

Supplementary Materials

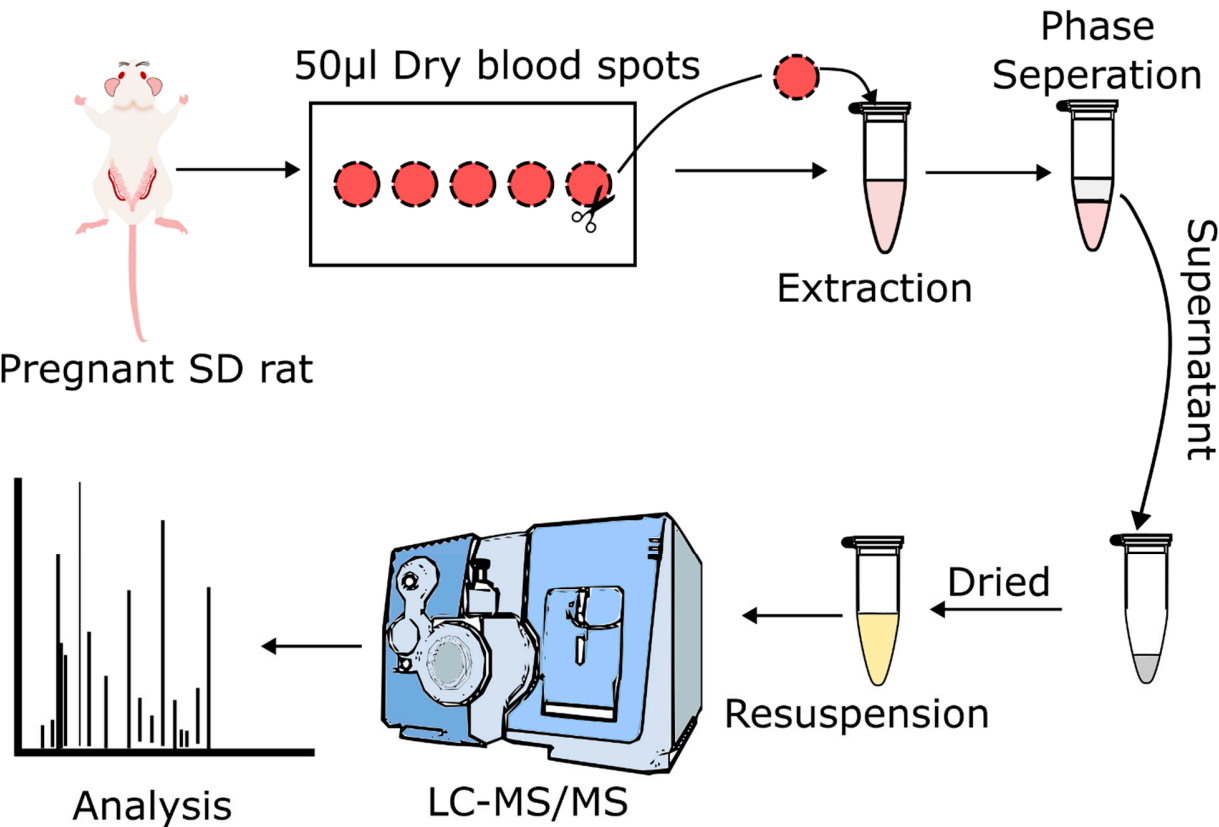


Figure S1. Schematic overview the lipidomic procedure.

