Electronic Supplementary Information

Quantitative analysis of 10 classes of phospholipids by ultrahigh-performance liquid chromatography tandem triple-quadrupole mass spectrometer

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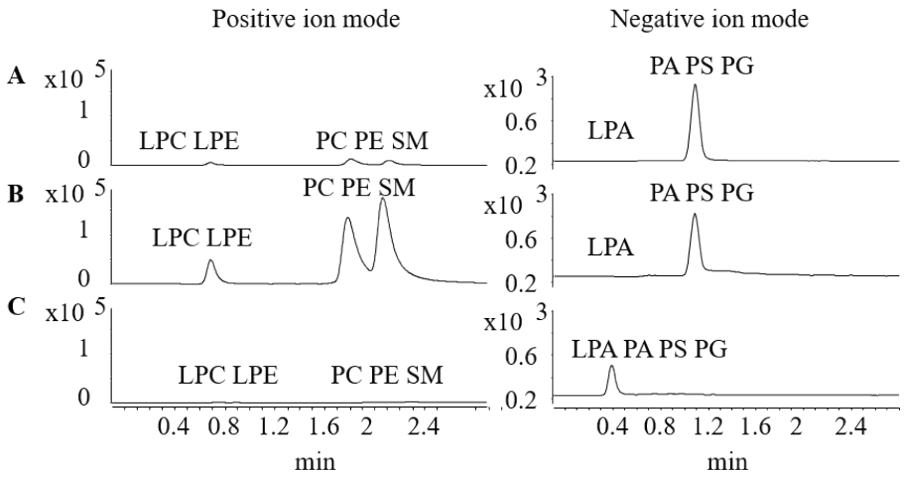
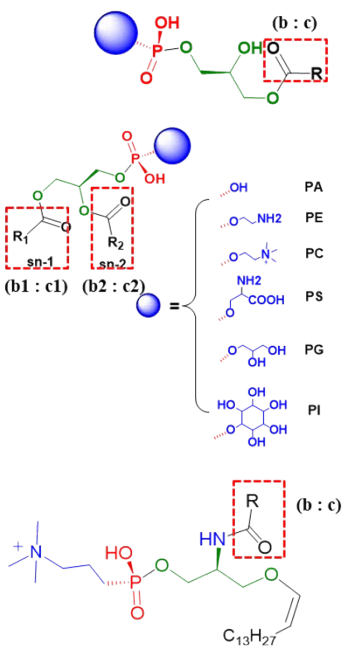


Fig S-1. Choice of mobile phase. 10 internal standards were selected for the analysis with an Agilent ZORBAX Eclipse plus C18 (2.1×100mm, 1.8μm) column. A binary isocratic elution with 98% B was applied, the column was held at 45 ℃ and the separation was allowed at a flow rate of 0.4 mL min^{-1}. **A:** The mobile phase A (water / 5mM ammonium acetate) and B (methanol / 5mM ammonium acetate). **B:** The mobile phase A (water / 5mM ammonium acetate / 0.01% formic acid) and B (methanol / 5mM ammonium acetate / 0.01% formic acid). **C:** The mobile phase A (water) and B (methanol).



$[M+H]^+ = a1 + [C_{(b)}H_{2(b)} -2(c) + O_2] + H$

$[M+H]^+ = a2 + [C_{(b)}H_{2(b)} -2(c) + O_2] + H$

$[M+H- H_2O]^+ = [M+H]^+ - H_2O$

$[M+H]^+ = a + [C_{(b1+b2)}H_{2(b1+b2)} - 2(c1+c2) + O_4] + H$

$[M+H-R_iCOOH]^+ = [M+H]^+ - [C_{bi}H_{2bi} + O_2 - 2ci]$

$[M+H-R_iCHCO]^+ = [M+H - R_iCOOH]^+ + H_2O$

$[M-H]^- = a + [C_{(b1+b2)}H_{2(b1+b2)} - 2(c1+c2) + O_4] - H$

$[M-H-R_iCOOH]^- = [M-H]^- - [C_{bi}H_{2bi} + O_2 - 2ci]$

$[M-H-R_iCHCO]^- = [M-H - R_iCOOH]^- + H_2O$

$[R_iCOO]^- = C_{bi}H_{2bi} + O_2 - 2ci-H$

(i=1, 2)

$[M+H]^+ = a + [C_{(b)}H_{2(b)} -2(c) + O_2] + H$

$[M+H- H_2O]^+ = [M+H]^+ - H_2O$

$[M-H]^- = a + [C_{(b)}H_{2(b)} - 2(c) + O_2] - H$

Fig. S-2. The structure and the calculation strategy of fragment ion of phospholipids. The basic unit of sphingomyelins (SM) is ceramide or dihydroceramide, and the hydroxyl group of ceramides or dihydroceramide are replaced by phosphorylcholine. Glycerophospholipids consist of two esterified nonpolar acyl chain (sn-1 and sn-2 positions) and a phosphoric acid polar head. Depending on the functional groups of phosphoric head, glycerophospholipids can be phosphatidylcholine (PC), phosphatidylethanolamine (PE), phosphatidylglycerol (PG), phosphatidylinositol (PI), phosphatidylserine (PS) and phosphatidic acid (PA). Lyso-glycerophospholipids can be formed by hydrolyzing one of the esterified nonpolar acyl chains (sn-1 or sn-2 positions) of glycerophospholipids, such as lyso-phosphatidic acid (LPA), lyso-phosphatidylcholines (LPC) and lyso-phosphatidylethanolamine (LPE). **a:** The molecular weight of the glycerol skeleton and phosphate substituent; **b:** The number of carbons in the acyl chain (red dashed frame); **c:** The number of double bonds in the acyl chain (red dashed frame).

