

## Online Appendix

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**Inclusion criteria**

1. Written informed consent
2. Male or female patients >50 years with type 2 diabetes (WHO criteria)
3. HbA<sub>1c</sub> ≥ 48 mmol/mol (6.5 %)
4. eGFR ≥ 30 ml/min/1.73 m<sup>2</sup> (estimated by CKD-epi formula)
5. Stable glucose-lowering medication (excluding oral glucocorticoids, calcineurin inhibitors, dipeptidyl peptidase 4 (DPP4) inhibitors, glucagon like peptide-1 agonists and other agents, which in the investigator's opinion could interfere with the effect of liraglutide) for at least 4 weeks before the baseline PET/CT
6. Stable/no treatment of hypercholesterolemia 4 weeks before baseline PET/CT
7. Must be able to communicate with the investigator and understand informed consent

**Exclusion criteria**

1. Type 1 diabetes mellitus
2. Chronic pancreatitis / previous acute pancreatitis
3. Known or suspected hypersensitivity to trial product(s) or related products
4. Treatment 90 days prior to screening with oral glucocorticoids, calcineurin inhibitors, dipeptidyl peptidase 4 (DPP4) inhibitors, glucagon like peptide-1 agonists and other agents, which in the investigator's opinion could interfere with the effect of liraglutide
5. Cancer or any other clinically significant disorder, except for conditions associated with type 2 diabetes history, which in the investigators opinion could interfere with the results of the trial
6. Clinical signs of diabetic gastroparesis
7. Previous bowel resection
8. Impaired liver function (transaminases > two times upper reference levels)
9. Inflammatory bowel disease
10. Weight >150 kg
11. Females of childbearing potential who are pregnant, breast-feeding, intend to become pregnant or are not using adequate contraceptive methods
12. Known or suspected abuse of alcohol or narcotics
13. Subjects with personal or family history of medullary thyroid carcinoma or a personal history of multiple endocrine neoplasia type 2

## Lipidomic analysis

### Sample preparation

Lipidomic analysis was performed at Steno Diabetes Center Copenhagen, where plasma samples were extracted and stored at  $-80\text{ }^{\circ}\text{C}$ . Heavy isotope and non-physiological lipids TG(15:0/15:0/15:0), LPC(17:0), DG(15:0/-/15:0), Cer(d18:1/17:0), SM(d18:1/17:0), PE(17:0/17:0), PC(17:0/17:0) and TG(15:0/15:0/15:0) in methanol (28 $\mu\text{L}$ ) were added 10  $\mu\text{L}$  plasma sample, followed by 10  $\mu\text{L}$  0.9% NaCl (aq) and 92 $\mu\text{L}$  2:1 v/v chloroform:methanol solution. The mixture was mixed for 5 minutes and left for half an hour on ice before centrifuging for 3 minutes at 10.000 g. The lower lipid containing chloroform layer (30  $\mu\text{L}$ ) was transferred to a glass LC vial containing 30  $\mu\text{L}$  of a 2:1 chloroform:methanol solution. Additionally, three quality control samples were also prepared by using the following material instead of a study samples: blank samples were prepared with 10  $\mu\text{L}$  chloroform:methanol solution, NIST samples were prepared with the 10 $\mu\text{L}$  NIST SRM 2378 Reference Material, and pooled samples were prepared with a 10  $\mu\text{L}$  mixture of all the plasma samples.

### Sample analysis

All samples were analysed using ultra-high-performance liquid chromatography coupled with quadrupole time-of-flight mass spectrometer (Agilent 6500 system). Chromatographic separation was achieved using Waters Acquity UPLC<sup>®</sup>, BEH C18 (2.1  $\times$  100 mm, 1.7  $\mu\text{m}$ ) at 50 $^{\circ}\text{C}$ . Two mobile phases were used, mobile phase A (MPA) consisted of H<sub>2</sub>O + 10mM NH<sub>4</sub>Ac + 0.1% v/v HCOOH while mobile phase B (MPB) consisted of ACN:IPA (1:1, v/v) + 10 $\mu\text{M}$  NH<sub>4</sub>Ac + 0.1% v/v HCOOH. The gradient utilized here was established with 0 minutes (35% MPB), 2 minutes (80% MPB), 7 minutes (100% MPB), 14 minutes (100% MPB) followed by 4 minutes column equilibration (35% MPB) prior to each injection, while the flow rate was kept constant at 0.4 mL/min.

The MS was operated in the positive ion mode with a capillary voltage of 3.6kV and a nozzle voltage of 15kV. The desolvation gas flow was 14L/min and the gas temperature were 193 $^{\circ}\text{C}$ . All analyses were acquired using the lock spray to ensure accuracy and reproducibility ( $m/z$  922.0097). Data were collected in the centroid mode over the mass range  $m/z$  100–1000 with an acquisition time of 0.2 seconds per scan. Samples were analysed in a randomized order with blank and pooled plasma samples (Quality control (QC) samples) being analysed after every 15 injections (1).

Table S1. Individual lipid overview

Individual lipid	Model coefficient	P	Bonferroni P<7.1e-03	Liraglutide							Placebo						
				Baseline			End-of-treatment			Change (%)	Baseline			End-of-treatment			Change (%)
				Median	Q1	Q3	Median	Q1	Q3		Median	Q1	Q3	Median	Q1	Q3	
TG(60:10)	-0.7949	0.0005	Passed	0.1479	0.0757	0.2958	0.0791	0.0367	0.1345	-46.6	0.1084	0.0502	0.2313	0.1147	0.0705	0.2229	4.5
PC(36:5)	-0.7546	0.0009	Passed	1.2312	0.9545	1.7526	1.0051	0.6349	1.3115	-22.1	1.1643	0.8741	1.6775	1.3435	1.0411	1.6661	6.4
TG(56:7)	-0.7474	0.0010	Passed	2.9403	1.6432	7.1062	2.0724	0.7914	4.3366	-40.0	2.2456	1.0577	3.8326	2.8142	1.4749	4.9651	26.9
TG(58:11)	-0.7424	0.0011	Passed	0.1045	0.0476	0.2932	0.0480	0.0195	0.1252	-53.4	0.0762	0.0397	0.1983	0.0983	0.0638	0.2286	1.9
TG(60:12)	-0.7449	0.0011	Passed	0.0893	0.0416	0.2552	0.0499	0.0194	0.1209	-60.6	0.0725	0.0355	0.1627	0.0899	0.0546	0.1584	1.6
TG(60:9)	-0.7263	0.0014	Passed	0.1874	0.1060	0.3812	0.1395	0.0476	0.2653	-40.0	0.1457	0.0715	0.2508	0.1779	0.0991	0.3104	10.4
Cer(d37:1)	-0.7177	0.0016	Passed	1.0592	0.6447	2.0972	0.5230	0.2391	1.2570	-30.3	0.7739	0.4608	1.3928	0.8210	0.4873	1.3095	-8.6
TG(56:4)	-0.7146	0.0017	Passed	0.9591	0.5092	1.9322	0.5118	0.2161	1.4684	-36.5	0.5141	0.2736	1.3612	0.7632	0.4194	1.4207	1.0
TG(58:8)	-0.7030	0.0020	Passed	1.4480	0.7011	2.7111	0.8260	0.3298	1.8711	-40.3	0.9867	0.5986	1.9429	1.3485	0.7687	2.1488	-2.3
PE(38:6)	-0.6973	0.0022	Passed	0.1129	0.0795	0.1660	0.0856	0.0559	0.1194	-24.2	0.1038	0.0693	0.1698	0.1054	0.0829	0.1558	-0.5
PC(37:5)	-0.6774	0.0029	Passed	0.0397	0.0292	0.0533	0.0256	0.0189	0.0411	-28.1	0.0360	0.0269	0.0544	0.0387	0.0299	0.0569	6.4
TG(58:6)	-0.6785	0.0030	Passed	0.1941	0.1188	0.3484	0.1345	0.0607	0.2376	-36.2	0.1195	0.0591	0.1938	0.1473	0.0997	0.2369	12.9
PE(O-40:7)/PE(P-40:6)	-0.6485	0.0043	Passed	0.0447	0.0338	0.0508	0.0365	0.0283	0.0484	-13.9	0.0465	0.0364	0.0561	0.0486	0.0369	0.0654	10.5
TG(58:10)	-0.6493	0.0047	Passed	0.1399	0.0649	0.3818	0.0861	0.0234	0.2314	-46.5	0.1017	0.0561	0.2055	0.1458	0.0595	0.2528	-18.7
HexCer(d34:1)	-0.6519	0.0047	Passed	18.3924	9.1737	31.9588	9.3225	5.4623	18.4613	-44.8	11.4503	6.5553	22.2962	12.7913	6.9852	19.3916	-12.2
TG(60:11)	-0.6458	0.0048	Passed	0.0725	0.0337	0.1338	0.0358	0.0154	0.0952	-50.5	0.0498	0.0251	0.1132	0.0682	0.0336	0.1215	-2.2
PC(40:7)	-0.6344	0.0052	Passed	0.1597	0.1304	0.2121	0.1379	0.0894	0.1804	-20.4	0.1614	0.1246	0.1963	0.1666	0.1310	0.1966	3.4
Cer(d38:1)	-0.6325	0.0054	Passed	0.0061	0.0042	0.0088	0.0052	0.0031	0.0074	-23.6	0.0054	0.0041	0.0069	0.0068	0.0047	0.0082	15.8
TG(54:6)	-0.6200	0.0069	Passed	0.4853	0.2331	0.8642	0.2625	0.1525	0.6351	-30.1	0.3718	0.2130	0.6055	0.4011	0.2506	0.5849	-8.2
TG(55:4)	-0.6129	0.0070	Passed	0.1111	0.0566	0.2628	0.0631	0.0293	0.1758	-42.8	0.0814	0.0435	0.1364	0.0861	0.0419	0.1439	-7.6
PE(O-34:2)/PE(P-34:1)	-0.6121	0.0071	Passed	0.0199	0.0145	0.0270	0.0158	0.0113	0.0245	-17.9	0.0209	0.0159	0.0247	0.0215	0.0149	0.0293	14.2
PE(36:0)	-0.6112	0.0072	Failed	9.9672	6.8616	20.8501	10.0063	5.3986	15.3863	-33.6	11.8777	7.2982	18.6577	13.2819	9.4722	19.7359	1.5
PE(O-36:3)/PE(P-36:2)	-0.6093	0.0073	Failed	0.0635	0.0400	0.0803	0.0518	0.0316	0.0750	-16.6	0.0598	0.0405	0.0803	0.0682	0.0426	0.1032	15.1
TG(56:3)	-0.6093	0.0073	Failed	0.6343	0.2927	1.9264	0.3016	0.1181	1.1179	-46.1	0.3889	0.2417	0.9163	0.5919	0.2673	1.0100	-8.6
TG(55:3)	-0.6082	0.0074	Failed	0.1086	0.0508	0.2848	0.0618	0.0253	0.1756	-47.8	0.0806	0.0400	0.1220	0.0944	0.0467	0.1526	-11.6
PC(P-38:6)/PC(O-38:7)	-0.6015	0.0081	Failed	0.0042	0.0027	0.0063	0.0033	0.0022	0.0057	-15.9	0.0050	0.0034	0.0069	0.0053	0.0036	0.0083	14.6