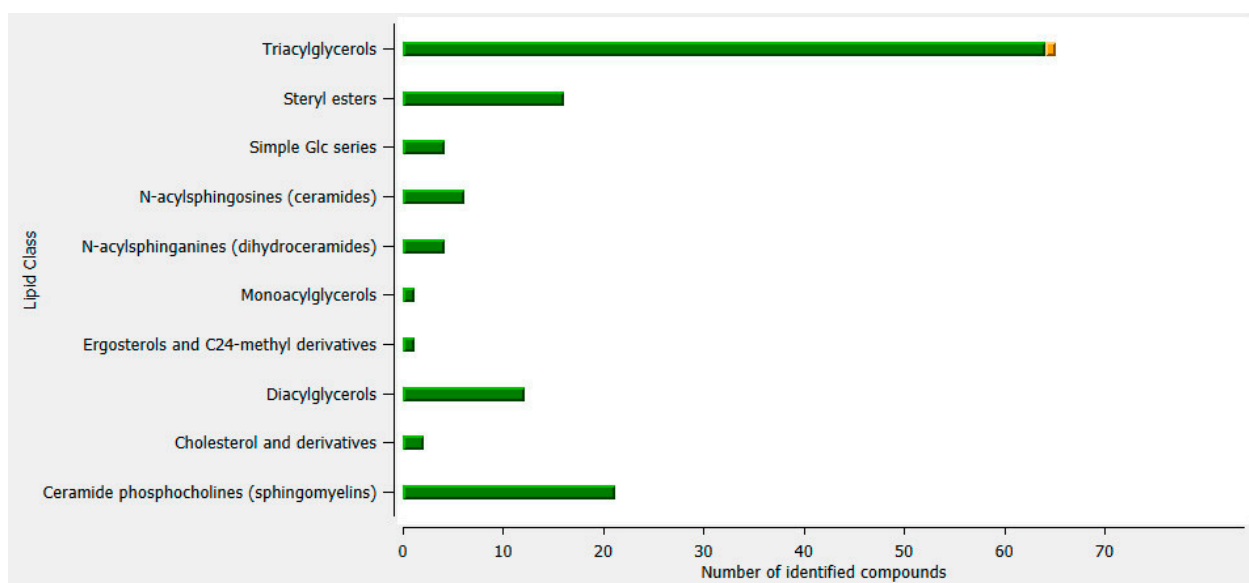


Figure S2. *Summary of molecular species identified in positive-ion mode.* This plot provides a histogram of the number of identified positive-ion features.

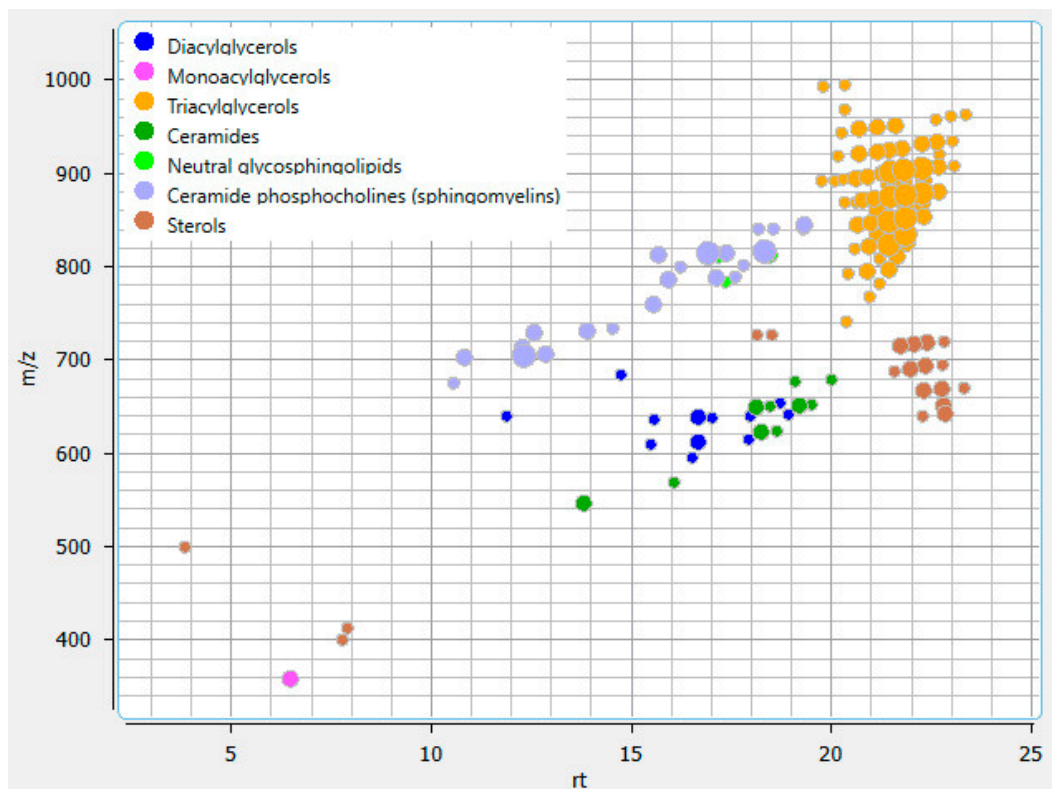


Figure S3. Mass-to-charge ratio (m/z) vs retention time plot of positive ions. A visual overview of the identified peaks in positive-ion mode from all samples combined, color coded by lipid class. The size of the spots is proportional to their relative abundance as peak area ratio (analyte/internal standard).

