

Supplemental Table S4. Metabolic reconstruction for *S. neurona*

Rxn name	Rxn description	Formula	Subsystem	Reversible	LB	UB	Obj.	E.C. number
1.1.1.1	alcohol dehydrogenase	1 C00469[c] + 1 C00003[c] -> 1 C00084[c] + 1 C00004[c] + 1 C00080[c]	Misc	1	-1000	1000	0	1.1.1.1
1.1.1.100a	3-oxoacyl-[acp] reductase	1 C05744[a] + 1 C00005[a] + 1 C00080[a] -> 1 C04618[a] + 1 C00006[a]	Fatty Acid Synthesis	1	-1000	1000	0	1.1.1.100
1.1.1.100b	3-oxoacyl-[acp] reductase	1 C05753[a] + 1 C00005[a] + 1 C00080[a] -> 1 C04619[a] + 1 C00006[a]	Fatty Acid Synthesis	1	-1000	1000	0	1.1.1.100
1.1.1.100c	3-oxoacyl-[acp] reductase	1 C05750[a] + 1 C00005[a] + 1 C00080[a] -> 1 C04620[a] + 1 C00006[a]	Fatty Acid Synthesis	1	-1000	1000	0	1.1.1.100
1.1.1.100d	3-oxoacyl-[acp] reductase	1 C05762[a] + 1 C00005[a] + 1 C00080[a] -> 1 C04633[a] + 1 C00006[a]	Fatty Acid Synthesis	1	-1000	1000	0	1.1.1.100
1.1.1.100e	3-oxoacyl-[acp] reductase	1 C05759[a] + 1 C00005[a] + 1 C00080[a] -> 1 C04688[a] + 1 C00006[a]	Fatty Acid Synthesis	1	-1000	1000	0	1.1.1.100
1.1.1.100f	3-oxoacyl-[acp] reductase	1 C05746[a] + 1 C00005[a] + 1 C00080[a] -> 1 C05747[a] + 1 C00006[a]	Fatty Acid Synthesis	1	-1000	1000	0	1.1.1.100
1.1.1.100g	3-oxoacyl-[acp] reductase	1 C05756[a] + 1 C00005[a] + 1 C00080[a] -> 1 C05757[a] + 1 C00006[a]	Fatty Acid Synthesis	1	-1000	1000	0	1.1.1.100
1.1.1.100h	3-oxoacyl-[acp] reductase	1 C16219[a] + 1 C00005[a] + 1 C00080[a] -> 1 C16220[a] + 1 C00006[a]	Fatty Acid Synthesis	1	-1000	1000	0	1.1.1.100
1.1.1.102	3-dehydroshinganine reductase	1 C02934[er] + 1 C00005[er] + 1 C00080[er] -> 1 C00836[er] + 1 C00006[er]	Phospholipid	1	-1000	1000	0	1.1.1.102
1.1.1.153	sepiapterin reductase	1 C00272[c] + 2 C00006[c] -> 1 C03684[c] + 2 C00005[c] + 2 C00080[c]	Biopterin	1	-1000	1000	0	1.1.1.153
1.1.1.169	2-dehydropantoate 2-reductase	1 C00522[m] + 1 C00006[m] -> 1 C00966[m] + 1 C00005[m] + 1 C00080[m]	CoA Synthesis	1	-1000	1000	0	1.1.1.169
1.1.1.205	IMP dehydrogenase	1 C00130[c] + 1 C00003[c] + 1 C00001[c] -> 1 C00655[c] + 1 C00004[c] + 1 C00080[c]	Purine	0	0	1000	0	1.1.1.205
1.1.1.267	1-deoxy-D-xylulose-5-phosphate reductoisomerase	1 C11437[a] + 1 C00005[a] + 1 C00080[a] -> 1 C11434[a] + 1 C00006[a]	Terpenoid Backbone	1	-1000	1000	0	1.1.1.267
1.1.1.27	L-lactate dehydrogenase	1 C00022[c] + 1 C00004[c] + 1 C00080[c] -> 1 C00186[c] + 1 C00003[c]	Glycolysis	1	-1000	1000	0	1.1.1.27
1.1.1.35a	3-hydroxyacyl-CoA dehydrogenase	1 C04405[m] + 1 C00003[m] -> 1 C03344[m] + 1 C00004[m] + 1 C00080[m]	Branched Amino Acid	1	-1000	1000	0	1.1.1.35
1.1.1.35b	3-hydroxyacyl-CoA dehydrogenase	1 C00640[m] + 1 C00003[m] -> 1 C00264[m] + 1 C00004[m] + 1 C00080[m]	Beta Oxidation	1	-1000	1000	0	1.1.1.35
1.1.1.37	malate dehydrogenase	1 C00149[m] + 1 C00003[m] -> 1 C00036[m] + 1 C00004[m] + 1 C00080[m]	TCA Cycle	0	0	1000	0	1.1.1.37
1.1.1.42	isocitrate dehydrogenase (NADP+)	1 C00311[m] + 1 C00006[m] -> 1 C00026[m] + 1 C00011[m] + 1 C00005[m] + 1 C00080[m]	TCA Cycle	1	-1000	1000	0	1.1.1.42
1.1.1.44	phosphogluconate dehydrogenase (decarboxylating)	1 C00345[c] + 1 C00006[c] -> 1 C00199[c] + 1 C00011[c] + 1 C00005[c]	Pentose Phosphate	0	0	1000	0	1.1.1.44
1.1.1.49	glucose-6-phosphate dehydrogenase	1 C00092[c] + 1 C00006[c] -> 1 C01236[c] + 1 C00005[c] + 1 C00080[c]	Pentose Phosphate	0	0	1000	0	1.1.1.49
1.1.1.8	glycerol-3-phosphate dehydrogenase (NAD+)	1 C00111[c] + 1 C00004[c] + 1 C00080[c] -> 1 C00093[c] + 1 C00003[c]	Phospholipid	1	-1000	1000	0	1.1.1.8
1.1.1.95	phosphoglycerate dehydrogenase	1 C00197[c] + 1 C00003[c] -> 1 C03232[c] + 1 C00004[c] + 1 C00080[c]	Serine/Glycine	1	-1000	1000	0	1.1.1.95
1.10.2.2	ubiquinol-cytochrome-c reductase	1 C00390[m] + 2 C00080[m] + 2 C00125[m] -> 1 C00399[m] + 2 C00126[m] + 4 C00080[im]	Oxidative Phosphorylation	0	0	1000	0	1.10.2.2
1.11.1.6	catalase	2 C00027[c] -> 1 C00007[c] + 2 C00001[c]	Misc	0	0	1000	0	1.11.1.6
1.14.-.-	sphingolipid delta-4 desaturase	1 C12126[er] + 1 C00030[er] + 1 C00007[er] -> 1 C00195[er] + 1 C00028[er] + 2 C00001[er]	Phospholipid	0	0	1000	0	1.14.-.-
1.14.16.2	tyrosine 3-monooxygenase	1 C00082[c] + 1 C00272[c] + 1 C00007[c] -> 1 C00355[c] + 1 C15522[c]	Biopterin	0	0	1000	0	1.14.16.2
1.14.19.2	acyl-[acyl-carrier-protein] desaturase	1 C04088[a] + 1 C00030[a] + 1 C00007[a] -> 1 C01203[a] + 1 C00028[a] + 2 C00001[a]	Fatty Acid Synthesis	0	0	1000	0	1.14.19.2
1.14.19.3	linoleoyl-CoA desaturase	1 C02050[a] + 1 C00030[a] + 1 C00007[a] -> 1 C03035[a] + 1 C00028[a] + 2 C00001[a]	Fatty Acid Synthesis	0	0	1000	0	1.14.19.3
1.14.19.6	Delta12-fatty-acyl desaturase	1 C00510[a] + 1 C00030[a] + 1 C00007[a] -> 1 C02050[a] + 1 C00028[a] + 2 C00001[a]	Fatty Acid Synthesis	0	0	1000	0	1.14.19.6
1.15.1.1	superoxide dismutase	2 C00704[c] + 2 C00080[c] -> 1 C00007[c] + 1 C00027[c]	Misc	0	0	1000	0	1.15.1.1
1.17.1.2a	4-hydroxy-3-methylbut-2-enyl diphosphate reductase	1 C11811[a] + 1 C00005[a] + 1 C00080[a] -> 1 C00129[a] + 1 C00006[a] + 1 C00001[a]	Terpenoid Backbone	0	0	1000	0	1.17.1.2
1.17.1.2b	4-hydroxy-3-methylbut-2-enyl diphosphate reductase	1 C11811[a] + 1 C00005[a] + 1 C00080[a] -> 1 C00235[a] + 1 C00006[a] + 1 C00001[a]	Terpenoid Backbone	0	0	1000	0	1.17.1.2
1.17.4.1a	ribonucleoside-diphosphate reductase	1 C00342[c] + 1 C00008[c] -> 1 C00206[c] + 1 C00343[c] + 1 C00001[c]	Purine	0	0	1000	0	1.17.4.1
1.17.4.1b	ribonucleoside-diphosphate reductase	1 C00342[c] + 1 C00015[c] -> 1 C01346[c] + 1 C00343[c] + 1 C00001[c]	Pyrimidine	0	0	1000	0	1.17.4.1
1.17.4.1c	ribonucleoside-diphosphate reductase	1 C00342[c] + 1 C00035[c] -> 1 C00361[c] + 1 C00343[c] + 1 C00001[c]	Purine	0	0	1000	0	1.17.4.1
1.17.4.1d	ribonucleoside-diphosphate reductase	1 C00342[c] + 1 C00112[c] -> 1 C00705[c] + 1 C00343[c] + 1 C00001[c]	Pyrimidine	0	0	1000	0	1.17.4.1
1.17.7.1	(E)-4-hydroxy-3-methylbut-2-enyl-diphosphate synthase	1 C11453[a] + 2 C00138[a] -> 1 C11811[a] + 1 C00001[a] + 2 C00139[a]	Terpenoid Backbone	1	-1000	1000	0	1.17.7.1
1.2.1.11	aspartate-semialdehyde dehydrogenase	1 C03082[m] + 1 C00005[m] + 1 C00080[m] -> 1 C00441[m] + 1 C00009[m] + 1 C00006[m]	Lysine	1	-1000	1000	0	1.2.1.11
1.2.1.12a	glyceraldehyde-3-phosphate dehydrogenase (phosphorylating)	1 C00118[c] + 1 C00009[c] + 1 C00003[c] -> 1 C00236[c] + 1 C00004[c] + 1 C00080[c]	Glycolysis	1	-1000	1000	0	1.2.1.12
1.2.1.12b	glyceraldehyde-3-phosphate dehydrogenase (phosphorylating)	1 C00118[a] + 1 C00009[a] + 1 C00003[a] -> 1 C00236[a] + 1 C00004[a] + 1 C00080[a]	Glycolysis	1	-1000	1000	0	1.2.1.12
1.2.1.27	methylmalonate-semialdehyde dehydrogenase (acylating)	1 C00349[m] + 1 C00010[m] + 1 C00001[m] + 1 C00003[m] -> 1 C00100[m] + 1 C00028[m] + 1 C00004[m]	Branched Amino Acid	1	-1000	1000	0	1.2.1.27
1.2.1.3a	aldehyde dehydrogenase (NAD+)	1 C00084[c] + 1 C00003[c] + 1 C00001[c] -> 1 C00033[c] + 1 C00004[c] + 1 C00080[c]	Glycolysis	0	0	1000	0	1.2.1.3
1.2.1.3b	aldehyde dehydrogenase (NAD+)	1 C05665[c] + 1 C00003[c] + 1 C00001[c] -> 1 C00099[c] + 1 C00004[c] + 1 C00080[c]	Beta-Alanine	0	0	1000	0	1.2.1.3
1.2.1.3c	aldehyde dehydrogenase (NAD+)	1 C00555[c] + 1 C00003[c] + 1 C00001[c] -> 1 C00334[c] + 1 C00004[c] + 1 C00080[c]	Beta-Alanine	0	0	1000	0	1.2.1.3
1.2.1.41	glutamate-5-semialdehyde dehydrogenase	1 C01165[c] + 1 C00009[c] + 1 C00006[c] -> 1 C03287[c] + 1 C00005[c] + 1 C00080[c]	Arginine/Proline	1	-1000	1000	0	1.2.1.41
1.2.4.1	pyruvate dehydrogenase (acetyl-transferring)	1 C00022[a] + 1 C16237[a] -> 1 C16255[a] + 1 C00011[a]	Glycolysis	0	0	1000	0	1.2.4.1
1.2.4.2	oxoglutarate dehydrogenase (succinyl-transferring)	1 C00026[m] + 1 C16237[m] -> 1 C16254[m] + 1 C00011[m]	TCA Cycle	0	0	1000	0	1.2.4.2
1.2.4.4a	3-methyl-2-oxobutanoate dehydrogenase	1 C00141[m] + 1 C16237[m] -> 1 C15977[m] + 1 C00011[m]	Branched Amino Acid	0	0	1000	0	1.2.4.4
1.2.4.4b	3-methyl-2-oxobutanoate dehydrogenase	1 C00233[m] + 1 C16237[m] -> 1 C15975[m] + 1 C00011[m]	Branched Amino Acid	0	0	1000	0	1.2.4.4
1.2.4.4c	3-methyl-2-oxobutanoate dehydrogenase	1 C00671[m] + 1 C16237[m] -> 1 C15979[m] + 1 C00011[m]	Branched Amino Acid	0	0	1000	0	1.2.4.4
1.3.1.26	dihydrodipicolinate reductase	1 C03340[m] + 1 C00004[m] + 1 C00080[m] -> 1 C03972[m] + 1 C00003[m]	Lysine	1	-1000	1000	0	1.3.1.26
1.3.1.9a	enoyl-[acp] reductase (NADH)	1 C05758[a] + 1 C00004[a] + 1 C00080[a] -> 1 C05223[a] + 1 C00003[a]	Fatty Acid Synthesis	1	-1000	1000	0	1.3.1.9
1.3.1.9b	enoyl-[acp] reductase (NADH)	1 C05748[a] + 1 C00004[a] + 1 C00080[a] -> 1 C05749[a] + 1 C00003[a]	Fatty Acid Synthesis	1	-1000	1000	0	1.3.1.9