PC(35:1)	-0.5997	0.0083	Failed	0.1594	0.1231	0.2420	0.1378	0.0874	0.2047	-23.8	0.1645	0.1353	0.2380	0.1861	0.1297	0.2488	1.5
PE(O-38:5)/PE(P-38:4)	-0.5968	0.0086	Failed	0.2670	0.1864	0.3738	0.1953	0.1295	0.3159	-24.4	0.2555	0.2032	0.3550	0.3116	0.2111	0.3999	16.8
PI(36:2)	-0.5935	0.0090	Failed	14.9802	10.5498	27.6776	14.2559	6.7832	24.7669	-30.6	19.3904	11.7353	29.3221	18.6561	13.1794	31.3760	1.3
PC(P-38:4)/PC(O-38:5)	-0.5895	0.0095	Failed	0.0367	0.0296	0.0447	0.0305	0.0230	0.0405	-15.2	0.0348	0.0309	0.0431	0.0356	0.0306	0.0502	7.8
TG(56:8)	-0.5901	0.0102	Failed	2.8926	1.0578	7.0002	2.2838	0.5438	3.9772	-44.5	2.2076	1.2550	4.5784	2.6385	1.4060	4.9925	-8.3
PC(34:1)	-0.5837	0.0102	Failed	2.2172	1.9543	2.7199	2.1131	1.8479	2.4890	-9.3	2.2363	1.9594	2.5700	2.3589	2.0915	2.6373	3.3
PC(36:4)	-0.5782	0.0110	Failed	2.5553	2.1821	2.9818	2.3617	2.0343	2.7599	-9.1	2.5309	2.3353	2.9068	2.6743	2.3618	2.9325	4.0
TG(58:9)	-0.5838	0.0113	Failed	1.2797	0.5620	2.6794	0.8774	0.2948	1.6077	-41.7	0.8639	0.4345	1.8008	1.1309	0.5599	2.0213	-6.6
PC(40:5)	-0.5655	0.0128	Failed	0.1044	0.0791	0.1350	0.0881	0.0635	0.1167	-16.1	0.1061	0.0812	0.1419	0.1128	0.0875	0.1365	0.6
PC(40:6)	-0.5642	0.0130	Failed	0.6145	0.4662	0.7934	0.4942	0.3781	0.6642	-17.0	0.6215	0.4872	0.8300	0.6555	0.5045	0.8065	0.1
Cer(d43:2)	-0.5642	0.0130	Failed	23.6997	15.9856	41.4725	14.8278	9.6628	24.6499	-32.6	18.6913	12.1660	27.3861	16.5816	10.8325	31.4655	-6.7
Cer(d40:1)	-0.5639	0.0131	Failed	0.0634	0.0482	0.1216	0.0452	0.0287	0.0901	-33.4	0.0640	0.0375	0.0943	0.0748	0.0427	0.1039	3.0
PC(34:4)	-0.5615	0.0135	Failed	0.0080	0.0048	0.0130	0.0057	0.0037	0.0096	-30.2	0.0100	0.0046	0.0132	0.0094	0.0065	0.0141	9.5
TG(56:5)	-0.5554	0.0145	Failed	1.6949	1.0631	5.2415	1.2097	0.7478	2.9865	-33.5	1.4675	0.7940	2.6969	1.7151	1.0018	2.8450	0.4
TG(58:7)	-0.5550	0.0146	Failed	0.6566	0.3934	1.6164	0.4392	0.1957	1.2923	-40.1	0.4144	0.2965	1.0182	0.7192	0.3487	1.3498	-21.5
Cer(d42:2)	-0.5514	0.0153	Failed	0.1241	0.0785	0.1768	0.0810	0.0531	0.1467	-32.1	0.1086	0.0714	0.1643	0.1257	0.0722	0.1721	1.2
TG(58:2)	-0.5624	0.0165	Failed	0.0938	0.0383	0.3308	0.0651	0.0165	0.1456	-67.8	0.0593	0.0345	0.1458	0.0783	0.0371	0.1343	-15.8
PC(34:3)	-0.5443	0.0166	Failed	0.3883	0.2928	0.5398	0.3044	0.2380	0.4363	-14.8	0.3871	0.2621	0.6057	0.4421	0.3098	0.5583	12.3
TG(58:4)	-0.5445	0.0169	Failed	0.0696	0.0354	0.2518	0.0484	0.0159	0.1396	-52.7	0.0563	0.0351	0.1161	0.0762	0.0348	0.1289	-6.4
TG(52:7)	-0.5501	0.0174	Failed	0.2102	0.1079	0.6096	0.1419	0.0357	0.3388	-57.1	0.1349	0.0915	0.2905	0.1664	0.0719	0.3355	-22.5
Cer(d43:1)	-0.5400	0.0175	Failed	37.2229	20.5971	54.4230	20.3287	12.8705	36.0558	-27.7	24.8606	16.2124	40.8524	23.9339	14.3666	44.4007	-3.2
PC(38:2)	-0.5400	0.0175	Failed	0.1197	0.0814	0.1685	0.0979	0.0650	0.1429	-19.7	0.1150	0.0781	0.1599	0.1247	0.0853	0.1679	1.7
TG(54:3)	-0.5394	0.0176	Failed	7.1294	4.8539	15.7071	5.2452	2.4018	12.1145	-30.5	5.8220	3.6462	9.8686	7.0693	4.5423	10.4084	-5.0
TG(54:8)	-0.5452	0.0180	Failed	0.3427	0.1718	0.9317	0.2234	0.0672	0.4804	-55.7	0.2321	0.1319	0.3770	0.2891	0.1509	0.5447	-16.7
TG(56:6)	-0.5381	0.0179	Failed	3.8949	2.3970	9.1681	2.8233	1.4440	6.2568	-29.6	3.1203	1.7904	5.1324	3.7695	2.0610	6.0018	-0.2
Cer(d39:1)	-0.5362	0.0183	Failed	0.0055	0.0035	0.0087	0.0041	0.0024	0.0066	-33.0	0.0049	0.0034	0.0076	0.0058	0.0040	0.0087	16.6
PC(36:1)	-0.5326	0.0191	Failed	1.2860	0.9834	1.8293	1.1481	0.7910	1.5847	-16.2	1.2404	1.0230	1.6608	1.4160	1.0572	1.7320	5.8
PE(O-36:2)/PE(P-36:1)	-0.5287	0.0200	Failed	0.0225	0.0166	0.0345	0.0177	0.0108	0.0286	-21.6	0.0248	0.0162	0.0311	0.0268	0.0174	0.0363	14.6
TG(53:3)	-0.5271	0.0204	Failed	1.0371	0.5226	2.7160	0.6857	0.2182	1.9382	-41.0	0.8160	0.3639	1.3453	0.9139	0.4960	1.5390	-14.2
PC(33:0)	-0.5271	0.0204	Failed	0.0215	0.0165	0.0434	0.0168	0.0128	0.0258	-27.5	0.0236	0.0146	0.0373	0.0211	0.0171	0.0333	-0.8
TG(54:5)	-0.5266	0.0205	Failed	4.9067	2.6901	10.9419	3.5530	1.5524	8.5635	-29.7	3.7102	1.9658	5.7839	4.3739	2.6347	7.3143	-11.6

TG(52:5)	-0.5316	0.0209	Failed	3.7870	1.8748	10.9733	2.4186	0.8503	7.5596	-33.5	3.2924	1.6333	5.7659	3.8884	2.0436	6.8633	-15.8
Cer(d40:2)	-0.5216	0.0217	Failed	0.0100	0.0064	0.0153	0.0068	0.0053	0.0122	-28.4	0.0089	0.0063	0.0128	0.0109	0.0072	0.0140	5.7
PC(35:4)	-0.5209	0.0219	Failed	0.0396	0.0237	0.0541	0.0323	0.0219	0.0436	-26.5	0.0333	0.0269	0.0485	0.0352	0.0296	0.0476	3.5
Cer(d41:2)	-0.5209	0.0219	Failed	0.0111	0.0062	0.0164	0.0089	0.0057	0.0129	-27.8	0.0096	0.0071	0.0135	0.0119	0.0081	0.0152	2.9
Cer(d41:2)	-0.5162	0.0231	Failed	11.1792	6.3053	22.6784	5.9147	3.5447	14.3758	-24.6	8.1410	4.3706	14.6380	9.0293	4.6787	15.7493	-4.1
TG(52:2)	-0.5134	0.0239	Failed	15.2460	9.9698	30.0033	10.7115	7.0213	23.6257	-29.9	12.4111	7.7343	18.4851	14.4262	9.3352	20.6522	-7.1
Cer(d42:3)	-0.5123	0.0242	Failed	1.8704	1.2494	3.1253	1.1270	0.6720	1.9907	-31.4	1.4814	0.9006	2.4399	1.4248	0.8463	2.3489	-10.1
TG(55:2)	-0.5107	0.0246	Failed	0.0869	0.0284	0.2492	0.0420	0.0185	0.1253	-57.2	0.0566	0.0241	0.1056	0.0620	0.0345	0.1284	-13.3
PC(38:1)	-0.5094	0.0250	Failed	0.0297	0.0216	0.0441	0.0239	0.0152	0.0389	-22.3	0.0272	0.0176	0.0409	0.0272	0.0199	0.0418	1.2
HexCer(d41:1)	-0.5084	0.0253	Failed	9.9271	6.7097	18.3390	6.5792	4.2275	10.5871	-24.0	8.7357	5.5947	15.2514	7.9418	6.4121	12.2866	-16.5
PC(34:2)	-0.5081	0.0254	Failed	2.6902	2.4090	3.1382	2.6020	2.3160	2.8829	-7.0	2.7437	2.3943	3.0231	2.9643	2.4934	3.0805	2.2
PC(32:1)	-0.5075	0.0255	Failed	0.2738	0.1922	0.3964	0.2605	0.1687	0.3307	-16.7	0.2714	0.1733	0.4136	0.2790	0.2136	0.3736	0.6
PC(36:2)	-0.5034	0.0267	Failed	2.2083	1.9098	2.5810	2.0690	1.6537	2.4244	-9.4	2.2884	1.8627	2.5583	2.3129	1.9643	2.6102	2.1
DG(36:0)	0.4964	0.0289	Failed	0.1447	0.1234	0.1796	0.1690	0.1517	0.1839	17.2	0.1511	0.1349	0.1647	0.1539	0.1337	0.1857	8.2
TG(54:4)	-0.4962	0.0290	Failed	6.7778	4.0477	15.0182	4.4832	2.0450	11.2555	-29.6	5.1862	2.9139	8.4053	6.0905	3.6173	9.9674	-9.4
PC(33:1)	-0.4949	0.0294	Failed	0.0085	0.0061	0.0148	0.0066	0.0046	0.0121	-34.1	0.0081	0.0057	0.0138	0.0086	0.0065	0.0138	-1.8
PC(38:6)	-0.4945	0.0295	Failed	0.3388	0.2048	0.4235	0.2658	0.1862	0.3734	-22.3	0.3068	0.2248	0.4368	0.3556	0.2282	0.4440	7.0
HexCer(d40:1)	-0.4934	0.0299	Failed	0.0327	0.0246	0.0420	0.0275	0.0217	0.0389	-12.2	0.0305	0.0255	0.0381	0.0311	0.0259	0.0394	8.8
TG(45:0)	-0.4865	0.0323	Failed	1.0053	1.0025	1.0099	1.0039	1.0020	1.0077	-0.2	1.0053	1.0023	1.0082	1.0057	1.0026	1.0096	0.1
SM(d44:3)	-0.4861	0.0324	Failed	0.0269	0.0188	0.0355	0.0206	0.0126	0.0341	-26.2	0.0260	0.0161	0.0412	0.0278	0.0171	0.0392	-2.5
PC(40:4)	-0.4833	0.0335	Failed	0.0783	0.0492	0.1242	0.0736	0.0344	0.1113	-18.7	0.0771	0.0474	0.1029	0.0810	0.0520	0.1078	2.3
PC(38:3)	-0.4825	0.0337	Failed	0.8146	0.5640	1.1047	0.7743	0.4822	0.9728	-14.9	0.8085	0.6389	1.0790	0.8731	0.6349	1.0787	-1.3
Cer(d40:1)	-0.4855	0.0346	Failed	2.6972	1.6253	4.4425	1.7037	1.0257	3.3873	-19.4	2.0127	1.2958	3.3375	1.9784	1.4215	3.2391	-6.3
PC(36:6)	-0.4794	0.0349	Failed	0.0215	0.0128	0.0386	0.0155	0.0092	0.0241	-31.5	0.0212	0.0145	0.0441	0.0247	0.0196	0.0398	-9.2
PC(42:10)	-0.4783	0.0353	Failed	0.0009	0.0006	0.0012	0.0007	0.0005	0.0009	-21.4	0.0008	0.0007	0.0012	0.0008	0.0007	0.0010	1.4
TG(52:1)	-0.4807	0.0357	Failed	5.6112	1.9414	11.5531	3.0741	1.4235	8.0827	-39.5	3.4135	1.4546	6.7875	3.8563	2.3608	7.8517	-17.5
PC(P-36:4)/PC(O-36:5)	-0.4779	0.0355	Failed	0.1064	0.0873	0.1318	0.0909	0.0752	0.1111	-9.9	0.1099	0.0905	0.1273	0.1084	0.0905	0.1322	6.2
TG(52:3)	-0.4730	0.0374	Failed	13.1375	8.0599	26.5472	9.2787	5.6630	20.3200	-29.1	10.0858	6.2472	15.5275	12.3211	7.5227	18.1029	-8.7
SM(d39:2)	-0.4707	0.0390	Failed	0.0311	0.0255	0.0378	0.0284	0.0229	0.0339	-15.4	0.0312	0.0246	0.0374	0.0310	0.0267	0.0371	1.3
TG(54:7)	-0.4690	0.0397	Failed	0.5938	0.2406	1.7629	0.3385	0.0922	1.0444	-43.4	0.4129	0.2226	0.7853	0.5202	0.2588	1.1208	-29.5
TG(53:2)	-0.4672	0.0398	Failed	1.1914	0.5007	3.6043	0.7179	0.2658	2.5650	-49.0	0.8916	0.4061	1.7135	1.0395	0.5156	1.8833	-19.8

