

Plasma lipidomic profiling

Plasma lipidome was profiled using a high-throughput liquid chromatography–tandem mass spectrometry (LC-MS) platform at the Broad Institute. The detailed methodology has been described previously (1,2). In short, reversed-phase C8 chromatography with positive-ion mode (C8-pos) was used to simultaneously profile 215 annotated lipid species based on total acyl carbon content and degrees of saturation. To normalize within-batch and cross batch bias, pooled reference samples were interspersed and analyzed at intervals of ~20 study samples. Of 215 annotated lipid species, 6 lipid species with a high coefficient of variance (CV > 20%) or a high fraction of missing values (>15%) were removed.

Definition of GDM and pre-existing diabetes

International Classification of Diseases (ICD) diagnosis codes for overt diabetes and/or GDM, history of antidiabetic medication (oral hypoglycemic drugs and insulin) prescription, as well as plasma glucose profile (including fasting and random plasma glucose, 1-h 50-g glucose load test, 3-h 100-g oral glucose tolerance test (OGTT), 75 g OGTT, A1C, and point of care blood glucose) were abstracted from electric medical record (EMR). At first, GDM was identified using ICD, Ninth Revision, Clinical Modification (ICD-9-CM) codes: 648.8x and Tenth Revision (ICD-10-CM) codes O24.4x listed anywhere on the discharge record. Pre-existing diabetes was identified when the ICD-9-CM codes of 250, 648.0x or ICD-10-CM of E8-E11, E13, O24.0x, O24.1x, O24.3x, O24.8x, and O24.9x presented at preconception or first trimester of the index pregnancy. Given the possibility of missing and delayed documentation, we used the plasma glucose profile to verify the diagnosis according to American Diabetes Association (ADA) criteria (3). GDM was diagnosed if women were free of pre-existing diabetes and at least two of the following plasma glucose values were met: fasting glucose ≥ 5.3 mmol/l, 1 h ≥ 10.0 mmol/l, 2 h ≥ 8.6 mmol/l, and 3 h ≥ 7.8 mmol/l in response to a 100 g oral glucose load at around 20-32 weeks of the index pregnancy. Pre-existing diabetes was identified when two of the following test results measured at preconception or first trimester of the index pregnancy were met: fasting glucose ≥ 7.0 mmol/l, 2 h ≥ 11.1 mmol/l in response to a 75 g oral glucose load, A1C $\geq 6.5\%$, a random plasma glucose ≥ 11.1 mmol/l, or when antidiabetic medicines were prescribed. If OGTT was not available or discordant with the ICD codes, other plasma glucose values (such as fasting glucose, random plasma glucose, point of care blood glucose) were used to adjudicate the definition. Given that metformin may also be prescribed to women with polycystic ovary syndrome (PCOS), if women were prescribed metformin, other information (including OGTT, fasting or random blood glucose, HbA1C, ICD codes, and the prescriptions of other antidiabetic medication in combination with metformin) was used to adjudicate the definition of diabetes.

Definition of incident T2D

Follow-up assessments to determine T2D status were conducted via EMR review to capture clinical diagnoses of diabetes and extraction of BMC clinical laboratory test results after baseline. Incident T2D was determined if women were free of pre-existing diabetes at baseline and presented with ICD-9-CM: 250.x0 and 250.x2 and ICD-10-CM: E11 after delivery. Since this study focused on the development of T2D, women with type 1 diabetes (ICD-9-CM codes 250.x1, 250.x3 or and ICD-10-CM: E10) or other specific diabetes (ICD-9-CM codes 249 and ICD-10-CM: E8, E9, E13) were excluded. Incident T2D in a subset of women was verified by 2-h 75-g OGTT screening based on the above mentioned ADA criteria (3). Notably, in the first 3

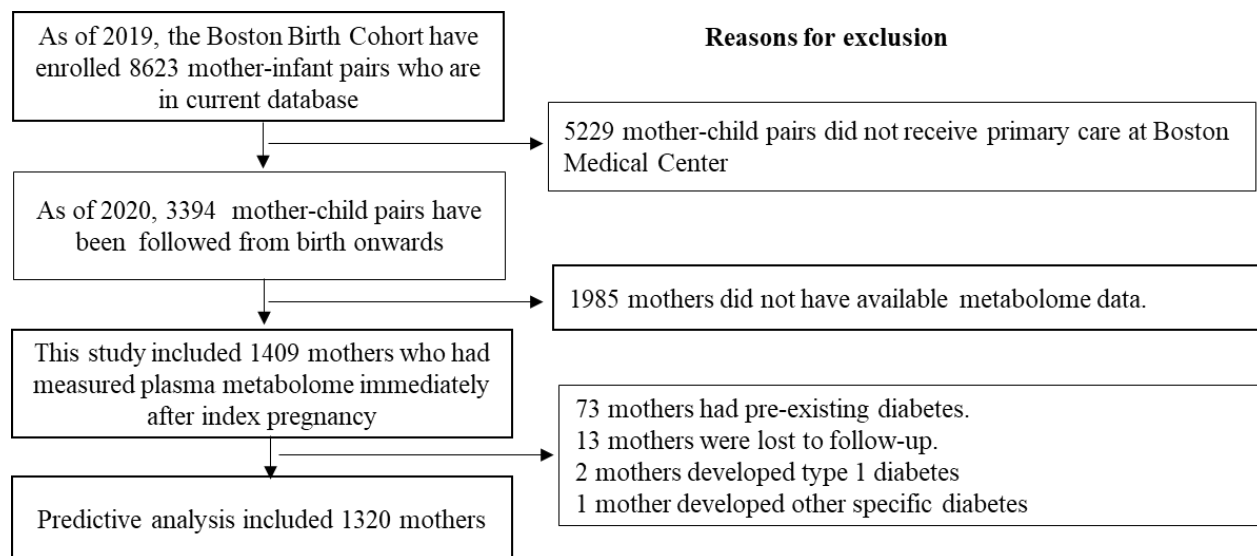
months postpartum, as data on OGTT was not available, T2D was defined as fasting glucose ≥ 7.0 mmol/L or random blood glucose ≥ 11.1 mmol/L in two separate test samples.

Construction of Penalized Cox PH regression model and calculation of predictive scores

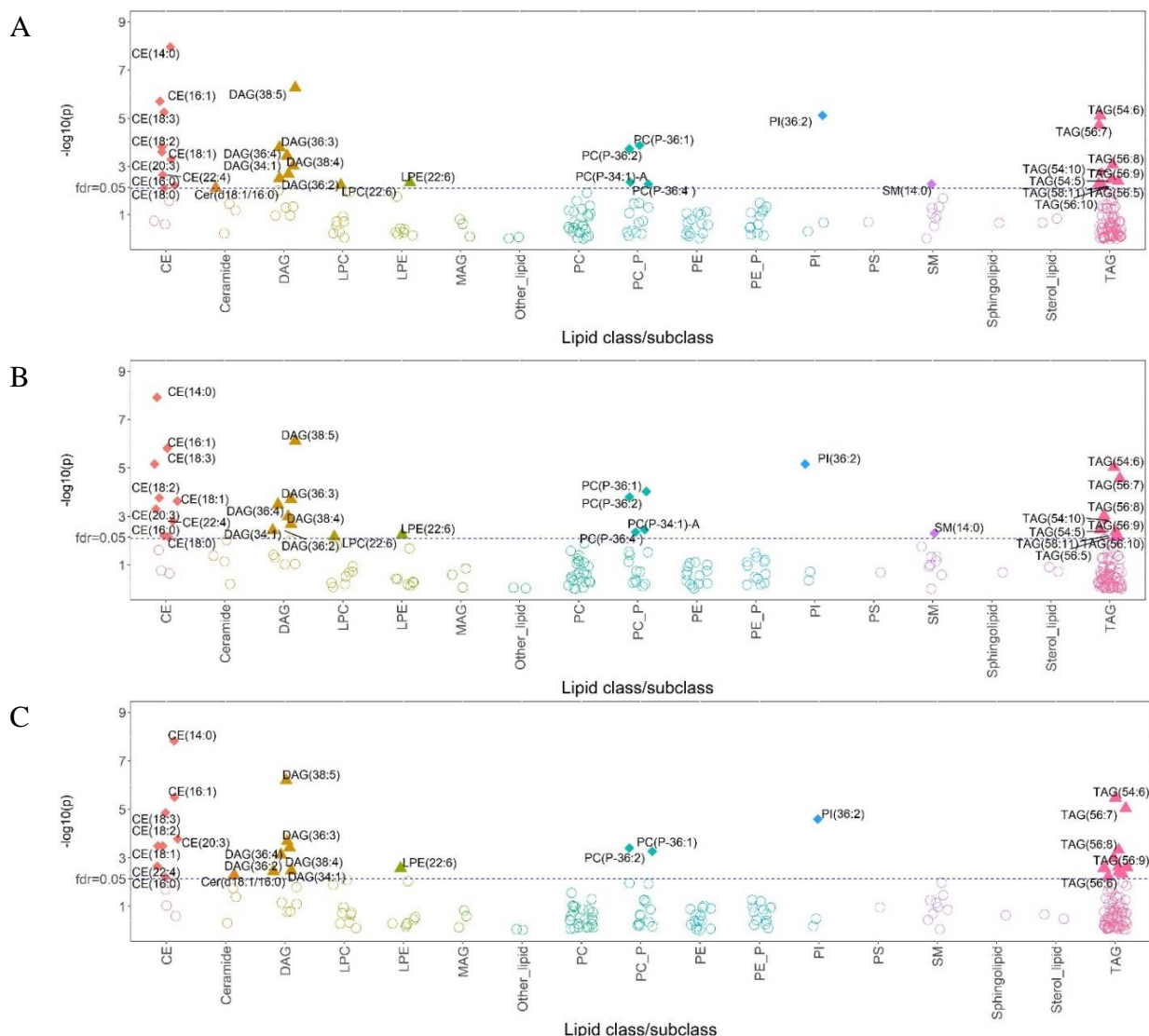
To avoid overfitting and account for the intercorrelation of lipid species, a penalized Cox PH regression was employed for lipid species selection. We built serial elastic net regression models (implemented in the R package glmnet (4)) to choose the tuning parameters α using the 10-fold cross-validation framework. Since Lasso ($\alpha=1$) model performed best in our data, we adopted 10-fold cross validation Lasso regression to build a prediction model for incident T2D. To obtain an unbiased predictive risk score, 90% of the samples were used as training set to develop a model for the remaining 10% of samples based on parameter of lambda.min in each run and repeated 10 times with the unpenalized variables of 5 classical risk factors, which included age at delivery, race and ethnicity, smoking status during pregnancy, prepregnancy BMI, and family history of diabetes.

References:

1. Hang D, Zeleznik OA, He X, Guasch-Ferre M, Jiang X, Li J, Liang L, Eliassen AH, Clish CB, Chan AT, Hu Z, Shen H, Wilson KM, Mucci LA, Sun Q, Hu FB, Willett WC, Giovannucci EL, Song M. Metabolomic Signatures of Long-term Coffee Consumption and Risk of Type 2 Diabetes in Women. *Diabetes Care* 2020;43:2588-2596.
2. Razquin C, Toledo E, Clish CB, Ruiz-Canela M, Dennis C, Corella D, Papandreou C, Ros E, Estruch R, Guasch-Ferre M, Gomez-Gracia E, Fito M, Yu E, Lapetra J, Wang D, Romaguera D, Liang L, Alonso-Gomez A, Deik A, Bullo M, Serra-Majem L, Salas-Salvado J, Hu FB, Martinez-Gonzalez MA. Plasma Lipidomic Profiling and Risk of Type 2 Diabetes in the PREDIMED Trial. *Diabetes Care* 2018;41:2617-2624.
3. American Diabetes A. 2. Classification and Diagnosis of Diabetes: Standards of Medical Care in Diabetes-2021. *Diabetes Care* 2021;44:S15-S33.
4. Friedman J, Hastie T, Tibshirani R, Narasimhan B, Tay K, Simon N, Qian J, Yang J. glmnet: Lasso and Elastic-Net Regularized Generalized Linear Models. .

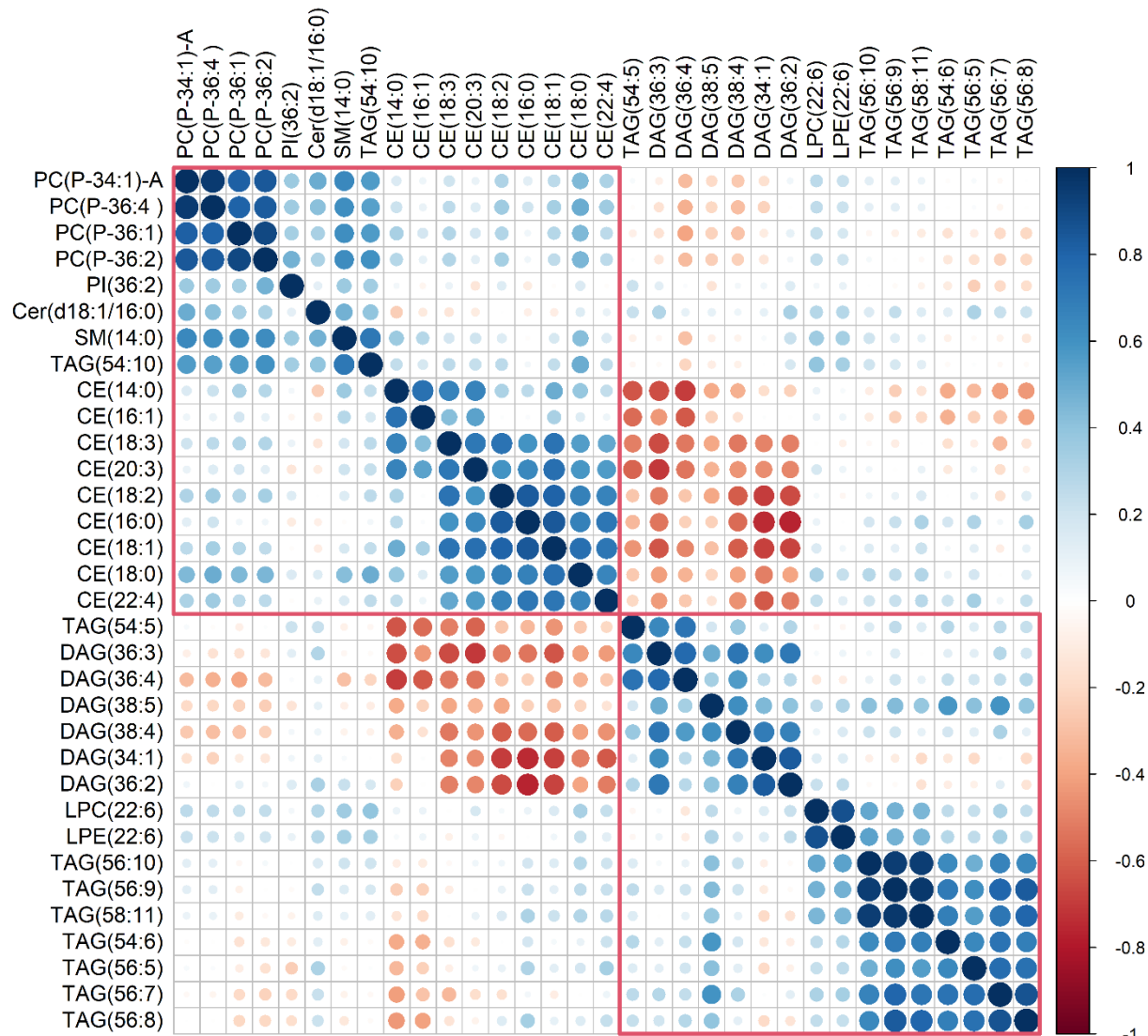
Supplemental Figure S1. Flowchart of study subjects

Supplemental Figure S2. Plots of associations between gestational diabetes and lipid species



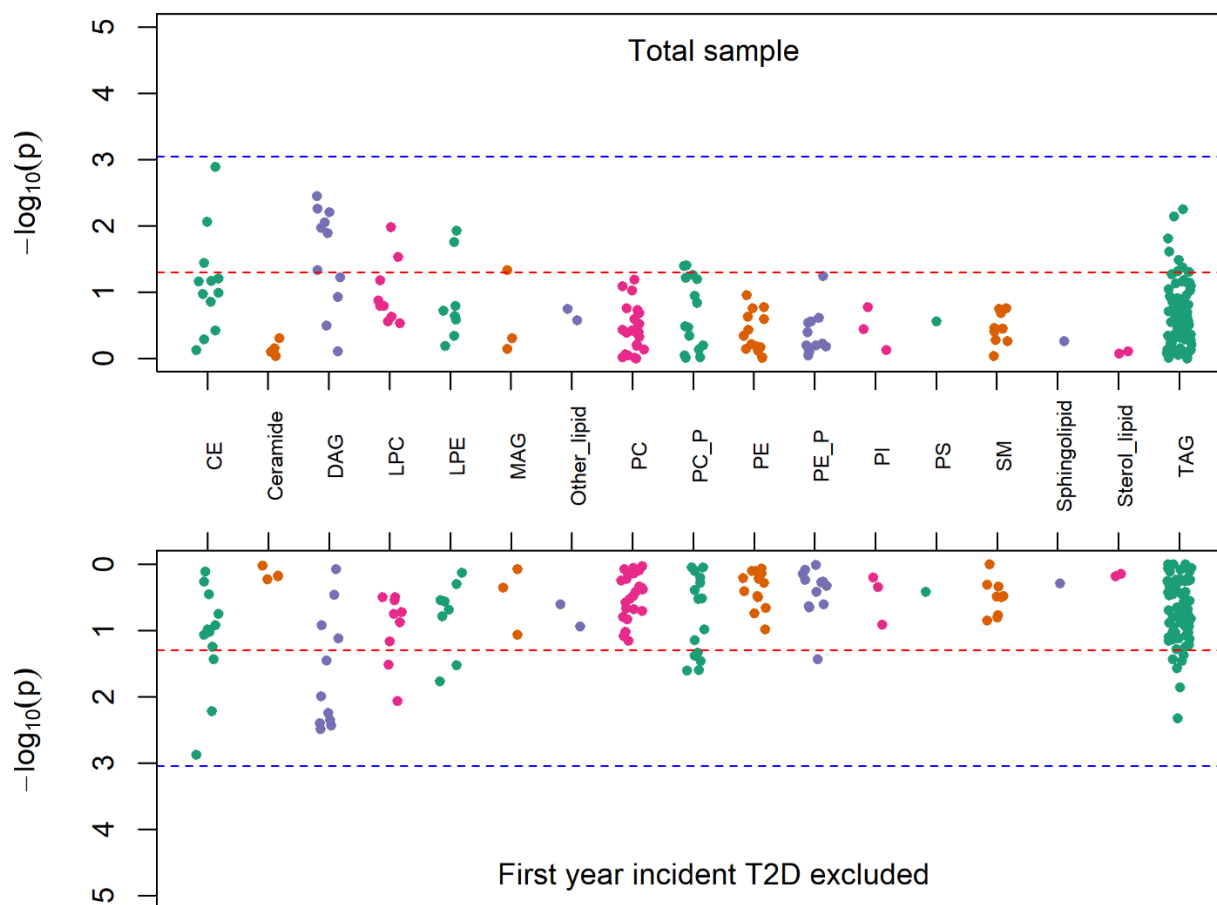
Abbreviations: CE, cholesterol esters; DAG, diacylglycerols; LPC, lysophosphatidylcholines; LPE, lysophosphatidylethanolamines; MAG, monoacylglycerols; PC, phosphatidylcholines; PC-P, phosphatidylcholine plasmalogens; PE, phosphatidylethanolamines; PE-P, phosphatidylethanolamine plasmalogens; PI, phosphatidylinositols; PS, phosphatidylserine; SM, sphingomyelins; TAG, triacylglycerols. Dashed line represents the cut point of p values after adjustment for FDR multiple testing for the significant associations.

