) (n=52)
△		
Fasting glucose (mg/dL)	4.00 (-9.00 - 2.00)	-2.00 (-6.00 - 3.00)
△		
2h glucose(mg/dL)	23.32	26.32
△		
Hba1c %	-0.01	0.06
△ Fasting insulin		
	-1.15 (-3.55 – 1.65)	-0.95 (-2.55 – 1.55)
△ ODI		
	0.01 (-0.07 – 0.06)	0.01 (-0.04 -0.07)

△ OGIS

21.05 ± 80.11

23.44 ± 81.49

△

Weight (kg)

1.01

0.79

△

Waist circumference (cm)

-10.12

4.5

△

Body fat mass

-0.76 (-2.3 – 0.49)

-0.80 (-2.45 - 0.5)

△

Free fat mass index

-0.2 (-0.54 - 0.12)

-0.12 (0.47 – 0.17)

△

VAT (cm³)

-56.50 (-204.25 - 90.50)

-54 (-224 – 106)

△

Energy intake (kcal)	-288.06 (-1043.70 - 241.88)	-223.39 326.15)	(-994.37 –	–
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△

Fat consumption (%)	13.13	13.31
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△

Protein consumption (%)	4.70 (-1.60- 8.32)	1.20 (-2.40 - 6.90)
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△

Carbohydrate consumption	14.17	16.46
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(%)

△

Sugar daily consumption	-6.75 (-48.24 - 18.18)	0.00 (-42.67 – 21.44)
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(gr)

△ T1D/A1C. Hemoglobin A1C. ODI. Oral Disposition Index. OGIS. Oral glucose insulin sensitivity index. P2. Post-intervention P2. P1. Pre-intervention P1. SD. Standard deviation and standard deviation or median and interquartile range according to distribution. D. Difference between baseline vs post-intervention P2 value was computed comparing | adjusting by age, age², sex, and BMI

ameters after 24 weeks of treatment

Regression to normal glucose tolerance (RNGT) (n=30)	P value 1	P value 2
-6.50 (-9.75 - -1.00)	0.0006*	0.101
18.04	0.062	0.487
-0.17	0.00001*	<0.001*
-2.20 (-4.25 – 2.25)	0.522	0.475
-0.01 (-0.12 – 0.04)	0.778	0.114

16.79 ± 78.89	0.022*	0.742
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1.45	0.00001*	0.327
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-12.3	0.0016*	0.542
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-0.70 (-2.0 – 0.37)	0.055	0.859
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-0.32 (-0.57 - -0.02)	0.585	0.34
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-66 (-171.5 – 49.5)	0.493	0.99
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-599.28 (-1139.65 – 116.13)	0.003*	0.1
<hr/>		
13.04	0.484	0.74
<hr/>		
5.65 (0.67 – 9.43)	0.002*	0.027*
<hr/>		
9.56	0.32	0.175
<hr/>		
-23.21 (-63.50 - 2.05)	0.108	0.118

activity index. VAT, visceral Adipose tissue. Data are presented as mean
 delta was computed final visit results/baseline visit. P1 represents the
 prediabetes maintenance and regression to normal tolerance

Supplementary table 4. Metabolites selected at least 10 times at baseline for th

Metabolites	times selected		
PS.P.36.1.PS.O.36.2	15		
C5.1.carnitine	11		
Cer.d18.1.24.1	10		
phenylacetylglutamine	9		
myristoleic.acid	9		
adenosine	8		
cyclohexylamine	7		
X7.methylxanthine	6		
PE.P.40.6.PE.O.40.7	6		
thyroxine	5		
Sd18.1.22.0	5		
piperine	4		
N.acetylhistidine	4		
ectoine	4		
X4.acetamidobutanoate	3		
X1.7.dimethyluric.acid	3		
ribothymidine	3		
PC.P.38.6.PC.O.38.7	3		
C6.carnitine	3		
C12.1.carnitine	3		
betaine	3		
arginine	3		
acetylcholine	3		
X5.acetylamino.6.amino.3.methyluracil	2		
vitamin.A	2		
trimethylamine.N.oxide	2		
Sd18.1.18.0	2		
PE.P.38.4.PE.O.38.5	2		
PC.P.38.5.PC.O.38.6	2		
LPE.20.0	2		
hydroxyproline	2		
cortisol	2		
citrulline	2		
Cer.d18.1.16.0	2		
C4.carnitine	2		
C12.carnitine	2		
alpha.glycerophosphocholine	2		
X2.hydroxyhippurate	1		
X2.aminooctanoate	1		
X2.aminoheptanoic.acid	1		
valsartan	1		

urocanic.acid	1			
trimethylbenzene	1			
sphinganine	1			
Sd18.1.18.1	1			
Sd18.1.16.0	1			
PS.P.36.2.PS.O.36.3	1			
proline.betaine	1			
pro.gly	1			
N6.acetyllysine	1			
N4.acetylcytidine	1			
N1.methyl.2.pyridone.5.carboxamide	1			
N.methylproline	1			
N.carbamoyl.beta.alanine	1			
N.acetylaspartic.acid	1			
methylimidazoleacetic.acid	1			
LPE.18.0	1			
LPC.P.18.0.LPC.O.18.1	1			
LPC.18.0	1			
homocitrulline	1			
glycodeoxycholate.glycochenodeoxycholate	1			
glycine	1			
glutamate	1			
gabapentin	1			
GABA	1			
cystine	1			
creatinine	1			
creatine	1			
cinnamoylglycine	1			
C5.DC.carnitine	1			
biliverdin	1			
xanthosine	1			



