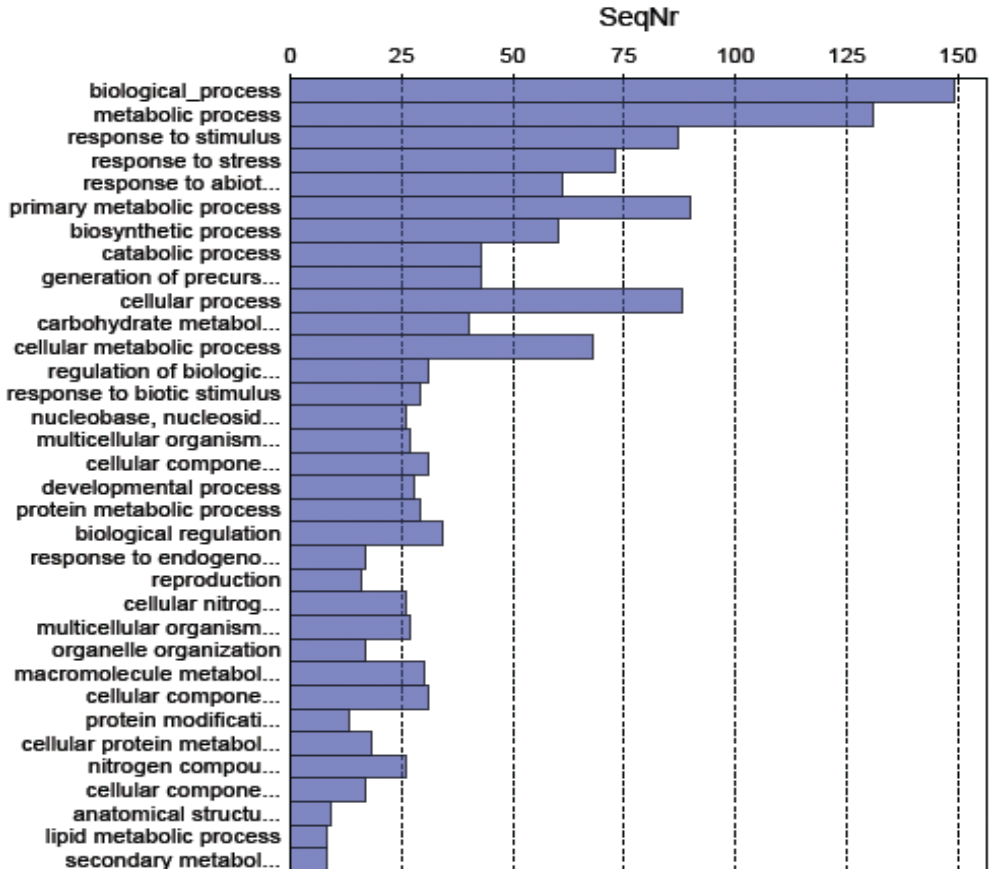
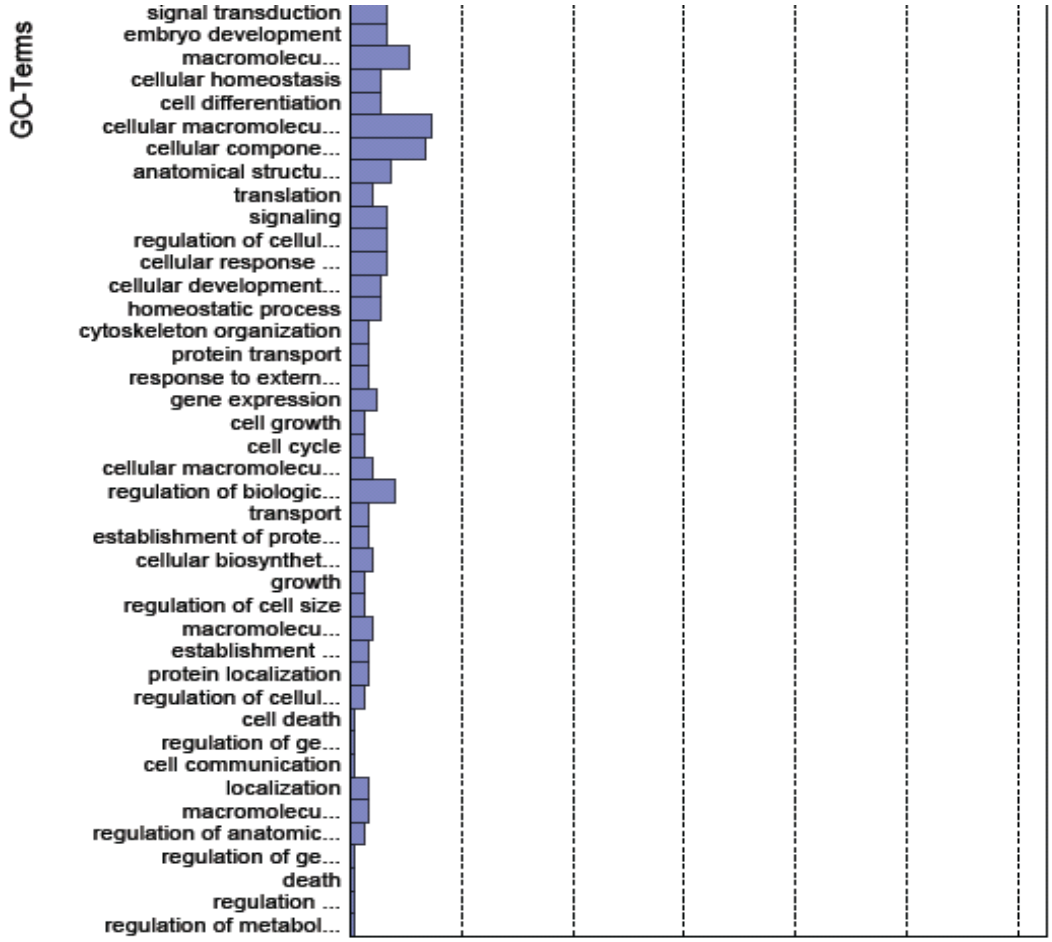
The main pathways involved in salt tolerance of Thellungiella leaves

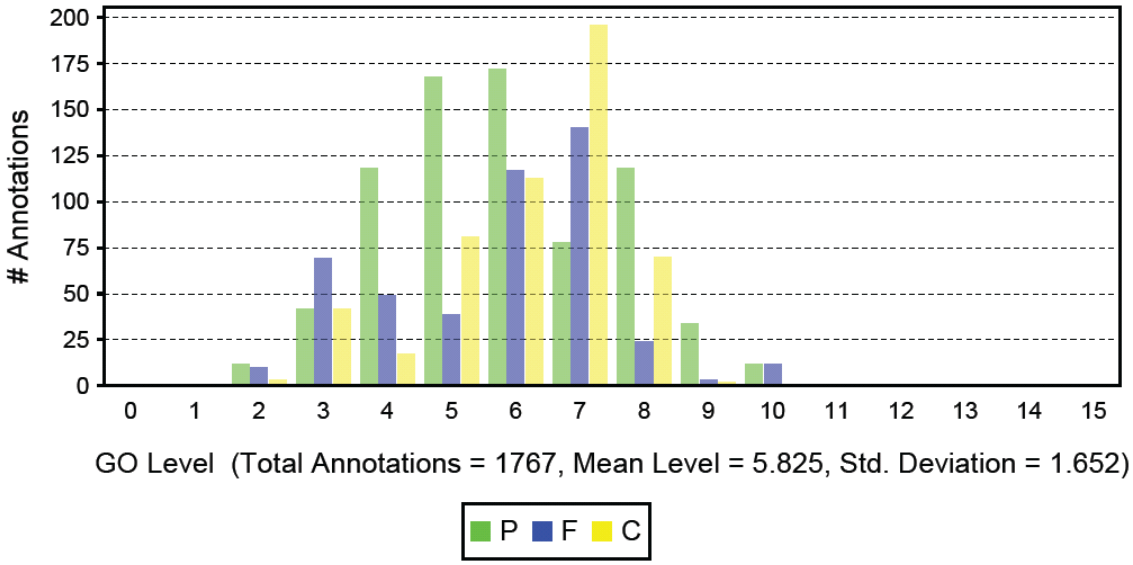
The main pathways involved in salt tolerance of Thellungiella leaves correspond to the proteins that listed in Table 1 and their GO information including the enzyme code (EC) numbers were provided in Suppl Data 5.

