Lipidomic Profiling on Oxidized Phospholipids in Type 2 Diabetes Mellitus Model Zebrafish

Supporting Information

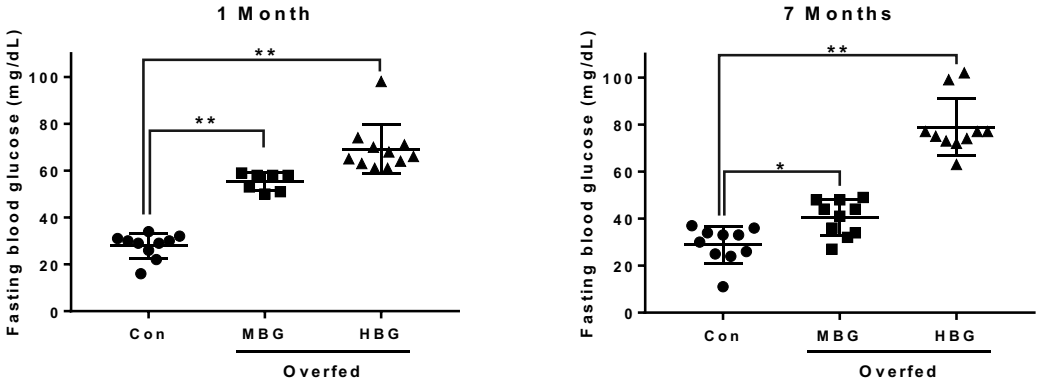

Fig. S1. Comparison of fasting blood glucose among the control (Con), medium blood glucose (MBG), and high blood glucose (HBG) zebrafish. All data were expressed as the means ± standard deviation by one-way ANOVA using the Tukey post-hoc test. * $P < 0.05$, ** $P < 0.01$.

Table S1. LC-HRMS data of phospholipids, oxidized phospholipids, phospholipid aldehydes, and lysophospholipids