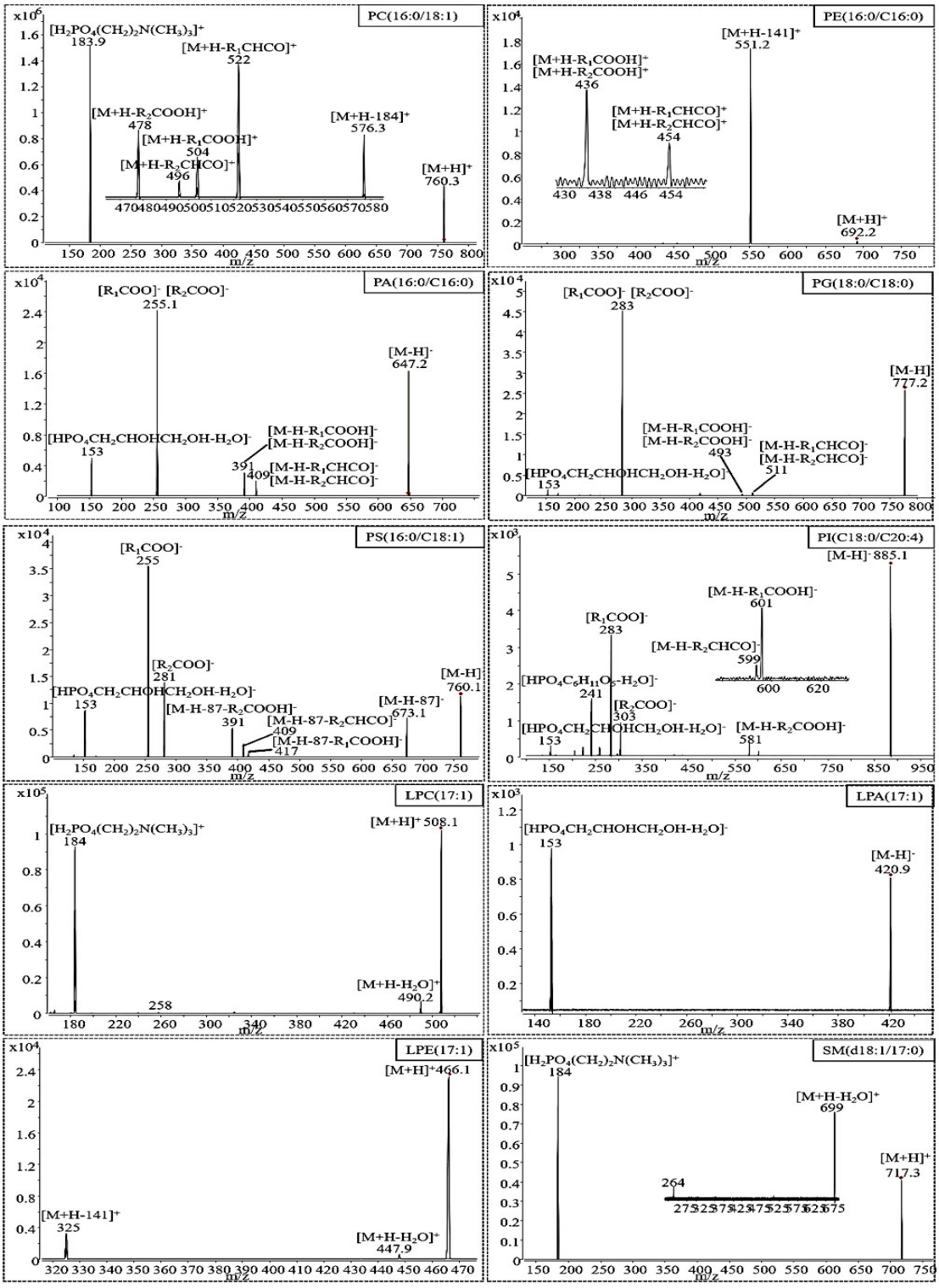
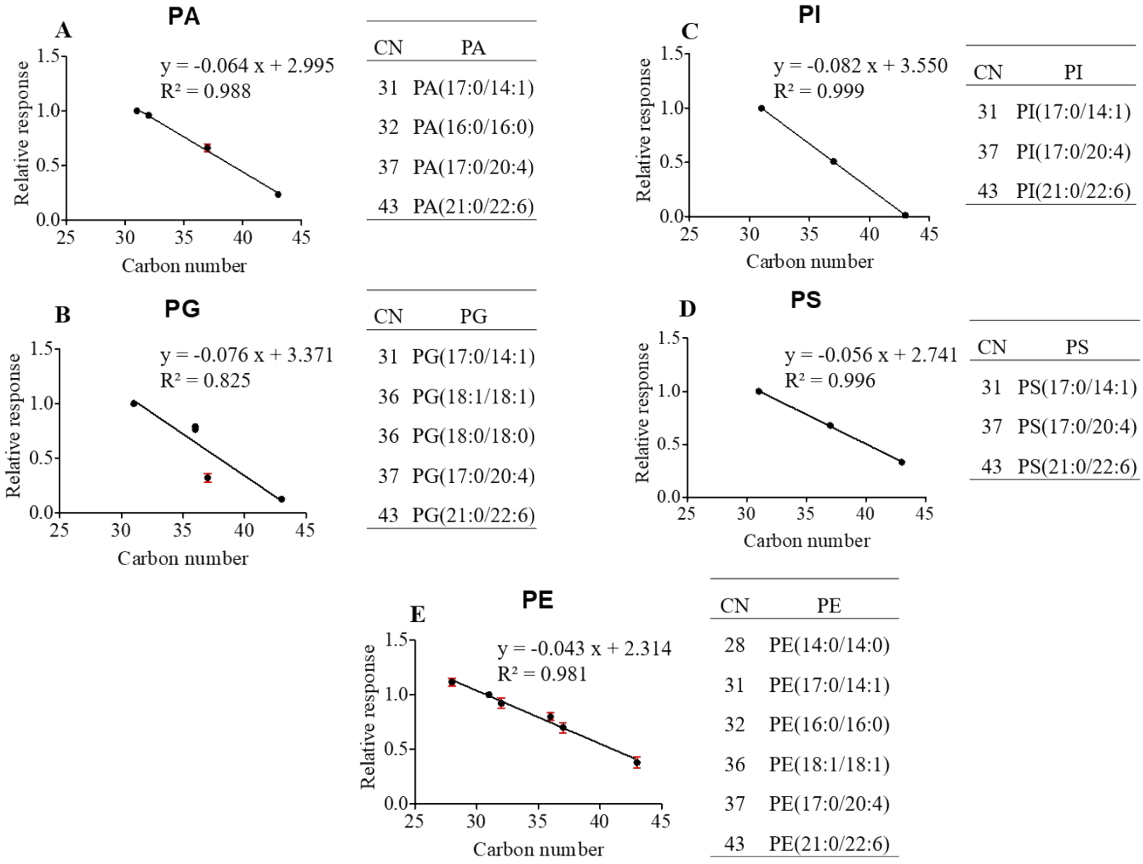


Fig. S-3. The MS/MS spectra of each class of phospholipid standards, including PC (16:0/18:1), PE (16:0/16:0), PA (16:0/C16:0), PG (18:0/18:0), PS (16:0/18:1), PI (18:0/20:4), LPC (17:1), LPA (17:1), LPE (17:1), SM (d18:1/17:0)



CN	PA
31	PA(17:0/14:1)
32	PA(16:0/16:0)
37	PA(17:0/20:4)
43	PA(21:0/22:6)

CN	PG
31	PG(17:0/14:1)
36	PG(18:1/18:1)
36	PG(18:0/18:0)
37	PG(17:0/20:4)
43	PG(21:0/22:6)

CN	PI
31	PI(17:0/14:1)
37	PI(17:0/20:4)
43	PI(21:0/22:6)

CN	PS
31	PS(17:0/14:1)
37	PS(17:0/20:4)
43	PS(21:0/22:6)

CN	PE
28	PE(14:0/14:0)
31	PE(17:0/14:1)
32	PE(16:0/16:0)
36	PE(18:1/18:1)
37	PE(17:0/20:4)
43	PE(21:0/22:6)

Fig. S-4. The relative response curves of each class of phospholipids obtained by multiple linear regression. A: The relative response curve of PA; B: The relative response curve of PG; C: The relative response curve of PI; D: The relative response curve of PS; E: The relative response curve of PE.

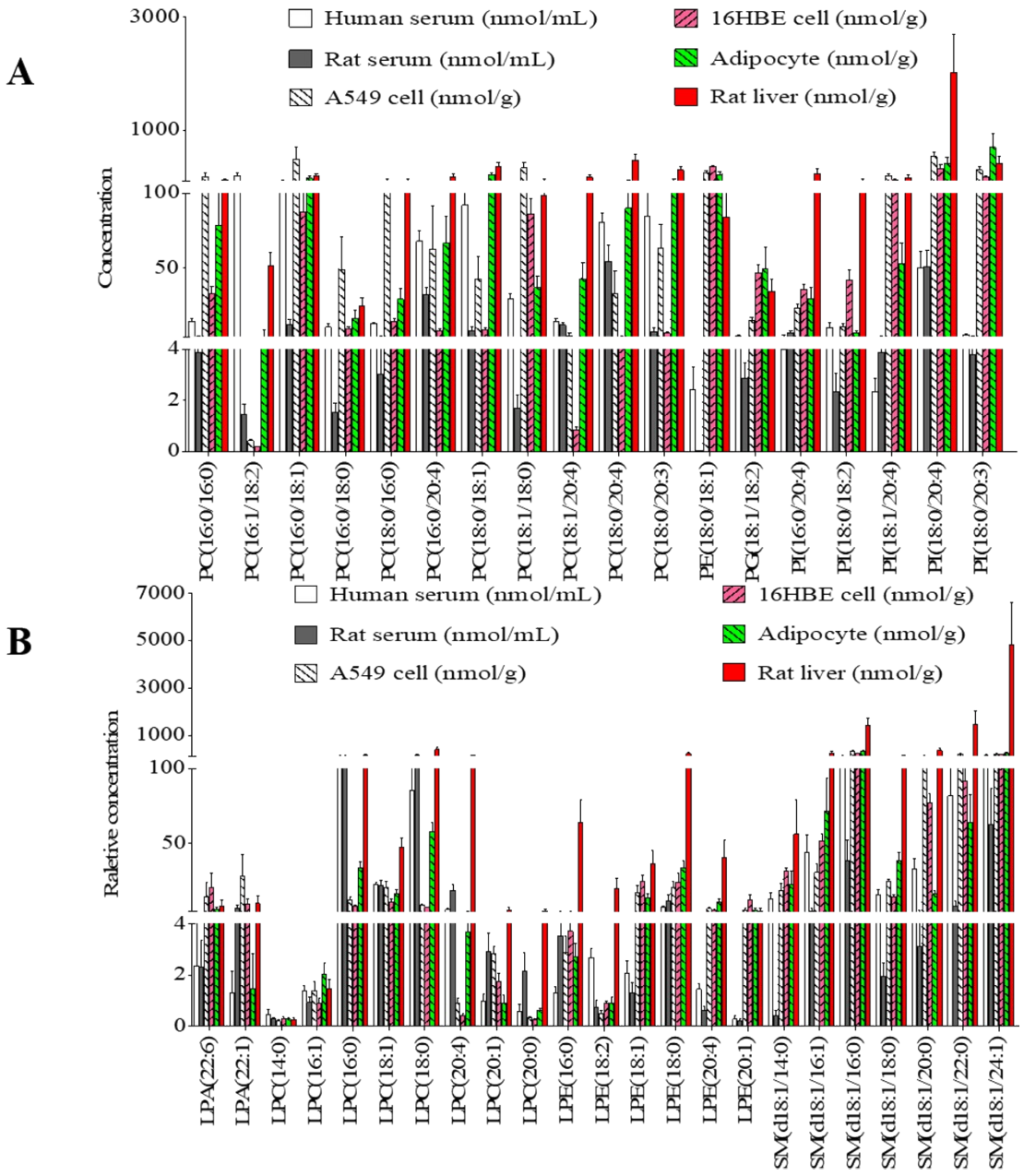


Fig. S-5. The distributions of common phospholipid species found in 6 kinds of samples. There were 41 phospholipid species, including 11 PCs, 1 PE, 5 PIs, 1PG, 2 LPAs, 8 LPCs, 6 LPEs and 7 SMs. A: Quantified using relative response and internal standard; B: Quantified using internal standard for relative quantification.