Sequence distribution: biological_process

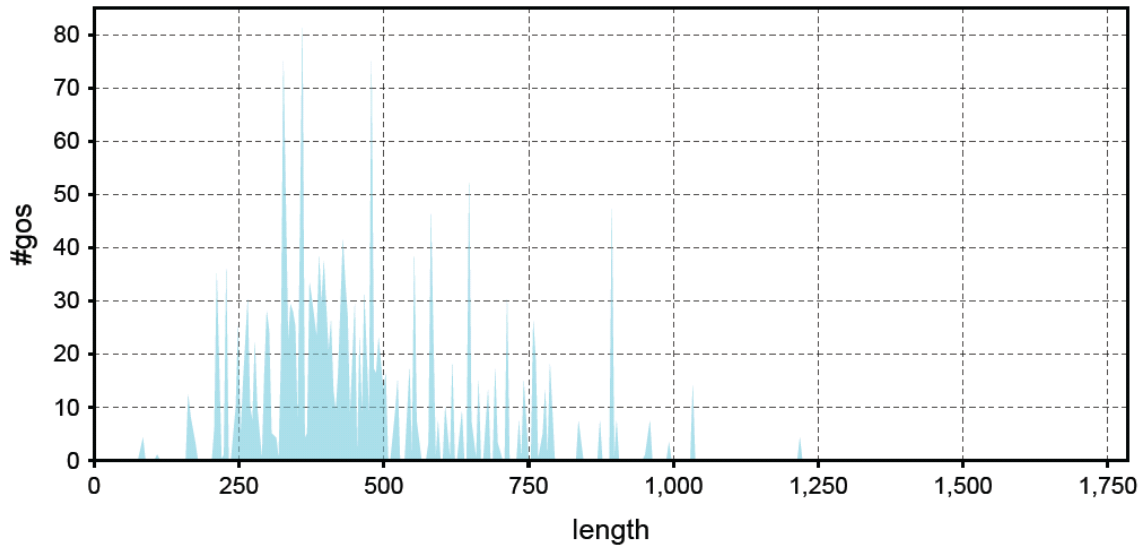




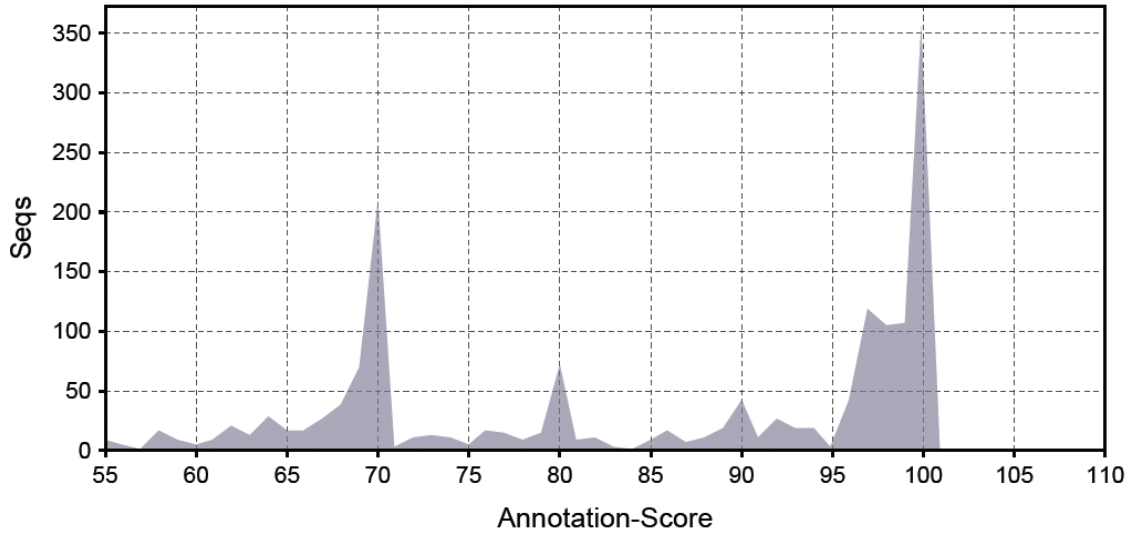
GO-level distribution



Number of GO-terms for sequences with length(x)