Supplementary table 5. Metabolites (fold change) selected their associ

Metabolites	times selecte	HMDB	
vitamin.A	100	HMDB0000305	
Cer.d18.1.16.0	54	HMDB0004949	
X1.7.dimethyluric.acid	47	HMDB0011103	
Sd18.1.22.1	41	HMDB0012104	
PC.P.38.5.PC.O.38.6	39	HMDB0011387	
Sd18.1.14.0	38	HMDB0012097	
LPC.18.3	37	HMDB0010387	
acetyl.galactosamine	35	HMDB0000212	
trigonelline	34	HMDB0000875	
tryptophan	34	HMDB0000929	
GABA	27	HMDB0000112	
allantoin	26	HMDB0000462	
N.carbamoyl.beta.alanine	26	HMDB0000026	
carnitine	25	HMDB0000062	
X1.methylhistamine	22	HMDB0000898	
C18.carnitine	21	HMDB0000848	
LPC.18.1	21	HMDB0002815	
N6.N6.N6.trimethyllysine	21	HMDB0001325	
Sd18.1.20.0	21	HMDB0012102	
C10.2.carnitine	20	HMDB0000651	
N6.methyllysine	20	HMDB0002038	
LPC.18.0	19	HMDB0010384	
X2.methylguanosine	19	HMDB0005862	
C5.DC.carnitine	18	HMDB0013130	
X7.methylguanine	17	HMDB0000897	
LPC.P.16.0.LPC.O.16.1	16	HMDB0010382	
thyroxine	16	HMDB0000248	
C4.OH.carnitine	14	HMDB0013127	
PE.40.6	14	HMDB0009012	
putrescine	14	HMDB0001414	
creatine	13	HMDB0000064	
LPC.14.0	12	HMDB0010379	
LPC.16.0	12	HMDB0010382	
N.acetylalanine	12	HMDB0000766	
alpha.glycerophosphocholine	11	HMDB0000086	
PE.P.40.6.PE.O.40.7	11	HMDB0011394	
C3.carnitine	10	HMDB0000824	
glutamine	10	HMDB0000641	
hydroxyproline	10	HMDB0000725	
PE.P.36.2.PE.O.36.3	10	HMDB0011343	
C12.1.carnitine	9		

C18.1.carnitine	9		
C18.2.carnitine	9		
N.acetylornithine	9		
N.acetylputrescine	9		
PC.34.3	9		
PS.P.36.1.PS.O.36.2	9		
acisoga	8		
C14.2.carnitine	8		
LPE.20.4	8		
N1.methyl.2.pyridone.5.carboxamide	8		
PE.36.2	8		
urate	8		
citrulline	7		
dimethylglycine	7		
methionine.sulfoxide	7		
methylimidazoleacetic.acid	7		
N.acetylaspartic.acid	7		
NMMA	7		
cystine	6		
gabapentin	6		
PC.32.2	6		
PC.P.36.4.PC.O.36.5	6		
PE.P.38.5.PE.O.38.6	6		
trimethylamine.N.oxide	6		
X2.hydroxyhippurate	6		
adenosine	5		
arginine	5		
bilirubin	5		
guanidinoacetic.acid	5		
homocysteine	5		
PC.P.34.2.PC.O.34.3	5		
X4.aminohippuric.acid	5		
X5.acetylamino.6.amino.3.methyluracil	5		
X5.methylcytidine	5		
X7.methylxanthine	5		
C20.4.carnitine	4		
LPC.18.2	4		
LPC.22.5	4		
LPE.18.3	4		
N.lauroylglycine	4		
PE.38.4	4		
pipecolic.acid	4		
SDMA	4		

sphingosine	4		
threonine	4		
butyrobetaine	3		
C16.carnitine	3		
C6.carnitine	3		
caffeine	3		
cinnamoylglycine	3		
cortisol	3		
cyclohexylamine	3		
diacetylspermine	3		
DMGV	3		
glycine	3		
isoleucine	3		
LPC.20.3	3		
LPE.18.1	3		
LPE.20.0	3		
myristoleic.acid	3		
ornithine	3		
PC.30.0	3		
PC.34.4	3		
PE.P.38.4.PE.O.38.5	3		
phenylacetylglutamine	3		
pro.gly	3		
Sd18.1.18.1	3		
serotonin	3		
trimethylbenzene	3		
X3.methylxanthine	3		
betaine	2		
C7.carnitine	2		
cytosine	2		
ectoine	2		
hydroxycotinine	2		
kynurenic.acid	2		
leucine	2		
LPC.16.1	2		
methionine	2		
PC.36.2	2		
PE.P.38.6.PE.O.38.7	2		
pseudouridine	2		
Sd18.1.16.0	2		
Sd18.1.18.0	2		
Sd18.1.22.0	2		
thiamine	2		