Panel A displays the results in total sample. Models adjusted for age at delivery, race and ethnicity, education, smoking status during pregnancy, parity, prepregnancy body mass index, and hypertensive disorder during pregnancy. Panel B displays the result in the total sample. Models adjusted for all covariates of Panel A as well as breastfeeding status. Panel C displays the results analyzed in the sample with exclusion of women who had gestational diabetes in index pregnancy and progressed to type 2 diabetes in the first year postpartum.

Supplemental Figure S3. Correlation among lipid species associated with gestational diabetes

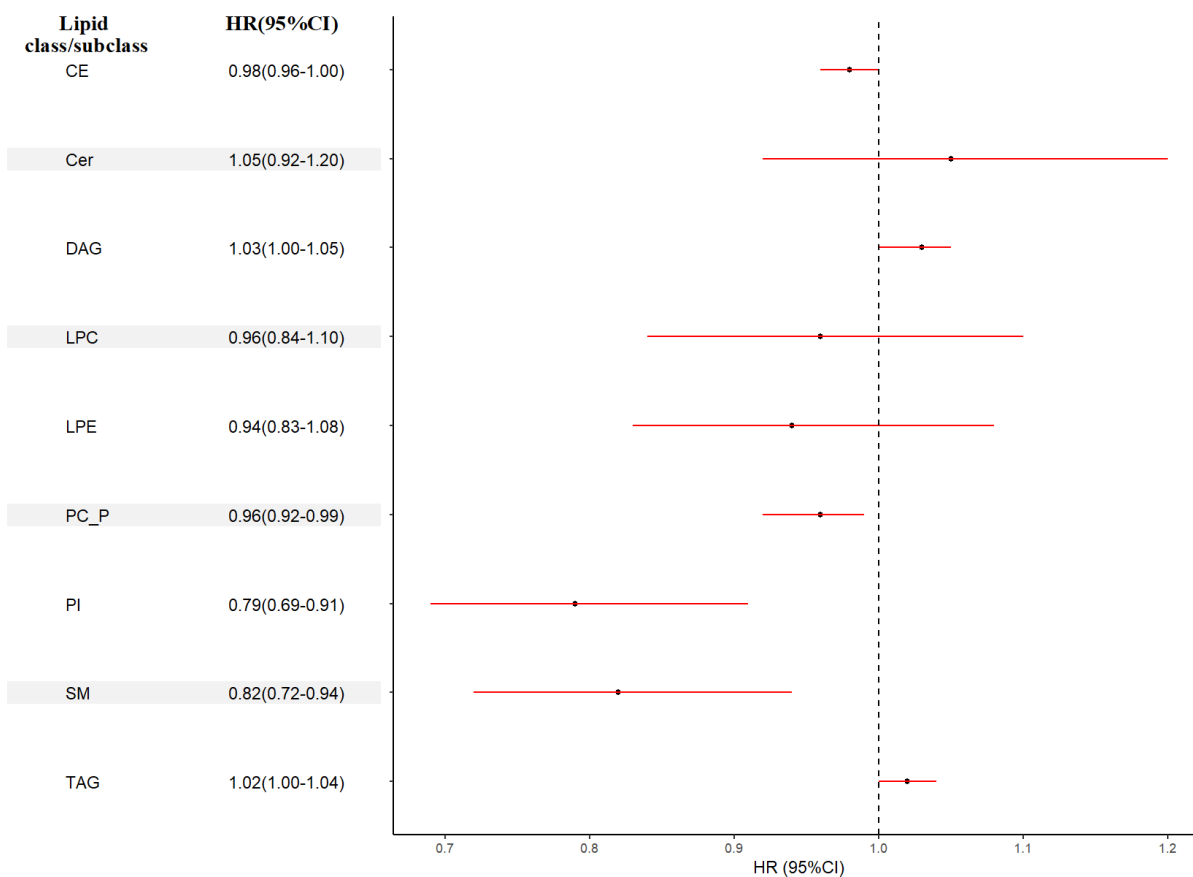
Pearson correlation coefficients calculated for each lipid species associated with gestational diabetes against each other species. The correlation coefficients are presented as a heat map. Abbreviations: CE, cholesterol esters; Cer, ceramides; DAG, diacylglycerols; LPC, lysophosphatidylcholines; LPE, lysophosphatidylethanolamines; PC, phosphatidylcholines; PC-P, phosphatidylcholine plasmalogens; PI, phosphatidylinositols; SM, sphingomyelins; TAG, triacylglycerols.

Supplemental Figure S4. Differences in postpartum plasma level of lipid species between women who developed gestational diabetes in index pregnancy and those with pre-existing diabetes in pregnancy



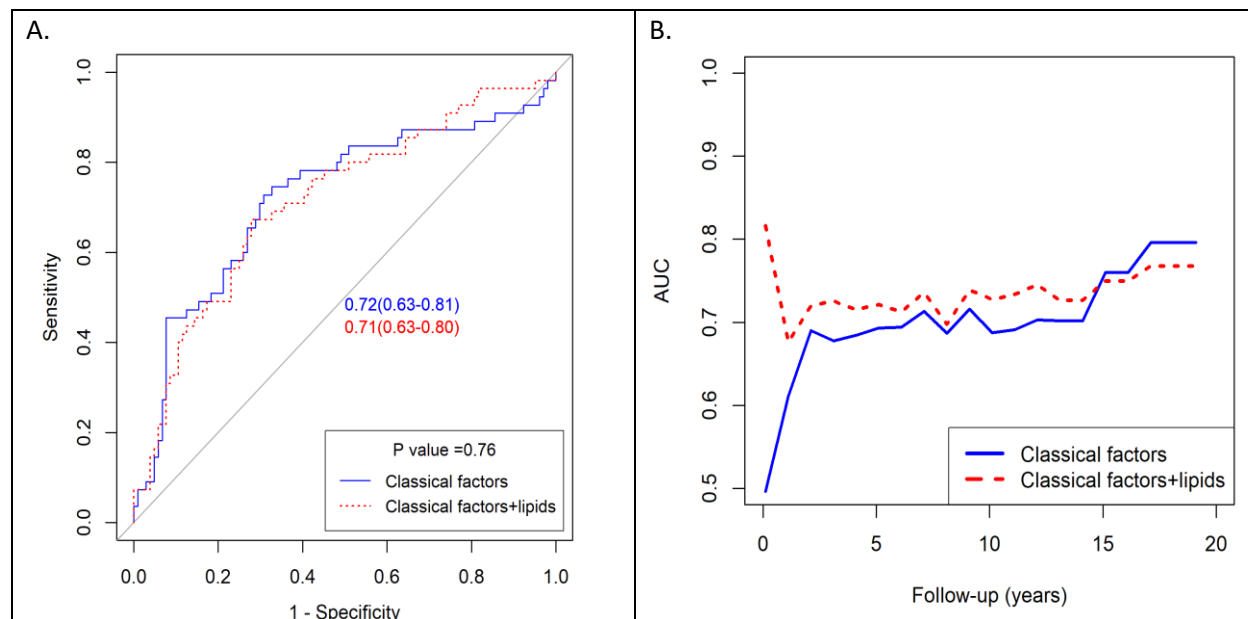
Abbreviations: CE, cholesterol esters; DAG, diacylglycerols; LPC, lysophosphatidylcholines; LPE, lysophosphatidylethanolamines; MAG, monoacylglycerols; PC, phosphatidylcholines; PC-P, phosphatidylcholine plasmalogens; PE, phosphatidylethanolamines; PE-P, phosphatidylethanolamine plasmalogens; PI, phosphatidylinositols; PS, phosphatidylserine; SM, sphingomyelins; TAG, triacylglycerols. Blue dash line represents the cut point of p value after adjusted for FDR multiple testing for the significant associations. Red dash line represents the cut point of p value=0.05.

Top panel displays the results in total sample of women who developed GDM in index pregnancy and those with pre-existing diabetes pregnancy. Bottom panel displays the results in samples with exclusion of incident type 2 diabetes in the first year postpartum. All analyses were adjusted for age at delivery, race and ethnicity, education, smoking status during pregnancy, parity, prepregnancy body mass index, and hypertensive disorder during pregnancy.

Supplemental Figure S5. Class/subclass of lipid species associated with incident type 2 diabetes

Abbreviations: CE, cholesterol esters; Cer, ceramides; CI, confidence interval; DAG, diacylglycerols; HR, hazard ratio; LPC, lysophosphatidylcholines; LPE, lysophosphatidylethanolamines; PC-P, phosphatidylcholine plasmalogens; PI, phosphatidylinositols; SM, sphingomyelins; TAG, triacylglycerols. All analyses were adjusted for age at delivery, race and ethnicity, education, smoking status during pregnancy, parity, prepregnancy body mass index, and hypertensive disorder during pregnancy.

Supplemental Figure S6. ROC curve and AUC(t) based on base model and full model across 20 years of follow-up among women who developed GDM in index pregnancy (n=159)



ROC curve (A) and AUC(t) (B) were generated in women who had GDM in index pregnancy (n=159). The base model included 5 classical factors (age at delivery, race and ethnicity, smoking during pregnancy, prepregnancy BMI, and family history of diabetes). The full model included a combination of the 5 classical risk factors and selected lipid species from the Lasso model, including LPE(22:6), PC(PA-34:1), PC(P-36:1), PC(P-36:4), PI(36:2), Cer(d18:1/16:0), SM(14:0), CE(16:1), CE(18:0), CE(18:1), CE(20:3), CE(22:4), DAG(34:1), DAG(36:2), DAG(36:3), DAG(36:4), TAG(54:4), TAG(56:5), TAG(56:7), TAG(56:9), TAG(56:10).

Supplemental Table S1. Comparison of basic characteristics of study population with women who initially enrolled and those who were followed.

Characteristics	Entire BBC sample enrolled at birth	Total sample with follow-up	Total sample included in this study	Sample included in prediction analysis
n	8623	3394	1409	1320
Age at delivery	28.19 (6.46)	28.52 (6.51)	28.47 (6.62)	28.31 (6.61)
Educational attainment				
High school and below	5589 (64.8)	2168 (63.9)	927 (65.8)	872 (66.1)
College and above	3034 (35.2)	1226 (36.1)	482 (34.2)	448 (33.9)
Smoking during pregnancy				
Non-smoker	6923 (80.3)	2753 (81.1)	1169 (83.0)	1096 (83.0)
Smoker	1700 (19.7)	641 (18.9)	240 (17.0)	224 (17.0)
Race and ethnicity				
Non-Hispanic Black	4087 (47.4)	1997 (58.8)	909 (64.5)	850 (64.4)
Other race	4536 (52.6)	1397 (41.2)	500 (35.5)	470 (35.6)
Preterm birth	2363 (27.4)	976 (28.8)	362 (25.7)	328 (24.8)
Gestational age at birth	37.92 (3.22)	37.66 (3.51)	37.89 (3.34)	37.96 (3.31)
Parity				
Primiparous	3730 (43.3)	1458 (43.0)	619 (43.9)	582 (44.1)
Multiparous	4892 (56.7)	1935 (57.0)	790 (56.1)	738 (55.9)
NA	1 (0.0)	1 (0.0)	0 (0.0)	0 (0.0)
Prepregnancy overweight or obesity	4161 (48.3)	1767 (52.1)	751 (53.3)	682 (51.7)
Diabetes status during pregnancy				
Normal glucose tolerance	7499 (87.0)	2845 (83.8)	1175 (83.4)	1161 (88.0)
Gestational diabetes	850 (9.9)	386 (11.4)	161 (11.4)	159 (12.0)
Pre-existing diabetes	266 (3.1)	162 (4.8)	73 (5.2)	0 (0.0)
NA	8 (0.1)	1 (0.0)	0 (0.0)	0 (0.0)
Hypertensive disorder during pregnancy	1121 (13.0)	524 (15.4)	208 (14.8)	179 (13.6)

BBC, Boston Birth Cohort

Supplemental Table S2. Description of all 215 quantified lipid species

Lipid species	Hit	Class	CV	Missing	Remove
CE(14:0)	CE(14:0)	CE	0.076	0	0
CE(16:0)	CE(16:0)	CE	0.027	0	0
CE(16:1)	CE(16:1(9Z))	CE	0.032	0	0
CE(18:0)	CE(18:0)	CE	0.021	0	0
CE(18:1)	CE(18:1(9Z))	CE	0.017	0	0
CE(18:2)	CE(18:2(9Z,12Z))	CE	0.021	0	0
CE(18:3)	CE(18:3(9Z,12Z,15Z))	CE	0.017	0	0
CE(20:3)	CE(20:3(8Z,11Z,14Z))	CE	0.039	0	0
CE(20:4)	CE(20:4(5Z,8Z,11Z,14Z))	CE	0.022	0	0
CE(20:5)	CE(20:5(5Z,8Z,11Z,14Z,17Z))	CE	0.017	0	0
CE(22:4)	CE(22:4(7Z,10Z,13Z,16Z))	CE	0.089	0.002	0
CE(22:5)	CE(22:5(7Z,10Z,13Z,16Z,19Z))	CE	0.475	0.071	1
CE(22:6)	CE(22:6(4Z,7Z,10Z,13Z,16Z,19Z))	CE	0.023	0	0
Ceramide (d18:1/16:0)	Ceramide (d18:1/16:0)	Ceramide	0.050	0	0
Ceramide (d18:1/22:0)	Ceramide (d18:1/22:0)	Ceramide	0.040	0	0
Ceramide (d18:1/24:0)	Ceramide (d18:1/24:0)	Ceramide	0.033	0	0
Ceramide (d18:1/24:1)	Cer(d18:1/24:1(15Z))	Ceramide	0.035	0	0
DAG(30:0)	DG(14:0/16:0/0:0)	DAG	0.345	0.287	1
DAG(32:0)	DG(16:0/16:0/0:0)	DAG	0.026	0	0
DAG(32:1)	DG(16:0/16:1(9Z)/0:0)	DAG	0.105	0.018	0
DAG(34:0)	DG(16:0/18:0/0:0)	DAG	0.026	0	0
DAG(34:1)	DG(16:0/18:1(9Z)/0:0)	DAG	0.018	0	0
DAG(34:2)	DG(16:0/18:2(9Z,12Z)/0:0)	DAG	0.030	0	0
DAG(34:3)	DG(16:1(9Z)/18:2(9Z,12Z)/0:0)	DAG	0.235	0.089	1
DAG(36:1)	DG(18:1(9Z)/18:0/0:0)	DAG	0.020	0	0
DAG(36:2)	DG(18:1(9Z)/18:1(9Z)/0:0)	DAG	0.015	0	0
DAG(36:3)	DG(18:1(9Z)/18:2(9Z,12Z)/0:0)	DAG	0.015	0	0
DAG(36:4)	DG(18:2(9Z,12Z)/18:2(9Z,12Z)/0:0)	DAG	0.058	0.004	0
DAG(38:4)	DG(18:0/20:4(5Z,8Z,11Z,14Z)/0:0)	DAG	0.048	0	0
DAG(38:5)	DG(18:1(11Z)/20:4(5Z,8Z,11Z,14Z)/0:0)	DAG	0.027	0	0
LPC(14:0)	LysoPC(14:0)	LPC	0.028	0	0
LPC(16:0)	LysoPC(16:0)	LPC	0.034	0	0
LPC(16:1)	LysoPC(16:1(9Z))	LPC	0.029	0	0
LPC(18:0)	LysoPC(18:0)	LPC	0.030	0	0
LPC(18:1)	LysoPC(18:1(9Z))	LPC	0.031	0	0

