

Supplemental Table 1: Fold change in lung metabolites from uninfected CD, LFD, HFD mice and at 4 and 8 days post-infection<sub>1</sub>

Time Point	Comparison	Metabolite Species	Metabolite	Fold Change	p value
Day 0 (naive)	HFD/CD	Amino Acid	p-Cresol Sulfate	4.93	0.010032
		Fatty Acid/Eicosanoid	Butyrylcarnitine	2.09	0.001060
		Fatty Acid/Eicosanoid	L-Acetylcarnitine	1.75	0.000940
		Fatty Acid/Eicosanoid	11Z-Octadecenylcarnitine	2.37	0.001580
		Fatty Acid/Eicosanoid	15(S)-HETE	0.33	0.003817
		Indole	Indoleacrylic acid	1.81	0.004640
		Nucleotide	Guanosine monophosphate	3.81	0.003523
		Phospholipid	Lysophospholipid (8)	1.5	0.000010
		Phospholipid	Phosphatidylcholine	1.15	0.023580
		Steroid/Cholesterol	Cholesteryl ester	1.91	0.000360
		Steroid/Cholesterol	Taurallocholic acid	1.11	0.029120
		Steroid/Cholesterol	Hyochoolic acid	4.93	0.002543
		TCA Cycle	Pantothenic Acid	1.57	0.050193
	HFD/LFD	Amino Acid	L-Tryptophan	0.75	0.024349
		Amino Acid	p-Cresol sulfate	0.54	0.000839
		Amino Acid	Sulfolithocholylglycine	Only in HFD	0.032456
		Amino Acid/Ketone	4-Hydroxy-2-oxoglutaric acid	0.77	0.005082
		Carbohydrate	Threonic acid	0.74	0.000676
		Fatty Acid/Eicosanoid	11Z-Octadecenylcarnitine	1.3	0.032900
		Fatty Acid/Eicosanoid	L-Acetylcarnitine	0.72	0.055300
		Fatty Acid/Eicosanoid	Linoelaidyl carnitine	3.14	0.000000
		Fatty Acid/Eicosanoid	L-Palmitoylcarnitine	1.52	0.013900
		Fatty Acid/Eicosanoid	Monoacylglyceride	1.3	0.031200
		Fatty Acid/Eicosanoid	Monoacylglyceride	0.51	0.045700
		Indole	Indoleacrylic acid	0.73	0.047200
		Nucleotide	8-Oxo-dGTP	2.47	0.015625
		Nucleotide	Cytidine 2'-phosphate	0.81	0.021372
		Nucleotide	Uridine triphosphate	2.27	0.025340
		Phospholipid	Lysophospholipid (7)	1.98	0.000100
		Phospholipid	Lysophospholipid (2)	0.69	0.003800
		Phospholipid	Phosphatidylcholine (3)	1.73	0.000300
		Phospholipid	Phosphatidylcholine (2)	0.83	0.004700
		Steroid/Cholesterol	12-Ketodeoxycholic acid	0.79	0.051700
		Steroid/Cholesterol	Taurallocholic acid	88.99	0.025386
		TCA Cycle	D-Malic acid	0.8	0.054900
	LFD/CD	Amino Acid	p-Cresol sulfate	9.21	0.007654
		Fatty Acid/Eicosanoid	Linoelaidyl carnitine	1.4	0.000946
		Fatty Acid/Eicosanoid	15(S)-HETE	0.18	0.000142
		Nucleotide	Guanosine monophosphate	4.02	0.012926
		Phospholipid	Lysophosphatidylethanolamine	1.23	0.017168

