

Supplementary Information

Evaluation of treadmill exercise effect on muscular lipid profiles of diabetic fatty rats by nanoflow liquid chromatography–tandem mass spectrometry

Jong Cheol Lee,¹ Il Yong Kim,^{2,3} Yeri Son,^{2,3} Seul Kee Byeon,¹ Dong Hyun Yoon,^{3,4} Jun Seok Son,^{3,4} Han Sol Song,^{3,4} Wook Song,^{3,4,5} Je Kyung Seong,^{2,3*} and Myeong Hee Moon^{1,*}

¹Department of Chemistry, Yonsei University, Seoul, 03722, Korea

²College of Veterinary Medicine, Seoul National University, Seoul, 08826, Korea

³Korea Mouse Phenotyping Center (KMPC), Seoul National University, Seoul, 08826, Korea

⁴Health and Exercise Science Laboratory, Institute of Sport Science, Seoul National University College of Education, Seoul, 08826, Korea

⁵Institute on Aging, Seoul National University College of Medicine, Seoul, 08826, Korea.

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37 *nLC-ESI-MS/MS*

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39 For the global search of lipids by nLC-ESI-MS/MS (ion trap), the column was prepared in
40 the laboratory by packing Watcher ODS-P (3 μm and 100 \AA) C18 resins (Isu Industry Corp.
41 Seoul, Korea) into a pulled tip silica capillary tube (75 μm I.D. with 360 μm O.D.) under N_2
42 (1000 psi) to a column length of 7 cm. The pulled tip column was prepared by pulling one
43 end of the silica tube with a flame to make a sharp needle so that ESI can be achieved without
44 a separate emitter. The analytical column was connected to a PEEK microcross (IDEX, Oak
45 Harbor, WA, USA), the other three ports of which were connected to a capillary tube (50 μm
46 I.D.) from the LC pump, a Pt wire to supply electrical voltage for ESI, and a pressure
47 capillary (20 μm I.D.) for venting. The latter was used to provide a pressure for the
48 controlling the column flow rate at 300 nL/min by varying its length and for venting the split
49 flow. The end of the pressure tube was attached to the on/off switching valve so that it was
50 closed during sample loading to column and opened during LC separation. Separation of
51 lipids by nLC was achieved with gradient elution using two mobile phases: $\text{H}_2\text{O}:\text{CH}_3\text{CN}$ (9:1,
52 v/v) for mobile phase A and $\text{CH}_3\text{OH}:\text{CH}_3\text{CN}:\text{isopropanol}$ (2:2:6, v/v/v) for phase B. To both
53 mobile phase solutions, 5 mM NH_4HCO_2 and 0.05% NH_4OH were added as modifiers, which
54 were utilized in the positive and negative ion modes of MS analysis. The sample was loaded
55 to an analytical column using mobile phase A with the switching valve off at 600 nL/min for
56 15 min. After loading, gradient elution was initiated by ramping mobile phase B from 0% to
57 55% for 1 min, 80% for 20 min, and 100% for 20 min. For column washing, mobile phase B
58 was maintained at 100% for 30 min and then lowered to 0%. To minimize the dwell time
59 during gradient elution, a flow rate of 15 $\mu\text{L}/\text{min}$ was applied with the switching valve on so
60 that a final concentration of 300 nL/min was delivered to an analytical column and the rest of
61 the flow exited through the vent tube. The injected amount of each sample was adjusted to 10
62 μg based on the weights of dried lipids. Two internal standards (IS), 1 pmol of 13:0/13:0-PC
63 for the positive ion mode and 1 pmol of 15:0/15:0-PG for the negative ion mode, were
64 injected together with 10 μg of sample to compensate the fluctuation in MS intensity. For MS
65 analysis, 3.0 kV of ESI voltage was applied. The mass ranges of detection were 400–1100
66 and 350–1100 amu for the negative and positive ion modes, respectively. For each precursor
67 run, 3 data-dependent CID analyses were accomplished with 40% normalized collision
68 energy. Structural determination of lipid molecules from fragment ion spectra was performed

69 using the LiPilot computer algorithm (1), which was developed in our laboratory and
70 confirmed by manual examinations.

71 For targeted quantitation of identified lipids from the non-targeted analysis, the selected
72 reaction monitoring (SRM)-based quantitation method was performed by UPLC–ESI–
73 MS/MS using a nanoACQUITY UPLC system (Waters, Milford, MA, USA) equipped with
74 an autosampler and a TSQ Vantage triple stage quadrupole MS system (Thermo Scientific).
75 The analytical column for UPLC was prepared in our laboratory in the same manner as that
76 described at the above, but it was packed in a pulled tip capillary (100 μm I.D.) using 1.7- μm
77 ethylene bridged hybrid (BEH) particles (130 \AA) that were unpacked from an XBridge®
78 BEH C18 column (2.1 mm \times 100 mm, Waters). Before packing, the 5-mm length of the
79 needle tip was filled with Watchers ODS-P (3 μm and 100 \AA) to make a self-assembled frit,
80 and the rest was packed with 1.7- μm BEH particles. Configuration of the column connection
81 with a vent tube and Pt wire, the injected amount of the lipid extract, and the type of mobile
82 phase solutions was as described previously. Sample loading was performed at 1 $\mu\text{L}/\text{min}$ of
83 mobile phase A for 10 min, and gradient elution was initiated by increasing mobile phase B to
84 70% for 0.1 min, 90% for 4.9 min, and 100% for 8 min and maintained for 7 min. During
85 gradient elution, the pump flow rate was maintained at 21 $\mu\text{L}/\text{min}$ to reduce the dwell time,
86 and the final column flow rate was adjusted to 300 nL/min. The same amount of samples (10
87 μg) and ISs (1 pmol) were injected for each analysis. The ESI voltage was fixed at 3.0 kV,
88 but the collision energies for SRM analysis were varied according to lipid types as 20 (LPE
89 and PE), 25 (DAG and TAG), 30 (Cer and MHC), 35 (LPG, PG, LPI, PI, LPS, PS, LPA, and
90 PA), or 40 V (LPC, PC, and SM) with a scan width of m/z 1.0 and a scan time of 0.01 s.
91 Targeted quantitation was performed in the positive and negative ion modes, which were
92 repeatedly switched during a single run. Lipid species detected during a positive ion mode
93 cycle were LPC, PC, LPE, PE, SM, Cer, and MHC for $[\text{M}+\text{H}]^+$ and DAG and TAG for
94 $[\text{M}+\text{NH}_4]^+$, and the remaining species were detected during a negative cycle for $[\text{M}-\text{H}]^-$. The
95 types of characteristic fragment ions for SRM were protonated phosphocholine ions (m/z 184)
96 for LPC, PC, and SM, neutral loss of phosphoethanolamine ($[\text{M}+\text{H}-141]^+$) for LPE and PE,
97 LCB fragments (m/z 264) for Cer and MHC, $[\text{M}+\text{NH}_4-\text{RCOONH}_4]^+$ for DAG and TAG, and
98 carboxylate anions of acyl chains ($[\text{R}_1\text{COO}]^-$ and $[\text{R}_2\text{COO}]^-$) for the remaining lipid species
99 detected using the negative ion mode. Statistical analyses of data were accomplished using
100 Minitab 15 software (<http://www.minitab.co.kr>) for principal component analysis and SPSS
101 software (version 20.0, IBM Corp. Armonk, NY, USA) for the Mann–Whitney U test.

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103 ***Structural determination of DAG and TAG***

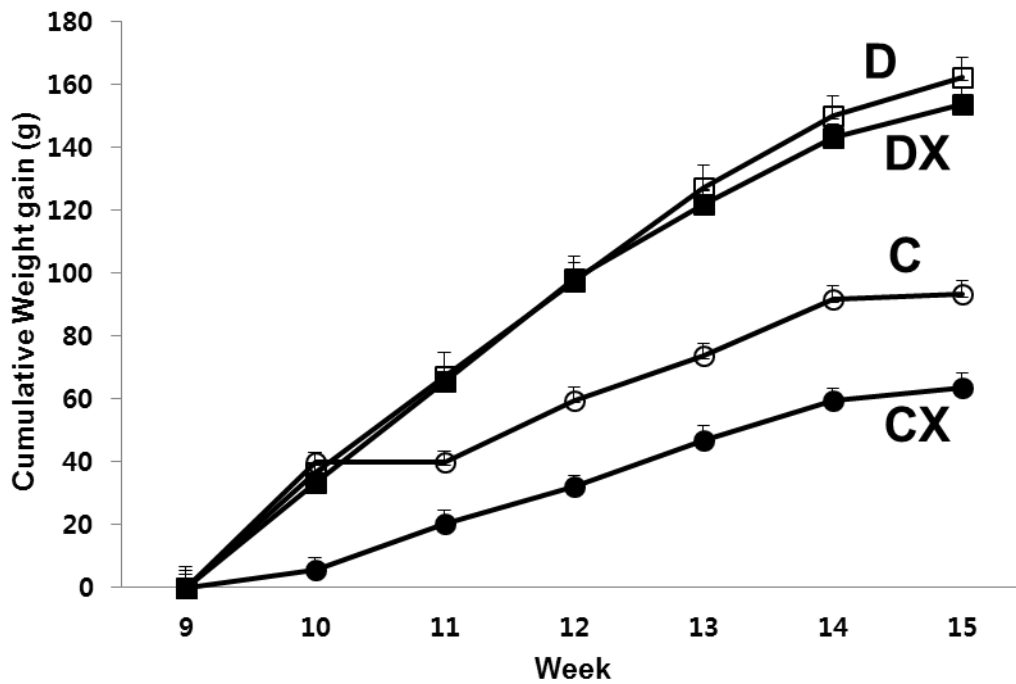
104 The CID spectra in Fig. S3a show four acylium ions, $[\text{RCO}]^+$ at m/z 237.3, 239.3, 263.4,
105 and 265.5, after the dissociation of acyl chains from TAG, corresponding to acyl chains of
106 16:1, 16:0, 18:2, and 18:1, respectively. Fragment ions at m/z 603.5, 601.6, 577.5, and 575.6
107 represent the loss of acyl chains (from 16:1 to 18:1) in the form of ammonium carboxylate as
108 $[\text{M}+\text{NH}_4\text{-RCOONH}_4]^+$ from the ammonium adduct form of TAG. Similarly, ions clustered
109 between m/z 313.5 and 341.5 represent the loss of two adjacent acyl chains in the form of
110 carboxylic acid and ketene, namely $[\text{M}+\text{NH}_4\text{-RCOONH}_4\text{-R}'\text{CH}=\text{C}=\text{O}]^+$. From these spectra,
111 the molecular structure of spectrum a) can be assigned as two isomeric TAG molecules,
112 (16:0,18:1,18:2)-TAG and (16:1,18:1,18:1)-TAG, without a positional order of acyl chains. A
113 slightly different fragmentation pattern was observed with DAG molecules in Fig. S3b,
114 revealing the loss of ammonia from the ammonium adduct ion ($[\text{M}+\text{NH}_4\text{-NH}_3]^+$) at m/z 621.6,
115 together with the loss of water ($[\text{M}+\text{NH}_4\text{-NH}_3\text{-H}_2\text{O}]^+$) at m/z 603.5 and the characteristic loss
116 of acyl chains in the form of ammonium carboxylate as $[\text{M}+\text{NH}_4\text{-RCOONH}_4]^+$ at m/z 337.4,
117 339.3, and 341.3, which were obtained from the dissociation of acyl chains 18:0, 18:1, and
118 18:2. The CID spectra in Fig. S3b can be assigned as (18:0,18:2)-DAG and (18:1,18:1)-DAG
119 without positional information for the acyl chains. The molecular structures of typical PLs
120 can be readily obtained via CID experiments during nLC–ESI–MS/MS, as reported in earlier
121 studies (refs. 23-26 in the text).

122

123 References

124 1. Lim, S., Byeon, S. K., Lee, J. Y. & Moon, M. H. Computational approach to structural
125 identification of phospholipids using raw mass spectra from nanoflow liquid
126 chromatography-electrospray ionization-tandem mass spectrometry. *J. Mass Spectrom.* **47**,
127 1004-1014, (2012).

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	ZLC		ZDF	
	C	CX	D	DX
Weight at 9 th week (g)	178.67 ± 4.22	184.80 ± 6.50	246.40 ± 5.34 ^a	235.00 ± 2.05 ^b
Weight at 15 th week (g)	272.00 ± 4.41	248.40 ± 4.71	408.80 ± 6.25 ^a	388.83 ± 4.79 ^{bc}
difference (g)	93.33 ± 4.31	63.60 ± 5.42 ^a	162.40 ± 4.75 ^a	153.83 ± 5.83 ^b

^a $P < 0.05$ vs. C group; ^b $P < 0.05$ vs. CX group; ^c $P < 0.05$ vs. D group.

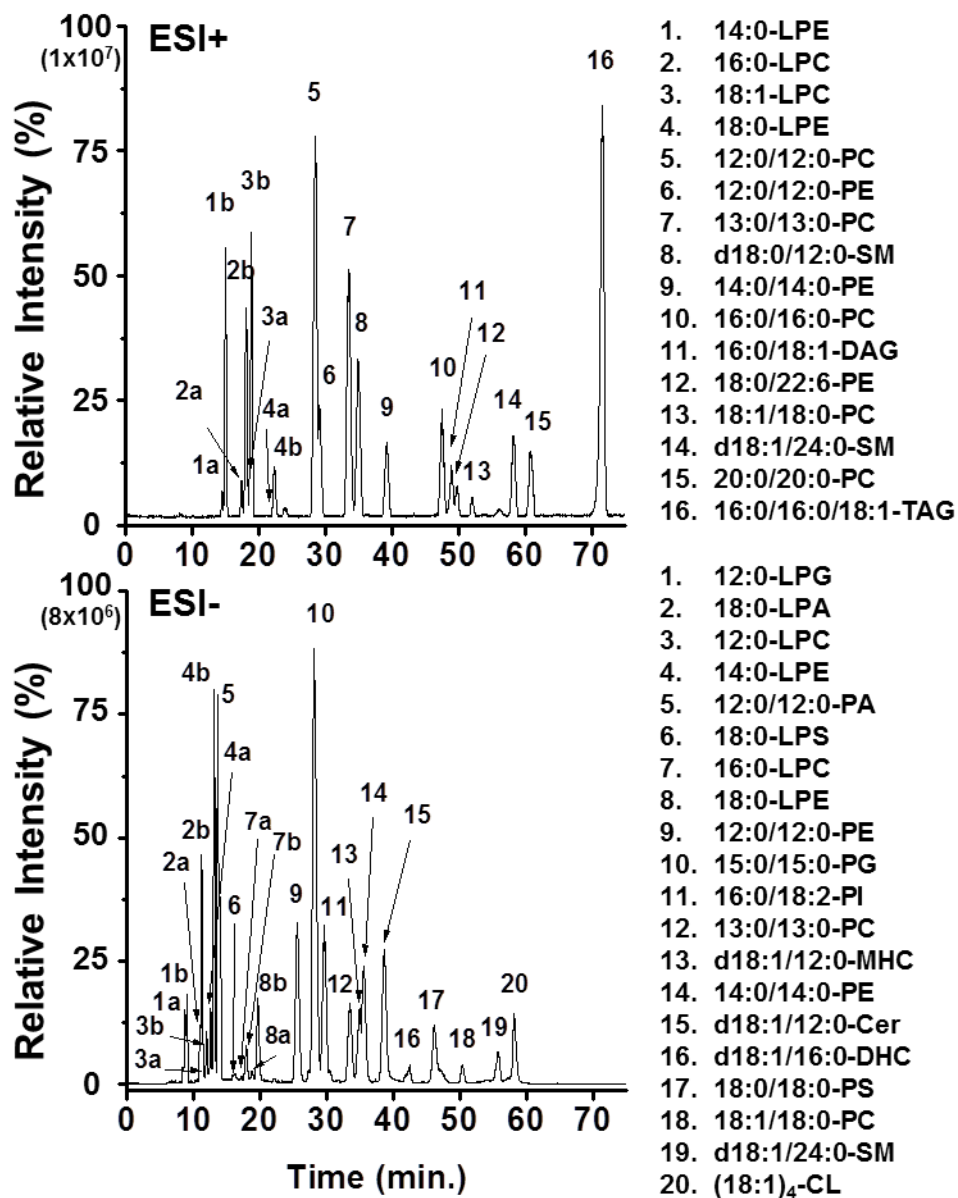
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132 Figure S1. Plot showing the cumulative body weight gains of animals during the period of
 133 exercise and measured weight values at weeks 9 and 15

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138 Figure S2. Base peak chromatograms of standard lipid mixtures obtained by nLC-ESI-
139 MS/MS in the positive (top) and negative (bottom) ion modes.