PC(30:1)	-0.4659	0.0404	Failed	0.0119	0.0072	0.0273	0.0107	0.0049	0.0164	-34.1	0.0120	0.0070	0.0259	0.0140	0.0082	0.0236	-1.1
PC(P-36:2)/PC(O-36:3)	-0.4645	0.0410	Failed	0.0669	0.0493	0.0865	0.0533	0.0434	0.0814	-14.9	0.0694	0.0555	0.0850	0.0727	0.0523	0.0873	4.0
HexCer(d40:2)	-0.4634	0.0414	Failed	1.3036	0.9075	2.1367	0.8467	0.5773	1.3253	-31.1	1.1089	0.7732	1.6436	1.0469	0.7781	1.6001	-15.8
SM(d42:2)	-0.4630	0.0416	Failed	4.1542	2.8328	5.5747	3.1764	2.0584	4.8367	-22.6	4.3154	2.5952	5.8963	4.2496	3.3098	5.7114	0.9
SHexCer(t34:1)	-0.4630	0.0416	Failed	7.8252	3.8028	11.4200	4.7756	2.8281	7.5875	-31.3	5.1196	2.8077	8.7027	5.2860	3.6776	9.4499	-8.4
TG(54:2)	-0.4608	0.0426	Failed	4.8827	2.0902	13.0142	2.7236	1.2123	8.4777	-38.9	3.1520	1.7112	6.9104	3.8684	2.2156	7.0836	-10.2
Cer(d40:2)	-0.4651	0.0444	Failed	4.5907	2.4416	8.2767	2.5616	1.4393	5.3242	-34.6	2.9094	2.1773	5.3430	3.1217	1.7148	5.4917	-17.3
PC(40:8)	-0.4580	0.0439	Failed	0.0376	0.0249	0.0580	0.0323	0.0191	0.0486	-28.0	0.0347	0.0255	0.0576	0.0384	0.0252	0.0576	3.8
TG(56:9)	-0.4648	0.0446	Failed	0.6220	0.2651	1.4041	0.3948	0.1180	0.7595	-43.7	0.4024	0.2606	0.7897	0.5283	0.2847	0.9606	-25.7
PC(37:2)	-0.4539	0.0458	Failed	0.0376	0.0218	0.0486	0.0271	0.0182	0.0377	-24.2	0.0328	0.0222	0.0479	0.0344	0.0235	0.0449	0.3
Cer(d41:1)	-0.4515	0.0469	Failed	0.0699	0.0456	0.1100	0.0513	0.0331	0.0926	-24.7	0.0639	0.0428	0.1026	0.0763	0.0465	0.1059	4.8
TG(52:4)	-0.4466	0.0494	Failed	9.3302	5.8625	22.4567	6.5074	3.6481	14.7105	-29.3	7.9702	4.2496	12.2037	9.4941	5.1724	13.7423	-11.1
TG(50:3)	-0.4462	0.0496	Failed	4.0285	2.3656	8.0556	3.1333	1.5960	6.8773	-34.9	3.8053	1.8955	5.3125	3.9077	2.5912	6.0454	-13.9
PC(35:2)	-0.4417	0.0519	Failed	158.383 4	134.615 5	185.748 2	135.579 7	103.456 5	179.943 1	-11.9	168.965 3	122.737 6	198.677 2	158.961 8	136.043 6	194.517 7	1.6
Cer(d42:0)	-0.4399	0.0529	Failed	0.0341	0.0227	0.0491	0.0244	0.0137	0.0407	-9.4	0.0334	0.0186	0.0471	0.0315	0.0188	0.0485	13.5
TG(60:2)	-0.4418	0.0536	Failed	0.0291	0.0098	0.1036	0.0207	0.0055	0.0517	-63.6	0.0203	0.0094	0.0502	0.0292	0.0116	0.0526	-15.6
PC(35:1)	-0.4380	0.0539	Failed	355.942 1	312.700 6	392.379 9	336.600 5	284.966 7	380.760 9	-5.8	359.242 6	299.215 3	399.254 4	351.191 8	324.424 1	400.441 4	3.0
TG(50:4)	-0.4397	0.0546	Failed	1.8511	0.8751	4.4775	1.1116	0.4200	3.1841	-42.1	1.4013	0.6580	2.4009	1.6922	0.7939	2.8662	-20.5
PC(P-36:3)/PC(O-36:4)	-0.4363	0.0549	Failed	0.3332	0.2196	0.3932	0.2598	0.2006	0.3334	-15.0	0.3005	0.2534	0.3694	0.3235	0.2439	0.3873	3.7
Cer(d41:1)	-0.4376	0.0559	Failed	4.5992	2.7310	7.7258	2.2692	1.5104	5.5267	-15.5	3.4331	1.8505	5.3379	3.2511	1.9323	5.1536	-2.4
PC(P-40:5)/PC(O-40:6)	-0.4349	0.0557	Failed	0.0224	0.0145	0.0282	0.0183	0.0142	0.0252	-11.9	0.0214	0.0151	0.0265	0.0195	0.0164	0.0283	5.6
PC(38:5)	-0.4335	0.0564	Failed	0.9778	0.7566	1.1536	0.8386	0.6885	1.1030	-10.7	0.9212	0.7557	1.1091	0.9945	0.7771	1.1122	4.1
Cer(d38:1)	-0.4305	0.0582	Failed	2.5290	1.2694	3.6788	1.5231	0.9115	2.0927	-28.6	1.6482	1.1963	2.7861	1.6033	0.9325	2.7054	-7.1
PC(35:3)	-0.4294	0.0639	Failed	0.0015	0.0009	0.0047	0.0012	0.0008	0.0022	-48.9	0.0012	0.0008	0.0042	0.0012	0.0008	0.0036	11.6
Cer(d39:1)	-0.4259	0.0638	Failed	3.1898	1.9617	5.8940	1.5247	0.9885	4.2101	-18.5	2.2379	1.3111	3.9807	2.5229	1.5504	4.2964	-8.0
TG(50:2)	-0.4211	0.0639	Failed	6.7968	3.6876	13.3403	5.2329	2.5057	9.9651	-32.4	5.8477	3.1061	8.3343	6.0701	4.0301	9.5028	-11.4
PE(O-40:6)/PE(P-40:5)	-0.4164	0.0669	Failed	0.0490	0.0363	0.0655	0.0378	0.0293	0.0630	-13.9	0.0532	0.0404	0.0655	0.0579	0.0428	0.0703	5.8
PC(38:4)	-0.4135	0.0688	Failed	1.6242	1.3246	2.0696	1.5005	1.2111	1.7880	-11.5	1.6780	1.3631	1.9820	1.6488	1.4750	1.9823	1.9
PC(36:5)	-0.4132	0.0690	Failed	195.923 0	188.996 9	202.878 0	191.668 8	180.655 7	201.314 7	-2.7	198.579 4	185.282 9	206.869 7	195.731 9	190.561 3	204.207 3	0.6
TG(46:1)	-0.4140	0.0704	Failed	0.5198	0.2836	1.4247	0.3801	0.1818	0.8971	-44.0	0.4103	0.1841	0.9246	0.3973	0.2270	0.9020	-1.6
TG(48:5)	-0.4109	0.0706	Failed	6.2113	3.7258	12.4569	4.3167	2.3517	9.8530	-35.2	6.2724	3.4456	8.3560	6.5219	3.9322	9.5552	-23.7