1.3.1.9c	enoyl-[acp] reductase (NADH)	1 C05751[a] + 1 C00004[a] + 1 C00080[a] -> 1 C05752[a] + 1 C00003[a]	Fatty Acid Synthesis	1	-1000	1000	0	1.3.1.9
1.3.1.9d	enoyl-[acp] reductase (NADH)	1 C05754[a] + 1 C00004[a] + 1 C00080[a] -> 1 C05755[a] + 1 C00003[a]	Fatty Acid Synthesis	1	-1000	1000	0	1.3.1.9
1.3.1.9e	enoyl-[acp] reductase (NADH)	1 C05760[a] + 1 C00004[a] + 1 C00080[a] -> 1 C05761[a] + 1 C00003[a]	Fatty Acid Synthesis	1	-1000	1000	0	1.3.1.9
1.3.1.9f	enoyl-[acp] reductase (NADH)	1 C05763[a] + 1 C00004[a] + 1 C00080[a] -> 1 C05764[a] + 1 C00003[a]	Fatty Acid Synthesis	1	-1000	1000	0	1.3.1.9
1.3.1.9g	enoyl-[acp] reductase (NADH)	1 C04246[a] + 1 C00004[a] + 1 C00080[a] -> 1 C05745[a] + 1 C00003[a]	Fatty Acid Synthesis	1	-1000	1000	0	1.3.1.9
1.3.1.9h	enoyl-[acp] reductase (NADH)	1 C16221[a] + 1 C00004[a] + 1 C00080[a] -> 1 C04088[a] + 1 C00003[a]	Fatty Acid Synthesis	1	-1000	1000	0	1.3.1.9
1.3.3.1	dihydroorotate oxidase	1 C00337[m] + 1 C00007[m] -> 1 C00295[m] + 1 C00027[m]	Pyrimidine	1	-1000	1000	0	1.3.3.1
1.3.3.3	coproporphyrinogen oxidase	1 C03263[c] + 1 C00007[c] + 2 C00080[c] -> 1 C01079[c] + 2 C00011[c] + 2 C00001[c]	Porphyrin	0	0	1000	0	1.3.3.3

1.3.3.4	protoporphyrinogen oxidase	1 C01079[m] + 3 C00007[m] -> 1 C02191[m] + 3 C00027[m]	Porphyrin	0	0	1000	0	1.3.3.4
1.3.3.6	acyl-CoA oxidase	1 C00040[m] + 1 C00007[m] -> 1 C00658[m] + 1 C00027[m]	Beta Oxidation	0	0	1000	0	1.3.3.6
1.3.5.1	succinate dehydrogenase (ubiquinone)	1 C00042[m] + 1 C00399[m] -> 1 C00122[m] + 1 C00390[m]	TCA Cycle	0	0	1000	0	1.3.5.1
1.3.99.10	isovaleryl-CoA dehydrogenase	1 C02939[m] + 1 C00016[m] -> 1 C03069[m] + 1 C01352[m]	Branched Amino Acid	0	0	1000	0	1.3.99.10
1.3.99.2a	butyryl-CoA dehydrogenase	1 C00630[m] + 1 C00016[m] -> 1 C03460[m] + 1 C01352[m]	Branched Amino Acid	0	0	1000	0	1.3.99.2
1.3.99.2b	butyryl-CoA dehydrogenase	1 C15980[m] + 1 C00016[m] -> 1 C03345[m] + 1 C01352[m]	Branched Amino Acid	0	0	1000	0	1.3.99.2
1.4.1.1	alanine dehydrogenase	1 C00022[c] + 1 C00014[c] + 1 C00004[c] + 1 C00080[c] -> 1 C00041[c] + 1 C00001[c] + 1 C00003[c]	Glutamate/Glutamine	1	-1000	1000	0	1.4.1.1
1.4.1.2	glutamate dehydrogenase	1 C00025[m] + 1 C00001[m] + 1 C00003[m] -> 1 C00026[m] + 1 C00014[m] + 1 C00004[m] + 1 C00080[m]	Glutamate/Glutamine	1	-1000	1000	0	1.4.1.2
1.4.1.4	glutamate dehydrogenase (NADP+)	1 C00025[c] + 1 C00001[c] + 1 C00006[c] -> 1 C00026[c] + 1 C00014[c] + 1 C00005[c] + 1 C00080[c]	Glutamate/Glutamine	1	-1000	1000	0	1.4.1.4
1.4.3.21	primary-amine oxidase	1 C00986[c] + 1 C00007[c] + 1 C00001[c] -> 1 C05665[c] + 1 C00014[c] + 1 C00027[c]	Beta-Alanine	0	0	1000	0	1.4.3.21
1.4.4.2	glycine dehydrogenase (decarboxylating)	1 C00037[m] + 1 C16237[m] -> 1 C01242[m] + 1 C00011[m]	Serine/Glycine	1	-1000	1000	0	1.4.4.2
1.5.1.12a	1-pyrroline-5-carboxylate dehydrogenase	1 C00025[c] + 1 C00004[c] + 1 C00080[c] -> 1 C03912[c] + 1 C00003[c] + 2 C00001[c]	Arginine/Proline	1	-1000	1000	0	1.5.1.12
1.5.1.12b	1-pyrroline-5-carboxylate dehydrogenase	1 C01165[c] + 1 C00003[c] + 1 C00001[c] -> 1 C00025[c] + 1 C00004[c] + 1 C00080[c]	Arginine/Proline	1	-1000	1000	0	1.5.1.12
1.5.1.2	pyrroline-5-carboxylate reductase	1 C03912[c] + 1 C00004[c] + 1 C00080[c] -> 1 C00148[c] + 1 C00003[c]	Arginine/Proline	1	-1000	1000	0	1.5.1.2
1.5.1.3a	dihydrofolate reductase	1 C00415[c] + 1 C00004[c] + 1 C00080[c] -> 1 C00101[c] + 1 C00003[c]	Folate	1	-1000	1000	0	1.5.1.3
1.5.1.3b	dihydrofolate reductase	1 C00504[c] + 1 C00004[c] + 1 C00080[c] -> 1 C00415[c] + 1 C00003[c]	Folate	1	-1000	1000	0	1.5.1.3
1.5.1.34	6,7-dihydropteridine reductase	1 C00272[c] + 1 C00003[c] -> 1 C00268[c] + 1 C00004[c] + 1 C00080[c]	Biopterin	1	-1000	1000	0	1.5.1.34
1.5.3.13a	N1-acetylpolyamine oxidase	1 C00612[c] + 1 C00007[c] + 1 C00001[c] -> 1 C00134[c] + 1 C18170[c] + 1 C00027[c]	Polyamines	0	0	1000	0	1.5.3.13
1.5.3.13b	N1-acetylpolyamine oxidase	1 C02567[c] + 1 C00007[c] + 1 C00001[c] -> 1 C00315[c] + 1 C18170[c] + 1 C00027[c]	Polyamines	0	0	1000	0	1.5.3.13
1.5.5.1	electron-transferring-flavoprotein dehydrogenase	1 C00016[m] + 1 C00390[m] -> 1 C01352[m] + 1 C00399[m]	Oxidative Phosphorylation	1	-1000	1000	0	1.5.5.1
1.5.99.6	spermidine dehydrogenase	1 C00315[c] + 1 C00007[c] + 1 C00001[c] -> 1 C00986[c] + 1 C00555[c] + 1 C00027[c]	Beta-Alanine	0	0	1000	0	1.5.99.6
1.6.2.4	NADPH-hemoprotein reductase	1 C00005[m] + 1 C00080[m] + 1 C00125[m] -> 1 C00006[m] + 1 C00126[m]	Oxidative Phosphorylation	1	-1000	1000	0	1.6.2.4
1.6.5.3	NADH dehydrogenase (ubiquinone)	1 C00004[m] + 5 C00080[m] + 1 C00399[m] -> 1 C00003[m] + 4 C00080[im] + 1 C00390[m]	Oxidative Phosphorylation	0	0	1000	0	1.6.5.3
1.8.1.4a	dihydrolipoyl dehydrogenase	1 C16832[a] + 1 C00003[a] -> 1 C16237[a] + 1 C00004[a] + 1 C00080[a]	Currency Exchange	1	-1000	1000	0	1.8.1.4
1.8.1.4b	dihydrolipoyl dehydrogenase	1 C16832[m] + 1 C00003[m] -> 1 C16237[m] + 1 C00004[m] + 1 C00080[m]	Currency Exchange	1	-1000	1000	0	1.8.1.4
1.8.1.7	glutathione-disulfide reductase	2 C00051[c] + 1 C00003[c] -> 1 C00127[c] + 1 C00004[c] + 1 C00080[c]	Currency Exchange	0	0	1000	0	1.8.1.7
1.8.1.9	thioredoxin-disulfide reductase	1 C00343[c] + 1 C00005[c] + 1 C00080[c] -> 1 C00342[c] + 1 C00006[c]	Currency Exchange	0	0	1000	0	1.8.1.9
1.8.3.1	sulfite oxidase	1 C00094[c] + 1 C00007[c] + 1 C00001[c] -> 1 C00059[c] + 1 C00027[c]	Sulfur	0	0	1000	0	1.8.3.1
1.8.4.9	adenyllyl-sulfate reductase (glutathione)	1 C00020[c] + 1 C00094[c] + 1 C00127[c] -> 1 C00224[c] + 2 C00051[c]	Sulfur	0	0	1000	0	1.8.4.9
1.9.3.1	cytochrome-c oxidase	4 C00126[m] + 1 C00007[m] + 8 C00080[m] -> 4 C00125[m] + 4 C00080[im] + 2 C00001[m]	Oxidative Phosphorylation	0	0	1000	0	1.9.3.1
2.1.1.10	homocysteine S-methyltransferase	1 C00019[c] + 1 C00155[c] -> 1 C00021[c] + 1 C00073[c]	Cysteine/Methionine	0	0	1000	0	2.1.1.10
2.1.1.45	thymidylate synthase	1 C00143[c] + 1 C00365[c] -> 1 C00415[c] + 1 C00364[c]	Pyrimidine	0	0	1000	0	2.1.1.45
2.1.2.1	glycine hydroxymethyltransferase	1 C00101[m] + 1 C00065[m] -> 1 C00143[m] + 1 C00037[m] + 1 C00001[m]	Serine/Glycine	0	0	1000	0	2.1.2.1
2.1.2.10	aminomethyltransferase	1 C01242[m] + 1 C00101[m] -> 1 C16832[m] + 1 C00143[m] + 1 C00014[m]	Serine/Glycine	0	0	1000	0	2.1.2.10
2.1.2.11	3-methyl-2-oxobutanoate hydroxymethyltransferase	1 C00143[m] + 1 C00141[m] + 1 C00001[m] -> 1 C00101[m] + 1 C00966[m]	CoA Synthesis	0	0	1000	0	2.1.2.11
2.1.3.2	aspartate carbamoyltransferase	1 C00169[c] + 1 C00049[c] -> 1 C00009[c] + 1 C00438[c]	Pyrimidine	0	0	1000	0	2.1.3.2
2.1.3.3	ornithine carbamoyltransferase	1 C00009[c] + 1 C00327[c] -> 1 C00169[c] + 1 C00077[c]	Arginine/Proline	1	-1000	1000	0	2.1.3.3
2.2.1.1a	transketolase	1 C05382[c] + 1 C00118[c] -> 1 C00117[c] + 1 C00231[c]	Pentose Phosphate	1	-1000	1000	0	2.2.1.1
2.2.1.1b	transketolase	1 C00279[c] + 1 C00231[c] -> 1 C00085[c] + 1 C00118[c]	Pentose Phosphate	1	-1000	1000	0	2.2.1.1
2.2.1.2	transaldolase	1 C05382[c] + 1 C00118[c] -> 1 C00279[c] + 1 C00085[c]	Glycolysis	1	-1000	1000	0	2.2.1.2
2.2.1.7	1-deoxy-D-xylulose-5-phosphate synthase	1 C00022[a] + 1 C00118[a] -> 1 C11437[a] + 1 C00011[a]	Terpenoid Backbone	0	0	1000	0	2.2.1.7
2.3.1.117	2,3,4,5-tetrahydropyridine-2,6-dicarboxylate N-succinyltransferase	1 C00091[m] + 1 C03972[m] + 1 C00001[m] -> 1 C00010[m] + 1 C04462[m]	Lysine	0	0	1000	0	2.3.1.117
2.3.1.12	dihydrolipoyllysine-residue acetyltransferase	1 C00010[a] + 1 C16255[a] -> 1 C00024[a] + 1 C16832[a]	Glycolysis	1	-1000	1000	0	2.3.1.12
2.3.1.15	glycerol-3-phosphate O-acyltransferase	1 C00040[er] + 1 C00093[er] -> 1 C00010[er] + 1 C00681[er]	Phospholipid	1	-1000	1000	0	2.3.1.15
2.3.1.16a	acetyl-CoA C-acyltransferase	1 C00100[m] + 1 C00024[m] -> 1 C00010[m] + 1 C03344[m]	Branched Amino Acid	1	-1000	1000	0	2.3.1.16
2.3.1.16b	Acetyl-CoA C-acyltransferase	1 C00040[m] + 1 C00024[m] -> 1 C00010[m] + 1 C00264[m]	Beta oxidation	1	-1000	1000	0	2.3.1.16
2.3.1.168a	dihydrolipoyllysine-residue (2-methylpropanoyl)transferase	1 C00010[m] + 1 C15977[m] -> 1 C00630[m] + 1 C16832[m]	Branched Amino Acid	0	0	1000	0	2.3.1.168
2.3.1.168b	dihydrolipoyllysine-residue (2-methylpropanoyl)transferase	1 C00010[m] + 1 C15979[m] -> 1 C15980[m] + 1 C16832[m]	Branched Amino Acid	0	0	1000	0	2.3.1.168
2.3.1.168c	dihydrolipoyllysine-residue (2-methylpropanoyl)transferase	1 C00010[m] + 1 C15975[m] -> 1 C02939[m] + 1 C16832[m]	Branched Amino Acid	0	0	1000	0	2.3.1.168