		Steroid/Cholesterol	Taurallocholic acid	Only in CD	0.046767	
Day 4	HFD/CD	Amino Acid	Glutaminy-Proline	6.01	0.000111	
		Amino Acid	p-Cresol sulfate	53.66	0.000057	
		Fatty Acid/Eicosanoid	3-Hydroxy-9Z-octadecenoylcarnitine	2.7	0.003400	
		Fatty Acid/Eicosanoid	Monoacylglyceride	1.97	0.019480	
		Fatty Acid/Eicosanoid	4-Hydroxyisovaleric acid	2.47	0.000093	
		Fatty Acid/Eicosanoid	Arachidonic acid	2.03	0.002542	
		Nucleotide	Adenine	1.25	0.007230	
		Nucleotide	Deoxyguanosine	1.28	0.004000	
		Nucleotide	8-Hydroxy-deoxyguanosine	1.67	0.003830	
		Nucleotide	Guanosine monophosphate	3.69	0.004201	
		Phospholipid	Lysophospholipid	1.32	0.018120	
		Phospholipid	Lysophospholipid (5)	0.28	0.000022	
		Phospholipid	Phosphatidylcholine (9)	2.44	0.000000	
		Phospholipid	Phosphatidylethanolamine (2)	0.64	0.000079	
		Steroid/Cholesterol	Tetrahydrocortisol	9.18	0.044979	
		TCA Cycle	D-Malic acid	1.4	0.031450	
		TCA Cycle	Pantothenic acid	2.2	0.000856	
			HFD/LFD	Nucleotide	Adenosine 2'-phosphate	1.68
		Phospholipid		Lysophospholipid (2)	1.75	0.004100
		Phospholipid		Lysophospholipid (2)	0.71	0.013900
		Phospholipid		Phosphatidylcholine (2)	1.41	0.001000
		Phospholipid		Phosphatidylcholine (2)	0.77	0.012300
		LFD/CD	Amino Acid	Glutaminy-Proline	6.3	0.001583
			Amino Acid	p-Cresol sulfate	29.95	0.000117
			Carbohydrate	3-Methoxy-4-hydroxyphenylethyleneglycol sulfate	Only in CD	0.000000
			Fatty Acid/Eicosanoid	11-Octadecenylcarnitine	1.85	0.032764
			Fatty Acid/Eicosanoid	3-Hydroxy-9Z-octadecenoylcarnitine	2.28	0.000160
			Fatty Acid/Eicosanoid	9-Hexadecenoylcarnitine	1.89	0.003522
			Fatty Acid/Eicosanoid	4-Hydroxyisovaleric acid	2.36	0.016748
	Fatty Acid/Eicosanoid		Arachidonic acid	1.96	0.027829	
	Indole		Indoleacrylic acid	0.83	0.013153	
	Ketone		3-Hydroxybutyric acid	3.22	0.024728	
	Phospholipid		Lysophosphatidylethanolamine (LysoPE)	0.78	0.003308	
	TCA Cycle		Pantothenic acid	1.78	0.001082	
	TCA Cycle		Pantothenic acid	1.94	0.015313	
Day 8	HFD/CD		Amino Acid	Glutaminy-Proline	8.33	0.000153
		Amino Acid	Leucinic acid	4.1	0.000110	
		Amino Acid	L-Tryptophan	0.66	0.031405	
		Amino Acid	p-Cresol sulfate	10.57	0.051959	
		Carbohydrate	1,4-beta-D-Glucan	0.79	0.053400	