TG(46:3)	-0.4089	0.0720	Failed	0.1210	0.0587	0.4939	0.0794	0.0346	0.2097	-55.0	0.0880	0.0318	0.2092	0.1053	0.0543	0.1934	9.5
TG(49:1)	-0.4068	0.0734	Failed	0.5144	0.1923	1.1356	0.2578	0.1232	0.9297	-49.5	0.3342	0.1863	0.6999	0.3382	0.2131	0.6064	-29.1
HexCer(d41:1)	-0.4037	0.0757	Failed	0.0162	0.0103	0.0239	0.0121	0.0078	0.0197	-18.9	0.0153	0.0098	0.0242	0.0162	0.0105	0.0244	-1.9
HexCer(d42:1)	-0.4029	0.0762	Failed	25.3911	15.4894	53.0254	14.6145	9.6617	28.0174	-21.2	22.3004	13.9596	34.9993	18.7325	14.0917	34.1498	-14.9
PC(35:4)	-0.4012	0.0775	Failed	61.5127	58.4385	64.5625	59.3098	54.0528	63.5298	-4.2	62.0891	56.1282	65.3061	60.6280	58.4439	65.2171	0.6
Cer(d42:3)	-0.3995	0.0788	Failed	0.0068	0.0045	0.0109	0.0047	0.0033	0.0099	-21.3	0.0065	0.0044	0.0093	0.0078	0.0043	0.0097	-0.1
SM(d40:3)	-0.3985	0.0795	Failed	0.0498	0.0383	0.0705	0.0442	0.0291	0.0604	-17.9	0.0526	0.0389	0.0737	0.0543	0.0378	0.0651	-1.3
TG(54:0)	-0.3965	0.0811	Failed	0.0541	0.0264	0.1505	0.0371	0.0195	0.0916	-46.8	0.0417	0.0191	0.0760	0.0470	0.0240	0.0912	-4.4
TG(48:3)	-0.3948	0.0823	Failed	0.7856	0.3535	2.5042	0.6208	0.2160	1.4750	-44.3	0.7207	0.2365	1.2924	0.7670	0.3246	1.4460	-12.4
TG(53:1)	-0.3979	0.0848	Failed	0.2182	0.0748	0.4693	0.0969	0.0571	0.3246	-57.2	0.1260	0.0603	0.2886	0.1364	0.0688	0.2907	-26.3
Cer(d42:1)	-0.3930	0.0838	Failed	0.2151	0.1593	0.3676	0.1529	0.1038	0.3347	-18.0	0.2309	0.1565	0.3840	0.2656	0.1426	0.3815	7.2
TG(58:3)	-0.3975	0.0869	Failed	0.1025	0.0413	0.4382	0.0773	0.0239	0.1775	-62.5	0.0766	0.0454	0.1766	0.1160	0.0469	0.1885	-20.3
Cer(d44:1)	-0.3893	0.0867	Failed	7.6464	4.8276	13.7377	4.6616	2.6830	6.8095	-28.0	6.0534	3.9233	9.7439	5.2930	3.0730	9.2788	-8.5
PC(P-40:4)/PC(O-40:5)	-0.3879	0.0879	Failed	0.0438	0.0322	0.0581	0.0381	0.0282	0.0560	-14.0	0.0474	0.0324	0.0579	0.0440	0.0359	0.0612	5.0
TG(51:3)	-0.3868	0.0887	Failed	1.0261	0.3710	2.1182	0.7471	0.2022	1.7724	-39.6	0.7487	0.3113	1.1717	0.8878	0.3501	1.3626	-26.3
TG(49:2)	-0.3846	0.0906	Failed	0.4082	0.1862	1.0753	0.2688	0.1214	0.8302	-45.4	0.3308	0.1407	0.6425	0.3254	0.2046	0.5783	-26.9
TG(45:1)	-0.3823	0.0926	Failed	0.0206	0.0098	0.0672	0.0167	0.0058	0.0366	-50.0	0.0217	0.0091	0.0470	0.0185	0.0117	0.0317	-7.2
PC(P-38:5)/PC(O-38:6)	-0.3815	0.0932	Failed	0.0241	0.0182	0.0286	0.0195	0.0153	0.0299	-13.7	0.0222	0.0193	0.0292	0.0230	0.0189	0.0296	1.2
PC(P-42:5)/PC(O-42:6)	-0.3797	0.0948	Failed	0.0120	0.0081	0.0165	0.0103	0.0071	0.0136	-14.3	0.0124	0.0080	0.0163	0.0116	0.0095	0.0154	4.8
TG(56:2)	-0.3877	0.0993	Failed	0.3808	0.1378	1.1864	0.2477	0.0840	0.5905	-48.3	0.2224	0.1437	0.4826	0.2660	0.1412	0.5570	-22.6
PC(32:0)	-0.3773	0.0969	Failed	0.1391	0.1258	0.1705	0.1300	0.1103	0.1536	-9.9	0.1446	0.1206	0.1746	0.1397	0.1190	0.1671	0.1
TG(58:5)	-0.3802	0.0990	Failed	0.1589	0.0654	0.2767	0.0997	0.0565	0.2049	-35.2	0.0722	0.0491	0.1603	0.0963	0.0504	0.1898	6.5
PC(P-38:3)/PC(O-38:4)	-0.3756	0.0984	Failed	63.8925	60.1505	66.7999	62.1147	57.6032	66.1510	-3.0	65.0158	59.8810	68.4728	63.8697	61.7823	67.3576	0.6
PC(P-36:2)/PC(O-36:3)	-0.3715	0.1021	Failed	41.2257	38.8874	43.1968	39.7276	36.5112	42.5098	-3.8	41.4226	38.1323	43.7930	40.8367	39.3748	43.4930	0.6
SM(d36:2)	-0.3709	0.1027	Failed	0.2148	0.1675	0.3065	0.2097	0.1582	0.2386	-11.4	0.2125	0.1682	0.2940	0.2329	0.1744	0.2948	2.7
PC(37:4)	-0.3696	0.1039	Failed	0.0634	0.0474	0.0870	0.0578	0.0417	0.0694	-16.3	0.0760	0.0510	0.0847	0.0692	0.0517	0.0815	-0.6
TG(58:1)	-0.3714	0.1060	Failed	0.0337	0.0112	0.0948	0.0210	0.0053	0.0580	-62.7	0.0200	0.0080	0.0511	0.0269	0.0114	0.0477	-13.9
PC(32:2)	-0.3673	0.1061	Failed	0.0947	0.0621	0.1553	0.0700	0.0476	0.1134	-23.6	0.1086	0.0666	0.1539	0.1114	0.0822	0.1513	-0.5
PC(O-34:0)	-0.3648	0.1085	Failed	0.0119	0.0071	0.0173	0.0087	0.0058	0.0164	-17.2	0.0116	0.0082	0.0176	0.0114	0.0086	0.0162	1.9
TG(40:1)	-0.3669	0.1102	Failed	0.0133	0.0054	0.0345	0.0086	0.0032	0.0188	-76.3	0.0081	0.0019	0.0183	0.0076	0.0030	0.0180	15.5
PC(P-36:1)/PC(O-36:2)	-0.3633	0.1099	Failed	0.0603	0.0467	0.0852	0.0473	0.0355	0.0815	-13.0	0.0616	0.0446	0.0873	0.0647	0.0496	0.0906	2.5



PC(O-34:1)	-0.3627	0.1105	Failed	15.2989	14.3984	16.1636	14.8186	13.5113	15.8814	-3.9	15.4794	13.9138	16.5597	15.1552	14.5562	16.3021	0.7
PC(31:0)	-0.3618	0.1114	Failed	0.0169	0.0129	0.0269	0.0137	0.0102	0.0203	-21.0	0.0197	0.0121	0.0287	0.0165	0.0133	0.0269	-2.4
TG(52:6)	-0.3616	0.1116	Failed	0.1113	0.0525	0.2515	0.0925	0.0423	0.2244	-39.3	0.0961	0.0492	0.1497	0.1022	0.0583	0.1663	-22.5
TG(50:5)	-0.3598	0.1133	Failed	0.0367	0.0157	0.0778	0.0202	0.0120	0.0627	-46.9	0.0251	0.0156	0.0500	0.0264	0.0167	0.0440	-31.1
PC(P-42:4)/PC(O-42:5)	-0.3597	0.1135	Failed	37.4101	34.8778	40.0047	35.2242	31.2569	39.5107	-4.9	38.5676	33.4962	41.7145	37.4679	35.1430	40.3355	0.4
SM(d36:3)	-0.3589	0.1143	Failed	0.0276	0.0194	0.0428	0.0222	0.0170	0.0338	-22.9	0.0294	0.0222	0.0424	0.0320	0.0232	0.0393	1.3
PC(37:6)	-0.3576	0.1156	Failed	0.0241	0.0176	0.0380	0.0187	0.0114	0.0305	-22.2	0.0281	0.0188	0.0472	0.0245	0.0196	0.0365	-10.9
PE(O-36:6)/PE(P-36:5)	-0.3574	0.1158	Failed	94.4836	66.8733	145.9274	91.5791	59.2843	134.4351	-18.2	101.6275	67.4787	156.6504	117.3961	75.8341	157.7947	1.6
PE(40:5)	-0.3560	0.1211	Failed	5.2730	3.6470	9.4997	6.1017	3.0761	9.0138	-25.9	6.4895	3.6725	8.9690	7.3282	5.1408	10.2459	1.5
PC(34:4)	-0.3533	0.1200	Failed	142.8970	132.6795	154.7995	135.7386	119.3656	151.3816	-5.1	145.8835	127.1568	158.2015	142.4975	134.7437	155.6992	1.5
SM(d42:3)	-0.3521	0.1213	Failed	1.3927	0.9839	2.2243	1.2071	0.7855	1.9011	-22.0	1.4492	0.9336	2.2390	1.4959	1.0713	2.0714	-2.5
PC(O-34:0)	-0.3519	0.1215	Failed	32.2224	28.5166	34.8641	30.5830	26.6804	34.0602	-4.8	32.8410	28.4207	35.5238	31.8048	30.1348	35.7493	2.0
SM(d30:1)	-0.3519	0.1215	Failed	0.0244	0.0156	0.0409	0.0195	0.0148	0.0285	-26.8	0.0244	0.0184	0.0431	0.0275	0.0194	0.0363	-1.9
PC(40:7)	-0.3501	0.1234	Failed	176.3268	162.4945	188.2037	166.5069	146.2972	185.3961	-5.2	180.2116	155.8123	193.7241	174.5415	165.0784	190.6682	1.3
PC(33:2)	-0.3495	0.1241	Failed	173.0267	150.4638	191.1813	156.3580	125.9101	186.5223	-8.6	178.0243	140.8572	200.3676	169.0010	154.0727	198.2871	1.4
LacCer(d42:2)	-0.3492	0.1244	Failed	0.0110	0.0065	0.0185	0.0073	0.0052	0.0145	-28.6	0.0127	0.0063	0.0186	0.0114	0.0078	0.0166	5.7
DG(36:2)	-0.3490	0.1246	Failed	0.2917	0.2009	0.5443	0.2563	0.1725	0.4608	-15.8	0.2775	0.1744	0.4038	0.2900	0.2098	0.3893	3.6
PC(P-34:2)/PC(O-34:3)	-0.3443	0.1298	Failed	1356.8349	1171.5198	1509.0069	1218.0250	965.9534	1469.9188	-9.0	1400.4135	1090.0269	1586.7578	1323.3006	1199.0667	1568.4620	1.4
PE(O-40:5)/PE(P-40:4)	-0.3462	0.1318	Failed	4.1651	2.7950	7.9130	3.9951	1.9060	6.3091	-33.1	4.5027	3.2024	7.0624	4.6398	3.2315	7.7495	-0.4
PC(40:8)	-0.3432	0.1310	Failed	1152.6326	1050.3137	1232.2194	1077.8422	936.7709	1211.1944	-5.7	1181.4692	1005.0599	1270.0931	1134.5959	1068.0145	1262.4203	1.2
PC(P-38:3)/PC(O-38:4)	-0.3400	0.1347	Failed	0.1741	0.1182	0.2475	0.1416	0.1000	0.2160	-18.3	0.1762	0.1341	0.2370	0.1828	0.1448	0.2279	4.5
PC(30:0)	-0.3386	0.1363	Failed	0.0452	0.0347	0.0694	0.0410	0.0316	0.0533	-17.7	0.0464	0.0327	0.0718	0.0439	0.0326	0.0667	-3.3
PC(32:1)	-0.3370	0.1381	Failed	260.8420	225.2802	305.6985	236.0364	180.2101	294.1649	-9.8	277.6716	204.4708	322.2482	259.3554	230.6952	321.2236	1.5
TG(48:2)	-0.3388	0.1402	Failed	1.9706	0.9395	3.6541	1.2700	0.6936	2.8649	-41.1	1.4862	0.6842	2.5223	1.5060	0.8626	2.6383	-15.1
TG(54:1)	-0.3378	0.1419	Failed	0.9192	0.3008	2.1188	0.4716	0.1915	1.3428	-46.4	0.5192	0.1797	1.2002	0.5387	0.2594	1.3558	-13.7
PC(P-40:3)/PC(O-40:4)	-0.3327	0.1432	Failed	0.0427	0.0292	0.0605	0.0343	0.0249	0.0574	-18.2	0.0446	0.0298	0.0613	0.0422	0.0350	0.0573	1.7
TG(50:1)	-0.3340	0.1445	Failed	7.5259	3.8395	15.3194	5.9642	2.6283	11.5195	-31.7	5.9338	3.1931	10.2305	6.9531	4.7024	10.7833	-13.0
PC(P-34:0)/PC(O-34:1)	-0.3319	0.1442	Failed	0.1657	0.1179	0.2376	0.1265	0.0992	0.2276	-16.0	0.1859	0.1234	0.2541	0.1799	0.1382	0.2328	3.9
LacCer(d34:1)	-0.3314	0.1448	Failed	0.0127	0.0098	0.0176	0.0129	0.0098	0.0157	-2.2	0.0135	0.0103	0.0165	0.0143	0.0111	0.0177	12.2
Cer(d42:2)	-0.3330	0.1463	Failed	133.760	71.1028	248.108	100.946	49.4992	150.704	-30.6	110.997	65.5490	187.239	110.114	58.1308	163.299	-15.2