2.3.1.180	beta-ketoacyl-acyl-carrier-protein synthase III	1 C00024[a] + 1 C01209[a] -> 1 C05744[a] + 1 C00010[a] + 1 C00011[a]	Fatty Acid Synthesis	0	0	1000	0	2.3.1.180
2.3.1.24	sphingosine N-acyltransferase	1 C00040[er] + 1 C00836[er] -> 1 C00010[er] + 1 C12126[er]	Phospholipid	0	0	1000	0	2.3.1.24
2.3.1.31	homoserine O-acetyltransferase	1 C00024[c] + 1 C00263[c] -> 1 C00010[c] + 1 C01077[c]	Cysteine/Methionine	0	0	1000	0	2.3.1.31
2.3.1.37	5-aminolevulinat synthase	1 C00091[m] + 1 C00037[m] -> 1 C00430[m] + 1 C00010[m] + 1 C00011[m]	Porphyrin	0	0	1000	0	2.3.1.37
2.3.1.39	[acp] S-malonyltransferase	1 C00083[a] + 1 C00229[a] -> 1 C00010[a] + 1 C01209[a]	Fatty Acid Synthesis	1	-1000	1000	0	2.3.1.39
2.3.1.4	glucosamine-phosphate N-acetyltransferase	1 C00024[c] + 1 C00352[c] -> 1 C00010[c] + 1 C00357[c]	Amino Sugar	0	0	1000	0	2.3.1.4
2.3.1.41a	beta-ketoacyl-acyl-carrier-protein synthase I	1 C05223[a] + 1 C01209[a] -> 1 C05759[a] + 1 C00011[a] + 1 C00229[a]	Fatty Acid Synthesis	0	0	1000	0	2.3.1.41
2.3.1.41b	beta-ketoacyl-acyl-carrier-protein synthase I	1 C05745[a] + 1 C01209[a] -> 1 C05746[a] + 1 C00011[a] + 1 C00229[a]	Fatty Acid Synthesis	0	0	1000	0	2.3.1.41
2.3.1.41c	beta-ketoacyl-acyl-carrier-protein synthase I	1 C05749[a] + 1 C01209[a] -> 1 C05750[a] + 1 C00011[a] + 1 C00229[a]	Fatty Acid Synthesis	0	0	1000	0	2.3.1.41
2.3.1.41d	beta-ketoacyl-acyl-carrier-protein synthase I	1 C05752[a] + 1 C01209[a] -> 1 C05753[a] + 1 C00011[a] + 1 C00229[a]	Fatty Acid Synthesis	0	0	1000	0	2.3.1.41
2.3.1.41e	beta-ketoacyl-acyl-carrier-protein synthase I	1 C05755[a] + 1 C01209[a] -> 1 C05756[a] + 1 C00011[a] + 1 C00229[a]	Fatty Acid Synthesis	0	0	1000	0	2.3.1.41
2.3.1.41f	beta-ketoacyl-acyl-carrier-protein synthase I	1 C05761[a] + 1 C01209[a] -> 1 C05762[a] + 1 C00011[a] + 1 C00229[a]	Fatty Acid Synthesis	0	0	1000	0	2.3.1.41
2.3.1.41g	beta-ketoacyl-acyl-carrier-protein synthase I	1 C05764[a] + 1 C01209[a] -> 1 C16219[a] + 1 C00011[a] + 1 C00229[a]	Fatty Acid Synthesis	0	0	1000	0	2.3.1.41
2.3.1.50	serine C-palmitoyltransferase	1 C00154[er] + 1 C00065[er] -> 1 C00010[er] + 1 C02934[er] + 1 C00011[er]	Phospholipid	0	0	1000	0	2.3.1.50
2.3.1.51	1-acylglycerol-3-phosphate O-acyltransferase	1 C00040[er] + 1 C00681[er] -> 1 C00010[er] + 1 C00416[er]	Phospholipid	0	0	1000	0	2.3.1.51
2.3.1.57a	diamine N-acetyltransferase	1 C00024[c] + 1 C00750[c] -> 1 C00010[c] + 1 C02567[c]	Polyamines	0	0	1000	0	2.3.1.57

2.3.1.57b	diamine N-acetyltransferase	1 C00024[c] + 1 C00315[c] -> 1 C00010[c] + 1 C00612[c]	Polyamines	0	0	1000	0 2.3.1.57
2.3.1.57c	diamine N-acetyltransferase	1 C00024[c] + 1 C00134[c] -> 1 C00010[c] + 1 C02714[c]	Polyamines	0	0	1000	0 2.3.1.57
2.3.1.61	dihydrolipoyllysine-residue succinyltransferase	1 C00010[m] + 1 C16254[m] -> 1 C00091[m] + 1 C16832[m]	TCA Cycle	1	-1000	1000	0 2.3.1.61
2.3.1.8	phosphate acetyltransferase	1 C00024[c] + 1 C00009[c] -> 1 C00010[c] + 1 C00227[c]	Misc	1	-1000	1000	0 2.3.1.8
2.3.1.85	fatty acid synthase I	1 C00024[c] + 8 C00083[c] + 16 C00005[c] + 16 C00080[c] -> 1 C00154[c] + 8 C00010[c] + 8 C00011[c] + 16 C00006[c]	Fatty Acid Synthesis	0	0	1000	0 2.3.1.85
2.3.1.9	acetyl-CoA C-acetyltransferase	1 C00010[m] + 1 C00332[m] -> 2 C00024[m]	Beta Oxidation	1	-1000	1000	0 2.3.1.9
2.3.3.1	citrate (S)-synthase	1 C00024[m] + 1 C00001[m] + 1 C00036[m] -> 1 C00158[m] + 1 C00010[m]	TCA Cycle	0	0	1000	0 2.3.3.1
2.3.3.5	2-methylcitrate synthase	1 C00100[m] + 1 C00001[m] + 1 C00036[m] -> 1 C02225[m] + 1 C00010[m]	MC Cycle	0	0	1000	0 2.3.3.5
2.3.3.8	ATP citrate synthase	1 C00002[c] + 1 C00158[c] + 1 C00010[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00024[c] + 1 C00036[c]	TCA Cycle	0	0	1000	0 2.3.3.8
2.4.1.198	phosphatidylinositol N-acetylglucosaminyltransferase	1 C00043[er] + 1 C01194[er] -> 1 C00015[er] + 1 C01288[er]	Phospholipid	0	0	1000	0 2.4.1.198
2.4.1.83	dolichyl-phosphate beta-D-mannosyltransferase	1 C00096[c] + 1 C00110[c] -> 1 C00035[c] + 1 C03862[c]	Amino Sugar	0	0	1000	0 2.4.1.83
2.4.2.1a	purine-nucleoside phosphorylase	1 C00212[c] + 1 C00009[c] -> 1 C00147[c] + 1 C00620[c]	Purine	1	-1000	1000	0 2.4.2.1
2.4.2.1b	purine-nucleoside phosphorylase	1 C00294[c] + 1 C00009[c] -> 1 C00262[c] + 1 C00620[c]	Purine	1	-1000	1000	0 2.4.2.1
2.4.2.1c	purine-nucleoside phosphorylase	1 C00387[c] + 1 C00009[c] -> 1 C00242[c] + 1 C00620[c]	Purine	1	-1000	1000	0 2.4.2.1
2.4.2.1d	purine-nucleoside phosphorylase	1 C01762[c] + 1 C00009[c] -> 1 C00385[c] + 1 C00620[c]	Purine	1	-1000	1000	0 2.4.2.1
2.4.2.1e	purine-nucleoside phosphorylase	1 C00330[c] + 1 C00009[c] -> 1 C00242[c] + 1 C00672[c]	Purine	1	-1000	1000	0 2.4.2.1
2.4.2.1f	purine-nucleoside phosphorylase	1 C03150[c] + 1 C00009[c] -> 1 C00153[c] + 1 C00620[c]	Nicotinate	1	-1000	1000	0 2.4.2.1
2.4.2.1g	purine-nucleoside phosphorylase	1 C05841[c] + 1 C00009[c] -> 1 C00253[c] + 1 C00620[c] + 1 C00080[c]	Nicotinate	1	-1000	1000	0 2.4.2.1
2.4.2.1h	purine-nucleoside phosphorylase	1 C00526[c] + 1 C00009[c] -> 1 C00106[c] + 1 C00672[c]	Pyrimidine	1	-1000	1000	0 2.4.2.1
2.4.2.1i	purine-nucleoside phosphorylase	1 C00559[c] + 1 C00009[c] -> 1 C00147[c] + 1 C00672[c]	Purine	1	-1000	1000	0 2.4.2.1
2.4.2.1j	purine-nucleoside phosphorylase	1 C05512[c] + 1 C00009[c] -> 1 C00262[c] + 1 C00672[c]	Purine	1	-1000	1000	0 2.4.2.1
2.4.2.10	orotate phosphoribosyltransferase	1 C00295[c] + 1 C00119[c] -> 1 C01103[c] + 1 C00013[c]	Pyrimidine	1	-1000	1000	0 2.4.2.10
2.4.2.11	nicotinate phosphoribosyltransferase	1 C01185[c] + 1 C00013[c] -> 1 C00253[c] + 1 C00119[c]	Nicotinate	1	-1000	1000	0 2.4.2.11
2.4.2.8a	hypoxanthine phosphoribosyltransferase	1 C00130[c] + 1 C00013[c] -> 1 C00119[c] + 1 C00262[c]	Purine	1	-1000	1000	0 2.4.2.8
2.4.2.8b	hypoxanthine phosphoribosyltransferase	1 C00020[c] + 1 C00013[c] -> 1 C00119[c] + 1 C00147[c]	Purine	0	0	1000	0 2.4.2.8
2.4.2.8c	hypoxanthine phosphoribosyltransferase	1 C00144[c] + 1 C00013[c] -> 1 C00119[c] + 1 C00242[c]	Purine	1	-1000	1000	0 2.4.2.8
2.4.2.8d	hypoxanthine phosphoribosyltransferase	1 C00655[c] + 1 C00013[c] -> 1 C00119[c] + 1 C00385[c]	Purine	1	-1000	1000	0 2.4.2.8
2.4.2.9	uracil phosphoribosyltransferase	1 C00105[c] + 1 C00013[c] -> 1 C00106[c] + 1 C00119[c]	Pyrimidine	1	-1000	1000	0 2.4.2.9
2.5.1.1	dimethylallyltransferase	1 C00235[m] + 1 C00129[m] -> 1 C00013[m] + 1 C00341[m]	Terpenoid Backbone	0	0	1000	0 2.5.1.1
2.5.1.10	geranyltransferase	1 C00341[m] + 1 C00129[m] -> 1 C00013[m] + 1 C00448[m]	Terpenoid Backbone	0	0	1000	0 2.5.1.10
2.5.1.15a	dihydropteroate synthase	1 C04807[c] + 1 C00568[c] -> 1 C00013[c] + 1 C00921[c]	Folate	0	0	1000	0 2.5.1.15
2.5.1.15b	dihydropteroate synthase	1 C01300[c] + 1 C00568[c] -> 1 C00001[c] + 1 C00921[c]	Folate	0	0	1000	0 2.5.1.15
2.5.1.19	3-phosphoshikimate 1-carboxyvinyltransferase	1 C00074[c] + 1 C03175[c] -> 1 C00009[c] + 1 C01269[c]	Shikimate	1	-1000	1000	0 2.5.1.19
2.5.1.29	farnesyltransferase	1 C00448[m] + 1 C00129[m] -> 1 C00013[m] + 1 C00353[m]	Terpenoid Backbone	0	0	1000	0 2.5.1.29
2.5.1.31a	di-trans,poly-cis-decaprenylcistransferase	1 C00448[m] + 1 C00129[m] -> 1 C11356[m] + 1 C00013[m]	Terpenoid Backbone	0	0	1000	0 2.5.1.31
2.5.1.31b	di-trans,poly-cis-decaprenylcistransferase	1 C11356[m] + 7 C00129[m] -> 1 C04574[m] + 7 C00013[m]	Terpenoid Backbone	0	0	1000	0 2.5.1.31
2.5.1.54	3-deoxy-7-phosphoheptulonate synthase	1 C00074[c] + 1 C00279[c] + 1 C00001[c] -> 1 C04691[c] + 1 C00009[c]	Shikimate	0	0	1000	0 2.5.1.54
2.5.1.6	methionine adenosyltransferase	1 C00002[c] + 1 C00073[c] + 1 C00001[c] -> 1 C00009[c] + 1 C00013[c] + 1 C00019[c]	Cysteine/Methionine	0	0	1000	0 2.5.1.6
2.5.1.61	hydroxymethylbilane synthase	4 C00931[a] + 1 C00001[a] -> 1 C01024[a] + 4 C00014[a]	Porphyrin	0	0	1000	0 2.5.1.61
2.6.99.2	pyridoxal 5-phosphate synthase	1 C00118[c] + 1 C00117[c] + 1 C00064[c] -> 1 C00018[c] + 1 C00025[c] + 1 C00009[c] + 3 C00001[c]	Misc	0	0	1000	0 2.6.99.2
2.6.1.1a	aspartate transaminase	1 C00049[c] + 1 C00026[c] -> 1 C00036[c] + 1 C00025[c]	Glutamate/Glutamine	1	-1000	1000	0 2.6.1.1
2.6.1.1b	aspartate transaminase	1 C00097[c] + 1 C00026[c] -> 1 C00957[c] + 1 C00025[c]	Cysteine/Methionine	1	-1000	1000	0 2.6.1.1
2.6.1.13	ornithine aminotransferase	1 C00077[c] + 1 C00026[c] -> 1 C01165[c] + 1 C00025[c]	Arginine/Proline	1	-1000	1000	0 2.6.1.13
2.6.1.16	glutamine-fructose-6-phosphate transaminase (isomerizing)	1 C00064[c] + 1 C00085[c] -> 1 C00025[c] + 1 C00352[c]	Amino Sugar	1	-1000	1000	0 2.6.1.16