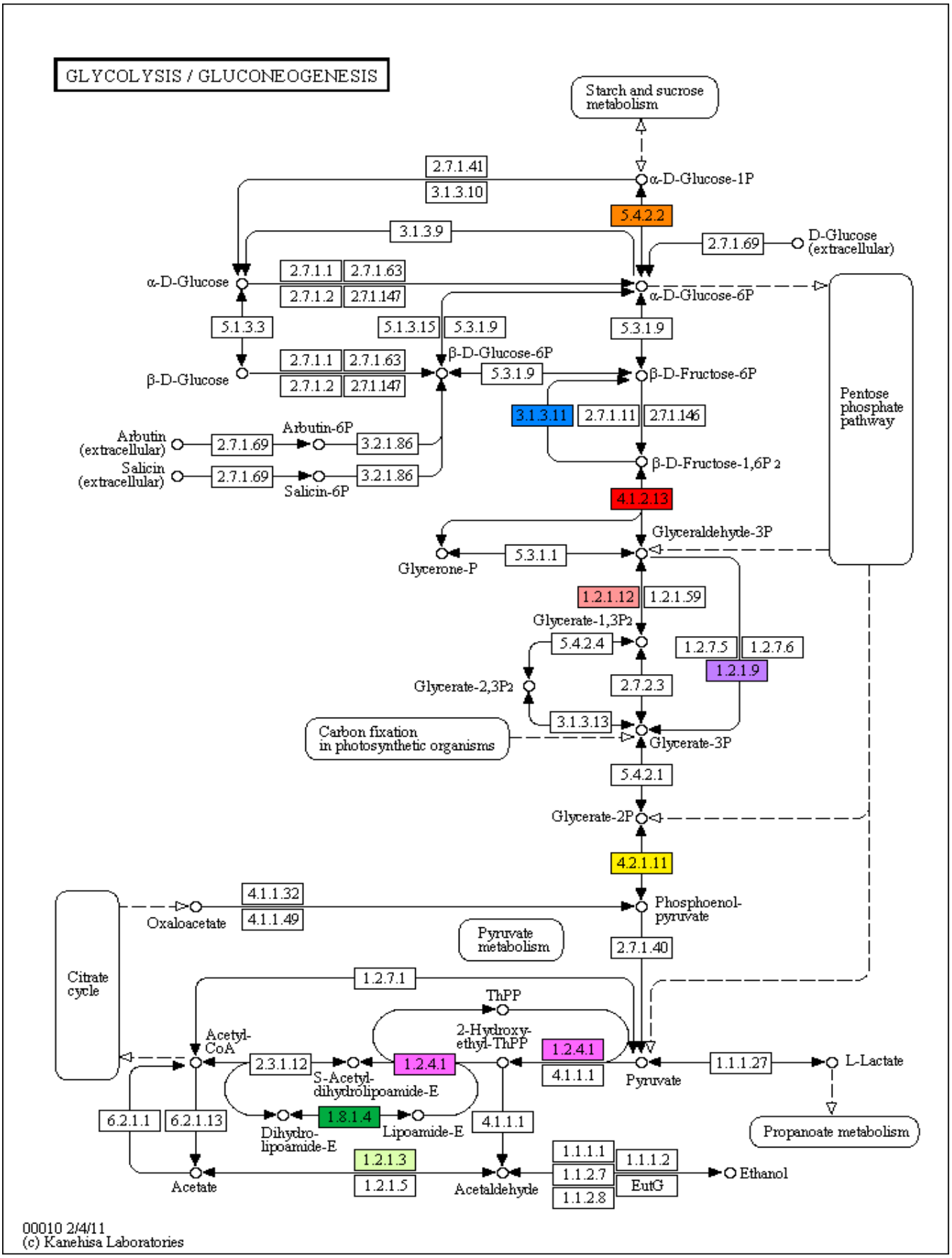


Annotation-Score distribution

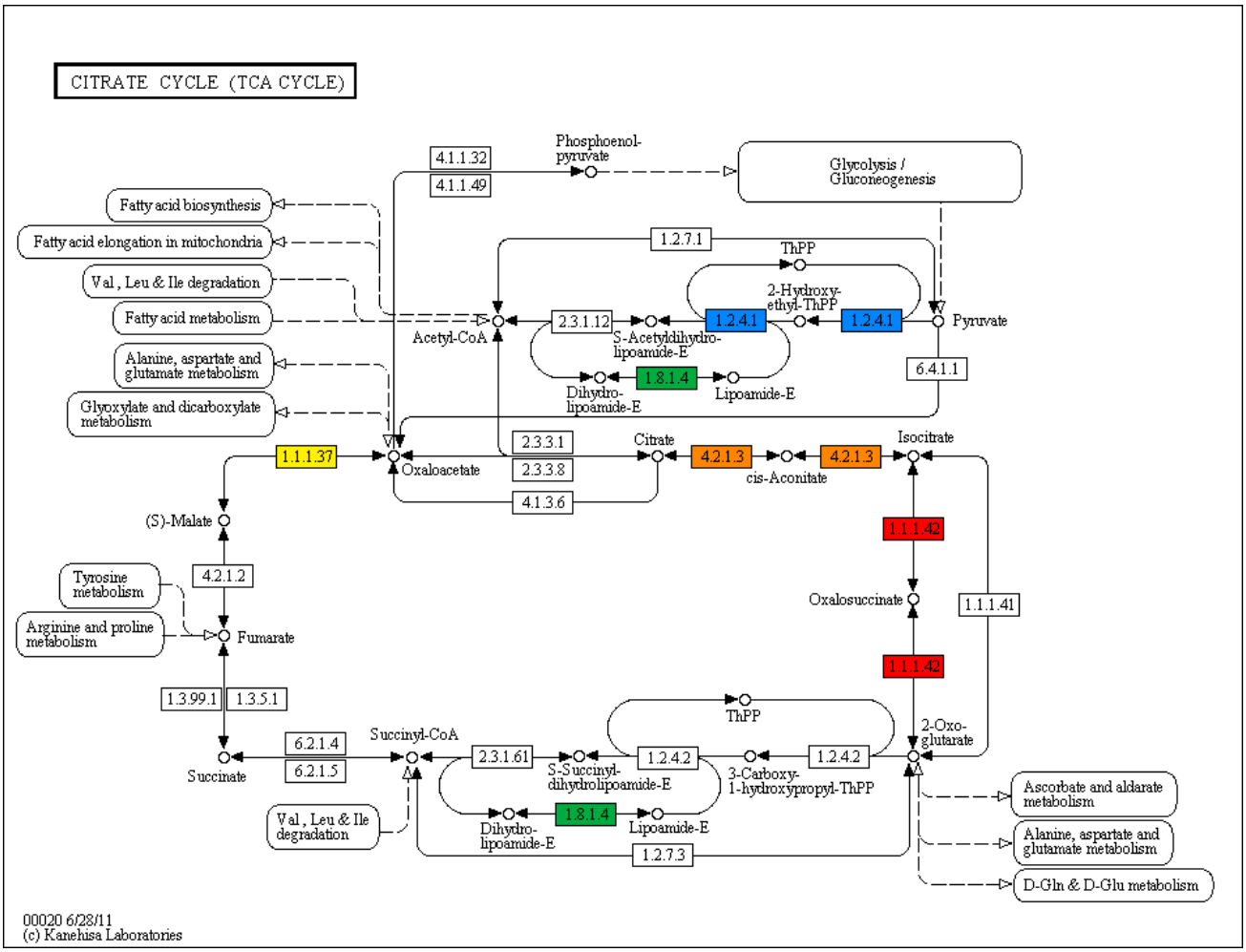


The main pathways involved in salt tolerance of Thellungiella

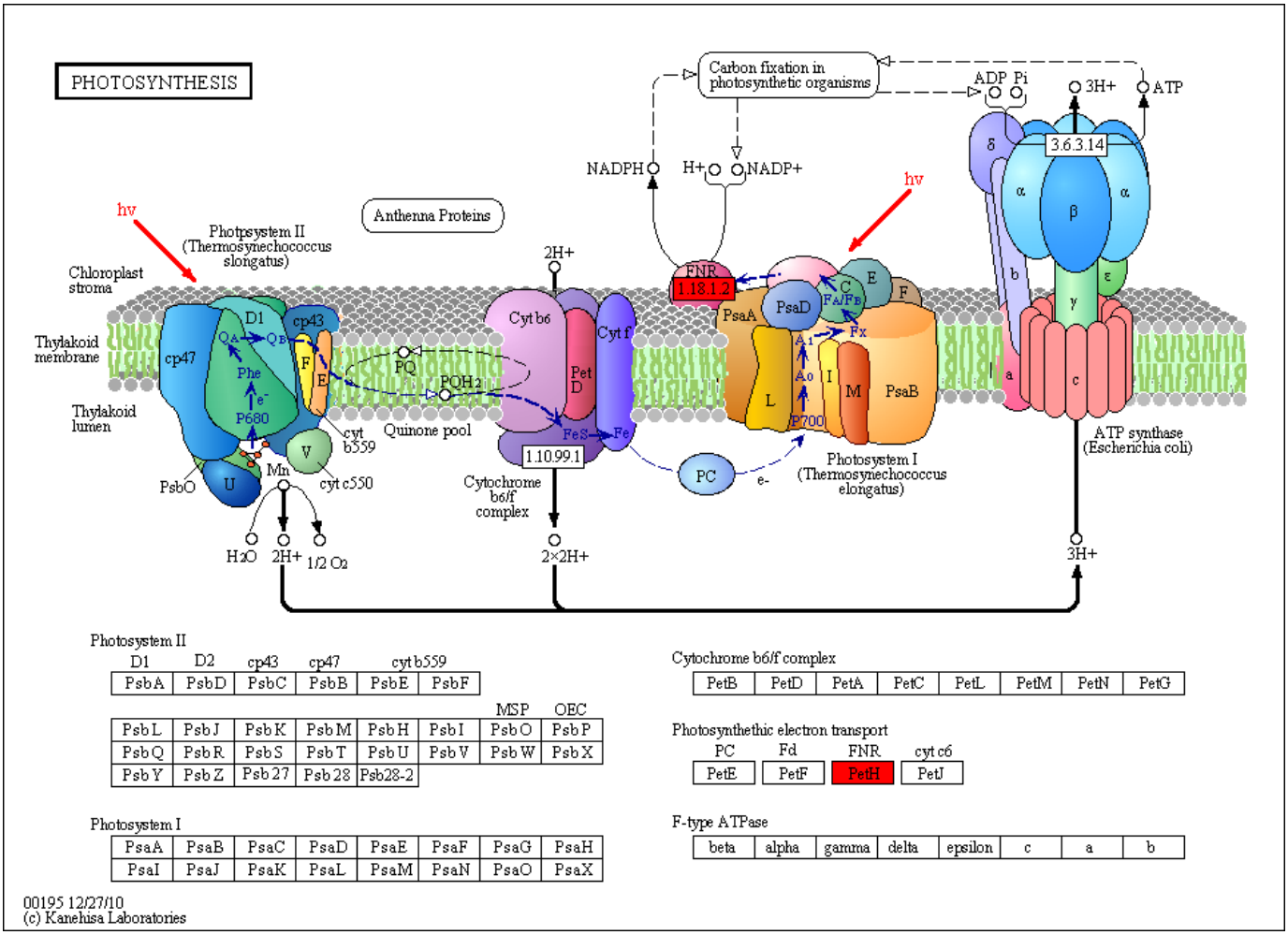
Glycolysis/gluconeogenesis: 9 proteins



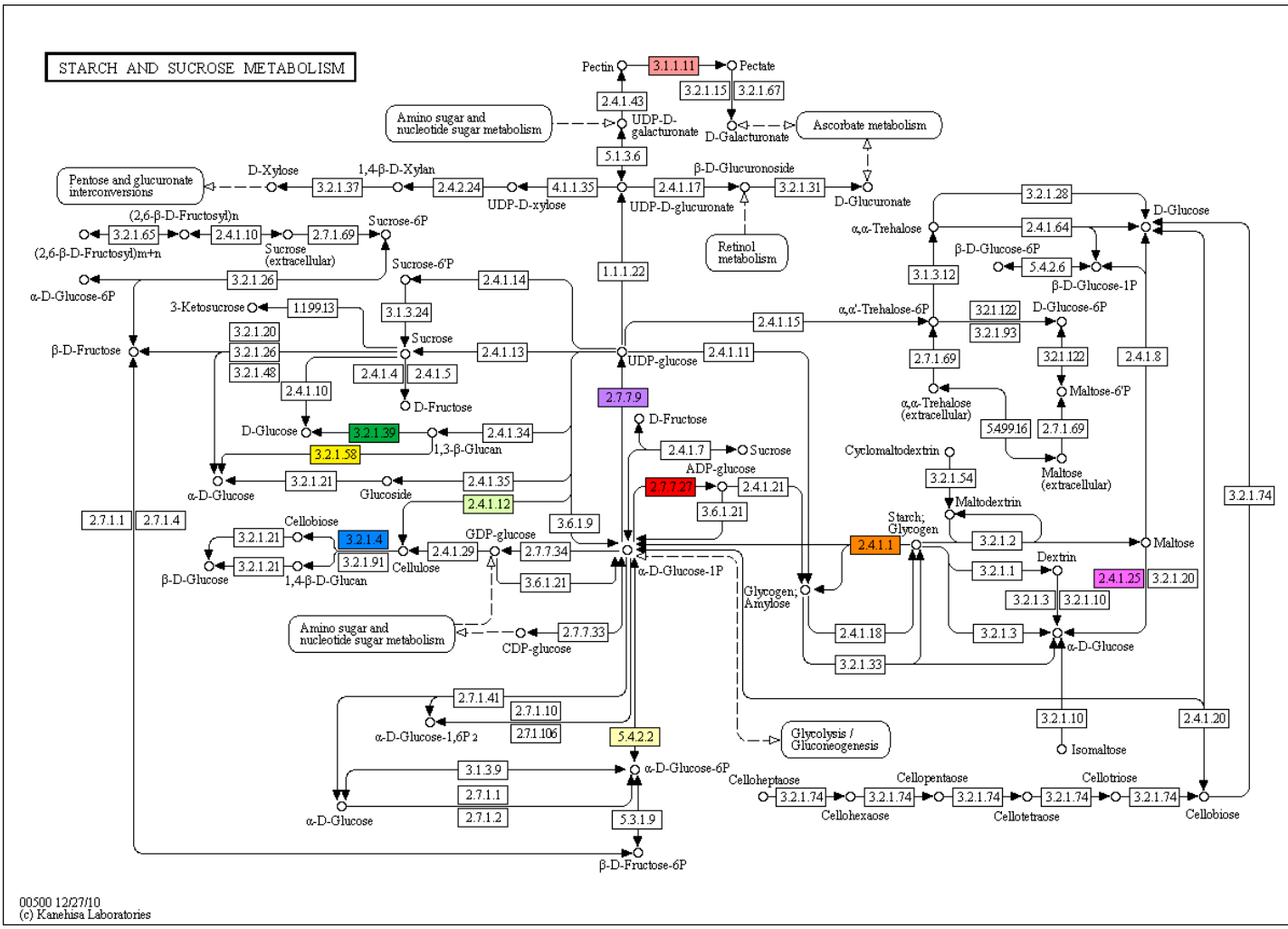