Table S-1. The common fragment ions of all possible phospholipids formed by esterification of 16:0 and 18:1 fatty acid

Phospholipids	R_1	R_2	CN	DB			$[M+H]^+$	$[M+H-R_1COOH]^+$	$[M+H-R_1CHCO]^+$	$[M+H-R_2COOH]^+$	$[M+H-R_2CHCO]^+$	Cation
PC (16:0/16:0)	16:0	16:0	32	0			734.3	478.3	496.3	478.3	496.3	184
PC (16:0/18:1)	16:0	18:1	34	1			760.3	504.3	522.3	478.3	496.3	184
PC (18:1/16:0)	18:1	16:0	34	1			760.3	478.3	496.3	504.3	522.3	184
PC (18:1/18:1)	18:1	18:1	36	2			786.3	504.3	522.3	504.3	522.3	184
Phospholipids	R_1	R_2	CN	DB			$[M+H]^+$	$[M+H-R_1COOH]^+$	$[M+H-R_1CHCO]^+$	$[M+H-R_2COOH]^+$	$[M+H-R_2CHCO]^+$	Neutral loss 141
PE (16:0/16:0)	16:0	16:0	32	0			692.2	436.2	454.2	436.2	454.2	551.2
PE (16:0/18:1)	16:0	18:1	34	1			718.2	462.2	480.2	436.2	454.2	577.2
PE (18:1/16:0)	18:1	16:0	34	1			718.2	436.2	454.2	462.2	480.2	577.2
PE (18:1/18:1)	18:1	18:1	36	2			744.2	462.2	480.2	462.2	480.2	603.2
Phospholipids	R_1	R_2	CN	DB	$[R_1COO]^-$	$[R_2COO]^-$	$[M-H]^-$	$[M-H-R_1COOH]^-$	$[M-H-R_1CHCO]^-$	$[M-H-R_2COOH]^-$	$[M-H-R_2CHCO]^-$	Anion
PA (16:0/16:0)	16:0	16:0	32	0	255	255	647.5	391.5	409.5	391.5	409.5	153
PA (16:0/18:1)	16:0	18:1	34	1	255	281	673.5	417.5	435.5	391.5	409.5	153
PA (18:1/16:0)	18:1	16:0	34	1	281	255	673.5	391.5	409.5	417.5	435.5	153
PA (18:1/18:1)	18:1	18:1	36	2	281	281	699.5	417.5	435.5	417.5	435.5	153
PG (16:0/16:0)	16:0	16:0	32	0	255	255	721.5	465.5	483.5	465.5	483.5	153
PG (16:0/18:1)	16:0	18:1	34	1	255	281	747.5	491.5	509.5	465.5	483.5	153
PG (18:1/16:0)	18:1	16:0	34	1	281	255	747.5	465.5	483.5	491.5	509.5	153
PG (18:1/18:1)	18:1	18:1	36	2	281	281	773.5	491.5	509.5	491.5	509.5	153
PI (16:0/16:0)	16:0	16:0	32	0	255	255	809.5	553.5	571.5	553.5	571.5	241
PI (16:0/18:1)	16:0	18:1	34	1	255	281	835.5	579.5	597.5	553.5	571.5	241
PI (18:1/16:0)	18:1	16:0	34	1	281	255	835.5	553.5	571.5	579.5	597.5	241
PI (18:1/18:1)	18:1	18:1	36	2	281	281	861.5	579.5	597.5	579.5	597.5	241
Phospholipids	R_1	R_2	CN	DB	$[R_1COO]^-$	$[R_2COO]^-$	$[M-H]^-$	$[M-H-87-R_1COOH]^-$	$[M-H-87-R_1CHCO]^-$	$[M-H-87-R_2COOH]^-$	$[M-H-87-R_2CHCO]^-$	Neutral loss 87
PS (16:0/16:0)	16:0	16:0	32	0	255	255	734.5	391.5	409.5	391.5	409.5	647.5
PS (16:0/18:1)	16:0	18:1	34	1	255	281	760.5	417.5	435.5	391.5	409.5	673.5
PS (18:1/16:0)	18:1	16:0	34	1	281	255	760.5	391.5	409.5	417.5	435.5	673.5
PS (18:1/18:1)	18:1	18:1	36	2	281	281	786.5	417.5	435.5	417.5	435.5	699.5
Phospholipids			CN	DB			$[M+H]^+$	$[M+H-H_2O]^+$		Cation		Cation 184
SM (d18:1/16:0)			34	1			703.5	685.5		264		184
SM (d18:1/18:1)			36	2			729.5	711.5		264		184
SM (d18:0/16:0)			34	0			705.5	687.5		266		184
SM (d18:0/18:1)			36	1			731.5	713.5		266		184
LPC (16:0)			16	0			496.5	478.5		258		184

LPC (18:1)	18	1	522.5	504.5	258	184
Phospholipids	CN	DB	$[M+H]^+$	$[M+H-H_2O]^+$		Neutral loss 141
LPE (16:0)	16	0	454.5	436.5		313.5
LPE (18:1)	18	1	480.5	462.5		339.5
Phospholipids	CN	DB	$[M-H]^-$			Anion 153
LPA (16:0)	16	0	409.5			153
LPA (18:1)	18	1	435.5			153

CN: carbon number, DB: double bond number

Table S-2. The relative response for each class of phospholipids

GP	Carbon number of two acyl chains									
	26	28	30	32	34	36	38	40	42	44
PC	1.236	1.138	1.040	0.942	0.844	0.746	0.648	0.550	0.452	0.354
PE	1.196	1.110	1.024	0.938	0.852	0.766	0.680	0.594	0.508	0.422
PA	1.331	1.203	1.075	0.947	0.819	0.691	0.563	0.435	0.307	0.179
PG	1.395	1.243	1.091	0.939	0.787	0.635	0.483	0.331	0.179	0.027
PI	1.418	1.254	1.090	0.926	0.762	0.598	0.434	0.270	0.106	
PS	1.285	1.173	1.061	0.949	0.837	0.725	0.613	0.501	0.389	0.277