2.6.1.17	succinyldiaminopimelate transaminase	1 C04462[m] + 1 C00025[m] -> 1 C04421[m] + 1 C00026[m]	Lysine	1	-1000	1000	0 2.6.1.17
2.6.1.42a	branched-chain-amino-acid transaminase	1 C00123[m] + 1 C00026[m] -> 1 C00233[m] + 1 C00025[m]	Branched Amino Acid	1	-1000	1000	0 2.6.1.42
2.6.1.42b	branched-chain-amino-acid transaminase	1 C00183[m] + 1 C00026[m] -> 1 C00141[m] + 1 C00025[m]	Branched Amino Acid	1	-1000	1000	0 2.6.1.42
2.6.1.42c	branched-chain-amino-acid transaminase	1 C00407[m] + 1 C00026[m] -> 1 C00671[m] + 1 C00025[m]	Branched Amino Acid	1	-1000	1000	0 2.6.1.42
2.6.1.52	phosphoserine transaminase	1 C03232[c] + 1 C00025[c] -> 1 C01005[c] + 1 C00026[c]	Serine/Glycine	1	-1000	1000	0 2.6.1.52
2.6.1.85	aminodeoxychorismate synthase	1 C00251[c] + 1 C00064[c] -> 1 C11355[c] + 1 C00025[c]	Folate	0	0	1000	0 2.6.1.85
2.7.1.1a	hexokinase	1 C00002[c] + 1 C00031[c] -> 1 C00008[c] + 1 C00092[c]	Glycolysis	0	0	1000	0 2.7.1.1
2.7.1.107	diacylglycerol kinase	1 C00002[er] + 1 C00641[er] -> 1 C00008[er] + 1 C00416[er]	Phospholipid	0	0	1000	0 2.7.1.107
2.7.1.137	phosphatidylinositol 3-kinase	1 C00002[er] + 1 C01194[er] -> 1 C00008[er] + 1 C04549[er]	Phospholipid	0	0	1000	0 2.7.1.137
2.7.1.148	4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol kinase	1 C00002[a] + 1 C11435[a] -> 1 C00008[a] + 1 C11436[a]	Terpenoid Backbone	0	0	1000	0 2.7.1.148
2.7.1.15a	ribokinase	1 C00002[c] + 1 C00121[c] -> 1 C00008[c] + 1 C00117[c]	Pentose Phosphate	1	-1000	1000	0 2.7.1.15
2.7.1.15b	ribokinase	1 C00002[c] + 1 C01801[c] -> 1 C00008[c] + 1 C00673[c]	Pentose Phosphate	1	-1000	1000	0 2.7.1.15
2.7.1.20	adenosine kinase	1 C00002[c] + 1 C00212[c] -> 1 C00008[c] + 1 C00020[c]	Purine	1	-1000	1000	0 2.7.1.20
2.7.1.23	NAD+ kinase	1 C00002[c] + 1 C00003[c] -> 1 C00008[c] + 1 C00006[c]	Nicotinate	0	0	1000	0 2.7.1.23
2.7.1.24	dephospho-CoA kinase	1 C00002[m] + 1 C00882[m] -> 1 C00008[m] + 1 C00010[m]	CoA Synthesis	0	0	1000	0 2.7.1.24
2.7.1.25	adenylyl-sulfate kinase	1 C00002[c] + 1 C00224[c] -> 1 C00008[c] + 1 C00053[c]	Sulfur	0	0	1000	0 2.7.1.25
2.7.1.32	choline kinase	1 C00002[c] + 1 C00114[c] -> 1 C00008[c] + 1 C00588[c]	Phospholipid	0	0	1000	0 2.7.1.32
2.7.1.33	pantothenate kinase	1 C00002[m] + 1 C00864[m] -> 1 C00008[m] + 1 C03492[m]	CoA Synthesis	0	0	1000	0 2.7.1.33
2.7.1.39	homoserine kinase	1 C00002[c] + 1 C00263[c] -> 1 C00008[c] + 1 C01102[c]	Serine/Glycine	0	0	1000	0 2.7.1.39
2.7.1.40a	pyruvate kinase	1 C00008[c] + 1 C00074[c] -> 1 C00002[c] + 1 C00022[c]	Glycolysis	0	0	1000	0 2.7.1.40
2.7.1.40b	pyruvate kinase	1 C00008[a] + 1 C00074[a] -> 1 C00002[a] + 1 C00022[a]	Glycolysis	0	0	1000	0 2.7.1.40

2.7.1.67	1-phosphatidylinositol 4-kinase	1 C00002[er] + 1 C01194[er] -> 1 C00008[er] + 1 C01277[er]	Phospholipid	0	0	1000	0	2.7.1.67
2.7.1.68	1-phosphatidylinositol-4-phosphate 5-kinase	1 C00002[er] + 1 C01277[er] -> 1 C00008[er] + 1 C04637[er]	Phospholipid	0	0	1000	0	2.7.1.68
2.7.1.71	shikimate kinase	1 C00002[c] + 1 C00493[c] -> 1 C00008[c] + 1 C03175[c]	Shikimate	0	0	1000	0	2.7.1.71
2.7.1.90	diphosphate-fructose-6-phosphate 1-phosphotransferase	1 C00013[c] + 1 C00085[c] -> 1 C00009[c] + 1 C00354[c]	Glycolysis	0	0	1000	0	2.7.1.90
2.7.2.11	glutamate 5-kinase	1 C00002[c] + 1 C00025[c] -> 1 C00008[c] + 1 C03287[c]	Arginine/Proline	0	0	1000	0	2.7.2.11
2.7.2.2	carbamate kinase	1 C00008[c] + 1 C00169[c] -> 1 C00002[c] + 1 C00014[c] + 1 C00011[c]	Pyrimidine	1	-1000	1000	0	2.7.2.2
2.7.2.3a	phosphoglycerate kinase	1 C00002[c] + 1 C00197[c] -> 1 C00008[c] + 1 C00236[c]	Glycolysis	1	-1000	1000	0	2.7.2.3
2.7.2.3b	phosphoglycerate kinase	1 C00002[a] + 1 C00197[a] -> 1 C00008[a] + 1 C00236[a]	Glycolysis	1	-1000	1000	0	2.7.2.3
2.7.2.4	aspartate kinase	1 C00002[m] + 1 C00049[m] -> 1 C00008[m] + 1 C03082[m]	Lysine	0	0	1000	0	2.7.2.4
2.7.4.14a	cytidylate kinase	1 C00002[c] + 1 C00055[c] -> 1 C00008[c] + 1 C00112[c]	Pyrimidine	1	-1000	1000	0	2.7.4.14
2.7.4.14b	cytidylate kinase	1 C00002[c] + 1 C00239[c] -> 1 C00008[c] + 1 C00705[c]	Pyrimidine	1	-1000	1000	0	2.7.4.14
2.7.4.14c	cytidylate kinase	1 C00002[c] + 1 C00105[c] -> 1 C00008[c] + 1 C00015[c]	Pyrimidine	1	-1000	1000	0	2.7.4.14
2.7.4.3a	adenylate kinase	1 C00002[c] + 1 C00020[c] -> 2 C00008[c]	Purine	1	-1000	1000	0	2.7.4.3
2.7.4.3b	adenylate kinase	1 C00002[c] + 1 C00360[c] -> 1 C00008[c] + 1 C00206[c]	Purine	1	-1000	1000	0	2.7.4.3
2.7.4.6a	nucleoside-diphosphate kinase	1 C00002[c] + 1 C00015[c] -> 1 C00008[c] + 1 C00075[c]	Pyrimidine	1	-1000	1000	0	2.7.4.6
2.7.4.6b	nucleoside-diphosphate kinase	1 C00002[c] + 1 C00035[c] -> 1 C00008[c] + 1 C00044[c]	Purine	1	-1000	1000	0	2.7.4.6
2.7.4.6c	nucleoside-diphosphate kinase	1 C00002[c] + 1 C00112[c] -> 1 C00008[c] + 1 C00063[c]	Pyrimidine	1	-1000	1000	0	2.7.4.6
2.7.4.6d	nucleoside-diphosphate kinase	1 C00002[c] + 1 C00104[c] -> 1 C00008[c] + 1 C00081[c]	Purine	1	-1000	1000	0	2.7.4.6
2.7.4.6e	nucleoside-diphosphate kinase	1 C00002[c] + 1 C00206[c] -> 1 C00008[c] + 1 C00131[c]	Pyrimidine	1	-1000	1000	0	2.7.4.6
2.7.4.6f	nucleoside-diphosphate kinase	1 C00002[c] + 1 C00361[c] -> 1 C00008[c] + 1 C00286[c]	Purine	1	-1000	1000	0	2.7.4.6
2.7.4.6g	nucleoside-diphosphate kinase	1 C00002[c] + 1 C00363[c] -> 1 C00008[c] + 1 C00459[c]	Pyrimidine	1	-1000	1000	0	2.7.4.6
2.7.4.6h	nucleoside-diphosphate kinase	1 C00002[c] + 1 C00705[c] -> 1 C00008[c] + 1 C00458[c]	Pyrimidine	1	-1000	1000	0	2.7.4.6
2.7.4.6i	nucleoside-diphosphate kinase	1 C00002[c] + 1 C01346[c] -> 1 C00008[c] + 1 C00460[c]	Pyrimidine	1	-1000	1000	0	2.7.4.6
2.7.4.8a	guanylate kinase	1 C00002[c] + 1 C00144[c] -> 1 C00008[c] + 1 C00035[c]	Purine	1	-1000	1000	0	2.7.4.8
2.7.4.8b	guanylate kinase	1 C00002[c] + 1 C00362[c] -> 1 C00008[c] + 1 C00361[c]	Purine	1	-1000	1000	0	2.7.4.8
2.7.4.9a	dTMP kinase	1 C00002[c] + 1 C00364[c] -> 1 C00008[c] + 1 C00363[c]	Pyrimidine	1	-1000	1000	0	2.7.4.9
2.7.4.9b	dTMP kinase	1 C00002[c] + 1 C00365[c] -> 1 C00008[c] + 1 C01346[c]	Pyrimidine	1	-1000	1000	0	2.7.4.9
2.7.6.1	ribose-phosphate diphosphokinase	1 C00002[c] + 1 C00117[c] -> 1 C00020[c] + 1 C00119[c]	Pentose Phosphate	0	0	1000	0	2.7.6.1
2.7.6.3	2-amino-4-hydroxy-6-hydroxymethylhydropteridine diphosphokinase	1 C00002[c] + 1 C01300[c] -> 1 C00020[c] + 1 C04807[c]	Folate	0	0	1000	0	2.7.6.3
2.7.7.13	mannose-1-phosphate guanylyltransferase	1 C00044[c] + 1 C00636[c] -> 1 C00013[c] + 1 C00096[c]	Misc	0	0	1000	0	2.7.7.13
2.7.7.15	choline-phosphate cytidyltransferase	1 C00063[c] + 1 C00588[c] -> 1 C00013[c] + 1 C00307[c]	Phospholipid	0	0	1000	0	2.7.7.15
2.7.7.18	Nicotinate-nucleotide adenyltransferase	1 C00002[c] + 1 C01185[c] -> 1 C00013[c] + 1 C00857[c]	Nicotinate	1	-1000	1000	0	2.7.7.18
2.7.7.23	UDP-N-acetylglucosamine diphosphorylase	1 C00075[c] + 1 C04256[c] -> 1 C00013[c] + 1 C00043[c]	Amino Sugar	0	0	1000	0	2.7.7.23
2.7.7.27	glucose-1-phosphate adenyltransferase	1 C00002[c] + 1 C00103[c] -> 1 C00013[c] + 1 C00498[c]	Misc	0	0	1000	0	2.7.7.27
2.7.7.3	pantetheine-phosphate adenyltransferase	1 C00002[m] + 1 C01134[m] -> 1 C00013[m] + 1 C00882[m]	CoA Synthesis	1	-1000	1000	0	2.7.7.3
2.7.7.4	sulfate adenyltransferase	1 C00002[c] + 1 C00059[c] -> 1 C00013[c] + 1 C00224[c]	Sulfur	0	0	1000	0	2.7.7.4
2.7.7.41	phosphatidate cytidyltransferase	1 C00063[er] + 1 C00416[er] -> 1 C00013[er] + 1 C00269[er]	Phospholipid	0	0	1000	0	2.7.7.41
2.7.7.60	2-C-methyl-D-erythritol 4-phosphate cytidyltransferase	1 C00063[a] + 1 C11434[a] -> 1 C00013[a] + 1 C11435[a]	Terpenoid Backbone	0	0	1000	0	2.7.7.60
2.7.8.11	CDP-diacylglycerol-inositol 3-phosphatidyltransferase	1 C00269[er] + 1 C00137[er] -> 1 C00055[er] + 1 C01194[er]	Phospholipid	0	0	1000	0	2.7.8.11
2.7.8.15	UDP-N-acetylglucosamine-dolichyl-phosphate	1 C00043[c] + 1 C00110[c] -> 1 C00105[c] + 1 C04500[c]	Amino Sugar	0	0	1000	0	2.7.8.15
2.7.8.2	diacylglycerol cholinephosphotransferase	1 C00307[er] + 1 C00641[er] -> 1 C00055[er] + 1 C00157[er]	Phospholipid	0	0	1000	0	2.7.8.2
2.7.8.27	sphingomyelin synthase	1 C00195[er] + 1 C00157[er] -> 1 C00550[er] + 1 C00641[er]	Phospholipid	0	0	1000	0	2.7.8.27
2.7.8.5	CDP-diacylglycerol-glycerol-3-phosphate 3-phosphatidyltransferase	1 C00269[er] + 1 C00093[er] -> 1 C00055[er] + 1 C03892[er]	Phospholipid	0	0	1000	0	2.7.8.5
2.7.8.8	CDP-diacylglycerol-serine O-phosphatidyltransferase	1 C00269[er] + 1 C00065[er] -> 1 C00055[er] + 1 C02737[er]	Phospholipid	0	0	1000	0	2.7.8.8