Citrate cycle (TCA cycle): 6 proteins



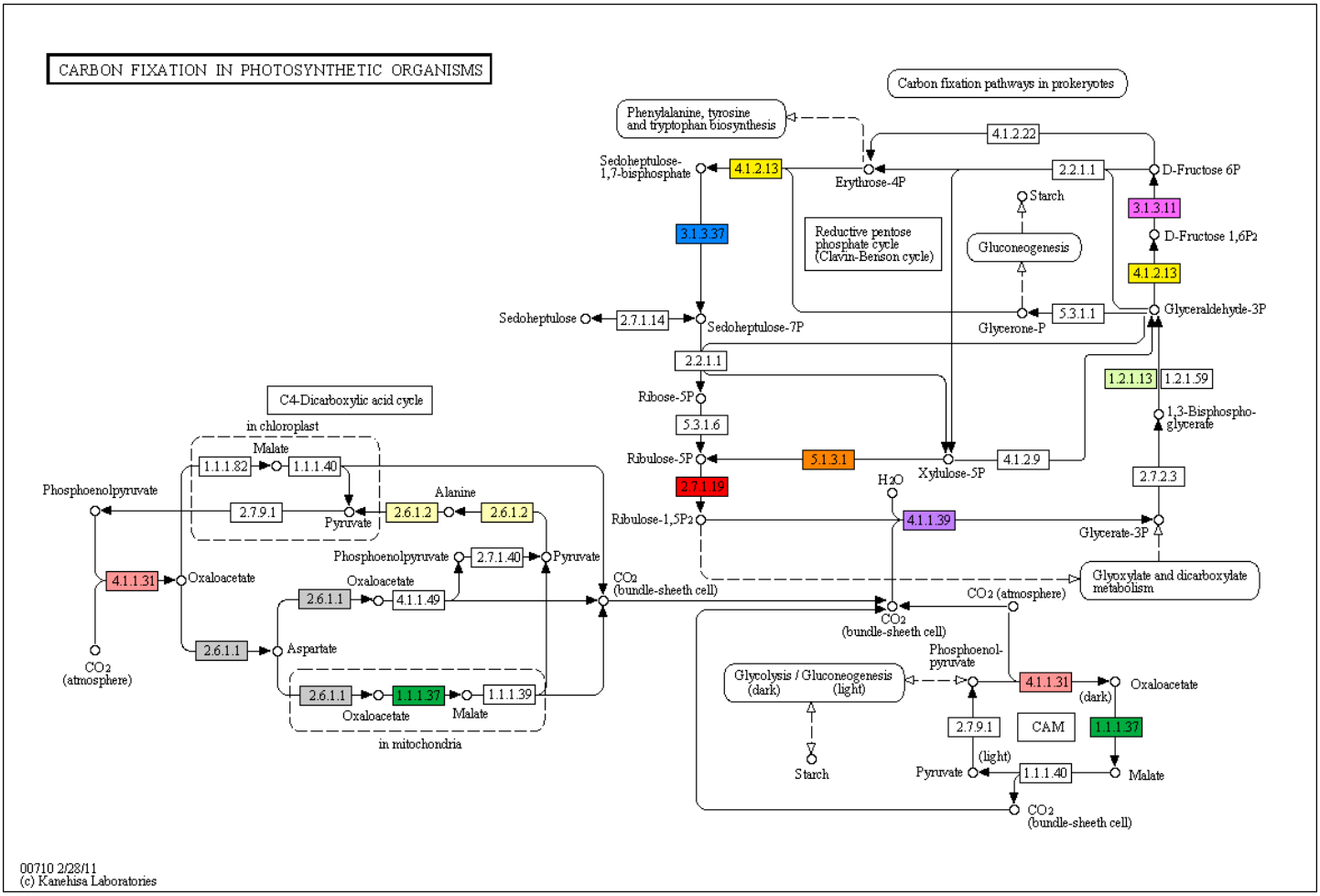
Photosynthesis related: 10 proteins



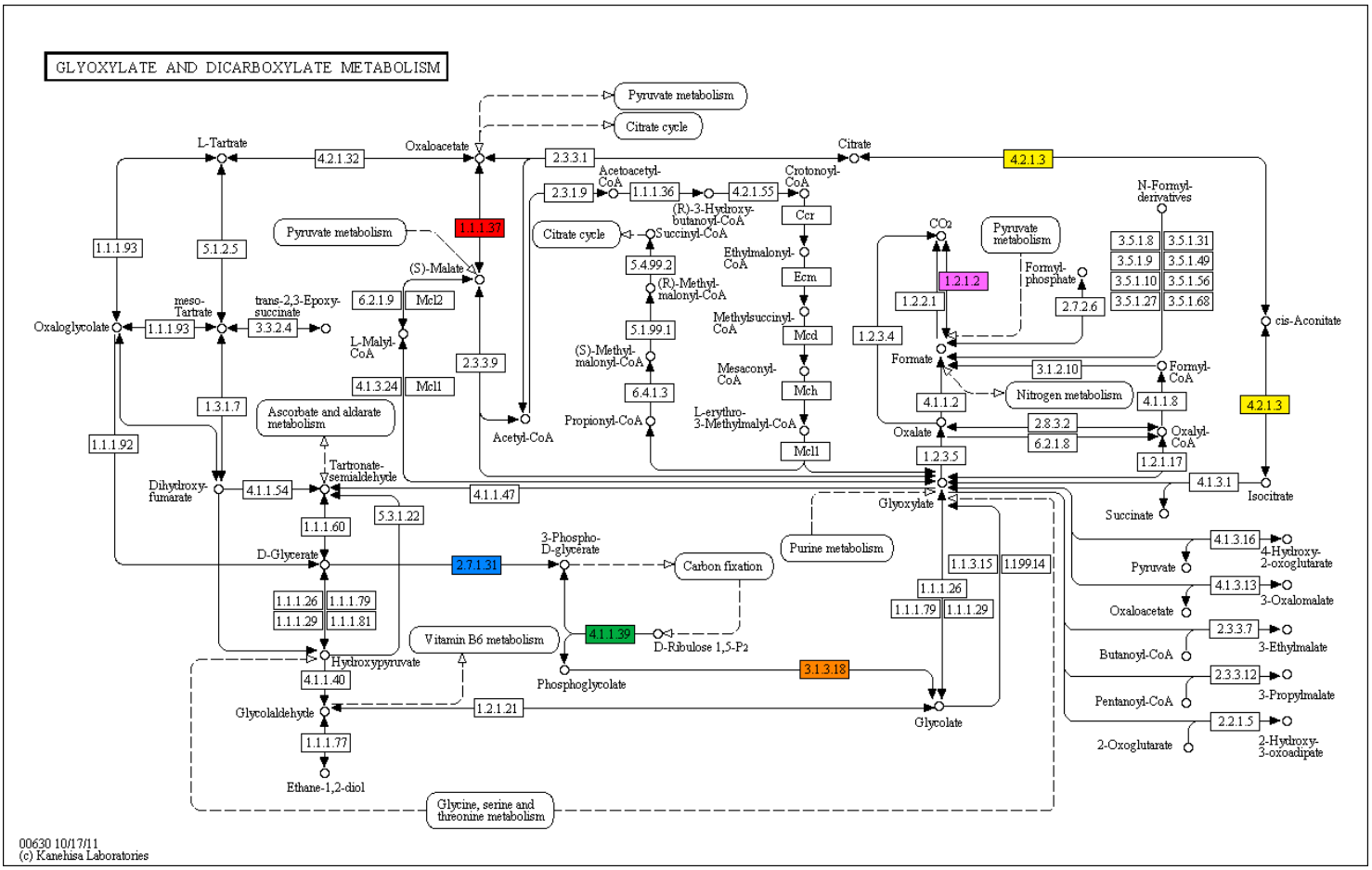
Starch and sucrose metabolism: 10 proteins



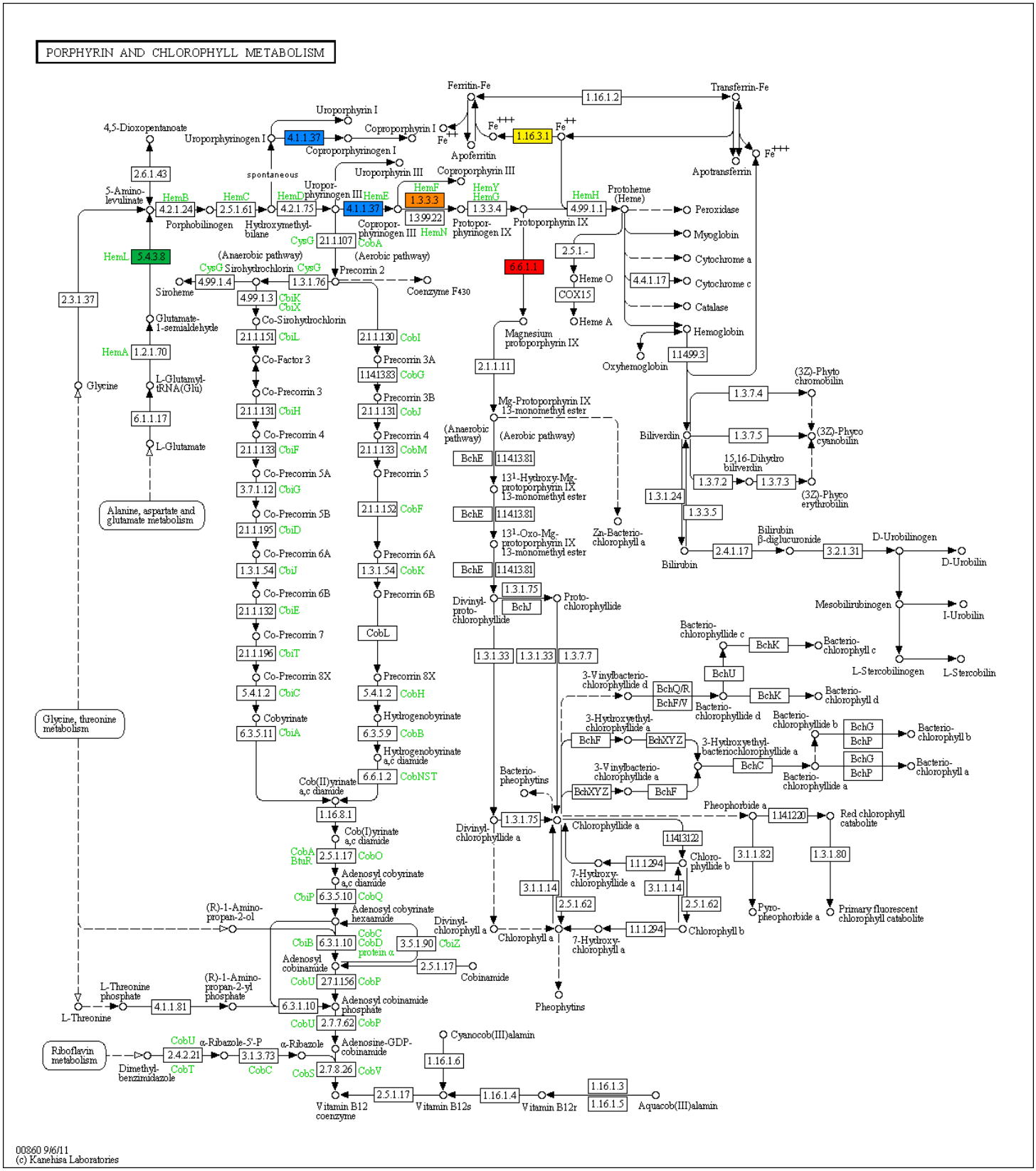
Carbon fixation in photosynthetic organisms: 11 proteins

