Supplementary information

Metabolomics reveals gut microbiota contribute to PPARα deficiency-induced alcoholic liver injury

Ting Zhang[1,2,3], Lijuan Bao[2], Qi Zhao[1], Zhanxuan E. Wu[1], Manyun Dai[1], Qianru Rao[1], and Fei Li[1,4*]

[1]Department of Pharmacy, Laboratory of Metabolomics and Drug-induced Liver Injury, Frontiers Science Center for Disease-related Molecular Network, West China Hospital, Sichuan University, Chengdu, 610041, China

[2]State Key Laboratory of Phytochemistry and Plant Resources in West China, Kunming Institute of Botany, Chinese Academy of Sciences, Kunming 650201, China

[3]University of Chinese Academy of Sciences, Beijing 100049, China

[4]Department of Gastroenterology and Hepatology, Sichuan University-Oxford University Huaxi Gastrointestinal Cancer Centre, State Key Laboratory of Biotherapy, West China Hospital, Sichuan University, Chengdu, 610041, China

Table of contents

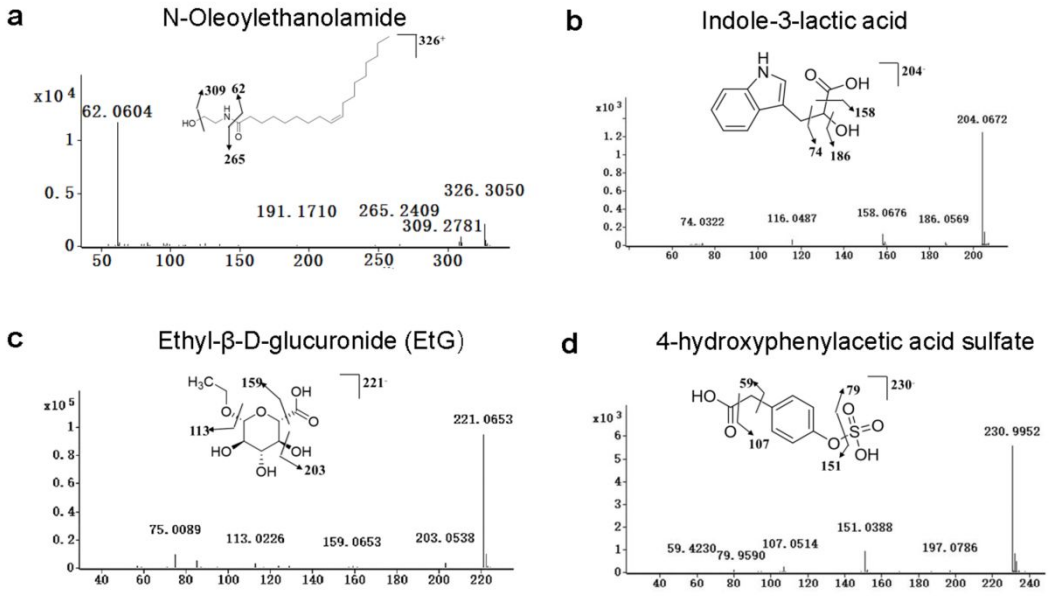

Figure S1. MS/MS of metabolites. (a) N-Oleoylethanolamide. (b) Indole-3-lactic acid. (c) Ethyl-β-D-glucuronide. (d) 4-hydroxyphenylacetic acid sulfate.