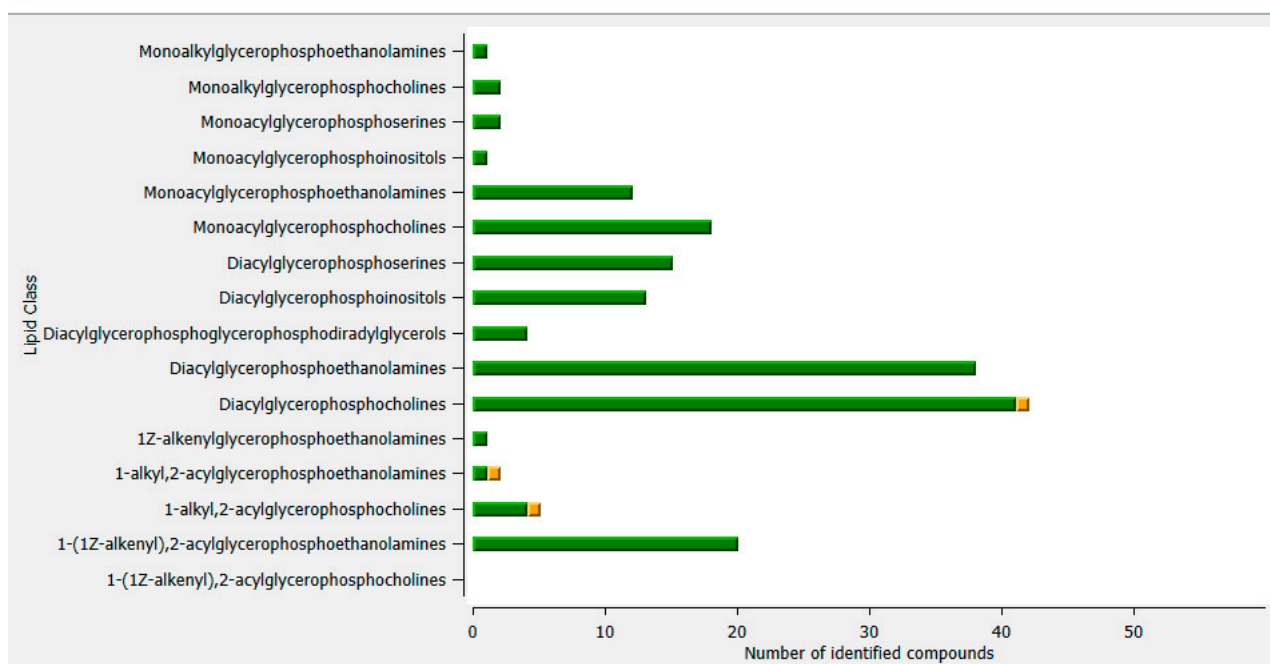


Figure S4. *Summary of molecular species identified in negative-ion mode.* This plot provides a histogram of the number of identified negative-ion features.