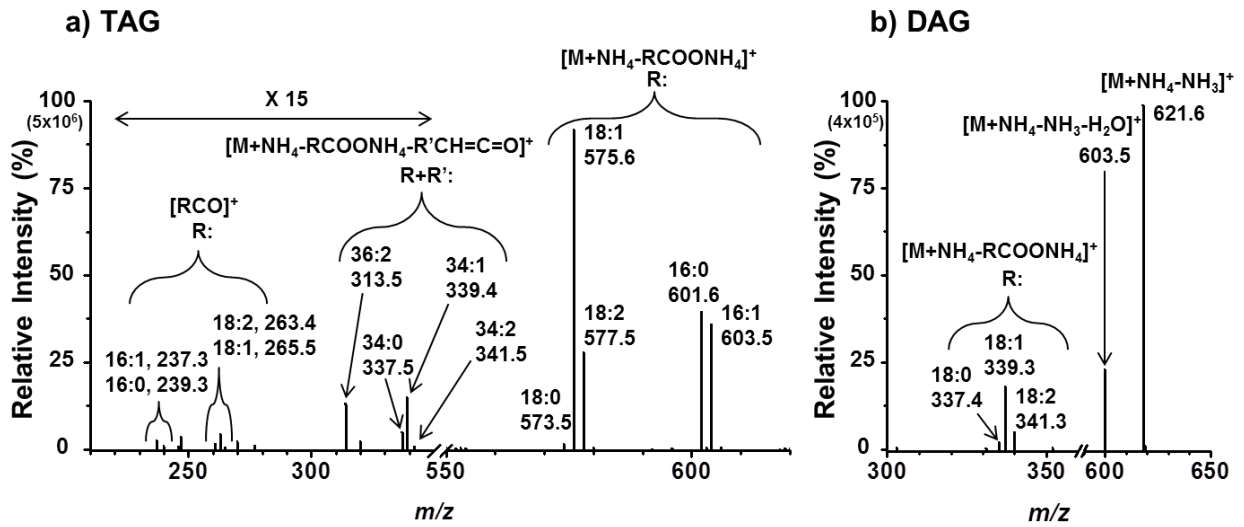
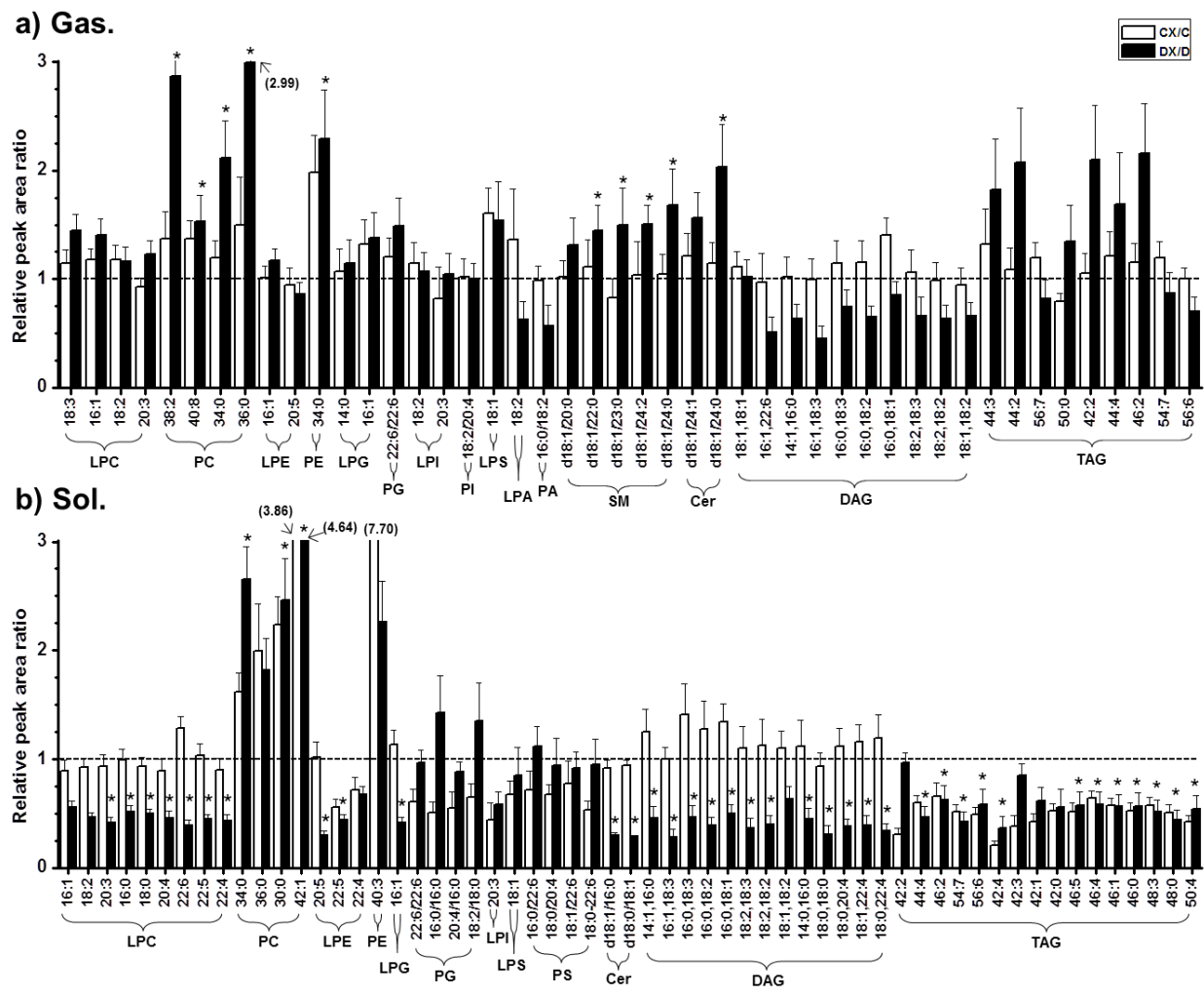


Figure S3. CID spectra assigned for a) 52:3-TAG isomeric forms (m/z 874.7, $[M+NH_4]^+$, $t_r = 60.86$ min) and b) 36:2-DAG (m/z 638.5, $[M+NH_4]^+$, $t_r = 49.57$ min) obtained by nLC-ESI-MS/MS analysis of a pooled soleus lipid sample from group D.

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Figure S4. Fold changes (CX/C and DX/D) of lipids species (D/C > 3-fold with p < 0.01) from Table S3. The species marked with asterisk (*) showed recovery trends sorted in Table 2a.

181 Table S1. Fasted body and tissue weights and fasted plasma glucose levels after 7 weeks of
 182 physical exercise (percentage (%) values are based on the relative amount of each organ or
 183 tissue relative to body weight).
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	ZLC		ZDF	
	C	CX	D	DX
body weight (g)	264.25 ± 4.00	244.28 ± 3.53 ^a	396.52 ± 6.35 ^a	387.25 ± 5.82 ^b
epididymal fat (g)	1.73 ± 0.06	1.54 ± 0.07	8.75 ± 0.40 ^a	8.05 ± 0.48 ^b
(%)	0.66 ± 0.02	0.63 ± 0.03	2.20 ± 0.07 ^a	2.07 ± 0.10 ^b
liver (g)	7.27 ± 0.14	6.72 ± 0.11 ^a	16.89 ± 1.01 ^a	15.83 ± 0.67 ^b
(%)	2.75 ± 0.08	2.75 ± 0.04	4.26 ± 0.24 ^a	4.08 ± 0.12 ^b
gastrocnemius (g)	2.57 ± 0.04	2.36 ± 0.01 ^a	2.19 ± 0.04	2.35 ± 0.07 ^{bc}
(%)	0.97 ± 0.01	0.97 ± 0.01	0.55 ± 0.01 ^a	0.61 ± 0.03 ^b
soleus (g)	0.26 ± 0.01	0.23 ± 0.00 ^a	0.25 ± 0.01 ^a	0.27 ± 0.00
(%)	0.10 ± 0.00	0.10 ± 0.00	0.06 ± 0.00 ^a	0.07 ± 0.00 ^{bc}
fasted blood glucose (mg/dL)	165.67 ± 8.98	144.40 ± 0.93	226.40 ± 7.78 ^a	210.00 ± 12.15 ^c

^ap < 0.05 vs. C group; ^bp < 0.05 vs. CX group; ^cp < 0.05 vs. D group

Table S2. a) Peak area of lipid species (vs. IS) from both tissue samples of the control (C), control after exercise (CX), diabetes (D), and diabetes after exercise (DX) groups obtained by nLC–ESI–MS/MS (The molecular structures of PC, PE, and TAG species are expressed with the total chain lengths, but detailed molecular structures of corresponding isomers for PC and PE identified from qualitative analysis are listed in b) and c) and the possible combinations of acyl chain structures for TAG species are listed in d). Species marked with ^{a, b, c} were isomers quantified individually because these isomers were separated as different molecular structures in nUPLC–ESI–MS/MS.).

a)

class	acyl chain	<i>m/z</i>	gastrocnemius				soleus			
			C	CX	D	DX	C	CX	D	DX
LPC	14:0	468.3	0.02 ± 0.00	0.03 ± 0.00	0.05 ± 0.00	0.05 ± 0.00	0.07 ± 0.00	0.06 ± 0.00	0.18 ± 0.02	0.08 ± 0.01
	16:1	494.3	0.08 ± 0.00	0.09 ± 0.01	0.47 ± 0.04	0.66 ± 0.05	0.23 ± 0.02	0.21 ± 0.02	1.29 ± 0.12	0.72 ± 0.04
	16:0	496.4	3.77 ± 0.22	4.55 ± 0.23	8.97 ± 0.77	7.89 ± 0.61	7.42 ± 0.56	7.33 ± 0.54	35.58 ± 2.95	18.34 ± 1.24
	18:3	518.5	0.02 ± 0.00	0.02 ± 0.00	0.07 ± 0.01	0.10 ± 0.01	0.12 ± 0.01	0.09 ± 0.01	0.33 ± 0.03	0.12 ± 0.01
	18:2	520.5	2.10 ± 0.17	2.48 ± 0.19	9.83 ± 0.95	11.37 ± 0.81	8.04 ± 0.51	7.41 ± 0.51	31.39 ± 2.46	14.5 ± 0.90
	18:1	522.4	1.22 ± 0.07	1.40 ± 0.09	3.55 ± 0.26	4.52 ± 0.33	5.20 ± 0.42	5.34 ± 0.42	13.66 ± 1.26	7.31 ± 0.45
	18:0	524.3	2.67 ± 0.20	4.08 ± 0.31	3.59 ± 0.33	3.72 ± 0.37	7.97 ± 0.51	7.41 ± 0.46	34.87 ± 2.15	17.45 ± 0.91
	20:4	544.3	2.53 ± 0.16	2.27 ± 0.18	5.22 ± 0.52	6.00 ± 0.47	4.36 ± 0.38	3.90 ± 0.32	15.63 ± 1.67	7.16 ± 0.64
	20:3	546.5	0.25 ± 0.02	0.23 ± 0.02	1.14 ± 0.08	1.40 ± 0.10	0.48 ± 0.04	0.44 ± 0.03	4.01 ± 0.41	1.65 ± 0.14
	22:6	568.4	1.52 ± 0.13	1.61 ± 0.18	2.72 ± 0.21	2.75 ± 0.21	2.93 ± 0.21	3.75 ± 0.20	12.06 ± 1.27	4.68 ± 0.42
	22:5	570.3	0.47 ± 0.03	0.54 ± 0.04	1.33 ± 0.09	1.38 ± 0.08	0.89 ± 0.08	0.91 ± 0.06	3.20 ± 0.22	1.43 ± 0.10
22:4	572.4	0.06 ± 0.00	0.06 ± 0.00	0.13 ± 0.01	0.19 ± 0.01	0.14 ± 0.01	0.12 ± 0.01	0.48 ± 0.05	0.21 ± 0.02	
PC	30:0	706.5	0.33 ± 0.03	0.37 ± 0.05	0.33 ± 0.05	0.59 ± 0.06	0.61 ± 0.06	1.37 ± 0.08	0.19 ± 0.02	0.46 ± 0.04
	32:2	730.6	0.96 ± 0.10	1.28 ± 0.13	1.17 ± 0.12	2.56 ± 0.19	0.97 ± 0.09	1.75 ± 0.12	0.43 ± 0.04	1.27 ± 0.09
	32:1	732.5	1.27 ± 0.12	2.03 ± 0.16	2.79 ± 0.35	6.02 ± 0.82	1.49 ± 0.16	4.10 ± 0.35	1.26 ± 0.09	3.38 ± 0.24
	32:0	734.5	7.29 ± 0.52	8.95 ± 0.80	4.79 ± 0.65	8.60 ± 1.26	7.64 ± 0.46	16.72 ± 0.81	3.43 ± 0.30	7.12 ± 0.66
	34:4	754.5	1.14 ± 0.09	1.27 ± 0.10	0.51 ± 0.05	1.05 ± 0.09	0.64 ± 0.05	1.21 ± 0.08	0.32 ± 0.03	0.81 ± 0.06
	34:3	756.5	3.78 ± 0.53	5.05 ± 0.61	5.85 ± 0.75	12.08 ± 1.01	3.36 ± 0.30	5.79 ± 0.43	2.20 ± 0.20	6.58 ± 0.50
	34:2	758.6	54.20 ± 4.89	84.17 ± 7.39	58.09 ± 7.84	98.26 ± 8.83	53.06 ± 4.93	127.63 ± 7.50	34.16 ± 1.99	67.24 ± 4.40