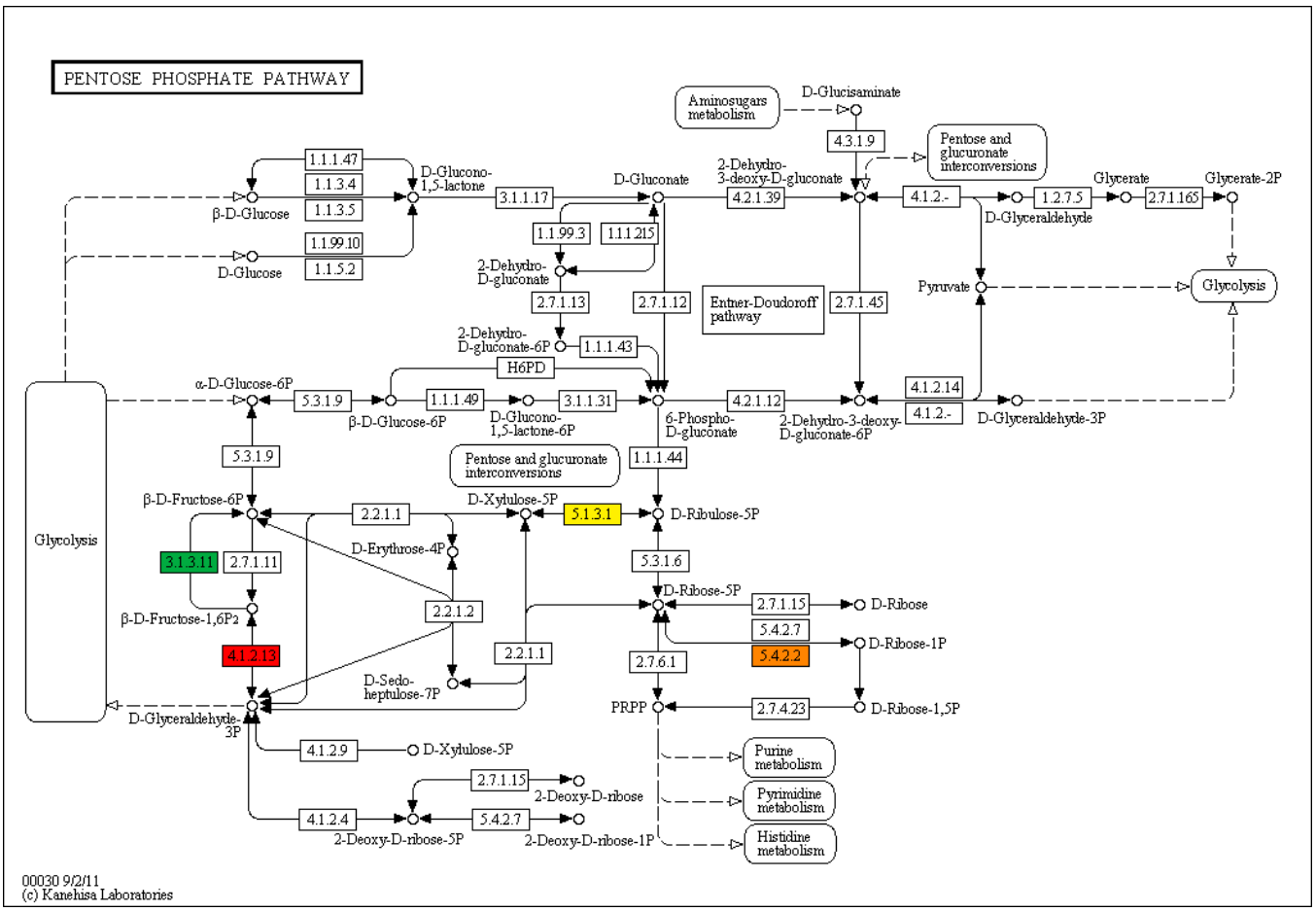


Glyoxylate and dicarboxylate metabolism: 11 proteins



Porphyrin and chlorophyll metabolism: 9 proteins




PENTOSE PHOSPHATE PATHWAY
Aminosugars metabolism
D-Glucisaminate
4.3.1.9
Pentose and glucuronate interconversions
1.1.1.47
1.1.3.4
1.1.3.5
D-Glucono-1,5-lactone
3.1.1.17
D-Gluconate
2-Dehydro-3-deoxy-D-gluconate
4.2.1.39
4.1.2.-
Glycerate
Glycerate-2P
1.2.7.5
2.7.1.165
D-Glyceraldehyde
β-D-Glucose
1.1.99.10
1.1.5.2
D-Glucose
1.1.99.3
1.1.1.215
2-Dehydro-D-gluconate
2.7.1.13
2.7.1.12
Entner-Doudoroff pathway
2.7.1.45
Pyruvate
Glycolysis
2-Dehydro-D-gluconate-6P
1.1.1.43
H6PD
α-D-Glucose-6P
5.3.1.9
β-D-Glucose-6P
1.1.1.49
D-Glucono-1,5-lactone-6P
3.1.1.31
6-Phospho-D-gluconate
4.2.1.12
2-Dehydro-3-deoxy-D-gluconate-6P
4.1.2.14
4.1.2.-
D-Glyceraldehyde-3P
5.3.1.9
Pentose and glucuronate interconversions
1.1.1.44
β-D-Fructose-6P
2.2.1.1
D-Xylulose-5P
5.1.3.1
D-Ribulose-5P
Glycolysis
3.1.3.11
2.7.1.11
D-Erythrose-4P
5.3.1.6
D-Ribose-5P
2.7.1.15
D-Ribose
β-D-Fructose-1,6P2
2.2.1.2
5.4.2.7
D-Ribose-1P
4.1.2.13
2.2.1.1
5.4.2.2
2.7.6.1
D-Seco-heptulose-7P
PRPP
2.7.4.23
D-Ribose-1,5P
D-Glyceraldehyde-3P
4.1.2.9
D-Xylulose-5P
Purine metabolism
2.7.1.15
2-Deoxy-D-ribose
Pyrimidine metabolism
4.1.2.4
5.4.2.7
2-Deoxy-D-ribose-5P
2-Deoxy-D-ribose-1P
Histidine metabolism
00030 9/2/11
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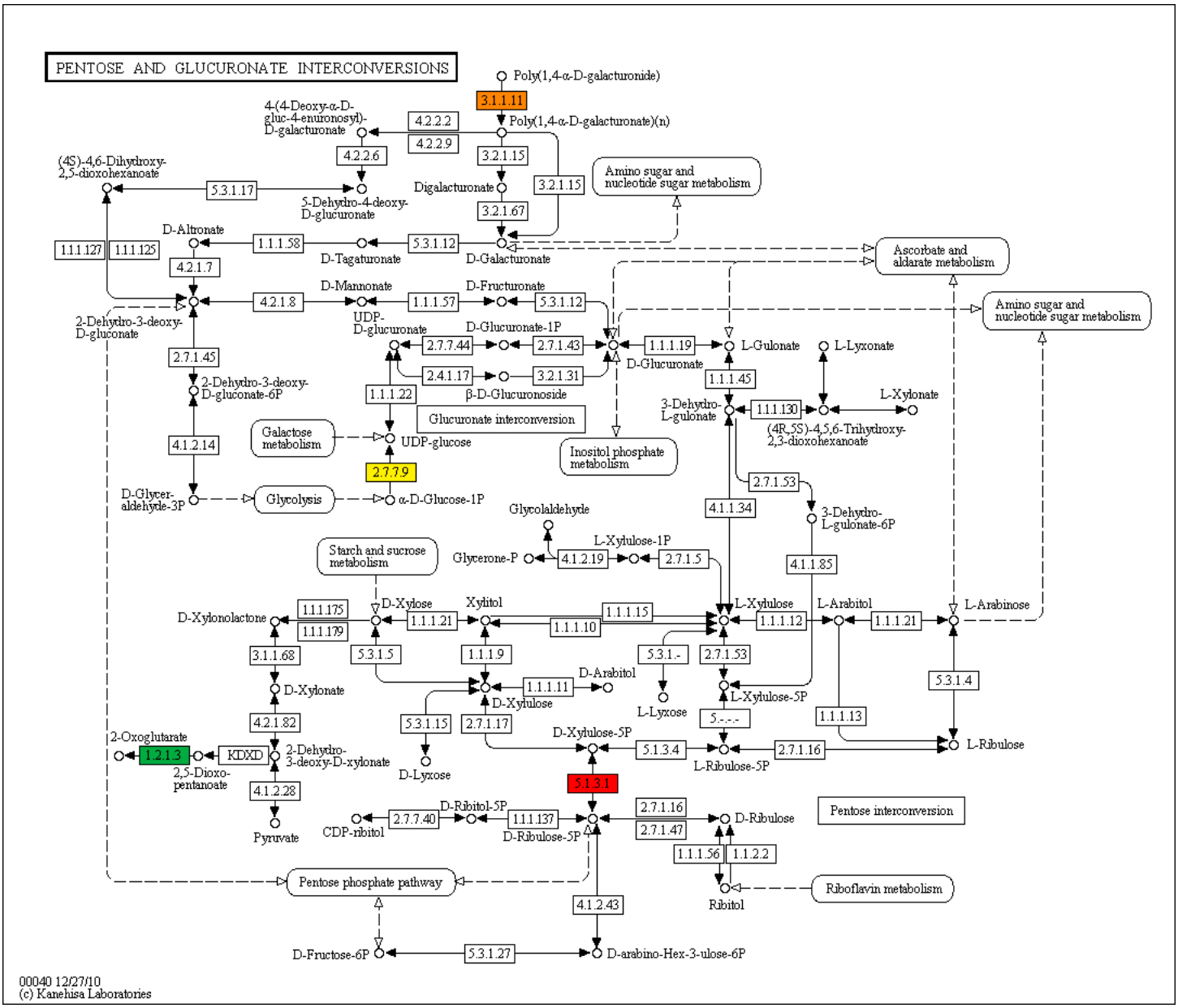
PENTOSE AND GLUCURONATE INTERCONVERSIONS
Poly(1,4-α-D-galacturonide)
3.1.1.11
Poly(1,4-α-D-galacturonate)(n)
4-(4-Deoxy-α-D-gluc-4-enuronosyl)-D-galacturonate
4.2.2.2
4.2.2.9
4.2.2.6
3.2.1.15
(4S)-4,6-Dihydroxy-2,5-dioxohexanoate
5.3.1.17
5-Dehydro-4-deoxy-D-glucuronate
Digalacturonate
3.2.1.67
Amino sugar and nucleotide sugar metabolism
D-Altronate
1.1.1.127
1.1.1.125
1.1.1.58
D-Tagaturonate
5.3.1.12
D-Galacturonate
Ascorbate and aldarate metabolism
4.2.1.7
D-Mannonate
4.2.1.8
1.1.1.57
D-Fructuronate
5.3.1.12
2-Dehydro-3-deoxy-D-gluconate
UDP-D-glucuronate
D-Glucuronate-1P
2.7.7.44
2.7.1.43
1.1.1.19
L-Gulonate
L-Lyxonate
2.7.1.45
2-Dehydro-3-deoxy-D-gluconate-6P
2.4.1.17