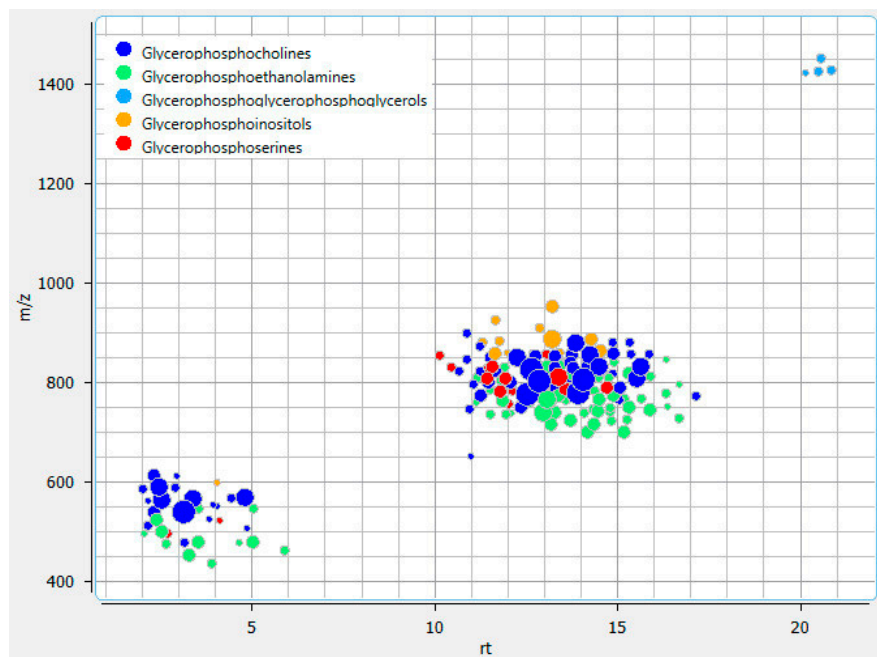


Figure S5. *Mass-to-charge ratio (m/z) vs retention time plot of negative ions.* A visual overview of the identified peaks in negative-ion mode from all samples combined, color coded by lipid class. The size of the spots is proportional to their relative abundance as peak area ratio (analyte/internal standard).

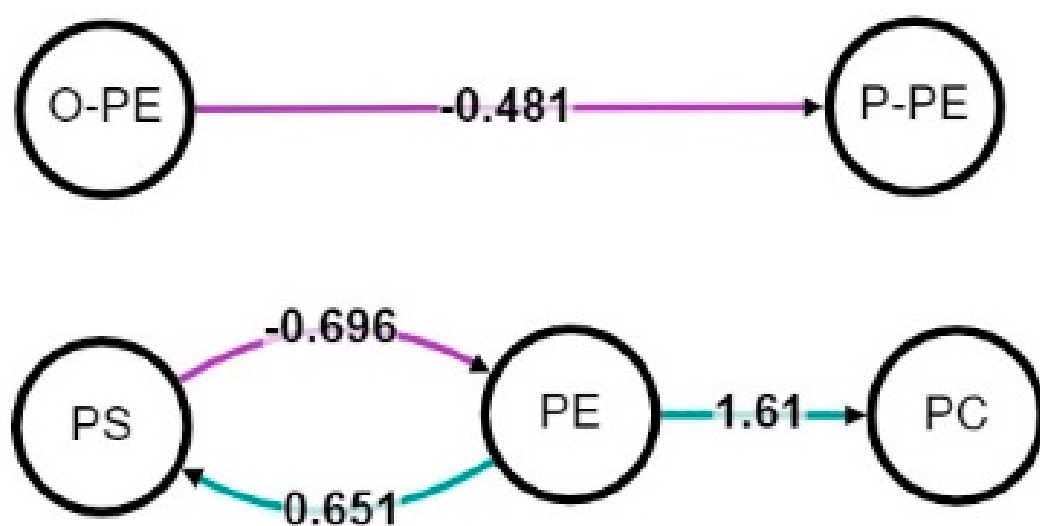


Figure S6. *Most active- and suppressed reaction and pathways.* A visual overview of most active and suppressed reaction and pathways between Pair-fed control and alcohol group as analyzed using LipidMaps.

Table S1. Numbers of Identified Molecular Species by Class and Subclass (Lipid Maps Classification).

Numbers of Identified Molecular Species by Class and Subclass (Lipid Maps Classification).	
Ceramides	9
N-acylsphinganine (dihydroceramides)	4
N-acylsphingosine (ceramides)	5
Diacylglycerols (DG)	11
Fatty Acids and Conjugates	12
Fatty acids	9
Hydroxy fatty acids	3
Glycerophosphocholines (PC)	65
1-alkyl,2-acylglycerophosphocholines	5
Diacylglycerophosphocholines	41
Monoacylglycerophosphocholines	17
Monoalkylglycerophosphocholines	2
Glycerophosphoethanolamines (PE)	76
1-(1Z-alkenyl),2-acylglycerophosphoethanolamines	22
1-alkyl,2-acylglycerophosphoethanolamines	2
1Z-alkenylglycerophosphoethanolamines	1
Diacylglycerophosphoethanolamines	38
Monoacylglycerophosphoethanolamines	12
Monoalkylglycerophosphoethanolamines	1
Glycerophosphoglycerophosphoglycerols (CL)	5
Diacylglycerophosphoglycerophosphodiradylglycerols	5
Glycerophosphoinositols (PI)	15