LPC(18:2)	LysoPC(18:2(9Z,12Z))	LPC	0.031	0	0
LPC(20:4)	LysoPC(20:4(5Z,8Z,11Z,14Z))	LPC	0.031	0	0
LPC(20:5)	LysoPC(20:5(5Z,8Z,11Z,14Z,17Z))	LPC	0.032	0	0
LPC(22:6)	LysoPC(22:6(4Z,7Z,10Z,13Z,16Z,19Z))	LPC	0.034	0	0
LPE(16:0)	LysoPE(16:0/0:0)	LPE	0.043	0	0
LPE(18:0)	NA	LPE	0.036	0	0
LPE(18:1)	LysoPE(18:1(9Z)/0:0)	LPE	0.034	0	0
LPE(18:2)	LysoPE(18:2(9Z,12Z)/0:0)	LPE	0.032	0	0
LPE(20:0)	LysoPE(20:0/0:0)	LPE	0.028	0	0
LPE(20:4)	LysoPE(20:4(5Z,8Z,11Z,14Z)/0:0)	LPE	0.034	0	0
LPE(22:0)	LysoPE(22:0/0:0)	LPE	0.059	0	0
LPE(22:6)	LysoPE(22:6(4Z,7Z,10Z,13Z,16Z,19Z)/0:0)	LPE	0.041	0	0
MAG(14:1)	MG(14:1(9Z)/0:0/0:0)	MAG	0.046	0	0
MAG(16:1)	MG(16:1(9Z)/0:0/0:0)	MAG	0.058	0	0
MAG(18:0)	MG(18:0/0:0/0:0)	MAG	0.018	0	0
N-oleoylethanolamine	N-Oleoylethanolamine	Other_lipid	0.146	0.036	0
palmitoylethanolamide	Palmitoylethanolamide	Other_lipid	0.036	0	0
PC(30:0)	PC(14:0/16:0)	PC	0.032	0	0
PC(30:1)	PC(14:0/16:1(9Z))	PC	0.033	0	0
PC(32:0)	PC(14:0/18:0)	PC	0.030	0	0
PC(32:1)	PC(14:0/18:1(9Z))	PC	0.031	0	0
PC(32:2)	PC(14:0/18:2(9Z,12Z))	PC	0.035	0	0
PC(34:0)	PC(16:0/18:0)	PC	0.034	0	0
PC(34:1)	PC(16:0/18:1(9Z))	PC	0.026	0	0
PC(34:2)	PC(16:0/18:2(9Z,12Z))	PC	0.025	0	0
PC(34:3)	PC(16:1(9Z)/18:2(9Z,12Z))	PC	0.032	0	0
PC(34:4)	PC(14:0/20:4(5Z,8Z,11Z,14Z))	PC	0.032	0	0
PC(36:0)	PC(18:0/18:0)	PC	0.050	0	0
PC(36:1)	PC(18:0/18:1(9Z))	PC	0.032	0	0
PC(36:2)	PC(18:0/18:2(9Z,12Z))	PC	0.027	0	0
PC(36:3)	PC(18:1(9Z)/18:2(9Z,12Z))	PC	0.029	0	0
PC(36:4-hydroxy)	NA	PC	0.041	0	0
PC(36:4)-A	PC(16:0/20:4(8Z,11Z,14Z,17Z))	PC	0.038	0	0
PC(36:4)-B	PC(18:2(9Z,12Z)/18:2(9Z,12Z))	PC	0.023	0	0
PC(38:2)	PC(20:0/18:2(9Z,12Z))	PC	0.032	0	0
PC(38:3)	PC(18:0/20:3(8Z,11Z,14Z))	PC	0.033	0	0
PC(38:4)	PC(18:0/20:4(5Z,8Z,11Z,14Z))	PC	0.029	0	0
PC(38:6)	PC(16:0/22:6(4Z,7Z,10Z,13Z,16Z,19Z))	PC	0.024	0	0

PC(40:10)	PC(20:5(5Z,8Z,11Z,14Z,17Z)/20:5(5Z,8Z,11Z,14Z,17Z))	PC	0.053	0	0
PC(40:6)	PC(18:0/22:6(4Z,7Z,10Z,13Z,16Z,19Z))	PC	0.035	0	0
PC(40:9)	PC(22:6(4Z,7Z,10Z,13Z,16Z,19Z)/18:3(6Z,9Z,12Z))	PC	0.018	0	0
PC(P-34:1)-A	PC(P-16:0/18:0)	PC_P	0.032	0	0
PC(P-34:1)-B	PC(P-18:0/16:0)	PC_P	0.100	0	0
PC(P-34:2)	PC(P-16:0/18:1(9Z))	PC_P	0.033	0	0
PC(P-34:3)	PC(P-16:0/18:2(9Z,12Z))	PC_P	0.026	0	0
PC(P-34:5)	PC(P-16:0/18:4(6Z,9Z,12Z,15Z))	PC_P	0.160	0.003	0
PC(P-36:1)	PC(P-18:0/18:0)	PC_P	0.040	0	0
PC(P-36:2)	PC(P-18:0/18:1(9Z))	PC_P	0.034	0	0
PC(P-36:3)	PC(P-18:0/18:2(9Z,12Z))	PC_P	0.032	0	0
PC(P-36:4)	PC(P-18:1(9Z)/18:2(9Z,12Z))	PC_P	0.062	0	0
PC(P-36:5)-A	PC(P-16:0/20:4(8Z,11Z,14Z,17Z))	PC_P	0.065	0	0
PC(P-36:5)-B	PC(P-16:0/20:4(5Z,8Z,11Z,14Z))	PC_P	0.027	0	0
PC(P-38:4)	PC(P-18:0/20:3(8Z,11Z,14Z))	PC_P	0.034	0	0
PC(p-38:6)	PC(P-18:1(9Z)/20:4(5Z,8Z,11Z,14Z))	PC_P	0.032	0	0
PC(P-38:7)	PC(P-16:0/22:6(4Z,7Z,10Z,13Z,16Z,19Z))	PC_P	0.032	0	0
PC(P-40:7)	PC(P-18:1(11Z)/22:5(7Z,10Z,13Z,16Z,19Z))	PC_P	0.032	0	0
PE(32:0)	PE(16:0/16:0)	PE	0.062	0	0
PE(32:1)	PE(16:0/16:1(9Z))	PE	0.085	0.001	0
PE(34:0)	PE(16:0/18:0)	PE	0.039	0	0
PE(34:2)	PE(16:0/18:2(9Z,12Z))	PE	0.037	0	0
PE(36:0)	PE(18:0/18:0)	PE	0.042	0	0
PE(36:1)	PE(18:0/18:1(9Z))	PE	0.038	0	0
PE(36:2)	PE(18:0/18:2(9Z,12Z))	PE	0.029	0	0
PE(36:3)	PE(18:1(9Z)/18:2(9Z,12Z))	PE	0.041	0	0
PE(36:4)	PE(16:0/20:4(5Z,8Z,11Z,14Z))	PE	0.042	0	0
PE(38:2)	PE(16:0/22:2(13Z,16Z))	PE	0.029	0	0
PE(38:4)	PE(18:0/20:4(5Z,8Z,11Z,14Z))	PE	0.035	0	0
PE(38:5)	PE(18:1(9Z)/20:4(5Z,8Z,11Z,14Z))	PE	0.044	0	0
PE(38:6)	PE(18:2(9Z,12Z)/20:4(5Z,8Z,11Z,14Z))	PE	0.036	0	0
PE(40:6)	PE(18:0/22:6(4Z,7Z,10Z,13Z,16Z,19Z))	PE	0.048	0	0
PE(P-34:2)	PE(16:0/P-18:1(9Z))	PE_P	0.063	0	0
PE(P-34:3)	PE(P-16:0/18:2(9Z,12Z))	PE_P	0.074	0.004	0
PE(P-36:1)	PE(18:0/P-18:0)	PE_P	0.103	0	0
PE(P-36:2)	PE(18:1(9Z)/P-18:0)	PE_P	0.042	0	0
PE(P-36:3)	PE(P-18:1(9Z)/18:1(9Z))	PE_P	0.034	0	0
PE(P-36:4)	PE(P-18:1(9Z)/18:2(9Z,12Z))	PE_P	0.070	0.001	0

PE(P-36:5)	PE(P-18:1(11Z)/18:3(6Z,9Z,12Z))	PE_P	0.041	0	0
PE(P-38:3)	PE(P-18:0/20:3(8Z,11Z,14Z))	PE_P	0.085	0.001	0
PE(P-38:5)	PE(P-18:0/20:4(8Z,11Z,14Z,17Z))	PE_P	0.032	0	0
PE(P-38:6)	PE(P-18:0/20:5(5Z,8Z,11Z,14Z,17Z))	PE_P	0.036	0	0
PE(P-38:7)	PE(P-18:1(11Z)/20:5(5Z,8Z,11Z,14Z,17Z))	PE_P	0.045	0	0
PE(P-40:7)	PE(P-18:0/22:6(4Z,7Z,10Z,13Z,16Z,19Z))	PE_P	0.039	0	0
PE(P-42:11)	NA	PE_P	0.270	0.022	1
PI(34:2)	PI(16:0/18:2(9Z,12Z))	PI	0.218	0.062	1
PI(36:2)	PI(18:0/18:2(9Z,12Z))	PI	0.117	0	0
PI(36:4)	PI(16:0/20:4(5Z,8Z,11Z,14Z))	PI	0.122	0	0
PI(38:4)	PI(18:0/20:4(5Z,8Z,11Z,14Z))	PI	0.070	0	0
PS(34:0)	PS(16:0/18:0)	PS	0.060	0	0
SM(14:0)	SM(d18:1/14:0)	SM	0.035	0	0
SM(16:0)	SM(d18:1/16:0)	SM	0.033	0	0
SM(16:1)	NA	SM	0.032	0	0
SM(18:0)	SM(d18:1/18:0)	SM	0.030	0	0
SM(18:1)	SM(d18:1/18:1(9Z))	SM	0.033	0	0
SM(20:0)	SM(d18:1/20:0)	SM	0.033	0	0
SM(22:0)	SM(d18:1/22:0)	SM	0.031	0	0
SM(24:0)	SM(d18:1/24:0)	SM	0.032	0	0
SM(24:1)	SM(d18:1/24:1(15Z))	SM	0.031	0	0
sphingosine	Sphingosine	Sphingolipid	0.094	0	0
Campesterol	Campesterol	Sterol_lipid	0.068	0	0
Cholesterol	Cholesterol	Sterol_lipid	0.037	0	0
TAG(41:0)	NA	TAG	0.052	0.105	0
TAG(42:0)	NA	TAG	0.027	0	0
TAG(43:0)	NA	TAG	0.061	0.002	0
TAG(43:1)	NA	TAG	0.044	0.008	0
TAG(43:2)	NA	TAG	0.069	0.035	0
TAG(44:0)	NA	TAG	0.025	0	0
TAG(44:1)	NA	TAG	0.023	0	0
TAG(44:2)	NA	TAG	0.024	0	0
TAG(45:0)	NA	TAG	0.050	0	0
TAG(45:1)	NA	TAG	0.051	0	0
TAG(45:2)	NA	TAG	0.036	0	0
TAG(45:3)	NA	TAG	0.051	0.004	0
TAG(46:0)	TG(16:0/14:0/16:0)[iso3]	TAG	0.051	0.001	0
TAG(46:1)	TG(16:0/14:0/16:1(9Z))[iso6]	TAG	0.019	0	0

TAG(46:2)	TG(16:1(9Z)/14:0/16:1(9Z))[iso3]	TAG	0.021	0	0
TAG(46:3)	NA	TAG	0.024	0	0
TAG(46:4)	NA	TAG	0.028	0.001	0
TAG(47:0)	NA	TAG	0.063	0.001	0
TAG(47:1)	NA	TAG	0.099	0.013	0
TAG(47:2)	NA	TAG	0.032	0	0
TAG(48:0)	TG(16:0/16:0/16:0)[iso]	TAG	0.045	0	0
TAG(48:1)	TG(16:0/16:0/16:1(9Z))[iso3]	TAG	0.033	0	0
TAG(48:2)	TG(16:0/16:1(9Z)/16:1(9Z))[iso3]	TAG	0.019	0	0
TAG(48:3)	TG(16:1(9Z)/16:1(9Z)/16:1(9Z))[iso]	TAG	0.019	0	0
TAG(48:4)	NA	TAG	0.024	0	0
TAG(48:5)	NA	TAG	0.027	0	0
TAG(49:0)	NA	TAG	0.042	0	0
TAG(49:1)	TG(15:0/18:1(9Z)/16:0)[iso6]	TAG	0.300	0.071	1
TAG(49:2)	TG(15:0/18:1(9Z)/16:1(9Z))[iso6]	TAG	0.069	0	0
TAG(49:3)	NA	TAG	0.031	0	0
TAG(50:0)	TG(16:0/16:0/18:0)[iso3]	TAG	0.024	0	0
TAG(50:1)	TG(16:0/16:0/18:1(9Z))[iso3]	TAG	0.031	0	0
TAG(50:2)	TG(16:0/16:1(9Z)/18:1(9Z))[iso6]	TAG	0.031	0	0
TAG(50:3)	TG(16:1(9Z)/16:1(9Z)/18:1(9Z))[iso3]	TAG	0.025	0	0
TAG(50:4)	TG(16:1(9Z)/16:1(9Z)/18:2(9Z,12Z))[iso3]	TAG	0.018	0	0
TAG(50:5)	TG(18:2(9Z,12Z)/14:0/18:3(9Z,12Z,15Z))[iso6]	TAG	0.022	0	0
TAG(50:6)	TG(18:3(9Z,12Z,15Z)/14:0/18:3(9Z,12Z,15Z))[iso3]	TAG	0.027	0	0
TAG(51:0)	Glycerol triheptadecanoate	TAG	0.063	0.001	0
TAG(51:1)	NA	TAG	0.045	0	0
TAG(51:2)	TG(16:0/16:0/18:2(9Z,12Z))[iso3]	TAG	0.047	0	0
TAG(51:3)	TG(15:0/16:0/20:3(8Z,11Z,14Z))[iso6]	TAG	0.052	0	0
TAG(52:0)	TG(16:0/18:0/18:0)	TAG	0.025	0	0
TAG(52:1)	TG(16:0/18:0/18:1(9Z))[iso6]	TAG	0.018	0	0
TAG(52:2)	TG(16:0/18:0/18:2(9Z,12Z))[iso6]	TAG	0.022	0	0
TAG(52:3)	TG(16:0/18:1(9Z)/18:2(9Z,12Z))[iso6]	TAG	0.028	0	0
TAG(52:4)	TG(16:0/16:0/20:4(5Z,8Z,11Z,14Z))[iso3]	TAG	0.025	0	0
TAG(52:5)	TG(16:0/16:1(9Z)/20:4(5Z,8Z,11Z,14Z))[iso6]	TAG	0.014	0	0
TAG(52:6)	TG(16:1(9Z)/16:1(9Z)/20:4(5Z,8Z,11Z,14Z))[iso3]	TAG	0.020	0	0
TAG(52:7)	TG(20:4(5Z,8Z,11Z,14Z)/14:0/18:3(9Z,12Z,15Z))[iso6]	TAG	0.024	0	0
TAG(53:2)	NA	TAG	0.024	0	0
TAG(53:3)	NA	TAG	0.053	0	0
TAG(54:1)	TG(18:0/18:0/18:1(9Z))[iso3]	TAG	0.023	0	0

TAG(54:10)	NA	TAG	0.101	0.010	0
TAG(54:2)	TG(18:0/18:1(9Z)/18:1(9Z))[iso3]	TAG	0.018	0	0
TAG(54:3)	TG(18:0/18:1(9Z)/18:2(9Z,12Z))[iso6]	TAG	0.018	0	0
TAG(54:4)	TG(16:0/18:0/20:4(5Z,8Z,11Z,14Z))[iso6]	TAG	0.027	0	0
TAG(54:5)	TG(16:0/18:1(9Z)/20:4(5Z,8Z,11Z,14Z))[iso6]	TAG	0.036	0	0
TAG(54:6)	TG(16:0/18:2(9Z,12Z)/20:4(5Z,8Z,11Z,14Z))[iso6]	TAG	0.057	0	0
TAG(54:7)	TG(16:1(9Z)/18:2(9Z,12Z)/20:4(5Z,8Z,11Z,14Z))[iso6]	TAG	0.016	0	0
TAG(54:8)	TG(20:4(5Z,8Z,11Z,14Z)/14:0/20:4(5Z,8Z,11Z,14Z))[iso3]	TAG	0.025	0	0
TAG(54:9)	TG(18:3(9Z,12Z,15Z)/14:0/22:6(4Z,7Z,10Z,13Z,16Z,19Z))[iso6]	TAG	0.066	0.001	0
TAG(55:2)	NA	TAG	0.030	0	0
TAG(55:3)	NA	TAG	0.036	0	0
TAG(56:1)	TG(18:0/18:0/20:1(11Z))[iso3]	TAG	0.032	0	0
TAG(56:10)	TG(18:3(9Z,12Z,15Z)/20:4(5Z,8Z,11Z,14Z)/18:3(9Z,12Z,15Z))[iso3]	TAG	0.032	0	0
TAG(56:2)	TG(18:0/18:1(9Z)/20:1(11Z))[iso6]	TAG	0.025	0	0
TAG(56:3)	TG(18:0/18:2(9Z,12Z)/20:1(11Z))[iso6]	TAG	0.025	0	0
TAG(56:4)	TG(18:0/18:0/20:4(5Z,8Z,11Z,14Z))[iso3]	TAG	0.022	0	0
TAG(56:5)	TG(18:0/18:1(9Z)/20:4(5Z,8Z,11Z,14Z))[iso6]	TAG	0.026	0	0
TAG(56:6)	TG(18:1(9Z)/18:1(9Z)/20:4(5Z,8Z,11Z,14Z))[iso3]	TAG	0.030	0	0
TAG(56:7)	TG(18:1(9Z)/18:2(9Z,12Z)/20:4(5Z,8Z,11Z,14Z))[iso6]	TAG	0.035	0	0
TAG(56:8)	TG(16:0/20:4(5Z,8Z,11Z,14Z)/20:4(5Z,8Z,11Z,14Z))[iso3]	TAG	0.023	0	0
TAG(56:9)	TG(16:1(9Z)/20:4(5Z,8Z,11Z,14Z)/20:4(5Z,8Z,11Z,14Z))[iso3]	TAG	0.026	0	0
TAG(58:10)	TG(18:2(9Z,12Z)/20:4(5Z,8Z,11Z,14Z)/20:4(5Z,8Z,11Z,14Z))[iso3]	TAG	0.022	0	0
TAG(58:11)	TG(20:4(5Z,8Z,11Z,14Z)/20:4(5Z,8Z,11Z,14Z)/18:3(9Z,12Z,15Z))[iso3]	TAG	0.027	0	0
TAG(58:6)	TG(18:1(9Z)/20:1(11Z)/20:4(5Z,8Z,11Z,14Z))[iso6]	TAG	0.042	0	0
TAG(58:7)	TG(18:2(9Z,12Z)/20:1(11Z)/20:4(5Z,8Z,11Z,14Z))[iso6]	TAG	0.105	0	0
TAG(58:8)	TG(18:0/20:4(5Z,8Z,11Z,14Z)/20:4(5Z,8Z,11Z,14Z))[iso3]	TAG	0.118	0.001	0
TAG(58:9)	TG(18:1(9Z)/20:4(5Z,8Z,11Z,14Z)/20:4(5Z,8Z,11Z,14Z))[iso3]	TAG	0.047	0	0
TAG(60:12)	TG(20:4(5Z,8Z,11Z,14Z)/20:4(5Z,8Z,11Z,14Z)/20:4(5Z,8Z,11Z,14Z))	TAG	0.037	0.003	0

Abbreviations: CE, cholesterol esters; DAG, diacylglycerols; LPC, lysophosphatidylcholines; LPE, lysophosphatidylethanolamines; MAG, monoacylglycerols; PC, phosphatidylcholines; PC-P, phosphatidylcholine plasmalogens; PE, phosphatidylethanolamines; PE-P, phosphatidylethanolamine plasmalogens; PI, phosphatidylinositols; PS, phosphatidylserine; SM, sphingomyelins; TAG, triacylglycerols.