class	acyl chain	m/z	gastrocnemius				soleus			
			C	CX	D	DX	C	CX	D	DX
	34:1	760.5	40.07 ± 2.74	57.45 ± 4.67	32.37 ± 2.04	63.20 ± 4.09	40.12 ± 4.10	104.35 ± 5.36	23.91 ± 1.50	50.91 ± 3.50
	34:0	762.5	6.02 ± 0.60	7.19 ± 0.60	1.57 ± 0.22	3.31 ± 0.27	5.52 ± 0.26	8.94 ± 0.85	1.49 ± 0.13	3.95 ± 0.30
	36:5 ^a	780.5	2.17 ± 0.26	3.04 ± 0.28	1.12 ± 0.15	2.02 ± 0.26	1.12 ± 0.07	1.80 ± 0.11	0.55 ± 0.07	3.24 ± 0.19*
	36:5 ^b	780.6	2.53 ± 0.23	2.98 ± 0.31	1.96 ± 0.26	4.08 ± 0.31	1.31 ± 0.13	2.34 ± 0.16	1.24 ± 0.16	3.35 ± 0.34
	36:5 ^c	780.5	2.42 ± 0.22	2.90 ± 0.28	1.28 ± 0.32	1.80 ± 0.15	1.64 ± 0.08	3.63 ± 0.20	0.86 ± 0.16	2.19 ± 0.48
	36:4 ^a	782.5	38.28 ± 3.81	47.40 ± 7.06	18.63 ± 0.69	33.80 ± 1.74	21.73 ± 3.35	48.07 ± 2.89	14.54 ± 0.89	33.95 ± 2.67
	36:4 ^b	782.5	38.36 ± 6.13	39.69 ± 6.33	23.22 ± 4.25	37.46 ± 4.02	21.25 ± 1.69	36.62 ± 2.57	13.76 ± 1.07	33.00 ± 2.53
	36:3	784.5	20.88 ± 1.47	30.16 ± 2.84	21.96 ± 2.30	35.62 ± 3.41	21.16 ± 2.39	64.62 ± 5.06	18.15 ± 1.17	36.13 ± 3.55
	36:2	786.5	34.90 ± 2.91	55.83 ± 4.30	24.41 ± 1.86	47.62 ± 3.70	59.73 ± 2.10	116.96 ± 12.35	35.47 ± 2.56	77.11 ± 5.39
	36:1	788.5	16.75 ± 1.87	24.28 ± 2.59	6.39 ± 0.79	15.00 ± 1.31	21.56 ± 1.15	37.37 ± 3.02	10.43 ± 0.95	29.55 ± 2.07
	36:0	790.6	0.56 ± 0.11	0.84 ± 0.19	0.12 ± 0.02	0.36 ± 0.05	3.02 ± 0.43	6.00 ± 0.99	0.79 ± 0.10	1.43 ± 0.14
	38:7	804.5	4.60 ± 0.70	6.86 ± 1.01	1.96 ± 0.31	3.49 ± 0.37	3.50 ± 0.27	10.33 ± 0.47	2.19 ± 0.26	6.53 ± 0.51
	38:6 ^a	806.6	19.35 ± 2.46	27.61 ± 4.51	15.14 ± 0.84	24.57 ± 1.56	20.95 ± 1.43	36.05 ± 4.27	11.52 ± 0.96	28.75 ± 2.33
	38:6 ^b	806.5	20.47 ± 3.25	23.95 ± 4.89	10.23 ± 1.95	16.29 ± 1.39	21.04 ± 1.76	35.87 ± 3.57	10.82 ± 1.14	23.79 ± 2.60
	38:5	808.5	17.17 ± 1.79	25.91 ± 2.52	12.11 ± 1.69	17.73 ± 1.88	20.73 ± 1.23	33.32 ± 1.53	9.28 ± 0.83	19.26 ± 1.90
	38:4	810.5	32.45 ± 2.76	43.77 ± 3.24	13.13 ± 1.64	20.48 ± 1.68	36.35 ± 2.08	81.87 ± 6.20	19.58 ± 1.49	44.18 ± 2.74
	38:3	812.5	9.05 ± 0.73	13.01 ± 0.97	4.83 ± 0.53	8.39 ± 0.40	11.16 ± 0.42	19.17 ± 1.83	9.97 ± 1.15	19.82 ± 1.20
	38:2	814.6	5.14 ± 0.77	7.06 ± 0.75	1.13 ± 0.15	3.26 ± 0.27	0.86 ± 0.17	4.93 ± 0.27	1.72 ± 0.24	4.88 ± 0.45
	40:8	830.5	7.57 ± 0.67	10.39 ± 0.86	1.98 ± 0.27	3.03 ± 0.25	19.00 ± 1.48	38.13 ± 2.30	7.94 ± 0.88	20.59 ± 2.34
	40:7	832.6	4.39 ± 0.49	6.18 ± 0.72	3.42 ± 0.57	4.50 ± 0.34	8.14 ± 0.69	16.88 ± 1.21	3.63 ± 0.33	8.50 ± 0.90
	40:6	834.5	7.91 ± 0.77	11.50 ± 1.11	6.75 ± 0.95	10.15 ± 0.93	16.98 ± 1.41	34.46 ± 3.77	6.73 ± 0.82	15.83 ± 1.69
	40:5	836.5	3.71 ± 0.35	5.46 ± 0.43	2.88 ± 0.38	4.61 ± 0.35	6.85 ± 0.34	12.93 ± 0.86	2.48 ± 0.31	6.14 ± 0.54
	40:4	838.5	1.90 ± 0.14	2.94 ± 0.25	1.35 ± 0.16	1.90 ± 0.15	1.48 ± 0.08	4.09 ± 0.27	0.91 ± 0.16	2.66 ± 0.32
	40:1	844.5	0.50 ± 0.08	0.72 ± 0.11	0.34 ± 0.07	0.46 ± 0.06	1.29 ± 0.15	6.51 ± 0.80*	0.43 ± 0.08	1.81 ± 0.21*

class	acyl chain	m/z	gastrocnemius				soleus			
			C	CX	D	DX	C	CX	D	DX
LPE	40:0	846.6	0.11 ± 0.02	0.08 ± 0.01	0.07 ± 0.02	0.06 ± 0.01	0.40 ± 0.05	0.74 ± 0.07	0.14 ± 0.02	0.38 ± 0.02
	42:10	854.5	0.97 ± 0.09	0.82 ± 0.06	0.54 ± 0.08	0.46 ± 0.03	2.39 ± 0.20	5.32 ± 0.36	1.24 ± 0.20	1.79 ± 0.13
	42:1	872.5	0.43 ± 0.08	0.49 ± 0.09	0.28 ± 0.07	0.43 ± 0.05	1.12 ± 0.18	4.31 ± 0.76*	0.36 ± 0.07	1.67 ± 0.20*
	16:1	452.4	0.01 ± 0.00	0.01 ± 0.00	0.05 ± 0.00	0.06 ± 0.00	0.02 ± 0.00	0.02 ± 0.00	0.03 ± 0.00	0.02 ± 0.00
	16:0	454.3	0.19 ± 0.01	0.16 ± 0.02	0.30 ± 0.02	0.32 ± 0.03	0.23 ± 0.03	0.25 ± 0.03	0.34 ± 0.04	0.28 ± 0.02
	18:2	478.4	0.20 ± 0.02	0.16 ± 0.01	0.35 ± 0.03	0.42 ± 0.03	0.44 ± 0.03	0.37 ± 0.02	0.41 ± 0.05	0.34 ± 0.02
	18:1	480.3	0.26 ± 0.03	0.38 ± 0.07	0.53 ± 0.04	0.65 ± 0.05	0.48 ± 0.03	0.53 ± 0.12	0.65 ± 0.06	0.32 ± 0.02
	18:0	482.5	0.37 ± 0.04	0.25 ± 0.02	0.52 ± 0.05	0.58 ± 0.06	1.04 ± 0.08	0.88 ± 0.06	1.29 ± 0.07	0.70 ± 0.05
	20:5	500.3	0.01 ± 0.00	0.01 ± 0.00	0.03 ± 0.00	0.03 ± 0.00	0.02 ± 0.00	0.02 ± 0.00	0.07 ± 0.00	0.02 ± 0.00*
	20:4	502.4	0.25 ± 0.02	0.19 ± 0.02	0.33 ± 0.02	0.28 ± 0.02	0.37 ± 0.03	0.26 ± 0.02	1.10 ± 0.13	0.58 ± 0.04
	20:3	504.3	0.02 ± 0.00	0.01 ± 0.00	0.03 ± 0.00	0.03 ± 0.00	0.03 ± 0.00	0.02 ± 0.00	0.09 ± 0.01	0.05 ± 0.01
	22:6	526.5	1.29 ± 0.11	1.11 ± 0.11	1.61 ± 0.12	1.27 ± 0.11	1.34 ± 0.11	0.92 ± 0.08	2.59 ± 0.14	1.78 ± 0.10
	22:5	528.4	0.44 ± 0.05	0.30 ± 0.04	0.59 ± 0.06	0.53 ± 0.05	0.44 ± 0.04	0.24 ± 0.02	1.46 ± 0.11	0.64 ± 0.06
	22:4	530.4	0.11 ± 0.01	0.07 ± 0.01	0.11 ± 0.01	0.11 ± 0.01	0.09 ± 0.01	0.07 ± 0.01	0.28 ± 0.02	0.19 ± 0.02
PE	34:3	714.5	0.01 ± 0.00	0.02 ± 0.00	0.02 ± 0.00	0.04 ± 0.00	0.01 ± 0.00	0.02 ± 0.00	0.01 ± 0.00	0.05 ± 0.00*
	34:2	716.5	0.32 ± 0.03	0.72 ± 0.08	0.29 ± 0.04	0.78 ± 0.08	0.28 ± 0.03	0.70 ± 0.05	0.23 ± 0.02	0.81 ± 0.07*
	34:1	718.5	0.11 ± 0.01	0.28 ± 0.04	0.09 ± 0.01	0.32 ± 0.03*	0.11 ± 0.01	0.30 ± 0.02	0.22 ± 0.02	0.43 ± 0.03
	34:0	720.6	0.05 ± 0.01	0.09 ± 0.01	0.01 ± 0.00	0.03 ± 0.00	0.05 ± 0.00	0.12 ± 0.01	0.04 ± 0.00	0.11 ± 0.01
	36:5	738.5	0.07 ± 0.01	0.17 ± 0.02	0.07 ± 0.01	0.15 ± 0.01	0.07 ± 0.01	0.22 ± 0.01*	0.02 ± 0.00	0.06 ± 0.00
	36:4 ^a	740.5	0.41 ± 0.05	0.61 ± 0.07	0.14 ± 0.02	0.42 ± 0.06	0.37 ± 0.02	0.29 ± 0.02	0.18 ± 0.01	0.72 ± 0.06*
	36:4 ^b	740.5	0.24 ± 0.04	0.68 ± 0.07	0.21 ± 0.03	0.39 ± 0.07	0.19 ± 0.02	0.34 ± 0.03	0.20 ± 0.01	0.60 ± 0.05*
	36:3	742.6	0.35 ± 0.04	0.80 ± 0.09	0.28 ± 0.04	0.66 ± 0.05	0.42 ± 0.03	1.09 ± 0.06	0.26 ± 0.02	0.92 ± 0.09*
	36:2	744.5	2.57 ± 0.27	5.97 ± 0.57	1.65 ± 0.24	4.50 ± 0.39	1.60 ± 0.20	6.47 ± 0.35	1.94 ± 0.18	4.21 ± 0.43
36:1	746.5	0.43 ± 0.05	0.85 ± 0.07	0.19 ± 0.03	0.54 ± 0.05	0.29 ± 0.02	0.71 ± 0.06	0.49 ± 0.04	0.81 ± 0.07	

class	acyl chain	m/z	gastrocnemius				soleus			
			C	CX	D	DX	C	CX	D	DX
	38:7	762.5	0.04 ± 0.00	0.08 ± 0.01	0.06 ± 0.01	0.14 ± 0.02	0.02 ± 0.00	0.05 ± 0.00	0.04 ± 0.00	0.14 ± 0.01*
	38:6 ^a	764.5	0.53 ± 0.09	1.27 ± 0.17	0.49 ± 0.10	0.94 ± 0.18	0.62 ± 0.05	1.37 ± 0.08	0.36 ± 0.04	1.20 ± 0.14*
	38:6 ^b	764.6	0.50 ± 0.07	0.67 ± 0.09	0.49 ± 0.05	0.58 ± 0.08	0.53 ± 0.03	0.81 ± 0.05	0.24 ± 0.02	0.98 ± 0.05*
	38:5	766.5	0.63 ± 0.06	1.29 ± 0.13	0.62 ± 0.12	0.94 ± 0.09	0.69 ± 0.07	0.95 ± 0.06	0.38 ± 0.04	1.21 ± 0.13*
	38:4	768.5	4.24 ± 0.39	7.70 ± 0.96	2.08 ± 0.34	3.53 ± 0.27	3.23 ± 0.27	8.26 ± 0.31	2.77 ± 0.15	7.21 ± 0.64
	38:3	770.6	0.72 ± 0.06	1.33 ± 0.14	0.53 ± 0.08	0.86 ± 0.06	0.70 ± 0.05	0.98 ± 0.07	0.41 ± 0.07	1.43 ± 0.14*
	38:2	772.5	0.07 ± 0.01	0.17 ± 0.02	0.04 ± 0.01	0.10 ± 0.01	0.07 ± 0.00	0.13 ± 0.01	0.10 ± 0.00	0.30 ± 0.02
	40:8	788.6	1.34 ± 0.18	2.09 ± 0.33	0.77 ± 0.17	0.99 ± 0.14	0.73 ± 0.15	1.25 ± 0.23	0.52 ± 0.10	1.53 ± 0.26
	40:7	790.5	0.65 ± 0.07	1.50 ± 0.16	0.69 ± 0.12	0.88 ± 0.11	0.94 ± 0.06	1.90 ± 0.20	0.45 ± 0.05	1.27 ± 0.11
	40:6	792.6	5.76 ± 0.51	13.56 ± 1.46	3.40 ± 0.57	6.17 ± 0.47	6.36 ± 0.49	11.39 ± 0.88	3.42 ± 0.20	9.72 ± 1.07
	40:5	794.5	1.96 ± 0.14	3.99 ± 0.42	1.30 ± 0.21	2.36 ± 0.17	1.07 ± 0.09	3.21 ± 0.18	1.41 ± 0.17	2.81 ± 0.35
	40:4	796.6	0.62 ± 0.05	1.15 ± 0.10	0.42 ± 0.07	0.69 ± 0.05	0.47 ± 0.02	1.09 ± 0.08	0.35 ± 0.02	0.85 ± 0.08
	40:3	798.6	0.04 ± 0.01	0.08 ± 0.01	0.01 ± 0.00	0.03 ± 0.00	0.01 ± 0.00	0.11 ± 0.01*	0.05 ± 0.00	0.11 ± 0.02
LPG	14:0	455.4	0.01 ± 0.00	0.01 ± 0.00	0.03 ± 0.00	0.03 ± 0.00	0.03 ± 0.00	0.02 ± 0.00	0.06 ± 0.01	0.02 ± 0.00*
	16:1	481.5	0.01 ± 0.00	0.02 ± 0.00	0.07 ± 0.01	0.10 ± 0.01	0.05 ± 0.01	0.06 ± 0.00	0.31 ± 0.02	0.13 ± 0.01
	16:0	483.3	0.20 ± 0.04	0.17 ± 0.01	0.55 ± 0.12	0.59 ± 0.09	2.53 ± 0.27	1.55 ± 0.12	2.69 ± 0.30	0.71 ± 0.06*
	18:2	507.5	0.37 ± 0.04	0.46 ± 0.05	0.80 ± 0.08	0.91 ± 0.08	3.03 ± 0.36	1.71 ± 0.20	3.40 ± 0.41	0.73 ± 0.09*
	18:1	509.4	0.52 ± 0.10	0.58 ± 0.06	0.95 ± 0.16	1.12 ± 0.16	3.06 ± 0.31	2.19 ± 0.22	4.27 ± 0.68	1.10 ± 0.10*
	18:0	511.4	0.06 ± 0.01	0.07 ± 0.01	0.09 ± 0.02	0.10 ± 0.02	0.34 ± 0.04	0.45 ± 0.03	0.68 ± 0.09	0.18 ± 0.02*
PG	16:1/16:0	719.5	0.06 ± 0.01	0.08 ± 0.01	0.09 ± 0.01	0.14 ± 0.01	0.04 ± 0.01	0.03 ± 0.00	0.03 ± 0.00	0.04 ± 0.00
	18:1/14:0	719.5	0.04 ± 0.01	0.05 ± 0.01	0.06 ± 0.01	0.08 ± 0.01	0.04 ± 0.01	0.04 ± 0.00	0.03 ± 0.00	0.04 ± 0.00
	16:0/16:0	721.6	0.35 ± 0.05	0.31 ± 0.04	0.17 ± 0.02	0.26 ± 0.04	0.20 ± 0.02	0.10 ± 0.01	0.06 ± 0.01	0.08 ± 0.01
	18:1/16:1	745.5	0.25 ± 0.03	0.28 ± 0.02	0.32 ± 0.03	0.31 ± 0.02	0.35 ± 0.03	0.29 ± 0.02	0.31 ± 0.03	0.34 ± 0.04
	18:2/16:0	745.5	1.89 ± 0.36	3.70 ± 0.93	1.53 ± 0.10	2.03 ± 0.17	1.13 ± 0.26	0.99 ± 0.28	0.52 ± 0.09	0.55 ± 0.05