Diacylglycerophosphoinositols	14
Monoacylglycerophosphoinositols	1
Glycerophosphoserines (PS)	17
Diacylglycerophosphoserines	15
Monoacylglycerophosphoserines	2
Monoradylglycerols	1
Neutral glycosphingolipids	4
Simple Glc series	4
Ceramide phosphocholines (sphingomyelins) (SM)	20
Sterols	16
Cholesterol and derivatives	2
Ergosterols and C24-methyl derivatives	1
Steryl esters	13
Triacylglycerols (TG)	64
Total	315

Table S2. Fold change and P-values in untargeted lipidomics.

Molecular Species	Lipid Class	Lipid Subclass	p-Value	Fold Change	Obervation
(20R22R)-2022-dihydroxycholesterol	Sterols	Cholesterol and derivatives	0.012964	0.72743348	Upregulated
LysoPE(0:0_20:5)	Glycerophosphoethanolamines	Monoacylglycerophosphoethanolamines	0.0398	-0.34734184	Downregulated
PC(0:0_18:0)	Glycerophosphocholines	Monoacylglycerophosphocholines	0.045674	0.24535438	Upregulated
PC(14:0_22:6)	Glycerophosphocholines	Diacylglycerophosphocholines	0.02639	-0.35053119	Downregulated
PC(16:0_18:2)	Glycerophosphocholines	Diacylglycerophosphocholines	0.013561	-0.18777102	Downregulated
PC(16:0_20:4)	Glycerophosphocholines	Diacylglycerophosphocholines	0.048485	-0.20923542	Downregulated
PC(16:0_20:5)	Glycerophosphocholines	Diacylglycerophosphocholines	0.003056	-0.42270341	Downregulated
PC(16:1_0:0)	Glycerophosphocholines	Monoacylglycerophosphocholines	0.037247	0.14392127	Upregulated
PC(18:0_16:0)	Glycerophosphocholines	Diacylglycerophosphocholines	0.045463	-0.15145998	Downregulated
PC(18:0_18:2)	Glycerophosphocholines	Diacylglycerophosphocholines	0.037057	-0.14580984	Downregulated
PC(18:2_20:4)	Glycerophosphocholines	Diacylglycerophosphocholines	0.027674	-0.28097996	Downregulated
PC(20:4/20:4)	Glycerophosphocholines	Diacylglycerophosphocholines	0.04594	-0.33552687	Downregulated
PC(O-16:0/20:4)	Glycerophosphocholines	1-alkyl,2-acylglycerophosphocholines	0.017634	-0.25560261	Downregulated
PC(O-16:0/22:6)	Glycerophosphocholines	1-alkyl,2-acylglycerophosphocholines	0.009509	-0.27661442	Downregulated
PC(O-18:1/20:4)	Glycerophosphocholines	1-alkyl,2-acylglycerophosphocholines	0.023766	-0.246618	Downregulated