Name	Formula	Diagnostic ion	Calc. *m/z*	Test *m/z*	Δppm	RT
PC 28:0	$C_{36}H_{72}O_8NP$	$[M + H]^+$	678.5068	678.5065	-0.44	7.26
PC 30:0	$C_{38}H_{76}O_8NP$	$[M + H]^+$	706.5381	706.5383	0.28	8.23
PC 32:0	$C_{40}H_{80}O_8NP$	$[M + H]^+$	734.5694	734.5696	0.27	9.19
PC 32:1	$C_{40}H_{78}O_8NP$	$[M + H]^+$	732.5538	732.5540	0.27	8.37
PC 32:2	$C_{40}H_{76}O_8NP$	$[M + H]^+$	730.5381	730.5383	0.27	7.82
PC 34:0	$C_{42}H_{84}O_8NP$	$[M + H]^+$	762.6007	762.6010	0.39	10.08
PC 34:1	$C_{42}H_{82}O_8NP$	$[M + H]^+$	760.5851	760.5847	-0.53	9.30
PC 34:2	$C_{42}H_{80}O_8NP$	$[M + H]^+$	758.5694	758.5697	0.40	8.73
PC 34:3	$C_{42}H_{78}O_8NP$	$[M + H]^+$	756.5538	756.5545	0.93	8.22
PC 34:4	$C_{42}H_{76}O_8NP$	$[M + H]^+$	754.5381	754.5382	0.13	7.70
PC 34:5	$C_{42}H_{74}O_8NP$	$[M + H]^+$	752.5225	752.5221	-0.53	7.11
PC 36:1	$C_{44}H_{86}O_8NP$	$[M + H]^+$	788.6164	788.6161	-0.38	10.25
PC 36:2	$C_{44}H_{84}O_8NP$	$[M + H]^+$	786.6007	786.6008	0.13	9.58
PC 36:3	$C_{44}H_{82}O_8NP$	$[M + H]^+$	784.5851	784.5850	-0.13	8.94
PC 36:4	$C_{44}H_{80}O_8NP$	$[M + H]^+$	782.5694	782.5698	0.51	8.65
PC 36:5	$C_{44}H_{78}O_8NP$	$[M + H]^+$	780.5538	780.5530	-1.02	8.06
PC 36:6	$C_{44}H_{76}O_8NP$	$[M + H]^+$	778.5381	778.5378	-0.39	7.40
PC 38:4	$C_{46}H_{84}O_8NP$	$[M + H]^+$	810.6007	810.6005	-0.25	9.62
PC 38:6	$C_{46}H_{80}O_8NP$	$[M + H]^+$	806.5694	806.5686	-0.99	8.32
PC 38:7	$C_{46}H_{78}O_8NP$	$[M + H]^+$	804.5538	804.5533	-0.62	7.67
PC 38:8	$C_{46}H_{76}O_8NP$	$[M + H]^+$	802.5381	802.5380	-0.12	7.06
PC 40:6	$C_{48}H_{84}O_8NP$	$[M + H]^+$	834.6007	834.6004	-0.36	9.44
PC 40:7	$C_{48}H_{82}O_8NP$	$[M + H]^+$	832.5851	832.5843	-0.96	8.73
PC 40:8	$C_{48}H_{80}O_8NP$	$[M + H]^+$	830.5694	830.5684	-1.20	7.97
PC 40:9	$C_{48}H_{78}O_8NP$	$[M + H]^+$	828.5538	828.5532	-0.72	7.49
PC 40:10	$C_{48}H_{76}O_8NP$	$[M + H]^+$	826.5381	826.5372	-1.09	6.96
PC 42:10	$C_{50}H_{80}O_8NP$	$[M + H]^+$	854.5694	854.5691	-0.35	7.84
PC 42:11	$C_{50}H_{78}O_8NP$	$[M + H]^+$	852.5538	852.5526	-1.41	7.38
PC 44:12	$C_{52}H_{80}O_8NP$	$[M + H]^+$	878.5694	878.5684	-1.14	7.84
PC-OOH 36:5	$C_{44}H_{78}O_{10}NP$	$[M + H]^+$	812.5436	812.5438	0.25	4.85
PC-OOH 38:6	$C_{46}H_{80}O_{10}NP$	$[M + H]^+$	838.5593	838.5590	-0.36	5.06
PC-OOH 38:8	$C_{46}H_{76}O_{10}NP$	$[M + H]^+$	834.5280	834.5257	-2.76	4.64
PC-OOH 40:6	$C_{48}H_{84}O_{10}NP$	$[M + H]^+$	866.5906	866.5908	0.23	6.48
PC-OOH 40:7	$C_{48}H_{82}O_{10}NP$	$[M + H]^+$	864.5749	864.5748	-0.12	6.27
PC-OOH 40:8	$C_{48}H_{80}O_{10}NP$	$[M + H]^+$	862.5593	862.5592	-0.12	5.50
PC 18:0/CHO-7-Δ3	$C_{33}H_{62}O_9NP$	$[M + H]^+$	648.4235	648.4233	-0.31	3.37
PC 18:1/CHO-7-Δ3	$C_{33}H_{60}O_9NP$	$[M + H]^+$	646.4078	646.4075	-0.46	3.40

