

Module	Main Category	Sub category of main category (if exist)	Description/Name	KGML	Paths	module_link	start_molecule	end_molecule
M00001	Carbohydrate and lipid metabolism	Central carbohydrate metabolism	Glycolysis (Embden-Meyerhof pathway), glucose => pyruvate	hsa00010	hsa01200;hsa00010	<a href="http://www.genome">http://www.genome</a>	C00267: alpha-D-Glucose	C00022: Pyruvate
M00002	Carbohydrate and lipid metabolism	Central carbohydrate metabolism	Glycolysis, core module involving three-carbon compounds	hsa00010	hsa01200;hsa01230;hsa00010	<a href="http://www.genome">http://www.genome</a>	C00111: Glycerone phosphate	C00022: Pyruvate
M00003	Carbohydrate and lipid metabolism	Central carbohydrate metabolism	Gluconeogenesis, oxaloacetate => fructose-6P	hsa00010	hsa00010;hsa00020	<a href="http://www.genome">http://www.genome</a>	C00036: Oxaloacetate	C05345: beta-D-Fructose 6-phosphate
M00004	Carbohydrate and lipid metabolism	Central carbohydrate metabolism	Pentose phosphate pathway (Pentose phosphate cycle)	hsa00030	hsa01200;hsa00030	<a href="http://www.genome">http://www.genome</a>	C01172: beta-D-Glucose 6-phosphate	C01172: beta-D-Glucose 6-phosphate
M00006	Carbohydrate and lipid metabolism	Central carbohydrate metabolism	Pentose phosphate pathway, oxidative phase, glucose 6P => ribulose 5P	hsa00030	hsa01200;hsa00030	<a href="http://www.genome">http://www.genome</a>	C01172: beta-D-Glucose 6-phosphate	C00199: D-Ribulose 5-phosphate
M00007	Carbohydrate and lipid metabolism	Central carbohydrate metabolism	Pentose phosphate pathway, non-oxidative phase, fructose 6P => ribose	hsa00030	hsa01200;hsa01230;hsa00030	<a href="http://www.genome">http://www.genome</a>	C05345+C00118: beta-D-Fructose 6-phosphate + D-Glyceraldehyde 3-phos	C00117: D-Ribose 5-phosphate
M00009	Carbohydrate and lipid metabolism	Central carbohydrate metabolism	Citrate cycle (TCA cycle, Krebs cycle)	hsa00020	hsa01200;hsa00020	<a href="http://www.genome">http://www.genome</a>	C00024+C00036: Acetyl-CoA + Oxaloacetate	C00036: Oxaloacetate
M00010	Carbohydrate and lipid metabolism	Central carbohydrate metabolism	Citrate cycle, first carbon oxidation, oxaloacetate => 2-oxoglutarate	hsa00020	hsa01200;hsa01210;hsa01230;hsa00020	<a href="http://www.genome">http://www.genome</a>	C00036+C00024: Oxaloacetate + Acetyl-CoA	C00026: 2-Oxoglutarate
M00011	Carbohydrate and lipid metabolism	Central carbohydrate metabolism	Citrate cycle, second carbon oxidation, 2-oxoglutarate => oxaloacetate	hsa00020	hsa01200;hsa00020	<a href="http://www.genome">http://www.genome</a>	C00026+C15972: 2-Oxoglutarate + Enzyme N6-(lipoyl)lysine	C00036: Oxaloacetate
M00013	Carbohydrate and lipid metabolism	Other carbohydrate metabolism	Malonate semialdehyde pathway, propanoyl-CoA => acetyl-CoA	hsa00640	hsa01200;hsa00640	<a href="http://www.genome">http://www.genome</a>	C00100: Propanoyl-CoA	C00024: Acetyl-CoA
M00014	Carbohydrate and lipid metabolism	Other carbohydrate metabolism	Glucuronate pathway (uronate pathway)	hsa00040	hsa00040	<a href="http://www.genome">http://www.genome</a>	C00029: UDP-glucose	C00231: D-Xylulose 5-phosphate
