Supplementary data

Table S1 – Significantly altered genes between all tested conditions

Figure S1 - Menaquinol pathway. This figure illustrates the Menoquinol pathway as proposed by KEGG. Colored genes are present in *A. muciniphila* Muc^T.

Figure S2 – Simplified schematic representation of the metabolic pathways propionate and acetate (NAD^+ pool) of *A. muciniphila*. Pyruvate to propionate results in netto 2 oxidized NADH to 2 NAD^+, while pyruvate to acetate production results in netto 1 reduced NAD^+.

Figure S3. Heme depended oxygen reduction. The oxygen was completely reduced when heme was present (aerobic fermentor + heme) and accumulated when no heme was present (aerobic fermentor – heme). The anaerobic fermentor was included to determine the influence of heme. The negative control fermentors without bacteria and with and without heme showed no difference in dissolved oxygen concentration.

T1vsT2_no_O2

Gene code	Annotation	2logFC	2logCPM	PValue
Amuc_0037	amino acid permease	1,03	9,57	2,85E-02
Amuc_0038	glutaminase	1,18	8,97	1,68E-02
Amuc_0089	hypothetical protein	1,44	7,19	3,89E-03
Amuc_0101	hypothetical protein	-1,29	14,74	4,25E-02
Amuc_0239	hypothetical protein	-1,12	5,05	3,67E-02
Amuc_0242	pseudouridine synthase	-0,78	10,15	2,28E-02
Amuc_0259	hypothetical protein	-1,05	6,67	3,38E-02
Amuc_0266	50S ribosomal protein L32	-0,86	8,06	4,85E-02
Amuc_0330	hypothetical protein	-1,13	9,17	9,20E-03
Amuc_0410	hypothetical protein	1,03	4,21	4,38E-02
Amuc_0468	DeoR family transcriptional regulator	-0,84	8,62	2,29E-02
Amuc_0469	N-acetyltransferase GCN5	-1,04	9,10	1,92E-02
Amuc_0504	hypothetical protein	0,75	6,62	4,67E-02
Amuc_0566	hypothetical protein	-1,66	2,63	1,57E-02
Amuc_0580	entericidin EcnAB	-1,31	8,16	3,10E-02
Amuc_0606	hypothetical protein	-1,43	7,69	1,30E-02
Amuc_0691	thioredoxin	-0,84	10,35	4,79E-02
Amuc_0748	riboflavin biosynthesis protein RibF	-0,74	7,49	4,26E-02
Amuc_0753	glycosyl transferase family protein	0,80	7,34	4,68E-02
Amuc_0819	multi antimicrobial extrusion protein MatE	-1,22	7,51	3,30E-02
Amuc_0976	hypothetical protein	-0,85	7,69	8,90E-03
Amuc_1022	G-D-S-L family lipolytic protein	0,74	7,77	3,02E-02
Amuc_1087	hypothetical protein	-2,70	6,04	3,46E-02
Amuc_1137	hypothetical protein	-0,93	7,06	4,75E-02
Amuc_1363	hypothetical protein	-1,00	8,97	2,59E-02
Amuc_1364	hypothetical protein	-1,10	9,28	1,33E-02
Amuc_1386	dihydropteroate synthase	-1,00	6,83	1,24E-02
Amuc_1409	hypothetical protein	-1,54	12,23	1,21E-02
Amuc_1430	50S ribosomal protein L31	-0,97	9,98	1,02E-02
Amuc_1508	hypothetical protein	1,98	0,56	1,09E-02
Amuc_1529	hypothetical protein	-1,09	9,42	5,54E-03
Amuc_1531	anthranilate synthase	0,97	9,01	7,01E-03
Amuc_1540	50S ribosomal protein L36	-1,09	10,25	1,07E-02
Amuc_1567	methylated-DNA--protein-cysteine methyltransferase	-0,84	6,78	1,10E-02
Amuc_1593	hypothetical protein	0,75	6,06	4,54E-02
Amuc_1679	Xylose isomerase domain-containing protein TIM barrel	0,78	6,21	4,79E-02
Amuc_1717	hypothetical protein	-0,94	11,51	2,78E-02
Amuc_1790	PDZ/DHR/GLGF domain-containing protein	0,75	6,54	3,16E-02
Amuc_1896	histone family protein DNA-binding protein	-1,31	11,34	9,73E-03
Amuc_1899	flavodoxin/nitric oxide synthase	-1,24	8,82	9,58E-03
Amuc_1936	hypothetical protein	-1,30	9,84	2,44E-03
Amuc_2072	rubrerythrin	-1,09	9,02	2,72E-03

