Table S2. List of metabolites with significant correlations to GABA.

	Stool correlation to GABA					
ID	cor_K(	p_KO	cor_W	p_WT	cor_Al	p
PALMITOYL_SPHINGOM	-0.50	0.00155809	-0.51	0.001598973	-0.49	1.0111E-05
Ribose	-0.32	0.051005396	-0.64	2.2902E-05	-0.43	0.00014638
_3_7_DIMETHYLURATE	-0.20	0.241940144	-0.69	2.92398E-06	-0.38	0.000911039
TOCOPHEROL	-0.60	8.13672E-05	-0.39	0.018166008	-0.37	0.001187516
Xylonate/Arabinonate	-0.23	0.176335167	-0.55	0.00045737	-0.37	0.001242794
LysoPC(16:0)	-0.19	0.257455369	-0.56	0.000341105	-0.35	0.002755485
PALMITOYL_ETHANOLA	-0.57	0.000224141	-0.33	0.050907375	-0.35	0.002772419
lysoPC(15:0)	-0.33	0.048478864	-0.59	0.000167949	-0.35	0.002775349
Quinate	0.55	0.000364213	-0.52	0.001021365	-0.24	0.044278567
Citraconate/glutaconat	0.73	3.57882E-07	0.12	0.48007519	0.44	8.8651E-05
Aspartic acid	0.91	9.87116E-15	0.38	0.021944111	0.46	4.17513E-05
Glucuronate	0.53	0.000651409	-0.13	0.452522737	0.48	1.8251E-05
TRICARBALLYLATE	0.56	0.000345486	0.64	2.96214E-05	0.51	3.43652E-06
Pyruvate	0.74	1.4265E-07	0.37	0.026799814	0.53	1.19945E-06
Cortisone	0.61	5.34306E-05	0.61	6.63062E-05	0.54	9.49036E-07
Anhydroglucitol	0.54	0.000584649	0.35	0.034955461	0.54	6.88641E-07
Pyroglutamate	0.90	1.69233E-14	0.07	0.687904643	0.57	1.33811E-07
Alanine	0.67	6.12014E-06	0.38	0.021832779	0.62	4.16728E-09
UROCANATE	0.86	1.5233E-11	0.81	2.07729E-09	0.63	2.87219E-09
Riboflavin (Vit B2)	0.71	6.77133E-07	0.79	1.22944E-08	0.67	1.16088E-10
N_ACETYLASPARTATE	0.84	6.99991E-11	0.72	6.8959E-07	0.69	1.03989E-11
NICOTINATE (Vit B3)	0.85	2.37911E-11	0.75	1.19832E-07	0.77	1.79187E-15
METHYLPHOSPHATE	0.77	2.68416E-08	0.90	1.29165E-13	0.77	1.04142E-15
Pantothenic acid (Vit B5	0.82	4.17485E-10	0.51	0.001391019	0.79	6.22574E-17
HYPOXANTHINE	0.81	1.48237E-09	0.91	3.51718E-14	0.80	2.97762E-17
N-(2-furoyl)glycine	0.82	3.82701E-10	0.78	2.04749E-08	0.82	3.91565E-19
Acetylserine	0.94	1.15216E-17	0.84	2.01992E-10	0.84	2.13621E-20
Glutamate	0.99	7.64475E-31	0.38	0.020498981	0.92	4.7143E-30

