SUPPLEMENTARY MATERIALS

Transcriptomics integrated with metabolomics reveals the amelioration of mussel-derived plasmalogens on high-fat diet-induced hyperlipidemia in zebrafish

Tables

Table S1. List of primers used in the qPCR experiments.

Gene Symbol	Forward Primer (5′–3′)	Reverse Primer (5′–3′)	Amplicon length (bp)
β-Actin	GATGCGGAAACTGGCAAAGG	GAGGAGGGCAAAGTGGTAAACG	115
Cyp1a	AGGACAACATCAGAGACATCACCG	CACTAGATAGACAACCGCCCAGG	178
Cp	TAAGAAGTGCTTCCCGAACG	GTCGGCCCATAATCCCAAAT	88
Gpx4a	TGCGTTTCTTAGGGTCTGCT	TCTCAGAGTACTTGGCGTGC	223
Lipca	ACTGAGCCTGAAGCCAAGATGAAG	CGTCTACCGACCAGCCATGAATG	184
Ndufs8b	TTACCATTCACAGAGGAGGCT	GGTAGTTGATCGTAGCTGGTTCT	167
Pla2g12b	CTGCTTGGCTTCCAGTTTGAT	TCTGCAAAGGTCTCACATGC	199
Pmt	AGGTGGGATTCAGTAATGTCC	TCCTGTATAAACTCGTCCTTCA	108
Ptgdsb	TGCCTATGACTGACTTCGACCT	AGCAGGAACCATCACTCTTTAGG	185
Sod3a	TGAAGTCTCTCCCATCCCAA	CCCTGACTGAGGTCTCCGTA	179
Sult2st3	GACCACATCAAAAGCTGGCGAAAC	GTGCTGTTACTGACGACACGATC C	164

25 **Table S4. The identified 20 potential metabolomics biomarkers based on MS/MS**

26

Metabolite	p(corr)[1]	Vip
Isobutyric acid	0.99	1.57
Methylsuccinic acid	0.99	1.57
2-Methoxy-3-methyl-9h-carbazole	0.96	1.53
4-Ethylphenylsulfate	0.93	1.48
2-Hydroxyacetaminophen sulfate	0.88	1.41
Pseudouridine	0.88	1.41
Cysteinyl-lysine	0.86	1.37
Uracil	0.86	1.37
Pa(14:0/0:0)	0.85	1.36
8(s)-Hydroxy-(5z,9e,11z,14z)-eicosatetraenoic acid	0.85	1.35
Gamma-glutamylisoleucine	0.83	1.33
Gamma-glutamylphenylalanine	0.83	1.32
Indole	0.80	1.28
5-Methoxytryptophan	0.80	1.28
Cis-5,8,11,14,17-eicosapentaenoic acid (EPA)	-0.80	1.27
5-alpha-Thdoc	-0.78	1.24
5-Hydroxytryptophol glucuronide	-0.88	1.25
Gamma-glutamyltyrosine	0.76	1.23
3-Methylglutarylcarnitine	0.89	1.43
Glutarylcarnitine	0.87	1.25

27

28

29

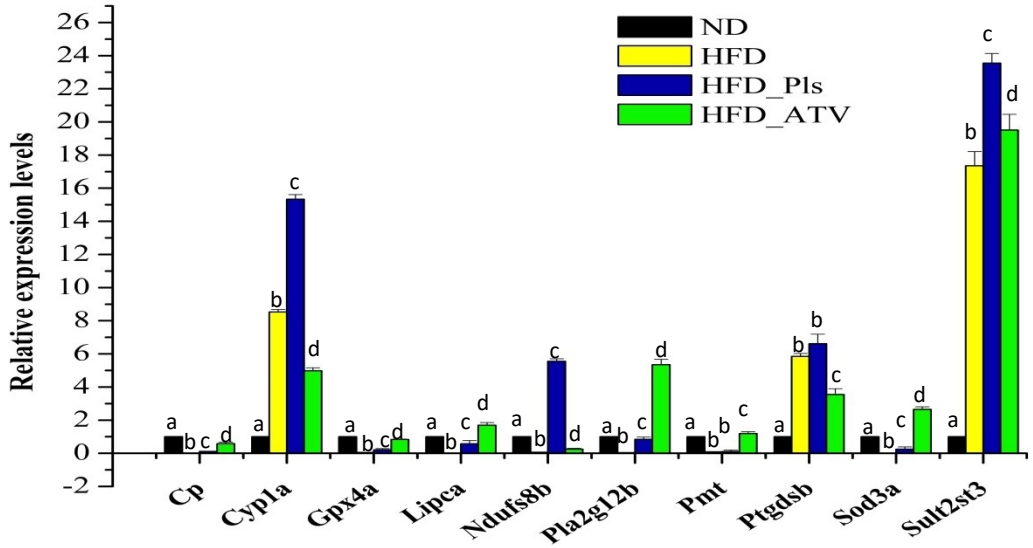
ND
HFD
HFD_Pls
HFD_ATV
Relative expression levels
26
24
22
20
18
16
14
12
10
8
6
4
2
0
-2
Cp
Cyp1a
Gpx4a
Lipca
Ndufs8b
Pla2g12b
Pmt
Ptgdsb
Sod3a
Sult2st3