T1vsT2_O2

Gene code	Annotation	2logFC	2logCPM	PValue
Amuc_0016	hypothetical protein	1,02	12,90	4,84E-02
Amuc_0037	amino acid permease	2,16	9,57	6,76E-06
Amuc_0038	glutaminase	-1,34	8,97	1,73E-04
Amuc_0089	hypothetical protein	2,65	7,19	9,65E-08
Amuc_0130	hypothetical protein	1,33	4,14	4,30E-02
Amuc_0131	hypothetical protein	1,70	3,97	2,71E-03
Amuc_0204	sodium ion-translocating decarboxylase subunit beta	0,66	9,01	4,58E-02
Amuc_0213	glutamyl-tRNA(Gln) amidotransferase subunit B	-0,79	10,09	3,76E-02
Amuc_0220	hydrophobe/amphiphile efflux-1 (HAE1) family transporter	-2,10	9,32	8,69E-04
Amuc_0236	Ion transport 2 domain-containing protein	0,95	7,04	5,38E-03
Amuc_0237	arsenate reductase-like protein	0,65	8,11	3,47E-02
Amuc_0267	hypothetical protein	-0,73	10,97	4,23E-02
Amuc_0270	shikimate kinase	-1,00	8,85	1,11E-02
Amuc_0271	30S ribosomal protein S16	-1,14	9,45	1,68E-02
Amuc_0275	preprotein translocase subunit YajC	-0,86	10,48	2,10E-02
Amuc_0327	hypothetical protein	-1,57	9,96	2,79E-02
Amuc_0328	hypothetical protein	-1,19	11,38	4,94E-02
Amuc_0330	hypothetical protein	-1,72	9,17	7,01E-04
Amuc_0372	glutamate decarboxylase	1,22	11,79	7,61E-03
Amuc_0384	Maltose O-acetyltransferase	0,62	7,40	4,86E-02
Amuc_0469	N-acetyltransferase GCN5	-1,04	9,10	1,92E-02
Amuc_0485	50S ribosomal protein L27	-0,94	9,05	3,41E-02
Amuc_0583	hypothetical protein	-1,29	6,30	2,56E-02
Amuc_0606	hypothetical protein	-1,46	7,69	1,11E-02
Amuc_0632	family 2 glycosyl transferase	-0,68	7,73	3,73E-02
Amuc_0677	hypothetical protein	0,66	7,05	3,80E-02
Amuc_0687	outer membrane autotransporter barrel domain-containing protein	-1,15	11,64	1,16E-04
Amuc_0717	amino acid permease	0,86	8,64	1,70E-02
Amuc_0748	riboflavin biosynthesis protein RibF	-0,76	7,49	3,77E-02
Amuc_0767	hypothetical protein	1,09	7,65	2,60E-03
Amuc_0772	phosphoglycerate mutase	1,15	8,95	1,74E-03
Amuc_0773	acyltransferase 3	0,69	7,14	3,59E-02
Amuc_0777	short-chain dehydrogenase/reductase SDR	2,51	6,92	3,49E-05
Amuc_0778	hypothetical protein	0,83	6,04	4,84E-02
Amuc_0803	coagulation factor 5/8 type domain-containing protein	0,87	9,38	1,62E-02
Amuc_0818	adenosylhomocysteinase	-0,83	7,14	3,20E-02
Amuc_0819	multi antimicrobial extrusion protein MatE	-1,28	7,51	2,48E-02
Amuc_0868	beta-N-acetylhexosaminidase	0,74	7,29	3,14E-02
Amuc_0882	hypothetical protein	1,34	12,90	4,17E-03
Amuc_0883	hypothetical protein	1,38	9,10	1,47E-03
Amuc_0907	hypothetical protein	-1,26	9,19	3,09E-02
Amuc_0925	KOW domain-containing protein	-0,93	10,99	4,35E-02
Amuc_0947	biotin/lipoyl attachment domain-containing protein	0,70	7,78	3,24E-02
Amuc_0998	hypothetical protein	1,28	7,62	9,53E-03
Amuc_1090	FeoA family protein	-0,88	9,43	4,82E-02
Amuc_1107	ATP phosphoribosyltransferase	-0,98	11,20	3,17E-02
Amuc_1141	glycosyl transferase family protein	1,76	6,93	1,46E-02
Amuc_1176	hypothetical protein	-0,76	8,59	8,01E-05
Amuc_1177	lipocalin family protein	1,39	6,25	9,40E-04
Amuc_1196	hypothetical protein	-0,90	7,77	1,67E-02
Amuc_1213	hypothetical protein	-1,53	10,91	5,35E-04
Amuc_1229	hypothetical protein	-0,80	11,64	4,14E-02
Amuc_1293	hypothetical protein	-1,79	6,81	6,33E-05
Amuc_1294	sulfite reductase	-1,45	11,21	3,11E-03
Amuc_1295	binding-protein-dependent transporters inner membrane component	-2,08	10,99	4,19E-06
Amuc_1296	ABC transporter	-1,88	9,96	5,47E-05
Amuc_1297	substrate-binding protein of aliphatic sulfonate ABC transporter	-2,01	10,18	2,19E-06
Amuc_1298	sulfate adenylyltransferase, large subunit	-1,72	10,77	4,30E-05
Amuc_1299	sulfate adenylyltransferase subunit 2	-1,25	10,39	6,08E-03
Amuc_1300	adenylylsulfate reductase	-0,85	10,96	3,33E-02
Amuc_1342	hypothetical protein	1,08	10,14	4,64E-02
Amuc_1363	hypothetical protein	-0,99	8,97	2,83E-02
Amuc_1364	hypothetical protein	-1,16	9,28	9,50E-03
Amuc_1365	hypothetical protein	-1,52	9,52	6,28E-03
Amuc_1368	hypothetical protein	-1,22	8,45	9,89E-03
Amuc_1381	ABC transporter	0,86	6,46	1,83E-02
Amuc_1394	hypothetical protein	1,20	7,82	4,38E-03
Amuc_1409	hypothetical protein	-1,20	12,23	4,84E-02
Amuc_1451	hypothetical protein	-0,97	8,25	6,97E-03
Amuc_1497	hypothetical protein	1,04	8,19	3,51E-02
Amuc_1529	hypothetical protein	-1,10	9,42	5,08E-03
Amuc_1540	50S ribosomal protein L36	-0,86	10,25	4,27E-02
Amuc_1594	NCAIR mutase-like protein	0,77	6,24	4,66E-02
Amuc_1602	hypothetical protein	0,93	8,25	2,62E-02
Amuc_1613	NADH dehydrogenase (ubiquinone) 24 kDa subunit	-0,81	9,83	3,93E-02
Amuc_1674	hypothetical protein	1,16	4,70	4,30E-02
Amuc_1676	Eco57I restriction endonuclease	-1,11	7,50	2,81E-02
Amuc_1684	TonB-dependent receptor	0,72	7,88	4,36E-02
Amuc_1692	2-oxoglutarate dehydrogenase, E2 subunit, dihydrolipoamide succinyltransferase	1,02	7,77	1,53E-02
Amuc_1693	2-oxoglutarate dehydrogenase, E1 subunit	0,99	9,86	1,70E-02
Amuc_1717	hypothetical protein	-1,30	11,51	2,65E-03
Amuc_1743	hypothetical protein	0,98	7,43	8,84E-03
Amuc_1770	AsnC family transcriptional regulator	-0,83	9,13	2,02E-02
Amuc_1812	alpha-amylase	1,89	10,22	5,33E-05
Amuc_1838	hypothetical protein	-1,04	7,93	4,40E-03
Amuc_1839	heavy metal translocating P-type ATPase	3,19	7,44	1,31E-05
Amuc_1870	Alpha-glucosidase	-0,77	9,54	2,61E-02
Amuc_1896	histone family protein DNA-binding protein	-1,39	11,34	6,39E-03
Amuc_1904	hypothetical protein	1,42	5,93	4,38E-03
Amuc_1914	restriction modification system DNA specificity domain	-0,87	9,25	4,02E-02
Amuc_1990	pyrroline-5-carboxylate reductase	0,76	5,90	4,00E-02
Amuc_2015	thiamine-phosphate pyrophosphorylase	-1,91	9,49	8,48E-04
Amuc_2016	Hydroxyethylthiazole kinase	-0,94	9,55	2,54E-02
Amuc_2035	hypothetical protein	1,31	5,04	3,25E-02
Amuc_2038	PUR-alpha/beta/gamma DNA/RNA-binding protein	-0,90	10,64	2,56E-02
Amuc_2051	glutamate dehydrogenase	-0,98	10,01	2,27E-02
Amuc_2053	hypothetical protein	-1,04	8,02	1,03E-02
Amuc_2055	hypothetical protein	1,18	9,20	6,54E-03
Amuc_2058	hypothetical protein	1,13	6,15	1,59E-02
Amuc_2060	hypothetical protein	0,95	6,42	2,67E-02
Amuc_2061	hypothetical protein	1,28	4,07	2,91E-02
Amuc_2070	hydroperoxidase II	-0,95	10,78	8,61E-05
Amuc_2078	capsular polysaccharide biosynthesis protein	0,87	9,28	2,26E-02
Amuc_2079	PHP domain-containing protein	1,15	6,07	3,06E-02
Amuc_2080	sugar transferase	1,37	7,19	1,63E-03
Amuc_2081	family 2 glycosyl transferase	1,05	6,65	7,28E-03
Amuc_2082	group 1 glycosyl transferase	0,94	7,07	1,31E-02
Amuc_2084	group 1 glycosyl transferase	1,16	6,54	1,15E-02
Amuc_2085	hypothetical protein	1,55	5,56	2,67E-03
Amuc_2088	group 1 glycosyl transferase	1,21	4,75	4,48E-02
Amuc_2093	family 2 glycosyl transferase	1,15	4,42	2,35E-02
Amuc_2094	family 2 glycosyl transferase	0,88	4,65	4,71E-02
Amuc_2129	nickel-dependent hydrogenase large subunit	0,97	9,03	1,10E-02
Amuc_2130	cytochrome B561	0,96	8,73	1,00E-02
Amuc_2131	hydrogenase maturation protease	1,31	6,72	5,55E-03
Amuc_2132	hydrogenase nickel incorporation protein HypA	1,02	5,39	1,77E-02
Amuc_2141	hypothetical protein	-0,92	9,89	2,68E-02
Amuc_2176	excinuclease ABC subunit A	0,90	8,75	5,75E-03