M00015	Nucleotide and amino acid metabolism	Arginine and proline metabolism	Proline biosynthesis, glutamate => proline	hsa00330	hsa01230;hsa00330	<a href="http://www.genome">http://www.genome</a>	C00025: L-Glutamate	C00148: L-Proline
M00020	Nucleotide and amino acid metabolism	Serine and threonine metabolism	Serine biosynthesis, glycerate-3P => serine	hsa00260	hsa01200;hsa01230;hsa00260	<a href="http://www.genome">http://www.genome</a>	C00197: 3-Phospho-D-glycerate	C00065: L-Serine
M00027	Nucleotide and amino acid metabolism	Other amino acid metabolism	GABA (gamma-Aminobutyrate) shunt	hsa00250	hsa00250	<a href="http://www.genome">http://www.genome</a>	C00025: L-Glutamate	C00042: Succinate
M00029_1	Nucleotide and amino acid metabolism	Arginine and proline metabolism	Urea cycle	hsa00220	hsa01230;hsa00220	<a href="http://www.genome">http://www.genome</a>	C00014+C00049: Ammonia + L-Aspartate	C00122: Fumarate
M00029_2	Nucleotide and amino acid metabolism	Arginine and proline metabolism	Urea cycle	hsa00220	hsa01230;hsa00220	<a href="http://www.genome">http://www.genome</a>	C00014+C00049: Ammonia + L-Aspartate	C00086: Urea
M00032	Nucleotide and amino acid metabolism	Lysine metabolism	Lysine degradation, lysine => saccharopine => acetoacetyl-CoA	hsa00310	hsa00310	<a href="http://www.genome">http://www.genome</a>	C00047: L-Lysine	C00332: Acetoacetyl-CoA
M00034_1	Nucleotide and amino acid metabolism	Cysteine and methionine metabolism	Methionine salvage pathway	hsa00270	hsa00270	<a href="http://www.genome">http://www.genome</a>	C00073: L-Methionine	C00147: Adenine
M00035_1	Nucleotide and amino acid metabolism	Cysteine and methionine metabolism	Methionine degradation	hsa00270	hsa00270	<a href="http://www.genome">http://www.genome</a>	C00073+C00065: L-Methionine + L-Serine	C02291: L-Cystathionine
M00036	Nucleotide and amino acid metabolism	Branched-chain amino acid metabolism	Leucine degradation, leucine => acetoacetate + acetyl-CoA	hsa00280	hsa00280	<a href="http://www.genome">http://www.genome</a>	C00123: L-Leucine	C00164: Acetoacetate
M00037	Nucleotide and amino acid metabolism	Aromatic amino acid metabolism	Melatonin biosynthesis, tryptophan => serotonin => melatonin	hsa00380	hsa00380	<a href="http://www.genome">http://www.genome</a>	C00078: L-Tryptophan	C01598: Melatonin
M00042	Nucleotide and amino acid metabolism	Aromatic amino acid metabolism	Catecholamine biosynthesis, tyrosine => dopamine => noradrenaline =>	hsa00350	hsa00350	<a href="http://www.genome">http://www.genome</a>	C00082: L-Tyrosine	C00788: L-Adrenaline
M00043	Nucleotide and amino acid metabolism	Aromatic amino acid metabolism	Thyroid hormone biosynthesis, tyrosine => triiodothyronine/thyroxine	hsa00350	hsa00350	<a href="http://www.genome">http://www.genome</a>	C00082: L-Tyrosine	C02465: Triiodothyronine
M00044_1	Nucleotide and amino acid metabolism	Aromatic amino acid metabolism	Tyrosine degradation, tyrosine => homogentisate	hsa00350	hsa00350	<a href="http://www.genome">http://www.genome</a>	C00082: L-Tyrosine	C00122: Fumarate