Supplemental Table S3. Characteristics of total study population stratified by diabetes status during pregnancy (n=1409)

Characteristic	NGT	GDM	Pre-existing DM	P value
n	1175	161	73	
At baseline				
Age at baseline	28.07 ±6.56	30.07 ±6.56	31.32 ±6.62	<0.001
Educational attainment				0.953
High school and below	773 (65.8)	107 (66.5)	47 (64.4)	
College and above	402 (34.2)	54 (33.5)	26 (35.6)	
Race and ethnicity				0.572
Non-Hispanic Black	751 (63.9)	109 (67.7)	49 (67.1)	
Nonblack	424 (36.1)	52 (32.3)	24 (32.9)	
Parity				0.053
Primiparous	533 (45.4)	59 (36.6)	27 (37.0)	
Multiparous	642 (54.6)	102 (63.4)	46 (63.0)	
Smoker	198 (16.9)	28 (17.4)	14 (19.2)	0.869
Pre-pregnancy BMI	26.10 ±6.06	29.34 ±7.59	31.60 ±7.44	<0.001
Overweight or obesity	578 (49.2)	111 (68.9)	62 (84.9)	<0.001
Hypertensive disorders during pregnancy	141 (12.0)	40 (24.8)	27 (37.0)	<0.001
Gestational age at birth (weeks)	38.34 ±2.73	35.26 ±5.30	36.47 ±3.64	<0.001
Preterm delivery	256 (21.8)	75 (46.6)	31 (42.5)	<0.001
Caesarean section	375 (31.9)	89(55.3)	44 (60.3)	<0.001
Family history of DM	37 (3.1)	4 (2.5)	11 (15.1)	<0.001
Prenatal vitamin intake				0.259
<2 times/week	132 (11.2)	22 (13.7)	5 (6.8)	
3-5 times/week	369 (31.4)	39 (24.2)	28 (38.4)	
Almost daily	574 (48.9)	81 (50.3)	34 (46.6)	
Missing	100 (8.5)	19 (11.8)	6 (8.2)	
At follow-up				
Breastfeeding status				0.272
Exclusively Formula	281(23.9)	45(28.0)	17(23.3)	
Exclusively breastfeed	96(8.2)	7(4.3)	53(72.6)	
Mixed	798(67.9)	109(67.7)	3(4.1)	

Data are shown as number (%) or mean (SD).

Abbreviations: BMI, body mass index; DM, diabetes mellitus; GDM, gestational diabetes; NGT, normal glucose tolerance.

Supplemental Table S4. Associations of gestational diabetes with 209 lipid species.

Lipid species	β	se	P value	p_fdr	Class/subclass
CE(14:0)	-0.455	0.079	1.1E-08	2.3E-06	CE
DAG(38:5)	0.411	0.082	5.5E-07	5.7E-05	DAG
CE(16:1)	-0.375	0.078	2.0E-06	1.4E-04	CE
CE(18:3)	-0.377	0.083	5.5E-06	2.7E-04	CE
PI(36:2)	-0.377	0.084	7.5E-06	2.7E-04	PI
TAG(54:6)	0.352	0.078	7.7E-06	2.7E-04	TAG
TAG(56:7)	0.346	0.081	2.0E-05	5.9E-04	TAG
PC(P-36:1)	-0.322	0.084	1.3E-04	3.4E-03	PC_P
CE(18:2)	-0.314	0.083	1.5E-04	3.4E-03	CE
DAG(36:3)	0.316	0.083	1.6E-04	3.4E-03	DAG
PC(P-36:2)	-0.315	0.084	1.9E-04	3.6E-03	PC_P
CE(18:1)	-0.305	0.083	2.4E-04	4.3E-03	CE
DAG(36:4)	0.303	0.085	3.6E-04	5.8E-03	DAG
CE(20:3)	-0.298	0.085	4.9E-04	7.4E-03	CE
TAG(56:8)	0.263	0.079	8.4E-04	1.2E-02	TAG
DAG(38:4)	0.277	0.083	9.3E-04	1.2E-02	DAG
TAG(54:10)	-0.269	0.085	1.7E-03	2.0E-02	TAG
DAG(34:1)	0.257	0.083	2.1E-03	2.4E-02	DAG
CE(22:4)	-0.254	0.083	2.2E-03	2.4E-02	CE
DAG(36:2)	0.243	0.082	3.1E-03	3.2E-02	DAG
TAG(56:9)	0.242	0.082	3.3E-03	3.3E-02	TAG
TAG(54:5)	0.248	0.086	4.0E-03	3.8E-02	TAG
PC(P-34:1)-A	-0.244	0.085	4.4E-03	4.0E-02	PC_P
LPE(22:6)	0.240	0.085	4.7E-03	4.1E-02	LPE
TAG(56:5)	0.225	0.081	5.2E-03	4.1E-02	TAG
SM(14:0)	-0.234	0.084	5.3E-03	4.1E-02	SM
PC(P-36:4)	-0.238	0.085	5.3E-03	4.1E-02	PC_P
LPC(22:6)	0.234	0.085	5.9E-03	4.4E-02	LPC
CE(16:0)	-0.225	0.082	6.1E-03	4.4E-02	CE
TAG(58:11)	0.223	0.082	6.3E-03	4.4E-02	TAG
TAG(56:10)	0.230	0.084	6.5E-03	4.4E-02	TAG
Cer(d18:1/16:0)	0.222	0.083	7.8E-03	5.0E-02	Ceramide
CE(18:0)	-0.223	0.084	7.8E-03	5.0E-02	CE
TAG(54:7)	0.226	0.086	8.5E-03	5.2E-02	TAG
DAG(34:2)	0.217	0.084	9.7E-03	5.8E-02	DAG
TAG(54:8)	0.218	0.085	1.1E-02	6.2E-02	TAG
LPC(20:4)	0.215	0.085	1.2E-02	6.7E-02	LPC
PC(32:2)	-0.202	0.081	1.2E-02	6.7E-02	PC
TAG(56:6)	0.202	0.081	1.3E-02	7.1E-02	TAG
LPE(20:4)	0.203	0.086	1.8E-02	9.3E-02	LPE
SM(16:1)	-0.196	0.085	2.1E-02	1.1E-01	SM
TAG(58:10)	0.178	0.078	2.3E-02	1.1E-01	TAG
TAG(52:6)	0.192	0.086	2.6E-02	1.2E-01	TAG
CE(20:4)	-0.180	0.081	2.6E-02	1.2E-01	CE
PC(30:1)	-0.176	0.079	2.6E-02	1.2E-01	PC
PC(P-36:3)	-0.183	0.085	3.2E-02	1.4E-01	PC_P
PE(P-38:3)	-0.183	0.085	3.3E-02	1.4E-01	PE_P
PC(P-34:1)-B	-0.181	0.085	3.4E-02	1.5E-01	PC_P

Cer(d18:1/24:1)	0.174	0.082	3.5E-02	1.5E-01	Ceramide
TAG(52:2)	0.169	0.081	3.6E-02	1.5E-01	TAG
TAG(52:7)	0.176	0.086	4.2E-02	1.7E-01	TAG
PC(34:3)	-0.168	0.083	4.2E-02	1.7E-01	PC
PE(P-36:4)	-0.168	0.084	4.6E-02	1.7E-01	PE_P
TAG(54:9)	0.169	0.084	4.6E-02	1.7E-01	TAG
DAG(32:0)	0.170	0.085	4.6E-02	1.7E-01	DAG
SM(24:0)	-0.170	0.086	4.7E-02	1.8E-01	SM
PC(P-38:4)	-0.167	0.085	4.9E-02	1.8E-01	PC_P
DAG(36:1)	0.168	0.086	5.0E-02	1.8E-01	DAG
TAG(50:2)	0.159	0.082	5.2E-02	1.8E-01	TAG
SM(22:0)	-0.168	0.086	5.2E-02	1.8E-01	SM
TAG(47:1)	-0.160	0.083	5.3E-02	1.8E-01	TAG
TAG(45:3)	-0.162	0.084	5.4E-02	1.8E-01	TAG
TAG(60:12)	0.150	0.078	5.5E-02	1.8E-01	TAG
TAG(52:4)	0.163	0.085	5.7E-02	1.8E-01	TAG
PC(38:2)	-0.159	0.083	5.7E-02	1.8E-01	PC
PE(P-36:1)	-0.158	0.085	6.4E-02	2.0E-01	PE_P
PC(30:0)	-0.150	0.081	6.4E-02	2.0E-01	PC
Cer(d18:1/22:0)	0.155	0.084	6.5E-02	2.0E-01	Ceramide
PC(34:4)	-0.150	0.084	7.3E-02	2.2E-01	PC
PE(36:3)	-0.147	0.082	7.4E-02	2.2E-01	PE
PE(P-36:3)	-0.149	0.084	7.6E-02	2.2E-01	PE_P
PE(32:1)	-0.138	0.079	8.0E-02	2.3E-01	PE
PE(P-36:2)	-0.149	0.085	8.0E-02	2.3E-01	PE_P
PC(P-34:2)	-0.148	0.086	8.5E-02	2.4E-01	PC_P
PE(32:0)	-0.138	0.080	8.6E-02	2.4E-01	PE
SM(18:1)	-0.145	0.085	8.7E-02	2.4E-01	SM
PC(32:1)	-0.136	0.080	8.7E-02	2.4E-01	PC
PE(34:2)	-0.138	0.083	9.5E-02	2.6E-01	PE
PC(36:3)	-0.134	0.081	9.9E-02	2.6E-01	PC
TAG(49:2)	-0.133	0.082	1.0E-01	2.7E-01	TAG
DAG(32:1)	0.135	0.083	1.0E-01	2.7E-01	DAG
DAG(34:0)	0.139	0.086	1.1E-01	2.7E-01	DAG
TAG(52:5)	0.138	0.086	1.1E-01	2.7E-01	TAG
PE(P-34:2)	-0.137	0.085	1.1E-01	2.7E-01	PE_P
SM(20:0)	-0.137	0.086	1.1E-01	2.7E-01	SM
TAG(58:8)	0.131	0.083	1.2E-01	2.8E-01	TAG
LPC(20:5)	0.136	0.086	1.2E-01	2.8E-01	LPC
TAG(52:3)	0.132	0.084	1.2E-01	2.8E-01	TAG
PC(34:2)	-0.130	0.083	1.2E-01	2.8E-01	PC
TAG(50:1)	0.127	0.083	1.3E-01	3.0E-01	TAG
SM(16:0)	-0.127	0.086	1.4E-01	3.2E-01	SM
cholesterol	-0.126	0.086	1.4E-01	3.2E-01	Sterol_lipid
TAG(58:9)	0.117	0.080	1.4E-01	3.2E-01	TAG
MAG(14:1)	0.123	0.086	1.5E-01	3.4E-01	MAG
PE(36:2)	-0.117	0.082	1.6E-01	3.4E-01	PE
CE(22:6)	-0.108	0.080	1.7E-01	3.8E-01	CE
PC(P-34:3)	-0.115	0.085	1.8E-01	3.8E-01	PC_P
TAG(45:2)	-0.111	0.083	1.8E-01	3.8E-01	TAG

TAG(49:3)	-0.107	0.080	1.8E-01	3.9E-01	TAG
TAG(50:6)	0.113	0.085	1.9E-01	3.9E-01	TAG
LPC(16:0)	0.113	0.086	1.9E-01	3.9E-01	LPC
LPC(18:2)	0.113	0.086	1.9E-01	3.9E-01	LPC
PC(40:9)	0.106	0.082	2.0E-01	3.9E-01	PC
TAG(48:2)	-0.104	0.081	2.0E-01	3.9E-01	TAG
PS(34:0)	0.110	0.086	2.0E-01	3.9E-01	PS
TAG(46:0)	-0.107	0.084	2.0E-01	4.0E-01	TAG
TAG(43:2)	-0.104	0.082	2.1E-01	4.0E-01	TAG
PI(36:4)	-0.106	0.084	2.1E-01	4.0E-01	PI
campesterol	-0.107	0.086	2.1E-01	4.0E-01	Sterol_lipid
PC(P-40:7)	-0.107	0.085	2.1E-01	4.0E-01	PC_P
PE(38:5)	-0.106	0.085	2.1E-01	4.0E-01	PE
sphingosine	0.107	0.086	2.1E-01	4.0E-01	Sphingolipid
TAG(54:4)	0.105	0.086	2.2E-01	4.1E-01	TAG
TAG(47:2)	-0.099	0.082	2.3E-01	4.2E-01	TAG
PE(36:1)	-0.102	0.085	2.3E-01	4.2E-01	PE
MAG(16:1)	-0.101	0.086	2.4E-01	4.3E-01	MAG
CE(20:5)	-0.097	0.083	2.4E-01	4.3E-01	CE
TAG(50:5)	0.098	0.085	2.5E-01	4.3E-01	TAG
PC(36:1)	-0.098	0.085	2.5E-01	4.3E-01	PC
TAG(53:3)	0.099	0.086	2.5E-01	4.3E-01	TAG
PE(P-36:5)	0.097	0.085	2.5E-01	4.4E-01	PE_P
PE(34:0)	-0.093	0.083	2.6E-01	4.4E-01	PE
PC(36:4)-A	-0.094	0.084	2.6E-01	4.5E-01	PC
LPC(18:0)	0.093	0.086	2.8E-01	4.7E-01	LPC
TAG(45:1)	-0.089	0.083	2.8E-01	4.7E-01	TAG
PC(34:1)	-0.089	0.084	2.9E-01	4.8E-01	PC
SM(24:1)	-0.091	0.086	2.9E-01	4.8E-01	SM
TAG(58:7)	0.089	0.084	2.9E-01	4.8E-01	TAG
TAG(45:0)	-0.086	0.083	3.0E-01	4.9E-01	TAG
TAG(51:3)	0.083	0.082	3.2E-01	5.1E-01	TAG
PC(40:6)	0.084	0.084	3.2E-01	5.1E-01	PC
TAG(54:2)	0.084	0.085	3.2E-01	5.1E-01	TAG
PE(P-40:7)	-0.083	0.085	3.3E-01	5.1E-01	PE_P
TAG(46:1)	-0.079	0.082	3.4E-01	5.2E-01	TAG
PC(36:4-hydroxy)	-0.082	0.086	3.4E-01	5.2E-01	PC
PE(P-34:3)	-0.080	0.084	3.4E-01	5.2E-01	PE_P
TAG(51:2)	-0.077	0.083	3.5E-01	5.4E-01	TAG
LPE(18:0)	0.079	0.086	3.6E-01	5.5E-01	LPE
TAG(52:1)	0.078	0.086	3.6E-01	5.5E-01	TAG
PC(38:4)	0.074	0.084	3.8E-01	5.6E-01	PC
TAG(43:1)	-0.072	0.083	3.9E-01	5.7E-01	TAG
TAG(53:2)	0.073	0.084	3.9E-01	5.7E-01	TAG
TAG(51:0)	-0.074	0.085	3.9E-01	5.7E-01	TAG
PC(38:3)	-0.070	0.082	3.9E-01	5.7E-01	PC
LPE(18:2)	0.071	0.085	4.0E-01	5.8E-01	LPE
PC(P-36:5)-A	-0.065	0.085	4.4E-01	6.4E-01	PC_P
PE(38:2)	-0.064	0.085	4.5E-01	6.4E-01	PE
TAG(43:0)	-0.061	0.084	4.7E-01	6.6E-01	TAG