T2_O2vsT2_no_O2

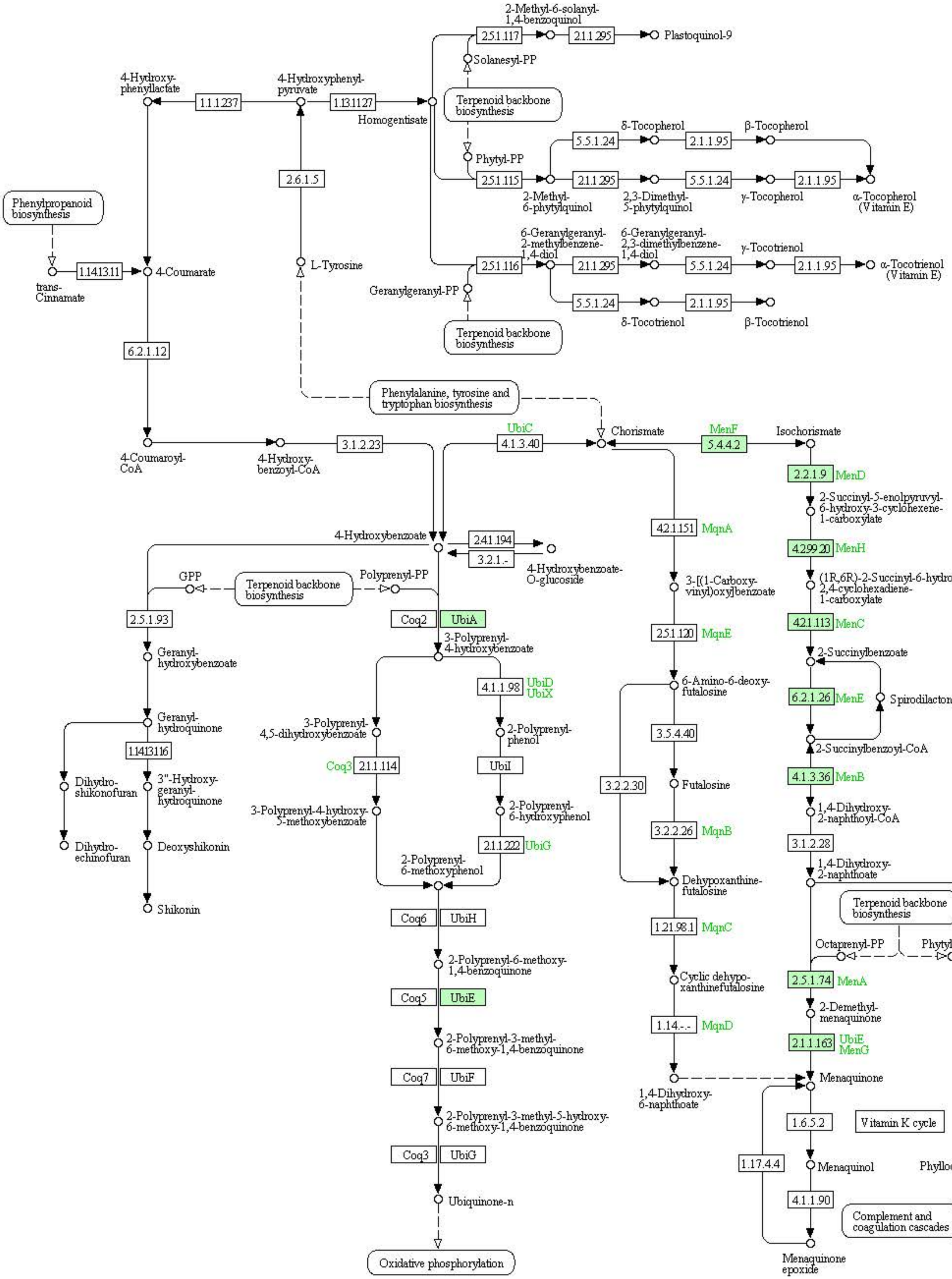
Gene code	Annotation	2logFC	2logCPM	PValue
Amuc_0037	amino acid permease	1,13	9,57	2,88E-02
Amuc_0089	hypothetical protein	1,21	7,19	1,58E-02
Amuc_0236	Ion transport 2 domain-containing protein	0,88	7,04	1,73E-02
Amuc_0342	OsmC family protein	0,81	6,76	3,25E-02
Amuc_0580	entericidin EcnAB	1,93	8,16	2,65E-03
Amuc_0687	outer membrane autotransporter barrel domain-containing protein	1,31	11,64	3,28E-02
Amuc_0719	hypothetical protein	-1,14	9,81	1,08E-02
Amuc_0777	short-chain dehydrogenase/reductase SDR	1,41	6,92	2,53E-02
Amuc_0844	Phosphopyruvate hydratase	1,40	8,27	3,18E-02
Amuc_0882	hypothetical protein	1,00	12,90	4,94E-02
Amuc_0883	hypothetical protein	1,56	9,10	1,10E-03
Amuc_0998	hypothetical protein	1,37	7,62	1,17E-02
Amuc_0999	sigma 54 modulation protein/ribosomal protein S30EA	1,08	10,76	1,02E-02
Amuc_1016	hypothetical protein	-0,82	6,43	4,36E-02
Amuc_1176	hypothetical protein	0,88	8,59	3,43E-02
Amuc_1177	lipocalin family protein	0,96	6,25	2,85E-02
Amuc_1255	hypothetical protein	-0,72	7,52	3,83E-02
Amuc_1293	hypothetical protein	-1,26	6,81	5,75E-03
Amuc_1295	binding-protein-dependent transporters inner membrane component	-1,72	10,99	1,90E-04
Amuc_1296	ABC transporter	-1,66	9,96	5,41E-04
Amuc_1297	substrate-binding protein of aliphatic sulfonate ABC transporter	-1,56	10,18	3,19E-04
Amuc_1298	sulfate adenylyltransferase, large subunit	-1,23	10,77	4,39E-03
Amuc_1394	hypothetical protein	1,41	7,82	2,28E-03
Amuc_1570	hypothetical protein	-0,76	7,92	2,11E-02
Amuc_1592	Superoxide dismutase	0,92	9,77	4,91E-02
Amuc_1655	sulfatase	0,73	8,98	2,62E-02
Amuc_1812	alpha-amylase	1,02	10,22	4,37E-02
Amuc_1839	heavy metal translocating P-type ATPase	3,51	7,44	2,46E-05
Amuc_1904	hypothetical protein	1,12	5,93	3,56E-02
Amuc_1936	hypothetical protein	1,24	9,84	5,74E-03
Amuc_2015	thiamine-phosphate pyrophosphorylase	-0,75	9,49	4,47E-02
Amuc_2055	hypothetical protein	1,22	9,20	1,04E-02
Amuc_2069	hypothetical protein	-2,11	3,59	3,80E-02
Amuc_2070	hydroperoxidase II	1,16	10,78	3,71E-02
Amuc_2072	rubrerythrin	0,98	9,02	9,80E-03
Amuc_2081	family 2 glycosyl transferase	0,86	6,65	4,01E-02
Amuc_2111	ErfK/YbiS/YcfS/YnhG family protein	-0,80	8,57	3,29E-02
Amuc_2176	excinuclease ABC subunit A	1,14	8,75	1,29E-03