	Intestine correlation to GABA					
ID	cor_K(	p_KO	cor_W	p_WT	cor_A	p
Inosine	-0.51	0.110775107	-0.70	0.015487	-0.52	0.012514396
Acetylserine	-0.79	0.003754983	-0.35	0.298215	-0.52	0.013597555
Dihydroxyisoflavone	-0.70	0.016954125	-0.54	0.088099	-0.50	0.016907575
LysoPC(14:0)	-0.78	0.004834359	-0.34	0.30915	-0.46	0.032679931
Propionic acid	0.84	0.001135893	-0.15	0.661433	0.51	0.015260178
Pyruvate	0.84	0.001339294	0.43	0.181582	0.51	0.014720317
GLYCYLTHREONINE	0.69	0.018449714	0.23	0.490006	0.53	0.011493985
GLYCYLTYROSINE	0.86	0.000658397	-0.29	0.380249	0.53	0.011137946
PALMITOYL_ETHANOLAMID	0.89	0.000272567	0.47	0.144025	0.54	0.009990836
Leucine	0.86	0.000680351	0.19	0.584017	0.56	0.00722476
GLUTAMYLISOLEUCINE	0.72	0.012751837	0.25	0.453521	0.56	0.006895382
Alanylalanine	0.93	4.22004E-05	-0.05	0.875602	0.64	0.001443315
PALMITOYL_SPHINGOMYEL	0.84	0.001167962	0.60	0.051237	0.64	0.001316603
UROCANATE	0.91	0.000113639	0.02	0.959822	0.66	0.000862432
Uric acid	0.92	6.39777E-05	0.13	0.701072	0.69	0.000434712
Aspartic acid	0.88	0.000380683	0.26	0.448004	0.70	0.000328907
Methylmalonic acid	0.91	9.26292E-05	0.48	0.139182	0.70	0.000254393
Fumarate	0.97	1.28791E-06	0.25	0.450299	0.75	6.4466E-05
Pantothenic acid (Vit B5)	0.88	0.000311409	0.29	0.394329	0.75	5.59814E-05
Pyroglutamate	0.91	0.000118175	0.23	0.501505	0.76	3.93157E-05
Malate	0.95	5.64684E-06	0.39	0.241986	0.77	2.43411E-05
Uric acid	0.94	1.54382E-05	0.45	0.16439	0.79	9.98252E-06
Ascorbic acid (Vit C)	0.90	0.000179573	0.65	0.031701	0.81	4.58631E-06
Taurine	0.87	0.000433389	0.71	0.013713	0.83	1.46657E-06
Alanine	0.98	3.3315E-07	0.79	0.004049	0.93	2.12362E-10
Glutamate	0.97	3.94224E-07	0.81	0.002737	0.94	1.23228E-10