PE(16:0_20:4)	Glycerophosphoethanolamines	Diacylglycerophosphoethanolamines	0.044354	-0.24356478	Downregulated
PE(16:0_20:4)	Glycerophosphoethanolamines	Diacylglycerophosphoethanolamines	0.049754	-0.20929542	Downregulated
PE(16:0_20:5)	Glycerophosphoethanolamines	Diacylglycerophosphoethanolamines	0.004828	-0.47743286	Downregulated
PE(16:0_22:6)	Glycerophosphoethanolamines	Diacylglycerophosphoethanolamines	0.030672	-0.32819892	Downregulated
PE(16:0_22:6)	Glycerophosphoethanolamines	Diacylglycerophosphoethanolamines	0.040031	-0.28477406	Downregulated
PE(16:1_22:6)	Glycerophosphoethanolamines	Diacylglycerophosphoethanolamines	0.013283	-0.46351708	Downregulated
PE(18:0_18:1)	Glycerophosphoethanolamines	Diacylglycerophosphoethanolamines	0.041335	-0.1524376	Downregulated
PE(18:0_18:2)	Glycerophosphoethanolamines	Diacylglycerophosphoethanolamines	0.011499	-0.23996974	Downregulated
PE(18:0_20:4)	Glycerophosphoethanolamines	Diacylglycerophosphoethanolamines	0.004107	-0.25884887	Downregulated
PE(18:0_20:4)	Glycerophosphoethanolamines	Diacylglycerophosphoethanolamines	0.004724	-0.22722437	Downregulated
PE(18:0_20:5)	Glycerophosphoethanolamines	Diacylglycerophosphoethanolamines	0.036235	-0.2780752	Downregulated
PE(18:0_22:6)	Glycerophosphoethanolamines	Diacylglycerophosphoethanolamines	0.010885	-0.32176478	Downregulated
PE(18:1_18:2)	Glycerophosphoethanolamines	Diacylglycerophosphoethanolamines	0.020208	-0.21192099	Downregulated
PE(18:1_22:6)	Glycerophosphoethanolamines	Diacylglycerophosphoethanolamines	0.047854	-0.33152371	Downregulated
PE(18:2_20:4)	Glycerophosphoethanolamines	Diacylglycerophosphoethanolamines	0.024248	-0.36132739	Downregulated
PE(18:2_22:6)	Glycerophosphoethanolamines	Diacylglycerophosphoethanolamines	0.041618	-0.40113414	Downregulated
PE(20:4_22:6)	Glycerophosphoethanolamines	Diacylglycerophosphoethanolamines	0.035615	-0.44986043	Downregulated

PE(20:5_16:0)	Glycerophosphoethanolamines	Diacylglycerophosphoethanolamines	0.030955	-0.24061563	Downregulated
PE(O-16:0/22:6)	Glycerophosphoethanolamines	1-alkyl,2-acylglycerophosphoethanolamines	0.030865	-0.29160853	Downregulated
PE(O-18:1/0:0)	Glycerophosphoethanolamines	Monoalkylglycerophosphoethanolamines	0.007393	-0.23108903	Downregulated
PE(P-16:0/0:0)	Glycerophosphoethanolamines	1Z-alkenylglycerophosphoethanolamines	0.029322	-0.20061354	Downregulated
PE(P-16:0/18:1)	Glycerophosphoethanolamines	1-(1Z-alkenyl),2-acylglycerophosphoethanolamines	0.032119	-0.22589886	Downregulated
PE(P-16:0/20:4)	Glycerophosphoethanolamines	1-(1Z-alkenyl),2-acylglycerophosphoethanolamines	0.012984	-0.31033166	Downregulated
PE(P-16:0/20:4)	Glycerophosphoethanolamines	1-(1Z-alkenyl),2-acylglycerophosphoethanolamines	0.010928	-0.28311475	Downregulated
PE(P-16:0/22:6)	Glycerophosphoethanolamines	1-(1Z-alkenyl),2-acylglycerophosphoethanolamines	0.027079	-0.32547637	Downregulated
PE(P-16:0/22:6)	Glycerophosphoethanolamines	1-(1Z-alkenyl),2-acylglycerophosphoethanolamines	0.047911	-0.25926571	Downregulated
PE(P-18:0/20:3)	Glycerophosphoethanolamines	1-(1Z-alkenyl),2-acylglycerophosphoethanolamines	0.012356	-0.32018721	Downregulated
PE(P-18:0/20:4)	Glycerophosphoethanolamines	1-(1Z-alkenyl),2-acylglycerophosphoethanolamines	0.005856	-0.33531187	Downregulated
PE(P-18:0/20:4)	Glycerophosphoethanolamines	1-(1Z-alkenyl),2-acylglycerophosphoethanolamines	0.011697	-0.27707214	Downregulated
PE(P-18:0/20:5)	Glycerophosphoethanolamines	1-(1Z-alkenyl),2-acylglycerophosphoethanolamines	0.00315	-0.43788169	Downregulated
PE(P-18:0/22:4)	Glycerophosphoethanolamines	1-(1Z-alkenyl),2-acylglycerophosphoethanolamines	0.007697	-0.32657583	Downregulated
PE(P-18:0/22:4)	Glycerophosphoethanolamines	1-(1Z-alkenyl),2-acylglycerophosphoethanolamines	0.025418	-0.37745622	Downregulated