M00046_1	Nucleotide and amino acid metabolism	Pyrimidine metabolism	Pyrimidine degradation, uracil => beta-alanine, thymine => 3-aminoisobu	hsa00240	hsa00240	<a href="http://www.genome">http://www.genome</a>	C00106: Uracil	C00099: beta-Alanine
M00046_2	Nucleotide and amino acid metabolism	Pyrimidine metabolism	Pyrimidine degradation, uracil => beta-alanine, thymine => 3-aminoisobu	hsa00240	hsa00240	<a href="http://www.genome">http://www.genome</a>	C00178: Thymine	C05145: 3-Aminoisobutyric acid
M00047	Nucleotide and amino acid metabolism	Other amino acid metabolism	Creatine pathway	hsa00330	hsa00330	<a href="http://www.genome">http://www.genome</a>	C00062: L-Arginine	C00791: Creatinine
M00048	Nucleotide and amino acid metabolism	Purine metabolism	Inosine monophosphate biosynthesis, PRPP + glutamine => IMP	hsa00230	hsa00230	<a href="http://www.genome">http://www.genome</a>	C00119+C00064: 5-Phospho-alpha-D-ribose 1-diphosphate + L-Glutamine	C00130: IMP
M00049	Nucleotide and amino acid metabolism	Purine metabolism	Adenine ribonucleotide biosynthesis, IMP => ADP,ATP	hsa00230	hsa00230	<a href="http://www.genome">http://www.genome</a>	C00130: IMP	C00002: ATP
M00050	Nucleotide and amino acid metabolism	Purine metabolism	Guanine ribonucleotide biosynthesis, IMP => GDP,GTP	hsa00230	hsa00230	<a href="http://www.genome">http://www.genome</a>	C00130: IMP	C00044: GTP
M00051_1	Nucleotide and amino acid metabolism	Pyrimidine metabolism	Uridine monophosphate biosynthesis, glutamine (+ PRPP) => UMP	hsa00240	hsa00240	<a href="http://www.genome">http://www.genome</a>	C00064+C00119: L-Glutamine + 5-Phospho-alpha-D-ribose 1-diphosphate	C00105: UMP
M00052	Nucleotide and amino acid metabolism	Pyrimidine metabolism	Pyrimidine ribonucleotide biosynthesis, UMP => UDP/UTP,CDP/CTP	hsa00240	hsa00240	<a href="http://www.genome">http://www.genome</a>	C00105: UMP	C00112: CDP
M00055	Carbohydrate and lipid metabolism	Glycan metabolism	N-glycan precursor biosynthesis	hsa00510	hsa00510	<a href="http://www.genome">http://www.genome</a>	C00110: Dolichyl phosphate	G00008:
M00056_1	Carbohydrate and lipid metabolism	Glycan metabolism	O-glycan biosynthesis, mucin type core	hsa00512	hsa00512	<a href="http://www.genome">http://www.genome</a>	C02189+G10611: [Protein]-L-serine	G00025:
M00056_2	Carbohydrate and lipid metabolism	Glycan metabolism	O-glycan biosynthesis, mucin type core	hsa00512	hsa00512	<a href="http://www.genome">http://www.genome</a>	C02189+G10611: [Protein]-L-serine	G00029:
M00056_3	Carbohydrate and lipid metabolism	Glycan metabolism	O-glycan biosynthesis, mucin type core	hsa00512	hsa00512	<a href="http://www.genome">http://www.genome</a>	C02189+G10611: [Protein]-L-serine	G00031:
M00057	Carbohydrate and lipid metabolism	Glycosaminoglycan metabolism	Glycosaminoglycan biosynthesis, linkage tetrasaccharide	hsa00532	hsa00532	<a href="http://www.genome">http://www.genome</a>	C02189: [Protein]-L-serine	G00157:
M00058	Carbohydrate and lipid metabolism	Glycosaminoglycan metabolism	Glycosaminoglycan biosynthesis, chondroitin sulfate backbone	hsa00532	hsa00532	<a href="http://www.genome">http://www.genome</a>	G00157:	G00160:
M00059	Carbohydrate and lipid metabolism	Glycosaminoglycan metabolism	Glycosaminoglycan biosynthesis, heparan sulfate backbone	hsa00534	hsa00534	<a href="http://www.genome">http://www.genome</a>	G00157:	G00164:
M00065	Carbohydrate and lipid metabolism	Glycan metabolism	GPI-anchor biosynthesis, core oligosaccharide	hsa00563	hsa00563	<a href="http://www.genome">http://www.genome</a>	C01194: 1-Phosphatidyl-D-myo-inositol	G13044:
M00066	Carbohydrate and lipid metabolism	Lipid metabolism	Lactosylceramide biosynthesis	hsa00600	hsa00600	<a href="http://www.genome">http://www.genome</a>	C00195: N-Acylsphingosine	C01290: beta-D-Galactosyl-(1->4)-beta-D-glucosyl-(11)-c
M00067_1	Carbohydrate and lipid metabolism	Lipid metabolism	Cerebroside and sulfatide biosynthesis	hsa00600	hsa00600;hsa00565	<a href="http://www.genome">http://www.genome</a>	C00195: N-Acylsphingosine	C06125: Sulfatide
M00067_2	Carbohydrate and lipid metabolism	Lipid metabolism	Cerebroside and sulfatide biosynthesis	hsa00600	hsa00600;hsa00565	<a href="http://www.genome">http://www.genome</a>	C03201: 1-Alkyl-2-acylglycerol	C20825: Seminolipid
M00068	Carbohydrate and lipid metabolism	Glycan metabolism	Glycosphingolipid biosynthesis, globo-series, LacCer => Gb4Cer	hsa00603	hsa00603	<a href="http://www.genome">http://www.genome</a>	G00092:	G00094:
M00069	Carbohydrate and lipid metabolism	Glycan metabolism	Glycosphingolipid biosynthesis, ganglio series, LacCer => GT3	hsa00604	hsa00604	<a href="http://www.genome">http://www.genome</a>	G00092:	G00118:
M00070	Carbohydrate and lipid metabolism	Glycan metabolism	Glycosphingolipid biosynthesis, lacto-series, LacCer => Lc4Cer	hsa00601	hsa00601	<a href="http://www.genome">http://www.genome</a>	G00092:	G00037:
M00071	Carbohydrate and lipid metabolism	Glycan metabolism	Glycosphingolipid biosynthesis, neolacto-series, LacCer => nLc4Cer	hsa00601	hsa00601	<a href="http://www.genome">http://www.genome</a>	G00092:	G00050:
M00073	Carbohydrate and lipid metabolism	Glycan metabolism	N-glycan precursor trimming	hsa00510	hsa00510	<a href="http://www.genome">http://www.genome</a>	G00009:	G00012:
M00075_1	Carbohydrate and lipid metabolism	Glycan metabolism	N-glycan biosynthesis, complex type	hsa00510	hsa00510	<a href="http://www.genome">http://www.genome</a>	G00013:	G00019:
M00075_2	Carbohydrate and lipid metabolism	Glycan metabolism	N-glycan biosynthesis, complex type	hsa00510	hsa00510	<a href="http://www.genome">http://www.genome</a>	G00013:	G00022:
M00075_3	Carbohydrate and lipid metabolism	Glycan metabolism	N-glycan biosynthesis, complex type	hsa00510	hsa00510	<a href="http://www.genome">http://www.genome</a>	G00013:	G00018:
M00076	Carbohydrate and lipid metabolism	Glycosaminoglycan metabolism	Dermatan sulfate degradation	hsa00531	hsa00531	<a href="http://www.genome">http://www.genome</a>	C00426: Dermatan sulfate	G00082:
M00077	Carbohydrate and lipid metabolism	Glycosaminoglycan metabolism	Chondroitin sulfate degradation	hsa00531	hsa00531	<a href="http://www.genome">http://www.genome</a>	G12336:	G00087:
M00078	Carbohydrate and lipid metabolism	Glycosaminoglycan metabolism	Heparan sulfate degradation	hsa00531	hsa00531	<a href="http://www.genome">http://www.genome</a>	C00925: Heparan sulfate	G02632:
M00079	Carbohydrate and lipid metabolism	Glycosaminoglycan metabolism	Keratan sulfate degradation	hsa00531	hsa00531	<a href="http://www.genome">http://www.genome</a>	C00573: Keratan sulfate	G01391:
M00082	Carbohydrate and lipid metabolism	Fatty acid metabolism	Fatty acid biosynthesis, initiation	hsa00061	hsa01212;hsa00061	<a href="http://www.genome">http://www.genome</a>	C00024: Acetyl-CoA	C05744: Acetoacetyl-[acp]
M00083	Carbohydrate and lipid metabolism	Fatty acid metabolism	Fatty acid biosynthesis, elongation	hsa00061	hsa01212;hsa00061	<a href="http://www.genome">http://www.genome</a>	C03939: Acetyl-[acyl-carrier protein]	C05745: Butyryl-[acp]
M00085	Carbohydrate and lipid metabolism	Fatty acid metabolism	Fatty acid biosynthesis, elongation, mitochondria	hsa00062	hsa01212;hsa00062	<a href="http://www.genome">http://www.genome</a>	C00024: Acetyl-CoA	C00040: Acyl-CoA
M00087	Carbohydrate and lipid metabolism	Fatty acid metabolism	beta-Oxidation	hsa00071	hsa01212;hsa00071	<a href="http://www.genome">http://www.genome</a>	C00154: Palmitoyl-CoA	C02593: Tetradecanoyl-CoA
M00089	Carbohydrate and lipid metabolism	Fatty acid metabolism	Triacylglycerol biosynthesis	hsa00561	hsa00561	<a href="http://www.genome">http://www.genome</a>	C00093: sn-Glycerol 3-phosphate	C00422: Triacylglycerol
M00090	Carbohydrate and lipid metabolism	Fatty acid metabolism	Phosphatidylcholine (PC) biosynthesis, choline => PC	hsa00564	hsa00564	<a href="http://www.genome">http://www.genome</a>	C00114: Choline	C00157: Phosphatidylcholine
M00091	Carbohydrate and lipid metabolism	Fatty acid metabolism	Phosphatidylcholine (PC) biosynthesis, PE => PC	hsa00564	hsa00564	<a href="http://www.genome">http://www.genome</a>	C00350: Phosphatidylethanolamine	C00157: Phosphatidylcholine
M00092	Carbohydrate and lipid metabolism	Fatty acid metabolism	Phosphatidylethanolamine (PE) biosynthesis, ethanolamine => PE	hsa00564	hsa00564	<a href="http://www.genome">http://www.genome</a>	C00189: Ethanolamine	C00350: Phosphatidylethanolamine
M00094_1	Carbohydrate and lipid metabolism	Lipid metabolism	Ceramide biosynthesis	hsa00600	hsa00600	<a href="http://www.genome">http://www.genome</a>	C00154+C00065: Palmitoyl-CoA + L-Serine	C00195: N-Acylsphingosine
M00095	Carbohydrate and lipid metabolism	Terpenoid backbone biosynthesis	C5 isoprenoid biosynthesis, mevalonate pathway	hsa00900	hsa00900	<a href="http://www.genome">http://www.genome</a>	C00024: Acetyl-CoA	C00235: Dimethylallyl diphosphate
M00098	Carbohydrate and lipid metabolism	Lipid metabolism	Acylglycerol degradation	hsa00561	hsa00561	<a href="http://www.genome">http://www.genome</a>	C00422: Triacylglycerol	C00116: Glycerol