	Carbohydrate	Fructose 1,6-bisphosphate	0.71	0.003255
	Carbohydrate	N-Glycolylneuraminic acid	0.67	0.005680
	Fatty Acid/Eicosanoid	11Z-Octadecenylcarnitine	2.08	0.001300
	Fatty Acid/Eicosanoid	3-Hydroxy-9Z-octadecenoylcarnitine	2.46	0.033900
	Fatty Acid/Eicosanoid	9-Hexadecenoylcarnitine	1.53	0.011300
	Fatty Acid/Eicosanoid	Hydroxybutyrylcarnitine	3.77	0.001100
	Fatty Acid/Eicosanoid	Linoelaidyl carnitine	1.64	0.001400
	Fatty Acid/Eicosanoid	L-Palmitoylcarnitine	1.99	0.004100
	Fatty Acid/Eicosanoid	Monoacylglyceride (6)	2.84	0.001100
	Fatty Acid/Eicosanoid	3-Oxododecanoic acid	8.81	0.004067
	Fatty Acid/Eicosanoid	4-Hydroxyisovaleric acid	2.91	0.000073
	Fatty Acid/Eicosanoid	Arachidonic acid	1.47	0.022347
	Fatty Acid/Eicosanoid	Elaidic carnitine	1.93	0.001976
	Fatty Acid/Eicosanoid	Monoacylglyceride (MG)	2.72	0.000394
	Fatty Acid/Eicosanoid	Oleic acid	1.83	0.001786
	Fatty Acid/Eicosanoid	Palmitic acid	1.78	0.021824
	Ketone	(S)-3-Hydroxybutyric acid	17.51	0.000123
	Ketone	3-Hydroxybutyric acid	8.98	0.000222
	Nucleotide	Inosine	0.89	0.053949
	Nucleotide	Uridine	0.9	0.037515
	Oxidative Stress	Oxidized glutathione	0.82	0.040813
	Phospholipid	Glycerophosphocholine	7.58	0.000400
	Phospholipid	Lysophospholipid (2)	0.48	0.001400
	Phospholipid	Lysophosphatidylethanolamine	1.77	0.003500
	Phospholipid	Phosphatidylcholine (3)	1.85	0.048600
	Phospholipid	Phosphatidylcholine (2)	0.83	0.009900
	TCA Cycle	Pantothenic acid	1.96	0.002300
HFD/LFD	Fatty Acid/Eicosanoid	Diglyceride	0.46	0.004300
	Fatty Acid/Eicosanoid	Linoelaidyl carnitine	2.3	0.000500
	Fatty Acid/Eicosanoid	L-Palmitoylcarnitine	1.55	0.035800
	Fatty Acid/Eicosanoid	Monoacylglyceride	1.86	0.009900
	Fatty Acid/Eicosanoid	Tetradecanoylcarnitine	1.51	0.035300
	Nucleotide	N(6)-(1,2-dicarboxyethyl)AMP	2.18	0.050232
	Phospholipid	Lysophospholipid	1.75	0.009100
	Phospholipid	Lysophospholipid (2)	0.68	0.011600
	Phospholipid	Phosphatidylcholine (2)	1.61	0.007800
	Phospholipid	Phosphatidylcholine	0.86	0.038900
LFD/CD	Amino Acid	Glutaminy-L-Proline	5.45	0.000519
	Amino Acid	p-Cresol sulfate	11.4	0.000083
	Amino Acid	Threonic acid	0.6	0.026154
	Carbohydrate	Lactic acid	0.6	0.035644

Carbohydrate	Fructose 1,6-bisphosphate	0.51	0.014900
Fatty Acid/Eicosanoid	11Z-Octadecenylcarnitine	1.48	0.037698
Fatty Acid/Eicosanoid	Imidazolepropionic acid	0.82	0.030614
Fatty Acid/Eicosanoid	Isobutyryl-L-carnitine	0.54	0.001310
Fatty Acid/Eicosanoid	Pantothenic acid	1.92	0.000229
Fatty Acid/Eicosanoid	4-Hydroxyisovaleric acid	2.84	0.045979
Histidine	N-Acetylhistamine	0.68	0.027555
Ketone	3-Hydroxybutyric acid	7.18	0.000970
Nucleotide	Deoxyguanosine	0.7	0.023211
Nucleotide	Adenine	0.56	0.036907
Nucleotide	Deoxyguanosine	0.58	0.044499
Nucleotide	N(6)-(1,2-dicarboxyethyl)AMP	0.53	0.028694
Nucleotide	Uridine	0.63	0.049945
Nucleotide	Uridine diphosphate glucose	0.47	0.029268
Nucleotide	Xanthine	0.62	0.042087
Oxidative Stress	Oxidized glutathione	0.69	0.005558
Oxidative Stress	Oxidized glutathione	0.55	0.029982
Phospholipid	Glycerophosphocholine	6.6	0.000003
Steroid/Cholesterol	Taurocholic acid	462.51	0.015758
Steroid/Cholesterol	Taurallocholic acid	76.43	0.013412

1. Fold change for significantly altered lung metabolites between CD, LFD and HFD mice during pH1N1 infection.