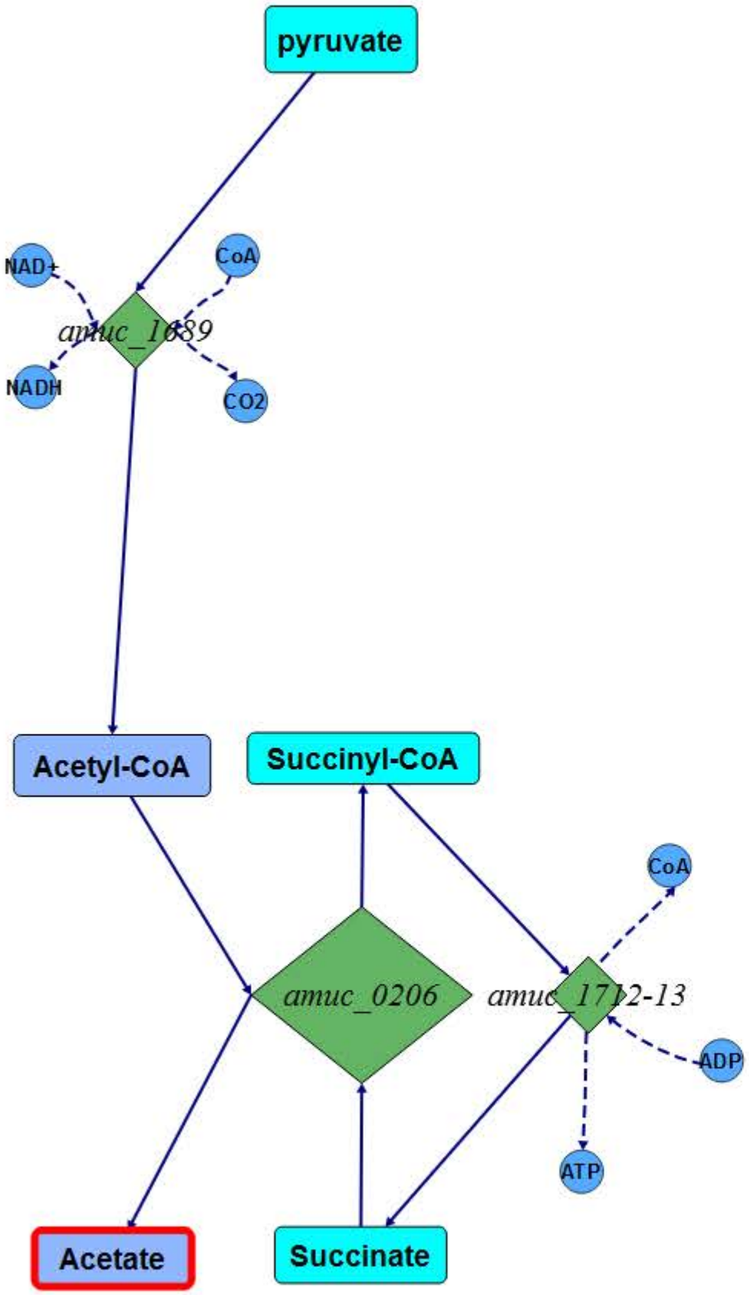
T3_O2vsT3_no_O2

Gene code	Annotation	2logFC	2logCPM	PValue
Amuc_0038	glutaminase	1,32	8,97	3,47E-02
Amuc_0059	ATPase AAA	1,04	11,25	1,68E-02
Amuc_0175	PDZ/DHR/GLGF domain-containing protein	1,30	8,86	3,57E-03
Amuc_0213	glutamyl-tRNA(Gln) amidotransferase subunit B	-1,18	10,09	6,68E-03
Amuc_0250	hypothetical protein	-1,71	8,08	2,23E-02
Amuc_0252	hypothetical protein	-1,02	7,89	1,67E-02
Amuc_0270	shikimate kinase	-0,95	8,85	3,27E-02
Amuc_0291	valyl-tRNA synthetase	-0,89	9,57	2,10E-02
Amuc_0337	prephenate dehydrogenase	0,82	6,99	3,14E-02
Amuc_0360	hypothetical protein	1,12	8,92	2,42E-02
Amuc_0422	3,4-dihydroxy-2-butanone 4-phosphate synthase	-1,00	9,48	2,25E-02
Amuc_0423	6,7-dimethyl-8-ribityllumazine synthase	-1,29	6,90	6,87E-03
Amuc_0424	NusB antitermination factor	-0,94	7,59	4,26E-02
Amuc_0425	signal recognition particle-docking protein FtsY	-1,14	7,15	1,21E-02
Amuc_0426	radical SAM enzyme, Cfr family	-0,93	9,11	1,46E-02
Amuc_0436	HAD-superfamily hydrolase	-0,90	8,49	3,38E-02
Amuc_0439	30S ribosomal protein S13	-1,03	9,91	1,58E-02
Amuc_0445	GTP-binding protein YchF	-0,97	8,61	2,08E-02
Amuc_0463	Phosphopantothenoylcysteine decarboxylase	-0,81	7,30	3,09E-02
Amuc_0469	N-acetyltransferase GCN5	1,35	9,10	1,28E-02
Amuc_0475	methyltransferase	0,81	6,76	4,60E-02
Amuc_0485	50S ribosomal protein L27	-1,00	9,05	4,80E-02
Amuc_0488	FeS assembly protein SufB	0,87	9,43	3,33E-02
Amuc_0489	SufBD protein	1,13	9,26	1,26E-02
Amuc_0533	hypothetical protein	-0,89	7,79	3,24E-02
Amuc_0534	phosphoribosylformylglycinamidine synthase II	-0,79	9,89	4,91E-02
Amuc_0556	FmdB family regulatory protein	1,11	5,23	3,44E-02
Amuc_0573	3'-5' exonuclease	-0,88	9,20	3,85E-02
Amuc_0616	protein serine/threonine phosphatase	1,09	7,42	4,60E-02
Amuc_0642	tRNA delta(2)-isopentenylpyrophosphate transferase	-1,13	5,44	3,68E-02
Amuc_0650	S-adenosyl-methyltransferase MraW	0,75	9,03	4,51E-02
Amuc_0760	hypothetical protein	-0,95	7,28	4,94E-02
Amuc_0775	thioesterase	1,28	7,60	4,20E-02
Amuc_0787	rhomboid family protein	-1,25	9,21	1,69E-02
Amuc_0844	Phosphopyruvate hydratase	2,13	8,27	7,11E-03
Amuc_0850	RNA methyltransferase, TrmA family	-0,78	7,96	4,04E-02
Amuc_0865	rubrerythrin	2,03	9,33	1,97E-03
Amuc_0868	beta-N-acetylhexosaminidase	0,92	7,29	3,25E-02
Amuc_0876	heavy metal translocating P-type ATPase	1,45	8,47	5,57E-03
Amuc_0888	MerR family transcriptional regulator	0,99	6,48	4,90E-02
Amuc_0955	ribosome-binding factor A	-1,21	9,71	3,21E-02
Amuc_0961	hypothetical protein	1,61	8,11	2,03E-04
Amuc_0962	4Fe-4S ferredoxin	1,10	7,63	4,60E-03
Amuc_0983	YD repeat protein	1,18	10,61	2,85E-02
Amuc_0988	TatD-related deoxyribonuclease	0,98	7,03	1,61E-02
Amuc_1017	hypothetical protein	-1,28	7,25	3,61E-02
Amuc_1030	cupin	-1,08	5,44	3,27E-02
Amuc_1084	hypothetical protein	4,33	7,04	6,64E-04
Amuc_1089	FeoA family protein	1,15	10,63	3,98E-02
Amuc_1090	FeoA family protein	1,22	9,43	2,58E-02
Amuc_1145	hypothetical protein	-0,98	10,22	2,49E-02
Amuc_1177	lipocalin family protein	1,15	6,25	2,27E-02
Amuc_1187	Alpha-galactosidase	1,04	9,85	4,58E-02
Amuc_1211	N-acetylmuramoyl-L-alanine amidase family 2 protein	0,91	7,15	3,60E-02