M00099	Carbohydrate and lipid metabolism	Lipid metabolism	Sphingosine biosynthesis	hsa00600	hsa00600	<a href="http://www.genome">http://www.genome</a>	C00154: Palmitoyl-CoA	C00319: Sphingosine
M00100	Carbohydrate and lipid metabolism	Lipid metabolism	Sphingosine degradation	hsa00600	hsa00600	<a href="http://www.genome">http://www.genome</a>	C00319: Sphingosine	C00346: Ethanolamine phosphate
M00101	Carbohydrate and lipid metabolism	Sterol biosynthesis	Cholesterol biosynthesis, squalene 2,3-epoxide => cholesterol	hsa00100	hsa00100	<a href="http://www.genome">http://www.genome</a>	C01054: (S)-2,3-Epoxy-squalene	C00187: Cholesterol
M00103	Carbohydrate and lipid metabolism	Sterol biosynthesis	Cholecalciferol biosynthesis	hsa00100	hsa00100	<a href="http://www.genome">http://www.genome</a>	C01164: 7-Dehydrocholesterol	C01673: Calcitriol
M00104_1	Carbohydrate and lipid metabolism	Sterol biosynthesis	Bile acid biosynthesis, cholesterol => cholate	hsa00120	hsa00120	<a href="http://www.genome">http://www.genome</a>	C00187: Cholesterol	C00695: Cholic acid
M00104_2	Carbohydrate and lipid metabolism	Sterol biosynthesis	Bile acid biosynthesis, cholesterol => cholate	hsa00120	hsa00120	<a href="http://www.genome">http://www.genome</a>	C00187: Cholesterol	C02528: Chenodeoxycholate
M00106_1	Carbohydrate and lipid metabolism	Sterol biosynthesis	Conjugated bile acid biosynthesis, cholate => taurocholate/glycocholate	hsa00120	hsa00120	<a href="http://www.genome">http://www.genome</a>	C00695: Cholic acid	C05122: Taurocholate
M00106_2	Carbohydrate and lipid metabolism	Sterol biosynthesis	Conjugated bile acid biosynthesis, cholate => taurocholate/glycocholate	hsa00120	hsa00120	<a href="http://www.genome">http://www.genome</a>	C00695: Cholic acid	C01921: Glycocholate
M00107	Carbohydrate and lipid metabolism	Sterol biosynthesis	Steroid hormone biosynthesis, cholesterol => progesterone => progesterone	hsa00140	hsa00140	<a href="http://www.genome">http://www.genome</a>	C00187: Cholesterol	C00410: Progesterone
M00108	Carbohydrate and lipid metabolism	Sterol biosynthesis	C21-Steroid hormone biosynthesis, progesterone => corticosterone/aldox	hsa00140	hsa00140	<a href="http://www.genome">http://www.genome</a>	C00410: Progesterone	C01780: Aldosterone
M00109	Carbohydrate and lipid metabolism	Sterol biosynthesis	C21-Steroid hormone biosynthesis, progesterone => cortisol/cortisone	hsa00140	hsa00140	<a href="http://www.genome">http://www.genome</a>	C00410: Progesterone	C00762: Cortisone
M00110	Carbohydrate and lipid metabolism	Sterol biosynthesis	C19/C18-Steroid hormone biosynthesis, pregnenolone => androstenedio	hsa00140	hsa00140	<a href="http://www.genome">http://www.genome</a>	C01953: Pregnenolone	C00468: Estrone
M00118	Nucleotide and amino acid metabolism	Cofactor and vitamin biosynthesis	Glutathione biosynthesis, glutamate => glutathione	hsa00480	hsa00480	<a href="http://www.genome">http://www.genome</a>	C00025: L-Glutamate	C00051: Glutathione