class	acyl chain	m/z	gastrocnemius				soleus			
			C	CX	D	DX	C	CX	D	DX
	18:1/16:0	747.5	6.07 ± 0.87	6.64 ± 0.88	4.02 ± 0.44	6.82 ± 1.15	3.14 ± 0.43	2.03 ± 0.29	1.31 ± 0.27	1.93 ± 0.36
	18:2/18:2	769.6	0.44 ± 0.06	0.64 ± 0.14	0.30 ± 0.02	0.31 ± 0.03	0.27 ± 0.06	0.16 ± 0.04	0.10 ± 0.01	0.09 ± 0.01
	20:4/16:0	769.6	0.08 ± 0.01	0.09 ± 0.02	0.03 ± 0.00	0.03 ± 0.00	0.05 ± 0.01	0.03 ± 0.01	0.02 ± 0.00	0.01 ± 0.00
	18:2/18:1	771.6	0.38 ± 0.06	0.41 ± 0.07	0.42 ± 0.03	0.40 ± 0.05	0.18 ± 0.03	0.12 ± 0.02	0.13 ± 0.03	0.11 ± 0.02
	18:1/18:1	773.6	0.18 ± 0.02	0.21 ± 0.02	0.22 ± 0.03	0.17 ± 0.03	0.18 ± 0.03	0.16 ± 0.02	0.15 ± 0.03	0.18 ± 0.01
	18:2/18:0	773.6	1.07 ± 0.12	1.25 ± 0.20	0.43 ± 0.06	0.70 ± 0.10	0.57 ± 0.06	0.37 ± 0.06	0.15 ± 0.03	0.20 ± 0.03
	20:2/16:0	773.6	0.32 ± 0.03	0.31 ± 0.02	0.41 ± 0.03	0.35 ± 0.03	0.28 ± 0.03	0.27 ± 0.02	0.24 ± 0.03	0.21 ± 0.01
	18:2/22:6	817.6	0.21 ± 0.03	0.22 ± 0.03	0.17 ± 0.01	0.14 ± 0.02	0.11 ± 0.01	0.07 ± 0.01	0.06 ± 0.01	0.04 ± 0.00
	18:1/22:6	819.5	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.
	22:6/22:6	865.6	0.07 ± 0.01	0.08 ± 0.01	0.02 ± 0.00	0.02 ± 0.00	0.05 ± 0.01	0.03 ± 0.00	0.01 ± 0.00	0.01 ± 0.00
LPI	16:0	571.4	0.05 ± 0.01	0.07 ± 0.01	0.14 ± 0.02	0.18 ± 0.03	0.34 ± 0.03	0.24 ± 0.02	0.70 ± 0.14	0.50 ± 0.09
	18:2	595.4	0.06 ± 0.01	0.07 ± 0.01	0.21 ± 0.02	0.23 ± 0.03	0.35 ± 0.03	0.22 ± 0.02	1.06 ± 0.11	0.62 ± 0.09
	18:1	597.5	0.05 ± 0.01	0.06 ± 0.01	0.14 ± 0.02	0.19 ± 0.03	0.37 ± 0.05	0.22 ± 0.02	0.73 ± 0.14	0.53 ± 0.10
	18:0	599.3	0.40 ± 0.06	0.42 ± 0.06	0.91 ± 0.21	0.83 ± 0.16	2.01 ± 0.31	1.05 ± 0.19	4.12 ± 1.17	1.99 ± 0.40
	20:4	619.5	0.41 ± 0.04	0.39 ± 0.05	0.88 ± 0.10	0.83 ± 0.09	1.94 ± 0.19	1.00 ± 0.09	3.83 ± 0.42	2.11 ± 0.33
	20:3	621.4	0.09 ± 0.03	0.07 ± 0.01	0.40 ± 0.05	0.42 ± 0.05	0.54 ± 0.19	0.24 ± 0.02	1.94 ± 0.26	1.13 ± 0.16
	22:6	643.4	0.01 ± 0.00	0.01 ± 0.00	0.02 ± 0.00	0.02 ± 0.00	0.13 ± 0.01	0.08 ± 0.00	0.16 ± 0.01	0.11 ± 0.01
PI	16:0/16:0	809.6	0.03 ± 0.00	0.03 ± 0.01	0.03 ± 0.00	0.04 ± 0.01	0.10 ± 0.01	0.07 ± 0.00	0.10 ± 0.01	0.08 ± 0.01
	18:1/16:1	833.5	0.03 ± 0.00	0.03 ± 0.00	0.04 ± 0.00	0.03 ± 0.00	0.05 ± 0.01	0.06 ± 0.01	0.05 ± 0.01	0.07 ± 0.02
	18:2/16:0	833.5	0.05 ± 0.00	0.06 ± 0.01	0.04 ± 0.00	0.05 ± 0.00	0.12 ± 0.01	0.08 ± 0.01	0.11 ± 0.01	0.08 ± 0.01
	18:1/16:0	835.5	0.11 ± 0.01	0.13 ± 0.01	0.11 ± 0.01	0.14 ± 0.02	0.16 ± 0.01	0.11 ± 0.01	0.13 ± 0.01	0.12 ± 0.01
	16:0/20:4	857.6	0.16 ± 0.02	0.18 ± 0.02	0.14 ± 0.01	0.15 ± 0.01	0.19 ± 0.02	0.14 ± 0.01	0.15 ± 0.01	0.12 ± 0.01
	16:0/20:3	859.5	0.02 ± 0.00	0.04 ± 0.01	0.03 ± 0.01	0.04 ± 0.00	0.05 ± 0.01	0.04 ± 0.01	0.05 ± 0.01	0.06 ± 0.01
	18:1/18:2	859.5	0.07 ± 0.01	0.09 ± 0.01	0.06 ± 0.00	0.06 ± 0.00	0.13 ± 0.01	0.09 ± 0.01	0.11 ± 0.01	0.09 ± 0.01

class	acyl chain	m/z	gastrocnemius				soleus			
			C	CX	D	DX	C	CX	D	DX
	18:0/18:2	861.6	0.17 ± 0.03	0.23 ± 0.02	0.23 ± 0.02	0.25 ± 0.03	0.20 ± 0.02	0.15 ± 0.01	0.19 ± 0.02	0.16 ± 0.02
	18:1/18:1	861.6	0.08 ± 0.01	0.07 ± 0.02	0.06 ± 0.01	0.05 ± 0.01	0.07 ± 0.01	0.09 ± 0.02	0.08 ± 0.01	0.07 ± 0.01
	18:0/18:1	863.5	0.05 ± 0.01	0.04 ± 0.01	0.05 ± 0.00	0.07 ± 0.01	0.12 ± 0.01	0.07 ± 0.00	0.11 ± 0.01	0.09 ± 0.01
	18:2/20:4	881.5	0.02 ± 0.00	0.02 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.10 ± 0.01	0.07 ± 0.00	0.09 ± 0.01	0.07 ± 0.01
	16:0/22:6	881.6	0.04 ± 0.00	0.05 ± 0.01	0.03 ± 0.00	0.04 ± 0.00	0.11 ± 0.01	0.08 ± 0.00	0.10 ± 0.01	0.08 ± 0.01
	16:0/22:5	883.5	0.04 ± 0.00	0.06 ± 0.01	0.05 ± 0.01	0.06 ± 0.01	0.06 ± 0.00	0.05 ± 0.01	0.05 ± 0.01	0.04 ± 0.00
	18:0/20:5	883.5	0.08 ± 0.01	0.09 ± 0.02	0.07 ± 0.01	0.08 ± 0.02	0.05 ± 0.01	0.04 ± 0.01	0.05 ± 0.00	0.04 ± 0.00
	18:1/20:4	883.5	0.31 ± 0.03	0.32 ± 0.04	0.18 ± 0.01	0.18 ± 0.02	0.30 ± 0.03	0.19 ± 0.02	0.16 ± 0.02	0.14 ± 0.01
	18:0/20:4	885.6	5.67 ± 0.65	4.57 ± 0.46	2.98 ± 0.25	2.86 ± 0.44	4.14 ± 0.43	1.98 ± 0.23	1.39 ± 0.28	1.22 ± 0.22
	18:0/20:3	887.5	0.36 ± 0.05	0.28 ± 0.05	0.55 ± 0.06	0.48 ± 0.09	0.38 ± 0.05	0.18 ± 0.03	0.34 ± 0.06	0.25 ± 0.04
	18:0/20:2	889.5	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.
	18:1/22:6	907.5	0.04 ± 0.00	0.04 ± 0.01	0.02 ± 0.00	0.02 ± 0.00	0.11 ± 0.01	0.07 ± 0.00	0.09 ± 0.01	0.07 ± 0.01
	18:0/22:6	909.6	0.55 ± 0.08	0.55 ± 0.06	0.38 ± 0.03	0.34 ± 0.05	0.47 ± 0.06	0.29 ± 0.03	0.24 ± 0.04	0.20 ± 0.02
	18:0/22:5	911.5	0.24 ± 0.03	0.23 ± 0.03	0.21 ± 0.02	0.21 ± 0.04	0.25 ± 0.02	0.15 ± 0.02	0.18 ± 0.03	0.15 ± 0.02
	18:0/22:4	913.6	0.09 ± 0.01	0.16 ± 0.03	0.06 ± 0.01	0.07 ± 0.02	0.16 ± 0.01	0.12 ± 0.01	0.11 ± 0.01	0.09 ± 0.01
LPS	18:1	522.3	0.06 ± 0.01	0.10 ± 0.01	0.24 ± 0.04	0.37 ± 0.06	0.23 ± 0.03	0.16 ± 0.02	0.70 ± 0.16	0.60 ± 0.12
	22:6	568.4	0.26 ± 0.02	0.29 ± 0.03	0.71 ± 0.08	0.75 ± 0.08	0.77 ± 0.07	0.47 ± 0.04	1.84 ± 0.25	1.19 ± 0.14
PS	16:0/18:2	758.6	0.24 ± 0.03	0.36 ± 0.05	0.69 ± 0.07	0.56 ± 0.05	0.19 ± 0.03	0.18 ± 0.03	0.33 ± 0.07	0.22 ± 0.03
	16:1/18:1	758.6	0.08 ± 0.02	0.09 ± 0.02	0.07 ± 0.01	0.08 ± 0.01	0.05 ± 0.01	0.07 ± 0.01	0.06 ± 0.01	0.05 ± 0.01
	16:0/18:1	760.5	0.02 ± 0.00	0.03 ± 0.00	0.02 ± 0.01	0.03 ± 0.01	0.03 ± 0.00	0.02 ± 0.00	0.02 ± 0.00	0.02 ± 0.00
	18:0/16:1	760.5	0.01 ± 0.00	0.01 ± 0.00	0.01 ± 0.01	0.01 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
	16:0/20:4	782.5	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.
	18:1/18:2	784.5	0.05 ± 0.01	0.12 ± 0.02	0.05 ± 0.01	0.05 ± 0.00	0.04 ± 0.00	0.06 ± 0.01	0.03 ± 0.00	0.03 ± 0.00
	18:0/18:2	786.6	0.14 ± 0.02	0.10 ± 0.01	0.15 ± 0.02	0.12 ± 0.01	0.08 ± 0.02	0.07 ± 0.01	0.06 ± 0.01	0.05 ± 0.01

class	acyl chain	m/z	gastrocnemius				soleus			
			C	CX	D	DX	C	CX	D	DX
	18:1/18:1	786.6	0.26 ± 0.03	0.46 ± 0.03	0.25 ± 0.04	0.36 ± 0.05	0.20 ± 0.02	0.18 ± 0.02	0.11 ± 0.02	0.16 ± 0.03
	18:0/18:1	788.5	0.65 ± 0.09	0.92 ± 0.17	0.54 ± 0.19	0.85 ± 0.15	0.46 ± 0.09	0.39 ± 0.09	0.25 ± 0.07	0.36 ± 0.08
	16:0/22:6	806.5	0.21 ± 0.03	0.26 ± 0.04	0.09 ± 0.02	0.12 ± 0.01	0.17 ± 0.03	0.12 ± 0.02	0.05 ± 0.01	0.06 ± 0.01
	18:1/20:4	808.5	0.06 ± 0.01	0.09 ± 0.01	0.05 ± 0.01	0.05 ± 0.00	0.06 ± 0.01	0.04 ± 0.01	0.03 ± 0.01	0.03 ± 0.00
	16:0/22:5	808.5	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.
	18:0/20:4	810.6	0.71 ± 0.08	0.79 ± 0.05	0.40 ± 0.06	0.38 ± 0.05	0.52 ± 0.06	0.35 ± 0.03	0.17 ± 0.03	0.16 ± 0.03
	18:0/20:3	812.5	0.14 ± 0.02	0.14 ± 0.02	0.14 ± 0.02	0.13 ± 0.02	0.10 ± 0.01	0.07 ± 0.01	0.07 ± 0.01	0.06 ± 0.01
	20:0/18:1	816.5	0.10 ± 0.02	0.27 ± 0.07	0.10 ± 0.03	0.11 ± 0.02	N.Q.	N.Q.	N.Q.	N.Q.
	18:1/22:6	832.6	0.17 ± 0.03	0.22 ± 0.04	0.08 ± 0.01	0.07 ± 0.01	0.13 ± 0.02	0.10 ± 0.02	0.04 ± 0.01	0.04 ± 0.00
	18:0/22:6	834.5	5.62 ± 0.49	5.06 ± 0.47	2.86 ± 0.36	2.73 ± 0.31	4.11 ± 0.38	2.18 ± 0.26	1.23 ± 0.22	1.17 ± 0.18
	18:0/22:5	836.6	1.01 ± 0.11	0.96 ± 0.08	0.64 ± 0.10	0.64 ± 0.09	0.69 ± 0.07	0.43 ± 0.05	0.27 ± 0.06	0.29 ± 0.05
	18:0/22:4	838.5	0.35 ± 0.05	0.40 ± 0.06	0.21 ± 0.02	0.19 ± 0.03	0.24 ± 0.03	0.19 ± 0.03	0.10 ± 0.01	0.09 ± 0.02
	22:1/18:1	842.6	0.05 ± 0.01	0.18 ± 0.04	0.05 ± 0.02	0.06 ± 0.02	0.04 ± 0.01	0.07 ± 0.02	0.03 ± 0.01	0.03 ± 0.01
	22:0/18:1	844.6	0.13 ± 0.04	0.48 ± 0.16	0.19 ± 0.08	0.22 ± 0.10	N.Q.	N.Q.	N.Q.	N.Q.
	24:1/18:1	870.5	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.
	24:0/18:1	872.5	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.
LPA	16:0	409.4	0.02 ± 0.00	0.02 ± 0.01	0.05 ± 0.01	0.04 ± 0.01	0.07 ± 0.01	0.04 ± 0.00	0.10 ± 0.01	0.08 ± 0.01
	18:2	433.5	0.01 ± 0.00	0.01 ± 0.00	0.03 ± 0.01	0.02 ± 0.00	0.05 ± 0.00	0.05 ± 0.00	0.09 ± 0.01	0.06 ± 0.01
	18:0	437.3	0.01 ± 0.00	0.01 ± 0.00	0.03 ± 0.01	0.01 ± 0.00	0.04 ± 0.01	0.02 ± 0.00	0.05 ± 0.01	0.03 ± 0.00
PA	16:0/18:2	671.5	0.03 ± 0.00	0.03 ± 0.00	0.11 ± 0.03	0.06 ± 0.02	0.04 ± 0.00	0.02 ± 0.00	0.01 ± 0.00	0.01 ± 0.00
	16:1/18:1	671.5	0.02 ± 0.00	0.02 ± 0.00	0.02 ± 0.00	0.03 ± 0.01	0.03 ± 0.00	0.03 ± 0.00	0.02 ± 0.00	0.04 ± 0.01
SM	d18:1/16:0	703.5	0.54 ± 0.07	0.59 ± 0.04	0.58 ± 0.07	0.58 ± 0.07	1.51 ± 0.08	1.59 ± 0.16	4.09 ± 0.34	1.14 ± 0.10*
	d18:1/18:0	731.6	12.01 ± 1.37	10.89 ± 0.98	6.62 ± 0.80	6.94 ± 0.78	2.46 ± 0.13	2.05 ± 0.20	5.86 ± 0.82	2.13 ± 0.14
	d18:1/20:0	759.5	3.21 ± 0.38	3.26 ± 0.31	1.01 ± 0.12	1.32 ± 0.21	2.54 ± 0.12	2.27 ± 0.20	7.57 ± 0.49	3.27 ± 0.22