				0	0	1	1	2	9	4	6						
TG(56:1)	-0.3294	0.1524	Failed	0.0683	0.0249	0.2363	0.0428	0.0120	0.1169	-59.0	0.0442	0.0197	0.1054	0.0508	0.0220	0.1036	-12.2
SM(d32:1)	-0.3269	0.1504	Failed	0.6154	0.4792	0.9119	0.5360	0.4194	0.7102	-19.5	0.6881	0.4287	0.9457	0.6966	0.5167	0.8069	-0.5
PC(P-40:6)/PC(O-40:7)	-0.3266	0.1507	Failed	0.0217	0.0160	0.0290	0.0206	0.0146	0.0246	-12.4	0.0227	0.0195	0.0279	0.0212	0.0176	0.0276	-2.1
PC(33:1)	-0.3241	0.1538	Failed	79.6891	67.6403	95.4131	71.2828	50.8548	90.1320	-12.7	83.4476	61.3936	104.601 6	77.6890	67.1810	98.2729	-0.3
PI(38:3)	-0.3229	0.1598	Failed	19.8426	13.3815	36.2448	18.4764	10.3592	32.9347	-30.1	24.0893	16.8399	39.4219	25.8747	17.2883	40.9082	-1.2
PC(28:0)	-0.3197	0.1594	Failed	0.0077	0.0039	0.0156	0.0061	0.0032	0.0098	-36.8	0.0085	0.0050	0.0160	0.0075	0.0052	0.0147	-1.0
PC(O-32:0)	-0.3192	0.1601	Failed	0.0657	0.0383	0.0908	0.0493	0.0390	0.0721	-18.3	0.0680	0.0459	0.0987	0.0667	0.0471	0.0828	1.1
HexCer(d42:1)	-0.3191	0.1602	Failed	0.0513	0.0300	0.0819	0.0384	0.0253	0.0787	-15.2	0.0501	0.0302	0.0797	0.0525	0.0347	0.0817	1.7
TG(53:5)	-0.3195	0.1628	Failed	0.5166	0.1989	0.8589	0.3205	0.1534	0.7018	-32.3	0.3082	0.1546	0.5631	0.3369	0.2212	0.6232	-17.9
TG(48:1)	-0.3183	0.1629	Failed	2.8826	1.4494	4.7724	1.7950	0.7158	3.8125	-41.5	2.1973	1.2538	3.6083	2.1477	1.4019	3.8518	-13.7
TG(56:0)	-0.3182	0.1660	Failed	0.0122	0.0063	0.0385	0.0108	0.0044	0.0228	-46.2	0.0100	0.0051	0.0194	0.0116	0.0056	0.0207	-17.4
TG(50:6)	-0.3169	0.1699	Failed	0.1280	0.0646	0.4489	0.0966	0.0372	0.2207	-54.7	0.0960	0.0534	0.2130	0.1200	0.0579	0.2140	-7.0
Cer(d42:0)	-0.3158	0.1699	Failed	22.1070	16.1433	46.4652	17.4933	10.8936	26.7970	-25.7	19.2165	12.8558	29.4727	17.4445	10.3075	31.0628	1.3
PC(P-32:0)/PC(O-32:1)	-0.3127	0.1688	Failed	0.0479	0.0321	0.0670	0.0416	0.0285	0.0664	-12.2	0.0516	0.0332	0.0726	0.0500	0.0376	0.0705	1.1
PC(33:0)	-0.3120	0.1697	Failed	66.6201	61.0077	71.2098	64.0803	57.2260	69.6977	-4.3	67.5810	59.7800	72.8589	65.6991	62.5132	71.1331	0.0
PC(36:3)	-0.3077	0.1758	Failed	1.8683	1.5353	2.3456	1.7972	1.3078	2.1752	-11.6	1.9591	1.6205	2.3457	1.8910	1.5590	2.3493	-0.2
DG(36:3)	-0.3006	0.1860	Failed	0.4329	0.2525	0.6791	0.3348	0.1961	0.5664	-13.2	0.3596	0.2405	0.4880	0.3836	0.2661	0.5110	-1.2
PC(P-42:2)/PC(O-42:3)	-0.2994	0.1877	Failed	0.0123	0.0081	0.0179	0.0110	0.0074	0.0168	-13.7	0.0125	0.0088	0.0193	0.0127	0.0092	0.0188	2.8
DG(40:6)	-0.2988	0.1886	Failed	0.1151	0.1064	0.1243	0.1148	0.1029	0.1279	3.7	0.1172	0.1073	0.1278	0.1248	0.1107	0.1368	10.5
LPC(16:0)	0.2981	0.1896	Failed	0.1520	0.1150	0.1884	0.1534	0.1213	0.2096	7.6	0.1690	0.1216	0.2196	0.1511	0.1233	0.1962	-3.4
TG(51:2)	-0.2983	0.1948	Failed	1.4990	0.6313	3.4812	1.1626	0.4957	3.0657	-40.6	1.2105	0.4799	2.0028	1.2579	0.6370	2.2093	-23.6
PC(36:0)	-0.2962	0.1924	Failed	0.0185	0.0159	0.0238	0.0162	0.0147	0.0225	-7.2	0.0197	0.0159	0.0230	0.0190	0.0156	0.0234	2.7
TG(46:2)	-0.2941	0.2020	Failed	0.3426	0.1809	1.0505	0.2464	0.1471	0.5752	-45.5	0.2727	0.1393	0.6902	0.2608	0.1562	0.5627	-4.4
DG(34:2)	-0.2885	0.2043	Failed	0.0984	0.0599	0.1371	0.0774	0.0474	0.1451	-17.3	0.0844	0.0467	0.1174	0.0823	0.0609	0.1162	2.0
LPC(O-18:0)	0.2877	0.2055	Failed	0.0037	0.0030	0.0047	0.0038	0.0032	0.0046	7.4	0.0037	0.0027	0.0049	0.0038	0.0025	0.0051	1.5
SM(d34:0)	-0.2933	0.2265	Failed	0.1813	0.1160	0.2290	0.1681	0.0358	0.2155	-19.6	0.1931	0.0732	0.2470	0.1786	0.1317	0.2564	2.2
TG(52:0)	-0.2874	0.2164	Failed	0.3173	0.1278	0.7500	0.2348	0.0991	0.6107	-48.1	0.1811	0.0889	0.5751	0.2242	0.0933	0.5630	-21.4
TG(44:1)	-0.2881	0.2180	Failed	0.1441	0.0596	0.5147	0.1015	0.0576	0.2326	-48.3	0.1309	0.0668	0.3050	0.1031	0.0566	0.2175	-4.2
TG(47:1)	-0.2786	0.2268	Failed	0.0873	0.0491	0.2482	0.0669	0.0479	0.1666	-48.2	0.0778	0.0454	0.1736	0.0744	0.0505	0.1312	-18.5
LPC(O-16:0)	0.2740	0.2279	Failed	0.0114	0.0085	0.0145	0.0116	0.0092	0.0138	3.3	0.0115	0.0082	0.0155	0.0101	0.0078	0.0150	-3.7

PC(34:1)	-0.2689	0.2367	Failed	177.912 4	155.979 0	193.469 6	167.698 8	143.454 1	188.645 4	-6.2	179.397 6	156.379 4	197.826 9	175.074 0	164.279 5	197.281 4	0.0
PC(P-42:4)/PC(O-42:5)	-0.2646	0.2443	Failed	0.0437	0.0272	0.0600	0.0341	0.0267	0.0554	-16.6	0.0469	0.0281	0.0628	0.0451	0.0326	0.0611	-1.2
TG(46:0)	-0.2631	0.2503	Failed	0.3246	0.1599	0.9018	0.2528	0.1061	0.6201	-43.0	0.2656	0.0890	0.6401	0.2251	0.1198	0.5642	-15.6
DG(34:1)	-0.2622	0.2486	Failed	0.0807	0.0495	0.1333	0.0678	0.0466	0.1164	-17.7	0.0708	0.0433	0.1025	0.0735	0.0515	0.1019	2.3
PC(34:2)	-0.2595	0.2535	Failed	231.331 2	213.764 8	246.349 7	220.632 9	196.468 0	241.764 9	-5.1	234.480 2	208.529 1	255.007 2	227.127 6	216.231 9	250.250 7	-0.5
TG(44:0)	-0.2508	0.2698	Failed	0.0786	0.0393	0.2898	0.0772	0.0278	0.1645	-41.5	0.0716	0.0298	0.1921	0.0552	0.0341	0.1517	4.4
SM(d36:0)	-0.2541	0.2951	Failed	0.0137	0.0110	0.0337	0.0130	0.0075	0.0249	-22.4	0.0208	0.0114	0.0320	0.0160	0.0105	0.0394	30.0
TG(50:0)	-0.2497	0.2806	Failed	1.0899	0.4768	2.6002	0.7717	0.4062	1.7537	-40.4	0.6704	0.2811	1.7507	0.7767	0.3882	1.7876	-34.4
TG(51:1)	-0.2459	0.2826	Failed	0.9709	0.3110	2.2207	0.4443	0.2767	1.5188	-52.7	0.6050	0.2762	1.1918	0.6059	0.3471	1.2542	-31.9
PC(O-36:0)	-0.2414	0.2882	Failed	0.0036	0.0025	0.0051	0.0029	0.0022	0.0048	-15.6	0.0039	0.0025	0.0050	0.0037	0.0026	0.0048	6.5
LPC(20:3)	0.2410	0.2889	Failed	0.0464	0.0395	0.0649	0.0532	0.0440	0.0733	-0.2	0.0523	0.0372	0.0741	0.0535	0.0381	0.0711	-3.9
PC(P-44:4)/PC(O-44:5)	-0.2373	0.2963	Failed	0.0714	0.0351	0.1000	0.0576	0.0390	0.0900	-19.3	0.0799	0.0400	0.1109	0.0713	0.0482	0.1014	3.3
TG(47:2)	-0.2353	0.3108	Failed	0.0610	0.0302	0.1636	0.0507	0.0290	0.1136	-51.9	0.0568	0.0314	0.1109	0.0576	0.0350	0.0919	-12.1
TG(42:0)	-0.2301	0.3114	Failed	0.0286	0.0129	0.1211	0.0275	0.0084	0.0642	-54.6	0.0292	0.0109	0.0738	0.0209	0.0105	0.0493	15.1
TG(48:0)	-0.2145	0.3555	Failed	1.1825	0.4911	2.8502	0.8398	0.4061	1.8555	-38.1	0.7230	0.3876	1.8143	0.7733	0.4740	1.6141	-30.6
PC(32:0)	-0.2092	0.3572	Failed	216.036 4	204.931 6	225.476 2	206.956 1	189.382 7	223.133 0	-4.2	219.172 8	198.558 2	232.241 5	213.269 9	205.559 6	226.607 6	-1.8
TG(51:4)	-0.2083	0.3679	Failed	0.1714	0.0818	0.3324	0.1259	0.0673	0.2693	-31.8	0.1199	0.0610	0.2433	0.1224	0.0750	0.2514	-29.0
PC(P-34:2)/PC(O-34:3)	-0.2059	0.3649	Failed	0.1318	0.0928	0.1973	0.1183	0.0862	0.1693	-6.8	0.1459	0.1092	0.1902	0.1390	0.1010	0.2018	0.4
PC(33:2)	-0.2047	0.3678	Failed	0.0780	0.0506	0.1222	0.0585	0.0466	0.1029	-20.1	0.0816	0.0659	0.1160	0.0897	0.0627	0.1207	-4.8
LPC(20:5)	-0.2028	0.3721	Failed	0.0288	0.0163	0.0420	0.0273	0.0155	0.0385	-19.9	0.0300	0.0173	0.0526	0.0298	0.0205	0.0425	3.7
PC(39:4)	-0.2005	0.3775	Failed	137.768 2	129.669 7	144.415 2	132.571 5	120.650 5	142.228 2	-3.9	139.418 7	127.052 5	148.196 2	136.066 0	131.011 5	144.548 2	-1.3
TG(53:4)	-0.1885	0.4135	Failed	0.0796	0.0357	0.1607	0.0616	0.0318	0.1297	-37.9	0.0502	0.0221	0.1155	0.0532	0.0287	0.1280	-22.3
PC(P-34:1)/PC(O-34:2)	-0.1854	0.4145	Failed	0.0663	0.0498	0.0819	0.0516	0.0416	0.0878	-6.8	0.0630	0.0523	0.0880	0.0658	0.0516	0.0942	0.7
LacCer(d32:1)	0.1827	0.4213	Failed	0.1065	0.0829	0.1200	0.1045	0.0821	0.1245	1.9	0.1099	0.0838	0.1324	0.1084	0.0775	0.1295	-3.8
LPC(P-16:0)	0.1755	0.4399	Failed	0.0137	0.0104	0.0178	0.0144	0.0109	0.0184	1.3	0.0142	0.0101	0.0180	0.0127	0.0094	0.0184	-1.2
TG(49:0)	-0.1726	0.4554	Failed	0.1152	0.0474	0.2332	0.0659	0.0425	0.1910	-47.0	0.0742	0.0423	0.1800	0.0805	0.0472	0.1313	-27.3
LPC(18:2)	0.1731	0.4463	Failed	0.6722	0.4805	0.8645	0.6942	0.5504	0.8176	3.9	0.6825	0.4805	0.7871	0.6426	0.5168	0.7870	1.3
LPC(15:0)	0.1678	0.4602	Failed	0.0177	0.0136	0.0209	0.0163	0.0139	0.0199	-2.4	0.0187	0.0146	0.0243	0.0178	0.0128	0.0214	-10.5
TG(55:1)	-0.1588	0.4932	Failed	0.0228	0.0077	0.0708	0.0178	0.0070	0.0367	-58.3	0.0146	0.0067	0.0353	0.0192	0.0064	0.0352	-17.1
SM(d37:1)	-0.1536	0.5021	Failed	0.0264	0.0187	0.0344	0.0238	0.0161	0.0316	-38.9	0.0282	0.0205	0.0352	0.0261	0.0190	0.0326	-21.4