3.2.1.31
D-Glucuronate
1.1.1.45
1.1.1.22
β-D-Glucuronoside
3-Dehydro-L-gulonate
1.1.1.130
L-Xylonate
Glucuronate interconversion
(4R,5S)-4,5,6-Trihydroxy-2,3-dioxohexanoate
Galactose metabolism
4.1.2.14
UDP-glucose
Inositol phosphate metabolism
2.7.7.9
2.7.1.53
D-Glycer-aldehyde-3P
Glycolysis
α-D-Glucose-1P
Glycolaldehyde
4.1.1.34
3-Dehydro-L-gulonate-6P
Starch and sucrose metabolism
Glycerone-P
4.1.2.19
L-Xylulose-1P
2.7.1.5
4.1.1.85
D-Xylonolactone
1.1.1.175
1.1.1.179
D-Xylose
1.1.1.21
Xylitol
1.1.1.15
1.1.1.10
L-Xylulose
L-Arabitol
1.1.1.12
1.1.1.21
L-Arabinose
3.1.1.68
5.3.1.5
1.1.1.9
5.3.1.-
2.7.1.53
D-Xylonate
D-Arabitol
1.1.1.11
D-Xylulose
L-Xylulose-5P
5.3.1.4
4.2.1.82
5.3.1.15
2.7.1.17
L-Lyxose
5.-.-.
1.1.1.13
D-Xylulose-5P
2-Oxoglutarate
1.2.1.3
KDXD
2-Dehydro-3-deoxy-D-xylonate
5.1.3.4
2.7.1.16
L-Ribulose
2,5-Dioxo-pentanoate
D-Lyxose
L-Ribulose-5P
5.1.3.1
4.1.2.28
D-Ribitol-5P
2.7.1.16
D-Ribulose
Pentose interconversion
Pyruvate
CDP-ribitol
2.7.7.40
1.1.1.137
D-Ribulose-5P
2.7.1.47
1.1.1.56
1.1.2.2
Pentose phosphate pathway
Riboflavin metabolism
Ribitol
4.1.2.43
D-Fructose-6P
5.3.1.27
D-arabino-Hex-3-ulose-6P
00040 12/27/10
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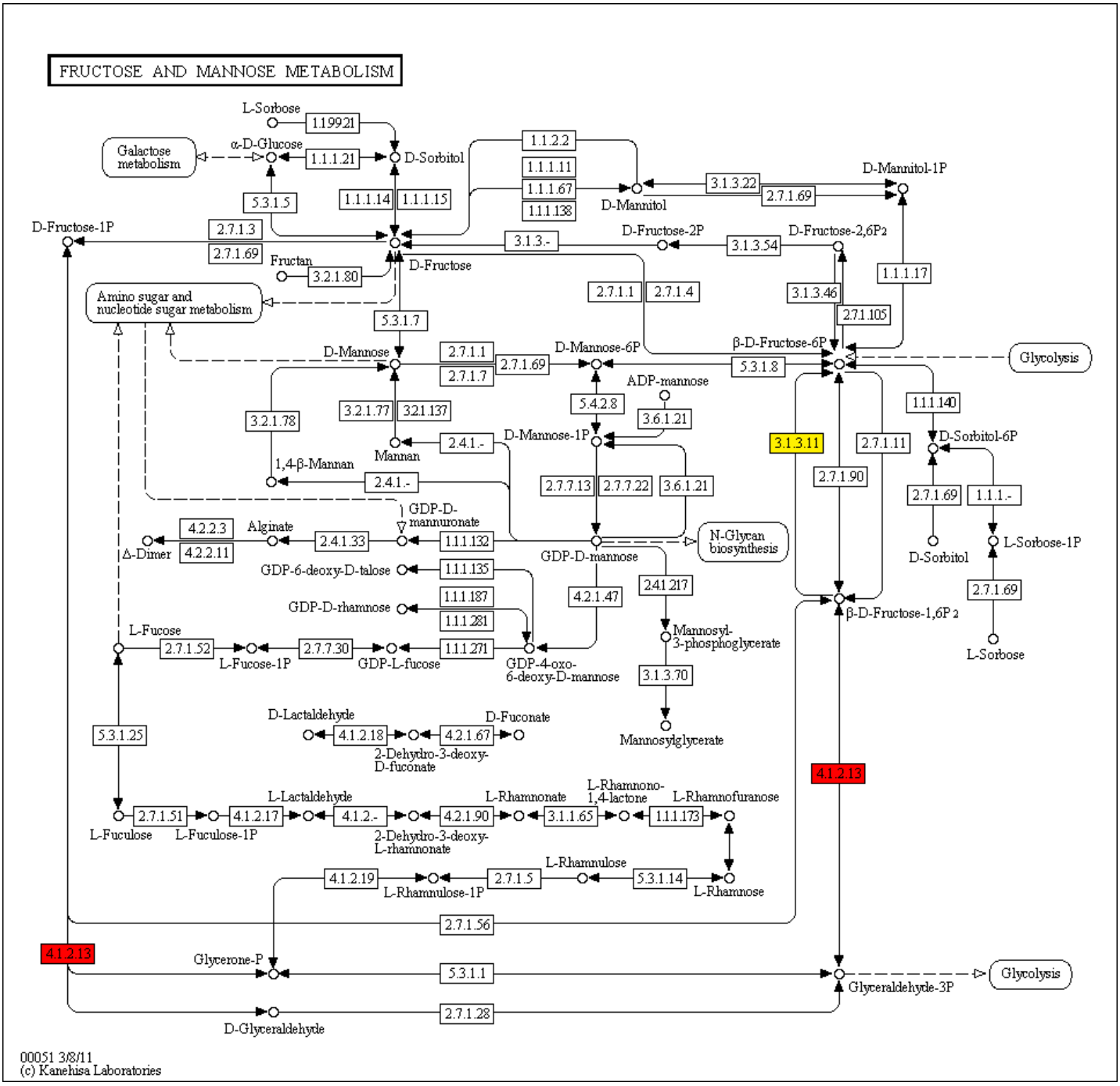
FRUCTOSE AND MANNOSE METABOLISM
L-Sorbose
1.1.99.21
Galactose metabolism
α-D-Glucose
1.1.1.21
D-Sorbitol
1.1.2.2
1.1.1.11
1.1.1.67
1.1.1.138
D-Mannitol
3.1.3.22
2.7.1.69
D-Mannitol-1P
5.3.1.5
1.1.1.14
1.1.1.15
D-Fructose-1P
2.7.1.3
2.7.1.69
3.1.3.-
D-Fructose-2P
3.1.3.54
D-Fructose-2,6P2
Fructan
3.2.1.80
D-Fructose
1.1.1.17
Amino sugar and nucleotide sugar metabolism
2.7.1.1
2.7.1.4
3.1.3.46
2.7.1.105
5.3.1.7
D-Mannose
2.7.1.1
2.7.1.7
2.7.1.69
D-Mannose-6P
β-D-Fructose-6P
5.3.1.8
Glycolysis
ADP-mannose
5.4.2.8
3.6.1.21
1.1.1.140
3.2.1.78
3.2.1.77
3.2.1.137
2.4.1.-
D-Mannose-1P
3.1.3.11
2.7.1.11
D-Sorbitol-6P
Mannan
1,4-β-Mannan
2.4.1.-
2.7.7.13
2.7.7.22
3.6.1.21
2.7.1.90
2.7.1.69
1.1.1.-
GDP-D-mannuronate
4.2.2.3
Alginate
2.4.1.33
1.1.1.132
N-Glycan biosynthesis
Δ-Dimer
4.2.2.11
GDP-D-mannose
D-Sorbitol
L-Sorbose-1P
GDP-6-deoxy-D-talose
1.1.1.135