urocanic.acid	2		
valsartan	2		
X2.aminoheptanoic.acid	2		
acetylcholine	1		
asparagine	1		
C10.carnitine	1		
C12.carnitine	1		
C26.carnitine	1		
C4.carnitine	1		
C5.carnitine	1		
choline	1		
glycocholate	1		
glycodeoxycholate.glycochenodeoxycholate	1		
id_number.xpred-141	1		
id_number.xpred-151	1		
id_number.xpred-172	1		
linoleoyl.ethanolamide	1		
LPC.20.1	1		
LPC.20.4	1		
LPC.22.6	1		
lysine	1		
N6.acetyllysine	1		
phenylalanine	1		
piperine	1		
proline.betaine	1		
PS.P.36.2.PS.O.36.3	1		
Sd18.1.16.1	1		
serine	1		
taurine	1		
valine	1		
X2.aminooctanoate	1		
X5.hydroxytryptophan	1		
xanthine	1		

ation with regression to normoglycemia with LASSO regression

Supplementary table 6. Metabolites

	logFC	t	P.Value	adj.P.Val
cystine	0.56118248	4.77221763	6.52E-06	0.00140743
hypotaurine	0.48828891	4.46364171	2.20E-05	0.00237235
sphinganine	0.64354987	4.25049618	4.95E-05	0.0035622
C14.carnitine	-0.4657375	-3.7291174	0.00032516	0.01344287
PS.P.36.2.PS.O.36.3	-0.3024346	-3.717713	0.00033824	0.01344287
inosine	-0.4511111	-3.6468866	0.00043139	0.01344287
taurine	0.45433261	3.64400476	0.00043565	0.01344287
thyroxine	-0.3533607	-3.5358338	0.00062784	0.01695174
myristoleic.acid	-0.2996608	-3.4909908	0.00072901	0.01749613
X5.hydroxytryptophan	0.46336451	3.39322308	0.00100529	0.02027298
serotonin	0.46188273	3.38503854	0.00103242	0.02027298
glycine	0.25241144	3.20554411	0.00183138	0.02987869
pro.gly	0.47810208	3.20113902	0.00185683	0.02987869
niacinamide	-0.4422621	-3.1876935	0.00193658	0.02987869
pantothenate	-0.3319995	-2.9743375	0.00371403	0.05348201
Sd18.1.18.0	-0.3143789	-2.9312361	0.00422043	0.05697575
N.acetylputrescine	-0.282156	-2.8686727	0.00506929	0.06234547
LPC.P.16.0.LPC.O.16.1	0.2857317	2.84691281	0.00539951	0.06234547
PS.P.36.1.PS.O.36.2	-0.3150078	-2.8415356	0.00548409	0.06234547
C2.carnitine	-0.3490149	-2.7804263	0.00653444	0.0705719
C16.carnitine	-0.384517	-2.7581464	0.00696101	0.07159898
hippurate	0.3050117	2.65520279	0.009281	0.09112258
LPC.20.1	0.28787271	2.61565566	0.01034465	0.09714976
PE.40.6	-0.2033433	-2.5630324	0.0119306	0.10737538
X1.methyladenosine	-0.2581428	-2.5321417	0.01296052	0.11197888
LPC.18.2	0.29400911	2.48404863	0.01472349	0.1223182
caffeine	-0.2624567	-2.455292	0.01587744	0.1243893
LPC.18.1	0.27483372	2.44486538	0.0163154	0.1243893
X1.methylnicotinamide	-0.3300825	-2.4359033	0.01670041	0.1243893
C6.carnitine	-0.2902056	-2.4053435	0.01807492	0.12564457
X7.methylguanaine	-0.2183316	-2.3963808	0.01849669	0.12564457
xanthine	-0.3056972	-2.3939201	0.01861401	0.12564457
N2.N2.dimethylguanosine	-0.240678	-2.3740194	0.01958735	0.12820814
bilirubin	0.28852147	2.34437845	0.02112083	0.13417942
N.lauroylglycine	-0.2474167	-2.3205182	0.02243146	0.13538592
PC.30.0	-0.2849873	-2.3181688	0.02256432	0.13538592
C7.carnitine	-0.2746426	-2.2813599	0.02473838	0.14340302
PE.38.6	-0.1884646	-2.2734601	0.02522831	0.14340302
LPC.20.4	0.20820304	2.21821584	0.02889904	0.15739536
LPE.22.6	-0.2626752	-2.2121855	0.02932672	0.15739536
Sd18.1.18.1	-0.2218476	-2.2045525	0.02987597	0.15739536