TG(40:0)	-0.1476	0.5213	Failed	0.0144	0.0050	0.0508	0.0102	0.0060	0.0265	-68.3	0.0114	0.0057	0.0395	0.0116	0.0055	0.0205	38.8
TG(42:2)	-0.1394	0.5545	Failed	0.0216	0.0073	0.0564	0.0133	0.0065	0.0325	-66.3	0.0138	0.0085	0.0368	0.0131	0.0068	0.0263	39.4
TG(44:2)	-0.1372	0.5631	Failed	0.0796	0.0353	0.2659	0.0523	0.0342	0.1649	-56.3	0.0588	0.0355	0.1481	0.0532	0.0318	0.0970	8.8
LPC(20:4)	0.1439	0.5266	Failed	0.1647	0.1290	0.2201	0.1807	0.1432	0.2375	-0.5	0.1693	0.1237	0.2431	0.1775	0.1270	0.2210	-5.4
DG(40:7)	0.1417	0.5331	Failed	0.0645	0.0596	0.0766	0.0677	0.0605	0.0780	5.7	0.0662	0.0611	0.0801	0.0658	0.0586	0.0756	2.7
LPC(18:0)	0.1410	0.5349	Failed	0.0407	0.0305	0.0557	0.0414	0.0340	0.0605	-1.9	0.0419	0.0309	0.0611	0.0395	0.0317	0.0586	-0.7
LPE(18:0)	-0.1338	0.5560	Failed	0.0226	0.0180	0.0263	0.0225	0.0201	0.0270	-4.1	0.0233	0.0198	0.0304	0.0236	0.0200	0.0295	1.2
LPC(22:6)	0.1295	0.5687	Failed	0.0422	0.0297	0.0595	0.0472	0.0341	0.0632	0.5	0.0546	0.0290	0.0707	0.0451	0.0330	0.0659	1.6
SM(d39:1)	0.1167	0.6206	Failed	0.0030	0.0021	0.0050	0.0032	0.0019	0.0050	46.1	0.0027	0.0017	0.0051	0.0027	0.0018	0.0045	-13.5
TG(49:3)	-0.1259	0.5823	Failed	0.0074	0.0032	0.0139	0.0055	0.0028	0.0113	-26.6	0.0052	0.0022	0.0103	0.0053	0.0031	0.0099	-22.8
PE(36:3)	0.1200	0.5975	Failed	0.2291	0.2244	0.2367	0.2326	0.2287	0.2360	1.2	0.2319	0.2262	0.2348	0.2320	0.2267	0.2361	0.7
LPC(14:0)	-0.1095	0.6299	Failed	0.0233	0.0198	0.0371	0.0251	0.0195	0.0347	-15.7	0.0290	0.0173	0.0401	0.0267	0.0191	0.0375	-7.6
Cer(d44:1)	-0.0899	0.6923	Failed	0.0059	0.0043	0.0086	0.0045	0.0037	0.0080	-12.3	0.0066	0.0051	0.0090	0.0059	0.0041	0.0098	7.1
TG(42:1)	-0.0628	0.7863	Failed	0.0431	0.0159	0.1388	0.0284	0.0131	0.0784	-64.2	0.0327	0.0178	0.0896	0.0253	0.0111	0.0551	13.5
LPE(16:0)	0.0430	0.8499	Failed	0.0153	0.0133	0.0194	0.0159	0.0140	0.0192	-0.7	0.0168	0.0126	0.0219	0.0170	0.0127	0.0227	-2.1
LPC(18:1)	0.0344	0.8796	Failed	0.5399	0.4587	0.6231	0.5536	0.4768	0.6436	-0.6	0.5641	0.4529	0.6614	0.5663	0.4635	0.6685	2.4
Cer(d44:2)	0.0076	0.9735	Failed	6.6925	4.7500	13.7110	5.7165	3.4543	9.2243	-14.5	5.5095	3.6270	8.1279	5.6264	2.3583	7.9418	-9.6
LPC(22:5)	-0.0192	0.9326	Failed	0.0034	0.0025	0.0050	0.0037	0.0027	0.0045	-7.8	0.0042	0.0025	0.0054	0.0038	0.0023	0.0049	-0.9
LPE(18:2)	0.0102	0.9643	Failed	0.0278	0.0224	0.0367	0.0291	0.0221	0.0362	-3.5	0.0279	0.0203	0.0345	0.0274	0.0211	0.0359	1.1
LPC(16:1)	0.0094	0.9669	Failed	0.0567	0.0450	0.0685	0.0525	0.0446	0.0700	-3.2	0.0598	0.0407	0.0769	0.0617	0.0449	0.0877	0.9

Overview of the 260 individual lipids identified using untargeted liquid-chromatography-coupled mass-spectrometry. Treatment response of each lipid was tested with lipid-specific linear mixed-effect models, where the observation of the lipid level at baseline and at end of treatment entered the model as a dependent variable, the treatment group, time and their interaction entered the model as fixed effects, and the participant ID entered the model as a random effect. Log10 coefficient from mixed model and corresponding P-value. Change given in percentage. Cer=Ceramides, DG=Diglycerides, HexCer=Hexosyl Ceramides, LacCer=Lactosyl Ceramides, LPC=Lysophosphatidylcholines, LPE=Lysophosphatidylethanolamines, PC=Phosphatidylcholines, PE=Phosphatidylethanolamines, PI=Phosphatidylinositols, SM=Sphingomyelins, TG=Triglycerides.

Table S2. Associations between selected individual lipids and clinical characteristics

Individual lipid	Sex			Age			Body Mass Index			HbA <sub>1c</sub>			Lipid lowering treatment		
	MC	P	R <sup>2</sup>	MC	P	R <sup>2</sup>	MC	P	R <sup>2</sup>	MC	P	R <sup>2</sup>	MC	P	R <sup>2</sup>
<sup>1</sup> TG(60:10);139	-0.0653	0.6372	-0.0077	0.0070	0.2609	0.0028	0.0175	0.1073	0.0160	-0.0053	0.2878	0.0014	0.1604	0.2717	0.0022
<sup>2</sup> PC(36:5);12	0.0363	0.5460	-0.0063	0.0028	0.2921	0.0012	0.0020	0.6701	-0.0082	-0.0023	0.2994	0.0009	0.0291	0.6474	-0.0079
<sup>3</sup> TG(56:7);32	-0.0758	0.5610	-0.0066	0.0011	0.8569	-0.0097	0.0080	0.4366	-0.0039	0.0010	0.8272	-0.0095	-0.1425	0.3001	0.0008
<sup>4</sup> TG(58:11);141	-0.0326	0.8426	-0.0096	0.0070	0.3387	-0.0008	-0.0007	0.9595	-0.0100	-0.0041	0.4877	-0.0051	-0.0132	0.9396	-0.0099
<sup>5</sup> TG(60:12);151	-0.0185	0.9091	-0.0099	0.0072	0.3226	-0.0001	0.0021	0.8709	-0.0097	-0.0029	0.6264	-0.0076	0.0389	0.8205	-0.0095
<sup>6</sup> TG(60:9);117	-0.1205	0.3561	-0.0014	0.0006	0.9128	-0.0099	0.0141	0.1705	0.0089	-0.0013	0.7861	-0.0093	-0.0383	0.7816	-0.0092
<sup>7</sup> Cer(d37:1);258	-0.2109	0.0618	0.0250	-0.0005	0.9242	-0.0100	0.0246	<b>0.0053</b>	0.0664	0.0037	0.3716	-0.0019	-0.1701	0.1554	0.0104
<sup>8</sup> TG(56:4);94	-0.2740	0.0597	0.0253	0.0023	0.7311	-0.0088	0.0223	0.0526	0.0274	0.0008	0.8880	-0.0098	-0.0622	0.6883	-0.0084
<sup>9</sup> TG(58:8);44	-0.1026	0.4491	-0.0042	0.0031	0.6087	-0.0073	0.0174	0.1020	0.0168	-0.0020	0.6828	-0.0083	-0.0957	0.5041	-0.0055
<sup>10</sup> PE(38:6);105	0.0032	0.9634	-0.0100	0.0070	<b>0.0257</b>	0.0393	0.0055	0.3234	-0.0001	-0.0043	0.0880	0.0191	-0.0459	0.5371	-0.0061
<sup>11</sup> PC(37:5);111	0.0999	0.1871	0.0075	0.0059	0.0821	0.0202	-0.0045	0.4533	-0.0043	-0.0035	0.2064	0.0061	0.1054	0.1879	0.0074
<sup>12</sup> TG(58:6);195	-0.1987	0.0914	0.0187	0.0030	0.5704	-0.0068	0.0156	0.0935	0.0183	0.0021	0.6180	-0.0076	-0.0200	0.8730	-0.0098
<sup>13</sup> PE(O-40:7)/PE(P-40:6);150	-0.0173	0.6970	-0.0085	0.0043	<b>0.0286</b>	0.0375	-0.0073	<b>0.0365</b>	0.0334	-0.0026	0.1042	0.0164	0.0764	0.1022	0.0168
<sup>14</sup> TG(58:10);128	-0.0507	0.7559	-0.0091	0.0057	0.4386	-0.0040	0.0136	0.2892	0.0014	-0.0024	0.6883	-0.0085	0.0170	0.9216	-0.0100
<sup>15</sup> HexCer(d34:1);223	-0.0709	0.5769	-0.0071	-0.0047	0.3787	-0.0022	0.0236	<b>0.0131</b>	0.0521	0.0079	0.0695	0.0236	-0.1570	0.2152	0.0056
<sup>16</sup> TG(60:11);159	0.0173	0.9049	-0.0100	0.0035	0.5858	-0.0071	0.0107	0.3480	-0.0011	-0.0028	0.5946	-0.0072	-0.0370	0.8091	-0.0095
<sup>17</sup> PC(40:7);51	-0.0279	0.6310	-0.0077	0.0029	0.2581	0.0029	-0.0028	0.5445	-0.0063	-0.0043	<b>0.0396</b>	0.0321	0.0590	0.3356	-0.0006
<sup>18</sup> Cer(d38:1);206	-0.0489	0.4323	-0.0038	-0.0005	0.8458	-0.0096	0.0101	<b>0.0389</b>	0.0324	0.0009	0.6966	-0.0085	0.0025	0.9698	-0.0100
<sup>19</sup> TG(54:6);68	-0.0421	0.7195	-0.0089	0.0030	0.5615	-0.0067	0.0199	<b>0.0298</b>	0.0375	0.0030	0.4940	-0.0054	-0.0994	0.4212	-0.0035
<sup>20</sup> TG(55:4);145	-0.1783	0.1437	0.0115	0.0007	0.8984	-0.0098	0.0171	0.0749	0.0217	0.0012	0.7951	-0.0093	-0.1178	0.3621	-0.0016
<sup>21</sup> PE(O-34:2)/PE(P-34:1);179	-0.0288	0.6307	-0.0077	0.0007	0.8050	-0.0094	0.0005	0.9094	-0.0099	-0.0015	0.5037	-0.0055	-0.0576	0.3628	-0.0016