	Cecum correlation to GABA					
ID	cor_K(	p_KO	cor_W	p_WT	cor_Al	p
AMINOBENZOATE	-0.33	0.322486952	-0.74	0.009007123	-0.58	0.004258373
Proline	0.15	0.662897136	-0.69	0.019476161	-0.56	0.00627229
Gulonate	0.26	0.431988541	-0.73	0.010259051	-0.55	0.007524596
Adenosine/DEOXYGUAI	-0.42	0.196620039	-0.53	0.089932569	-0.55	0.008162606
N_ACETYLTRYPTOPHAN	-0.09	0.80174252	-0.75	0.007277869	-0.55	0.008377887
PALMITOYL_SPHINGOM	-0.38	0.25465977	-0.72	0.011831335	-0.49	0.021733692
THREONYLVALINE	0.35	0.294957402	-0.48	0.132086867	-0.48	0.023407036
ISOLEUCYLVALINE	0.15	0.661927285	-0.22	0.512104953	-0.48	0.025073421
Xylonate/Arabinonate	0.25	0.461998967	-0.63	0.036080637	-0.47	0.028049693
Uridine	0.27	0.420119789	-0.66	0.02561042	-0.43	0.047810447
2-Oxindole-3-acetic aci	-0.08	0.807360803	0.87	0.000568613	0.51	0.015353538
Imidazole propionate	0.07	0.828971838	0.62	0.043895748	0.52	0.012874968
DODECANEDIOATE	-0.08	0.807910028	0.88	0.000414608	0.53	0.011053783
Azelaic acid	0.21	0.530150113	0.79	0.004180648	0.54	0.009132664
Pantothenic acid (Vit B5	0.42	0.194759696	0.88	0.000354216	0.55	0.008658822
Undecanedionic acid	0.30	0.364558313	0.57	0.065383743	0.56	0.006336014
Threonic acid	0.10	0.777123241	0.86	0.000621165	0.59	0.004001792
Fumarate	0.44	0.179585424	0.42	0.194739889	0.60	0.002973178
ASPARTYLPHENYLALAN	0.40	0.217833724	0.34	0.299865472	0.61	0.002476275
_3_HYDROXYPYRIDINE	0.15	0.650696579	0.86	0.000670881	0.61	0.00235648
Hypoxanthine	-0.01	0.977120724	0.91	0.000116635	0.62	0.002095407
spermidine	0.08	0.825640901	0.85	0.000988684	0.62	0.002060244
Malate	0.37	0.264150284	0.53	0.092717423	0.62	0.001905219
N-(2-furoyl)glycine	0.24	0.472037718	0.93	4.4238E-05	0.63	0.001614961
Aspartic acid	0.66	0.027714081	0.34	0.310045203	0.64	0.001335929
Inosine	0.31	0.349581022	0.69	0.01838728	0.64	0.001213247
Xanthine	0.10	0.767577734	0.88	0.000379906	0.65	0.001128249
N_ACETYLGLUTAMATE	0.51	0.105923475	0.87	0.000530424	0.65	0.001011155
N_ACETYLASPARTATE	0.50	0.118601615	0.94	2.06931E-05	0.67	0.000611297
Sebacic acid	0.40	0.225814711	0.81	0.002266192	0.70	0.000280803
PHENYLALANYLSERINE	0.78	0.004709661	0.90	0.000144377	0.72	0.000155018
Glutamate	0.76	0.007082165	0.86	0.00067064	0.82	3.06309E-06

Yellow: carbonhydrate
light blue: bacteria compound
light purple: vitamins
light pink: GABA pathway

Table S3. List of metabolites with significant correlations to riboflavin.

	Stool Corr to riboflavin					
ID	cor_KO	p_KO	cor_W	p_WT	cor_All	p
_3_7_DIMETHYLURATE	-0.21	0.217526986	-0.67	8.19228E-06	-0.57	1.53231E-07
Quinate	0.47	0.003074945	-0.62	6.47673E-05	-0.51	4.62844E-06
Citraconate/glutaconate	-0.26	0.117721446	-0.53	0.000944817	-0.50	6.53904E-06
Xylonate/Arabinonate	-0.17	0.316772975	-0.51	0.001546912	-0.50	7.85385E-06
LysoPC(16:0)	-0.11	0.511862309	-0.50	0.0019176	-0.50	8.18217E-06
Ribose	-0.15	0.387375719	-0.71	1.17049E-06	-0.48	1.64528E-05
LysoPC(18:2)	-0.19	0.2669847	-0.46	0.005016252	-0.48	2.06741E-05
LysoPC(15:0)	-0.02	0.909372928	-0.44	0.007022336	-0.45	5.58955E-05
myo-Inositol/glucose	0.01	0.945370944	-0.55	0.000525043	-0.41	0.000353855
PALMITOYL_SPHINGOMYE	-0.34	0.036747273	-0.33	0.047031109	-0.40	0.000424403
2-Oxindole-3-acetic acid	-0.08	0.621302162	-0.36	0.030007454	-0.39	0.000577545
ACETOACETATE	0.10	0.557134874	-0.26	0.120286407	-0.31	0.008275016
Citric Acid	0.08	0.637699413	-0.09	0.607761649	-0.25	0.035090912
Phenyllactic acid	-0.27	0.10153637	0.78	2.60925E-08	0.42	0.000182335
Tyrosine	0.64	1.86307E-05	0.74	2.83538E-07	0.43	0.000163466
Imidazole propionate	0.14	0.423712757	0.69	2.60889E-06	0.43	0.000159083
Alanine	0.39	0.017811585	0.37	0.024696286	0.43	0.000146965
SAMe	0.09	0.609976085	0.49	0.00214994	0.44	0.000119052
Glutamate	0.73	2.92863E-07	0.00	0.984277784	0.46	4.35073E-05
Iso/Leucine	0.37	0.02614632	0.64	2.56545E-05	0.47	3.11761E-05
OROTATE	0.54	0.000606186	0.45	0.005760394	0.47	2.55571E-05
Methionine	0.64	1.8016E-05	0.77	5.25652E-08	0.51	3.51167E-06
Cortisone	0.31	0.063716781	0.56	0.000362913	0.52	2.94604E-06
N-(2-furoyl)glycine	0.59	0.000119529	0.66	1.32124E-05	0.58	8.35875E-08
Acetylserine	0.77	3.09253E-08	0.66	1.29409E-05	0.64	1.3684E-09
N_ACETYLASPARTATE	0.64	1.85309E-05	0.76	7.80454E-08	0.64	1.16006E-09
Pantothenic acid (Vit B5)	0.84	7.46614E-11	0.62	5.72574E-05	0.64	7.34141E-10
GABA	0.71	6.77133E-07	0.79	1.22944E-08	0.67	1.16088E-10
METHYLPHOSPHATE	0.56	0.000350099	0.83	4.48252E-10	0.72	4.38821E-13
UROCANATE	0.76	5.58248E-08	0.83	4.89913E-10	0.73	1.99701E-13
NICOTINATE (Vit B3)	0.77	2.01752E-08	0.74	2.19924E-07	0.77	2.78635E-15
HYPOXANTHINE	0.88	1.2401E-12	0.85	4.65769E-11	0.86	8.75609E-23