PE(P-18:0/22:6)	Glycerophosphoethanolamines	1-(1Z-alkenyl),2-acylglycerophosphoethanolamines	0.006499	-0.39577869	Downregulated
PE(P-18:0/22:6)	Glycerophosphoethanolamines	1-(1Z-alkenyl),2-acylglycerophosphoethanolamines	0.005225	-0.37582648	Downregulated
PE(P-18:1/22:6)	Glycerophosphoethanolamines	1-(1Z-alkenyl),2-acylglycerophosphoethanolamines	0.018287	-0.35844567	Downregulated
PE(P-18:1/22:6)	Glycerophosphoethanolamines	1-(1Z-alkenyl),2-acylglycerophosphoethanolamines	0.041576	-0.32612134	Downregulated
PI(16:0_20:4)	Glycerophosphoinositols	Diacylglycerophosphoinositols	0.005886	-0.28668304	Downregulated
PI(16:0_20:4)	Glycerophosphoinositols	Diacylglycerophosphoinositols	0.043766	-0.2255854	Downregulated
PI(16:0_22:6)	Glycerophosphoinositols	Diacylglycerophosphoinositols	0.020681	-0.30522366	Downregulated
PI(18:0_18:2)	Glycerophosphoinositols	Diacylglycerophosphoinositols	0.024881	-0.20172803	Downregulated
PI(18:0_20:4)	Glycerophosphoinositols	Diacylglycerophosphoinositols	0.001674	-0.26621007	Downregulated
PI(18:0_20:4)	Glycerophosphoinositols	Diacylglycerophosphoinositols	0.006659	-0.22088965	Downregulated
PS(18:0_18:1)	Glycerophosphoserines	Diacylglycerophosphoserines	0.033526	-0.12873491	Downregulated
SM(d16:1/24:1)	Phosphosphingolipids	Ceramide phosphocholines (sphingomyelins)	0.000163	-0.26465766	Downregulated
SM(d17:1/24:1)	Phosphosphingolipids	Ceramide phosphocholines (sphingomyelins)	0.041579	0.16872072	Upregulated
SM(d18:0/22:0)	Phosphosphingolipids	Ceramide phosphocholines (sphingomyelins)	0.008956	-0.20435751	Downregulated
SM(d18:1/16:1)	Phosphosphingolipids	Ceramide phosphocholines (sphingomyelins)	0.001477	-0.14477802	Downregulated
SM(d24:1/18:1)	Phosphosphingolipids	Ceramide phosphocholines (sphingomyelins)	0.008518	-0.19497704	Downregulated

SM(d26:1/18:1)	Phosphosphingolipids	Ceramide phosphocholines (sphingomyelins)	0.008063	- 0.26221638	Downregulated
TG(14:0_18:1_22:6)	Triradylglycerols	Triacylglycerols	0.028989	- 0.3373549	Downregulated
TG(15:0_16:0_16:0)	Triradylglycerols	Triacylglycerols	0.008912	0.1138037	Upregulated
TG(16:0_16:0_17:0)	Triradylglycerols	Triacylglycerols	0.007499	0.12622925	Upregulated
TG(16:0_18:1_22:6)	Triradylglycerols	Triacylglycerols	0.029267	- 0.34209496	Downregulated
TG(16:1_18:1_22:6)	Triradylglycerols	Triacylglycerols	0.028843	- 0.32733661	Downregulated
TG(18:0_18:2_22:6)	Triradylglycerols	Triacylglycerols	0.033527	- 0.31243992	Downregulated
TG(18:1_22:6_22:6)	Triradylglycerols	Triacylglycerols	0.036958	- 0.46729967	Downregulated
TG(18:2_18:2_22:6)	Triradylglycerols	Triacylglycerols	0.006824	- 0.41903541	Downregulated
TG(18:2_22:6_22:6)	Triradylglycerols	Triacylglycerols	0.038133	- 0.53840984	Downregulated

Table S3. Fold change and P-values in targeted lipidomics.