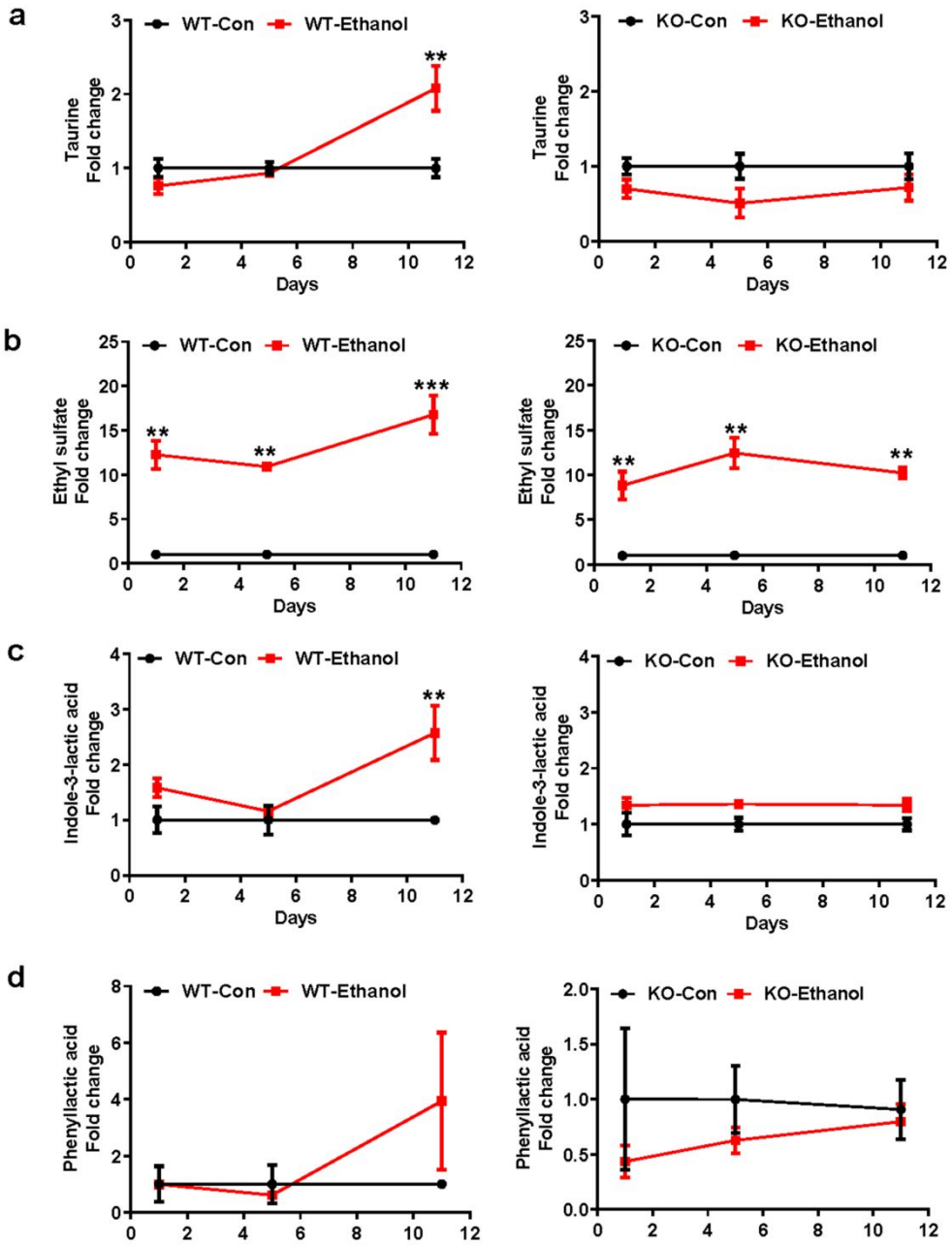

Figure S2. Effect of alcohol consumption on alcohol metabolism and endogenous metabolites. (a) Taurine. (b) Ethyl sulfate. (c) Indole-3-lactic acid. (d) Phenyllactic acid. All data were repressed as mean ± SD (n=5). **P*<0.05, ***P*<0.01, and ****P*<0.001.

Tab.S1 Primers for RT-qPCR.

Name	Forward primer	Reverse primer
Gapdh	AGGTCGGTGTGAACGGATTTG	TGTAGACCATGTAGTTGAGGTCA
Ppara	CCCAAGGGAGGAATAGCTTCT	CTCTGCGATGCGGTTCCAA
Cpt1a	TGGCATCATCACTGGTGTGTT	CTCTAGGGTCCGATTGATCTTTG
Acot1	ATGGCAGCAGCTCCAGACTT	CCCAACCTCCAAACCATCAT
Acadm	TGACGGAGCAGCCAATGA	ATGGCCGCCACATCAGA
Acadl	GGCTGGTTAAGTGATCTCGTGAT	ATGGGCAGGCGATCGA
Hadha	AAGGGGATGTGGCAGTTATT	ACTCCTGATTTGGTCGTTGG
Mcad	GCGAGCAGAAATGAAACTCC	AGCTCTAGACGAAGCCACGA
Il1b	CCCTGTCAGCTGTGAGAGTGTTGTGA	TGTTGTCTCTGTCTTGTTGTAGGTGTCTGT
Il6	CGGAGAGGAGACTTCACAGAGGA	TTTCCACGATTTCCCAGAGAACA
Tnfa	CCACCACGCTCTTCTGTCTAC	AGGGTCTGGGCCATAGAACT
Il10	TGTCAAATTCATTCATGGCCT	ATCGATTTCTCCCCTGTGAA
Pgc1a	ACCATGACTACTGTCAGTCACTC	GTCACAGGAGGCATCTTTGAAG
Fasn	AAGTTGCCCGAGTCAGAGAACC	ATCCATAGAGCCCAGCCTTCCATC
Acaa1a	ATGGGCGGAATGGTCTCTTTC	TGGGGACCTTGTCTTCATCAT
Dgat1	GTGCCATCGTCTGCAAGATTC	GCATCACCACACACCAATTCAG
Dgat2	CCGAACACTCTCCATCTTACAGT	ACAAGGGCCATAAGGTAGTGA

Tab.S2 Metabolites in liver and urine.