2.8.3.8	acetate CoA-transferase	1 C00332[m] + 1 C00033[m] -> 1 C00164[m] + 1 C00024[m]	Misc	0	0	1000	0	2.8.3.8
3.1.1.31	6-phosphogluconolactonase	1 C01236[c] + 1 C00001[c] -> 1 C00345[c]	Pentose Phosphate	0	0	1000	0	3.1.1.31
3.1.1.32	phospholipase A1	1 C00157[er] + 1 C00001[er] -> 1 C04233[er] + 1 C00060[er]	Phospholipid	0	0	1000	0	3.1.1.32
3.1.1.4	phospholipase A2	1 C00157[er] + 1 C00001[er] -> 1 C04230[er] + 1 C00060[er]	Phospholipid	0	0	1000	0	3.1.1.4
3.1.1.5a	lysophospholipase	1 C04230[er] + 1 C00001[er] -> 1 C00670[er] + 1 C00060[er]	Phospholipid	0	0	1000	0	3.1.1.5
3.1.1.5b	lysophospholipase	1 C04233[er] + 1 C00001[er] -> 1 C00670[er] + 1 C00060[er]	Phospholipid	0	0	1000	0	3.1.1.5
3.1.2.14a	oleoyl-[acyl-carrier-protein] hydrolase	1 C01203[a] + 1 C00001[a] -> 1 C00229[a] + 1 C00712[a]	Fatty Acid Synthesis	0	0	1000	0	3.1.2.14
3.1.2.14b	oleoyl-[acyl-carrier-protein] hydrolase	1 C05764[a] + 1 C00001[a] -> 1 C00229[a] + 1 C00249[a]	Fatty Acid Synthesis	0	0	1000	0	3.1.2.14
3.1.2.14c	oleoyl-[acyl-carrier-protein] hydrolase	1 C05223[a] + 1 C00001[a] -> 1 C00229[a] + 1 C02679[a]	Fatty Acid Synthesis	0	0	1000	0	3.1.2.14
3.1.2.14d	oleoyl-[acyl-carrier-protein] hydrolase	1 C05761[a] + 1 C00001[a] -> 1 C00229[a] + 1 C06424[a]	Fatty Acid Synthesis	0	0	1000	0	3.1.2.14
3.1.2.14e	oleoyl-[acyl-carrier-protein] hydrolase	1 C04088[a] + 1 C00001[a] -> 1 C00229[a] + 1 C01530[a]	Fatty Acid Synthesis	0	0	1000	0	3.1.2.14
3.1.2.2	palmitoyl-CoA hydrolase	1 C00154[a] + 1 C00001[a] -> 1 C00010[a] + 1 C00249[a]	Fatty Acid Synthesis	0	0	1000	0	3.1.2.2
3.1.2.4	3-hydroxyisobutyryl-CoA hydrolase	1 C04047[m] + 1 C00001[m] -> 1 C00010[m] + 1 C01188[m]	Branched Amino Acid	0	0	1000	0	3.1.2.4
3.1.2.6	hydroxyacylglutathione hydrolase	1 C03451[c] + 1 C00001[c] -> 1 C00051[c] + 1 C00256[c]	Misc	0	0	1000	0	3.1.2.6
3.1.3.11	fructose-bisphosphatase	1 C00354[c] + 1 C00001[c] -> 1 C00085[c] + 1 C00009[c]	Glycolysis	0	0	1000	0	3.1.3.11
3.1.3.25	inositol-phosphate phosphatase	1 C04006[er] + 1 C00001[er] -> 1 C00137[er] + 1 C00009[er]	Phospholipid	0	0	1000	0	3.1.3.25
3.1.3.3	phosphoserine phosphatase	1 C01005[c] + 1 C00001[c] -> 1 C00065[c] + 1 C00009[c]	Serine/Glycine	0	0	1000	0	3.1.3.3
3.1.3.37	sedoheptulose-bisphosphatase	1 C00447[c] + 1 C00001[c] -> 1 C05382[c] + 1 C00009[c]	Glycolysis	0	0	1000	0	3.1.3.37
3.1.3.4	phosphatidate phosphatase	1 C00416[er] + 1 C00001[er] -> 1 C00641[er] + 1 C00009[er]	Phospholipid	0	0	1000	0	3.1.3.4
3.1.3.5a	5'-nucleotidase	1 C00020[c] + 1 C00001[c] -> 1 C00212[c] + 1 C00009[c]	Purine	0	0	1000	0	3.1.3.5
3.1.3.5b	5'-nucleotidase	1 C00055[c] + 1 C00001[c] -> 1 C00475[c] + 1 C00009[c]	Pyrimidine	0	0	1000	0	3.1.3.5

3.1.3.5c	5'-nucleotidase	1 C00105[c] + 1 C00001[c] -> 1 C00299[c] + 1 C00009[c]	Pyrimidine	0	0	1000	0 3.1.3.5
3.1.3.5d	5'-nucleotidase	1 C00130[c] + 1 C00001[c] -> 1 C00294[c] + 1 C00009[c]	Purine	0	0	1000	0 3.1.3.5
3.1.3.5e	5'-nucleotidase	1 C00144[c] + 1 C00001[c] -> 1 C00387[c] + 1 C00009[c]	Purine	0	0	1000	0 3.1.3.5
3.1.3.5f	5'-nucleotidase	1 C00455[c] + 1 C00001[c] -> 1 C03150[c] + 1 C00009[c]	Nicotinate	0	0	1000	0 3.1.3.5
3.1.3.5g	5'-nucleotidase	1 C00655[c] + 1 C00001[c] -> 1 C01762[c] + 1 C00009[c]	Purine	0	0	1000	0 3.1.3.5
3.1.3.5h	5'-nucleotidase	1 C01185[c] + 1 C00001[c] -> 1 C05841[c] + 1 C00009[c]	Nicotinate	0	0	1000	0 3.1.3.5
3.1.3.5i	5'-nucleotidase	1 C00362[c] + 1 C00001[c] -> 1 C00330[c] + 1 C00009[c]	Purine	0	0	1000	0 3.1.3.5
3.1.3.5j	5'-nucleotidase	1 C00360[c] + 1 C00001[c] -> 1 C00559[c] + 1 C00009[c]	Purine	1	-1000	1000	0 3.1.3.5
3.1.3.5k	2'-Deoxyuridine 5'-monophosphate phosphohydrolase	1 C00365[c] + 1 C00001[c] -> 1 C00526[c] + 1 C00009[c]	Pyrimidine	1	-1000	1000	0 3.1.3.5
3.1.4.11	phosphoinositide phospholipase C	1 C04637[er] + 1 C00001[er] -> 1 C01245[er] + 1 C00641[er]	Phospholipid	0	0	1000	0 3.1.4.11
3.1.4.17a	3',5'-cyclic-nucleotide phosphodiesterase	1 C00575[c] + 1 C00001[c] -> 1 C00020[c]	Purine	0	0	1000	0 3.1.4.17
3.1.4.17b	3',5'-cyclic-nucleotide phosphodiesterase	1 C00942[c] + 1 C00001[c] -> 1 C00144[c]	Purine	0	0	1000	0 3.1.4.17
3.1.4.46	glycerophosphodiester phosphodiesterase	1 C00670[c] + 1 C00001[c] -> 1 C00114[c] + 1 C00093[c]	Phospholipid	0	0	1000	0 3.1.4.46
3.3.1.1	adenosylhomocysteinase	1 C00021[c] + 1 C00001[c] -> 1 C00155[c] + 1 C00212[c]	Cysteine/Methionine	0	0	1000	0 3.3.1.1
3.5.1.18	succinyl-diaminopimelate desuccinylase	1 C04421[m] + 1 C00001[m] -> 1 C00042[m] + 1 C00666[m]	Lysine	0	0	1000	0 3.5.1.18
3.5.1.19	nicotinamidase	1 C00153[c] + 1 C00001[c] -> 1 C00253[c] + 1 C00014[c]	Nicotinate	0	0	1000	0 3.5.1.19
3.5.1.89	N-acetylglucosaminylphosphatidylinositol deacetylase	1 C01288[er] + 1 C00001[er] -> 1 C04248[er] + 1 C00033[er]	Phospholipid	0	0	1000	0 3.5.1.89
3.5.2.3	dihydroorotase	1 C00438[c] -> 1 C00337[c] + 1 C00001[c]	Pyrimidine	0	0	1000	0 3.5.2.3
3.5.3.6	arginine deiminase	1 C00062[c] + 1 C00001[c] -> 1 C00327[c] + 1 C00014[c]	Arginine/Proline	0	0	1000	0 3.5.3.6
3.5.4.12	dCMP aminohydrolase	1 C00239[c] + 1 C00001[c] -> 1 C00365[c] + 1 C00014[c]	Pyrimidine	1	-1000	1000	0 3.5.4.12
3.5.4.16	GTP cyclohydrolase I	1 C00044[c] + 1 C00001[c] -> 1 C00058[c] + 1 C04895[c]	Folate	0	0	1000	0 3.5.4.16
3.5.4.2	adenine deaminase	1 C00147[c] + 1 C00001[c] -> 1 C00262[c] + 1 C00014[c]	Purine	0	0	1000	0 3.5.4.2
3.5.4.4a	adenosine deaminase	1 C00212[c] + 1 C00001[c] -> 1 C00294[c] + 1 C00014[c]	Purine	0	0	1000	0 3.5.4.4
3.5.4.4b	adenosine deaminase	1 C00559[c] + 1 C00001[c] -> 1 C05512[c] + 1 C00014[c]	Purine	0	0	1000	0 3.5.4.4
3.5.4.6	AMP deaminase	1 C00020[c] + 1 C00001[c] -> 1 C00130[c] + 1 C00014[c]	Purine	0	0	1000	0 3.5.4.6
3.6.1.-	Hydrolases	1 C04895[c] + 2 C00001[c] -> 1 C04874[c] + 1 C00013[c] + 1 C00009[c]	Folate	0	0	1000	0 3.6.1.-
3.6.1.1	inorganic diphosphatase	1 C00013[c] + 1 C00001[c] -> 2 C00009[c]	Misc	0	0	1000	0 3.6.1.1
3.6.1.22a	NAD+ diphosphatase	1 C00003[c] + 1 C00001[c] -> 1 C00020[c] + 1 C00455[c]	Nicotinate	0	0	1000	0 3.6.1.22
3.6.1.22b	NAD+ diphosphatase	1 C00857[c] + 1 C00001[c] -> 1 C00020[c] + 1 C01185[c]	Nicotinate	0	0	1000	0 3.6.1.22
3.6.1.23	dUTP diphosphatase	1 C00460[c] + 1 C00001[c] -> 1 C00365[c] + 1 C00013[c]	Pyrimidine	0	0	1000	0 3.6.1.23
3.6.1.29	bis(5'-adenosyl)-triphosphatase	1 C06197[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00020[c]	Purine	0	0	1000	0 3.6.1.29
3.6.1.5a	apyrase	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c]	Purine	0	0	1000	0 3.6.1.5
3.6.1.5b	apyrase	1 C00008[c] + 1 C00001[c] -> 1 C00020[c] + 1 C00009[c]	Purine	0	0	1000	0 3.6.1.5
3.6.1.5c	apyrase	1 C00015[c] + 1 C00001[c] -> 1 C00105[c] + 1 C00009[c]	Pyrimidine	0	0	1000	0 3.6.1.5
3.6.1.5d	apyrase	1 C00075[c] + 1 C00001[c] -> 1 C00015[c] + 1 C00009[c]	Pyrimidine	0	0	1000	0 3.6.1.5
3.6.1.5e	apyrase	1 C00035[c] + 1 C00001[c] -> 1 C00144[c] + 1 C00009[c]	Purine	0	0	1000	0 3.6.1.5
3.6.1.5f	apyrase	1 C00044[c] + 1 C00001[c] -> 1 C00035[c] + 1 C00009[c]	Purine	0	0	1000	0 3.6.1.5
3.6.1.5g	apyrase	1 C00112[c] + 1 C00001[c] -> 1 C00055[c] + 1 C00009[c]	Pyrimidine	0	0	1000	0 3.6.1.5
3.6.1.5h	apyrase	1 C00063[c] + 1 C00001[c] -> 1 C00112[c] + 1 C00009[c]	Pyrimidine	0	0	1000	0 3.6.1.5
3.6.1.5i	apyrase	1 C00081[c] + 1 C00001[c] -> 1 C00104[c] + 1 C00009[c]	Purine	0	0	1000	0 3.6.1.5
3.6.1.5j	apyrase	1 C00104[c] + 1 C00001[c] -> 1 C00130[c] + 1 C00009[c]	Purine	0	0	1000	0 3.6.1.5
3.6.1.5k	apyrase	1 C00363[c] + 1 C00001[c] -> 1 C00364[c] + 1 C00009[c]	Pyrimidine	0	0	1000	0 3.6.1.5
3.6.1.5l	apyrase	1 C00459[c] + 1 C00001[c] -> 1 C00363[c] + 1 C00009[c]	Pyrimidine	0	0	1000	0 3.6.1.5
3.6.1.7	acylphosphatase	1 C00227[c] + 1 C00001[c] -> 1 C00033[c] + 1 C00009[c]	Misc	1	-1000	1000	0 3.6.1.7
3.6.3.12	K+-transporting ATPase	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00238[c]	Extracellular Transport	0	0	1000	0 3.6.3.12
3.6.3.14	H+-transporting two-sector ATPase	1 C00002[m] + 1 C00001[m] + 3.5 C00080[m] -> 1 C00008[m] + 1 C00009[m] + 3.5 C00080[m]	Oxidative Phosphorylation	1	-1000	1000	0 3.6.3.14
3.6.3.16	arsenite-transporting ATPase	1 C00002[c] + 1 C00001[c] + 1 C06697[c] -> 1 C00008[c] + 1 C00009[c]	Extracellular Transport	0	0	1000	0 3.6.3.16
3.6.3.25	sulfate-transporting ATPase	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00059[c]	Extracellular Transport	0	0	1000	0 3.6.3.25
3.6.3.4	Cu2+-exporting ATPase	1 C00002[c] + 1 C00001[c] + 1 C00070[c] -> 1 C00008[c] + 1 C00009[c]	Extracellular Transport	0	0	1000	0 3.6.3.4