asparagine	0.24727463	2.1610062	0.03318441	0.17066267
Sd18.1.14.0	-0.2116682	-2.150748	0.03400862	0.17070407
trimethylbenzene	-0.2024874	-2.1271242	0.0359746	0.17070407
acetyl.galactosamine	-0.2064157	-2.1269212	0.03599191	0.17070407
urate	-0.2263797	-2.1226986	0.03635364	0.17070407
C4.OH.carnitine	-0.262321	-2.0991318	0.03843087	0.17661845
LPE.18.0	0.24266942	2.03156136	0.04496369	0.1977704
LPC.P.18.0.LPC.O.18.1	0.23261494	2.02494741	0.04565151	0.1977704
Sd18.1.16.1	-0.1787309	-2.0150746	0.04669497	0.1977704
biliverdin	-0.2132152	-2.0150669	0.04669579	0.1977704
N.acetylalanine	-0.2036638	-1.9673194	0.05203456	0.21614355
N1.methyl.2.pyridone.5.carboxamide	-0.2460852	-1.9568056	0.0532774	0.21713055
pseudouridine	-0.1694091	-1.8956703	0.06101356	0.24405426
cinnamoylglycine	0.21596527	1.8665038	0.06502522	0.25537179
LPE.18.1	0.23463696	1.835859	0.06947594	0.26684646
N.methylproline	-0.2495608	-1.8160875	0.07248018	0.26684646
C18.1.carnitine	-0.2507949	-1.8141492	0.07278043	0.26684646
choline	-0.1952357	-1.8134524	0.07288862	0.26684646
methionine.sulfoxide	0.20023337	1.80064219	0.07490154	0.26964554
C14.1.carnitine	-0.2393701	-1.7605009	0.08150971	0.28862454
cytosine	-0.2132408	-1.7170024	0.08920549	0.30756454
Sd18.1.22.0	-0.1836851	-1.6988038	0.09259696	0.30756454
LPC.20.3	0.21075494	1.69379012	0.09354957	0.30756454
arginine	0.18215843	1.69174408	0.0939406	0.30756454
acisoga	-0.1923304	-1.6915485	0.09397806	0.30756454
N4.acetylcytidine	-0.1411256	-1.6492371	0.10236983	0.33002811
LPC.20.5	0.19598025	1.62789971	0.10682597	0.33682481
Sd18.1.20.0	-0.166945	-1.6171259	0.1091346	0.33682481
LPC.18.0	0.1850398	1.61113813	0.1104349	0.33682481
PE.34.0	-0.1959091	-1.6098531	0.11071556	0.33682481
LPE.20.0	0.19708051	1.59568843	0.11384738	0.34154215
GABA	-0.1796392	-1.5645624	0.12097825	0.35405856
alanine	0.20209089	1.55716228	0.12272476	0.35405856
PE.P.38.6.PE.O.38.7	-0.1855823	-1.5562687	0.122937	0.35405856
PC.P.34.2.PC.O.34.3	0.1431997	1.54314051	0.1260889	0.35835794
citrulline	0.16638177	1.51293224	0.13358422	0.37195452
piperine	-0.1931699	-1.4936661	0.13854457	0.37195452
C3.DC.CH3.carnitine	-0.1292942	-1.492119	0.13894908	0.37195452
X4.acetamidobutanoate	-0.1483395	-1.4893247	0.13968201	0.37195452
PC.32.2	-0.1791517	-1.4890094	0.13976489	0.37195452
X1.methylguanosine	-0.1949676	-1.4835548	0.14120496	0.37195452
C12.carnitine	-0.2001572	-1.4406232	0.15294685	0.39803035
N.acetylaspartic.acid	0.20717165	1.42497748	0.15740883	0.40476555