Mass	Lipidomics RT	Metabolics RT	Metabolite	Main fragments	Error (ppm)	Mode
537.512	17.29		Cer (d18:1/16:0)	252.28, 264.27, 520.51, 538.52	-2.00	ESI+
565.543	19.71		Cer (d18:1/18:0)	252.27, 264.27, 548.54, 566.55	-2.60	ESI+
593.575	22.68		Cer(d18:1/20:0)	252.26. 264.27, 576.57, 594.58	-2.70	ESI+
621.606	24.56		Cer(d18:1/22:0)	252.28, 264.27, 282.27, 604.60, 622.61	2.90	ESI+
649.637	24.66		Cer(d18:1/24:0)	252.27, 264.27, 632.63, 650.64	0.70	ESI+
647.622	23.44		Cer(d18:1/24:1)	252.27, 264.27, 630.62, 648.63	-3.20	ESI+
783.578	14.73		PC(36:3)	86.18, 184.07, 784.58	0.76	ESI+
787.608	18.3		PC(36:1)	86.18, 184.07, 788.61	4.21	ESI+
781.562	13.19		PC(36:4)	86.18, 184.07, 782.57	0.97	ESI+
785.593	16.34		PC(36:2)	86.18, 184.07, 786.59	3.43	ESI+
741.533	15.46		PC(33:3)	86.18, 184.07, 742.54	-1.32	ESI+
739.513	13.88		PC(33:4)	86.18, 184.07, 740.52	0.87	ESI+
771.577	15.53		PC(35:2)	86.18, 184.07, 730.53	-2.43	ESI+
729.534	16.24		PC(32:2)	86.18, 184.07, 772.58	0.34	ESI+
835.538	13.7		PS(40:6)	153.04, 747.55, 834.54	3.29	ESI-
771.578	15.23		PE(38:2)	140.01, 770.58	0.88	ESI-
791.545	16.78		PE(40:6)	140.01, 790.54	-0.31	ESI-
325.301	7.55		N-Oleoylethanolamide	62.06, 265.25, 308.30, 326.31	-2.90	ESI+
327.314	12.9		Stearoylethanolamide	62..04, 239.27, 310.31, 328.32	-1.20	ESI+
345.266	8.31		Eicosapentaenoyl Ethanolamide	62.06, 257.23, 285.22, 330.24, 346.26	-1.70	ESI+
372.266	13.61		Cervonoyl ethanolamide	62.05, 319.23, 337.25, 355.26	1.69	ESI+
297.268	8.61		Palmitoleoyl Ethanolamide	62.06, 237.22, 282.26, 298.27	0.27	ESI+
347.2824	9.09		Arachidonoyl ethanolamide	62.06,331.26, 348.31	0.29	ESI+
356.273	10.55		Tetracosahexaenoic acid	45.00, 107.08, 311.27, 339.23	-1.72	ESI-
310.288	12.89		Eicosenoic acid	45.00, 70.04, 108.09, 187.15, 287.24	-2.21	ESI-
308.272	11.3		Eicosadienoic acid	45.00, 97.07, 97.11	-0.98	ESI-
222.075		1.021	Ethyl-β-D-glucuronide	75.01, 113.02, 159.06, 203.05, 221.06	0.15	ESI-
152.045		4.624	4-hydroxyphenylacetic acid	107.05, 151.04	1.76	ESI-
232.01		3.896	4-hydroxyphenylacetic acid sulfate	59.42, 79.96, 107.05, 197.08, 230.99	-0.74	ESI-
146.059		3.981	Adipic acid	59.02, 83.05, 101.06, 127.04, 145.05	1.32	ESI-
160.074		4.682	Pimelic acid	67.19, 84.97, 97.07, 115.07, 141.06, 159.06	-0.87	ESI-
117.043		1.012	N-Acetylglycine	50.01, 73.03, 99.01, 116.04	-4.38	ESI-
125.015		0.846	Taurine	79.96, 94.98, 106.98	-3.28	ESI-
205.074		5.691	Indole-3-lactic acid	74.03, 116.05, 158.07, 206.07	1.79	ESI-
126.001		0.86	Ethyl sulfate	78.96, 94.98, 106.98, 124.99	-0.97	ESI-
166.063		5.449	Phenyllactic acid	102.09 .119.10, 147.10, 165.06	1.45	ESI-