Linear regression was used to analyze associations between individual lipids and sex, age, body mass index, HbA<sub>1c</sub> and lipid lowering treatment at baseline. n= 21 lipids significantly reduced by liraglutide compared to placebo treatment. MC=Model coefficient, P = P-value of the coefficient, Cer=Ceramides, HexCer=Hexosyl Ceramides, PC=Phosphatidylcholines, PE=Phosphatidylethanolamines, TG=Triglycerides.

**Table S3. Sensitivity analysis assuming zero change for the participants with missing lipidomics data at end-of-treatment**

Individual lipid	Model coefficient	P	Bonferroni P<7.1e-03
TG(60:10)	-0.7408	0.0006	Passed
TG(56:7)	-0.6808	0.0015	Passed
PC(36:5)	-0.6787	0.0016	Passed
Cer(d37:1)	-0.6739	0.0017	Passed
TG(58:11)	-0.6581	0.0022	Passed
TG(60:9)	-0.6555	0.0022	Passed
TG(60:12)	-0.6523	0.0024	Passed
PC(37:5)	-0.6401	0.0028	Passed
PE(38:6)	-0.6371	0.0030	Passed
PE(O-40:7)/PE(P-40:6)	-0.6342	0.0031	Passed
TG(58:8)	-0.6205	0.0038	Passed
PC(40:7)	-0.6124	0.0043	Passed
TG(56:4)	-0.6068	0.0047	Passed
TG(58:6)	-0.6060	0.0049	Passed
HexCer(d34:1)	-0.6003	0.0058	Passed
PC(P-38:6)/PC(O-38:7)	-0.5689	0.0080	Failed
Cer(d38:1)	-0.5652	0.0084	Failed
PE(36:0)	-0.5633	0.0086	Failed
PC(P-38:4)/PC(O-38:5)	-0.5629	0.0087	Failed
PE(O-36:3)/PE(P-36:2)	-0.5626	0.0087	Failed
PC(35:1)	-0.5608	0.0089	Failed
TG(60:11)	-0.5607	0.0094	Failed
PI(36:2)	-0.5558	0.0096	Failed
TG(58:10)	-0.5601	0.0098	Failed
PE(O-34:2)/PE(P-34:1)	-0.5514	0.0101	Failed
PC(40:6)	-0.5511	0.0102	Failed
PC(34:1)	-0.5487	0.0105	Failed
PC(40:5)	-0.5470	0.0108	Failed
TG(55:4)	-0.5457	0.0109	Failed
Cer(d43:2)	-0.5435	0.0113	Failed
TG(55:3)	-0.5377	0.0122	Failed
PE(O-38:5)/PE(P-38:4)	-0.5335	0.0129	Failed
PC(36:4)	-0.5334	0.0129	Failed
TG(54:6)	-0.5332	0.0139	Failed
TG(56:3)	-0.5266	0.0141	Failed
Cer(d43:1)	-0.5264	0.0141	Failed
TG(56:8)	-0.5224	0.0160	Failed
Cer(d40:1)	-0.5157	0.0162	Failed
Cer(d42:3)	-0.5144	0.0165	Failed
HexCer(d41:1)	-0.5132	0.0167	Failed
PC(38:2)	-0.5106	0.0173	Failed

TG(58:9)	-0.5092	0.0193	Failed
Cer(d42:2)	-0.4951	0.0210	Failed
PC(34:4)	-0.4933	0.0214	Failed
PC(36:1)	-0.4929	0.0215	Failed
DG(36:0)	0.4924	0.0217	Failed
PC(34:3)	-0.4908	0.0221	Failed
PC(34:2)	-0.4907	0.0221	Failed
TG(56:5)	-0.4875	0.0230	Failed
PC(36:2)	-0.4872	0.0231	Failed
PC(33:0)	-0.4858	0.0235	Failed
Cer(d39:1)	-0.4786	0.0256	Failed
PC(32:1)	-0.4776	0.0259	Failed
TG(58:4)	-0.4781	0.0263	Failed
Cer(d41:2)	-0.4736	0.0272	Failed
TG(56:6)	-0.4726	0.0275	Failed
HexCer(d40:2)	-0.4712	0.0280	Failed
TG(53:3)	-0.4699	0.0284	Failed
PC(38:1)	-0.4697	0.0285	Failed
Cer(d41:2)	-0.4692	0.0287	Failed
PE(O-36:2)/PE(P-36:1)	-0.4690	0.0288	Failed
TG(52:5)	-0.4735	0.0292	Failed
TG(54:3)	-0.4682	0.0290	Failed
HexCer(d40:1)	-0.4647	0.0303	Failed
Cer(d40:2)	-0.4629	0.0309	Failed
PC(33:1)	-0.4624	0.0311	Failed
Cer(d40:1)	-0.4661	0.0315	Failed
TG(58:2)	-0.4745	0.0321	Failed
PC(38:3)	-0.4500	0.0359	Failed
PC(P-36:2)/PC(O-36:3)	-0.4478	0.0368	Failed
TG(54:8)	-0.4520	0.0377	Failed
PC(40:4)	-0.4458	0.0376	Failed
Cer(d40:2)	-0.4513	0.0388	Failed
TG(52:2)	-0.4420	0.0393	Failed
PC(P-36:4)/PC(O-36:5)	-0.4415	0.0395	Failed
PC(38:6)	-0.4394	0.0405	Failed
SHexCer(t34:1)	-0.4393	0.0405	Failed
Cer(d38:1)	-0.4377	0.0413	Failed
SM(d44:3)	-0.4366	0.0418	Failed
PC(42:10)	-0.4361	0.0420	Failed
TG(54:5)	-0.4360	0.0421	Failed
TG(54:4)	-0.4355	0.0423	Failed
PC(35:4)	-0.4303	0.0448	Failed
PC(36:6)	-0.4292	0.0454	Failed
PC(37:2)	-0.4290	0.0455	Failed

TG(58:7)	-0.4279	0.0460	Failed
TG(52:7)	-0.4337	0.0470	Failed
PC(38:5)	-0.4248	0.0476	Failed
SM(d42:2)	-0.4210	0.0497	Failed
Cer(d41:1)	-0.4197	0.0503	Failed
PC(P-40:5)/PC(O-40:6)	-0.4174	0.0516	Failed
HexCer(d42:1)	-0.4142	0.0534	Failed
PC(30:1)	-0.4134	0.0539	Failed
SM(d39:2)	-0.4145	0.0541	Failed
TG(55:2)	-0.4101	0.0558	Failed
Cer(d41:1)	-0.4100	0.0577	Failed
TG(52:3)	-0.4031	0.0602	Failed
PC(40:8)	-0.4013	0.0613	Failed
PC(P-36:3)/PC(O-36:4)	-0.4007	0.0617	Failed
TG(45:0)	-0.4002	0.0621	Failed
PC(35:2)	-0.3993	0.0626	Failed
TG(53:2)	-0.3977	0.0637	Failed
PC(38:4)	-0.3963	0.0646	Failed
TG(54:7)	-0.3969	0.0652	Failed
Cer(d44:1)	-0.3953	0.0653	Failed
Cer(d42:0)	-0.3942	0.0661	Failed
PC(P-38:5)/PC(O-38:6)	-0.3884	0.0701	Failed
PC(35:1)	-0.3880	0.0704	Failed
TG(52:1)	-0.3888	0.0718	Failed
Cer(d39:1)	-0.3881	0.0734	Failed
TG(52:4)	-0.3849	0.0727	Failed
TG(56:9)	-0.3891	0.0749	Failed
PC(P-42:5)/PC(O-42:6)	-0.3831	0.0741	Failed
Cer(d42:1)	-0.3827	0.0744	Failed
SM(d40:3)	-0.3811	0.0755	Failed
HexCer(d41:1)	-0.3803	0.0762	Failed
TG(54:2)	-0.3788	0.0774	Failed
TG(50:4)	-0.3768	0.0810	Failed
PC(36:5)	-0.3746	0.0807	Failed
TG(50:3)	-0.3739	0.0813	Failed
PE(O-40:6)/PE(P-40:5)	-0.3718	0.0830	Failed
PC(P-40:4)/PC(O-40:5)	-0.3709	0.0838	Failed
PC(37:4)	-0.3706	0.0840	Failed
Cer(d42:3)	-0.3697	0.0847	Failed
TG(60:2)	-0.3668	0.0895	Failed
PC(35:4)	-0.3628	0.0908	Failed
PC(35:3)	-0.3566	0.1030	Failed
TG(48:5)	-0.3514	0.1013	Failed
PC(P-36:1)/PC(O-36:2)	-0.3500	0.1027	Failed



TG(50:2)	-0.3487	0.1039	Failed
PC(32:0)	-0.3485	0.1041	Failed
PC(P-40:6)/PC(O-40:7)	-0.3485	0.1042	Failed
PC(37:6)	-0.3471	0.1055	Failed
PC(31:0)	-0.3458	0.1069	Failed
SM(d36:2)	-0.3439	0.1088	Failed
PC(O-34:0)	-0.3431	0.1096	Failed
TG(46:1)	-0.3404	0.1151	Failed
PC(P-38:3)/PC(O-38:4)	-0.3334	0.1201	Failed
PC(P-36:2)/PC(O-36:3)	-0.3331	0.1204	Failed
TG(51:3)	-0.3297	0.1242	Failed
TG(46:3)	-0.3295	0.1244	Failed
TG(49:1)	-0.3280	0.1262	Failed
PE(O-36:6)/PE(P-36:5)	-0.3277	0.1265	Failed
SM(d36:3)	-0.3248	0.1299	Failed
PC(O-34:1)	-0.3240	0.1308	Failed
TG(48:3)	-0.3225	0.1326	Failed
PC(P-40:3)/PC(O-40:4)	-0.3219	0.1334	Failed
PE(40:5)	-0.3233	0.1359	Failed
TG(49:2)	-0.3199	0.1358	Failed
Cer(d42:2)	-0.3213	0.1374	Failed
PC(32:2)	-0.3194	0.1364	Failed
PC(P-42:4)/PC(O-42:5)	-0.3191	0.1368	Failed
LacCer(d42:2)	-0.3181	0.1380	Failed
SM(d42:3)	-0.3181	0.1381	Failed
TG(58:3)	-0.3216	0.1420	Failed
PC(34:4)	-0.3169	0.1396	Failed
TG(45:1)	-0.3158	0.1409	Failed
PC(P-38:3)/PC(O-38:4)	-0.3151	0.1418	Failed
PC(40:7)	-0.3140	0.1432	Failed
PC(33:2)	-0.3136	0.1437	Failed
PC(30:0)	-0.3135	0.1438	Failed
PC(O-34:0)	-0.3116	0.1463	Failed
SM(d30:1)	-0.3094	0.1491	Failed
HexCer(d42:1)	-0.3094	0.1492	Failed
PC(P-34:2)/PC(O-34:3)	-0.3081	0.1509	Failed
TG(58:5)	-0.3101	0.1539	Failed
PC(40:8)	-0.3068	0.1526	Failed
PC(P-34:0)/PC(O-34:1)	-0.3066	0.1528	Failed
PC(P-42:2)/PC(O-42:3)	-0.3048	0.1553	Failed
LPC(16:0)	0.3026	0.1583	Failed
SM(d32:1)	-0.3001	0.1618	Failed
TG(56:2)	-0.3048	0.1697	Failed
PE(O-40:5)/PE(P-40:4)	-0.3007	0.1654	Failed