3.6.3.44	xenobiotic-transporting ATPase	1 C00002[c] + 1 C00001[c] + 1 xenobiotic[c] -> 1 C00008[c] + 1 C00009[c]	Extracellular Transport	0	0	1000	0 3.6.3.44
3.6.3.6	H+-exporting ATPase	1 C00002[c] + 1 C00001[c] + 1 C00080[c] -> 1 C00008[c] + 1 C00009[c]	Extracellular Transport	0	0	1000	0 3.6.3.6
3.6.3.8	Ca2+-transporting ATPase	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00076[c]	Extracellular Transport	0	0	1000	0 3.6.3.8
4.1.1.20	diaminopimelate decarboxylase	1 C00680[m] -> 1 C00047[m] + 1 C00011[m]	Lysine	0	0	1000	0 4.1.1.20
4.1.1.23	orotidine-5'-phosphate decarboxylase	1 C01103[c] -> 1 C00105[c] + 1 C00011[c]	Pyrimidine	0	0	1000	0 4.1.1.23
4.1.1.36	phosphopantotheno[cysteine] decarboxylase	1 C04352[m] -> 1 C01134[m] + 1 C00011[m]	CoA Synthesis	0	0	1000	0 4.1.1.36
4.1.1.37	uroporphyrinogen decarboxylase	1 C01051[a] -> 1 C03263[a] + 4 C00011[a]	Porphyrin	0	0	1000	0 4.1.1.37
4.1.1.49	phosphoenolpyruvate carboxykinase (ATP)	1 C00002[c] + 1 C00036[c] -> 1 C00008[c] + 1 C00074[c] + 1 C00011[c]	Glycolysis	0	0	1000	0 4.1.1.49
4.1.1.65	phosphatidylserine decarboxylase	1 C02737[er] -> 1 C00350[er] + 1 C00011[er]	Phospholipid	0	0	1000	0 4.1.1.65
4.1.2.13a	fructose-bisphosphate aldolase	1 C00354[c] -> 1 C00111[c] + 1 C00118[c]	Glycolysis	1	-1000	1000	0 4.1.2.13
4.1.2.13b	fructose-bisphosphate aldolase	1 C00447[c] -> 1 C00111[c] + 1 C00279[c]	Pentose Phosphate	1	-1000	1000	0 4.1.2.13
4.1.2.25	dihydroneopterin aldolase	1 C04874[c] -> 1 C01300[c] + 1 C00266[c]	Folate	0	0	1000	0 4.1.2.25
4.1.2.4	deoxyribose-phosphate aldolase	1 C00673[c] -> 1 C00118[c] + 1 C00084[c]	Pentose Phosphate	1	-1000	1000	0 4.1.2.4
4.1.3.30	methylisocitrate lyase	1 C04593[m] -> 1 C00042[m] + 1 C00022[m]	MC Cycle	0	0	1000	0 4.1.3.30
4.1.3.38	aminodeoxychorismate lyase	1 C11355[c] -> 1 C00568[c] + 1 C00022[c]	Folate	0	0	1000	0 4.1.3.38
4.2.1.10	3-dehydroquinate dehydratase	1 C00944[c] -> 1 C02637[c] + 1 C00001[c]	Shikimate	1	-1000	1000	0 4.2.1.10

4.2.1.11	phosphopyruvate hydratase	1 C00631[c] -> 1 C00074[c] + 1 C00001[c]	Glycolysis	1	-1000	1000	0	4.2.1.11
4.2.1.17a	enoyl-CoA hydratase	1 C00640[m] -> 1 C00658[m] + 1 C00001[m]	Beta Oxidation	1	-1000	1000	0	4.2.1.17
4.2.1.17b	enoyl-CoA hydratase	1 C04405[m] -> 1 C03345[m] + 1 C00001[m]	Branched Amino Acid	1	-1000	1000	0	4.2.1.17
4.2.1.17c	enoyl-CoA hydratase	1 C04047[m] -> 1 C03460[m] + 1 C00001[m]	Branched Amino Acid	1	-1000	1000	0	4.2.1.17
4.2.1.18	methylglutaconyl-CoA hydratase	1 C03231[m] + 1 C00001[m] -> 1 C00356[m]	Branched Amino Acid	1	-1000	1000	0	4.2.1.18
4.2.1.2	fumarate hydratase	1 C00122[m] + 1 C00001[m] -> 1 C00149[m]	TCA Cycle	1	-1000	1000	0	4.2.1.2
4.2.1.22	cystathionine beta-synthase	1 C00065[c] + 1 C00155[c] -> 1 C02291[c] + 1 C00001[c]	Cysteine/Methionine	0	0	1000	0	4.2.1.22
4.2.1.24	porphobilinogen synthase	2 C00430[a] -> 1 C00931[a] + 2 C00001[a]	Porphyrin	0	0	1000	0	4.2.1.24
4.2.1.3	aconitate hydratase	1 C00158[m] -> 1 C00311[m]	TCA Cycle	1	-1000	1000	0	4.2.1.3
4.2.1.52	dihydrodipicolinate synthase	1 C00441[m] + 1 C00022[m] -> 1 C03340[m] + 2 C00001[m]	Lysine	0	0	1000	0	4.2.1.52
4.2.1.60a	3-hydroxydecanoyl-[acp] dehydratase	1 C04619[a] -> 1 C05754[a] + 1 C00001[a]	Fatty Acid Synthesis	1	-1000	1000	0	4.2.1.60
4.2.1.60b	3-hydroxydecanoyl-[acp] dehydratase	1 C05757[a] -> 1 C05758[a] + 1 C00001[a]	Fatty Acid Synthesis	1	-1000	1000	0	4.2.1.60
4.2.1.60c	3-hydroxydecanoyl-[acp] dehydratase	1 C04618[a] -> 1 C04246[a] + 1 C00001[a]	Fatty Acid Synthesis	1	-1000	1000	0	4.2.1.60
4.2.1.60d	3-hydroxydecanoyl-[acp] dehydratase	1 C05747[a] -> 1 C05748[a] + 1 C00001[a]	Fatty Acid Synthesis	1	-1000	1000	0	4.2.1.60
4.2.1.60e	3-hydroxydecanoyl-[acp] dehydratase	1 C04620[a] -> 1 C05751[a] + 1 C00001[a]	Fatty Acid Synthesis	1	-1000	1000	0	4.2.1.60
4.2.1.61a	3-hydroxydecanoyl-[acp] dehydratase	1 C04688[a] -> 1 C05760[a] + 1 C00001[a]	Fatty Acid Synthesis	1	-1000	1000	0	4.2.1.61
4.2.1.61b	3-hydroxydecanoyl-[acp] dehydratase	1 C04633[a] -> 1 C05763[a] + 1 C00001[a]	Fatty Acid Synthesis	1	-1000	1000	0	4.2.1.61
4.2.1.61c	3-hydroxydecanoyl-[acp] dehydratase	1 C16220[a] -> 1 C16221[a] + 1 C00001[a]	Fatty Acid Synthesis	1	-1000	1000	0	4.2.1.61
4.2.1.75	uroporphyrinogen-III synthase	1 C01024[a] -> 1 C01051[a] + 1 C00001[a]	Porphyrin	1	-1000	1000	0	4.2.1.75
4.2.1.79	2-methylcitrate dehydratase	1 C02225[m] -> 1 C04225[m] + 1 C00001[m]	MC Cycle	1	-1000	1000	0	4.2.1.79
4.2.1.96	4a-hydroxytetrahydrobiopterin dehydratase	1 C15522[c] -> 1 C00268[c] + 1 C00001[c]	Biopterin	1	-1000	1000	0	4.2.1.96
4.2.1.99	2-methylisocitrate dehydratase	1 C04593[m] -> 1 C04225[m] + 1 C00001[m]	MC Cycle	1	-1000	1000	0	4.2.1.99
4.2.3.1	threonine synthase	1 C01102[c] + 1 C00001[c] -> 1 C00188[c] + 1 C00009[c]	Serine/Glycine	0	0	1000	0	4.2.3.1
4.2.3.12	6-pyruvoyltetrahydropterin synthase	1 C04895[c] + 1 C00008[c] -> 1 C03684[c] + 1 C00002[c] + 1 C00013[c]	Biopterin	0	0	1000	0	4.2.3.12
4.2.3.4	3-dehydroquininate synthase	1 C04691[c] -> 1 C00944[c] + 1 C00009[c]	Shikimate	0	0	1000	0	4.2.3.4
4.2.3.5	chorismate synthase	1 C01269[c] -> 1 C00251[c] + 1 C00009[c]	Shikimate	0	0	1000	0	4.2.3.5
4.3.2.2	adenylosuccinate lyase	1 C03794[m] -> 1 C00122[m] + 1 C00020[m]	Purine	1	-1000	1000	0	4.3.2.2
4.4.1.1	cystathionine gamma-lyase	1 C02291[c] + 1 C00001[c] -> 1 C00097[c] + 1 C00014[c] + 1 C00109[c]	Cysteine/Methionine	0	0	1000	0	4.4.1.1
4.4.1.17	holocytochrome-c synthase	1 C00032[c] -> 1 C00126[c]	Porphyrin	0	0	1000	0	4.4.1.17
4.4.1.5	lactoylglutathione lyase	1 C03451[c] -> 1 C00051[c] + 1 C00546[c]	Misc	1	-1000	1000	0	4.4.1.5
4.6.1.1a	adenylate cyclase	1 C00002[c] -> 1 C00575[c] + 1 C00013[c]	Purine	0	0	1000	0	4.6.1.1
4.6.1.1b	adenylate cyclase	1 C00044[c] -> 1 C00942[c] + 1 C00013[c]	Purine	0	0	1000	0	4.6.1.1
4.6.1.12	2-C-methyl-D-erythritol 2,4-cyclodiphosphate synthase	1 C11436[a] -> 1 C11453[a] + 1 C00055[a]	Terpenoid Backbone	0	0	1000	0	4.6.1.12
4.99.1.1	ferrochelatase	1 C02191[m] + 1 C14818[m] -> 1 C00032[m] + 2 C00080[m]	Porphyrin	0	0	1000	0	4.99.1.1
5.1.1.7	diaminopimelate epimerase	1 C00666[m] -> 1 C00680[m]	Lysine	1	-1000	1000	0	5.1.1.7
5.1.3.1	ribulose-phosphate 3-epimerase	1 C00199[c] -> 1 C00231[c]	Pentose Phosphate	1	-1000	1000	0	5.1.3.1
5.1.3.2	UDP-glucose 4-epimerase	1 C00029[c] -> 1 C00052[c]	Misc	1	-1000	1000	0	5.1.3.2
5.3.1.1a	triose-phosphate isomerase	1 C00118[c] -> 1 C00111[c]	Glycolysis	1	-1000	1000	0	5.3.1.1
5.3.1.1b	triose-phosphate isomerase	1 C00118[a] -> 1 C00111[a]	Glycolysis	1	-1000	1000	0	5.3.1.1
5.3.1.6	ribose-5-phosphate isomerase	1 C00199[c] -> 1 C00117[c]	Pentose Phosphate	1	-1000	1000	0	5.3.1.6
5.3.1.8	mannose-6-phosphate isomerase	1 C00275[c] -> 1 C00085[c]	Misc	1	-1000	1000	0	5.3.1.8
5.3.1.9	glucose-6-phosphate isomerase	1 C00092[c] -> 1 C00085[c]	Glycolysis	1	-1000	1000	0	5.3.1.9
5.4.2.1	phosphoglycerate mutase	1 C00197[c] -> 1 C00631[c]	Glycolysis	1	-1000	1000	0	5.4.2.1
5.4.2.2	phosphoglucomutase	1 C00103[c] -> 1 C00092[c]	Glycolysis	1	-1000	1000	0	5.4.2.2
5.4.2.3	phosphoacetylglucosamine mutase	1 C04256[c] -> 1 C00357[c]	Amino Sugar	1	-1000	1000	0	5.4.2.3
5.4.2.8	phosphomannomutase	1 C00636[c] -> 1 C00275[c]	Misc	1	-1000	1000	0	5.4.2.8
5.5.1.4	inositol-3-phosphate synthase	1 C00092[c] -> 1 C04006[c]	Phospholipid	1	-1000	1000	0	5.5.1.4
6.2.1.1	acetate-CoA ligase	1 C00002[c] + 1 C00033[c] + 1 C00010[c] -> 1 C00020[c] + 1 C00013[c] + 1 C00024[c]	Glycolysis	0	0	1000	0	6.2.1.1
6.2.1.3a	long-chain-fatty-acid-CoA ligase	1 C00002[a] + 1 C00060[a] + 1 C00010[a] -> 1 C00020[a] + 1 C00013[a] + 1 C00040[a]	Fatty Acid Synthesis	1	-1000	1000	0	6.2.1.3
6.2.1.3b	long-chain-fatty-acid-CoA ligase	1 C00020[a] + 1 C00154[a] + 1 C00013[a] -> 1 C00002[a] + 1 C00249[a] + 1 C00010[a]	Fatty Acid Synthesis	1	-1000	1000	0	6.2.1.3
6.2.1.3c	long-chain-fatty-acid-CoA ligase	1 C00002[a] + 1 C00712[a] + 1 C00010[a] -> 1 C00020[a] + 1 C00510[a] + 1 C00013[a]	Fatty Acid Synthesis	1	-1000	1000	0	6.2.1.3
6.2.1.3d	long-chain-fatty-acid-CoA ligase	1 C00020[a] + 1 C02050[a] + 1 C00013[a] -> 1 C00002[a] + 1 C01595[a] + 1 C00010[a]	Fatty Acid Synthesis	1	-1000	1000	0	6.2.1.3
6.2.1.5	succinate-CoA ligase (ADP-forming)	1 C00008[m] + 1 C00009[m] + 1 C00091[m] -> 1 C00002[m] + 1 C00042[m] + 1 C00010[m]	TCA Cycle	1	-1000	1000	0	6.2.1.5
6.3.1.2	glutamate-ammonia ligase	1 C00002[c] + 1 C00025[c] + 1 C00014[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00064[c]	Glutamate/Glutamine	0	0	1000	0	6.3.1.2