2.4.1.217
2.7.1.69
GDP-D-rhamnose
1.1.1.187
1.1.1.281
4.2.1.47
β-D-Fructose-1,6P 2
L-Fucose
2.7.1.52
L-Fucose-1P
2.7.7.30
GDP-L-fucose
1.1.1.271
GDP-4-oxo-6-deoxy-D-mannose
Mannosyl-3-phosphoglycerate
L-Sorbose
3.1.3.70
Mannosylglycerate
D-Lactaldehyde
D-Fuconate
5.3.1.25
4.1.2.18
4.2.1.67
2-Dehydro-3-deoxy-D-fuconate
4.1.2.13
L-Lactaldehyde
L-Rhamnonate
L-Rhamnono-1,4-lactone
L-Rhamnofuranose
2.7.1.51
4.1.2.17
4.1.2.-
4.2.1.90
3.1.1.65
1.1.1.173
L-Fuculose
L-Fuculose-1P
2-Dehydro-3-deoxy-L-rhamnonate
L-Rhamnulose
4.1.2.19
2.7.1.5
5.3.1.14
L-Rhamnulose-1P
L-Rhamnose
2.7.1.56
4.1.2.13
Glycerone-P
5.3.1.1
Glycolysis
Glyceraldehyde-3P
2.7.1.28
D-Glyceraldehyde
00051 3/8/11
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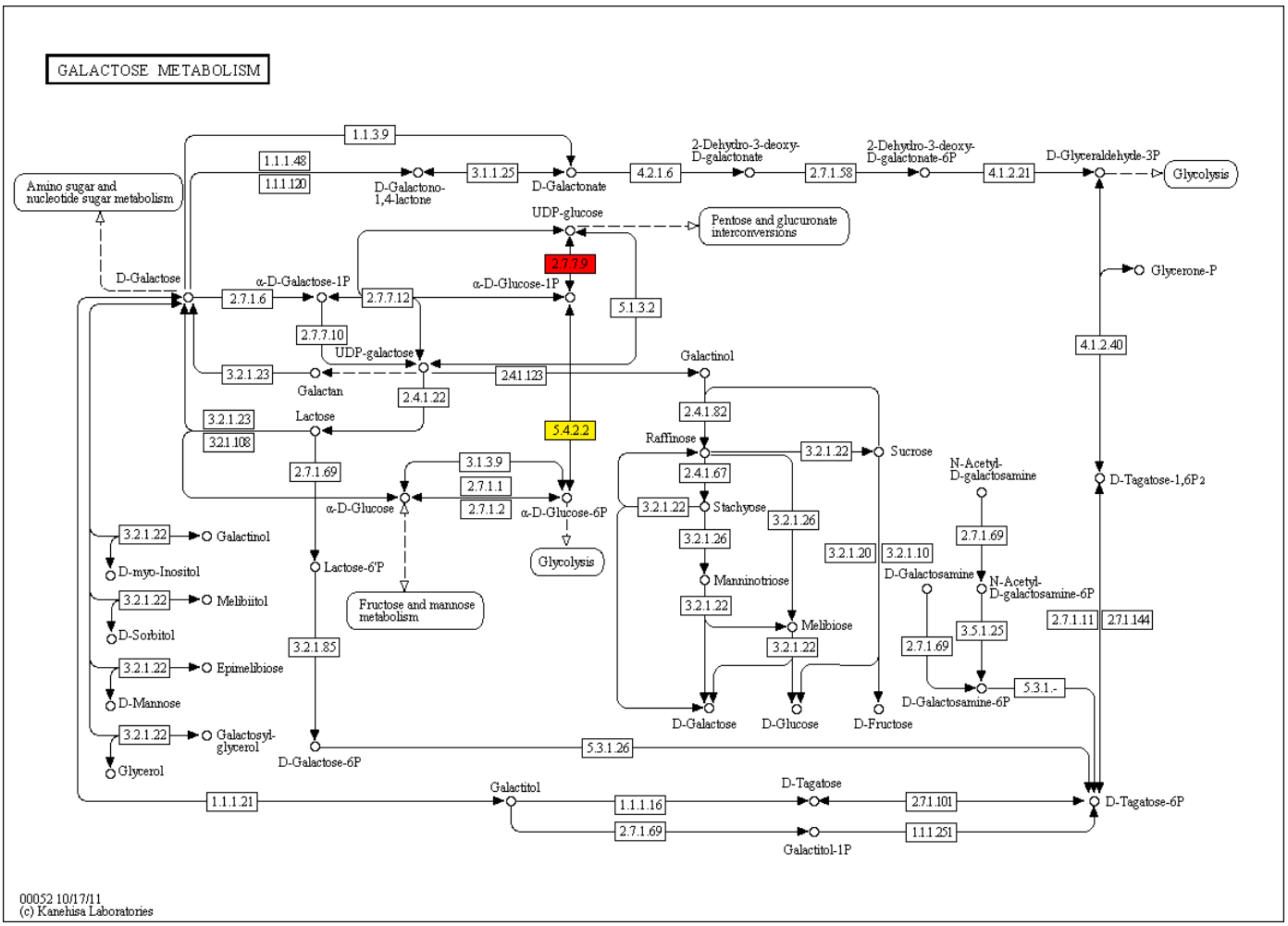
GALACTOSE METABOLISM
Amino sugar and nucleotide sugar metabolism
1.1.3.9
1.1.1.48
1.1.1.120
D-Galactono-1,4-lactone
3.1.1.25
D-Galactonate
4.2.1.6
2-Dehydro-3-deoxy-D-galactonate
2.7.1.58
2-Dehydro-3-deoxy-D-galactonate-6P
4.1.2.21
D-Glyceraldehyde-3P
Glycolysis
UDP-glucose
Pentose and glucuronate interconversions
D-Galactose
α-D-Galactose-1P
2.7.1.6
2.7.7.12
α-D-Glucose-1P
2.7.7.9
5.1.3.2
Glycerone-P
4.1.2.40
2.7.7.10
UDP-galactose
Galactinol
3.2.1.23
Galactan
2.4.1.123
2.4.1.22
3.2.1.23
3.2.1.108
Lactose
5.4.2.2
2.4.1.82
Raffinose
3.2.1.22
Sucrose
N-Acetyl-D-galactosamine
D-Tagatose-1,6P2
2.7.1.69
3.1.3.9
2.7.1.1
2.7.1.2
α-D-Glucose
α-D-Glucose-6P
2.4.1.67
3.2.1.22
Stachyose
3.2.1.26
3.2.1.26
3.2.1.20
3.2.1.10
Glycolysis
D-Galactosamine
N-Acetyl-D-galactosamine-6P
2.7.1.69
3.2.1.22
Galactinol
D-myo-Inositol
Lactose-6'P
Fructose and mannose metabolism
Manninotriose
3.2.1.22
Melibiitol
D-Sorbitol
3.2.1.85
3.2.1.22
Melibiose
3.2.1.22
2.7.1.69
3.5.1.25
2.7.1.11
2.7.1.144
3.2.1.22
Epimelibiose
D-Mannose
D-Galactosamine-6P
5.3.1.-
3.2.1.22
Galactosyl-glycerol
Glycerol
D-Galactose-6P
5.3.1.26
D-Galactose
D-Glucose
D-Fructose
1.1.1.21
Galactitol
D-Tagatose
D-Tagatose-6P
1.1.1.16
2.7.1.101
2.7.1.69
1.1.1.251
Galactitol-1P
00052 10/17/11
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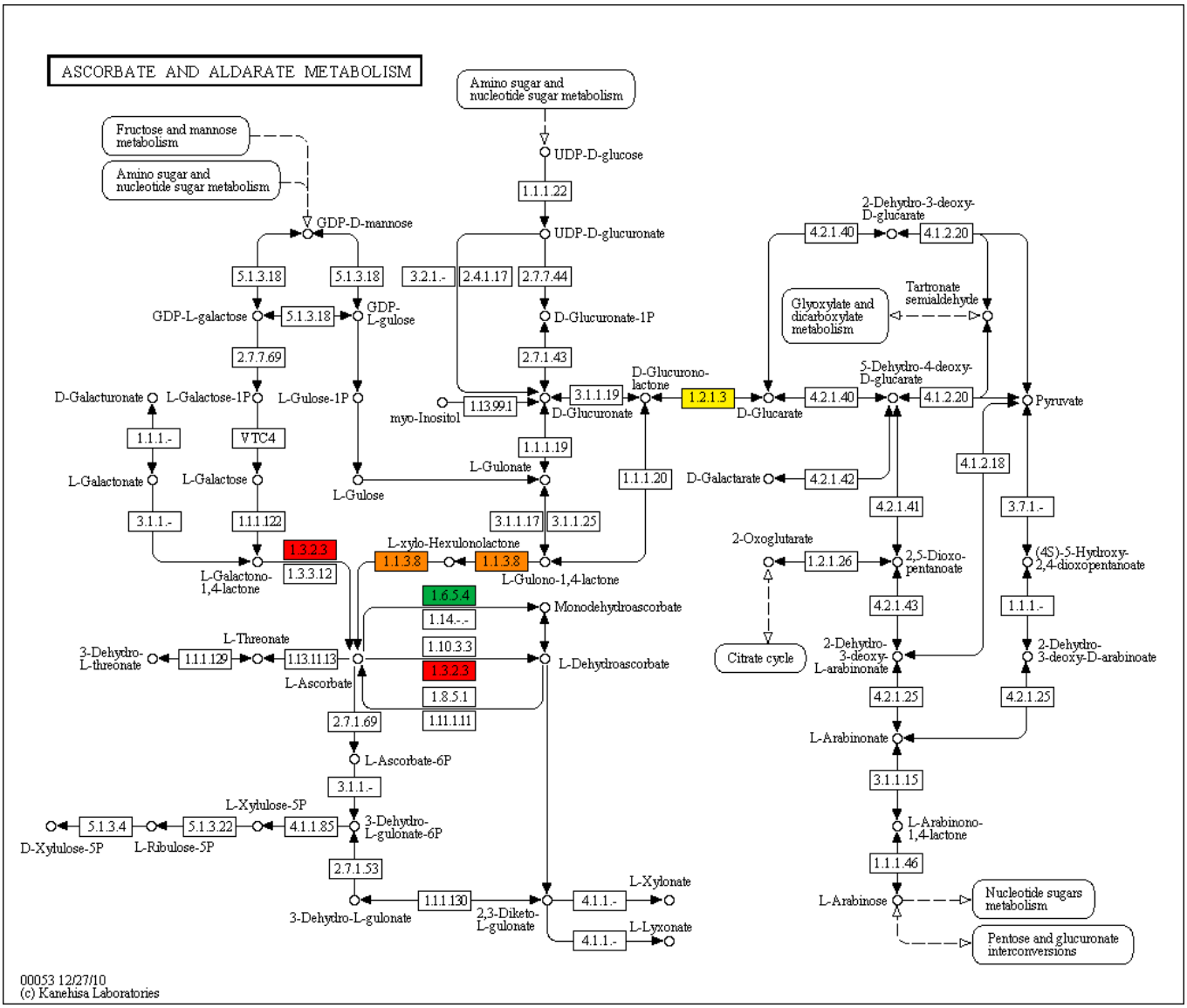