Amuc_1219	hypothetical protein	-1,35	9,65	4,26E-02
Amuc_1222	oligopeptide transporter	-0,75	8,69	3,53E-02
Amuc_1250	carbamoyl-phosphate synthase small subunit	-0,88	8,15	2,08E-02
Amuc_1290	hypothetical protein	1,02	9,17	2,42E-02
Amuc_1291	surface layer protein	1,32	7,32	7,79E-03
Amuc_1295	binding-protein-dependent transporters inner membrane component	-1,17	10,99	1,75E-02
Amuc_1297	substrate-binding protein of aliphatic sulfonate ABC transporter	-1,18	10,18	1,11E-02
Amuc_1298	sulfate adenylyltransferase, large subunit	-1,42	10,77	2,47E-03
Amuc_1299	sulfate adenylyltransferase subunit 2	-1,50	10,39	3,57E-03
Amuc_1300	adenylylsulfate reductase	-1,33	10,96	3,49E-03
Amuc_1301	cysteine synthase A	-1,19	11,38	1,13E-02
Amuc_1309	aldose 1-epimerase	1,30	8,74	3,02E-03
Amuc_1310	17 kDa surface antigen	0,91	9,36	2,70E-02
Amuc_1321	alkyl hydroperoxide reductase	2,34	10,72	6,90E-04
Amuc_1343	hypothetical protein	-1,30	7,46	3,23E-02
Amuc_1408	chaperonin GroEL	0,91	12,13	4,18E-02
Amuc_1412	hypothetical protein	0,85	10,64	4,93E-02
Amuc_1517	ECF subfamily RNA polymerase sigma-24 subunit	0,86	7,61	3,19E-02
Amuc_1537	outer membrane autotransporter barrel domain-containing protein	1,12	11,00	1,77E-02
Amuc_1609	4Fe-4S ferredoxin	-0,99	8,25	1,36E-02
Amuc_1612	NADH dehydrogenase (quinone)	-0,79	9,51	2,83E-02
Amuc_1653	Ribulose-phosphate 3-epimerase	-0,84	7,02	3,81E-02
Amuc_1654	leucyl-tRNA synthetase	-0,89	10,73	3,05E-02
Amuc_1692	2-oxoglutarate dehydrogenase, E2 subunit, dihydrolipoamide succinyltransferase	1,19	7,77	2,35E-02
Amuc_1693	2-oxoglutarate dehydrogenase, E1 subunit	1,57	9,86	3,34E-03
Amuc_1694	cytochrome d ubiquinol oxidase, subunit II	1,47	7,92	6,53E-03
Amuc_1757	phosphotransferase system, phosphocarrier protein HPr	1,45	9,97	4,13E-03
Amuc_1764	hypothetical protein	-1,28	7,66	1,20E-02
Amuc_1776	hypothetical protein	1,09	9,66	1,74E-02
Amuc_1777	von Willebrand factor type A	1,19	12,17	2,25E-02
Amuc_1780	hypothetical protein	0,93	7,67	3,35E-02
Amuc_1814	hypothetical protein	-1,34	5,86	3,92E-02
Amuc_1843	hypothetical protein	1,17	6,11	3,16E-02
Amuc_1901	metallophosphoesterase	-1,23	8,28	2,28E-02
Amuc_1902	hypothetical protein	-1,44	10,54	2,39E-03
Amuc_1903	hypothetical protein	-1,06	9,13	2,02E-02
Amuc_1922	ferredoxin	1,07	11,13	3,88E-02
Amuc_1960	PA14 domain-containing protein	1,07	6,59	4,92E-02
Amuc_1965	aspartate kinase	-0,82	8,72	3,67E-02
Amuc_1972	HhH-GPD family protein	-0,86	7,24	4,69E-02
Amuc_1985	hypothetical protein	0,88	9,05	1,89E-02
Amuc_2051	glutamate dehydrogenase	-1,01	10,01	3,73E-02
Amuc_2054	hypothetical protein	-1,08	6,15	3,90E-02
Amuc_2072	rubrerythrin	1,31	9,02	3,07E-03
Amuc_2111	ErfK/YbiS/YcfS/YnhG family protein	-0,95	8,57	1,96E-02
Amuc_2120	hypothetical protein	1,12	7,78	9,56E-03
Amuc_2129	nickel-dependent hydrogenase large subunit	1,46	9,03	2,85E-03
Amuc_2130	cytochrome B561	1,58	8,73	1,04E-03
Amuc_2131	hydrogenase maturation protease	1,79	6,72	3,28E-03
Amuc_2136	Glycoside hydrolase, family 20, catalytic core	0,98	10,15	1,47E-02
Amuc_2148	beta-N-acetylhexosaminidase	1,03	7,62	2,30E-02
Amuc_2154	hypothetical protein	1,64	8,54	8,00E-03
Amuc_2176	excinuclease ABC subunit A	1,19	8,75	3,74E-03