6.3.2.1	pantoate-beta-alanine ligase	1 C00002[c] + 1 C00522[c] + 1 C00099[c] -> 1 C00020[c] + 1 C00013[c] + 1 C00864[c]	CoA Synthesis	0	0	1000	0	6.3.2.1
6.3.2.17	tetrahydrofolate synthase	1 C00002[c] + 1 C00921[c] + 1 C00025[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00415[c]	Folate	0	0	1000	0	6.3.2.17
6.3.2.2	glutamate-cysteine ligase	1 C00002[c] + 1 C00025[c] + 1 C00097[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00669[c]	Glutamate/Glutamine	0	0	1000	0	6.3.2.2
6.3.2.3	glutathione synthase	1 C00002[c] + 1 C00669[c] + 1 C00037[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00051[c]	Glutamate/Glutamine	0	0	1000	0	6.3.2.3
6.3.2.5	phosphopantothenate-cysteine ligase	1 C00063[m] + 1 C03492[m] + 1 C00097[m] -> 1 C00055[m] + 1 C00013[m] + 1 C04352[m]	CoA Synthesis	0	0	1000	0	6.3.2.5
6.3.4.2	CTP synthase	1 C00002[c] + 1 C00075[c] + 1 C00014[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00063[c]	Pyrimidine	0	0	1000	0	6.3.4.2
6.3.4.4	adenylosuccinate synthase	1 C00044[c] + 1 C00130[c] + 1 C00049[c] -> 1 C00035[c] + 1 C00009[c] + 1 C03794[c]	Purine	0	0	1000	0	6.3.4.4
6.3.5.1	NAD+ synthase (glutamine-hydrolysing)	1 C00002[c] + 1 C00857[c] + 1 C00064[c] + 1 C00001[c] -> 1 C00020[c] + 1 C00013[c] + 1 C00003[c] + 1 C00025[c]	Nicotinate	1	-1000	1000	0	6.3.5.1
6.3.5.2	GMP synthase (glutamine-hydrolysing)	1 C00002[c] + 1 C00655[c] + 1 C00064[c] + 1 C00001[c] -> 1 C00020[c] + 1 C00013[c] + 1 C00144[c] + 1 C00025[c]	Purine	0	0	1000	0	6.3.5.2
6.3.5.4	asparagine synthase (glutamine-hydrolysing)	1 C00002[c] + 1 C00049[c] + 1 C00064[c] + 1 C00001[c] -> 1 C00020[c] + 1 C00013[c] + 1 C00152[c] + 1 C00025[c]	Glutamate/Glutamine	1	-1000	1000	0	6.3.5.4
6.3.5.5	carbamoyl-phosphate synthase (glutamine-hydrolysing)	2 C00002[c] + 1 C00064[c] + 1 C00288[c] + 1 C00001[c] + 1 C00080[c] -> 2 C00008[c] + 1 C00009[c] + 1 C00025[c] + 1	Pyrimidine	0	0	1000	0	6.3.5.5

6.4.1.1	pyruvate carboxylase	1 C00002[m] + 1 C00022[m] + 1 C00288[m] + 1 C00080[m] -> 1 C00008[m] + 1 C00009[m] + 1 C00036[m]	TCA Cycle	0	0	1000	0	6.4.1.1
6.4.1.2a	acetyl-CoA carboxylase	1 C00002[c] + 1 C00024[c] + 1 C00288[c] + 1 C00080[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00083[c]	Fatty Acid Synthesis	1	-1000	1000	0	6.4.1.2
6.4.1.2b	acetyl-CoA carboxylase	1 C00002[a] + 1 C00024[a] + 1 C00288[a] + 1 C00080[a] -> 1 C00008[a] + 1 C00009[a] + 1 C00083[a]	Fatty Acid Synthesis	1	-1000	1000	0	6.4.1.2
6.4.1.4	methylcrotonoyl-CoA carboxylase	1 C00002[m] + 1 C03069[m] + 1 C00288[m] + 1 C00080[m] -> 1 C00008[m] + 1 C00009[m] + 1 C03231[m]	Branched Amino Acid	0	0	1000	0	6.4.1.4
NGAM	Non-growth associated maintenance	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00080[c]	Biomass	0	5	1000	0	
GAM	Growth associated maintenance	28.76 C00002[c] + 28.76 C00001[c] -> 28.76 C00008[c] + 28.76 C00009[c] + 28.76 C00080[c] + 1 GAM[u]	Biomass	0	0	1000	0	
DNA	DNA composition	0.002855 C00131[c] + 0.003128 C00458[c] + 0.003128 C00286[c] + 0.002855 C00459[c] -> 1 DNA[u] + 0.011966 C00001[c]	Biomass	0	0	1000	0	
RNA	RNA composition	0.01678 C00002[c] + 0.02167 C00063[c] + 0.02263 C00044[c] + 0.01523 C00075[c] -> 1 RNA[u] + 0.07631 C00013[c]	Biomass	0	0	1000	0	
Proteins	Amino acid composition	0.684 C00041[c] + 0.1297 C00097[c] + 0.3194 C00049[c] + 0.5263 C00025[c] + 0.2276 C00079[c] + 0.5002 C00037[c]	Biomass	0	0	1000	0	
Lipids	Lipid composition	0.007777 C01194[er] + 0.08017 C00157[er] + 0.01084 C02737[er] + 0.01141 C00550[er] + 0.0153 C00350[er] + 0.035 Biomass	Biomass	0	0	1000	0	
EMs	Essential Molecules	0.00563 C00010[m] + 0.00563 C00101[c] + 0.00563 C00032[c] + 0.00563 C04574[m] + 0.00563 C00018[c] + 0.00563 C00001[a]	Biomass	0	0	1000	0	
Biomass	Biomass	1 DNA[u] + 1 RNA[u] + 1 Proteins[u] + 1 Lipids[u] + 1 EMs[u] + 1 GAM[u] ->	Biomass	0	0	1000	1	
Acyl	fatty acid aggregate	0.073 C02679[a] + 0.09 C06424[a] + 0.166 C00249[a] + 0.108 C01530[a] + 0.306 C00712[a] + 0.198 C01595[a] + 0.058 Biomass	Biomass	0	0	1000	0	
Blackbox1	arachidonic acid blackbox	1 C03035[a] + 1 C00024[a] + 1 C00030[a] + 1 C00007[a] -> 1 C00219[a] + 1 C00028[a] + 2 C00010[a] + 2 C00001[a]	Fatty Acid Synthesis	0	0	1000	0	
Currency1	Acceptor exchange [a]	1 C00028[a] + 1 C00004[a] -> 1 C00080[a] + 1 C00030[a] + 1 C00003[a]	Currency Exchange	1	-1000	1000	0	
Currency2	Acceptor exchange [er]	1 C00028[er] + 1 C00004[c] + 1 C00080[c] -> 1 C00030[er] + 1 C00003[c]	Currency Exchange	1	-1000	1000	0	
Currency3	Ferredoxin exchange	1 C00139[a] + 1 C00004[a] + 1 C00080[a] -> 1 C00138[a] + 1 C00003[a]	Currency Exchange	1	-1000	1000	0	
S1	bicarbonate[c]	1 C00011[c] + 1 C00001[c] -> 1 C00288[c] + 1 C00080[c]	Spontaneous	1	-1000	1000	0	
S2	bicarbonate[a]	1 C00011[a] + 1 C00001[a] -> 1 C00288[a] + 1 C00080[a]	Spontaneous	1	-1000	1000	0	
S3	bicarbonate[m]	1 C00011[m] + 1 C00001[m] -> 1 C00288[m] + 1 C00080[m]	Spontaneous	1	-1000	1000	0	
O1	ATP[a]	1 C00002[c] -> 1 C00002[a]	Organellar Transport	1	-1000	1000	0	
O2	ADP[a]	1 C00008[a] -> 1 C00008[c]	Organellar Transport	1	-1000	1000	0	
O3	AMP[a]	1 C00020[a] -> 1 C00020[c]	Organellar Transport	1	-1000	1000	0	
O4	CTP[a]	1 C00063[c] + 1 C00055[a] + 1 C00013[a] -> 1 C00055[c] + 1 C00063[a] + 1 C00013[c]	Organellar Transport	1	-1000	1000	0	
O5	phosphate[a]	1 C00009[a] -> 1 C00009[c]	Organellar Transport	1	-1000	1000	0	
O6	diphosphate[a]	1 C00013[a] -> 1 C00013[c]	Organellar Transport	1	-1000	1000	0	
O7	NADH[a]	1 C00004[c] -> 1 C00004[a]	Organellar Transport	1	-1000	1000	0	
O8	NAD+[a]	1 C00003[a] -> 1 C00003[c]	Organellar Transport	1	-1000	1000	0	
O9	NADPH[a]	1 C00005[c] -> 1 C00005[a]	Organellar Transport	1	-1000	1000	0	
O10	NADP+[a]	1 C00006[a] -> 1 C00006[c]	Organellar Transport	1	-1000	1000	0	
O11	H+[a]	1 C00080[c] -> 1 C00080[a]	Organellar Transport	1	-1000	1000	0	
O12	Fe2+[m]	1 C14818[c] -> 1 C14818[m]	Organellar Transport	1	-1000	1000	0	
O13	O2[a]	1 C00007[c] -> 1 C00007[a]	Organellar Transport	1	-1000	1000	0	
O14	H2O[a]	1 C00001[a] -> 1 C00001[c]	Organellar Transport	1	-1000	1000	0	
O15	CO2[a]	1 C00011[a] -> 1 C00011[c]	Organellar Transport	1	-1000	1000	0	
O16	H2O2[a]	1 C00027[a] -> 1 C00027[c]	Organellar Transport	1	-1000	1000	0	
O17	NH3[a]	1 C00014[a] -> 1 C00014[c]	Organellar Transport	1	-1000	1000	0	
O18	CoA[a]	1 C00010[a] -> 1 C00010[c]	Organellar Transport	1	-1000	1000	0	
O19	palmitoyl-CoA[a]	1 C00154[a] -> 1 C00154[c]	Organellar Transport	1	-1000	1000	0	
O20	glycerone-phosphate[a]	1 C00111[c] -> 1 C00111[a]	Organellar Transport	1	-1000	1000	0	
O21	phosphoenolpyruvate[a]	1 C00074[c] + 1 C00009[a] -> 1 C00074[a] + 1 C00009[c]	Organellar Transport	1	-1000	1000	0	
O22	3-phospho-D-glycerate[a]	1 C00197[a] -> 1 C00197[c]	Organellar Transport	1	-1000	1000	0	
O23	ATP[er]	1 C00002[c] -> 1 C00002[er]	Organellar Transport	1	-1000	1000	0	
O24	ADP[er]	1 C00008[er] -> 1 C00008[c]	Organellar Transport	1	-1000	1000	0	
O25	CTP[er]	1 C00063[c] + 1 C00055[er] + 1 C00013[er] -> 1 C00055[c] + 1 C00063[er] + 1 C00013[c]	Organellar Transport	1	-1000	1000	0	
O26	CMP[er]	1 C00055[er] -> 1 C00055[c]	Organellar Transport	1	-1000	1000	0	
O27	phosphate[er]	1 C00009[er] -> 1 C00009[c]	Organellar Transport	1	-1000	1000	0	
O28	NAD+[er]	1 C00003[er] -> 1 C00003[c]	Organellar Transport	1	-1000	1000	0	
O29	NADH[er]	1 C00004[c] -> 1 C00004[er]	Organellar Transport	1	-1000	1000	0	
O30	NADP+[er]	1 C00006[er] -> 1 C00006[c]	Organellar Transport	1	-1000	1000	0	
O31	NADPH[er]	1 C00005[c] -> 1 C00005[er]	Organellar Transport	1	-1000	1000	0	
O32	H+[er]	1 C00080[c] -> 1 C00080[er]	Organellar Transport	1	-1000	1000	0	
O33	O2[er]	1 C00007[c] -> 1 C00007[er]	Organellar Transport	1	-1000	1000	0	
O34	H2O[er]	1 C00001[c] -> 1 C00001[er]	Organellar Transport	1	-1000	1000	0	
O35	CO2[er]	1 C00011[er] -> 1 C00011[c]	Organellar Transport	1	-1000	1000	0	
O36	L-serine[er]	1 C00065[c] -> 1 C00065[er]	Organellar Transport	1	-1000	1000	0	
O37	CoA[er]	1 C00010[er] -> 1 C00010[c]	Organellar Transport	1	-1000	1000	0	
O38	acyl[er]	1 C00060[er] -> 1 C00060[a]	Organellar Transport	1	-1000	1000	0	
O39	acyl-CoA[er]	1 C00040[a] -> 1 C00040[er]	Organellar Transport	1	-1000	1000	0	
O40	palmitoyl-CoA[er]	1 C00154[c] -> 1 C00154[er]	Organellar Transport	1	-1000	1000	0	
O41	1D-myo-inositol-3-phosphate[er]	1 C04006[c] -> 1 C04006[er]	Organellar Transport	1	-1000	1000	0	
O42	CDP-choline[er]	1 C00307[c] -> 1 C00307[er]	Organellar Transport	1	-1000	1000	0	