class	acyl chain	m/z	gastrocnemius				soleus			
			C	CX	D	DX	C	CX	D	DX
Cer	d18:1/22:1	785.5	0.80 ± 0.08	0.91 ± 0.07	0.27 ± 0.03	0.47 ± 0.09	0.27 ± 0.03	0.23 ± 0.02	0.27 ± 0.03	0.14 ± 0.02
	d18:1/22:0	787.6	4.65 ± 0.68	5.16 ± 0.92	1.21 ± 0.17	1.75 ± 0.16	1.52 ± 0.19	1.25 ± 0.18	1.20 ± 0.16	0.52 ± 0.06
	d18:1/23:0	801.6	2.57 ± 0.42	2.13 ± 0.29	0.42 ± 0.06	0.62 ± 0.11	0.90 ± 0.12	0.56 ± 0.07	0.44 ± 0.06	0.18 ± 0.03
	d18:1/24:2	811.6	2.21 ± 0.36	2.29 ± 0.56	0.50 ± 0.05	0.74 ± 0.04	0.72 ± 0.13	0.56 ± 0.10	0.48 ± 0.05	0.22 ± 0.01
	d18:1/24:1	813.5	4.57 ± 0.67	3.65 ± 0.77	2.92 ± 0.47	4.39 ± 0.43	13.09 ± 1.42	10.7 ± 1.30	27.24 ± 3.76	12.90 ± 1.43
	d18:1/24:0	815.6	6.90 ± 0.86	7.20 ± 0.93	1.44 ± 0.24	2.42 ± 0.26	27.04 ± 3.85	20.95 ± 2.07	16.51 ± 2.27	8.01 ± 0.96
	d18:1/16:0	538.6	0.02 ± 0.00	0.02 ± 0.00	0.02 ± 0.00	0.03 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.03 ± 0.00	0.01 ± 0.00*
	d18:0/18:1	564.5	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.02 ± 0.00	0.01 ± 0.00*
	d18:1/18:0	566.5	0.52 ± 0.04	0.55 ± 0.05	0.38 ± 0.04	0.41 ± 0.04	0.10 ± 0.01	0.09 ± 0.01	0.22 ± 0.02	0.07 ± 0.01*
	d18:1/20:0	594.8	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.
MHC	d18:1/22:0	622.5	0.09 ± 0.02	0.11 ± 0.01	0.03 ± 0.00	0.04 ± 0.00	0.02 ± 0.00	0.02 ± 0.00	0.03 ± 0.00	0.01 ± 0.00*
	d18:1/24:2	646.5	0.10 ± 0.01	0.12 ± 0.01	0.04 ± 0.00	0.06 ± 0.01	0.02 ± 0.00	0.02 ± 0.00	0.04 ± 0.00	0.01 ± 0.00
	d18:1/24:1	648.6	0.61 ± 0.09	0.74 ± 0.06	0.20 ± 0.02	0.32 ± 0.03	0.11 ± 0.01	0.11 ± 0.01	0.13 ± 0.01	0.05 ± 0.00
	d18:1/24:0	650.6	0.98 ± 0.13	1.12 ± 0.12	0.22 ± 0.02	0.44 ± 0.07	0.18 ± 0.02	0.16 ± 0.01	0.13 ± 0.01	0.07 ± 0.01
	d18:1/24:1	810.6	0.18 ± 0.03	0.27 ± 0.02	0.10 ± 0.01	0.16 ± 0.01	0.07 ± 0.00	0.09 ± 0.01	0.13 ± 0.01	0.07 ± 0.01
DAG	d18:1/24:0	812.5	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.
	14:1,16:1	554.5	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.
	14:0,16:1	556.5	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.01 ± 0.01	0.01 ± 0.00
	14:1,16:0	556.5	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.04 ± 0.01	0.02 ± 0.00
	14:0,16:0	558.5	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.00	0.00 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.02 ± 0.00	0.01 ± 0.00
	14:0,18:2	582.6	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.03 ± 0.00	0.04 ± 0.01	0.05 ± 0.00	0.04 ± 0.01
	16:1,16:1	582.6	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.11 ± 0.02	0.11 ± 0.01	0.12 ± 0.02	0.10 ± 0.01
	14:0,18:1	584.5	0.00 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.00 ± 0.00	0.03 ± 0.01	0.04 ± 0.00	0.05 ± 0.01	0.04 ± 0.00
16:0,16:1	584.5	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.00	0.00 ± 0.00	0.05 ± 0.01	0.04 ± 0.00	0.07 ± 0.01	0.05 ± 0.00	

class	acyl chain	m/z	gastrocnemius				soleus			
			C	CX	D	DX	C	CX	D	DX
	16:0,16:0	586.6	0.22 ± 0.02	0.27 ± 0.02	0.22 ± 0.02	0.15 ± 0.01	0.05 ± 0.01	0.04 ± 0.00	0.09 ± 0.01	0.11 ± 0.02
	16:1,18:3	606.5	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.00	0.00 ± 0.00*
	16:0,18:3	608.7	0.01 ± 0.00	0.01 ± 0.00	0.07 ± 0.01	0.05 ± 0.01	0.03 ± 0.00	0.04 ± 0.00	0.35 ± 0.06	0.16 ± 0.02
	16:1,18:2	608.7	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.00	0.00 ± 0.00	0.02 ± 0.00	0.03 ± 0.01	0.03 ± 0.00	0.04 ± 0.01
	16:0,18:2	610.5	0.27 ± 0.03	0.32 ± 0.04	1.06 ± 0.12	0.68 ± 0.08	0.32 ± 0.05	0.41 ± 0.05	2.07 ± 0.31	0.81 ± 0.09
	16:0,18:1	612.4	0.44 ± 0.03	0.62 ± 0.05	1.35 ± 0.17	1.15 ± 0.07	0.57 ± 0.06	0.76 ± 0.06	2.74 ± 0.42	1.37 ± 0.09
	16:0,18:0	614.5	0.08 ± 0.01	0.09 ± 0.01	0.07 ± 0.01	0.05 ± 0.00	0.12 ± 0.02	0.11 ± 0.01	0.15 ± 0.02	0.06 ± 0.01
	18:2,18:3	632.5	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.02 ± 0.00	0.01 ± 0.00
	18:1,18:3	634.5	0.02 ± 0.00	0.03 ± 0.01	0.03 ± 0.00	0.04 ± 0.01	0.20 ± 0.02	0.22 ± 0.03	0.23 ± 0.02	0.24 ± 0.03
	18:2,18:2	634.5	0.06 ± 0.01	0.06 ± 0.01	0.18 ± 0.02	0.12 ± 0.02	0.36 ± 0.06	0.40 ± 0.05	2.33 ± 0.38	0.93 ± 0.12
	18:1,18:2	636.6	0.38 ± 0.04	0.35 ± 0.05	1.37 ± 0.18	0.91 ± 0.12	1.10 ± 0.12	1.21 ± 0.12	5.56 ± 0.88	3.52 ± 0.34
	18:0,18:2	638.5	0.30 ± 0.04	0.42 ± 0.04	0.34 ± 0.04	0.28 ± 0.02	0.05 ± 0.01	0.05 ± 0.00	0.04 ± 0.01	0.04 ± 0.00
	18:1,18:1	638.5	1.00 ± 0.08	1.11 ± 0.11	3.12 ± 0.41	3.19 ± 0.25	0.18 ± 0.02	0.17 ± 0.01	0.37 ± 0.06	0.21 ± 0.02
	18:0,18:1	640.6	0.14 ± 0.02	0.16 ± 0.01	0.21 ± 0.02	0.18 ± 0.01	0.03 ± 0.00	0.02 ± 0.00	0.02 ± 0.00	0.01 ± 0.00
	18:0,18:0	642.5	0.02 ± 0.00	0.02 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.00	0.00 ± 0.00*
	16:1,22:6	656.6	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.03 ± 0.00	0.03 ± 0.00	0.09 ± 0.02	0.02 ± 0.00*
	16:0,22:6	658.5	0.01 ± 0.00	0.01 ± 0.00	0.02 ± 0.00	0.01 ± 0.00	0.04 ± 0.01	0.03 ± 0.00	0.09 ± 0.02	0.02 ± 0.00*
	18:1,20:4	660.6	0.01 ± 0.00	0.01 ± 0.00	0.02 ± 0.00	0.01 ± 0.00	0.08 ± 0.01	0.09 ± 0.01	0.12 ± 0.01	0.05 ± 0.00
	18:0,20:4	662.5	0.15 ± 0.02	0.19 ± 0.02	0.05 ± 0.01	0.04 ± 0.00	0.02 ± 0.00	0.02 ± 0.00	0.10 ± 0.01	0.04 ± 0.00
	18:1,20:2	664.5	0.01 ± 0.00	0.00 ± 0.00	0.01 ± 0.00	0.00 ± 0.00	0.03 ± 0.00	0.03 ± 0.00	0.03 ± 0.01	0.02 ± 0.00
	18:2,20:1	664.5	0.03 ± 0.00	0.03 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.02 ± 0.00	0.02 ± 0.00	0.02 ± 0.00	0.01 ± 0.00
	18:0,20:2	666.6	0.02 ± 0.00	0.02 ± 0.00	0.02 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.01 ± 0.00
	18:1,20:1	666.6	0.03 ± 0.00	0.03 ± 0.00	0.02 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.02 ± 0.00	0.00 ± 0.00*
	18:1,20:0	668.5	0.01 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.02 ± 0.00	0.02 ± 0.00	0.05 ± 0.01	0.01 ± 0.00*

class	acyl chain	m/z	gastrocnemius				soleus			
			C	CX	D	DX	C	CX	D	DX
	18:2,22:6	682.5	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00*	0.03 ± 0.01	0.03 ± 0.00	0.08 ± 0.02	0.03 ± 0.00*
	18:1,22:6	684.5	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.00	0.00 ± 0.00	0.03 ± 0.00	0.03 ± 0.00	0.05 ± 0.01	0.02 ± 0.00
	18:1,22:5	686.6	0.01 ± 0.00	0.01 ± 0.00	0.02 ± 0.00	0.01 ± 0.00	0.04 ± 0.00	0.04 ± 0.00	0.03 ± 0.00	0.01 ± 0.00
	18:1,22:4	688.5	0.01 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.02 ± 0.00	0.01 ± 0.00
	18:0,22:4	690.6	0.01 ± 0.00	0.01 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.00	0.00 ± 0.00
TAG	42:4	732.7	0.01 ± 0.00	0.01 ± 0.00	0.00 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.00 ± 0.00*	0.10 ± 0.02	0.04 ± 0.01
	42:3	734.7	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.00	0.02 ± 0.00	0.01 ± 0.00	0.00 ± 0.00	0.04 ± 0.00	0.03 ± 0.00
	42:2	736.7	0.01 ± 0.00	0.01 ± 0.00	0.04 ± 0.01	0.09 ± 0.01	0.01 ± 0.00	0.00 ± 0.00*	0.16 ± 0.01	0.15 ± 0.01
	42:1	738.7	0.10 ± 0.01	0.14 ± 0.02	0.21 ± 0.04	0.41 ± 0.05	0.08 ± 0.01	0.03 ± 0.00	0.59 ± 0.09	0.37 ± 0.04
	42:0	740.8	0.04 ± 0.00	0.06 ± 0.01	0.08 ± 0.02	0.12 ± 0.02	0.03 ± 0.00	0.02 ± 0.00	0.32 ± 0.09	0.18 ± 0.01
	44:4	760.7	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.00	0.04 ± 0.00	0.02 ± 0.00	0.27 ± 0.05	0.13 ± 0.01
	44:3	762.7	0.01 ± 0.00	0.01 ± 0.00	0.04 ± 0.01	0.08 ± 0.01	11.65 ± 1.03	6.18 ± 0.80	10.38 ± 1.50	5.38 ± 0.66
	44:2	764.7	0.05 ± 0.01	0.05 ± 0.01	0.21 ± 0.05	0.44 ± 0.05	3.71 ± 0.35	1.98 ± 0.36	2.34 ± 0.39	1.13 ± 0.18
	44:1	766.7	0.13 ± 0.01	0.19 ± 0.02	0.33 ± 0.06	0.56 ± 0.06	0.71 ± 0.05	0.37 ± 0.03	1.11 ± 0.19	0.43 ± 0.05
	44:0	768.6	0.05 ± 0.01	0.06 ± 0.01	0.05 ± 0.01	0.09 ± 0.01	0.57 ± 0.04	0.25 ± 0.02	0.90 ± 0.14	0.31 ± 0.04
	46:5	786.6	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.07 ± 0.01	0.04 ± 0.00	0.62 ± 0.12	0.35 ± 0.04
	46:4	788.7	0.03 ± 0.00	0.03 ± 0.00	0.03 ± 0.01	0.05 ± 0.01	0.08 ± 0.00	0.05 ± 0.00	0.41 ± 0.07	0.23 ± 0.02
	46:3	790.8	0.09 ± 0.01	0.11 ± 0.01	0.27 ± 0.05	0.59 ± 0.08	0.06 ± 0.01	0.03 ± 0.00	0.08 ± 0.01	0.05 ± 0.01
	46:2	792.7	0.24 ± 0.02	0.28 ± 0.03	0.76 ± 0.14	1.65 ± 0.20	1.05 ± 0.08	0.70 ± 0.12	7.17 ± 1.36	4.46 ± 0.47
	46:1	794.7	0.29 ± 0.02	0.40 ± 0.04	0.49 ± 0.09	1.05 ± 0.10	1.20 ± 0.07	0.69 ± 0.06	4.68 ± 0.83	2.63 ± 0.26
	46:0	796.7	0.21 ± 0.05	0.21 ± 0.02	0.09 ± 0.02	0.18 ± 0.03	0.71 ± 0.06	0.37 ± 0.04	5.31 ± 0.97	3.01 ± 0.36
	48:5	814.7	0.01 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.00 ± 0.00	0.01 ± 0.00	0.00 ± 0.00
	48:4	816.8	0.23 ± 0.02	0.29 ± 0.03	0.17 ± 0.03	0.28 ± 0.04	0.07 ± 0.01	0.04 ± 0.00	0.15 ± 0.02	0.06 ± 0.01
	48:3	818.7	0.69 ± 0.04	0.78 ± 0.08	1.77 ± 0.31	3.83 ± 0.47	2.09 ± 0.13	1.20 ± 0.13	11.23 ± 2.07	5.74 ± 0.68