TAG(54:3)	0.061	0.086	4.8E-01	6.7E-01	TAG
PI(38:4)	-0.061	0.086	4.8E-01	6.7E-01	PI
PC(38:6)	0.058	0.084	4.9E-01	6.8E-01	PC
LPC(18:1)	0.056	0.086	5.1E-01	7.0E-01	LPC
PC(36:0)	-0.056	0.086	5.2E-01	7.0E-01	PC
PC(P-38:7)	0.053	0.082	5.2E-01	7.0E-01	PC_P
TAG(48:1)	-0.053	0.082	5.2E-01	7.0E-01	TAG
LPE(16:0)	0.054	0.085	5.3E-01	7.0E-01	LPE
TAG(56:3)	-0.053	0.085	5.3E-01	7.1E-01	TAG
LPE(20:0)	0.054	0.086	5.3E-01	7.1E-01	LPE
TAG(48:4)	0.051	0.084	5.4E-01	7.1E-01	TAG
PC(36:2)	-0.050	0.084	5.5E-01	7.2E-01	PC
PC(p-38:6)	-0.050	0.085	5.5E-01	7.2E-01	PC_P
PE(P-38:7)	-0.048	0.083	5.6E-01	7.3E-01	PE_P
PE(40:6)	0.047	0.084	5.8E-01	7.4E-01	PE
PE(38:4)	0.047	0.085	5.8E-01	7.4E-01	PE
TAG(44:0)	-0.046	0.084	5.8E-01	7.4E-01	TAG
LPC(16:1)	0.045	0.084	5.9E-01	7.4E-01	LPC
Cer(d18:1/24:0)	0.044	0.084	6.0E-01	7.5E-01	Ceramide
PC(P-34:5)	0.043	0.085	6.1E-01	7.6E-01	PC_P
TAG(48:0)	-0.042	0.085	6.2E-01	7.7E-01	TAG
TAG(50:3)	-0.038	0.078	6.3E-01	7.7E-01	TAG
PE(36:0)	-0.040	0.085	6.4E-01	7.8E-01	PE
TAG(41:0)	-0.038	0.082	6.4E-01	7.8E-01	TAG
PE(P-38:5)	0.040	0.086	6.4E-01	7.8E-01	PE_P
LPE(22:0)	0.039	0.086	6.5E-01	7.8E-01	LPE
TAG(48:5)	0.038	0.085	6.6E-01	7.8E-01	TAG
TAG(50:4)	0.035	0.082	6.7E-01	7.9E-01	TAG
PE(P-38:6)	-0.033	0.086	7.0E-01	8.3E-01	PE_P
TAG(47:0)	-0.032	0.084	7.1E-01	8.3E-01	TAG
LPE(18:1)	0.031	0.085	7.1E-01	8.3E-01	LPE
PC(P-36:5)-B	0.028	0.083	7.4E-01	8.6E-01	PC_P
TAG(54:1)	0.028	0.085	7.4E-01	8.6E-01	TAG
TAG(56:2)	-0.026	0.085	7.6E-01	8.6E-01	TAG
PC(40:10)	-0.026	0.085	7.6E-01	8.6E-01	PC
PE(36:4)	-0.026	0.086	7.6E-01	8.6E-01	PE
TAG(44:1)	-0.025	0.083	7.6E-01	8.6E-01	TAG
TAG(49:0)	-0.025	0.085	7.7E-01	8.6E-01	TAG
TAG(56:4)	0.025	0.086	7.7E-01	8.6E-01	TAG
TAG(42:0)	-0.024	0.084	7.8E-01	8.6E-01	TAG
TAG(48:3)	-0.022	0.081	7.9E-01	8.7E-01	TAG
TAG(46:3)	-0.022	0.083	7.9E-01	8.7E-01	TAG
MAG(18:0)	-0.022	0.086	8.0E-01	8.8E-01	MAG
TAG(44:2)	-0.019	0.084	8.2E-01	8.9E-01	TAG
PC(36:4)-B	0.019	0.085	8.2E-01	8.9E-01	PC
TAG(46:4)	-0.018	0.084	8.3E-01	8.9E-01	TAG
TAG(56:1)	-0.018	0.085	8.3E-01	8.9E-01	TAG
palmitoylethanolamide	-0.017	0.086	8.4E-01	9.0E-01	Other_lipid
TAG(46:2)	-0.014	0.083	8.7E-01	9.2E-01	TAG
LPC(14:0)	0.014	0.083	8.7E-01	9.2E-01	LPC

TAG(58:6)	0.012	0.084	8.9E-01	9.3E-01	TAG
TAG(50:0)	0.011	0.086	9.0E-01	9.4E-01	TAG
PE(38:6)	0.007	0.084	9.3E-01	9.7E-01	PE
PC(32:0)	0.007	0.086	9.4E-01	9.7E-01	PC
N-oleoylethanolamine	-0.006	0.085	9.4E-01	9.7E-01	Other_lipid
TAG(55:3)	0.006	0.085	9.4E-01	9.7E-01	TAG
SM(18:0)	0.006	0.086	9.5E-01	9.7E-01	SM
TAG(55:2)	0.005	0.084	9.6E-01	9.7E-01	TAG
PC(34:0)	0.004	0.086	9.6E-01	9.7E-01	PC
TAG(51:1)	0.004	0.085	9.7E-01	9.7E-01	TAG
TAG(52:0)	0.001	0.086	9.9E-01	9.9E-01	TAG

The lipid species are ordered according to p value; Bold represents significant (FDR corrected $p < 0.05$). Abbreviations: CE, cholesterol esters; Cer, ceramides; DAG, diacylglycerols; LPC, lysophosphatidylcholines; LPE, lysophosphatidylethanolamines; MAG, monoacylglycerols; PC, phosphatidylcholines; PC-P, phosphatidylcholine plasmalogens; PE, phosphatidylethanolamines; PE-P, phosphatidylethanolamine plasmalogens; PI, phosphatidylinositols; PS, phosphatidylserine; SM, sphingomyelins; TAG, triacylglycerols. All analyses were adjusted for age at delivery, race/ethnicity, education attainment, smoking during pregnancy, parity, prepregnancy body mass index, and hypertensive disorder during pregnancy.

Supplemental Table S5. Associations between gestational diabetes, lipid species, and type 2 diabetes

Lipid species	Gestational diabetes*				Incident diabetes†				Class/ subclass
	β	se	P value	p_fdr	HR	95%CI	pvalue	p_fdr	
PI(36:2)	-0.38	0.08	7.5E-06	2.7E-04	0.79	0.69-0.91	8.7E-04	2.9E-02	PI
SM(14:0)	-0.23	0.08	5.3E-03	4.1E-02	0.82	0.72-0.94	3.8E-03	4.1E-02	SM
TAG(56:5)	0.23	0.08	5.2E-03	4.1E-02	1.22	1.06-1.41	4.5E-03	4.1E-02	TAG
PC(P-36:2)	-0.31	0.08	1.9E-04	3.6E-03	0.82	0.72-0.94	5.0E-03	4.1E-02	PC_P
TAG(54:10)	-0.27	0.09	1.7E-03	2.0E-02	0.84	0.74-0.96	1.3E-02	6.6E-02	TAG
TAG(56:8)	0.26	0.08	8.4E-04	1.2E-02	1.21	1.04-1.40	1.3E-02	6.6E-02	TAG
CE(16:1)	-0.37	0.08	2.0E-06	1.4E-04	0.83	0.72-0.97	1.5E-02	6.6E-02	CE
TAG(56:7)	0.35	0.08	2.0E-05	5.9E-04	1.19	1.03-1.38	1.6E-02	6.6E-02	TAG
PC(P-36:4)	-0.24	0.09	5.3E-03	4.1E-02	0.86	0.75-0.98	2.4E-02	8.2E-02	PC_P
PC(P-36:1)	-0.32	0.08	1.3E-04	3.4E-03	0.86	0.75-0.98	2.5E-02	8.2E-02	PC_P
CE(14:0)	-0.45	0.08	1.1E-08	2.3E-06	0.85	0.73-0.99	3.2E-02	9.6E-02	CE
PC(P-34:1)-A	-0.24	0.09	4.4E-03	4.0E-02	0.87	0.76-0.99	3.8E-02	1.0E-01	PC_P
CE(18:0)	-0.22	0.08	7.8E-03	5.0E-02	0.87	0.76-0.99	4.1E-02	1.0E-01	CE
CE(18:1)	-0.31	0.08	2.4E-04	4.3E-03	0.87	0.75-1.00	4.8E-02	1.1E-01	CE
TAG(54:6)	0.35	0.08	7.7E-06	2.7E-04	1.15	0.99-1.34	6.1E-02	1.3E-01	TAG
DAG(38:5)	0.41	0.08	5.5E-07	5.7E-05	1.14	0.99-1.31	6.5E-02	1.3E-01	DAG
DAG(36:4)	0.30	0.08	3.6E-04	5.8E-03	1.13	0.99-1.30	7.6E-02	1.5E-01	DAG
CE(18:2)	-0.31	0.08	1.5E-04	3.4E-03	0.88	0.77-1.02	8.7E-02	1.6E-01	CE
CE(18:3)	-0.38	0.08	5.6E-06	2.7E-04	0.89	0.77-1.02	1.0E-01	1.8E-01	CE
DAG(34:1)	0.26	0.08	2.1E-03	2.4E-02	1.11	0.96-1.27	1.5E-01	2.4E-01	DAG
DAG(38:4)	0.28	0.08	9.3E-04	1.2E-02	1.09	0.95-1.26	1.9E-01	3.0E-01	DAG
TAG(58:11)	0.22	0.08	6.3E-03	4.4E-02	1.09	0.95-1.27	2.3E-01	3.3E-01	TAG
DAG(36:3)	0.32	0.08	1.6E-04	3.4E-03	1.09	0.95-1.25	2.3E-01	3.3E-01	DAG
TAG(56:9)	0.24	0.08	3.3E-03	3.3E-02	1.09	0.94-1.25	2.5E-01	3.5E-01	TAG
TAG(54:5)	0.25	0.09	4.0E-03	3.8E-02	1.08	0.94-1.24	3.0E-01	3.9E-01	TAG
DAG(36:2)	0.24	0.08	3.1E-03	3.2E-02	1.06	0.92-1.23	3.9E-01	4.9E-01	DAG
LPE(22:6)	0.24	0.08	4.7E-03	4.1E-02	0.94	0.83-1.08	4.0E-01	4.9E-01	LPE
Cer(d18:1/16:0)	0.22	0.08	7.8E-03	5.0E-02	1.05	0.92-1.20	4.7E-01	5.3E-01	Cer
CE(20:3)	-0.30	0.09	4.9E-04	7.4E-03	0.95	0.83-1.09	4.7E-01	5.3E-01	CE
CE(16:0)	-0.22	0.08	6.1E-03	4.4E-02	0.96	0.83-1.10	5.2E-01	5.7E-01	CE
LPC(22:6)	0.23	0.09	5.9E-03	4.4E-02	0.96	0.84-1.10	5.4E-01	5.7E-01	LPC
TAG(56:10)	0.23	0.08	6.5E-03	4.4E-02	1.04	0.90-1.20	5.7E-01	5.9E-01	TAG
CE(22:4)	-0.25	0.08	2.2E-03	2.4E-02	0.98	0.85-1.13	8.3E-01	8.3E-01	CE

Abbreviations: CE, cholesterol esters; Cer, ceramides; CI, confidence interval; DAG, diacylglycerols; HR, hazard ratio; LPC, lysophosphatidylcholines; LPE, lysophosphatidylethanolamines; PC, phosphatidylcholines; PC-P, phosphatidylcholine plasmalogens; PI, phosphatidylinositols; SM, sphingomyelins; TAG, triacylglycerols.

*In the model, gestational diabetes was the predictor and lipid species were the outcomes; adjusted for age at delivery, race and ethnicity, education, smoking status during pregnancy, parity, prepregnancy body mass index, and hypertensive disorder during pregnancy.

†In the model, lipid species were the predictors; and incident diabetes was the outcome; adjusted for age at delivery, race and ethnicity, education, smoking status during pregnancy, parity, prepregnancy body mass index, hypertensive disorder during pregnancy, family history of diabetes. HRs were for incident type 2 diabetes per 1 SD increase in each lipid species.

Supplemental Table S6. Associations between class/subclass of lipid species and incident type 2 diabetes

Lipid class/subclass	HR	95%CI	P value	p_fdr	Lipid species
PI	0.79	0.69-0.91	8.7E-04	7.8E-03	PI(36:2)
SM	0.82	0.72-0.94	3.8E-03	1.7E-02	SM(14:0), PC-P(34:1)-A, PC-P(C36:4), PC-P(C36:2), PC-P(C36:1)
PC_P	0.96	0.92-0.99	1.4E-02	4.1E-02	CE(14:0), CE(C16:1), CE(16:0), CE(C18:3), CE(C18:2), CE(C18:1), CE(C18:0), CE(C20:3), CE(C22:4)
CE	0.98	0.96-1.00	5.6E-02	1.3E-01	DAG(C34:1), DAG(C36:3), DAG(C36:2), DAG(C36:4), DAG(C38:5), DAG(C38:4)
DAG	1.03	1.00-1.05	8.5E-02	1.5E-01	TAG(C54:10), TAG(C54:6), TAG(C54:5), TAG(C56:10), TG(C56:9), TAG(C56:8), TAG(C56:7), TAG(C56:5), TAG(C58:11)
TAG	1.02	1.00-1.04	1.0E-01	1.5E-01	TAG(C58:11)
LPE	0.94	0.83-1.08	4.0E-01	5.1E-01	LPE(C22:6)
Ceramide	1.05	0.92-1.20	4.7E-01	5.2E-01	Cer(C16:0)(d18:1)
LPC	0.96	0.84-1.10	5.4E-01	5.4E-01	LPC(C22:6)

Abbreviations: CE, cholesterol esters; Cer, ceramides; DAG, diacylglycerols; HR, hazard ratio; LPC, lysophosphatidylcholines; LPE, lysophosphatidylethanolamines; PC-P, phosphatidylcholine plasmalogens; PI, phosphatidylinositols; SM, sphingomyelins; TAG, triacylglycerols.

All analyses were adjusted for age at delivery, race and ethnicity, education, smoking status during pregnancy, parity, prepregnancy body mass index, hypertensive disorder during pregnancy, and family history of diabetes.

Supplemental Table S7. Associations between GDM-related lipid species and progression to type 2 diabetes among women who had GDM in index pregnancy.

Lipid species	HR	95%CI	p	p_fdr	Class/subclass
CE(16:1)	0.66	0.49-0.88	4.8E-03	8.7E-02	CE
SM(14:0)	0.59	0.41-0.86	5.3E-03	8.7E-02	SM
CE(14:0)	0.71	0.53-0.96	2.5E-02	2.7E-01	CE
CE(18:1)	0.77	0.58-1.04	8.6E-02	5.3E-01	CE
DAG(34:1)	1.29	0.96-1.75	9.7E-02	5.3E-01	DAG
TAG(56:10)	0.79	0.60-1.04	9.7E-02	5.3E-01	TAG
DAG(36:2)	1.23	0.93-1.63	1.4E-01	6.1E-01	DAG
LPE(22:6)	0.81	0.62-1.08	1.5E-01	6.1E-01	LPE
TAG(56:7)	1.20	0.90-1.59	2.1E-01	6.1E-01	TAG
CE(18:3)	0.82	0.59-1.13	2.2E-01	6.1E-01	CE
TAG(54:5)	1.22	0.88-1.68	2.3E-01	6.1E-01	TAG
DAG(38:4)	1.20	0.88-1.63	2.5E-01	6.1E-01	DAG
DAG(36:4)	1.17	0.89-1.54	2.6E-01	6.1E-01	DAG
DAG(36:3)	1.17	0.88-1.56	2.7E-01	6.1E-01	DAG
TAG(56:9)	0.85	0.64-1.14	2.8E-01	6.1E-01	TAG
PI(36:2)	1.16	0.85-1.58	3.4E-01	6.5E-01	PI
TAG(56:8)	1.14	0.86-1.52	3.6E-01	6.5E-01	TAG
PC(P-36:2)	0.87	0.64-1.19	3.9E-01	6.5E-01	PC_P
TAG(54:10)	0.86	0.61-1.22	4.0E-01	6.5E-01	TAG
CE(22:4)	0.87	0.64-1.20	4.0E-01	6.5E-01	CE
LPC(22:6)	0.90	0.69-1.18	4.4E-01	6.5E-01	LPC
CE(18:0)	0.89	0.66-1.21	4.5E-01	6.5E-01	CE
CE(20:3)	0.90	0.69-1.19	4.6E-01	6.5E-01	CE
TAG(58:11)	0.90	0.68-1.20	4.8E-01	6.5E-01	TAG
PC(P-36:1)	0.90	0.67-1.21	4.9E-01	6.5E-01	PC_P
PC(P-36:4)	0.91	0.67-1.24	5.6E-01	7.1E-01	PC_P
CE(18:2)	0.92	0.68-1.25	6.0E-01	7.1E-01	CE
DAG(38:5)	1.07	0.81-1.42	6.1E-01	7.1E-01	DAG
Cer(d18:1/16:0)	1.07	0.81-1.41	6.3E-01	7.1E-01	Ceramide
CE(16:0)	0.94	0.70-1.25	6.5E-01	7.2E-01	CE
PC(P-34:1)-A	0.95	0.70-1.30	7.6E-01	8.1E-01	PC_P
TAG(56:5)	1.04	0.79-1.36	7.9E-01	8.1E-01	TAG
TAG(54:6)	1.01	0.73-1.39	9.6E-01	9.6E-01	TAG

Abbreviations: CE, cholesterol esters; Cer, ceramides; DAG, diacylglycerols; GDM, gestational diabetes; LPC, lysophosphatidylcholines; LPE, lysophosphatidylethanolamines; PC, phosphatidylcholines; PC-P, phosphatidylcholine plasmalogens; PI, phosphatidylinositols; SM, sphingomyelins; TAG, triacylglycerols. All analyses were adjusted for age at delivery, race and ethnicity, education, smoking status during pregnancy, parity, prepregnancy body mass index, hypertensive disorder during pregnancy, and family history of diabetes.