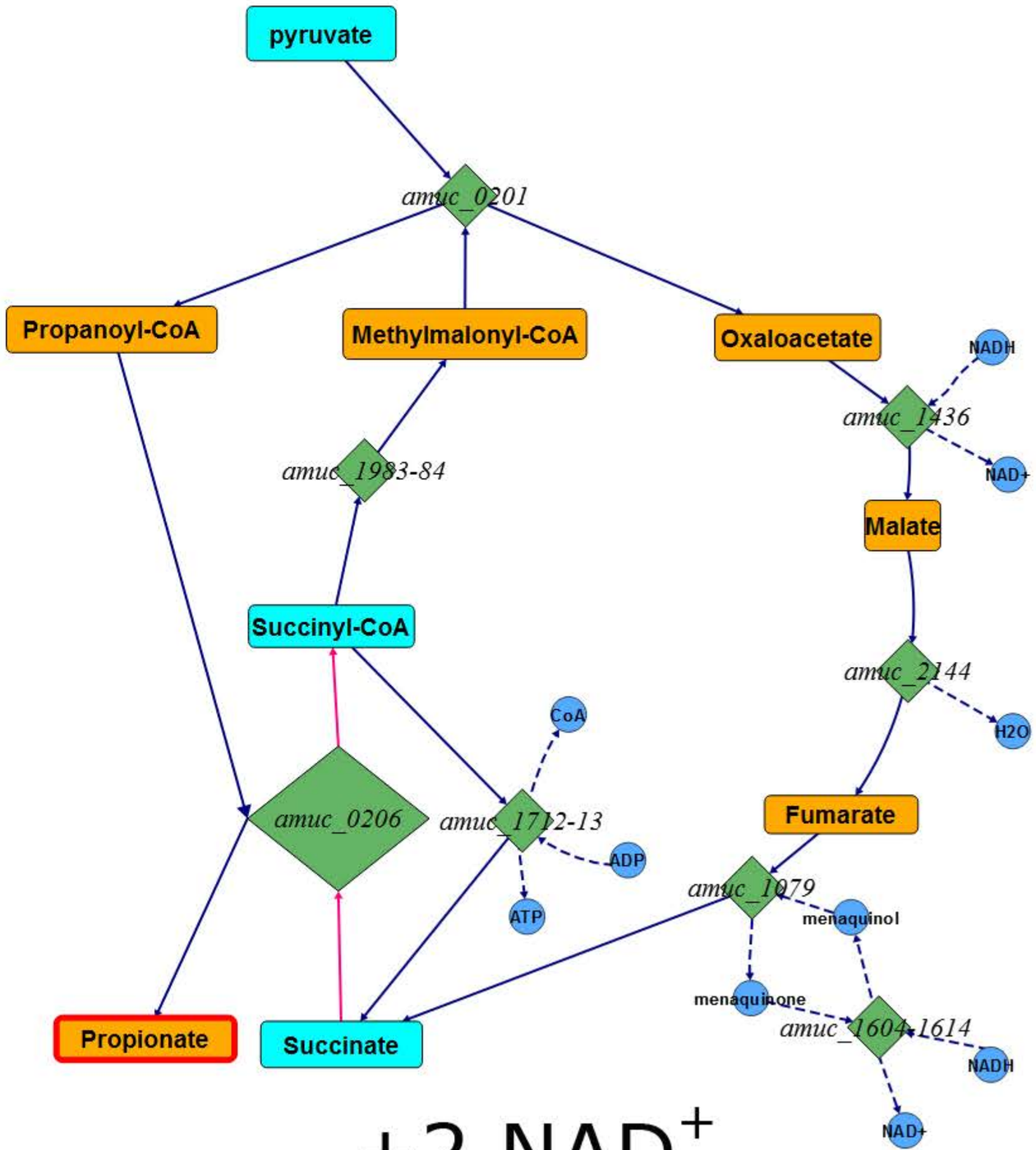
T2_O2vsT3_O2		logFC	logCPM	Pvalue
Amuc_1901	metallophosphoesterase	3,0831181	8,2555898	4,06E-10
Amuc_1301	cysteine synthase A	-2,828484	11,363636	2,56E-09
Amuc_0439	30S ribosomal protein S13	-2,354276	9,8971835	4,13E-09
Amuc_2051	glutamate dehydrogenase	-2,747406	9,9682574	7,89E-09
Amuc_1654	leucyl-tRNA synthetase	-2,279947	10,71736	1,38E-08
Amuc_0422	3,4-dihydroxy-2-butanone 4-phosphate synthase	-2,404636	9,4654387	3,21E-08
Amuc_0616	protein serine/threonine phosphatase	3,3136865	7,5315867	4,94E-08
Amuc_0485	50S ribosomal protein L27	-2,608255	9,0202648	2,19E-07
Amuc_2111	ErfK/YbiS/YcfS/YnhG family protein	-2,134594	8,549084	2,56E-07
Amuc_0573	3'-5' exonuclease	-2,470652	9,1955026	2,67E-07
Amuc_1612	NADH dehydrogenase (quinone)	-1,805625	9,5047812	3,25E-07
Amuc_0534	phosphoribosylformylglycinamidine synthase II	-2,022778	9,8876794	5,40E-07
Amuc_0426	radical SAM enzyme, Cfr family	-2,076444	9,1054727	7,06E-07
Amuc_1694	cytochrome d ubiquinol oxidase, subunit II	2,427151	7,8897516	8,05E-07
Amuc_0469	N-acetyltransferase GCN5	2,636532	9,185689	1,71E-06
Amuc_1089	FeoA family protein	-2,204915	10,606229	5,91E-06
Amuc_1965	aspartate kinase	-1,954368	8,7217209	6,30E-06
Amuc_1609	4Fe-4S ferredoxin	-1,958321	8,2610765	7,61E-06
Amuc_1300	adenylylsulfate reductase	-2,061794	10,948189	1,62E-05
Amuc_1090	FeoA family protein	-1,945762	9,3963681	2,76E-05
Amuc_1653	Ribulose-phosphate 3-epimerase	-2,038659	7,0277773	3,22E-05
Amuc_0213	glutamyl-tRNA(Gln) amidotransferase subunit B	-1,828489	10,076033	3,57E-05
Amuc_0983	YD repeat protein	1,9580647	10,614751	5,16E-05
Amuc_0425	signal recognition particle-docking protein FtsY	-2,092449	7,1589697	5,49E-05
Amuc_0955	ribosome-binding factor A	1,9276162	9,6668002	6,45E-05
Amuc_1693	2-oxoglutarate dehydrogenase, E1 subunit	1,789015	9,8574798	0,0001124
Amuc_1250	carbamoyl-phosphate synthase small subunit	-1,532275	8,1586652	0,0001503
Amuc_0424	NusB antitermination factor	-1,970672	7,6051034	0,0001525
Amuc_1299	sulfate adenylyltransferase subunit 2	-1,950689	10,375281	0,000317
Amuc_1295	binding-protein-dependent transporters inner membrane component	-1,561301	10,950387	0,0004176
Amuc_0291	valyl-tRNA synthetase	-1,346841	9,5790453	0,0006301
Amuc_1960	PA14 domain-containing protein	1,7058458	6,5694799	0,0007416
Amuc_1177	lipocalin family protein	1,7053483	6,300294	0,0011035
Amuc_0270	shikimate kinase	1,1599099	8,8413758	0,0021792
Amuc_0436	HAD-superfamily hydrolase	1,2968292	8,5057113	0,0022388
Amuc_1692	2-oxoglutarate dehydrogenase, E2 subunit, dihydrolipoamide succinyltransferase	1,4881232	7,7691748	0,002355
Amuc_1298	sulfate adenylyltransferase, large subunit	-1,381019	10,746457	0,0033551
Amuc_0423	6,7-dimethyl-8-ribityllumazine synthase	-1,552627	6,9055966	0,0035626
Amuc_0962	4Fe-4S ferredoxin	1,1178834	7,6453974	0,0037849
Amuc_0868	beta-N-acetylhexosaminidase	1,1830352	7,2960662	0,003817
Amuc_0038	glutaminase	1,5693084	8,9611051	0,0038361