class	acyl chain	m/z	gastrocnemius				soleus			
			C	CX	D	DX	C	CX	D	DX
	48:2	820.7	1.06 ± 0.07	1.49 ± 0.29	2.36 ± 0.45	5.55 ± 0.54	6.57 ± 0.42	3.50 ± 0.32	13.44 ± 2.46	7.27 ± 0.92
	48:1	822.8	1.42 ± 0.11	1.39 ± 0.14	1.56 ± 0.27	3.06 ± 0.32	5.96 ± 0.40	3.14 ± 0.22	10.17 ± 1.78	5.96 ± 0.72
	48:0	824.8	1.00 ± 0.05	0.46 ± 0.03	0.31 ± 0.07	0.53 ± 0.10	0.81 ± 0.06	0.41 ± 0.05	4.82 ± 0.82	2.11 ± 0.25
	50:6	840.8	0.01 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.96 ± 0.06	0.22 ± 0.01*	0.97 ± 0.21	0.51 ± 0.10
	50:5	842.7	0.06 ± 0.00	0.06 ± 0.01	0.13 ± 0.03	0.26 ± 0.04	0.02 ± 0.00	0.01 ± 0.00	0.03 ± 0.01	0.01 ± 0.00
	50:4	844.7	0.79 ± 0.05	0.86 ± 0.10	1.56 ± 0.28	2.73 ± 0.34	0.07 ± 0.01	0.03 ± 0.00	0.38 ± 0.07	0.21 ± 0.03
	50:3	846.7	2.10 ± 0.13	2.46 ± 0.26	3.73 ± 0.68	7.27 ± 0.80	1.13 ± 0.07	0.51 ± 0.04	0.64 ± 0.10	0.26 ± 0.05
	50:2	848.7	6.55 ± 0.48	7.11 ± 0.57	4.47 ± 0.76	8.81 ± 1.04	15.32 ± 0.98	8.17 ± 0.74	31.34 ± 5.75	16.96 ± 2.14
	50:1	850.7	5.90 ± 0.60	6.50 ± 0.52	3.34 ± 0.55	6.96 ± 0.81	13.91 ± 0.94	7.33 ± 0.51	23.73 ± 4.15	13.91 ± 1.68
	50:0	852.7	1.14 ± 0.08	0.91 ± 0.06	0.19 ± 0.03	0.25 ± 0.05	2.64 ± 0.15	1.19 ± 0.08	1.48 ± 0.23	0.59 ± 0.13
	52:7	866.8	0.01 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.02 ± 0.00	0.03 ± 0.00	0.02 ± 0.00	0.09 ± 0.02	0.05 ± 0.00
	52:6	868.7	0.13 ± 0.01	0.13 ± 0.02	0.13 ± 0.02	0.20 ± 0.03	0.32 ± 0.02	0.14 ± 0.02	0.87 ± 0.14	0.36 ± 0.05
	52:5	870.7	2.11 ± 0.16	2.36 ± 0.29	1.22 ± 0.17	1.71 ± 0.23	5.12 ± 0.34	2.56 ± 0.29	8.54 ± 1.26	3.06 ± 0.38
	52:4	872.7	2.10 ± 0.20	2.32 ± 0.23	1.43 ± 0.23	2.37 ± 0.24	4.91 ± 0.33	2.54 ± 0.23	10.00 ± 1.71	4.31 ± 0.49
	52:3	874.8	8.90 ± 0.66	9.96 ± 0.86	6.04 ± 0.58	10.66 ± 1.00	21.43 ± 1.20	11.02 ± 0.90	40.07 ± 4.85	19.36 ± 2.05
	52:2	876.7	11.83 ± 1.14	14.11 ± 1.38	6.15 ± 0.66	12.96 ± 0.96	28.53 ± 1.78	15.42 ± 1.39	42.56 ± 5.22	24.40 ± 2.12
	52:1	878.7	3.44 ± 0.47	4.15 ± 0.57	7.00 ± 0.79	7.23 ± 0.85	8.43 ± 0.73	4.42 ± 0.56	8.43 ± 1.06	4.56 ± 0.59
	52:0	880.8	0.43 ± 0.04	0.33 ± 0.02	0.31 ± 0.07	0.23 ± 0.05	1.02 ± 0.10	0.43 ± 0.02	0.88 ± 0.21	0.18 ± 0.04
	54:7	894.7	0.11 ± 0.01	0.13 ± 0.01	0.68 ± 0.13	0.59 ± 0.07	0.28 ± 0.02	0.14 ± 0.01	0.84 ± 0.15	0.36 ± 0.04
	54:6	896.7	4.30 ± 0.34	4.58 ± 0.67	4.86 ± 0.53	3.04 ± 0.32	10.71 ± 0.72	4.85 ± 0.59	11.89 ± 1.58	1.77 ± 0.18*
	54:5	898.7	7.44 ± 0.87	7.67 ± 0.89	7.27 ± 0.88	5.41 ± 0.57	17.95 ± 1.39	8.27 ± 0.88	17.63 ± 2.80	3.10 ± 0.34*
	54:4	900.6	9.03 ± 0.73	9.68 ± 0.90	13.36 ± 1.32	10.51 ± 0.95	22.11 ± 1.56	10.55 ± 0.90	15.79 ± 2.15	6.12 ± 0.66
	54:3	902.7	10.83 ± 0.91	12.34 ± 1.18	26.71 ± 3.09	24.97 ± 2.32	26.56 ± 1.95	13.3 ± 1.16	31.95 ± 4.53	14.73 ± 1.46
	54:2	904.7	4.70 ± 0.57	5.92 ± 0.89	8.41 ± 1.24	8.70 ± 1.15	0.02 ± 0.00	0.01 ± 0.00	0.05 ± 0.01	0.02 ± 0.00

class	acyl chain	m/z	gastrocnemius				soleus			
			C	CX	D	DX	C	CX	D	DX
	54:1	906.7	1.40 ± 0.18	1.95 ± 0.41	1.81 ± 0.30	1.72 ± 0.32	0.01 ± 0.00	0.00 ± 0.00*	0.01 ± 0.00	0.00 ± 0.00*
	56:8	920.7	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.	N.Q.
	56:7	922.7	0.28 ± 0.02	0.34 ± 0.03	0.86 ± 0.16	0.71 ± 0.08	0.01 ± 0.00	0.01 ± 0.00	0.04 ± 0.01	0.01 ± 0.00
	56:6	924.7	0.22 ± 0.01	0.23 ± 0.02	0.73 ± 0.11	0.51 ± 0.06	0.03 ± 0.00	0.01 ± 0.00	0.22 ± 0.05	0.13 ± 0.02
	56:5	926.8	0.19 ± 0.01	0.20 ± 0.02	0.54 ± 0.07	0.38 ± 0.04	0.48 ± 0.04	0.22 ± 0.02	0.65 ± 0.10	0.24 ± 0.03
	56:4	928.7	0.30 ± 0.03	0.34 ± 0.03	0.41 ± 0.06	0.35 ± 0.03	0.75 ± 0.06	0.37 ± 0.03	0.51 ± 0.08	0.21 ± 0.02
	56:3	930.8	0.65 ± 0.07	0.87 ± 0.06	1.56 ± 0.17	1.32 ± 0.23	1.61 ± 0.14	0.92 ± 0.07	1.89 ± 0.22	0.80 ± 0.11
	56:2	932.7	0.33 ± 0.04	0.53 ± 0.06	0.60 ± 0.08	0.51 ± 0.11	0.85 ± 0.09	0.53 ± 0.06	0.77 ± 0.12	0.32 ± 0.05
	58:10	944.7	0.10 ± 0.01	0.11 ± 0.02	0.19 ± 0.03	0.09 ± 0.01	0.25 ± 0.02	0.12 ± 0.01	0.24 ± 0.02	0.06 ± 0.01
	58:9	946.7	0.16 ± 0.01	0.19 ± 0.02	0.30 ± 0.04	0.17 ± 0.01	0.40 ± 0.03	0.20 ± 0.02	0.40 ± 0.05	0.11 ± 0.01
	58:8	948.7	0.10 ± 0.01	0.12 ± 0.01	0.17 ± 0.04	0.12 ± 0.01	0.27 ± 0.02	0.14 ± 0.01	0.23 ± 0.04	0.07 ± 0.01
	58:7	950.8	0.06 ± 0.00	0.06 ± 0.01	0.13 ± 0.02	0.10 ± 0.01	0.16 ± 0.01	0.07 ± 0.01	0.17 ± 0.02	0.06 ± 0.01
	58:6	952.8	0.05 ± 0.00	0.05 ± 0.00	0.09 ± 0.02	0.08 ± 0.01	0.13 ± 0.01	0.06 ± 0.00	0.12 ± 0.02	0.05 ± 0.01
	58:5	954.7	0.01 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.03 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.01 ± 0.00
	58:4	956.7	0.03 ± 0.00	0.04 ± 0.01	0.06 ± 0.01	0.06 ± 0.01	0.08 ± 0.01	0.04 ± 0.00	0.08 ± 0.01	0.03 ± 0.00
	58:3	958.6	0.16 ± 0.01	0.17 ± 0.02	0.16 ± 0.03	0.18 ± 0.03	0.32 ± 0.02	0.20 ± 0.02	0.21 ± 0.03	0.11 ± 0.02
	58:2	960.7	0.09 ± 0.01	0.16 ± 0.02	0.12 ± 0.03	0.14 ± 0.02	0.23 ± 0.03	0.17 ± 0.02	0.17 ± 0.03	0.09 ± 0.01
	58:1	962.7	0.03 ± 0.01	0.07 ± 0.01	0.03 ± 0.01	0.08 ± 0.01	0.09 ± 0.01	0.09 ± 0.01	0.04 ± 0.01	0.05 ± 0.00
	60:4	984.7	0.04 ± 0.00	0.06 ± 0.01	0.04 ± 0.01	0.05 ± 0.00	0.11 ± 0.01	0.07 ± 0.01	0.05 ± 0.01	0.03 ± 0.00
	60:3	986.7	0.08 ± 0.01	0.16 ± 0.02	0.08 ± 0.02	0.10 ± 0.01	0.20 ± 0.03	0.17 ± 0.02	0.10 ± 0.02	0.06 ± 0.01
	60:2	988.8	0.05 ± 0.01	0.11 ± 0.02	0.04 ± 0.01	0.08 ± 0.01	0.13 ± 0.02	0.14 ± 0.01	0.06 ± 0.01	0.04 ± 0.00

N.Q.: not quantifiable, ^{a,b,c}: refers to the molecular structure of each isomer in b).

- significant change (>3-fold, p-value<0.01) between groups C and CX or D and DX marked with asterisk(*) in CX and DX column respectively.

b) PC

total chain length	acyl chains	<i>m/z</i>	total chain length	acyl chains	<i>m/z</i>	total chain length	acyl chains	<i>m/z</i>
30:0	14:0/16:0	706.5	36:2	18:0/18:2	786.5	40:7	18:2/22:5	832.6
32:2	14:0/18:2	730.6		18:1/18:1			20:3/20:4	
	16:1/16:1		36:1	16:0/20:1	788.5		22:6/18:1	
32:1	14:0/18:1	732.5		18:0/18:1		40:6	22:6/18:0	834.5
	16:0/16:1		36:0	16:0/20:0	790.6	40:5	18:0/22:5	836.5
32:0	16:0/16:0	734.5		18:0/18:0			20:1/20:4	
34:4	14:0/20:4	754.5	38:7	16:1/22:6	804.5	40:4	16:0/24:4	838.5
	16:2/18:2			18:2/20:5			18:0/22:4	
	18:3/16:1			18:3/20:4			20:1/20:3	
34:3	16:0/18:3	756.5	38:6 ^a	16:0/22:6	806.5	40:1	16:0/24:1	844.5
	16:1/18:2		38:6 ^b	18:2/20:4	806.6		16:1/24:0	
34:2	16:0/18:2	758.6	38:5	16:0/22:5	808.5		22:0/18:1	
34:1	16:0/18:1	760.5		18:1/20:4		40:0	16:0/24:0	846.6
34:0	18:0/16:0	762.5	38:4	16:0/22:4	810.5	42:10	22:6/20:4	854.5
36:5 ^a	16:0/20:5	780.5		18:0/20:4		42:1	24:0/18:1	872.5
36:5 ^b	16:1/20:4	780.6	38:3	18:0/20:3	812.5			
36:5 ^c	18:3/18:2	780.5	38:2	18:0/20:2	814.6			
36:4 ^a	16:0/20:4	782.5		20:0/18:2				
36:4 ^b	18:2/18:2	782.5		20:1/18:1				
36:3	16:0/20:3	784.5	40:8	18:2/22:6	830.5			
	18:1/18:2			20:4/20:4				

c) PE

total chain length	acyl chains	<i>m/z</i>	total chain length	acyl chains	<i>m/z</i>	total chain length	acyl chains	<i>m/z</i>
34:3	16:1/18:2	714.5	36:2	18:0/18:2	744.5	38:3	18:0/20:3	770.6
34:2	16:0/18:2	716.5		18:1/18:1		38:2	18:0/20:2	772.5
	16:1/18:1		36:1	18:0/18:1	746.5		18:1/20:1	
34:1	16:0/18:1	718.5		20:1/16:0			20:0/18:2	
	18:0/16:1		38:7	16:1/22:6	762.5	40:8	18:2/22:6	788.6
34:0	18:0/16:0	720.6	38:6 ^a	16:0/22:6	764.6	40:7	18:1/22:6	790.5
36:5	16:1/20:4	738.5	38:6 ^b	18:2/20:4	764.5		22:5/18:2	
36:4 ^a	16:0/20:4	740.5	38:5	16:0/22:5	766.5	40:6	22:6/18:0	792.6
36:4 ^b	18:2/18:2	740.5		18:1/20:4		40:5	18:0/22:5	794.5
36:3	16:0/20:3	742.6		20:5/18:0		40:4	18:0/22:4	796.6
	18:1/18:2		38:4	16:0/22:4	768.5	40:3	18:0/22:3	798.6
				18:0/20:4				