Table S-3. The repeatability of peak area and retention time

Phospholipids	Intraday precision (RSD, n = 15)						Inter-day precision (RSD, n = 10)					
	0.01 nmol mL^{-1}		0.1 nmol mL^{-1}		1 nmol mL^{-1}		0.01 nmol mL^{-1}		0.1 nmol mL^{-1}		1 nmol mL^{-1}	
	A	t_R	A	t_R	A	t_R	A	t_R	A	t_R	A	t_R
PC (16:0/22:6)	2.21	3.84	4.64	5.38	4.02	7.79	0.94	3.52	5.04	4.60	5.53	6.10
PC (18:1/18:2)	1.58	3.67	2.32	4.49	2.96	5.87	2.54	3.26	1.71	4.15	3.70	3.93
PC (16:0/16:1)	1.86	3.93	3.59	4.64	4.89	5.92	1.30	3.37	3.33	3.10	5.41	2.77
PC (16:0/18:2)	1.55	4.08	2.28	4.01	4.65	5.69	1.51	3.78	1.93	4.46	2.66	3.94
PC (16:0/20:4)	1.69	3.68	1.95	4.35	4.02	7.50	2.23	3.31	1.24	4.90	4.21	5.19
PE (18:0/20:4)	1.40	2.67	2.46	3.19	3.23	5.33	1.46	2.15	2.34	2.52	3.24	3.14
PE (18:2/20:4)	3.11	3.21	5.30	3.91	6.32	6.38	1.38	2.44	3.53	2.96	5.22	3.62
PE (18:0/18:1)	4.63	2.43	3.09	2.99	5.38	4.31	5.62	2.03	2.20	2.57	1.78	3.25
PE (18:2/18:0)	1.77	2.56	2.22	3.02	1.63	4.89	1.81	2.07	2.93	2.55	2.96	3.06
PE (16:0/18:0)	1.85	2.56	2.99	3.00	4.09	5.01	1.45	2.23	2.96	2.69	4.81	2.93
PE (18:1/16:0)	1.24	2.59	4.27	3.00	4.44	5.03	1.63	2.10	4.53	2.59	5.03	2.98
PE (16:0/18:2)	2.31	3.10	3.14	3.69	4.88	5.95	2.22	2.47	2.47	3.00	3.74	3.41
PI (18:0/20:3)	5.60	6.81	5.44	7.29	5.37	8.91	5.84	5.03	3.74	5.29	4.37	6.41
PI (18:0/20:4)	5.31	6.74	4.10	7.56	5.13	9.50	6.22	4.99	2.84	5.52	4.15	6.66
PI (18:0/18:1)	6.62	6.57	7.04	7.23	8.79	9.07	3.99	4.77	5.64	5.40	6.71	6.22
PI (18:0/18:2)	5.76	6.64	4.08	7.37	6.31	9.01	5.11	4.82	3.28	5.40	6.10	6.22
PI (18:2/18:1)	6.48	7.68	4.84	8.28	10.41	9.90	6.26	5.54	5.62	5.80	6.15	6.62
PI (16:0/18:1)	5.85	6.88	5.01	7.80	6.90	9.04	3.75	4.94	2.27	5.49	2.67	6.27
PI (18:2/16:0)	7.86	7.43	4.94	7.91	3.61	9.97	6.68	5.11	3.11	5.69	2.67	7.01
PG (18:0/18:2)	7.36	6.78	8.51	7.46	4.43	8.86	7.53	4.99	8.47	5.65	2.18	6.10
PG (18:0/20:4)	6.39	7.57	4.05	8.43	10.2	10.74	2.34	5.49	5.38	6.43	13.94	7.07
PG (16:0/18:0)	7.32	6.51	7.27	7.40	6.85	9.51	7.49	4.86	9.21	5.51	3.64	6.20
PG (18:1/16:0)	6.60	7.40	5.98	8.05	11.41	10.20	7.65	5.34	2.65	6.32	14.68	6.81
PG (16:0/18:1)	7.65	6.50	7.32	7.30	6.38	9.32	8.28	4.85	7.45	5.51	4.47	6.28
PG (16:0/18:2)	8.01	7.53	7.87	7.97	7.00	9.56	8.86	5.45	4.80	5.90	8.37	6.57
PG (16:1/16:0)	4.82	7.41	2.77	8.41	8.33	10.19	3.58	5.80	6.13	6.18	9.74	6.35
PA (16:0/18:1)	9.27	0.40	9.70	0.61	6.85	0.61	9.52	1.12	8.84	1.24	12.66	1.70
PA (16:0/18:2)	8.21	0.30	5.19	0.38	5.58	0.46	4.83	0.86	12.26	0.63	7.35	0.66
PS (20:1/18:1)	4.58	0.30	7.07	0.33	7.57	0.65	5.17	0.43	12.24	0.56	8.27	0.37
PS (18:1/18:1)	5.27	0.28	2.29	0.42	2.00	0.29	3.87	0.54	15.31	1.27	5.36	0.76

The repeatability of peak area and retention time were determined from 5 consecutive measurements of mixed phospholipid standards (PC, PE, PS, PA, PG, PI and SM) for low, middle and high concentrations intraday (morning, noon and evening) and inter-day (two consecutive days), and then expressed with RSD of peak area and retention time. 5.1 ± 2.7 % for average RSD in peak area. 4.8 ± 2.3 % for average RSD in retention time. A：peak area, t_R：retention time, RSD: relative standard deviation, PC: phosphatidylcholines, PE: phosphatidylethanolamine, PA: phosphatidic acid, PG: phosphatidylglycerol, PI: phosphatidylinositol, PS: phosphatidylserine, SM: sphingomyelin.

Table S-4 The quantitative relative error of phospholipids

CN	GP	Concentration (nmol/mL)					
		1.00	0.20	0.10	0.05	0.02	0.01
28	PC (14:0/14:0)	-8.01	-4.85	-1.18	5.35	10.91	23.08
31	PC (17:0/14:1)	0.91	0.91	0.91	0.91	0.91	0.91
36	PC (18:1/18:1)	-10.78	-11.08	-10.61	-9.53	-5.37	-5.96
36	PC (18:0/18:0)	-9.26	-7.89	-2.62	-5.73	-6.83	-2.05
37	PC (17:0/20:4)	-16.25	-13.46	-12.08	-5.05	2.02	14.70
43	PC (21:0/22:6)	-11.19	-4.22	-4.73	-8.12	-3.93	3.86
28	PE (14:0/14:0)	-2.79	-0.83	-1.24	3.35	5.82	-1.51
31	PE (17:0/14:1)	1.94	1.94	1.94	1.94	1.94	1.94
32	PE (16:0/16:0)	-2.35	3.99	2.85	0.23	-5.18	-9.76
36	PE (18:1/18:1)	4.56	10.08	8.19	2.26	2.98	-2.91
37	PE (17:0/20:4)	-4.39	1.74	2.69	0.99	-5.40	-14.56
43	PE (21:0/22:6)	-5.07	-10.25	-11.77	-23.02	-35.14	-24.59
31	PA (17:0/14:1)	-1.09		-1.09	-1.09	-1.09	
32	PA (16:0/16:0)	-0.50		1.38	2.15	1.51	
37	PA (17:0/20:4)	10.39		9.73	-1.35	1.98	
43	PA (21:0/22:6)	-7.52		-7.70	23.26	2.54	
31	PI (17:0/14:1)	-0.79		-0.79	-0.79	-0.79	
37	PI (17:0/20:4)	-7.60		-1.28	-4.67	0.15	
43	PI (21:0/22:6)	-0.85		6.28	2.46	8.23	
31	PS (17:0/14:1)	-0.50		-0.50	-0.50	-0.50	
37	PS (17:0/20:4)	0.09		-0.76	3.32	1.09	
43	PS (21:0/22:6)	1.03		2.76	-1.04	-0.73	
31	PG (17:0/14:1)	-1.48		-1.48	-1.48	-1.48	
36	PG (18:1/18:1)	20.21		23.20	16.52	25.60	
36	PG (18:0/18:0)	22.48		24.19	24.67	29.38	
37	PG (17:0/20:4)	-7.57		-9.73	0.12	-13.32	
43	PG (21:0/22:6)	29.24		28.93	16.45	33.70	

Table S-5. Corrected phospholipid concentrations in different biological samples

RMR	CN	Phospholipids	Plasma (nmol/mL)		Cell (nmol/g)			Tissue (nmol/g)
			Human plasma	Rat plasma	A549 cell	16HBE cell	Adipose cell	Rat liver
1.236	28	PC(14:1/14:1)	0.05±0.01	ND	ND	ND	ND	ND
1.236	28	PC(14:0/14:1)	ND	ND	3.26±0.27	2.52±0.17	ND	ND
1.236	28	PC(12:0/16:1)	1.05±0.26	0.04±0.02	ND	ND	ND	1.88±0.66
1.236	28	PC(14:0/14:0)	ND	ND	4.36±0.68	7.49±0.57	ND	ND
1.236	28	PC(12:0/16:0)	ND	ND	ND	ND	0.89±0.23	ND
1.138	30	PC(16:0/14:0)	ND	0.27±0.07	ND	ND	ND	ND
1.138	30	PC(18:2/12:0)	8.96±3.44	0.09±0.03	5.76±0.88	4.39±0.41	ND	ND
1.138	30	PC(14:1/16:1)	4.09±1.00	ND	ND	ND	ND	ND
1.138	30	PC(14:0/16:1)	20.02±2.38	ND	23.08±2.28	16.10±1.80	5.15±1.26	ND
1.138	30	PC(18:1/12:0)	21.58±3.23	ND	63.31±18.19	18.78±2.66	54.52±13.90	44.58±6.73
1.138	30	PC(14:0/16:0)	1.88±0.39	ND	1.78±0.21	1.12±0.14	20.84±4.75	ND
1.138	30	PC(16:0/14:0)	0.99±0.26	ND	77.09±16.83	33.22±4.83	ND	5.24±0.45
0.942	32	PC(12:0/20:4)	ND	ND	ND	ND	ND	2.54±1.53
0.942	32	PC(14:0/18:3)	ND	ND	ND	ND	2.03±0.58	6.22±2.26
0.942	32	PC(14:0/18:2)	3.81±1.50	0.34±0.12	<LOQ	<LOQ	ND	40.04±10.32
0.942	32	PC(16:1/16:1)	3.89±1.39	ND	51.93±5.50	23.80±2.44	14.67±3.62	ND
0.942	32	PC(14:1/18:1)	ND	0.14±0.03	ND	ND	ND	ND
0.942	32	PC(16:0/16:1)	4.66±1.10	ND	236.49±77.54	63.63±11.07	81.67±18.76	6.16±1.85
0.942	32	PC(16:1/16:0)	4.75±1.61	ND	11.23±4.24	2.48±0.51	10.13±3.28	5.76±1.44
0.942	32	PC(14:0/18:1)	ND	0.50±0.13	ND	ND	ND	ND
0.942	32	PC(18:1/14:0)	ND	0.29±0.07	ND	ND	ND	3.48±0.88
0.942	32	PC(14:0/18:0)	0.48±0.12	ND	24.49±7.89	6.69±1.18	8.04±1.72	ND
0.942	32	PC(16:0/16:0)	14.64±1.72	3.87±1.00	179.83±62.97	32.79±4.92	78.62±23.14	119.10±22.57
0.844	34	PC(14:0/20:4)	2.30±0.91	0.28±0.12	5.51±0.56	2.43±0.25	ND	71.07±23.59