Amuc_0850	RNA methyltransferase, TrmA family	-1,26071	7,9636325	0,0038597
Amuc_0888	MerR family transcriptional regulator	1,485917	6,5001104	0,0047559
Amuc_1310	17 kDa surface antigen	0,9471355	9,367004	0,0084824
Amuc_1222	oligopeptide transporter	0,902992	8,7017587	0,0098723
Amuc_0445	GTP-binding protein YchF	-1,130249	8,618394	0,010741
Amuc_1297	substrate-binding protein of aliphatic sulfonate ABC transporter	-1,179303	10,154277	0,0131821
Amuc_1537	outer membrane autotransporter barrel domain-containing protein	1,0880405	11,034807	0,0139166
Amuc_1922	ferredoxin	-0,967352	11,104148	0,0194634
Amuc_1321	alkyl hydroperoxide reductase	1,124966	10,64336	0,0278377
Amuc_0175	PDZ/DHR/GLGF domain-containing protein	0,7723019	8,8404695	0,0458318
Amuc_1517	ECF subfamily RNA polymerase sigma-24 subunit	0,7568531	7,6162318	0,0501435
Amuc_1309	aldose 1-epimerase	0,79048	8,7614337	0,0624429
Amuc_1757	phosphotransferase system, phosphocarrier protein HPr	0,8253138	9,9653033	0,0641482
Amuc_1291	surface layer protein	0,8170864	7,3034615	0,0659608
Amuc_0787	rhomboid family protein	0,801822	9,1860889	0,0726464
Amuc_2129	nickel-dependent hydrogenase large subunit	0,6806369	9,0147144	0,0971012
Amuc_1030	cupin	-0,855423	5,4633321	0,1355599
Amuc_2148	beta-N-acetylhexosaminidase	0,6116368	7,6038901	0,1370898
Amuc_2072	rubrerythrin	-0,602047	9,0064825	0,1400122
Amuc_1211	N-acetylmuramoyl-L-alanine amidase family 2 protein	0,5858091	7,1364379	0,1454888
Amuc_1408	chaperonin GroEL	0,5394538	12,130001	0,1489132
Amuc_1972	HhH-GPD family protein	-0,695225	7,2543545	0,1503753
Amuc_0642	tRNA delta(2)-isopentenylpyrophosphate transferase	0,8173769	5,4747345	0,1764931
Amuc_0463	Phosphopantothenoylcysteine decarboxylase	-0,487409	7,3112798	0,2363912
Amuc_1777	von Willebrand factor type A	0,4785982	12,160799	0,2730257
Amuc_2131	hydrogenase maturation protease	0,4658233	6,6870249	0,3846652
Amuc_0876	heavy metal translocating P-type ATPase	-0,375897	8,4640434	0,4215729
Amuc_0337	prephenate dehydrogenase	-0,262005	6,9903225	0,5121969
Amuc_0865	rubrerythrin	0,300594	9,28322	0,5466938
Amuc_2130	cytochrome B561	0,2435824	8,7141287	0,5469988
Amuc_0775	thioesterase	-0,332983	7,5940299	0,5562132
Amuc_2176	excinuclease ABC subunit A	-0,197821	8,7555832	0,5983606
Amuc_0650	S-adenosyl-methyltransferase MraW	-0,158646	9,0190582	0,6223322
Amuc_0988	TatD-related deoxyribonuclease	0,1841692	7,0191819	0,6253979
Amuc_0489	SufBD protein	-0,18256	9,2444137	0,6281635
Amuc_0556	FmdB family regulatory protein	0,2202356	5,2415355	0,6850028
Amuc_1187	Alpha-galactosidase	0,1444941	9,8298793	0,7328473
Amuc_0059	ATPase AAA	-0,097593	11,23193	0,7834778
Amuc_2136	Glycoside hydrolase, family 20, catalytic core	-0,099948	10,143943	0,78636
Amuc_0844	Phosphopyruvate hydratase	-0,159245	8,227131	0,8043425
Amuc_0488	FeS assembly protein SufB	-0,086016	9,4290307	0,814634
Amuc_0475	methyltransferase	-0,086027	6,7806505	0,8438369