PC.P.36.4.PC.O.36.5	0.15538663	1.41194544	0.16120135	0.40964107
X3.methylxanthine	-0.1441937	-1.3955431	0.16607383	0.4165119
X1.7.dimethyluric.acid	-0.1437281	-1.3899469	0.16776174	0.4165119
PE.34.2	-0.1253309	-1.3779478	0.17142492	0.42077026
C5.1.carnitine	-0.1433486	-1.3598233	0.17707303	0.42682154
X2.aminoisobutyric.acid	-0.1292841	-1.3480638	0.18081223	0.42682154
N6.acetyllysine	-0.1349063	-1.3414348	0.18294616	0.42682154
C12.1.carnitine	-0.177118	-1.33837	0.18393909	0.42682154
X1.methylhistamine	0.1425841	1.3357421	0.18479375	0.42682154
diacetylspermine	-0.1365789	-1.3328235	0.18574641	0.42682154
N1.acetylspermidine	-0.1577492	-1.2836652	0.20235092	0.46008209
PE.P.36.4.PE.O.36.5	0.15434071	1.26249791	0.20982988	0.47211723
carnitine	-0.1151537	-1.2377859	0.21881614	0.4851729
N6.N6.N6.trimethyllysine	-0.1529901	-1.2342495	0.22012474	0.4851729
creatinine.y	-0.0977873	-1.1937171	0.23553202	0.50622427
linoleoyl.ethanolamide	-0.1397724	-1.1921272	0.23615181	0.50622427
valine	-0.1251492	-1.184878	0.23899257	0.50622427
proline.betaine	-0.1640154	-1.1819584	0.24014356	0.50622427
Sd18.1.16.0	-0.1307243	-1.1787979	0.24139398	0.50622427
PC.34.3	-0.1308011	-1.1408267	0.25678184	0.53331614
phenylalanine	-0.1078506	-1.1279185	0.26216722	0.53745072
PE.36.4	-0.0920375	-1.1241626	0.26374897	0.53745072
glycodeoxycholate.glycochenodeoxycholate	0.11946815	1.10981742	0.26985176	0.54474748
C14.2.carnitine	-0.1442392	-1.0854177	0.2804566	0.55646221
phenylacetylglutamine	0.12447519	1.08039632	0.28267423	0.55646221
PE.P.38.4.PE.O.38.5	0.11412076	1.07879598	0.28338353	0.55646221
LPC.22.6	-0.1192407	-1.0649183	0.28958577	0.56351826
cotinine	-0.0892225	-1.0541132	0.2944786	0.56792301
LPC.22.5	-0.1066787	-1.0378486	0.30194928	0.57717739
C5.carnitine	-0.1204617	-1.0298695	0.30566066	0.57734658
X7.methylxanthine	-0.1203289	-1.0261876	0.3073836	0.57734658
histidine	0.10773818	1.00082301	0.31943001	0.59389126
Sd18.1.22.1	-0.108598	-0.995882	0.32181269	0.59389126
cortisol	-0.1175134	-0.9904605	0.3244406	0.59389126
PC.34.4	-0.103478	-0.9743653	0.3323256	0.60295973
isoleucine	-0.1027244	-0.9598271	0.33955499	0.60295973
proline	0.09017489	0.95376739	0.34259835	0.60295973
hydroxyproline	0.12230937	0.95104704	0.34397031	0.60295973
lysine	-0.1039932	-0.9477849	0.34562022	0.60295973
C20.4.carnitine	0.10023013	0.94143505	0.34884648	0.60295973
ribothymidine	-0.0946853	-0.9383427	0.35042469	0.60295973
adenosine	-0.1251681	-0.9357986	0.35172651	0.60295973
serine	0.09216425	0.92300437	0.35832046	0.60942692

sphingosine	0.12372552	0.91038513	0.36490108	0.61044853
PE.P.38.5.PE.O.38.6	0.11209848	0.90831546	0.36598763	0.61044853
LPE.16.0	0.10984132	0.89859405	0.37111867	0.61044853
C3.carnitine	0.08530714	0.89115574	0.37507514	0.61044853
butyrobetaine	-0.0865815	-0.8883809	0.37655783	0.61044853
C18.2.carnitine	-0.1142673	-0.887757	0.3768917	0.61044853
X4.guanidinobutanoic.acid	0.11337544	0.88437618	0.37870418	0.61044853
tyrosine	-0.085581	-0.8701972	0.38636474	0.61818358
SDMA	0.08567043	0.85901419	0.39247394	0.62334096
C10.2.carnitine	-0.1020992	-0.8454802	0.39994651	0.6305726
PC.P.38.6.PC.O.38.7	-0.0913825	-0.8207387	0.41382981	0.64686416
ectoine	0.12130425	0.81524631	0.41695063	0.64686416
allantoin	-0.102442	-0.8111912	0.41926381	0.64686416
urocanic.acid	-0.1081752	-0.7854602	0.43411931	0.66503383
N.alpha.acetylgarginine	0.06118152	0.77177874	0.44214238	0.66800565
C34.1.DAG.or.TAG.NH4.adduct	-0.0758615	-0.7716056	0.44224448	0.66800565
alpha.glycerophosphocholine	0.11608734	0.76389571	0.44680402	0.67003346
PE.P.40.6.PE.O.40.7	-0.0800365	-0.7588696	0.44979098	0.67003346
LPC.16.0	0.09186628	0.75219477	0.45377548	0.67133906
C8.carnitine	-0.0939831	-0.7358159	0.46363795	0.67809207
X1.methylguanine	0.09858147	0.7341981	0.46461864	0.67809207
creatine	-0.0705238	-0.7200237	0.47326095	0.68200651
glutamate	-0.0901319	-0.7194399	0.4736188	0.68200651
Cer.d18.1.24.1	0.07705367	0.71386805	0.47704192	0.68200651
LPE.18.3	0.08960329	0.70918351	0.47993051	0.68200651
pipecolic.acid	-0.0961592	-0.7036381	0.48336242	0.68239401
C10.carnitine	-0.0886473	-0.6858087	0.49448768	0.69356713
dimethylglycine	-0.061462	-0.645835	0.51992803	0.72454486
X2.methylguanosine	-0.0799053	-0.625136	0.53336591	0.73850665
acetylcholine	0.0853802	0.60387447	0.54735236	0.75186043
glycocholate	0.06335514	0.5999229	0.54997198	0.75186043
LPE.18.2	0.07271165	0.5892131	0.55710326	0.75409068
LPE.20.1	0.06612461	0.57136039	0.56909149	0.75409068
xanthosine	0.08026385	0.57026705	0.56982973	0.75409068
guanidinoacetic.acid	0.06644375	0.56717737	0.57191841	0.75409068
methionine	0.06257316	0.56450587	0.57372739	0.75409068
homoarginine	-0.0556162	-0.5639867	0.57407926	0.75409068
X4.aminohippuric.acid	-0.0606687	-0.5610943	0.57604149	0.75409068
LPC.18.3	0.06541013	0.54734084	0.58541563	0.76174564
C26.carnitine	-0.0504314	-0.5344637	0.5942572	0.7686201
PC.36.2	0.05878152	0.52585377	0.60020323	0.76925236
LPC.14.0	-0.0637058	-0.5234491	0.60186875	0.76925236
N.acetylmornithine	0.05399549	0.51301468	0.60912034	0.77253132