Supplemental Table S8. Summary of mediation effect estimations for progression from gestational diabetes to incident diabetes

Mediator	TE/DE (95% CI)	IE (95% CI)	RE (%)
Total effect	1.296(0.936, 1.682)		
Direct effect	0.874(0.543, 1.231)		0.675(0.544, 0.806)
PC(P36:2)		0.001(-0.077, 0.078)	0.000(-0.058, 0.060)
PI(36:2)		0.052(-0.025, 0.130)	0.040(-0.022, 0.105)
SM(14:0)		0.045(-0.012, 0.089)	0.035(-0.010, 0.070)
TAG(56:5)		0.060(-0.012, 0.133)	0.047(-0.009, 0.102)
Joint effect of lipids*		0.156(0.045, 0.259)	0.120(0.032, 0.203)
Postpartum obesity		0.048(-0.013, 0.115)	0.037(-0.011, 0.090)
Postpartum MetS		0.026(-0.013, 0.063)	0.020(-0.010, 0.048)
Breastfeeding		0.014(-0.015, 0.039)	0.011(-0.012, 0.030)

Abbreviations: DE, direct effect; IE, indirect effect, MetS, metabolic syndrome; PC-P, phosphatidylcholine plasmalogens; PI, phosphatidylinositols; RE, relative effect; SM, sphingomyelins; TAG, triacylglycerols; TE, total effect.

*Joint effect of lipids is the joint effect from 4 lipid species including PC(P-36:2), PI(36:2), SM(14:0), TAG(56:5).

Model was adjusted for age at delivery, parity, prepregnancy body mass index.

Supplemental Table S9. Associations between gestational diabetes and lipid species with additional adjustments

Lipid species	Model 1				Model 2				Model 3			
	β	se	P value	p_fdr	β	se	P value	p_fdr	β	se	P value	p_fdr
CE(14:0)	-0.49	0.08	4.9E-09	1.0E-06	-0.38	0.08	1.3E-06	1.4E-04	-0.45	0.08	1.7E-08	3.6E-06
CE(16:1)	-0.44	0.08	1.2E-07	1.3E-05	-0.33	0.08	2.5E-05	1.8E-03	-0.37	0.08	1.8E-06	1.2E-04
CE(20:3)	-0.46	0.09	2.1E-07	1.5E-05	-0.30	0.09	5.6E-04	8.4E-03	-0.29	0.09	6.6E-04	9.8E-03
CE(18:3)	-0.44	0.09	3.1E-07	1.6E-05	-0.34	0.08	3.9E-05	2.0E-03	-0.37	0.08	7.7E-06	2.9E-04
CE(18:1)	-0.41	0.09	2.7E-06	1.1E-04	-0.31	0.08	1.8E-04	5.5E-03	-0.30	0.08	2.9E-04	5.1E-03
CE(22:4)	-0.37	0.09	1.3E-05	3.9E-04	-0.30	0.08	3.1E-04	6.6E-03	-0.25	0.08	2.4E-03	2.8E-02
CE(18:2)	-0.37	0.09	1.5E-05	3.9E-04	-0.33	0.08	8.0E-05	2.8E-03	-0.31	0.08	2.3E-04	4.7E-03
CE(18:0)	-0.33	0.09	1.6E-04	2.6E-03	-0.21	0.08	1.4E-02	6.7E-02	-0.21	0.08	1.1E-02	6.8E-02
CE(16:0)	-0.31	0.09	2.4E-04	3.1E-03	-0.28	0.08	7.7E-04	1.0E-02	-0.22	0.08	7.6E-03	5.0E-02
CE(20:4)	-0.30	0.08	3.4E-04	4.2E-03	-0.22	0.08	7.9E-03	4.8E-02	-0.18	0.08	2.7E-02	1.3E-01
CE(22:6)	-0.21	0.08	9.8E-03	6.9E-02	-0.17	0.08	2.7E-02	1.1E-01	-0.11	0.08	1.8E-01	3.8E-01
CE(20:5)	-0.17	0.09	4.9E-02	1.9E-01	-0.15	0.08	7.5E-02	2.5E-01	-0.10	0.08	2.3E-01	4.3E-01
Cer(d18:1/16:0)	0.16	0.09	6.6E-02	2.3E-01	0.10	0.08	2.3E-01	4.9E-01	0.22	0.08	8.7E-03	5.5E-02
Cer(d18:1/24:1)	0.14	0.09	1.0E-01	2.8E-01	0.09	0.08	2.7E-01	5.1E-01	0.17	0.08	3.8E-02	1.6E-01
Cer(d18:1/22:0)	0.12	0.09	1.8E-01	3.9E-01	0.09	0.08	2.9E-01	5.1E-01	0.16	0.08	6.5E-02	2.1E-01
Cer(d18:1/24:0)	0.02	0.09	8.4E-01	9.5E-01	0.03	0.09	7.0E-01	8.6E-01	0.04	0.08	6.0E-01	7.6E-01
DAG(38:5)	0.39	0.09	6.2E-06	2.2E-04	0.40	0.08	1.4E-06	1.4E-04	0.40	0.08	9.8E-07	1.0E-04
DAG(36:3)	0.38	0.09	1.7E-05	3.9E-04	0.29	0.08	6.7E-04	9.3E-03	0.31	0.08	2.3E-04	4.7E-03
DAG(36:4)	0.33	0.09	2.3E-04	3.1E-03	0.24	0.08	3.9E-03	3.5E-02	0.30	0.08	3.8E-04	6.0E-03
DAG(38:4)	0.29	0.09	8.5E-04	9.3E-03	0.30	0.08	3.0E-04	6.6E-03	0.27	0.08	1.2E-03	1.6E-02
DAG(34:1)	0.29	0.09	9.1E-04	9.5E-03	0.30	0.08	3.0E-04	6.6E-03	0.25	0.08	2.8E-03	3.1E-02
DAG(36:2)	0.27	0.09	1.7E-03	1.6E-02	0.26	0.08	1.6E-03	1.9E-02	0.24	0.08	4.1E-03	4.0E-02
DAG(34:2)	0.24	0.09	6.6E-03	5.1E-02	0.27	0.08	1.2E-03	1.4E-02	0.21	0.08	1.3E-02	7.3E-02
DAG(32:0)	0.21	0.09	1.9E-02	1.1E-01	0.25	0.08	3.4E-03	3.3E-02	0.17	0.09	5.3E-02	2.0E-01
DAG(36:1)	0.20	0.09	2.9E-02	1.4E-01	0.24	0.08	4.6E-03	3.5E-02	0.16	0.09	5.9E-02	2.0E-01
DAG(34:0)	0.16	0.09	7.7E-02	2.4E-01	0.22	0.08	1.1E-02	5.6E-02	0.14	0.09	1.1E-01	2.9E-01
DAG(32:1)	0.14	0.09	1.1E-01	2.9E-01	0.21	0.08	9.4E-03	5.3E-02	0.13	0.08	1.2E-01	2.9E-01
LPC(20:4)	0.09	0.09	3.1E-01	5.5E-01	0.22	0.09	1.0E-02	5.3E-02	0.21	0.09	1.2E-02	6.9E-02
LPC(22:6)	0.09	0.09	3.1E-01	5.5E-01	0.23	0.09	6.8E-03	4.6E-02	0.23	0.09	6.3E-03	4.9E-02
LPC(16:0)	0.05	0.09	5.5E-01	7.8E-01	0.17	0.09	4.1E-02	1.6E-01	0.12	0.09	1.8E-01	3.8E-01
LPC(20:5)	0.05	0.09	5.8E-01	8.1E-01	0.19	0.09	2.7E-02	1.1E-01	0.14	0.09	9.6E-02	2.6E-01
LPC(18:2)	0.03	0.09	7.2E-01	9.1E-01	0.17	0.09	4.8E-02	1.8E-01	0.12	0.09	1.6E-01	3.5E-01

LPC(16:1)	-0.03	0.09	7.2E-01	9.1E-01	0.08	0.08	3.4E-01	5.7E-01	0.05	0.08	5.2E-01	6.9E-01
LPC(18:1)	-0.02	0.09	8.0E-01	9.5E-01	0.10	0.09	2.4E-01	5.0E-01	0.05	0.09	5.3E-01	7.0E-01
LPC(14:0)	-0.02	0.09	8.4E-01	9.5E-01	0.10	0.08	2.0E-01	4.7E-01	0.03	0.08	7.3E-01	8.4E-01
LPC(18:0)	0.01	0.09	8.8E-01	9.7E-01	0.12	0.09	1.6E-01	4.1E-01	0.10	0.09	2.7E-01	4.6E-01
LPE(22:6)	0.12	0.09	1.9E-01	3.9E-01	0.25	0.09	3.4E-03	3.3E-02	0.24	0.08	5.0E-03	4.6E-02
LPE(20:4)	0.10	0.09	2.6E-01	5.2E-01	0.23	0.09	7.1E-03	4.6E-02	0.20	0.09	1.7E-02	9.1E-02
LPE(16:0)	0.05	0.09	5.5E-01	7.8E-01	0.16	0.08	5.6E-02	2.0E-01	0.06	0.09	4.8E-01	6.7E-01
LPE(18:0)	0.04	0.09	6.3E-01	8.5E-01	0.14	0.09	9.4E-02	3.1E-01	0.08	0.09	3.3E-01	5.2E-01
LPE(18:2)	0.03	0.09	7.4E-01	9.2E-01	0.15	0.08	7.5E-02	2.5E-01	0.08	0.08	3.3E-01	5.2E-01
LPE(20:0)	-0.01	0.09	9.3E-01	9.9E-01	0.10	0.09	2.6E-01	5.1E-01	0.06	0.09	5.2E-01	6.9E-01
LPE(18:1)	0.00	0.09	9.6E-01	1.0E+00	0.12	0.08	1.4E-01	4.1E-01	0.03	0.09	7.1E-01	8.3E-01
LPE(22:0)	0.00	0.09	9.7E-01	1.0E+00	0.10	0.09	2.5E-01	5.0E-01	0.04	0.09	6.2E-01	7.6E-01
MAG(14:1)	0.14	0.09	1.2E-01	3.0E-01	0.13	0.09	1.4E-01	4.0E-01	0.13	0.09	1.2E-01	2.9E-01
MAG(16:1)	-0.05	0.09	5.8E-01	8.1E-01	-0.13	0.09	1.5E-01	4.1E-01	-0.10	0.09	2.3E-01	4.3E-01
MAG(18:0)	0.00	0.09	1.0E+00	1.0E+00	-0.01	0.09	9.4E-01	9.7E-01	-0.02	0.09	8.1E-01	8.8E-01
N-oleoylethanolamine palmithoylethanolamide	-0.06	0.09	5.1E-01	7.6E-01	-0.02	0.09	7.9E-01	9.0E-01	-0.02	0.08	8.5E-01	9.0E-01
PC(32:2)	-0.19	0.08	2.6E-02	1.4E-01	-0.08	0.08	2.8E-01	5.1E-01	-0.19	0.08	1.6E-02	8.6E-02
PC(30:1)	-0.18	0.08	2.6E-02	1.4E-01	-0.07	0.08	3.9E-01	6.2E-01	-0.17	0.08	3.0E-02	1.4E-01
PC(38:2)	-0.19	0.09	2.9E-02	1.4E-01	-0.10	0.08	2.1E-01	4.9E-01	-0.15	0.08	6.6E-02	2.1E-01
PC(34:4)	-0.17	0.09	5.2E-02	1.9E-01	-0.02	0.08	7.9E-01	9.0E-01	-0.14	0.08	8.6E-02	2.5E-01
PC(32:1)	-0.15	0.08	7.5E-02	2.4E-01	-0.06	0.08	4.6E-01	6.4E-01	-0.13	0.08	9.4E-02	2.6E-01
PC(38:3)	-0.15	0.09	8.1E-02	2.5E-01	-0.03	0.08	7.5E-01	9.0E-01	-0.06	0.08	4.5E-01	6.5E-01
PC(36:3)	-0.15	0.08	8.4E-02	2.5E-01	-0.09	0.08	2.9E-01	5.1E-01	-0.13	0.08	1.1E-01	2.9E-01
PC(34:3)	-0.15	0.09	8.5E-02	2.5E-01	-0.10	0.08	2.3E-01	4.9E-01	-0.17	0.08	4.6E-02	1.8E-01
PC(30:0)	-0.14	0.08	1.0E-01	2.8E-01	-0.06	0.08	4.6E-01	6.4E-01	-0.14	0.08	7.6E-02	2.3E-01
PC(36:1)	-0.12	0.09	1.6E-01	3.6E-01	-0.05	0.08	5.9E-01	7.6E-01	-0.10	0.09	2.6E-01	4.4E-01
PC(36:0)	-0.12	0.09	1.7E-01	3.8E-01	-0.07	0.09	4.4E-01	6.4E-01	-0.05	0.09	5.6E-01	7.2E-01
PC(40:10)	-0.10	0.09	2.7E-01	5.2E-01	0.02	0.09	7.8E-01	9.0E-01	-0.02	0.09	7.9E-01	8.8E-01
PC(34:1)	-0.09	0.09	3.3E-01	5.7E-01	-0.02	0.08	7.7E-01	9.0E-01	-0.09	0.08	3.0E-01	4.9E-01
PC(34:2)	-0.07	0.09	4.2E-01	6.5E-01	-0.11	0.08	1.9E-01	4.4E-01	-0.12	0.08	1.3E-01	3.1E-01
PC(36:4)-A	-0.07	0.09	4.5E-01	6.9E-01	-0.03	0.08	7.2E-01	8.6E-01	-0.09	0.08	2.9E-01	4.8E-01
PC(36:4-hydroxy)	-0.04	0.09	6.3E-01	8.5E-01	0.00	0.08	1.0E+00	1.0E+00	-0.10	0.09	2.5E-01	4.4E-01
PC(34:0)	-0.04	0.09	6.7E-01	8.7E-01	-0.02	0.09	7.8E-01	9.0E-01	0.01	0.09	9.5E-01	9.6E-01
PC(36:2)	-0.03	0.09	6.9E-01	8.9E-01	-0.04	0.08	6.4E-01	8.2E-01	-0.04	0.08	6.1E-01	7.6E-01
PC(40:6)	-0.02	0.09	8.3E-01	9.5E-01	0.09	0.08	3.0E-01	5.2E-01	0.09	0.08	3.0E-01	4.9E-01