Figure S1

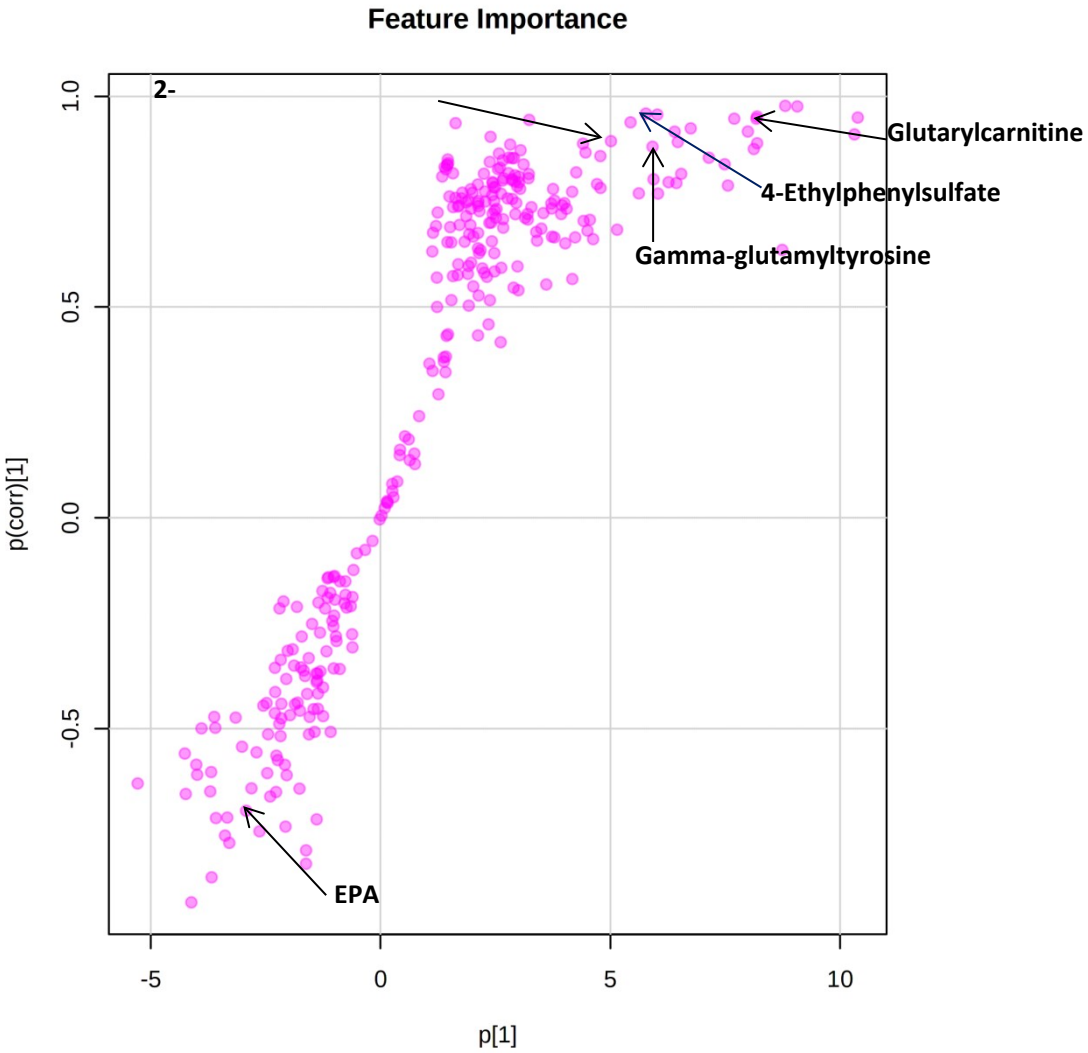
Feature Importance
2-
Glutarylcarnitine
4-Ethylphenylsulfate
Gamma-glutamyltyrosine
EPA
p(corr)[1]
p[1]
1.0
0.5
0.0
-0.5
-5
0
5
10