d) TAG

total chain length	acyl chains	m/z	total chain length	acyl chains	m/z	total chain length	acyl chains	m/z
42:4	12:1, 12:1, 18:2	732.7	48:2	12:0, 18:1, 18:1	820.7	54:1	16:0, 18:1, 20:0	906.7
	12:1, 14:1, 16:2			14:0, 16:0, 18:2			18:0, 18:0, 18:1	
	12:1, 14:2, 16:1			14:0, 16:1, 18:1		56:8	16:0, 18:2, 22:6	920.7
	14:1, 14:1, 14:2			14:1, 16:0, 18:1			16:0, 20:4, 20:4	
42:3	12:0, 12:1, 18:2	734.7		16:0, 16:1, 16:1			18:1, 18:2, 20:5	
	12:1, 12:1, 18:1		48:1	14:0, 16:0, 18:1	822.8		18:2, 18:2, 20:4	
	12:1, 14:1, 16:1			14:0, 16:1, 18:0		56:7	16:0, 18:1, 22:6	922.7
	14:1, 14:1, 14:1			16:0, 16:0, 16:1			16:0, 18:2, 22:5	
42:2	12:0, 12:0, 18:2	736.7	48:0	16:0, 16:0, 16:0	824.8		16:0, 20:3, 20:4	
	12:0, 14:1, 16:1		50:6	14:0, 16:1, 20:5	840.8		18:1, 18:2, 20:4	
	14:0, 14:1, 14:1			14:0, 18:3, 18:3			18:2, 18:2, 20:3	
42:1	12:0, 12:0, 18:1	738.7		14:1, 16:0, 20:5		56:6	16:0, 18:1, 22:5	924.7
	12:0, 14:0, 16:1			14:1, 16:1, 20:4			16:0, 18:2, 22:4	
	12:0, 14:1, 16:0			14:2, 16:0, 20:4			16:0, 20:3, 20:3	
	14:0, 14:0, 14:1			16:0, 16:3, 18:3			18:1, 18:1, 20:4	
42:0	12:0, 14:0, 16:0	740.8		16:1, 16:3, 18:2			18:1, 18:2, 20:3	
	14:0, 14:0, 14:0		50:5	14:0, 18:2, 18:3	842.7	56:5	16:0, 18:1, 22:4	926.8
44:4	12:1, 14:1, 18:2	760.7		14:1, 18:2, 18:2			16:0, 20:2, 20:3	
	12:1, 16:1, 16:2			16:1, 16:1, 18:3			18:0, 18:2, 20:3	
	14:1, 14:1, 16:2			16:1, 16:2, 18:2			18:1, 18:1, 20:3	
44:3	12:0, 14:1, 18:2	762.7	50:4	16:0, 16:1, 18:3	844.7		18:1, 18:2, 20:2	
	12:1, 14:1, 18:1			16:0, 16:2, 18:2			18:2, 18:2, 20:1	
	12:1, 16:1, 16:1			16:1, 16:1, 18:2		56:4	16:0, 20:2, 20:2	928.7
	14:1, 14:1, 16:1			16:1, 16:2, 18:1			18:1, 18:1, 20:2	
44:2	12:0, 14:0, 18:2	764.7	50:3	16:0, 16:0, 18:3	846.7		18:1, 18:2, 20:1	
	12:0, 14:1, 18:1			16:0, 16:1, 18:2		56:3	16:0, 20:1, 20:2	930.8
	12:0, 16:1, 16:1			16:1, 16:1, 18:1			18:0, 18:1, 20:2	
	14:0, 14:1, 16:1		50:2	16:0, 16:0, 18:2	848.7		18:0, 18:2, 20:1	
	14:1, 14:1, 16:0			16:0, 16:1, 18:1			18:1, 18:1, 20:1	
44:1	12:0, 14:0, 18:1	766.7	50:1	16:0, 16:0, 18:1	850.7		18:1, 18:2, 20:0	
	12:0, 16:0, 16:1		50:0	16:0, 16:0, 18:0	852.7	56:2	16:0, 20:1, 20:1	932.7
	14:0, 14:0, 16:1		52:7	14:0, 16:1, 22:6	866.8		16:1, 18:1, 22:0	
	14:0, 14:1, 16:0			14:0, 18:2, 20:5			18:0, 18:1, 20:1	
44:0	12:0, 16:0, 16:0	768.6		14:1, 16:0, 22:6			18:1, 18:1, 20:0	
	14:0, 14:0, 16:0			14:1, 18:1, 20:5		58:10	18:2, 18:2, 22:6	944.7
46:5	12:0, 14:1, 20:4	786.6		14:1, 18:2, 20:4			18:2, 20:4, 20:4	
	12:1, 16:2, 18:2			16:0, 16:2, 20:5		58:9	18:1, 18:2, 22:6	946.7
	14:1, 16:2, 16:2			16:1, 16:1, 20:5			18:1, 20:4, 20:4	
46:4	12:0, 16:1, 18:3	788.7		16:1, 16:2, 20:4			18:2, 18:2, 22:5	
	12:1, 16:1, 18:2		52:6	14:0, 18:2, 20:4	868.7	58:8	16:0, 18:2, 24:6	948.7
	14:1, 14:1, 18:2			16:1, 16:1, 20:4			18:1, 18:1, 22:6	
46:3	12:0, 16:1, 18:2	790.8		16:1, 18:2, 18:3			18:1, 18:2, 22:5	
	12:1, 16:0, 18:2		52:5	16:0, 16:0, 20:5	870.7	58:7	18:0, 18:1, 22:6	950.8

total chain length	acyl chains	<i>m/z</i>	total chain length	acyl chains	<i>m/z</i>	total chain length	acyl chains	<i>m/z</i>
	12:1, 16:1, 18:1			16:0, 16:1, 20:4			18:1, 18:1, 22:5	
	14:0, 14:1, 18:2			16:0, 18:2, 18:3		58:6	18:0, 18:1, 22:5	952.8
	14:1, 14:1, 18:1			16:1, 18:1, 18:3			18:0, 18:2, 22:4	
46:2	14:1, 16:1, 16:1		52:4	16:0, 16:0, 20:4	872.7		18:1, 18:1, 22:4	
	12:0, 16:0, 18:2	792.7		16:0, 18:1, 18:3		58:5	18:0, 18:1, 22:4	954.7
	12:0, 16:1, 18:1			16:1, 18:1, 18:2			18:0, 18:2, 22:3	
	14:0, 14:0, 18:2		52:3	16:0, 18:1, 18:2	874.8		18:0, 20:1, 20:4	
	14:0, 14:1, 18:1			16:1, 18:1, 18:1			18:1, 18:1, 22:3	
	14:0, 16:1, 16:1		52:2	16:0, 18:1, 18:1	876.7		18:1, 20:1, 20:3	
46:1	14:1, 16:0, 16:1		52:1	16:0, 18:0, 18:1	878.7	58:4	18:1, 18:1, 22:2	956.7
	12:0, 16:0, 18:1	794.7	52:0	16:0, 18:0, 18:0	880.8		18:1, 18:2, 22:1	
	14:0, 14:0, 18:1		54:7	16:1, 16:1, 22:5	894.7		18:1, 20:1, 20:2	
	14:0, 16:0, 16:1			16:1, 18:1, 20:5			18:2, 20:1, 20:1	
46:0	14:1, 16:0, 16:0	796.7		16:1, 18:2, 20:4		58:3	16:0, 18:2, 24:1	958.6
48:5	14:0, 16:0, 16:0	814.7		18:1, 18:2, 18:4			18:0, 18:2, 22:1	
	12:0, 18:2, 18:3			18:1, 18:3, 18:3			18:1, 18:1, 22:1	
	12:1, 18:2, 18:2		54:6	16:0, 16:0, 22:6	896.7		18:1, 18:2, 22:0	
	14:1, 16:1, 18:3			16:0, 18:2, 20:4			18:1, 20:1, 20:1	
	14:2, 16:1, 18:2			18:1, 18:2, 18:3		58:2	16:0, 18:1, 24:1	960.7
48:4	12:0, 18:2, 18:2	816.8		18:2, 18:2, 18:2			16:0, 20:1, 22:1	
	12:1, 18:1, 18:2		54:5	16:0, 18:1, 20:4	898.7		18:1, 18:1, 22:0	
	14:0, 16:2, 18:2			16:0, 18:2, 20:3		58:1	16:0, 18:0, 24:1	962.7
	14:1, 16:1, 18:2			18:0, 18:2, 18:3			18:0, 18:1, 22:0	
	14:1, 16:2, 18:1			18:1, 18:1, 18:3		60:4	18:1, 18:1, 24:2	984.7
	16:1, 16:1, 16:2			18:1, 18:2, 18:2			18:1, 18:2, 24:1	
48:3	12:0, 18:1, 18:2	818.7	54:4	16:0, 18:1, 20:3	900.6		18:2, 20:1, 22:1	
	14:0, 16:1, 18:2			18:0, 18:1, 18:3		60:3	18:1, 18:1, 24:1	986.7
	14:1, 16:0, 18:2			18:0, 18:2, 18:2			18:1, 18:2, 24:0	
	14:1, 16:1, 18:1			18:1, 18:1, 18:2			18:1, 20:1, 22:1	
	16:1, 16:1, 16:1		54:3	18:0, 18:1, 18:2	902.7	60:2	18:0, 18:1, 24:1	988.8
				18:1, 18:1, 18:1			18:0, 18:2, 24:0	
			54:2	16:0, 18:1, 20:1	904.7		18:1, 18:1, 24:0	
				18:0, 18:0, 18:2				
				18:0, 18:1, 18:1				

Table S3. Lipid species stimulated by diabetes (at least D/C>3-fold with p-value<0.01 in the gastrocnemius or soleus) expressed with the relative peak area of the lipid species from C (n=14), D (n = 9), DX (n = 12), and CX groups (n = 15) (number of “abundance in class” represents the percentage of peak area of each species among its corresponding head group species).

class	acyl chain	m/z	gastrocnemius					soleus				
			D/C	DX/C	CX/C	DX/D	% in class	D/C	DX/C	CX/C	DX/D	% in class
LPC	18:3	518.5	3.20 ± 0.34	4.64 ± 0.50	1.14 ± 0.13	1.45 ± 0.15	0.01	2.90 ± 0.27	1.03 ± 0.10	0.74 ± 0.07	0.35 ± 0.04	0.02
	16:1	494.5	6.18 ± 0.59	8.69 ± 0.79	1.17 ± 0.10	1.41 ± 0.15	0.02	5.52 ± 0.68	3.06 ± 0.29	0.89 ± 0.10	0.55 ± 0.06	0.05
	18:2	520.5	4.67 ± 0.58	5.40 ± 0.58	1.18 ± 0.13	1.16 ± 0.14	0.50	3.91 ± 0.39	1.80 ± 0.16	0.92 ± 0.09	0.46 ± 0.05	1.69
	20:3	546.5	4.62 ± 0.43	5.70 ± 0.54	0.92 ± 0.09	1.23 ± 0.12	0.06	8.45 ± 1.16	3.47 ± 0.44	0.93 ± 0.11	0.41 ± 0.05**	0.10
	16:0	496.5	2.38 ± 0.25	2.09 ± 0.20	1.21 ± 0.09	0.88 ± 0.10	0.89	4.80 ± 0.54	2.47 ± 0.25	0.99 ± 0.10	0.52 ± 0.06**	1.56
	18:0	524.5	1.34 ± 0.16	1.39 ± 0.17	1.53 ± 0.16	1.04 ± 0.14	0.63	4.38 ± 0.39	2.19 ± 0.18	0.93 ± 0.08	0.50 ± 0.04*	1.67
	20:4	544.5	2.07 ± 0.24	2.38 ± 0.24	0.90 ± 0.09	1.15 ± 0.15	0.60	3.58 ± 0.49	1.64 ± 0.21	0.89 ± 0.11	0.46 ± 0.06**	0.92
	22:6	568.5	1.79 ± 0.20	1.81 ± 0.20	1.06 ± 0.15	1.01 ± 0.11	0.36	4.12 ± 0.52	1.60 ± 0.18	1.28 ± 0.12	0.39 ± 0.05**	0.62
	22:5	570.5	2.81 ± 0.27	2.92 ± 0.27	1.14 ± 0.12	1.04 ± 0.09	0.11	3.62 ± 0.40	1.61 ± 0.18	1.03 ± 0.11	0.45 ± 0.04**	0.19
PC	38:2	814.5	0.22 ± 0.04	0.63 ± 0.11	1.37 ± 0.25	2.87 ± 0.45**	1.22	2.00 ± 0.49	5.66 ± 1.25	5.72 ± 1.19	2.83 ± 0.48	0.18
	40:8	830.5	0.26 ± 0.04	0.40 ± 0.0	1.37 ± 0.17	1.53 ± 0.25*	1.79	0.42 ± 0.06	1.08 ± 0.15	2.01 ± 0.20	2.59 ± 0.41	<u>3.99</u>
	34:0	762.5	0.26 ± 0.04	0.55 ± 0.07	1.19 ± 0.15	2.12 ± 0.34**	1.42	0.27 ± 0.03	0.72 ± 0.06	1.62 ± 0.17	2.65 ± 0.31**	1.16
	36:0	790.5	0.21 ± 0.05	0.64 ± 0.15	1.50 ± 0.44	2.99 ± 0.65**	0.13	0.26 ± 0.05	0.47 ± 0.08	1.99 ± 0.43	1.82 ± 0.29	0.63
	30:0	706.5	0.98 ± 0.16	1.76 ± 0.23	1.11 ± 0.18	1.79 ± 0.31	0.08	0.30 ± 0.05	0.75 ± 0.10	2.23 ± 0.26	2.46 ± 0.39**	0.13
	42:1	872.5	0.65 ± 0.20	1.00 ± 0.21	1.14 ± 0.28	1.52 ± 0.41	0.10	0.32 ± 0.08	1.49 ± 0.30	3.86 ± 0.92	4.64 ± 1.11**	0.23
LPE	16:1	452.5	3.91 ± 0.36	4.57 ± 0.45	1.01 ± 0.11	1.17 ± 0.10	0.05	2.16 ± 0.31	1.60 ± 0.22	1.38 ± 0.19	0.74 ± 0.09	0.07
	20:5	500.5	4.05 ± 0.67	3.49 ± 0.48	0.94 ± 0.16	0.86 ± 0.10	0.03	4.20 ± 0.46	1.25 ± 0.19	1.02 ± 0.14	0.30 ± 0.04**	0.07
	22:5	528.5	1.34 ± 0.21	1.22 ± 0.19	0.68 ± 0.12	0.90 ± 0.12	1.76	3.35 ± 0.39	1.46 ± 0.19	0.56 ± 0.07	0.44 ± 0.05**	1.87
PE	22:4	530.5	1.03 ± 0.14	0.98 ± 0.14	0.66 ± 0.10	0.96 ± 0.10	0.44	3.10 ± 0.43	2.08 ± 0.31	0.71 ± 0.11	0.67 ± 0.07	0.39
	34:0	720.5	0.27 ± 0.05	0.61 ± 0.10	1.98 ± 0.35	2.29 ± 0.45**	0.19	0.95 ± 0.10	2.25 ± 0.28	2.56 ± 0.22	2.36 ± 0.32	0.20
	40:3	798.5	0.35 ± 0.08	0.77 ± 0.15	2.10 ± 0.48	2.18 ± 0.46	0.15	3.38 ± 0.31	7.66 ± 1.27	7.70 ± 0.73	2.26 ± 0.37**	0.06
LPG	14:0	455.5	3.44 ± 0.77	3.94 ± 0.77	1.07 ± 0.21	1.15 ± 0.22	0.07	1.84 ± 0.28	0.50 ± 0.09	0.70 ± 0.10	0.27 ± 0.05	0.21