C5.DC.carnitine	-0.0456643	-0.5091802	0.61179503	0.77253132
hydroxycotinine	-0.046041	-0.5043614	0.61516383	0.77253132
kynurenic.acid	-0.050361	-0.4847354	0.62896898	0.77834587
valsartan	0.07274486	0.48095411	0.63164417	0.77834587
Cer.d18.1.16.0	-0.0517543	-0.474313	0.6363545	0.77834587
ornithine	0.04769144	0.47399975	0.63657706	0.77834587
methylimidazoleacetic.acid	0.06228132	0.47187761	0.63808563	0.77834587
N6.N6.dimethyllysine	0.03469818	0.45960716	0.64683802	0.77834587
N.acetylhistidine	0.04305797	0.45712419	0.64861521	0.77834587
homocitrulline	0.05300106	0.45711532	0.64862156	0.77834587
PE.P.36.2.PE.O.36.3	0.04746349	0.44291626	0.65882339	0.78532272
cortisone	0.04925823	0.43257862	0.66629177	0.78532272
leucine	-0.0448392	-0.427606	0.66989624	0.78532272
X5.acetylamino.6.amino.3.methyluracil	-0.0417746	-0.4246683	0.67202937	0.78532272
X2.aminooctanoate	-0.0465737	-0.4238633	0.67261436	0.78532272
X3.methylhistidine	-0.0537015	-0.4124189	0.68095255	0.79078361
LPE.20.4	0.04210785	0.38146079	0.70370488	0.81077521
PE.36.2	-0.035875	-0.3759825	0.70776003	0.81077521
trigonelline	-0.0437189	-0.373732	0.70942831	0.81077521
gabapentin	0.04518354	0.34631096	0.72986739	0.82556594
vitamin.A	0.03399565	0.34135834	0.73358035	0.82556594
C18.carnitine	0.04211489	0.34067119	0.734096	0.82556594
thiamine	0.04418653	0.33592837	0.73765845	0.82556594
DMGV	-0.0241689	-0.3148608	0.75355109	0.83900533
X2.aminoheptanoic.acid	-0.035378	-0.2942595	0.76919531	0.84509795
ADMA	0.02969387	0.2925109	0.7705277	0.84509795
betaine	0.03036132	0.2922053	0.77076063	0.84509795
LPC.16.1	-0.0284268	-0.2715111	0.78658137	0.85808877
PE.P.34.2.PE.O.34.3	0.03016	0.26582941	0.79094101	0.85850884
glutamine	0.02319114	0.22054375	0.82591636	0.89198966
N6.methyllysine	-0.0135524	-0.1983676	0.84317717	0.90610084
tryptophan	-0.0186828	-0.1863875	0.85253444	0.9086509
C4.carnitine	-0.0171018	-0.1845602	0.85396357	0.9086509
N.carbamoyl.beta.alanine	0.01797747	0.17707911	0.85981956	0.91039718
PC.P.38.5.PC.O.38.6	-0.0166056	-0.1577176	0.87501077	0.92196257
homocysteine	0.02056582	0.13973735	0.88916046	0.93232359
C9.carnitine	-0.0159486	-0.129694	0.89708007	0.93608355
PE.38.4	0.00945246	0.1222435	0.90296188	0.93769118
X2.hydroxyhippurate	-0.0133732	-0.1137827	0.9096478	0.94011447
cyclohexylamine	-0.0120444	-0.108246	0.91402662	0.94014167
NMMA	-0.0097757	-0.09982	0.92069554	0.94251297
putrescine	0.0047479	0.04046056	0.96781003	0.98515156
threonine	0.00406906	0.0358595	0.97146889	0.98515156