PC(32:0)	0.01	0.09	8.7E-01	9.7E-01	-0.02	0.09	8.4E-01	9.4E-01	0.01	0.09	8.9E-01	9.2E-01
PC(38:6)	-0.01	0.09	8.8E-01	9.7E-01	0.09	0.08	2.9E-01	5.1E-01	0.06	0.08	4.7E-01	6.6E-01
PC(38:4)	-0.01	0.09	9.0E-01	9.8E-01	0.05	0.08	5.1E-01	6.9E-01	0.08	0.08	3.5E-01	5.3E-01
PC(40:9)	0.01	0.09	9.3E-01	9.9E-01	0.13	0.08	1.3E-01	3.8E-01	0.11	0.08	1.8E-01	3.8E-01
PC(36:4)-B	0.00	0.09	9.7E-01	1.0E+00	0.06	0.09	5.0E-01	6.8E-01	0.02	0.08	8.1E-01	8.8E-01
PC(P-36:1)	-0.33	0.09	1.4E-04	2.4E-03	-0.29	0.08	5.2E-04	8.4E-03	-0.32	0.08	1.3E-04	3.5E-03
PC(P-36:2)	-0.29	0.09	8.1E-04	9.3E-03	-0.26	0.08	2.0E-03	2.2E-02	-0.31	0.08	2.5E-04	4.7E-03
PC(P-38:4)	-0.21	0.09	1.8E-02	1.1E-01	-0.12	0.08	1.5E-01	4.1E-01	-0.16	0.08	5.6E-02	2.0E-01
PC(P-36:4)	-0.21	0.09	1.9E-02	1.1E-01	-0.23	0.09	7.7E-03	4.8E-02	-0.23	0.09	7.2E-03	4.9E-02
PC(P-34:1)-A	-0.21	0.09	1.9E-02	1.1E-01	-0.24	0.09	4.7E-03	3.5E-02	-0.24	0.09	5.7E-03	4.9E-02
PC(P-36:3)	-0.19	0.09	3.0E-02	1.4E-01	-0.13	0.09	1.4E-01	4.0E-01	-0.18	0.09	3.4E-02	1.5E-01
PC(P-34:1)-B	-0.18	0.09	4.3E-02	1.8E-01	-0.16	0.09	6.0E-02	2.1E-01	-0.18	0.09	3.4E-02	1.5E-01
PC(P-40:7)	-0.14	0.09	1.1E-01	2.9E-01	-0.07	0.09	4.4E-01	6.4E-01	-0.10	0.09	2.3E-01	4.3E-01
PC(P-34:2)	-0.14	0.09	1.3E-01	3.1E-01	-0.12	0.09	1.7E-01	4.3E-01	-0.15	0.09	8.8E-02	2.5E-01
PC(p-38:6)	-0.08	0.09	3.6E-01	6.0E-01	-0.01	0.09	8.8E-01	9.5E-01	-0.05	0.09	5.7E-01	7.2E-01
PC(P-34:3)	-0.07	0.09	4.6E-01	7.0E-01	-0.06	0.09	5.1E-01	6.9E-01	-0.11	0.09	2.2E-01	4.2E-01
PC(P-36:5)-A	-0.05	0.09	5.4E-01	7.8E-01	-0.01	0.08	8.9E-01	9.5E-01	-0.06	0.09	4.6E-01	6.6E-01
PC(P-34:5)	0.03	0.09	7.0E-01	8.9E-01	0.12	0.08	1.5E-01	4.1E-01	0.05	0.08	5.5E-01	7.1E-01
PC(P-38:7)	0.02	0.09	8.1E-01	9.5E-01	0.09	0.08	3.0E-01	5.2E-01	0.06	0.08	4.8E-01	6.7E-01
PC(P-36:5)-B	0.00	0.09	1.0E+00	1.0E+00	0.06	0.08	4.5E-01	6.4E-01	0.04	0.08	6.6E-01	7.9E-01
PE(32:0)	-0.12	0.08	1.5E-01	3.4E-01	-0.05	0.08	5.4E-01	7.2E-01	-0.13	0.08	1.0E-01	2.8E-01
PE(38:4)	0.12	0.09	1.8E-01	3.8E-01	0.06	0.09	5.0E-01	6.8E-01	0.06	0.08	5.1E-01	6.9E-01
PE(38:6)	0.10	0.09	2.5E-01	4.9E-01	0.07	0.08	4.2E-01	6.2E-01	0.01	0.08	8.7E-01	9.1E-01
PE(36:4)	0.10	0.09	2.8E-01	5.2E-01	0.04	0.09	6.6E-01	8.3E-01	-0.02	0.09	8.5E-01	9.0E-01
PE(40:6)	0.08	0.09	3.4E-01	5.8E-01	0.08	0.08	3.2E-01	5.4E-01	0.05	0.08	5.4E-01	7.1E-01
PE(32:1)	-0.07	0.08	4.2E-01	6.5E-01	-0.03	0.08	6.5E-01	8.2E-01	-0.13	0.08	9.1E-02	2.6E-01
PE(34:0)	-0.07	0.09	4.2E-01	6.5E-01	-0.05	0.08	5.5E-01	7.2E-01	-0.09	0.08	3.0E-01	4.9E-01
PE(36:3)	-0.03	0.09	7.7E-01	9.3E-01	-0.07	0.08	4.1E-01	6.2E-01	-0.14	0.08	8.8E-02	2.5E-01
PE(36:0)	-0.02	0.09	8.1E-01	9.5E-01	-0.01	0.09	8.7E-01	9.4E-01	-0.03	0.08	6.9E-01	8.1E-01
PE(34:2)	0.02	0.09	8.2E-01	9.5E-01	-0.06	0.08	4.9E-01	6.8E-01	-0.13	0.08	1.2E-01	2.9E-01
PE(38:5)	-0.02	0.09	8.3E-01	9.5E-01	-0.03	0.08	6.8E-01	8.4E-01	-0.10	0.09	2.4E-01	4.3E-01
PE(38:2)	-0.02	0.09	8.4E-01	9.5E-01	-0.04	0.09	6.0E-01	7.8E-01	-0.06	0.08	5.1E-01	6.9E-01
PE(36:1)	-0.01	0.09	8.7E-01	9.7E-01	0.00	0.08	9.6E-01	9.8E-01	-0.10	0.09	2.4E-01	4.3E-01
PE(36:2)	0.01	0.09	9.0E-01	9.8E-01	-0.03	0.08	7.1E-01	8.6E-01	-0.11	0.08	1.9E-01	3.9E-01
PE(P-36:2)	-0.16	0.09	7.0E-02	2.3E-01	-0.08	0.08	3.2E-01	5.4E-01	-0.15	0.09	8.0E-02	2.4E-01
PE(P-36:4)	-0.15	0.09	8.5E-02	2.5E-01	-0.06	0.08	4.5E-01	6.4E-01	-0.16	0.08	5.8E-02	2.0E-01

PE(P-38:3)	-0.15	0.09	8.8E-02	2.5E-01	-0.11	0.08	2.0E-01	4.6E-01	-0.18	0.09	3.6E-02	1.6E-01
PE(P-34:2)	-0.14	0.09	1.2E-01	2.9E-01	-0.08	0.08	3.7E-01	6.0E-01	-0.14	0.09	1.1E-01	2.9E-01
PE(P-36:3)	-0.13	0.09	1.3E-01	3.1E-01	-0.07	0.08	4.3E-01	6.2E-01	-0.14	0.08	9.7E-02	2.6E-01
PE(P-36:1)	-0.11	0.09	2.0E-01	4.2E-01	-0.12	0.09	1.5E-01	4.1E-01	-0.15	0.09	7.2E-02	2.2E-01
PE(P-40:7)	-0.08	0.09	3.5E-01	5.9E-01	-0.01	0.08	8.6E-01	9.4E-01	-0.08	0.08	3.6E-01	5.4E-01
PE(P-36:5)	0.07	0.09	4.0E-01	6.5E-01	0.15	0.08	7.2E-02	2.5E-01	0.11	0.08	2.0E-01	4.0E-01
PE(P-38:6)	-0.05	0.09	5.4E-01	7.8E-01	0.05	0.08	5.7E-01	7.5E-01	-0.03	0.09	7.6E-01	8.7E-01
PE(P-34:3)	-0.05	0.09	5.6E-01	7.9E-01	0.00	0.08	9.9E-01	9.9E-01	-0.07	0.08	4.2E-01	6.1E-01
PE(P-38:7)	-0.03	0.09	7.6E-01	9.3E-01	0.01	0.08	9.5E-01	9.8E-01	-0.04	0.08	6.2E-01	7.6E-01
PE(P-38:5)	0.00	0.09	9.7E-01	1.0E+00	0.10	0.09	2.2E-01	4.9E-01	0.05	0.09	5.7E-01	7.2E-01
PI(36:2)	-0.25	0.09	3.8E-03	3.2E-02	-0.28	0.08	5.6E-04	8.4E-03	-0.38	0.08	8.4E-06	2.9E-04
PI(36:4)	-0.13	0.09	1.5E-01	3.4E-01	0.00	0.08	9.7E-01	9.8E-01	-0.10	0.08	2.4E-01	4.3E-01
PI(38:4)	-0.10	0.09	2.6E-01	5.0E-01	0.01	0.09	9.2E-01	9.6E-01	-0.05	0.09	5.3E-01	7.0E-01
PS(34:0)	0.12	0.09	1.9E-01	3.9E-01	0.12	0.09	1.6E-01	4.1E-01	0.11	0.09	1.9E-01	3.9E-01
SM(14:0)	-0.23	0.09	9.5E-03	6.9E-02	-0.20	0.08	1.8E-02	8.4E-02	-0.23	0.08	7.0E-03	4.9E-02
SM(24:0)	-0.20	0.09	2.4E-02	1.3E-01	-0.11	0.09	1.8E-01	4.3E-01	-0.17	0.09	5.3E-02	2.0E-01
SM(22:0)	-0.20	0.09	2.6E-02	1.4E-01	-0.12	0.09	1.7E-01	4.3E-01	-0.16	0.09	5.9E-02	2.0E-01
SM(18:1)	-0.19	0.09	3.2E-02	1.4E-01	-0.18	0.08	3.0E-02	1.2E-01	-0.15	0.08	8.4E-02	2.5E-01
SM(16:1)	-0.18	0.09	4.6E-02	1.8E-01	-0.19	0.09	2.3E-02	9.9E-02	-0.20	0.08	2.1E-02	1.1E-01
SM(20:0)	-0.17	0.09	5.6E-02	2.0E-01	-0.09	0.09	2.9E-01	5.1E-01	-0.13	0.09	1.3E-01	3.0E-01
SM(16:0)	-0.14	0.09	1.3E-01	3.1E-01	-0.13	0.09	1.3E-01	3.9E-01	-0.12	0.09	1.5E-01	3.3E-01
SM(24:1)	-0.13	0.09	1.5E-01	3.4E-01	-0.07	0.09	4.1E-01	6.2E-01	-0.09	0.09	3.1E-01	5.0E-01
SM(18:0)	-0.06	0.09	4.9E-01	7.4E-01	-0.04	0.09	6.2E-01	7.9E-01	0.01	0.09	9.2E-01	9.4E-01
sphingosine	0.04	0.09	6.4E-01	8.5E-01	0.07	0.09	4.0E-01	6.2E-01	0.10	0.09	2.4E-01	4.3E-01
cholesterol	-0.15	0.09	8.6E-02	2.5E-01	-0.09	0.09	2.7E-01	5.1E-01	-0.12	0.09	1.5E-01	3.3E-01
campesterol	-0.12	0.09	1.8E-01	3.8E-01	-0.08	0.09	3.8E-01	6.1E-01	-0.10	0.09	2.3E-01	4.3E-01
TAG(56:7)	0.36	0.08	2.4E-05	5.1E-04	0.28	0.08	4.0E-04	7.7E-03	0.34	0.08	3.2E-05	9.5E-04
TAG(54:6)	0.33	0.08	4.7E-05	8.9E-04	0.31	0.08	8.0E-05	2.8E-03	0.35	0.08	7.7E-06	2.9E-04
TAG(54:5)	0.34	0.09	1.7E-04	2.6E-03	0.21	0.09	1.3E-02	6.5E-02	0.25	0.09	4.2E-03	4.0E-02
TAG(54:10)	-0.29	0.09	9.9E-04	9.9E-03	-0.22	0.09	1.0E-02	5.3E-02	-0.26	0.09	2.0E-03	2.4E-02
TAG(56:8)	0.27	0.08	1.3E-03	1.2E-02	0.18	0.08	1.9E-02	8.6E-02	0.26	0.08	1.0E-03	1.4E-02
TAG(54:7)	0.27	0.09	2.7E-03	2.3E-02	0.24	0.09	5.4E-03	3.9E-02	0.23	0.09	7.3E-03	4.9E-02
TAG(52:2)	0.23	0.08	6.3E-03	5.1E-02	0.18	0.08	3.0E-02	1.2E-01	0.17	0.08	4.1E-02	1.7E-01
TAG(52:4)	0.24	0.09	6.8E-03	5.1E-02	0.12	0.09	1.8E-01	4.3E-01	0.16	0.09	6.2E-02	2.0E-01
TAG(56:9)	0.21	0.09	1.4E-02	9.3E-02	0.22	0.08	8.1E-03	4.8E-02	0.24	0.08	3.6E-03	3.8E-02
TAG(50:2)	0.21	0.09	1.6E-02	1.0E-01	0.23	0.08	4.2E-03	3.5E-02	0.16	0.08	5.5E-02	2.0E-01

TAG(58:11)	0.19	0.09	2.8E-02	1.4E-01	0.21	0.08	9.6E-03	5.3E-02	0.22	0.08	6.7E-03	4.9E-02
TAG(52:3)	0.19	0.09	2.8E-02	1.4E-01	0.10	0.08	2.6E-01	5.1E-01	0.13	0.08	1.3E-01	3.0E-01
TAG(50:1)	0.19	0.09	2.9E-02	1.4E-01	0.20	0.08	1.7E-02	8.0E-02	0.13	0.08	1.3E-01	3.0E-01
TAG(56:5)	0.18	0.08	3.3E-02	1.4E-01	0.09	0.08	2.3E-01	4.9E-01	0.22	0.08	6.7E-03	4.9E-02
TAG(52:6)	0.18	0.09	4.0E-02	1.7E-01	0.25	0.09	4.3E-03	3.5E-02	0.19	0.09	2.6E-02	1.2E-01
TAG(54:4)	0.18	0.09	4.2E-02	1.7E-01	0.07	0.09	4.3E-01	6.2E-01	0.10	0.09	2.4E-01	4.3E-01
TAG(54:8)	0.18	0.09	4.6E-02	1.8E-01	0.25	0.09	4.2E-03	3.5E-02	0.22	0.09	1.2E-02	6.9E-02
TAG(52:5)	0.18	0.09	4.7E-02	1.8E-01	0.10	0.09	2.2E-01	4.9E-01	0.14	0.09	1.1E-01	2.8E-01
TAG(56:10)	0.17	0.09	5.3E-02	1.9E-01	0.23	0.09	6.1E-03	4.3E-02	0.23	0.08	6.6E-03	4.9E-02
TAG(58:10)	0.15	0.08	5.9E-02	2.1E-01	0.12	0.08	1.1E-01	3.6E-01	0.18	0.08	2.4E-02	1.2E-01
TAG(54:2)	0.17	0.09	6.2E-02	2.1E-01	0.13	0.08	1.2E-01	3.6E-01	0.08	0.08	3.5E-01	5.3E-01
TAG(47:1)	-0.16	0.09	6.9E-02	2.3E-01	-0.07	0.08	3.8E-01	6.1E-01	-0.16	0.08	5.3E-02	2.0E-01
TAG(58:8)	0.16	0.09	7.1E-02	2.3E-01	0.10	0.08	2.4E-01	5.0E-01	0.13	0.08	1.3E-01	3.0E-01
TAG(53:3)	0.16	0.09	7.6E-02	2.4E-01	0.07	0.09	4.1E-01	6.2E-01	0.09	0.09	2.8E-01	4.7E-01
TAG(56:6)	0.14	0.08	9.5E-02	2.7E-01	0.13	0.08	1.1E-01	3.5E-01	0.20	0.08	1.7E-02	9.0E-02
TAG(54:3)	0.15	0.09	1.0E-01	2.8E-01	0.02	0.09	8.2E-01	9.3E-01	0.05	0.09	5.3E-01	7.0E-01
TAG(51:3)	0.14	0.09	1.1E-01	2.9E-01	0.08	0.08	3.2E-01	5.4E-01	0.08	0.08	3.4E-01	5.2E-01
TAG(52:7)	0.14	0.09	1.1E-01	2.9E-01	0.26	0.08	2.4E-03	2.5E-02	0.18	0.09	4.1E-02	1.7E-01
TAG(58:7)	0.13	0.09	1.5E-01	3.4E-01	0.07	0.08	4.1E-01	6.2E-01	0.08	0.08	3.2E-01	5.2E-01
TAG(52:1)	0.13	0.09	1.5E-01	3.4E-01	0.18	0.08	3.0E-02	1.2E-01	0.08	0.09	3.5E-01	5.3E-01
TAG(58:9)	0.12	0.08	1.5E-01	3.4E-01	0.05	0.08	5.1E-01	6.9E-01	0.11	0.08	1.6E-01	3.5E-01
TAG(60:12)	0.11	0.08	1.6E-01	3.6E-01	0.11	0.08	1.7E-01	4.3E-01	0.15	0.08	5.9E-02	2.0E-01
TAG(49:2)	-0.12	0.09	1.7E-01	3.6E-01	-0.04	0.08	6.2E-01	7.9E-01	-0.13	0.08	1.1E-01	2.8E-01
TAG(53:2)	0.11	0.09	2.2E-01	4.5E-01	0.09	0.08	3.1E-01	5.4E-01	0.07	0.08	4.1E-01	5.9E-01
TAG(48:2)	-0.10	0.08	2.4E-01	4.8E-01	0.02	0.08	8.4E-01	9.4E-01	-0.10	0.08	2.0E-01	4.0E-01
TAG(47:2)	-0.09	0.09	2.7E-01	5.2E-01	0.01	0.08	9.0E-01	9.6E-01	-0.10	0.08	2.2E-01	4.3E-01
TAG(45:3)	-0.09	0.09	2.8E-01	5.2E-01	-0.01	0.08	9.4E-01	9.7E-01	-0.17	0.08	4.8E-02	1.8E-01
TAG(50:6)	0.10	0.09	2.8E-01	5.2E-01	0.22	0.08	9.1E-03	5.3E-02	0.11	0.09	1.8E-01	3.8E-01
TAG(49:3)	-0.09	0.08	2.9E-01	5.4E-01	-0.04	0.08	6.6E-01	8.2E-01	-0.11	0.08	1.8E-01	3.8E-01
TAG(45:1)	-0.09	0.09	3.1E-01	5.5E-01	0.01	0.08	8.9E-01	9.5E-01	-0.09	0.08	2.8E-01	4.7E-01
TAG(50:5)	0.09	0.09	3.1E-01	5.5E-01	0.19	0.08	2.2E-02	9.8E-02	0.10	0.08	2.5E-01	4.3E-01
TAG(54:9)	0.09	0.09	3.1E-01	5.6E-01	0.19	0.08	2.4E-02	1.0E-01	0.17	0.08	4.7E-02	1.8E-01
TAG(46:0)	-0.09	0.09	3.2E-01	5.6E-01	0.02	0.08	7.9E-01	9.0E-01	-0.11	0.08	2.1E-01	4.1E-01
TAG(54:1)	0.09	0.09	3.4E-01	5.8E-01	0.13	0.08	1.2E-01	3.6E-01	0.03	0.09	7.6E-01	8.7E-01
TAG(55:3)	0.08	0.09	3.6E-01	6.0E-01	-0.02	0.09	8.3E-01	9.4E-01	0.00	0.08	9.9E-01	9.9E-01
TAG(55:2)	0.08	0.09	3.7E-01	6.1E-01	0.10	0.08	2.3E-01	4.9E-01	0.00	0.08	9.9E-01	9.9E-01