O43	sn-glycerol-3-phosphate[er]	1 C00093[c] -> 1 C00093[er]	Organellar Transport	1	-1000	1000	0	
O44	sn-glycero-3-phosphocholine[er]	1 C00670[er] -> 1 C00670[c]	Organellar Transport	1	-1000	1000	0	
O45	ATP[m]	1 C00002[c] -> 1 C00002[m]	Organellar Transport	1	-1000	1000	0	

O46	ADP[m]	1 C00008[m] -> 1 C00008[c]	Organellar Transport	1	-1000	1000	0
O47	AMP[m]	1 C00020[m] -> 1 C00020[c]	Organellar Transport	1	-1000	1000	0
O48	CTP[m]	1 C00063[c] + 1 C00055[m] + 1 C00013[m] -> 1 C00055[c] + 1 C00063[m] + 1 C00013[c]	Organellar Transport	1	-1000	1000	0
O49	phosphate[m]	1 C00009[m] -> 1 C00009[c]	Organellar Transport	1	-1000	1000	0
O50	diphosphate[m]	1 C00013[m] -> 1 C00013[c]	Organellar Transport	1	-1000	1000	0
O51	NAD+[m]	1 C00003[m] -> 1 C00003[c]	Organellar Transport	1	-1000	1000	0
O52	NADH[m]	1 C00004[m] -> 1 C00004[c]	Organellar Transport	1	-1000	1000	0
O53	NADP+[m]	1 C00006[m] -> 1 C00006[c]	Organellar Transport	1	-1000	1000	0
O54	NADPH[m]	1 C00005[c] -> 1 C00005[m]	Organellar Transport	1	-1000	1000	0
O55	H+[m]	1 C00080[m] -> 1 C00080[c]	Organellar Transport	1	-1000	1000	0
O56	H2O2[m]	1 C00027[m] -> 1 C00027[c]	Organellar Transport	1	-1000	1000	0
O57	O2[m]	1 C00007[c] -> 1 C00007[m]	Organellar Transport	1	-1000	1000	0
O58	H2O[m]	1 C00001[m] -> 1 C00001[c]	Organellar Transport	1	-1000	1000	0
O59	CO2[m]	1 C00011[m] -> 1 C00011[c]	Organellar Transport	1	-1000	1000	0
O60	NH3[m]	1 C00014[m] -> 1 C00014[c]	Organellar Transport	1	-1000	1000	0
O61	L-aspartate[m]	1 C00049[c] + 1 C00002[c] + 1 C00001[c] -> 1 C00049[m] + 1 C00008[c] + 1 C00009[c]	Organellar Transport	1	-1000	1000	0
O62	L-cysteine[m]	1 C00097[c] + 1 C00002[c] + 1 C00001[c] -> 1 C00097[m] + 1 C00008[c] + 1 C00009[c]	Organellar Transport	1	-1000	1000	0
O63	L-isoleucine[m]	1 C00407[c] + 1 C00002[c] + 1 C00001[c] -> 1 C00407[m] + 1 C00008[c] + 1 C00009[c]	Organellar Transport	1	-1000	1000	0
O64	L-leucine[m]	1 C00123[c] + 1 C00002[c] + 1 C00001[c] -> 1 C00123[m] + 1 C00008[c] + 1 C00009[c]	Organellar Transport	1	-1000	1000	0
O65	L-valine[m]	1 C00183[c] + 1 C00002[c] + 1 C00001[c] -> 1 C00183[m] + 1 C00008[c] + 1 C00009[c]	Organellar Transport	1	-1000	1000	0
O66	L-serine[m]	1 C00065[c] + 1 C00002[c] + 1 C00001[c] -> 1 C00065[m] + 1 C00008[c] + 1 C00009[c]	Organellar Transport	1	-1000	1000	0
O67	glycine[m]	1 C00037[m] -> 1 C00037[c]	Organellar Transport	1	-1000	1000	0
O68	L-glutamate[m]	1 C00025[m] -> 1 C00025[c]	Organellar Transport	1	-1000	1000	0
O69	CoA[m]	1 C00010[m] -> 1 C00010[c]	Organellar Transport	1	-1000	1000	0
O70	pyruvate[m]	1 C00022[c] + 1 C00002[c] + 1 C00001[c] -> 1 C00022[m] + 1 C00008[c] + 1 C00009[c]	Organellar Transport	1	-1000	1000	0
O71	citrate[m]	1 C00158[m] -> 1 C00158[c]	Organellar Transport	1	-1000	1000	0
O72	(S)-dihydrooorotate[m]	1 C00337[c] + 1 C00002[c] + 1 C00001[c] -> 1 C00337[m] + 1 C00008[c] + 1 C00009[c]	Organellar Transport	1	-1000	1000	0
O73	orotate[m]	1 C00295[m] -> 1 C00295[c]	Organellar Transport	1	-1000	1000	0
O74	(R)-pantoatem	1 C00522[m] -> 1 C00522[c]	Organellar Transport	1	-1000	1000	0
O75	pantothenate[m]	1 C00864[c] + 1 C00002[c] + 1 C00001[c] -> 1 C00864[m] + 1 C00008[c] + 1 C00009[c]	Organellar Transport	1	-1000	1000	0
O76	dimethylallyl-diphosphate[a/m]	1 C00235[a] + 1 C00002[c] + 1 C00001[c] -> 1 C00235[m] + 1 C00008[c] + 1 C00009[c]	Organellar Transport	1	-1000	1000	0
O77	isopentenyl-diphosphate[a/m]	1 C00129[a] + 1 C00002[c] + 1 C00001[c] -> 1 C00129[m] + 1 C00008[c] + 1 C00009[c]	Organellar Transport	1	-1000	1000	0
O78	N6-(1,2-Dicarboxyethyl)-AMP[m]	1 C03794[c] -> 1 C03794[m]	Organellar Transport	1	-1000	1000	0
O79	5-aminolevulinate[a/m]	1 C00430[m] -> 1 C00430[a]	Organellar Transport	1	-1000	1000	0
O80	tetrahydrofolate[m]	1 C00101[c] + 1 C00002[c] + 1 C00001[c] -> 1 C00101[m] + 1 C00008[c] + 1 C00009[c]	Organellar Transport	1	-1000	1000	0
O81	5,10-methylenetetrahydrofolate[m]	1 C00143[m] -> 1 C00143[c]	Organellar Transport	1	-1000	1000	0
O82	coproporphyrinogen-III	1 C03263[a] -> 1 C03263[c]	Organellar Transport	1	-1000	1000	0
O83	protoporphyrinogen-IX	1 C01079[c] -> 1 C01079[m]	Organellar Transport	1	-1000	1000	0
O84	heme	1 C00032[m] -> 1 C00032[c]	Organellar Transport	1	-1000	1000	0
O85	ferrocytochrome-c	1 C00126[c] -> 1 C00126[m]	Organellar Transport	1	-1000	1000	0
T1	spermine import	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00750[c]	Extracellular Transport	0	0	1000	0
T2	arginine transport	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00062[c]	Extracellular Transport	0	0	1000	0
T3	ornithine transport	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00077[c]	Extracellular Transport	0	0	1000	0
T4	glucose transport	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00092[c]	Extracellular Transport	0	0	10	0
T5	folic acid transport	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00504[c]	Extracellular Transport	0	0	1000	0
T6	adenosine transport	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00212[c]	Extracellular Transport	0	0	1000	0
T7	tryptophan transport	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00078[c]	Extracellular Transport	0	0	1000	0
T8	cysteine transport	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00097[c]	Extracellular Transport	0	0	1000	0
T9	histidine transport	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00135[c]	Extracellular Transport	0	0	1000	0
T10	threonine transport	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00188[c]	Extracellular Transport	0	0	1000	0
T11	isoleucine transport	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00407[c]	Extracellular Transport	0	0	1000	0
T12	leucine transport	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00123[c]	Extracellular Transport	0	0	1000	0
T13	methionine transport	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00073[c]	Extracellular Transport	0	0	1000	0
T14	phenylalanine transport	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00079[c]	Extracellular Transport	0	0	1000	0
T15	tyrosine transport	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00082[c]	Extracellular Transport	0	0	1000	0
T16	valine transport	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00183[c]	Extracellular Transport	0	0	1000	0
T17	cholesterol transport	-> 1 C00187[c]	Extracellular Transport	0	0	1000	0
T18	choline transport	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00114[c]	Extracellular Transport	0	0	1000	0
T19	adenine transport	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00147[c]	Extracellular Transport	0	0	1000	0
T20	serine transport	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00065[c]	Extracellular Transport	0	0	1000	0
T21	Iron (II) ion transport	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C14818[c]	Extracellular Transport	0	0	1000	0
T22	(S)-lactate transport	1 C00186[c] ->	Extracellular Transport	0	0	1000	0
X1	oxidative stress	-> 1 C00704[c]	Stress	0	0	0	0
D1	water	1 C00001[c] ->	Diffusion	1	-1000	1000	0
D2	oxygen import	-> 1 C00007[c]	Diffusion	0	0	20	0

D3	CO2 export	1 C00011[c] ->	Diffusion	0	0	1000	0
D4	NH3 import	1 C00014[c] ->	Diffusion	0	0	5	0
D5	diphosphate	1 C00013[c] ->	Diffusion	1	-10	10	0
D6	phosphate	1 C00009[c] ->	Diffusion	1	-1000	1000	0
D7	ethanol	1 C00469[c] ->	Diffusion	1	-1000	1000	0
Demand	acyl carrier protein	-> 1 C00229[a]	Demand	0	0	1000	0
Sink1	4-aminobutanoate	1 C00334[c] ->	Sink	1	-1000	1000	0
Sink2	formate	1 C00058[c] ->	Sink	1	-1000	1000	0
Sink3	3-acetamidopropanal	1 C18170[c] ->	Sink	1	-1000	1000	0
Sink4	5,10-methylenetetrahydrofolate[m]	1 C00143[m] ->	Sink	1	-1000	1000	0
Sink5	glycolaldehyde	1 C00266[c] ->	Sink	0	0	1000	0
Sink6	3,4-dihydroxy-L-phenylalanine	1 C00355[c] ->	Sink	0	0	1000	0
3.2.1.20	alpha-glucosidase	1 C00089[c] + 1 C00001[c] -> 1 C00095[c] + 1 C00031[c]	Misc	0	0	1000	0
T23	Sucrose transport	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00089[c]	Extracellular Transport	0	0	10	0
2.7.1.1b	hexokinase	1 C00002[c] + 1 C00095[c] -> C00008[c] + 1 C00085[c]	Misc	0	0	1000	0
T24	Fructose transport	1 C00002[c] + 1 C00001[c] -> 1 C00008[c] + 1 C00009[c] + 1 C00095[c]	Extracellular Transport	0	0	10	0
4.3.1.19a	L-threonine ammonia-lyase (2-oxobutanoate-forming)	1 C00188[c] -> 1 C00109[c] + 1 C00014[c]	Misc	0	0	1000	0
4.3.1.19b	L-serine ammonia-lyase	1 C00065[c] -> 1 C00022[c] + 1 C00014[c]	Misc	1	-1000	1000	0
T25	2-oxobutanoate	1 C00109[c] ->	Extracellular Transport	1	-1000	1000	0