Component Name	P-value	Fold Change	Observation
PA(16:0_20:5)	0.004879315	-0.414634146	Downregulated
PA(16:1_20:4)	0.023067617	-0.325	Downregulated
PA(18:1_20:5)	0.049735563	-0.333333333	Downregulated
PE(16:0_20:5)	0.007511166	-0.404661017	Downregulated
PE(16:1_20:5)	0.012034365	-0.427083333	Downregulated
PE(16:0e/20:5)	0.001828191	-0.4375	Downregulated
PE(16:1e/20:5)	0.001940685	-0.469255663	Downregulated
PE(18:0_18:0)	0.03805855	-0.239215686	Downregulated
PE(18:0_18:2)	0.007746768	-0.116662238	Downregulated
PE(18:0_20:4)	0.041206605	-0.13469405	Downregulated
PE(18:0_20:5)	0.012861419	-0.362790698	Downregulated
PE(18:0e/18:1)	0.028582587	0.081833061	Upregulated
PE(18:0e/20:5)	0.009465852	-0.409937888	Downregulated
PE(18:1_20:5)	0.007487479	-0.376822717	Downregulated
PE(18:1e/18:2)	0.039205499	-0.203021719	Downregulated
PE(18:1e/20:5)	0.003679739	-0.440940012	Downregulated
PE(18:2_18:2)	0.036143541	-0.246846847	Downregulated
PE(18:2_20:4)	0.048753052	-0.244867301	Downregulated
PE(18:2_20:5)	0.040247574	-0.330357143	Downregulated
PE(20:4_20:5)	0.033730391	-0.333333333	Downregulated

PC(16:0_20:5)	0.005599484	-0.393558523	Downregulated
PC(16:1_20:5)	0.006270164	-0.409638554	Downregulated
PC(16:0e/20:5)	0.00250644	-0.400327869	Downregulated
PC(18:0_20:5)	0.005949119	-0.403100775	Downregulated
PC(18:0e/20:5)	0.035129931	-0.352544451	Downregulated
PC(18:1_20:5)	0.013834941	-0.351515152	Downregulated
PC(18:1e/20:5)	0.019542988	-0.382	Downregulated
PC(18:2_20:5)	0.004675328	-0.510948905	Downregulated
PG(16:0_16:0)	0.007120571	1.630434783	Upregulated
PG(16:0_18:0)	0.017171256	1.476683938	Upregulated
PG(16:0_18:1)	0.003240316	1.62221515	Upregulated
PG(16:0_18:2)	0.003528504	1.251336898	Upregulated
PG(16:0_18:3)	0.039968524	0.6	Upregulated
PG(16:0_20:3)	0.001109672	1.444444444	Upregulated
PG(16:0_20:4)	0.004680048	1.452830189	Upregulated
PG(16:0_22:6)	0.000446351	1.4	Upregulated
PG(18:0_18:0)	0.014063722	1.25	Upregulated
PG(18:0_18:1)	0.000614993	1.664772727	Upregulated
PG(18:0_18:2)	0.001030603	1.666666667	Upregulated
PG(18:0_18:3)	0.003949773	4	Upregulated
PG(18:0_20:3)	0.001164968	1.833333333	Upregulated

PG(18:0_20:4)	0.038170949	1.625	Upregulated
PG(18:1_18:1)	0.004730356	2.02173913	Upregulated
PG(18:1_18:2)	0.000502474	2	Upregulated
PG(18:1_20:4)	0.002060314	2.375	Upregulated
PG(18:2_18:2)	0.000763792	2.285714286	Upregulated
PG(20:4_20:4)	0.033730391	0.857142857	Upregulated
PI(18:0_18:1)	0.009366305	0.166945566	Upregulated
PI(18:0_20:5)	0.011172497	-0.338854879	Downregulated
PI(20:5_OH)	0.03119884	-0.606584821	Downregulated
PS(16:0_20:5)	0.002668482	-0.446969697	Downregulated
PS(18:0_18:0)	0.033077894	-0.158944659	Downregulated
PS(18:0_18:1)	0.018227462	-0.16382282	Downregulated
PS(18:0_20:5)	0.005581885	-0.434013605	Downregulated
PS(18:1_20:5)	0.008125641	-0.362573099	Downregulated
PS(18:2_22:6)	0.023500536	-0.321705426	Downregulated