0.844	34	PC(16:1/18:2)	192.76±49.19	1.45±0.40	0.43±0.06	0.20±0.02	4.18±4.30	51.58±9.29
0.844	34	PC(16:0/18:3)	10.59±2.44	ND	24.62±4.85	9.02±0.90	8.97±2.10	31.94±3.92
0.844	34	PC(16:0/18:2)	111.13±13.58	33.15±6.98	241.00±79.11	63.34±10.53	ND	131.11±47.77
0.844	34	PC(18:2/16:0)	27.65±4.98	ND	ND	ND	ND	55.77±17.04
0.844	34	PC(18:1/16:0)	10.26±1.55	2.78±0.58	21.08±7.38	5.51±0.96	ND	ND
0.844	34	PC(18:1/16:1)	ND	ND	ND	ND	60.70±14.16	ND
0.844	34	PC(16:0/18:1)	104.42±8.54	12.54±2.99	488.72±207.12	87.86±16.26	144.14±38.89	188.82±41.50
0.844	34	PC(16:0/18:0)	10.58±2.12	1.52±0.38	49.18±21.53	9.14±1.69	16.41±5.14	24.70±5.44
0.844	34	PC(18:0/16:0)	12.90±1.03	3.02±1.40	106.22±22.61	14.34±1.82	29.18±6.98	105.62±23.31
0.746	36	PC(14:0/22:6)	1.54±0.74	ND	ND	ND	ND	38.16±11.88
0.746	36	PC(16:1/20:4)	13.08±4.87	ND	ND	ND	ND	188.99±35.72
0.746	36	PC(18:3/18:2)	2.88±1.37	ND	ND	ND	ND	ND
0.746	36	PC(16:0/20:5)	10.52±5.23	ND	18.73±2.44	4.83±0.42	ND	ND
0.746	36	PC(14:1/22:6)	0.36±0.08	ND	ND	ND	1.13±0.17	ND
0.746	36	PC(16:1/20:4)	ND	1.80±0.48	ND	ND	ND	ND
0.746	36	PC(18:2/18:2)	34.08±3.83	2.63±0.94	6.70±1.53	1.90±0.23	ND	96.29±19.40
0.746	36	PC(16:0/20:4)	68.02±6.73	32.23±4.69	62.71±29.12	8.16±1.11	66.57±17.87	167.49±64.66
0.746	36	PC(20:3/16:0)	5.94±0.50	ND	3.81±1.78	0.52±0.08	58.11±16.53	ND
0.746	36	PC(16:0/20:3)	88.39±7.41	2.43±0.38	109.96±39.30	23.07±3.94	58.07±16.55	ND
0.746	36	PC(18:1/18:2)	3.28±0.47	12.77±2.88	ND	ND	ND	148.03±36.06
0.746	36	PC(18:1/18:1)	8.15±0.70	0.99±0.23	424.13±143.16	85.80±16.23	100.58±27.86	ND
0.746	36	PC(16:0/20:2)	ND	ND	10.07±3.90	2.09±0.32	ND	ND
0.746	36	PC(18:0/18:2)	211.78±26.15	35.63±10.15	ND	ND	ND	320.74±78.69
0.746	36	PC(20:0/16:1)	ND	3.30±0.91	ND	ND	ND	ND
0.746	36	PC(18:0/18:1)	92.09±8.95	7.77±3.20	42.71±14.92	8.70±1.62	206.38±42.31	358.97±69.46
0.746	36	PC(18:1/18:0)	29.71±3.43	1.70±0.54	330.94±92.31	86.46±9.99	36.78±7.96	98.47±31.47
0.746	36	PC(18:0/18:0)	10.04±0.99	1.10±0.36	42.84±11.58	11.13±1.30	ND	ND

0.648	38	PC(16:1/22:6)	3.78±1.90	0.56±0.15	2.87±0.34	0.62±0.06	ND	90.37±21.82
0.648	38	PC(18:2/20:4)	8.58±0.99	3.36±0.93	ND	ND	ND	145.29±26.74
0.648	38	PC(16:0/22:6)	72.30±13.81	23.80±4.71	14.66±4.41	2.01±0.28	ND	269.78±61.67
0.648	38	PC(20:5/18:0)	9.04±1.51	ND	ND	ND	ND	ND
0.648	38	PC(20:4/18:1)	ND	0.35±0.09	ND	ND	ND	ND
0.648	38	PC(18:1/20:4)	14.65±1.74	11.93±1.98	4.43±2.28	0.85±0.12	42.85±10.85	165.94±46.28
0.648	38	PC(18:0/20:5)	15.54±2.30	2.36±0.46	87.42±32.82	11.47±1.88	ND	ND
0.648	38	PC(18:1/20:3)	16.05±2.52	ND	14.91±5.19	2.45±0.42	ND	ND
0.648	38	PC(20:3/18:1)	ND	ND	8.84±3.21	1.17±0.20	ND	ND
0.648	38	PC(18:0/20:4)	80.40±6.74	54.43±10.82	32.90±15.02	4.09±0.65	90.12±22.56	464.69±113.44
0.648	38	PC(20:4/18:0)	ND	ND	ND	ND	ND	251.00±94.69
0.648	38	PC(18:0/20:3)	85.11±17.27	7.41±3.02	63.09±16.30	6.50±1.11	101.03±30.93	294.66±55.34
0.648	38	PC(20:3/18:0)	39.75±12.28	3.84±1.60	13.38±3.80	1.70±0.32	ND	ND
0.648	38	PC(18:2/20:0)	ND	0.82±0.28	ND	ND	ND	ND
0.648	38	PC(18:1/20:1)	ND	ND	75.06±10.52	31.42±2.41	ND	ND
0.648	38	PC(20:1/18:1)	ND	ND	114.01±19.12	41.47±6.14	ND	ND
0.648	38	PC(20:0/18:2)	ND	2.22±1.10	ND	ND	ND	26.59±5.05
0.648	38	PC(20:2/18:0)	9.09±1.90	ND	ND	ND	ND	ND
0.648	38	PC(18:0/20:2)	22.62±5.43	ND	ND	ND	ND	106.31±29.01
0.55	40	PC(20:4/20:5)	ND	0.11±0.04	ND	ND	ND	20.22±6.84
0.55	40	PC(20:4/20:4)	1.18±0.27	3.00±0.76	ND	ND	0.96±0.20	110.80±25.75
0.55	40	PC(20:5/20:3)	21.47±5.11	ND	ND	ND	ND	ND
0.55	40	PC(20:3/20:4)	ND	0.33±0.09	ND	ND	ND	12.33±2.78
0.55	40	PC(18:1/22:6)	18.73±5.15	1.84±0.38	ND	ND	2.85±0.85	ND
0.55	40	PC(22:6/18:1)	3.76±1.02	ND	ND	ND	ND	ND
0.55	40	PC(20:2/20:4)	ND	1.18±0.29	ND	ND	ND	ND
0.55	40	PC(18:0/22:6)	27.67±9.95	13.62±3.51	ND	ND	ND	203.40±48.85