TAG(56:4)	0.08	0.09	3.8E-01	6.2E-01	0.00	0.09	9.7E-01	9.8E-01	0.02	0.09	8.1E-01	8.8E-01
TAG(45:0)	-0.08	0.09	3.9E-01	6.3E-01	0.01	0.08	8.7E-01	9.4E-01	-0.08	0.08	3.2E-01	5.1E-01
TAG(46:1)	-0.07	0.09	4.1E-01	6.5E-01	0.05	0.08	5.4E-01	7.2E-01	-0.08	0.08	3.4E-01	5.3E-01
TAG(43:2)	-0.07	0.09	4.1E-01	6.5E-01	0.01	0.08	8.7E-01	9.4E-01	-0.10	0.08	2.1E-01	4.1E-01
TAG(51:2)	-0.07	0.09	4.2E-01	6.5E-01	-0.01	0.08	9.2E-01	9.6E-01	-0.08	0.08	3.4E-01	5.3E-01
TAG(45:2)	-0.07	0.09	4.3E-01	6.6E-01	0.01	0.08	8.6E-01	9.4E-01	-0.11	0.08	1.7E-01	3.8E-01
TAG(51:0)	-0.06	0.09	5.1E-01	7.6E-01	0.03	0.08	7.1E-01	8.6E-01	-0.07	0.09	4.0E-01	5.9E-01
TAG(48:4)	0.06	0.09	5.2E-01	7.7E-01	0.16	0.08	5.3E-02	1.9E-01	0.05	0.08	5.3E-01	7.0E-01
TAG(43:0)	-0.05	0.09	5.8E-01	8.1E-01	0.01	0.08	9.3E-01	9.6E-01	-0.06	0.08	4.9E-01	6.9E-01
TAG(52:0)	0.05	0.09	6.0E-01	8.2E-01	0.11	0.08	1.7E-01	4.3E-01	0.00	0.09	9.9E-01	9.9E-01
TAG(43:1)	-0.04	0.09	6.2E-01	8.5E-01	0.03	0.08	6.8E-01	8.4E-01	-0.07	0.08	3.8E-01	5.7E-01
TAG(56:2)	0.04	0.09	6.2E-01	8.5E-01	0.09	0.08	2.7E-01	5.1E-01	-0.03	0.08	7.4E-01	8.5E-01
TAG(56:3)	0.04	0.09	6.3E-01	8.5E-01	0.01	0.08	8.8E-01	9.5E-01	-0.06	0.08	5.0E-01	6.9E-01
TAG(50:4)	0.04	0.09	6.5E-01	8.5E-01	0.09	0.08	2.5E-01	5.0E-01	0.04	0.08	6.7E-01	7.9E-01
TAG(48:5)	0.04	0.09	6.7E-01	8.7E-01	0.14	0.08	7.8E-02	2.6E-01	0.04	0.08	6.5E-01	7.9E-01
TAG(50:0)	0.04	0.09	6.7E-01	8.7E-01	0.13	0.08	1.2E-01	3.7E-01	0.01	0.09	8.7E-01	9.1E-01
TAG(48:1)	-0.03	0.09	7.3E-01	9.2E-01	0.07	0.08	3.7E-01	6.0E-01	-0.05	0.08	5.0E-01	6.9E-01
TAG(44:0)	-0.03	0.09	7.4E-01	9.2E-01	0.06	0.08	4.2E-01	6.2E-01	-0.04	0.08	6.0E-01	7.6E-01
TAG(48:0)	-0.03	0.09	7.7E-01	9.3E-01	0.07	0.08	3.8E-01	6.1E-01	-0.04	0.09	6.3E-01	7.7E-01
TAG(48:3)	-0.02	0.08	8.0E-01	9.5E-01	0.09	0.08	2.3E-01	4.9E-01	-0.02	0.08	7.9E-01	8.8E-01
TAG(51:1)	0.02	0.09	8.2E-01	9.5E-01	0.09	0.08	2.8E-01	5.1E-01	0.01	0.09	9.2E-01	9.4E-01
TAG(56:1)	0.02	0.09	8.2E-01	9.5E-01	0.11	0.08	1.8E-01	4.3E-01	-0.02	0.08	8.3E-01	8.8E-01
TAG(41:0)	-0.02	0.09	8.3E-01	9.5E-01	0.03	0.08	7.6E-01	9.0E-01	-0.03	0.08	6.7E-01	8.0E-01
TAG(46:4)	0.02	0.09	8.5E-01	9.5E-01	0.09	0.08	2.6E-01	5.1E-01	-0.02	0.08	8.2E-01	8.8E-01
TAG(47:0)	-0.01	0.09	8.8E-01	9.7E-01	0.08	0.08	3.5E-01	5.8E-01	-0.03	0.08	7.0E-01	8.3E-01
TAG(44:2)	0.01	0.09	9.3E-01	9.9E-01	0.09	0.08	2.7E-01	5.1E-01	-0.02	0.08	8.2E-01	8.8E-01
TAG(58:6)	-0.01	0.09	9.3E-01	9.9E-01	0.05	0.08	5.9E-01	7.6E-01	0.01	0.08	9.1E-01	9.4E-01
TAG(44:1)	-0.01	0.09	9.4E-01	9.9E-01	0.09	0.08	2.8E-01	5.1E-01	-0.02	0.08	7.6E-01	8.7E-01
TAG(42:0)	0.00	0.09	9.8E-01	1.0E+00	0.07	0.08	4.0E-01	6.2E-01	-0.02	0.08	8.0E-01	8.8E-01
TAG(46:3)	0.00	0.09	9.8E-01	1.0E+00	0.09	0.08	2.4E-01	5.0E-01	-0.02	0.08	7.9E-01	8.8E-01
TAG(46:2)	0.00	0.09	9.9E-01	1.0E+00	0.11	0.08	1.8E-01	4.3E-01	-0.01	0.08	8.7E-01	9.1E-01
TAG(50:3)	0.00	0.08	9.9E-01	1.0E+00	0.02	0.08	8.4E-01	9.4E-01	-0.04	0.08	6.2E-01	7.6E-01
TAG(49:0)	0.00	0.09	9.9E-01	1.0E+00	0.09	0.08	2.8E-01	5.1E-01	-0.02	0.08	7.8E-01	8.8E-01

Abbreviations: BMI, body mass index; CE, cholesterol esters; Cer, ceramides; DAG, diacylglycerols; LPC, lysophosphatidylcholines; LPE, lysophosphatidylethanolamines; MAG, monoacylglycerols; PC, phosphatidylcholines; PC-P, phosphatidylcholine plasmalogens; PE,

phosphatidylethanolamines; PE-P, phosphatidylethanolamine plasmalogens; PI, phosphatidylinositols; PS, phosphatidylserine; SM, sphingomyelins; TAG, triacylglycerols.

Model 1: adjusted for age at delivery, race and ethnicity, education, smoking status during pregnancy, parity, prepregnancy BMI, hypertensive disorder during pregnancy, and gestational age at birth.

Model 2: adjusted for age at delivery, race and ethnicity, education, smoking status during pregnancy, parity, prepregnancy BMI, hypertensive disorder during pregnancy, and C-section.

Model 3: adjusted for age at delivery, race and ethnicity, education, smoking status during pregnancy, parity, prepregnancy BMI, hypertensive disorder during pregnancy, and prenatal vitamin intake during 3rd trimester.

Supplemental Table S10. Associations between gestational diabetes and lipid species stratified by prepregnancy overweight or obesity status.

Metab	Women with OWO				Women without OWO				P_int*
	β	se	P value	p_fdr	β	se	P value	p_fdr	
CE(14:0)	-0.53	0.09	1.5E-08	4.9E-07	-0.41	0.15	4.7E-03	3.6E-02	0.55
SM(14:0)	-0.24	0.10	1.9E-02	2.6E-02	-0.19	0.15	1.9E-01	2.2E-01	0.80
CE(16:0)	-0.18	0.10	7.9E-02	8.4E-02	-0.28	0.14	4.5E-02	8.3E-02	0.54
Cer(d18:1/16:0)	0.17	0.10	9.7E-02	1.0E-01	0.35	0.14	1.3E-02	3.8E-02	0.28
CE(16:1)	-0.40	0.10	3.2E-05	5.2E-04	-0.35	0.14	1.2E-02	3.8E-02	0.74
CE(18:0)	-0.20	0.10	4.3E-02	5.2E-02	-0.25	0.15	9.5E-02	1.3E-01	0.80
CE(18:1)	-0.27	0.10	6.4E-03	1.3E-02	-0.38	0.15	1.0E-02	3.8E-02	0.54
CE(18:2)	-0.30	0.10	3.8E-03	9.0E-03	-0.35	0.14	1.4E-02	3.8E-02	0.76
CE(18:3)	-0.39	0.10	4.8E-05	5.2E-04	-0.37	0.15	1.5E-02	3.8E-02	0.94
CE(20:3)	-0.30	0.10	3.5E-03	8.8E-03	-0.27	0.15	7.3E-02	1.1E-01	0.85
CE(22:4)	-0.25	0.10	1.2E-02	1.9E-02	-0.25	0.15	8.5E-02	1.2E-01	0.99
LPC(22:6)	0.25	0.10	1.5E-02	2.3E-02	0.17	0.15	2.5E-01	2.8E-01	0.63
LPE(22:6)	0.27	0.10	9.4E-03	1.6E-02	0.19	0.15	1.9E-01	2.2E-01	0.66
DAG(34:1)	0.22	0.10	3.2E-02	4.1E-02	0.32	0.15	2.9E-02	6.4E-02	0.58
PC(P-34:1)-A	-0.21	0.11	4.8E-02	5.5E-02	-0.29	0.15	5.2E-02	9.1E-02	0.69
PC(P-36:1)	-0.28	0.10	6.9E-03	1.3E-02	-0.40	0.15	6.6E-03	3.6E-02	0.54
DAG(36:2)	0.24	0.10	1.8E-02	2.5E-02	0.23	0.14	9.9E-02	1.3E-01	0.97
PC(P-36:2)	-0.27	0.10	7.6E-03	1.4E-02	-0.41	0.15	5.6E-03	3.6E-02	0.46
PI(36:2)	-0.36	0.10	5.8E-04	2.4E-03	-0.45	0.14	1.7E-03	2.2E-02	0.68
DAG(36:3)	0.37	0.10	2.0E-04	1.1E-03	0.19	0.15	1.9E-01	2.2E-01	0.31
DAG(36:4)	0.37	0.10	3.0E-04	1.4E-03	0.15	0.15	3.0E-01	3.1E-01	0.23
PC(P-36:4)	-0.16	0.11	1.3E-01	1.3E-01	-0.37	0.15	1.2E-02	3.8E-02	0.27
DAG(38:4)	0.28	0.10	6.1E-03	1.3E-02	0.23	0.14	1.1E-01	1.3E-01	0.77
DAG(38:5)	0.40	0.10	6.9E-05	5.7E-04	0.47	0.14	1.1E-03	2.2E-02	0.70
TAG(54:10)	-0.22	0.10	3.0E-02	4.0E-02	-0.32	0.15	3.5E-02	6.7E-02	0.64
TAG(54:5)	0.30	0.10	2.8E-03	7.8E-03	0.09	0.16	5.7E-01	5.7E-01	0.26
TAG(54:6)	0.38	0.10	1.1E-04	6.9E-04	0.34	0.14	1.2E-02	3.8E-02	0.84
TAG(56:10)	0.19	0.10	6.3E-02	6.9E-02	0.32	0.14	2.8E-02	6.4E-02	0.51
TAG(56:5)	0.32	0.10	1.7E-03	5.1E-03	0.15	0.14	2.6E-01	2.8E-01	0.35
TAG(56:7)	0.33	0.10	7.7E-04	2.8E-03	0.43	0.14	2.0E-03	2.2E-02	0.58
TAG(56:8)	0.32	0.10	1.0E-03	3.4E-03	0.24	0.14	7.8E-02	1.2E-01	0.62
TAG(56:9)	0.26	0.10	1.2E-02	1.9E-02	0.25	0.14	7.2E-02	1.1E-01	0.95
TAG(58:11)	0.20	0.10	4.8E-02	5.5E-02	0.30	0.14	3.3E-02	6.7E-02	0.57

Abbreviations: CE, cholesterol esters; Cer, ceramides; DAG, diacylglycerols; LPC, lysophosphatidylcholines; LPE, lysophosphatidylethanolamines; PC, phosphatidylcholines; PC-P, phosphatidylcholine plasmalogens; PI, phosphatidylinositols; SM, sphingomyelins; TAG, triacylglycerols. *P_int, p value for interaction.

Models were adjusted for age at delivery, race and ethnicity, education, smoking status during pregnancy, parity, and hypertensive disorder during pregnancy.

Supplemental Table S11. Comparison of early postpartum plasma lipid species between women who developed T2D in the first 5 years postpartum vs those who developed T2D in more than 5 years after delivery (reference group).

Lipid species	Unadjusted model				Adjusted model				Class subclass
	β	se	p	p_fdr	β	se	p	p_fdr	
CE(16:1)	-0.36	0.15	1.50E-02	5.60E-02	-0.31	0.15	3.40E-02	1.20E-01	CE
CE(14:0)	-0.42	0.16	8.20E-03	4.50E-02	-0.32	0.15	3.60E-02	1.20E-01	CE
CE(20:3)	-0.19	0.15	2.20E-01	3.30E-01	-0.13	0.16	4.10E-01	6.10E-01	CE
CE(18:1)	-0.21	0.16	2.00E-01	3.10E-01	-0.13	0.17	4.30E-01	6.20E-01	CE
CE(18:3)	-0.24	0.15	1.10E-01	2.10E-01	-0.09	0.15	5.60E-01	7.10E-01	CE
CE(18:2)	-0.15	0.15	2.90E-01	4.10E-01	-0.08	0.15	6.30E-01	7.70E-01	CE
CE(16:0)	0.04	0.16	7.90E-01	8.70E-01	0.07	0.16	6.80E-01	7.80E-01	CE
CE(22:4)	-0.07	0.17	6.60E-01	7.50E-01	0.06	0.17	7.30E-01	7.90E-01	CE
CE(18:0)	-0.12	0.17	4.80E-01	5.60E-01	-0.06	0.18	7.40E-01	7.90E-01	CE
Cer(d18:1/16:0)	0.00	0.15	1.00E+00	1.00E+00	-0.01	0.16	9.30E-01	9.30E-01	Cer
DAG(36:4)	0.30	0.16	6.10E-02	1.50E-01	0.29	0.16	7.40E-02	2.00E-01	DAG
DAG(38:5)	0.29	0.15	6.30E-02	1.50E-01	0.18	0.16	2.40E-01	4.50E-01	DAG
DAG(38:4)	0.21	0.15	1.70E-01	3.00E-01	0.18	0.16	2.50E-01	4.50E-01	DAG
DAG(36:3)	0.20	0.15	1.70E-01	3.00E-01	0.17	0.15	2.80E-01	4.70E-01	DAG
DAG(36:2)	-0.04	0.15	8.20E-01	8.70E-01	-0.10	0.16	5.30E-01	7.00E-01	DAG
DAG(34:1)	0.01	0.15	9.60E-01	9.90E-01	-0.07	0.15	6.70E-01	7.80E-01	DAG
LPC(22:6)	0.16	0.16	3.30E-01	4.30E-01	0.12	0.16	4.70E-01	6.50E-01	LPC
LPE(22:6)	0.19	0.16	2.30E-01	3.40E-01	0.17	0.16	3.00E-01	4.70E-01	LPE
PC(P-36:1)	-0.58	0.16	2.30E-04	7.60E-03	-0.50	0.16	1.80E-03	5.00E-02	PC_P
PC(P-36:2)	-0.49	0.15	1.10E-03	1.20E-02	-0.36	0.15	1.70E-02	9.00E-02	PC_P
PC(P-34:1)-A	-0.29	0.16	6.20E-02	1.50E-01	-0.24	0.16	1.40E-01	3.60E-01	PC_P
PC(P-36:4)	-0.26	0.16	1.00E-01	2.10E-01	-0.19	0.16	2.30E-01	4.50E-01	PC_P
PI(36:2)	-0.11	0.15	4.60E-01	5.60E-01	-0.03	0.15	8.30E-01	8.60E-01	PI
SM(14:0)	-0.20	0.15	2.00E-01	3.10E-01	-0.19	0.16	2.20E-01	4.50E-01	SM
TAG(56:8)	0.52	0.16	1.10E-03	1.20E-02	0.47	0.16	3.00E-03	5.00E-02	TAG
TAG(56:7)	0.51	0.16	1.60E-03	1.30E-02	0.44	0.16	5.20E-03	5.70E-02	TAG
TAG(54:6)	0.45	0.16	5.10E-03	3.40E-02	0.40	0.15	9.90E-03	7.60E-02	TAG
TAG(58:11)	0.42	0.17	1.20E-02	5.60E-02	0.43	0.17	1.20E-02	7.60E-02	TAG
TAG(56:9)	0.40	0.17	1.50E-02	5.60E-02	0.40	0.17	1.90E-02	9.00E-02	TAG
TAG(56:10)	0.35	0.17	3.90E-02	1.20E-01	0.38	0.17	2.90E-02	1.20E-01	TAG
TAG(56:5)	0.39	0.16	1.80E-02	6.00E-02	0.31	0.16	5.90E-02	1.80E-01	TAG
TAG(54:10)	-0.25	0.16	1.10E-01	2.10E-01	-0.21	0.16	2.10E-01	4.50E-01	TAG
TAG(54:5)	0.13	0.14	3.40E-01	4.40E-01	0.15	0.15	3.00E-01	4.70E-01	TAG

Abbreviations: CE, cholesterol esters; Cer, ceramides; DAG, diacylglycerols; LPC, lysophosphatidylcholines; LPE, lysophosphatidylethanolamines; PC, phosphatidylcholines; PC-P, phosphatidylcholine plasmalogens; PI, phosphatidylinositols; SM, sphingomyelins; TAG, triacylglycerols. Bold represents significant (FDR corrected $p < 0.05$).

Adjusted models included age at delivery, race and ethnicity, education, smoking status during pregnancy, parity, prepregnancy body mass index, hypertensive disorder during pregnancy, and family history of diabetes.