M00120	Nucleotide and amino acid metabolism	Cofactor and vitamin biosynthesis	Cofactor and vitamin biosynthesis	hsa00770	hsa00770	<a href="http://www.genome">http://www.genome</a>	C00864: Pantothenate	C00010: CoA
M00128	Nucleotide and amino acid metabolism	Cofactor and vitamin biosynthesis	Ubiquinone biosynthesis, eukaryotes, 4-hydroxybenzoate => ubiquinone	hsa00130	hsa00130	<a href="http://www.genome">http://www.genome</a>	C00156: 4-Hydroxybenzoate	C00399: Ubiquinone
M00130	Carbohydrate and lipid metabolism	Lipid metabolism	Inositol phosphate metabolism, PI=>PIP2 => Ins(1,4,5)P3 => Ins(1,3,4,5)P4 => Ins(1,3,4,5)P4 => myo-in	hsa00562	hsa00562	<a href="http://www.genome">http://www.genome</a>	C01194: 1-Phosphatidyl-D-myo-inositol	C01272: 1D-myo-Inositol 1,3,4,5-tetrakisphosphate
M00131	Carbohydrate and lipid metabolism	Lipid metabolism	Inositol phosphate metabolism, Ins(1,3,4,5)P4 => Ins(1,3,4)P3 => myo-in	hsa00562	hsa00562	<a href="http://www.genome">http://www.genome</a>	C01272: 1D-myo-Inositol 1,3,4,5-tetrakisphosphate	C00137: myo-Inositol
M00132	Carbohydrate and lipid metabolism	Lipid metabolism	Inositol phosphate metabolism, Ins(1,3,4)P3 => phytate	hsa00562	hsa00562	<a href="http://www.genome">http://www.genome</a>	C01243: 1D-myo-Inositol 1,3,4-trisphosphate	C01204: Phytic acid
M0								

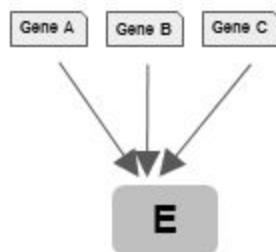
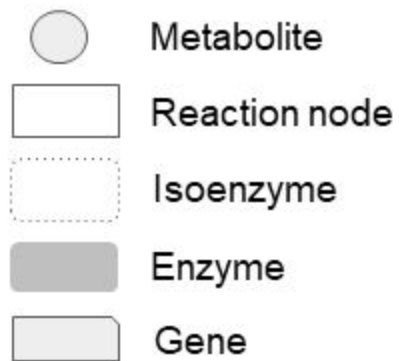
M00135	Nucleotide and amino acid metabolism	Polyamine biosynthesis	GABA biosynthesis, eukaryotes, putrescine => GABA	hsa00330	hsa00330	<a href="http://www.genome">http://www.genome</a> C00134: Putrescine	C00334: 4-Aminobutanoate
M00141	Nucleotide and amino acid metabolism	Cofactor and vitamin biosynthesis	C1-unit interconversion, eukaryotes	hsa00670	hsa00670	<a href="http://www.genome">http://www.genome</a> C00101: Tetrahydrofolate	C00101: Tetrahydrofolate
M00338_1	Nucleotide and amino acid metabolism	Cysteine and methionine metabolism	Cysteine biosynthesis, homocysteine + serine => cysteine	hsa00270	hsa01230;hsa00270	<a href="http://www.genome">http://www.genome</a> C00065+C00155: L-Serine + L-Homocysteine	C00097: L-Cysteine
M00367	Nucleotide and amino acid metabolism	Terpenoid backbone biosynthesis	C10-C20 isoprenoid biosynthesis, non-plant eukaryotes	hsa00900	hsa00900	<a href="http://www.genome">http://www.genome</a> C00129: Isopentenyl diphosphate	C00353: Geranylgeranyl diphosphate
M00415	Nucleotide and amino acid metabolism	Fatty acid metabolism	Fatty acid biosynthesis, elongation, endoplasmic reticulum	hsa00062	hsa01212;hsa00062	<a href="http://www.genome">http://www.genome</a> C00083: Malonyl-CoA	C20876: Very-long-chain acyl-CoA
M00549	Carbohydrate and lipid metabolism	Other carbohydrate metabolism	Nucleotide sugar biosynthesis, glucose => UDP-glucose	hsa00520	hsa00520	<a href="http://www.genome">http://www.genome</a> C00267: alpha-D-Glucose	C00029: UDP-glucose
M00554	Carbohydrate and lipid metabolism	Other carbohydrate metabolism	Nucleotide sugar biosynthesis, galactose => UDP-galactose	hsa00520	hsa00520;hsa00052	<a href="http://www.genome">http://www.genome</a> C00124: D-Galactose	C00052: UDP-alpha-D-galactose