0.55	40	PC(20:1/20:4)	3.25±0.96	ND	ND	ND	ND	88.40±18.31
0.55	40	PC(20:0/20:5)	16.09±2.18	ND	ND	ND	ND	ND
0.55	40	PC(20:4/20:1)	ND	ND	ND	ND	ND	24.65±6.11
0.55	40	PC(20:0/20:4)	ND	ND	ND	ND	ND	62.20±17.62
0.55	40	PC(20:3/20:1)	5.11±2.22	ND	ND	ND	ND	ND
0.452	42	PC(20:1/22:2)	ND	ND	ND	ND	5.77±1.57	ND
0.452	42	PC(22:6/20:4)	ND	ND	ND	ND	ND	24.05±10.29
0.452	42	PC(20:4/22:6)	0.53±0.22	ND	ND	ND	ND	ND
0.938	32	PE(16:1/16:1)	ND	ND	2.19±0.50	4.03±0.37	4.02±1.66	ND
0.938	32	PE(16:0/16:1)	ND	ND	10.44±1.23	14.49±1.76	ND	ND
0.938	32	PE(18:1/14:1)	ND	ND	ND	ND	ND	1.28±0.43
0.938	32	PE(16:0/16:0)	ND	ND	2.41±0.36	2.04±0.17	ND	ND
0.852	34	PE(20:3/14:1)	ND	ND	ND	ND	ND	2.55±0.85
0.852	34	PE(14:0/20:3)	ND	ND	ND	ND	ND	7.02±1.43
0.852	34	PE(16:1/18:2)	ND	ND	ND	ND	ND	13.08±1.06
0.852	34	PE(18:3/16:0)	0.09±0.05	ND	ND	ND	ND	ND
0.852	34	PE(18:1/16:1)	0.50±0.15	ND	ND	ND	17.04±3.45	ND
0.852	34	PE(16:0/18:2)	ND	0.15±0.06	22.61±3.05	36.80±3.35	ND	48.87±9.93
0.852	34	PE(16:0/18:1)	0.06±0.02	0.07±0.02	2.39±0.32	3.91±0.32	ND	28.86±7.95
0.852	34	PE(18:1/16:0)	0.73±0.23	ND	40.22±3.87	50.12±4.86	ND	6.31±1.30
0.852	34	PE(16:0/18:0)	ND	0.02±0.01	2.70±0.26	3.35±0.33	0.08±0.02	ND
0.766	36	PE(16:1/20:4)	ND	0.03±0.01	9.10±1.93	6.24±0.81	4.70±1.11	ND
0.766	36	PE(18:0/16:1)	ND	ND	ND	ND	44.95±17.38	ND
0.766	36	PE(16:1/18:0)	ND	ND	ND	ND	48.41±8.92	ND
0.766	36	PE(16:1/20:4)	ND	ND	4.92±0.72	6.92±0.42	ND	64.66±13.21
0.766	36	PE(20:4/16:0)	0.40±0.09	ND	1.11±0.26	1.68±0.29	ND	53.93±11.32
0.766	36	PE(16:0/20:4)	0.98±0.27	0.27±0.08	23.13±1.89	22.28±1.81	ND	65.80±17.64

0.766	36	PE(18:1/18:2)	1.31±0.46	0.13±0.04	5.00±0.54	2.89±0.40	ND	ND
0.766	36	PE(18:2/18:1)	42.02±22.75	ND	14.63±2.14	27.73±2.62	ND	84.39±17.34
0.766	36	PE(18:3/18:0)	ND	ND	1.92±0.18	1.88±0.18	ND	ND
0.766	36	PE(18:1/18:1)	5.93±1.83	ND	124.91±14.74	179.96±12.49	91.83±19.86	ND
0.766	36	PE(18:0/18:2)	0.21±0.09	0.43±0.13	1.63±0.25	2.60±0.27	ND	171.76±23.77
0.766	36	PE(18:1/18:0)	0.52±0.16	0.13±0.05	10.86±1.17	16.57±1.07	ND	15.90±2.49
0.766	36	PE(18:0/18:1)	2.44±0.89	0.04±0.01	249.97±32.85	353.39±25.13	212.62±48.36	84.09±21.15
0.766	36	PE(18:0/18:0)	0.17±0.07	ND	18.03±2.28	25.59±1.89	15.08±3.68	4.23±1.12
0.68	38	PE(18:2/20:4)	4.03±1.54	0.10±0.04	ND	ND	ND	ND
0.68	38	PE(18:2/20:5)	ND	ND	ND	ND	ND	35.24±8.90
0.68	38	PE(18:1/20:5)	ND	0.44±0.12	1.84±0.29	1.44±0.12	ND	ND
0.68	38	PE(16:0/22:6)	4.57±1.74	ND	5.85±0.65	5.29±0.28	17.71±4.40	280.65±55.90
0.68	38	PE(20:2/18:3)	0.94±0.37	ND	ND	ND	ND	ND
0.68	38	PE(18:2/20:3)	ND	0.22±0.07	ND	ND	ND	ND
0.68	38	PE(18:1/20:4)	0.85±0.34	ND	146.40±11.93	126.46±7.19	ND	164.38±26.97
0.68	38	PE(18:1/20:3)	ND	ND	14.75±1.37	12.69±0.91	ND	ND
0.68	38	PE(20:4/18:0)	6.44±1.94	ND	6.99±0.87	9.19±0.85	ND	189.22±28.87
0.68	38	PE(18:0/20:4)	195.79±117.97	ND	216.54±19.09	171.40±9.37	280.76±57.85	283.93±51.94
0.68	38	PE(20:2/18:2)	ND	1.10±0.34	ND	ND	ND	ND
0.68	38	PE(20:3/18:0)	ND	ND	34.82±4.65	33.99±2.57	ND	ND
0.68	38	PE(18:0/20:3)	1.16±0.49	ND	103.43±14.00	38.96±2.18	412.81±90.53	149.41±22.87
0.68	38	PE(20:2/18:1)	1.90±0.68	ND	18.99±2.22	16.65±1.03	ND	ND
0.68	38	PE(18:1/20:1)	ND	ND	49.60±10.00	85.21±4.19	ND	36.57±14.40
0.68	38	PE(20:1/18:1)	ND	ND	ND	ND	ND	13.15±2.22
0.68	38	PE(16:0/22:0)	0.29±0.06	ND	ND	ND	ND	ND
0.68	38	PE(22:0/16:0)	0.47±0.12	ND	ND	ND	ND	ND
0.68	38	PE(20:1/18:0)	ND	ND	ND	ND	1.31±0.40	ND

0.594	40	PE(18:0/22:6)	2.76±0.84	0.34±0.12	ND	ND	19.21±5.07	168.72±38.40
0.594	40	PE(18:2/22:6)	0.19±0.05	ND	ND	ND	ND	ND
0.594	40	PE(18:1/22:6)	0.20±0.07	ND	5.56±0.56	6.77±0.30	ND	ND
0.594	40	PE(20:1/20:4)	0.99±0.51	0.08±0.03	ND	ND	ND	ND
0.594	40	PE(20:2/20:3)	ND	ND	ND	ND	17.12±4.56	ND
0.594	40	PE(20:0/20:5)	ND	ND	16.28±1.45	15.79±1.13	ND	91.20±17.83
0.594	40	PE(20:0/20:4)	0.35±0.15	ND	ND	ND	ND	ND
0.947	32	PA(16:0/16:0)	ND	ND	1.07±0.54	3.13±1.97	ND	ND
0.819	34	PA(16:0/18:2)	ND	ND	0.50±0.46	1.36±1.07	ND	ND
0.819	34	PA(16:0/18:1)	ND	ND	12.31±4.79	10.53±3.85	ND	ND
0.863	34	PA(16:0/18:0)	ND	ND	<LOQ	<LOQ	ND	ND
0.691	36	PA(18:1/18:1)	<LOQ	ND	34.65±12.52	40.81±15.75	ND	ND
0.691	36	PA(18:0/18:2)	5.83±3.01	ND	<LOQ	<LOQ	ND	ND
0.691	36	PA(18:0/18:1)	ND	ND	59.91±20.46	52.39±16.16	ND	ND
0.563	38	PA(18:0/20:2)	ND	ND	2.91±0.91	4.16±0.87	ND	ND
0.627	38	PA(18:0/20:4)	ND	ND	<LOQ	<LOQ	ND	ND
0.627	38	PA(18:0/20:3)	ND	ND	ND	ND	ND	<LOQ
0.435	40	PA(18:0/22:6)	23.01±8.11	0.46±0.34	54.41±23.66	97.66±32.44	ND	83.38±15.54
0.179	44	PA(22:6/22:6)	ND	ND	ND	ND	11.96±4.30	ND
0.837	34	PS(16:0/18:1)	ND	ND	26.07±3.54	29.70±4.83	ND	ND
0.837	34	PS(18:0/16:1)	ND	ND	19.10±2.94	18.35±2.34	48.35±17.46	7.68±2.51
0.837	34	PS(16:0/18:0)	3.56±1.61	ND	3.74±0.87	2.74±0.57	ND	752.47±168.41
0.837	34	PS(18:0/16:0)	ND	ND	ND	ND	ND	204.12±45.60
0.725	36	PS(18:2/18:3)	ND	ND	ND	ND	ND	2.14±0.33
0.725	36	PS(16:0/20:4)	ND	ND	ND	ND	ND	76.25±17.13
0.725	36	PS(18:2/18:2)	0.97±0.48	ND	1.32±0.26	3.39±0.65	ND	25.81±19.27
0.750	36	PS(18:1/18:2)	ND	ND	<LOQ	<LOQ	ND	ND