Figure S2

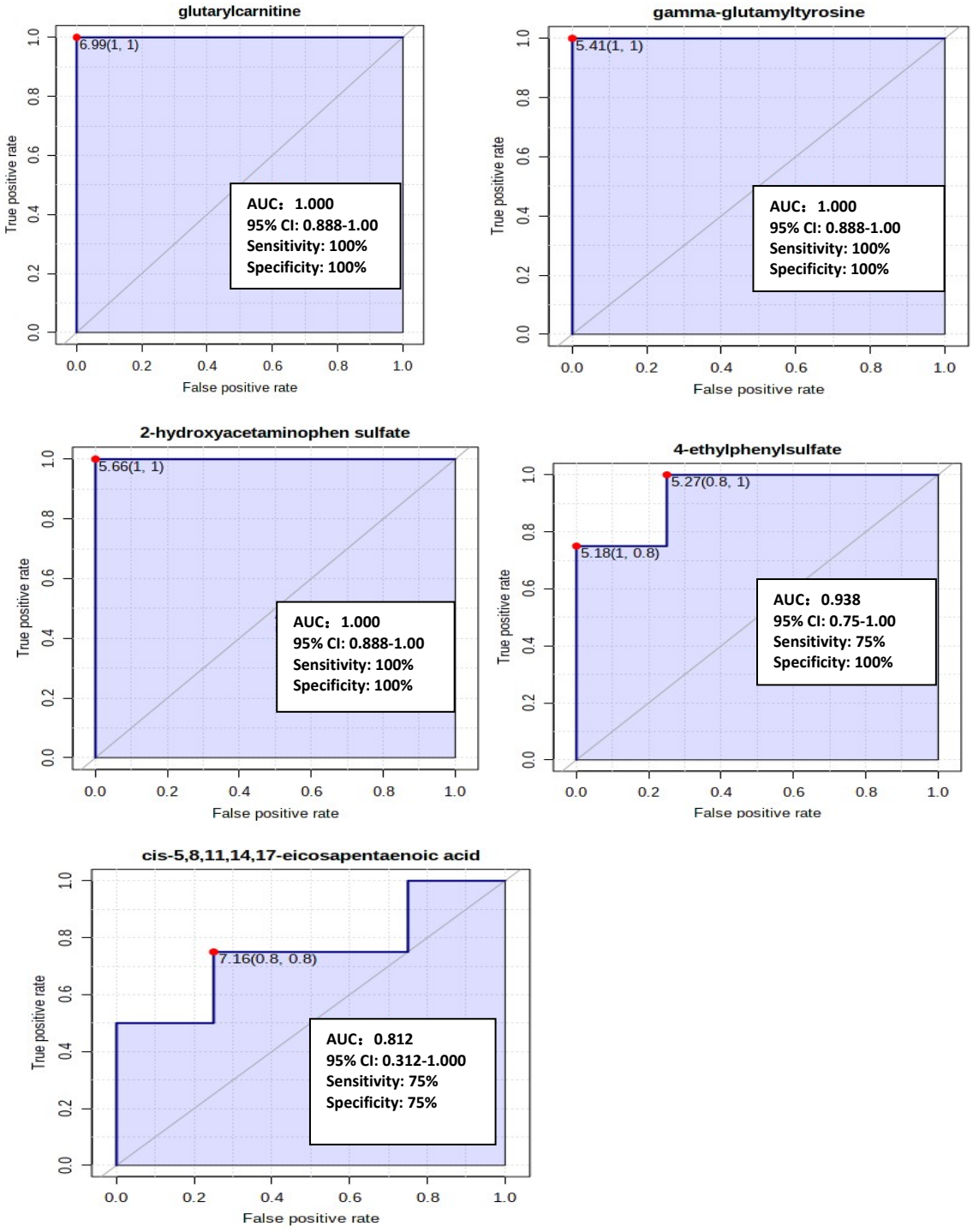
glutarylcarnitine
6.99(1, 1)
AUC：1.000
95% CI: 0.888-1.00
Sensitivity: 100%
Specificity: 100%
gamma-glutamyltyrosine
5.41(1, 1)
AUC：1.000
95% CI: 0.888-1.00
Sensitivity: 100%
Specificity: 100%
2-hydroxyacetaminophen sulfate
5.66(1, 1)
AUC：1.000
95% CI: 0.888-1.00
Sensitivity: 100%
Specificity: 100%
4-ethylphenylsulfate
5.27(0.8, 1)
5.18(1, 0.8)
AUC：0.938
95% CI: 0.75-1.00
Sensitivity: 75%
Specificity: 100%
cis-5,8,11,14,17-eicosapentaenoic acid
7.16(0.8, 0.8)
AUC：0.812
95% CI: 0.312-1.000
Sensitivity: 75%
Specificity: 75%
True positive rate
False positive rate

Figure S3