PC 18:0/CHO-4	$C_{30}H_{58}O_9NP$	$[M + H]^+$	608.3922	608.3915	-1.15	3.27
PC 18:1/CHO-4	$C_{30}H_{56}O_9NP$	$[M + H]^+$	606.3765	606.3761	-0.66	3.33
PC 16:1/CHO-8-Δ3	$C_{32}H_{58}O_9NP$	$[M + H]^+$	632.3922	632.3919	-0.47	3.37
PC 16:0/CHO-5	$C_{29}H_{56}O_9NP$	$[M + H]^+$	594.3765	594.3762	-0.50	3.21
PC 18:1/CHO-5	$C_{31}H_{58}O_9NP$	$[M + H]^+$	620.3922	620.3916	-0.97	3.33
LysoPC 14:0	$C_{22}H_{46}O_7NP$	$[M + H]^+$	468.3085	468.3086	0.21	2.91
LysoPC 16:0	$C_{24}H_{50}O_7NP$	$[M + H]^+$	496.3398	496.3396	-0.40	3.37
LysoPC 18:0	$C_{26}H_{54}O_7NP$	$[M + H]^+$	524.3711	524.3710	-0.19	4.31
LysoPC 18:1	$C_{26}H_{52}O_7NP$	$[M + H]^+$	522.3554	522.3549	-0.96	3.42
LysoPC 18:2	$C_{26}H_{50}O_7NP$	$[M + H]^+$	520.3398	520.3398	0.00	3.17
LysoPC 20:4	$C_{28}H_{50}O_7NP$	$[M + H]^+$	544.3398	544.3395	-0.55	3.08
LysoPC 20:5	$C_{28}H_{48}O_7NP$	$[M + H]^+$	542.3241	542.3236	-0.92	2.79
LysoPC 22:6	$C_{30}H_{50}O_7NP$	$[M + H]^+$	568.3398	568.3392	-1.06	3.05
PE 32:0	$C_{37}H_{74}O_8NP$	$[M - H]^-$	690.5079	690.5095	2.32	16.74
PE 32:1	$C_{37}H_{72}O_8NP$	$[M - H]^-$	688.4923	688.4940	2.47	16.17
PE 34:1	$C_{39}H_{76}O_8NP$	$[M - H]^-$	716.5236	716.5242	0.84	16.86
PE 36:1	$C_{41}H_{80}O_8NP$	$[M - H]^-$	744.5549	744.5571	2.95	19.82
PE 36:3	$C_{41}H_{76}O_8NP$	$[M - H]^-$	740.5236	740.5257	2.84	19.50
PE 36:4	$C_{41}H_{74}O_8NP$	$[M - H]^-$	738.5079	738.5103	3.25	19.35
PE 36:5	$C_{41}H_{72}O_8NP$	$[M - H]^-$	736.4923	736.4943	2.72	18.92
PE 38:4	$C_{43}H_{78}O_8NP$	$[M - H]^-$	766.5392	766.5413	2.74	20.09
PE 38:5	$C_{43}H_{76}O_8NP$	$[M - H]^-$	764.5236	764.5250	1.83	19.68
PE 38:6	$C_{43}H_{74}O_8NP$	$[M - H]^-$	762.5079	762.5093	1.84	19.27
PE 40:6	$C_{45}H_{78}O_8NP$	$[M - H]^-$	790.5392	790.5414	2.78	19.99
PE 40:7	$C_{45}H_{76}O_8NP$	$[M - H]^-$	788.5236	788.5250	1.78	19.35
PE 40:8	$C_{45}H_{74}O_8NP$	$[M - H]^-$	786.5079	786.5099	2.54	18.82
PE 40:9	$C_{45}H_{72}O_8NP$	$[M - H]^-$	784.4923	784.4946	2.93	18.31
PE 42:11	$C_{47}H_{72}O_8NP$	$[M - H]^-$	808.4923	808.4941	2.23	18.22
PE-OOH 36:2	$C_{41}H_{78}O_{10}NP$	$[M - H]^-$	774.5291	774.5304	1.68	17.47
PE-OOH 38:6	$C_{43}H_{74}O_{10}NP$	$[M - H]^-$	794.4978	794.4988	1.26	16.59
PE-OOH 40:6	$C_{45}H_{78}O_{10}NP$	$[M - H]^-$	822.5291	822.5300	1.09	17.29
PE-OOH 40:7	$C_{45}H_{76}O_{10}NP$	$[M - H]^-$	820.5134	820.5144	1.22	16.87
PE-OOH 40:8	$C_{45}H_{74}O_{10}NP$	$[M - H]^-$	818.4978	818.5000	2.69	16.25
LysoPE 16:0	$C_{21}H_{44}O_7NP$	$[M - H]^-$	452.2783	452.2798	3.32	12.84
LysoPE 18:0	$C_{23}H_{48}O_7NP$	$[M - H]^-$	480.3096	480.3109	2.71	14.39
LysoPE 18:1	$C_{23}H_{46}O_7NP$	$[M - H]^-$	478.2939	478.2953	2.93	13.14
LysoPE 20:5	$C_{25}H_{42}O_7NP$	$[M - H]^-$	498.2626	498.2641	3.01	11.04
LysoPE 22:6	$C_{27}H_{44}O_7NP$	$[M - H]^-$	524.2783	524.2800	3.24	11.72
PI 32:1	$C_{41}H_{77}O_{13}P$	$[M - H]^-$	807.5029	807.5043	1.73	16.41
PI 32:2	$C_{41}H_{75}O_{13}P$	$[M - H]^-$	805.4873	805.4890	2.11	15.93
PI 34:1	$C_{43}H_{81}O_{13}P$	$[M - H]^-$	835.5342	835.5356	1.68	17.16
PI 34:2	$C_{43}H_{79}O_{13}P$	$[M - H]^-$	833.5186	833.5201	1.80	16.62