0.725	36	PS(18:1/18:1)	ND	ND	11.13±1.81	33.96±3.74	ND	ND
0.725	36	PS(18:2/18:0)	ND	ND	ND	ND	ND	9.35±2.74
0.725	36	PS(18:0/18:2)	ND	ND	ND	ND	69.13±22.03	36.92±9.68
0.725	36	PS(18:0/18:1)	0.72±0.36	ND	129.89±27.41	236.21±19.88	182.86±101.06	48.73±10.44
0.725	36	PS(18:1/18:0)	0.74±0.33	ND	ND	ND	ND	96.81±18.52
0.725	36	PS(18:0/18:0)	2.88±1.14	ND	7.14±1.61	13.24±1.20	11.60±5.82	731.77±125.12
0.725	36	PS(18:0/20:4)	ND	ND	41.53±8.04	13.26±1.64	192.83±79.35	898.07±195.50
0.725	36	PS(18:0/20:3)	ND	ND	ND	ND	68.44±41.54	38.99±8.25
0.725	36	PS(18:0/20:2)	ND	ND	ND	ND	32.63±11.70	27.01±6.80
0.725	36	PS(20:3/20:1)	ND	ND	ND	ND	71.38±26.11	ND
0.725	36	PS(18:1/20:1)	ND	ND	4.01±0.70	6.68±1.19	ND	ND
0.725	36	PS(18:0/22:6)	ND	ND	ND	ND	ND	252.17±57.57
0.652	38	PS(20:0/18:1)	ND	ND	<LOQ	<LOQ	ND	ND
0.652	38	PS(18:0/22:5)	ND	ND	<LOQ	<LOQ	ND	ND
0.939	32	PG(14:1/18:2)	0.05±0.02	ND	ND	ND	ND	ND
0.939	32	PG(16:1/16:1)	ND	ND	ND	ND	7.88±5.55	ND
0.939	32	PG(16:0/16:1)	ND	ND	1.62±0.18	2.52±0.31	ND	ND
0.939	32	PG(16:1/16:0)	ND	0.34±0.05	0.35±0.06	0.85±0.11	ND	<LOQ
0.787	34	PG(16:1/18:2)	4.82±0.86	3.09±0.70	0.79±0.11	1.80±0.34	3.18±2.45	ND
0.787	34	PG(18:3/16:0)	111.04±37.47	ND	ND	ND	ND	ND
0.842	34	PG(16:0/18:3)	ND	ND	ND	ND	ND	<LOQ
0.787	34	PG(16:1/18:1)	1.93±0.39	0.74±0.10	14.83±2.39	38.49±3.15	ND	ND
0.787	34	PG(16:0/18:1)	ND	ND	9.22±1.07	15.13±1.91	71.96±16.59	22.67±5.17
0.787	34	PG(18:1/16:0)	ND	ND	ND	ND	ND	3.37±0.83
0.842	34	PG(16:0/18:0)	ND	ND	ND	ND	ND	<LOQ
0.842	34	PG(14:1/20:4)	<LOQ	ND	ND	ND	ND	ND
0.635	36	PG(16:0/20:5)	0.99±0.13	ND	ND	ND	ND	ND

0.635	36	PG(18:2/18:3)	ND	0.50±0.16	ND	ND	ND	ND
0.635	36	PG(18:2/18:2)	1.09±0.38	ND	ND	ND	0.16±0.13	56.27±15.94
0.635	36	PG(18:1/18:2)	4.46±1.01	2.87±0.60	14.74±2.41	46.71±5.31	49.37±14.47	34.33±8.55
0.635	36	PG(18:2/18:1)	ND	ND	ND	ND	ND	2.05±0.31
0.635	36	PG(18:1/18:1)	0.79±0.19	ND	82.00±18.25	184.79±33.92	ND	14.02±4.24
0.635	36	PG(18:0/18:2)	ND	ND	ND	ND	ND	1.86±0.58
0.635	36	PG(18:2/18:0)	ND	ND	ND	ND	ND	10.41±2.33
0.635	36	PG(18:0/18:1)	0.03±0.02	ND	5.51±0.57	10.00±1.54	ND	2.36±0.55
0.635	36	PG(18:0/18:0)	ND	ND	0.30±0.06	0.49±0.08	ND	2.33±0.60
0.483	38	PG(18:3/20:4)	ND	ND	ND	ND	0.39±0.37	ND
0.483	38	PG(20:4/18:2)	ND	ND	ND	ND	ND	22.34±5.71
0.483	38	PG(18:1/20:5)	ND	0.27±0.06	ND	ND	5.36±1.30	ND
0.483	38	PG(18:1/20:4)	ND	ND	13.85±1.57	12.82±2.55	54.82±13.60	15.34±3.35
0.483	38	PG(18:1/20:3)	ND	ND	10.72±1.80	12.59±2.19	ND	ND
0.483	38	PG(18:0/20:5)	ND	1.74±0.31	ND	ND	ND	ND
0.331	40	PG(18:2/22:6)	ND	ND	ND	ND	ND	129.91±33.23
0.331	40	PG(18:1/22:6)	ND	ND	ND	ND	ND	78.88±17.67
0.027	44	PG(22:6/22:6)	ND	ND	ND	ND	ND	2565.56±554.81
0.926	32	PI(16:0/16:1)	0.12±0.06	ND	1.04±0.30	14.03±1.29	ND	ND
0.926	32	PI(16:0/16:0)	0.16±0.09	ND	0.68±0.17	9.45±1.16	ND	5.25±1.53
0.762	34	PI(16:0/18:2)	3.79±1.68	1.80±0.42	ND	ND	ND	60.63±23.86
0.762	34	PI(16:1/18:1)	ND	ND	17.64±2.87	42.41±4.29	ND	ND
0.762	34	PI(16:0/18:1)	ND	0.13±0.04	ND	ND	36.81±9.09	3.82±1.44
0.762	34	PI(18:1/16:0)	1.61±0.30	0.29±0.08	17.01±2.81	87.76±9.86	ND	6.48±2.27
0.762	34	PI(16:1/18:0)	ND	ND	4.69±0.64	26.48±3.41	ND	ND
0.762	34	PI(16:0/18:0)	0.20±0.09	ND	1.25±0.28	6.46±0.68	ND	8.36±3.04
0.598	36	PI(16:0/20:4)	4.00±1.27	6.72±1.45	23.19±2.99	35.85±3.28	29.38±7.54	228.14±87.58

0.598	36	PI(18:1/18:2)	2.61±0.74	0.75±0.18	ND	ND	ND	23.85±10.07
0.598	36	PI(20:3/16:0)	ND	0.37±0.10	ND	ND	ND	27.79±8.53
0.598	36	PI(16:0/20:3)	ND	0.65±0.13	ND	ND	ND	13.31±5.45
0.598	36	PI(18:1/18:1)	2.07±0.52	ND	235.22±35.15	397.17±49.40	ND	ND
0.598	36	PI(18:0/18:2)	10.35±2.98	2.36±0.72	10.67±2.44	42.24±6.42	6.64±1.62	102.41±34.16
0.598	36	PI(18:1/18:0)	0.35±0.08	ND	ND	ND	ND	6.29±2.39
0.598	36	PI(18:0/18:1)	1.82±0.32	ND	45.03±8.80	309.25±40.17	30.92±8.49	7.76±2.78
0.598	36	PI(18:0/18:0)	ND	ND	4.06±0.69	26.64±3.53	ND	39.16±16.76
0.434	38	PI(16:0/22:6)	ND	0.67±0.16	ND	ND	ND	34.84±14.86
0.434	38	PI(18:1/20:4)	2.33±0.53	3.89±0.46	190.60±28.27	114.47±14.29	52.93±13.99	151.80±53.82
0.434	38	PI(18:0/20:4)	50.32±10.76	50.94±11.04	531.36±73.34	325.46±64.40	409.15±109.10	2012.17±678.06
0.434	38	PI(20:3/18:0)	3.57±0.71	3.27±0.76	38.53±5.35	24.40±4.84	ND	79.75±35.53
0.434	38	PI(18:0/20:3)	5.16±1.18	3.80±0.85	296.94±61.47	168.36±26.64	699.33±238.18	410.62±133.66
0.434	38	PI(18:0/20:2)	ND	ND	17.05±4.70	54.86±9.72	39.12±14.33	26.59±8.73
0.434	38	PI(18:0/20:1)	ND	ND	ND	ND	ND	4.19±1.75
0.27	40	PI(18:0/22:6)	1.89±0.59	4.48±0.81	ND	ND	ND	211.59±78.89
0.27	40	PI(18:0/22:5)	ND	1.81±0.41	ND	ND	ND	111.48±38.78

The relative concentrations of phospholipids in different biological samples

	LPA(16:0)	1.41±0.85	ND	10.06±10.03	3.57±2.19	ND	ND
	LPA(18:3)	1.82±0.80	7.71±2.47	21.69±10.71	9.44±4.13	ND	13.83±7.75
	LPA(18:2)	4.47±2.31	2.49±1.01	14.01±8.25	6.25±1.95	ND	5.91±2.28
	LPA(18:1)	<LOQ	1.43±0.87	7.86±5.06	10.77±4.92	ND	2.49±1.47
	LPA(18:0)	3.04±2.14	ND	ND	ND	8.52±4.29	3.57±3.04
	LPA(20:4)	2.67±1.90	4.68±1.64	12.94±10.86	4.88±2.08	ND	11.45±5.77
	LPA(20:3)	11.81±3.84	16.67±7.13	ND	ND	ND	35.65±21.98
	LPA(20:2)	<LOQ	ND	ND	ND	ND	ND