trimethylamine.N.oxide	-0.0032367	-0.0246314	0.98040009	0.98956271
PE.P.34.1.PE.O.34.2	0.0014638	0.01219346	0.99029659	0.99490262
X5.methylcytidine	0.00043544	0.00448954	0.9964272	0.9964272

tes before and after treatment

B	Metabolite		
3.43537288	cystine		
2.27776651	hypotaurine		
1.50763751	sphinganine		
-0.2647207	C14.carnitine		
-0.3016067	PS.P.36.2.PS.O.36.3		
-0.5287925	inosine		
-0.537967	taurine		
-0.8783534	thyroxine		
-1.0171626	myristoleic.acid		
-1.3150365	X5.hydroxytryptophan		
-1.3396734	serotonin		
-1.8681234	glycine		
-1.8808035	pro.gly		
-1.9194195	niacinamide		
-2.5144285	pantothenate		
-2.6305029	Sd18.1.18.0		
-2.7964721	N.acetylputrescine		
-2.8534929	LPC.P.16.0.LPC.O.16.1		
-2.8675273	PS.P.36.1.PS.O.36.2		
-3.0254459	C2.carnitine		
-3.0822974	C16.carnitine		
-3.3398983	hippurate		
-3.4366179	LPC.20.1		
-3.5633678	PE.40.6		
-3.6367282	X1.methyladenosine		
-3.7493932	LPC.18.2		
-3.8158542	caffeine		
-3.8397836	LPC.18.1		
-3.86028	X1.methylnicotinamide		
-3.9296713	C6.carnitine		
-3.9498758	X7.methylguanaine		
-3.9554112	xanthine		
-3.9999932	N2.N2.dimethylguanosine		
-4.0657827	bilirubin		
-4.118207	N.lauroylglycine		
-4.1233432	PC.30.0		
-4.203205	C7.carnitine		
-4.2201957	PE.38.6		
-4.337533	LPC.20.4		
-4.350184	LPE.22.6		
-4.3661527	Sd18.1.18.1		

-4.4563001	asparagine		
-4.4772992	Sd18.1.14.0		
-4.5253135	trimethylbenzene		
-4.525724	acetyl.galactosamine		
-4.5342548	urate		
-4.5815828	C4.OH.carnitine		
-4.714606	LPE.18.0		
-4.7274126	LPC.P.18.0.LPC.O.18.1		
-4.7464581	Sd18.1.16.1		
-4.7464728	biliverdin		
-4.8373739	N.acetylalanine		
-4.8571203	N1.methyl.2.pyridone.5.carboxamide		
-4.9700035	pseudouridine		
-5.0226883	cinnamoylglycine		
-5.0772253	LPE.18.1		
-5.1119654	N.methylproline		
-5.1153523	C18.1.carnitine		
-5.116569	choline		
-5.13886	methionine.sulfoxide		
-5.2077529	C14.1.carnitine		
-5.2807641	cytosine		
-5.310801	Sd18.1.22.0		
-5.3190233	LPC.20.3		
-5.3223721	arginine		
-5.3226921	acisoga		
-5.3910821	N4.acetylcytidine		
-5.4249505	LPC.20.5		
-5.441893	Sd18.1.20.0		
-5.4512633	LPC.18.0		
-5.4532699	PE.34.0		
-5.4752883	LPE.20.0		
-5.5230242	GABA		
-5.5342418	alanine		
-5.5355929	PE.P.38.6.PE.O.38.7		
-5.5553586	PC.P.34.2.PC.O.34.3		
-5.6002346	citrulline		
-5.6284139	piperine		
-5.6306618	C3.DC.CH3.carnitine		
-5.6347163	X4.acetamidobutanoate		
-5.6351733	PC.32.2		
-5.6430653	X1.methylguanosine		
-5.7042143	C12.carnitine		
-5.7260718	N.acetylaspartic.acid		