PI 34:3	$C_{43}H_{77}O_{13}P$	$[M-H]^-$	831.5029	831.5055	3.13	16.17
PI 34:4	$C_{43}H_{75}O_{13}P$	$[M-H]^-$	829.4873	829.4890	2.05	15.91
PI 36:1	$C_{45}H_{85}O_{13}P$	$[M-H]^-$	863.5655	863.5660	0.58	17.92
PI 36:2	$C_{45}H_{83}O_{13}P$	$[M-H]^-$	861.5499	861.5512	1.51	17.31
PI 36:3	$C_{45}H_{81}O_{13}P$	$[M-H]^-$	859.5342	859.5367	2.91	16.79
PI 36:4	$C_{45}H_{79}O_{13}P$	$[M-H]^-$	857.5186	857.5214	3.27	16.65
PI 36:5	$C_{45}H_{77}O_{13}P$	$[M-H]^-$	855.5029	855.5034	0.58	16.23
PI 36:6	$C_{45}H_{75}O_{13}P$	$[M-H]^-$	853.4873	853.4884	1.29	15.62
PI 38:4	$C_{47}H_{83}O_{13}P$	$[M-H]^-$	885.5499	885.5505	0.68	17.39
PI 38:5	$C_{47}H_{81}O_{13}P$	$[M-H]^-$	883.5342	883.5340	-0.23	16.94
PI 38:6	$C_{47}H_{79}O_{13}P$	$[M-H]^-$	881.5186	881.5187	0.11	16.35
PI 38:7	$C_{47}H_{77}O_{13}P$	$[M-H]^-$	879.5029	879.5032	0.34	15.88
PI 38:8	$C_{47}H_{75}O_{13}P$	$[M-H]^-$	877.4873	877.4877	0.46	15.35
PI 40:10	$C_{49}H_{75}O_{13}P$	$[M-H]^-$	901.4873	901.4880	0.78	15.32
PI 40:6	$C_{49}H_{83}O_{13}P$	$[M-H]^-$	909.5499	909.5491	-0.88	17.29
PI 40:7	$C_{49}H_{81}O_{13}P$	$[M-H]^-$	907.5342	907.5339	-0.33	16.67
PI 40:8	$C_{49}H_{79}O_{13}P$	$[M-H]^-$	905.5186	905.5184	-0.22	16.13
PI 40:9	$C_{49}H_{77}O_{13}P$	$[M-H]^-$	903.5029	903.5040	1.22	15.69
PI 42:10	$C_{51}H_{79}O_{13}P$	$[M-H]^-$	929.5186	929.5187	0.11	15.97
PI 42:11	$C_{51}H_{77}O_{13}P$	$[M-H]^-$	927.5029	927.5030	0.11	15.69
PI 44:12	$C_{53}H_{79}O_{13}P$	$[M-H]^-$	953.5186	953.5185	-0.10	16.04
LysoPI 16:0	$C_{25}H_{49}O_{12}P$	$[M-H]^-$	571.2889	571.2901	2.10	10.37
LysoPI 18:0	$C_{27}H_{53}O_{12}P$	$[M-H]^-$	599.3202	599.3219	2.84	11.96
LysoPI 18:1	$C_{27}H_{51}O_{12}P$	$[M-H]^-$	597.3045	597.3065	3.35	10.81
LysoPI 20:4	$C_{29}H_{49}O_{12}P$	$[M-H]^-$	619.2889	619.2900	1.78	9.33
LysoPI 20:5	$C_{29}H_{47}O_{12}P$	$[M-H]^-$	617.2732	617.2745	2.11	8.20
LysoPI 22:6	$C_{31}H_{49}O_{12}P$	$[M-H]^-$	643.2889	643.2900	1.71	9.28
PS 34:1	$C_{40}H_{76}NO_{10}P$	$[M-H]^-$	760.5134	760.5150	2.10	15.03
PS 36:0	$C_{42}H_{82}NO_{10}P$	$[M-H]^-$	790.5604	790.5607	0.38	18.97
PS 36:1	$C_{42}H_{80}NO_{10}P$	$[M-H]^-$	788.5447	788.5466	2.41	18.55
PS 36:2	$C_{42}H_{78}NO_{10}P$	$[M-H]^-$	786.5291	786.5307	2.03	18.22
PS 38:4	$C_{44}H_{78}NO_{10}P$	$[M-H]^-$	810.5291	810.5308	2.10	18.02
PS 38:6	$C_{44}H_{74}NO_{10}P$	$[M-H]^-$	806.4978	806.4988	1.24	14.35
PS 40:6	$C_{46}H_{78}NO_{10}P$	$[M-H]^-$	834.5291	834.5308	2.04	17.58
LysoPS 22:6	$C_{28}H_{44}NO_9P$	$[M-H]^-$	568.2681	568.2694	2.29	9.40