class	acyl chain	m/z	gastrocnemius				soleus					
			D/C	DX/C	CX/C	DX/D	% in class	D/C	DX/C	CX/C	DX/D	% in class
PG	16:1	481.5	5.35 ± 0.91	7.37 ± 1.31	1.32 ± 0.23	1.38 ± 0.23	0.11	5.66 ± 0.70	2.33 ± 0.31	1.13 ± 0.14	0.41 ± 0.05**	0.35
	22:6/22:6	865.5	0.23 ± 0.03	0.34 ± 0.07	1.20 ± 0.17	1.49 ± 0.26	0.55	0.29 ± 0.04	0.28 ± 0.04	0.61 ± 0.12	0.97 ± 0.12	0.29
	16:0/16:0	721.5	0.47 ± 0.09	0.74 ± 0.14	0.87 ± 0.17	1.55 ± 0.32	2.82	0.29 ± 0.06	0.41 ± 0.09	0.50 ± 0.10	1.42 ± 0.34	1.26
	20:4/16:0	769.5	0.35 ± 0.06	0.40 ± 0.07	1.11 ± 0.31	1.15 ± 0.15	0.62	0.30 ± 0.06	0.27 ± 0.05	0.55 ± 0.15	0.88 ± 0.09	0.35
	18:2/18:0	773.5	0.40 ± 0.08	0.65 ± 0.12	1.17 ± 0.23	1.64 ± 0.34	<u>8.52</u>	0.26 ± 0.06	0.35 ± 0.07	0.65 ± 0.13	1.35 ± 0.35	3.63
LPI	18:2	595.5	3.62 ± 0.55	3.86 ± 0.60	1.14 ± 0.20	1.07 ± 0.18	0.64	2.98 ± 0.43	1.75 ± 0.30	0.62 ± 0.07	0.59 ± 0.10	2.73
	20:3	621.5	4.41 ± 1.67	4.60 ± 1.74	0.81 ± 0.30	1.04 ± 0.19	0.98	3.56 ± 1.33	2.07 ± 0.78	0.44 ± 0.16	0.58 ± 0.12	<u>4.18</u>
PI	18:2/20:4	881.5	0.29 ± 0.04	0.29 ± 0.05	1.02 ± 0.16	1.00 ± 0.15	0.23	0.89 ± 0.08	0.65 ± 0.07	0.65 ± 0.05	0.74 ± 0.08	0.78
LPS	18:1	522.5	3.78 ± 0.80	5.81 ± 1.15	1.61 ± 0.23	1.54 ± 0.36	0.62	3.04 ± 0.79	2.58 ± 0.62	0.67 ± 0.12	0.85 ± 0.26	2.87
PS	16:0/22:6	806.5	0.44 ± 0.11	0.54 ± 0.09	1.23 ± 0.27	1.22 ± 0.26	2.07	0.30 ± 0.06	0.33 ± 0.07	0.72 ± 0.17	1.12 ± 0.18	2.07
	18:0/20:4	810.5	0.56 ± 0.10	0.53 ± 0.09	1.11 ± 0.14	0.95 ± 0.19	<u>6.93</u>	0.33 ± 0.07	0.31 ± 0.07	0.67 ± 0.10	0.94 ± 0.25	<u>6.41</u>
	18:1/22:6	832.5	0.45 ± 0.10	0.43 ± 0.08	1.28 ± 0.32	0.94 ± 0.18	1.64	0.32 ± 0.07	0.29 ± 0.06	0.78 ± 0.20	0.92 ± 0.15	1.57
	18:0/22:6	834.5	0.51 ± 0.08	0.49 ± 0.07	0.90 ± 0.11	0.95 ± 0.16	<u>54.49</u>	0.30 ± 0.06	0.28 ± 0.05	0.53 ± 0.08	0.95 ± 0.23	<u>50.83</u>
LPA	18:2	433.5	4.23 ± 1.40	2.66 ± 0.70	1.36 ± 0.47	0.63 ± 0.17	7.54	1.64 ± 0.17	1.20 ± 0.13	0.95 ± 0.08	0.73 ± 0.08	<u>23.66</u>
PA	16:0/18:2	671.5	3.56 ± 0.94	2.00 ± 0.50	0.99 ± 0.13	0.56 ± 0.20	<u>38.30</u>	0.35 ± 0.07	0.33 ± 0.07	0.67 ± 0.09	0.92 ± 0.23	15.75
SM	d18:1/20:0	759.5	0.31 ± 0.05	0.41 ± 0.08	1.02 ± 0.16	1.31 ± 0.25	8.56	2.98 ± 0.24	1.29 ± 0.11	0.89 ± 0.09	0.43 ± 0.04	5.07
	d18:1/22:0	787.5	0.26 ± 0.05	0.38 ± 0.06	1.11 ± 0.26	1.44 ± 0.24*	<u>12.42</u>	0.79 ± 0.14	0.34 ± 0.06	0.82 ± 0.16	0.43 ± 0.07	3.03
	d18:1/23:0	801.5	0.16 ± 0.04	0.24 ± 0.06	0.83 ± 0.18	1.50 ± 0.34*	6.86	0.49 ± 0.09	0.20 ± 0.04	0.62 ± 0.11	0.41 ± 0.08	1.79
	d18:1/24:2	811.5	0.22 ± 0.04	0.34 ± 0.06	1.04 ± 0.30	1.50 ± 0.18*	5.91	0.67 ± 0.14	0.30 ± 0.06	0.77 ± 0.20	0.45 ± 0.05	1.44
	d18:1/24:0	815.5	0.21 ± 0.04	0.35 ± 0.06	1.04 ± 0.19	1.68 ± 0.34*	<u>18.42</u>	0.61 ± 0.12	0.30 ± 0.06	0.77 ± 0.13	0.49 ± 0.09	<u>54.02</u>
Cer	d18:1/24:1	648.5	0.33 ± 0.06	0.52 ± 0.09	1.21 ± 0.21	1.56 ± 0.24	<u>26.15</u>	1.18 ± 0.20	0.48 ± 0.07	0.99 ± 0.15	0.41 ± 0.06	<u>24.21</u>
	d18:1/24:0	650.5	0.22 ± 0.04	0.45 ± 0.09	1.14 ± 0.20	2.04 ± 0.39**	<u>42.31</u>	0.74 ± 0.11	0.41 ± 0.07	0.92 ± 0.14	0.56 ± 0.08	<u>40.55</u>
	d18:1/16:0	538.5	1.31 ± 0.24	1.45 ± 0.24	1.03 ± 0.16	1.10 ± 0.22	0.78	3.43 ± 0.33	1.02 ± 0.08	0.92 ± 0.07	0.30 ± 0.03**	1.92
	d18:0/18:1	564.5	0.83 ± 0.13	0.79 ± 0.13	1.11 ± 0.18	0.95 ± 0.17	0.12	3.12 ± 0.14	0.90 ± 0.04	0.95 ± 0.05	0.29 ± 0.01**	1.30
DAG	18:1,18:1	638.5	3.13 ± 0.48	3.20 ± 0.36	1.11 ± 0.15	1.02 ± 0.15	<u>30.76</u>	2.10 ± 0.39	1.17 ± 0.16	0.95 ± 0.13	0.55 ± 0.09	<u>4.89</u>

class	acyl chain	m/z	gastrocnemius					soleus					
			D/C	DX/C	CX/C	DX/D	% in class	D/C	DX/C	CX/C	DX/D	% in class	
	16:1,22:6	656.5	5.87 ± 1.59	2.96 ± 0.76	0.97 ± 0.26	0.50 ± 0.14	0.00	2.92 ± 0.70	0.80 ± 0.15	0.90 ± 0.15	0.28 ± 0.07	0.85	
	14:1,16:0	556.5	7.04 ± 1.48	4.46 ± 0.86	1.02 ± 0.18	0.63 ± 0.14	0.01	3.92 ± 0.87	1.79 ± 0.36	1.25 ± 0.21	0.46 ± 0.11**	0.28	
	16:1,18:3	606.5	8.84 ± 2.23	3.99 ± 0.76	0.99 ± 0.20	0.45 ± 0.12	0.01	7.97 ± 1.77	2.27 ± 0.33	1.00 ± 0.11	0.28 ± 0.07**	0.03	
	16:0,18:3	608.5	7.20 ± 1.41	5.33 ± 1.08	1.14 ± 0.21	0.74 ± 0.16	0.29	12.4 ± 2.93	5.80 ± 1.21	1.41 ± 0.28	0.47 ± 0.10*	0.79	
	16:0,18:2	610.5	3.87 ± 0.61	2.50 ± 0.39	1.16 ± 0.20	0.65 ± 0.10	<u>8.43</u>	6.50 ± 1.43	2.53 ± 0.49	1.28 ± 0.26	0.39 ± 0.07**	<u>8.83</u>	
	16:0,18:1	612.5	3.08 ± 0.45	2.62 ± 0.25	1.40 ± 0.16	0.85 ± 0.12	<u>13.56</u>	4.83 ± 0.89	2.41 ± 0.29	1.34 ± 0.17	0.50 ± 0.08**	<u>15.76</u>	
	18:2,18:3	632.5	4.93 ± 1.14	3.24 ± 0.64	1.06 ± 0.21	0.66 ± 0.17	0.02	7.02 ± 1.63	2.54 ± 0.52	1.10 ± 0.20	0.36 ± 0.09*	0.06	
	18:2,18:2	634.5	3.05 ± 0.54	1.93 ± 0.36	0.98 ± 0.17	0.63 ± 0.12	1.85	6.54 ± 1.54	2.62 ± 0.55	1.13 ± 0.24	0.40 ± 0.08**	<u>9.90</u>	
	18:1,18:2	636.5	3.64 ± 0.62	2.40 ± 0.42	0.94 ± 0.16	0.66 ± 0.12	<u>11.63</u>	5.06 ± 0.96	3.20 ± 0.46	1.10 ± 0.16	0.63 ± 0.12	<u>30.50</u>	
	14:0,16:0	558.5	2.39 ± 0.45	1.29 ± 0.23	1.12 ± 0.20	0.54 ± 0.10	0.11	3.87 ± 0.98	1.72 ± 0.41	1.12 ± 0.24	0.44 ± 0.11**	0.17	
	18:0,18:0	642.5	0.62 ± 0.09	0.48 ± 0.15	1.03 ± 0.14	0.77 ± 0.23	0.59	5.52 ± 1.18	1.71 ± 0.32	0.93 ± 0.13	0.31 ± 0.08**	0.03	
	18:0,20:4	662.5	0.36 ± 0.06	0.24 ± 0.03	1.27 ± 0.21	0.67 ± 0.10	<u>4.61</u>	4.45 ± 0.82	1.68 ± 0.28	1.12 ± 0.17	0.38 ± 0.07*	0.61	
	18:1,22:4	688.5	1.05 ± 0.19	0.59 ± 0.08	0.88 ± 0.13	0.56 ± 0.10	0.27	9.61 ± 2.02	3.73 ± 0.65	1.16 ± 0.16	0.39 ± 0.09**	0.05	
	18:0,22:4	690.5	0.35 ± 0.07	0.23 ± 0.03	1.18 ± 0.18	0.67 ± 0.12	0.33	3.55 ± 0.77	1.20 ± 0.23	1.19 ± 0.21	0.34 ± 0.06**	0.09	
TAG	44:3	762.7	4.46 ± 1.18	8.14 ± 1.41	1.32 ± 0.33	1.82 ± 0.47	0.01	0.89 ± 0.15	0.46 ± 0.07	0.53 ± 0.08	0.52 ± 0.10	<u>5.22</u>	
	44:2	764.7	4.53 ± 1.17	9.38 ± 1.65	1.09 ± 0.20	2.07 ± 0.51*	0.05	0.63 ± 0.12	0.31 ± 0.06	0.53 ± 0.11	0.48 ± 0.11	<u>1.66</u>	
	50:0	852.7	0.17 ± 0.03	0.22 ± 0.05	0.80 ± 0.07	1.34 ± 0.33	1.24	0.56 ± 0.09	0.22 ± 0.05	0.45 ± 0.04	0.40 ± 0.10	1.18	
	56:7	922.7	3.03 ± 0.59	2.49 ± 0.34	1.20 ± 0.14	0.82 ± 0.18	0.31	2.97 ± 0.53	1.00 ± 0.12	0.44 ± 0.04	0.34 ± 0.06	0.01	
	42:2	736.7	5.25 ± 1.35	11.02 ± 2.02	1.05 ± 0.18	2.10 ± 0.50*	0.01	11.47 ± 2.07	11.08 ± 2.12	0.30 ± 0.06	0.97 ± 0.09	0.01	
	44:4	760.7	4.00 ± 1.19	6.76 ± 1.40	1.21 ± 0.23	1.69 ± 0.47	0.00	6.53 ± 1.21	3.04 ± 0.40	0.60 ± 0.06	0.47 ± 0.10*	0.02	
	46:2	792.7	3.19 ± 0.64	6.87 ± 1.03	1.16 ± 0.17	2.15 ± 0.46*	0.26	6.80 ± 1.39	4.23 ± 0.56	0.66 ± 0.12	0.62 ± 0.14*	0.47	
	54:7	894.7	6.12 ± 1.22	5.30 ± 0.76	1.19 ± 0.16	0.87 ± 0.20	0.12	3.05 ± 0.59	1.30 ± 0.16	0.52 ± 0.06	0.43 ± 0.09**	0.12	
	56:6	924.7	3.26 ± 0.50	2.29 ± 0.31	1.00 ± 0.10	0.70 ± 0.13	0.24	7.36 ± 1.63	4.27 ± 0.63	0.49 ± 0.06	0.58 ± 0.14*	0.01	
	42:4	732.7	0.60 ± 0.14	1.01 ± 0.18	1.13 ± 0.18	1.68 ± 0.35	0.01	7.20 ± 1.84	2.61 ± 0.66	0.20 ± 0.04	0.36 ± 0.11*	0.01	
	42:3	734.7	2.31 ± 0.56	4.79 ± 0.87	1.15 ± 0.21	2.08 ± 0.47	0.00	6.30 ± 1.60	5.33 ± 1.31	0.38 ± 0.09	0.85 ± 0.11	0.00	
	42:1	738.7	2.07 ± 0.45	4.09 ± 0.65	1.36 ± 0.22	1.98 ± 0.45	0.11	7.55 ± 1.59	4.66 ± 0.89	0.42 ± 0.08	0.62 ± 0.12	0.04	

class	acyl chain	m/z	gastrocnemius					soleus				
			D/C	DX/C	CX/C	DX/D	% in class	D/C	DX/C	CX/C	DX/D	% in class
	42:0	740.7	1.85 ± 0.43	2.64 ± 0.46	1.24 ± 0.20	1.43 ± 0.35	0.05	9.47 ± 2.99	5.29 ± 0.69	0.52 ± 0.07	0.56 ± 0.17	0.02
	46:5	786.7	1.06 ± 0.26	1.36 ± 0.24	1.13 ± 0.17	1.28 ± 0.34	0.00	8.75 ± 1.84	5.00 ± 0.78	0.52 ± 0.08	0.57 ± 0.13**	0.03
	46:4	788.7	1.31 ± 0.29	1.78 ± 0.27	1.15 ± 0.14	1.37 ± 0.32	0.03	4.90 ± 0.90	2.83 ± 0.33	0.64 ± 0.07	0.58 ± 0.12**	0.04
	46:1	794.7	1.69 ± 0.32	3.59 ± 0.43	1.37 ± 0.16	2.13 ± 0.43	0.32	3.89 ± 0.73	2.19 ± 0.25	0.57 ± 0.06	0.56 ± 0.11**	0.54
	46:0	796.7	0.42 ± 0.12	0.86 ± 0.23	0.96 ± 0.23	2.06 ± 0.54	0.23	7.49 ± 1.53	4.24 ± 0.64	0.52 ± 0.07	0.57 ± 0.12**	0.32
	48:3	818.7	2.57 ± 0.48	5.55 ± 0.77	1.13 ± 0.14	2.16 ± 0.47	0.75	5.38 ± 1.05	2.75 ± 0.37	0.57 ± 0.07	0.51 ± 0.11**	0.94
	48:0	824.7	0.31 ± 0.07	0.53 ± 0.10	0.46 ± 0.03	1.74 ± 0.50	1.09	5.96 ± 1.12	2.61 ± 0.37	0.51 ± 0.07	0.44 ± 0.09**	0.36
	50:4	844.7	1.97 ± 0.38	3.46 ± 0.47	1.09 ± 0.15	1.76 ± 0.39	0.86	5.68 ± 1.18	3.07 ± 0.48	0.42 ± 0.06	0.54 ± 0.13*	0.03

- species marked as **bold** in D/C column represent significant change (>3-fold, p-value < 0.01 in D/C)

- species marked as **bold** in DX/D column represent significant change (>3-fold, p-value < 0.01 in D/C and >2-fold, p-value < 0.05 in DX/D)

- species written in underline denote high abundance in each class from group C

- * p<0.05, ** p<0.01 : significant change between groups D and DX marked in DX/D column

Table S4. Training intensity of rats on a treadmill.

Age (weeks old)	Intensity (m/min)	Time (min)
8	10	10
9	12	25
10	11–12.5	35
11	12.5–14.5	40
12	14.5	40
13	14.5	40
14	14.5	50

Table S5. SRM transitions for quantifying lipids species according to the class

Class	Precursor ion	Product ion	Collision energy (V)
LPC	[M+H] ⁺	^a [Pcho+H] ⁺	40
PC	[M+H] ⁺	^a [Pcho+H] ⁺	40
LPE	[M+H] ⁺	^b [M+H-141] ⁺	20
PE	[M+H] ⁺	^b [M+H-141] ⁺	20
LPG	[M-H] ⁻	[RCOO] ⁻	35
PG	[M-H] ⁻	[RCOO] ⁻	35
LPI	[M-H] ⁻	[RCOO] ⁻	35
PI	[M-H] ⁻	[RCOO] ⁻	35
LPS	[M-H] ⁻	[M-H-RCOOH] ⁻	35
PS	[M-H] ⁻	[RCOO] ⁻	35
LPA	[M-H] ⁻	[M-H-RCOOH] ⁻	35
PA	[M-H] ⁻	[RCOO] ⁻	35
SM	[M+H] ⁺	^a [Pcho+H] ⁺	40
Cer	[M+H] ⁺	^c [d18:1] ⁺	30
MHC	[M+H] ⁺	^c [d18:1] ⁺	30
DAG	[M+NH ₄] ⁺	[M+NH ₄ -RCOONH ₄] ⁺	25
TAG	[M+NH ₄] ⁺	[M+NH ₄ -RCOONH ₄] ⁺	25

^aprotonated phosphocholine ion, ^bloss of phosphoethanolamine, ^csphingosine long chain base fragments