PC(O-32:0)	-0.2979	0.1648	Failed
PC(32:1)	-0.2979	0.1649	Failed
TG(50:5)	-0.2947	0.1694	Failed
TG(58:1)	-0.2961	0.1721	Failed
PI(38:3)	-0.2954	0.1729	Failed
TG(52:6)	-0.2911	0.1747	Failed
PC(33:1)	-0.2884	0.1787	Failed
Cer(d42:0)	-0.2891	0.1830	Failed
TG(54:0)	-0.2869	0.1810	Failed
TG(53:1)	-0.2887	0.1852	Failed
LPC(20:3)	0.2860	0.1823	Failed
LacCer(d34:1)	-0.2854	0.1833	Failed
LPC(O-18:0)	0.2842	0.1851	Failed
PC(P-32:0)/PC(O-32:1)	-0.2822	0.1882	Failed
PC(28:0)	-0.2816	0.1892	Failed
TG(40:1)	-0.2739	0.2063	Failed
DG(36:2)	-0.2709	0.2065	Failed
PC(33:0)	-0.2707	0.2068	Failed
LPC(O-16:0)	0.2700	0.2080	Failed
PC(36:3)	-0.2692	0.2093	Failed
TG(48:2)	-0.2663	0.2192	Failed
SM(d34:0)	-0.2660	0.2450	Failed
TG(54:1)	-0.2584	0.2353	Failed
PC(P-42:4)/PC(O-42:5)	-0.2544	0.2355	Failed
DG(36:3)	-0.2542	0.2360	Failed
PC(36:0)	-0.2522	0.2397	Failed
TG(50:1)	-0.2523	0.2427	Failed
TG(56:1)	-0.2508	0.2481	Failed
TG(48:1)	-0.2459	0.2533	Failed
TG(50:6)	-0.2460	0.2589	Failed
PC(34:1)	-0.2370	0.2692	Failed
TG(56:0)	-0.2363	0.2755	Failed
TG(53:5)	-0.2358	0.2749	Failed
DG(34:2)	-0.2326	0.2782	Failed
DG(40:6)	-0.2323	0.2787	Failed
TG(51:2)	-0.2288	0.2921	Failed
PC(34:2)	-0.2280	0.2877	Failed
TG(46:2)	-0.2269	0.2971	Failed
SM(d36:0)	-0.2283	0.3206	Failed
TG(47:1)	-0.2181	0.3160	Failed
PC(P-44:4)/PC(O-44:5)	-0.2164	0.3130	Failed
TG(44:1)	-0.2115	0.3380	Failed
TG(52:0)	-0.2095	0.3412	Failed
PC(P-34:2)/PC(O-34:3)	-0.2046	0.3402	Failed

PC(O-36:0)	-0.2005	0.3498	Failed
TG(46:0)	-0.1979	0.3596	Failed
TG(44:0)	-0.1937	0.3664	Failed
PC(33:2)	-0.1910	0.3730	Failed
PC(P-34:1)/PC(O-34:2)	-0.1895	0.3770	Failed
LPC(18:2)	0.1856	0.3868	Failed
LPC(20:4)	0.1818	0.3966	Failed
TG(47:2)	-0.1795	0.4124	Failed
LPC(P-16:0)	0.1806	0.3997	Failed
LPC(22:6)	0.1801	0.4009	Failed
PC(32:0)	-0.1795	0.4027	Failed
TG(51:1)	-0.1766	0.4135	Failed
PC(39:4)	-0.1721	0.4223	Failed
DG(34:1)	-0.1710	0.4254	Failed
TG(42:0)	-0.1684	0.4324	Failed
SM(d37:1)	-0.1673	0.4386	Failed
TG(50:0)	-0.1607	0.4615	Failed
LPC(20:5)	-0.1540	0.4726	Failed
TG(48:0)	-0.1508	0.4913	Failed
LPC(18:0)	0.1506	0.4824	Failed
SM(d39:1)	0.1337	0.5475	Failed
LPC(15:0)	0.1368	0.5237	Failed
TG(51:4)	-0.1244	0.5688	Failed
TG(53:4)	-0.1221	0.5758	Failed
LacCer(d32:1)	0.1213	0.5716	Failed
DG(40:7)	0.1187	0.5799	Failed
TG(40:0)	-0.1105	0.6122	Failed
TG(44:2)	-0.0922	0.6817	Failed
TG(49:0)	-0.1035	0.6352	Failed
TG(42:2)	-0.0845	0.7041	Failed
Cer(d44:1)	-0.0951	0.6575	Failed
TG(55:1)	-0.0865	0.6924	Failed
LPE(18:0)	-0.0890	0.6782	Failed
LPC(18:1)	0.0873	0.6838	Failed
TG(49:3)	-0.0780	0.7181	Failed
LPC(16:1)	0.0699	0.7446	Failed
LPC(14:0)	-0.0665	0.7566	Failed
LPE(16:0)	0.0596	0.7811	Failed
TG(42:1)	-0.0270	0.9023	Failed
PE(36:3)	0.0526	0.8062	Failed
Cer(d44:2)	0.0117	0.9570	Failed
LPC(22:5)	0.0272	0.8992	Failed
LPE(18:2)	0.0229	0.9151	Failed

Sensitivity analysis, where zero change from baseline to end-of-treatment was assumed for the 5 participants with lipidomics data missing at end-of-treatment. Overall results were similar, but 6 single lipids (TG(58:10); TG(60:11); Cer(d38:1); TG(54:6); TG(55:4) and PE(O-34:2)/PE(P-34:1)), were no longer significantly reduced by liraglutide treatment compared to placebo after multiple adjustment. Treatment response of each lipid was tested with lipid-specific linear mixed-effect models, where the observation of the lipid level at baseline and at end of treatment entered the model as a dependent variable, the treatment group, time and their interaction entered the model as fixed effects, and the participant ID entered the model as a random effect. Log10 coefficient from mixed model and corresponding P-value. Cer=Ceramides, DG=Diglycerides, HexCer=Hexosyl Ceramides, LacCer=Lactosyl Ceramides, LPC=Lysophosphatidylcholines, LPE=Lysophosphatidylethanolamines, PC=Phosphatidylcholines, PE=Phosphatidylethanolamines, PI=Phosphatidylinositols, SM=Sphingomyelins, TG=Triglycerides.

**Table S4. Mediation – BMI and HbA<sub>1c</sub>**

	Total Effect Estimate (95 % CI)	P	ADE Estimate (95 % CI)	P	ACME Estimate	P
<b>BMI</b>						
TG(60:10)	0.214 (-0.037; 0.726)	0.120	-0.310 (-0.527; -0.068)	0.004	-0.084 (-0.225; 0.016)	0.120
PC(36:5)	0.311 (-0.055; 0.924)	0.100	-0.114 (-0.229; -0.007)	0.044	-0.052 (-0.118; 0.006)	0.100
TG(56:7)	0.096 (-0.298; 0.472)	0.520	-0.327 (-0.554; -0.110)	0.000	-0.035 (-0.145; 0.087)	0.520
TG(58:11)	0.287 (-0.008; 1.025)	0.064	-0.300 (-0.574; 0.005)	0.068	-0.121 (-0.282; 0.002)	0.060
TG(60:12)	0.023 (-0.266; 0.452)	0.856	-0.415 (-0.715; -0.137)	0.008	-0.010 (-0.148; 0.116)	0.856
TG(60:9)	0.127 (-0.175; 0.511)	0.296	-0.288 (-0.520; -0.092)	0.000	-0.042 (-0.131; 0.052)	0.296
Cer(d37:1)	-0.005 (-0.790; 0.877)	1.000	-0.262 (-0.481; -0.010)	0.044	0.001 (-0.157; 0.136)	1.000
TG(56:4)	-0.025 (-0.423; 0.406)	0.844	-0.339 (-0.584; -0.092)	0.008	0.008 (-0.106; 0.130)	0.844
TG(58:8)	0.216 (-0.204; 1.067)	0.272	-0.247 (-0.484; 0.008)	0.060	-0.068 (-0.190; 0.055)	0.272
PE(38:6)	0.025 (-0.284; 0.341)	0.796	-0.172 (-0.276; -0.053)	0.000	-0.004 (-0.047; 0.043)	0.796
<b>HbA<sub>1c</sub></b>						
TG(60:10)	0.092 (-0.193; 0.264)	0.484	-0.358 (-0.614; -0.169)	0.000	-0.036 (-0.077; 0.073)	0.484
PC(36:5)	0.129 (-0.207; 0.463)	0.416	-0.144 (-0.268; -0.046)	0.004	-0.021 (-0.053; 0.036)	0.416
TG(56:7)	0.161 (-0.174; 0.524)	0.288	-0.304 (-0.545; -0.082)	0.012	-0.058 (-0.119; 0.061)	0.288
TG(58:11)	0.117 (-0.320; 0.466)	0.460	-0.372 (-0.700; -0.088)	0.012	-0.049 (-0.124; 0.135)	0.460
TG(60:12)	0.101 (-0.304; 0.333)	0.476	-0.382 (-0.688; -0.137)	0.000	-0.043 (-0.105; 0.124)	0.476
TG(60:9)	0.136 (-0.198; 0.391)	0.368	-0.285 (-0.501; -0.086)	0.000	-0.045 (-0.090; 0.065)	0.368
Cer(d37:1)	0.332 (-0.260; 1.734)	0.208	-0.174 (-0.454; 0.076)	0.128	-0.087 (-0.191; 0.041)	0.180
TG(56:4)	0.127 (-0.208; 0.327)	0.352	-0.289 (-0.525; -0.106)	0.004	-0.042 (-0.084; 0.072)	0.352
TG(58:8)	0.121 (-0.280; 0.357)	0.476	-0.277 (-0.545; -0.096)	0.004	-0.038 (-0.087; 0.091)	0.476
PE(38:6)	0.117 (-0.333; 0.450)	0.516	-0.155 (-0.285; -0.042)	0.004	-0.021 (-0.048; 0.053)	0.512

Mediation analysis of the top 10 most associated lipids, testing if observed effect of liraglutide on these lipids were mediated through change in BMI or HbA<sub>1c</sub>. We applied linear regression models, the significance and the tested mediation effect was calculated with the “mediation” package in R, using bootstrapping to simulate 500 samples. Total effect is the effect between treatment and lipid without the mediator, ADE (average direct effect) is the effect between treatment and lipid when the mediator is taking into account and ACME (average casual mediation effect) is the mediation effect. None of the P values for mediation effect were significant, indicating that the lipid regulating effect of liraglutide is likely not mediated by change in BMI or HbA<sub>1c</sub>.

**References**

1. Broadhurst D, Goodacre R, Reinke SN et al. Guidelines and considerations for the use of system suitability and quality control samples in mass spectrometry assays applied in untargeted clinical metabolomic studies. *Metabolomics* 2018;14:72.