-5.7441034	PC.P.36.4.PC.O.36.5		
-5.7665725	X3.methylxanthine		
-5.7741809	X1.7.dimethyluric.acid		
-5.7903956	PE.34.2		
-5.8146316	C5.1.carnitine		
-5.8301913	X2.aminoisobutyric.acid		
-5.8389052	N6.acetyllysine		
-5.8429198	C12.1.carnitine		
-5.8463552	X1.methylhistamine		
-5.8501629	diacetylspermine		
-5.9130907	N1.acetylspermidine		
-5.9394837	PE.P.36.4.PE.O.36.5		
-5.9697596	carnitine		
-5.9740448	N6.N6.N6.trimethyllysine		
-6.0223113	creatinine.y		
-6.0241727	linoleoyl.ethanolamide		
-6.0326294	valine		
-6.0360212	proline.betaine		
-6.0396836	Sd18.1.16.0		
-6.0829404	PC.34.3		
-6.0973318	phenylalanine		
-6.1014893	PE.36.4		
-6.117244	glycodeoxycholate.glycochenodeoxycholate		
-6.1435883	C14.2.carnitine		
-6.148939	phenylacetylglutamine		
-6.1506392	PE.P.38.4.PE.O.38.5		
-6.1652798	LPC.22.6		
-6.1765506	cotinine		
-6.1933048	LPC.22.5		
-6.2014308	C5.carnitine		
-6.2051599	X7.methylxanthine		
-6.2304942	histidine		
-6.2353571	Sd18.1.22.1		
-6.2406658	cortisol		
-6.2562588	PC.34.4		
-6.270128	isoleucine		
-6.2758486	proline		
-6.2784051	hydroxyproline		
-6.2814613	lysine		
-6.2873809	C20.4.carnitine		
-6.2902495	ribothymidine		
-6.2926026	adenosine		
-6.3043412	serine		

-6.3157638	sphingosine		
-6.3176224	PE.P.38.5.PE.O.38.6		
-6.3262971	LPE.16.0		
-6.3328725	C3.carnitine		
-6.3353116	butyrobetaine		
-6.335859	C18.2.carnitine		
-6.3388187	X4.guanidinobutanoic.acid		
-6.3511105	tyrosine		
-6.3606672	SDMA		
-6.3720701	C10.2.carnitine		
-6.3924546	PC.P.38.6.PC.O.38.7		
-6.3968988	ectoine		
-6.4001612	allantoin		
-6.4204879	urocanic.acid		
-6.4310325	N.alpha.acetylarginine		
-6.4311648	C34.1.DAG.or.TAG.NH4.adduct		
-6.437025	alpha.glycerophosphocholine		
-6.4408141	PE.P.40.6.PE.O.40.7		
-6.4458078	LPC.16.0		
-6.4578769	C8.carnitine		
-6.4590547	X1.methylguanine		
-6.4692649	creatine		
-6.4696812	glutamate		
-6.4736376	Cer.d18.1.24.1		
-6.4769404	LPE.18.3		
-6.4808224	pipecolic.acid		
-6.4930992	C10.carnitine		
-6.5194897	dimethylglycine		
-6.5325379	X2.methylguanosine		
-6.5455019	acetylcholine		
-6.5478622	glycocholate		
-6.5541821	LPE.18.2		
-6.5644659	LPE.20.1		
-6.5650855	xanthosine		
-6.56683	guanidinoacetic.acid		
-6.5683308	methionine		
-6.5686217	homoarginine		
-6.5702372	X4.aminohippuric.acid		
-6.577806	LPC.18.3		
-6.5847235	C26.carnitine		
-6.5892573	PC.36.2		
-6.5905104	LPC.14.0		
-6.5958821	N.acetylornithine		

-6.5978291	C5.DC.carnitine		
-6.6002552	hydroxycotinine		
-6.6098995	kynurenic.acid		
-6.6117138	valsartan		
-6.6148662	Cer.d18.1.16.0		
-6.6150138	ornithine		
-6.6160113	methylimidazoleacetic.acid		
-6.6216914	N6.N6.dimethyllysine		
-6.6228227	N.acetylhistidine		
-6.6228267	homocitrulline		
-6.6291786	PE.P.36.2.PE.O.36.3		
-6.6336776	cortisone		
-6.635804	leucine		
-6.6370487	X5.acetylamino.6.amino.3.methyluracil		
-6.6373883	X2.aminooctanoate		
-6.6421467	X3.methylhistidine		
-6.6543682	LPE.20.4		
-6.6564319	PE.36.2		
-6.6572711	trigonelline		
-6.6670923	gabapentin		
-6.6687866	vitamin.A		
-6.6690197	C18.carnitine		
-6.6706162	thiamine		
-6.6774378	DMGV		
-6.6836821	X2.aminoheptanoic.acid		
-6.6841927	ADMA		
-6.6842817	betaine		
-6.6900875	LPC.16.1		
-6.691607	PE.P.34.2.PE.O.34.3		
-6.7025711	glutamine		
-6.7071962	N6.methyllysine		
-6.7094913	tryptophan		
-6.7098288	C4.carnitine		
-6.7111759	N.carbamoyl.beta.alanine		
-6.7144037	PC.P.38.5.PC.O.38.6		
-6.7170671	homocysteine		
-6.7184147	C9.carnitine		
-6.7193495	PE.38.4		
-6.7203441	X2.hydroxyhippurate		
-6.7209563	cyclohexylamine		
-6.7218295	NMMA		
-6.7259769	putrescine		
-6.7261518	threonine		

-6.7264901	trimethylamine.N.oxide		
-6.7267182	PE.P.34.1.PE.O.34.2		
-6.7267823	X5.methylcytidine		