	Cecum corr to riboflavin					
ID	cor_KO	p_KO	cor_W	p_WT	cor_All	p
LysoPE(18:0)	-0.60	0.051152573	-0.84	0.001230558	-0.73	0.000127285
PALMITOYL_SPHINGOMYE	-0.62	0.040224211	-0.79	0.00347281	-0.70	0.000249737
N_ACETYLTRYPTOPHAN	-0.48	0.135302997	-0.75	0.007329334	-0.64	0.001406446
Ribose	-0.33	0.316913356	-0.69	0.017655195	-0.58	0.004899231
Xylonate/Arabinonate	-0.36	0.273207122	-0.70	0.015449827	-0.57	0.00522855
palmitoyl-2-oleyl-glycero-	-0.54	0.087314577	-0.63	0.037634852	-0.56	0.006403676
AMINOBENZOATE	0.07	0.835647134	-0.75	0.007499957	-0.56	0.006746355
Gulonic acid	-0.23	0.49555589	-0.74	0.009701017	-0.56	0.006985888
Imidazole propionate	-0.30	0.365477306	-0.57	0.06859792	-0.49	0.019635676
THYMINE	-0.49	0.122876633	-0.47	0.140939881	-0.49	0.020997187
LysoPC(20:0)	-0.70	0.01600261	-0.54	0.089521264	-0.49	0.021873878
2-Oxindole-3-acetic acid	-0.02	0.960204037	0.94	1.43585E-05	0.47	0.025735249
Sebacic acid	0.27	0.430128163	0.93	4.41734E-05	0.50	0.018486768
_3_HYDROXYPYRIDINE	-0.21	0.538698633	0.91	0.00010868	0.51	0.014337239
VAL_VAL_VAL	0.05	0.880189717	0.86	0.000791429	0.52	0.013657544
ENTEROLACTONE	0.41	0.208091113	0.67	0.023211861	0.52	0.012756634
N_ACETYLGLUTAMATE	0.22	0.513336133	0.80	0.003431636	0.56	0.006609848
Hypoxanthine	-0.09	0.796657419	0.91	9.96397E-05	0.57	0.00544035
Glutamate	0.25	0.45422354	0.92	7.38974E-05	0.59	0.004229433
DODECANEDIOATE	0.31	0.354853012	0.93	2.52201E-05	0.59	0.003599948
TETRADECANEDIOATE	0.11	0.754128409	0.92	6.96265E-05	0.61	0.002782525
HEPTAETHYLENE_GLYCOL	0.36	0.281252816	0.90	0.000175468	0.61	0.002768459
PHENYLALANYLSERINE	0.17	0.62347292	0.89	0.000220978	0.64	0.001227295
Azelaic acid	0.32	0.330983135	0.82	0.00202672	0.65	0.000940995
Citrulline	0.12	0.721473542	0.90	0.000134346	0.67	0.000624102
UROCANATE	0.20	0.558924908	0.90	0.000162647	0.68	0.000496756
Threonic acid	0.49	0.122107552	0.91	8.06433E-05	0.69	0.000409615
Linoleic acid	0.13	0.696668923	0.94	1.73427E-05	0.69	0.000409031
HEXADECANEDIOATE	0.46	0.157734473	0.94	1.52775E-05	0.69	0.000337196
Pantothenic acid (Vit B5)	0.38	0.253736798	0.89	0.000231143	0.74	7.40232E-05
N-(2-furoyl)glycine	0.63	0.036796107	0.90	0.000132829	0.79	1.4449E-05