M00632_1	Carbohydrate and lipid metabolism	Other carbohydrate metabolism	Galactose degradation, Leloir pathway, galactose => alpha-D-glucose-1F	hsa00052	hsa00052	<a href="http://www.genome">http://www.genome</a> C00124: D-Galactose	C00103: D-Glucose 1-phosphate
M00741	Carbohydrate and lipid metabolism	Other carbohydrate metabolism	Propanoyl-CoA metabolism, propanoyl-CoA => succinyl-CoA	hsa00280	hsa01200;hsa00280;hsa00630;hsa00640	<a href="http://www.genome">http://www.genome</a> C00100: Propanoyl-CoA	C00091: Succinyl-CoA

\*[http://www.genome.jp/kegg-bin/get\\_htext](http://www.genome.jp/kegg-bin/get_htext)

eramide



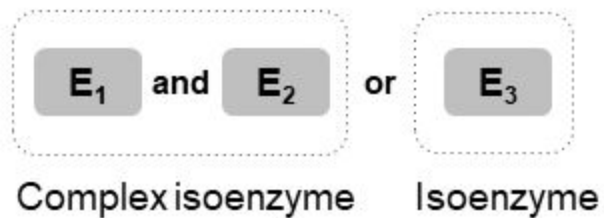
Aldosterone (M00108_C01780)	Down (3.17e-12)	Down (1.16e-14)	Up (4.04e-07)	
Cortisone (M00109_C00762)		Down (0.00497)	Down (1.16e-12)	
Estrone (M00110_C00468)	Down (0.00994)	Up (3.63e-06)	Up (0.0152)	Down (0.00749) Down (0.0128)
Glutathione (M00118_C00051)		Down (0.00139)		Down (0.0186)
CoA (M00120_C00010)	Up (9.74e-31)			Up (6.62e-07)
Ubiquinone (M00128_C00399)	Up (1.31e-09)	Down (1.33e-10)	Down (1.74e-16)	Up (1.77e-07)
1D-myo-Inositol 1,3,4,5-tetrakisphosphate (M00130_C01272)		Up (1.39e-14)	Down (3.99e-25)	Down (4.35e-05) Unknown (0.0233)
myo-Inositol (M00131_C00137)	Down (5.43e-42)	Down (0.0223)	Down (3.5e-10)	Down (5.97e-12) Unknown (0.0233)
Phytic acid (M00132_C01204)	Up (0.000437)	Down (0.000525)	Up (2.21e-12)	
Spermidine (M00133_C00315)		Up (0.0315)	Up (7.28e-19)	Up (2.94e-13)
Putrescine (M00134_C00134)	Down (9.62e-16)	Down (0.000205)	Down (8.28e-29)	
4-Aminobutanoate (M00135_C00334)	Down (3.91e-42)	Down (3.35e-16)	Down (2.27e-07)	Down (0.0138)
C1-unit interconversion (M00141)	Up (0.0167)	Down (2.63e-17)	Down (0.00222)	Up (3.03e-14)
L-Cysteine (M00338_C00097)	Up (2.11e-09)	Down (7.38e-16)	Down (3.48e-29)	Up (9.44e-11)
Geranylgeranyl diphosphate (M00367_C00353)	Up (1.22e-40)	Up (2.88e-11)	Down (1.18e-10)	Up (0.000693)
Very-long-chain acyl-CoA (M00415_C20876)	Up (1.27e-61)	Up (1.49e-26)	Up (1.06e-40)	Up (1.62e-28)
UDP-glucose (M00549_C00029)	Down (7.92e-31)	Down (1.23e-05)	Up (6.14e-14)	Down (9.92e-08)
UDP-alpha-D-galactose (M00554_C00052)			Down (0.00149)	
D-Glucose 1-phosphate (M00632_C00103)		Down (0.000985)	Down (6.04e-10)	
Succinyl-CoA (M00741_C00091)	Up (0.0346)	Down (2.14e-20)	Down (1.21e-33)	Up (0.000249)
		Unknown (0.0228)	Unknown (3.66e-05)	Unknown (1.26e-05)



**1**

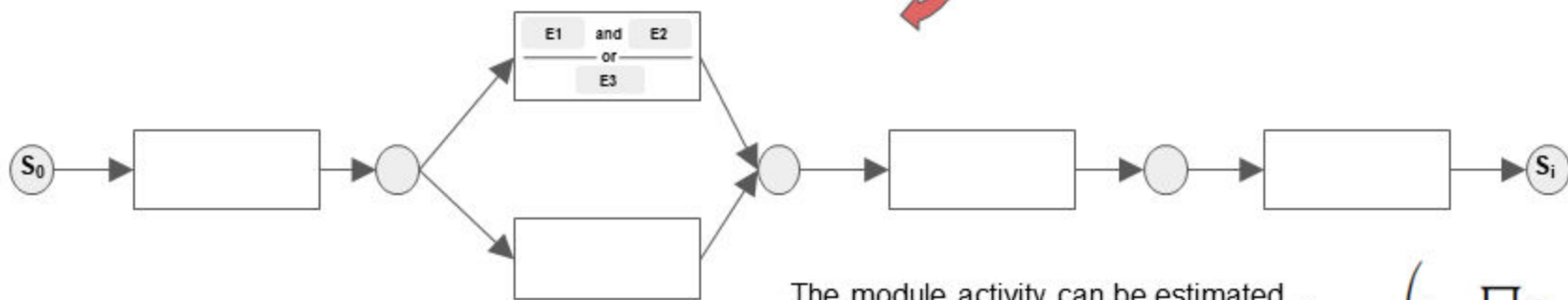
Enzymes can be formed by one or several genes

90<sup>th</sup> percentile of normalized gene expression of gene A,B,C



**2**

Reaction node with two alternative isoenzymes  
 if "and" minimum value of activities  
 if "or" maximum value of activities  
 Reaction node activity =  $\max\{\min\{E1,E2\},E3\}$



**3**

The module activity can be estimated from the reaction node activities using the equation:

$$S_i = n_i \cdot \left( 1 - \prod_{s_a \in A_i} (1 - s_a) \right)$$