UBIQUINONE AND OTHER TERPENOID-QUINONE BIOSYNTHESIS




pyruvate
NAD+
CoA
amuc_1689
NADH
CO2
Acetyl-CoA
Succinyl-CoA
amuc_0206
amuc_1712-13
CoA
ADP
ATP
Acetate
Succinate

-1 NAD^+


pyruvate
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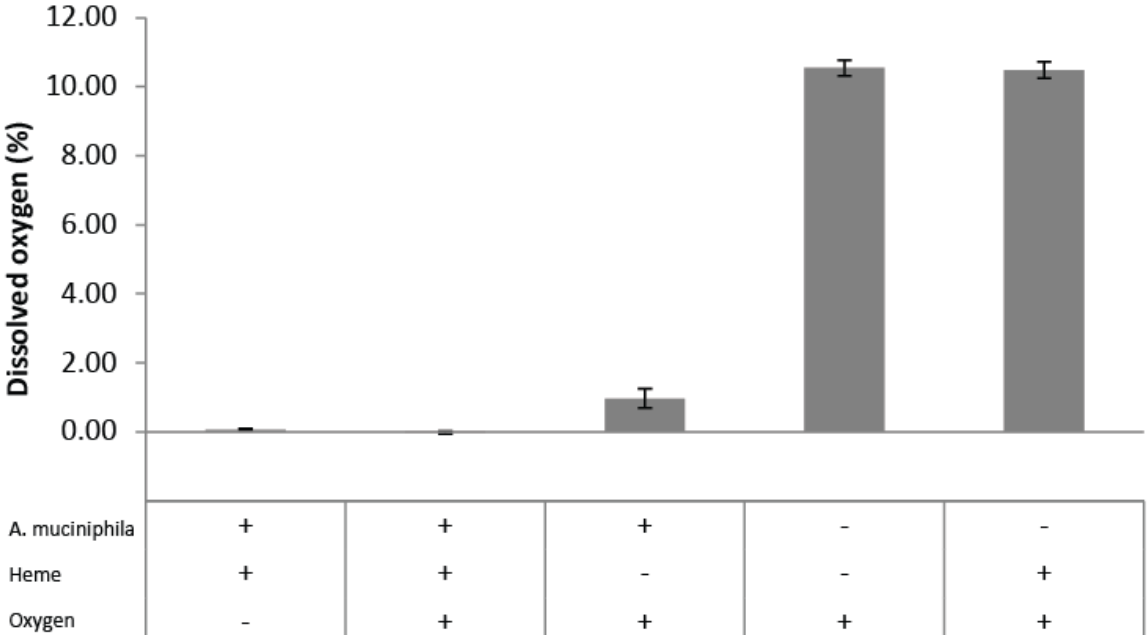
Propanoyl-CoA
Methylmalonyl-CoA
Oxaloacetate
NADH
amuc_1436
amuc_1983-84
NAD+
Malate
amuc_2144
H2O
Succinyl-CoA
CoA
Fumarate
amuc_0206
amuc_1712-13
ADP
ATP
amuc_1079
menaquinol
menaquinone
amuc_1604-1614
NADH
NAD+
Propionate
Succinate

+2 NAD^+


12.00
10.00
8.00
6.00
4.00
2.00
0.00
Dissolved oxygen (%)
A. muciniphila + + + - -
Heme + + - - +
Oxygen - + + + +