	Intestine corr to riboflavin					
ID	cor_KO	p_KO	cor_W	p_WT	cor_All	p
Citrulline	-0.17	0.6252051	0.56	0.07537806	0.44	0.0399913
HOMOSERINE	0.09	0.7917369	0.51	0.11278773	0.45	0.0346374
Homoveratric acid sulfat	0.65	0.0321092	0.50	0.12158532	0.46	0.0295133
THREONYLSERINE	-0.18	0.5937231	0.67	0.02272687	0.47	0.0276291
3-Hydroxypropanoate	0.23	0.4889448	0.56	0.07357648	0.47	0.0263
Epiandrosterone sulfate	0.80	0.0032658	0.46	0.1568108	0.48	0.0230438
Glutamylglutamate	-0.21	0.5317396	0.58	0.06149194	0.49	0.0198267
Citric acid	-0.08	0.821077	0.59	0.05417848	0.52	0.0122028
PYRIDOXAL (vit B6)	-0.46	0.1541611	0.60	0.05202905	0.53	0.0109281
Caffeic acid	0.05	0.8737849	0.60	0.05296629	0.53	0.0103226
Azelaic acid	-0.14	0.6813503	0.59	0.05684104	0.54	0.0095171
Threonic acid	0.15	0.6689911	0.86	0.0006135	0.58	0.0043148
Acetylcarnitine	0.31	0.3567639	0.90	0.00014044	0.61	0.0028258
STEAROYL_ETHANOLAM	-0.30	0.3755387	0.70	0.01600659	0.62	0.0020297
STEARAMIDE 1	0.20	0.5579765	0.69	0.01836856	0.64	0.0014466
Methylmalonic acid	0.60	0.0525493	0.74	0.00861337	0.66	0.0008911
SPHINGANINE	0.15	0.6577894	0.73	0.01129357	0.67	0.000696
Phenyllactic acid	0.64	0.0328415	0.75	0.00748504	0.69	0.0003668
GLYCYLTHREONINE	0.73	0.010295	0.85	0.00099082	0.70	0.0002613
Proline	0.25	0.4618661	0.82	0.00187639	0.71	0.0002072
NICOTINATE (Vit B3)	-0.55	0.0777802	0.83	0.00173697	0.73	0.0001209
Xanthine	0.49	0.1232136	0.97	6.75E-07	0.73	0.000118

Yellow: carbonhydrate
light blue: bacteria compound
light purple: vitamins
Light green: Oxidative stress compounds