LPA(20:1)	7.99±4.96	17.59±7.20	73.82±35.12	49.86±16.03	ND	ND
LPA(20:0)	1.13±0.35	ND	35.19±16.88	26.69±10.69	ND	ND
LPA(22:6)	2.37±1.83	2.31±1.06	14.37±9.58	20.39±9.47	5.37±1.89	7.87±4.06
LPA(22:2)	1.50±1.04	6.48±2.12	49.08±25.33	21.09±12.51	ND	13.58±7.07
LPA(22:1)	1.30±0.86	6.09±2.18	28.20±14.25	9.07±3.52	1.46±1.39	9.50±5.36
LPA(22:0)	ND	ND	ND	ND	ND	3.88±3.66
LPA(24:1)	ND	4.23±1.37	23.59±15.19	9.84±5.64	ND	ND
LPA(24:0)	ND	2.08±1.09	ND	ND	ND	ND
LPC(14:0)	0.46±0.18	0.27±0.07	0.19±0.06	0.30±0.06	0.27±0.05	0.25±0.09
LPC(16:1)	1.38±0.19	0.93±0.21	1.39±0.34	0.91±0.17	2.03±0.43	1.46±0.37
LPC(16:0)	111.35±12.84	112.15±17.96	11.67±2.09	7.59±1.14	33.17±4.28	166.23±36.45
LPC(18:3)	0.27±0.09	0.15±0.04	ND	ND	0.13±0.04	0.63±0.10
LPC(18:2)	21.34±1.93	21.22±5.49	0.76±0.19	0.62±0.10	ND	63.25±13.25
LPC(18:1)	22.00±2.02	21.93±3.24	20.23±4.13	10.66±1.91	16.02±2.76	47.26±6.25
LPC(18:0)	85.53±14.78	162.14±29.72	8.33±1.10	6.76±0.54	57.74±6.04	387.11±103.93
LPC(20:5)	0.26±0.17	ND	ND	ND	ND	1.39±0.45
LPC(20:4)	5.46±0.55	18.47±3.57	0.90±0.18	0.41±0.06	3.69±0.77	133.38±22.02
LPC(20:3)	1.49±0.35	1.60±0.26	0.69±0.12	0.23±0.03	ND	10.69±1.66
LPC(20:2)	1.17±0.21	1.42±0.30	0.63±0.09	0.36±0.05	ND	3.83±0.93
LPC(20:1)	0.96±0.29	2.92±0.72	2.85±0.25	1.76±0.32	0.89±0.31	5.28±1.53
LPC(20:0)	0.58±0.29	2.17±0.69	0.33±0.05	0.26±0.03	0.61±0.08	4.40±1.37
LPC(22:6)	1.24±0.43	2.35±0.40	ND	ND	ND	23.31±6.25
LPC(22:1)	ND	0.58±0.13	ND	ND	ND	ND
LPC(22:0)	ND	0.66±0.19	ND	ND	ND	1.51±0.58
LPC(24:1)	ND	0.87±0.23	ND	ND	ND	1.47±0.44
LPC(24:0)	ND	1.37±0.40	ND	ND	2.19±0.57	4.80±2.06
LPE(14:1)	<LOQ	0.75±0.15	0.19±0.11	0.07±0.04	ND	1.38±0.73

LPE(16:1)	ND	ND	0.62±0.18	0.32±0.12	ND	<LOQ
LPE(16:0)	1.28±0.28	3.54±1.04	2.86±0.66	3.73±0.84	2.71±0.53	64.16±15.36
LPE(18:3)	0.05±0.03	ND	ND	ND	ND	<LOQ
LPE(18:2)	2.68±0.34	0.73±0.27	0.48±0.13	0.89±0.09	0.88±0.24	19.31±6.99
LPE(18:1)	2.07±0.49	1.30±0.42	17.05±4.45	24.56±3.95	13.18±2.93	36.22±9.28
LPE(18:0)	6.73±1.26	11.30±4.29	20.36±3.77	23.96±6.17	33.50±4.49	216.28±49.45
LPE(20:5)	<LOQ	ND	ND	ND	ND	0.73±0.44
LPE(20:4)	1.44±0.22	0.62±0.17	6.13±0.88	5.22±0.74	10.25±2.55	40.40±11.51
LPE(20:3)	0.29±0.06	ND	3.00±0.63	1.72±0.27	13.25±3.51	4.13±1.16
LPE(20:2)	0.28±0.06	ND	1.11±0.25	1.65±0.28	1.65±0.39	2.84±0.89
LPE(20:1)	0.27±0.13	0.21±0.09	5.12±0.99	11.99±3.65	5.32±1.23	4.60±1.55
LPE(20:0)	0.06±0.06	ND	ND	ND	ND	1.62±0.90
LPE(22:1)	<LOQ	ND	ND	ND	ND	ND
LPE(22:0)	0.25±0.16	0.19±0.09	ND	ND	ND	0.62±0.36
LPE(24:1)	0.05±0.03	0.09±0.05	ND	ND	ND	ND
LPE(24:0)	0.40±0.24	0.52±0.16	ND	ND	1.50±0.55	0.99±0.54
SM(d18:1/14:1)	0.53±0.15	ND	0.19±0.05	0.54±0.07	0.42±0.18	ND
SM(d18:1/14:0)	12.53±4.11	0.41±0.19	18.18±4.69	31.31±2.23	22.54±8.76	56.28±23.10
SM(d18:1/16:1)	43.72±11.99	4.59±2.06	30.30±5.69	51.70±4.31	71.87±22.12	251.09±64.31
SM(d18:1/16:0)	114.54±24.02	38.19±14.00	322.70±32.25	228.54±13.87	340.33±44.55	1437.42±270.19
SM(d18:0/16:0)	8.15±1.66	2.72±1.03	ND	ND	35.02±3.98	113.51±20.82
SM(d18:0/18:3)	1.47±0.43	ND	ND	ND	ND	ND
SM(d18:0/18:2)	ND	ND	ND	ND	14.50±2.21	ND
SM(d18:1/18:1)	12.33±4.17	0.91±0.27	4.91±0.52	7.27±0.60	ND	9.31±1.92
SM(d18:1/18:0)	15.29±3.54	1.94±0.54	24.17±1.80	14.12±1.22	38.27±5.82	129.08±39.60
SM(d18:0/18:0)	ND	ND	ND	ND	ND	<LOQ
SM(d18:0/20:3)	ND	ND	ND	ND	2.46±0.82	ND

SM(d18:0/20:6)	ND	ND	0.61±0.06	0.30±0.03	ND	ND
SM(d18:0/20:5)	ND	ND	0.27±0.05	0.29±0.05	ND	ND
SM(d18:1/20:2)	ND	ND	3.02±0.74	2.99±0.14	ND	ND
SM(d18:1/20:1)	6.09±1.54	0.51±0.13	ND	ND	ND	<LOQ
SM(d18:1/20:0)	32.89±6.98	3.11±1.50	123.17±11.69	77.05±6.21	15.85±2.53	353.38±88.47
SM(d18:0/20:0)	ND	ND	205.34±17.72	94.68±9.72	ND	ND
SM(d18:1/22:6)	ND	ND	20.25±2.13	6.20±0.57	ND	10.40±3.58
SM(d18:0/22:6)	ND	ND	ND	ND	ND	<LOQ
SM(d18:0/22:2)	ND	ND	ND	ND	14.75±2.96	ND
SM(d18:1/22:1)	65.69±17.65	4.21±1.91	48.55±4.46	24.24±2.28	ND	300.22±89.21
SM(d18:1/22:0)	81.99±33.31	7.93±3.15	195.11±16.77	91.70±9.07	63.99±18.68	1468.37±546.81
SM(d18:0/22:0)	ND	ND	ND	ND	0.44±0.17	ND
SM(d18:1/24:1)	132.37±38.25	62.58±24.01	206.62±42.66	193.16±10.65	227.27±60.90	4846.06±1791.39
SM(d18:0/24:1)	83.31±40.27	ND	ND	ND	ND	ND
SM(d18:1/24:0)	ND	6.43±2.50	ND	ND	70.90±31.92	4808.32±2504.25
SM(d18:0/24:0)	ND	ND	ND	ND	ND	549.21±288.04

Data are shown as average ± SD, n=10. ND: not detected, RMR: relative molar response, CN: carbon number of two acyl chains, PC: phosphatidylcholines, PE: phosphatidylethanolamine, PA: phosphatidic acid, PG: phosphatidylglycerol, PI: phosphatidylinositol, PS: phosphatidylserine, SM: sphingomyelin, LPA: lyso-phosphatidic acid, LPC: lyso-phosphatidylcholines, LPE: lyso-phosphatidylethanolamine.