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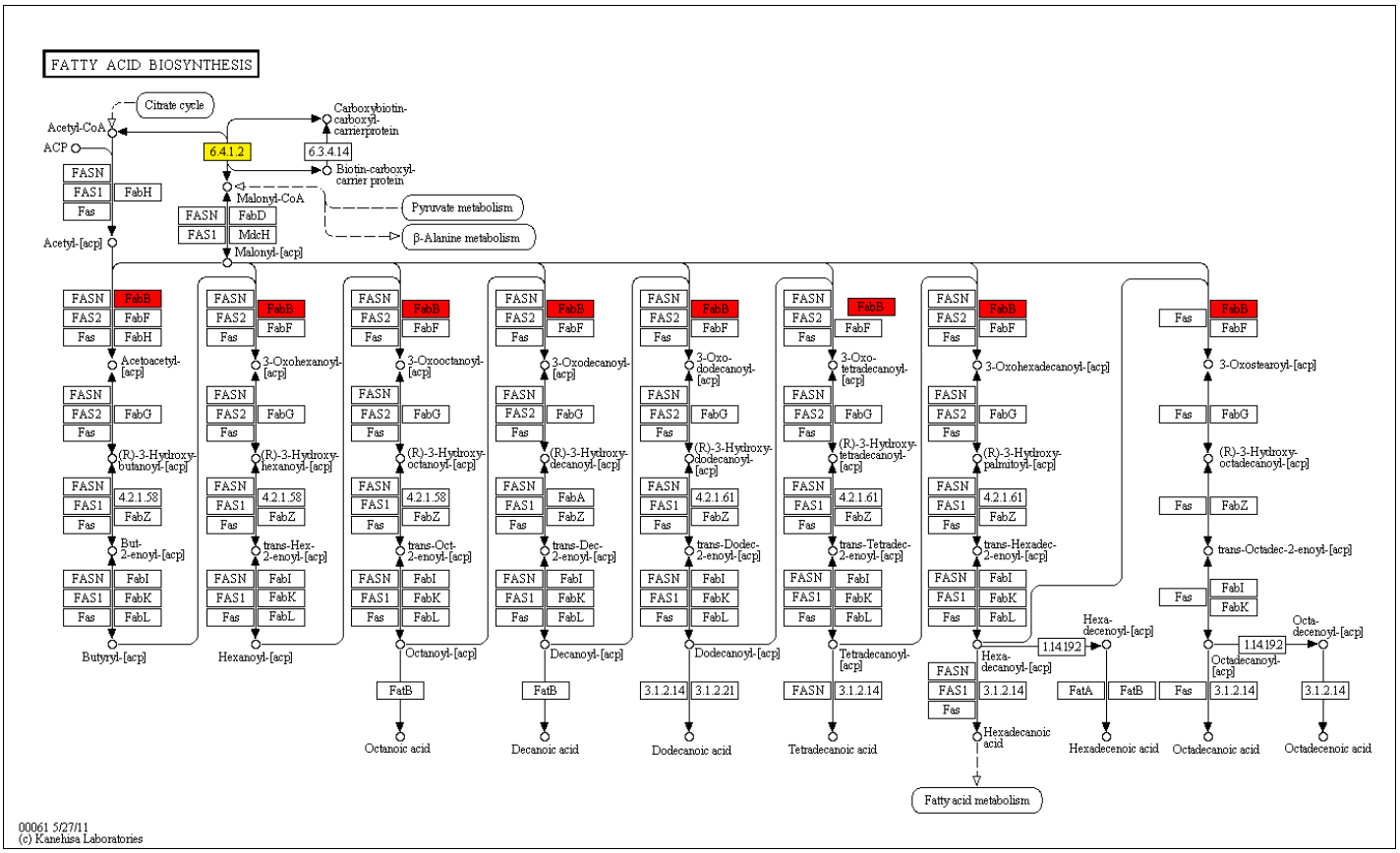
FATTY ACID BIOSYNTHESIS
Citrate cycle
Acetyl-CoA
ACP
Carboxybiotin-carboxyl-carrierprotein
6.4.1.2
6.3.4.14
Biotin-carboxyl-carrier protein
Malonyl-CoA
Pyruvate metabolism
β-Alanine metabolism
FASN
FAS1
Fas
FAS2
FabH
FabD
MdcH
FabB
FabF
FabG
FabZ
FabI
FabK
FabL
FabA
4.2.1.58
4.2.1.61
3.1.2.14
3.1.2.21
1.14.19.2
FatA
FatB
Acetyl-[acp]
Malonyl-[acp]
Acetoacetyl-[acp]
3-Oxohexanoyl-[acp]
3-Oxooctanoyl-[acp]
3-Oxodecanoyl-[acp]
3-Oxo-dodecanoyl-[acp]
3-Oxo-tetradecanoyl-[acp]
3-Oxohexadecanoyl-[acp]
3-Oxostearoyl-[acp]
(R)-3-Hydroxy-butanoyl-[acp]
(R)-3-Hydroxy-hexanoyl-[acp]
(R)-3-Hydroxy-octanoyl-[acp]
(R)-3-Hydroxy-decanoyl-[acp]
(R)-3-Hydroxy-dodecanoyl-[acp]
(R)-3-Hydroxy-tetradecanoyl-[acp]
(R)-3-Hydroxy-palmitoyl-[acp]
(R)-3-Hydroxy-octadecanoyl-[acp]
But-2-enoyl-[acp]
trans-Hex-2-enoyl-[acp]
trans-Oct-2-enoyl-[acp]
trans-Dec-2-enoyl-[acp]
trans-Dodec-2-enoyl-[acp]
trans-Tetradec-2-enoyl-[acp]
trans-Hexadec-2-enoyl-[acp]
trans-Octadec-2-enoyl-[acp]
Butyryl-[acp]
Hexanoyl-[acp]
Octanoyl-[acp]
Decanoyl-[acp]
Dodecanoyl-[acp]
Tetradecanoyl-[acp]
Hexadecanoyl-[acp]
Hexadecenoyl-[acp]
Octadecanoyl-[acp]
Octadecenoyl-[acp]
Octanoic acid
Decanoic acid
Dodecanoic acid
Tetradecanoic acid
Hexadecanoic acid
Hexadecenoic acid
Octadecanoic acid
Octadecenoic acid
Fatty acid metabolism
00061 5/27/11
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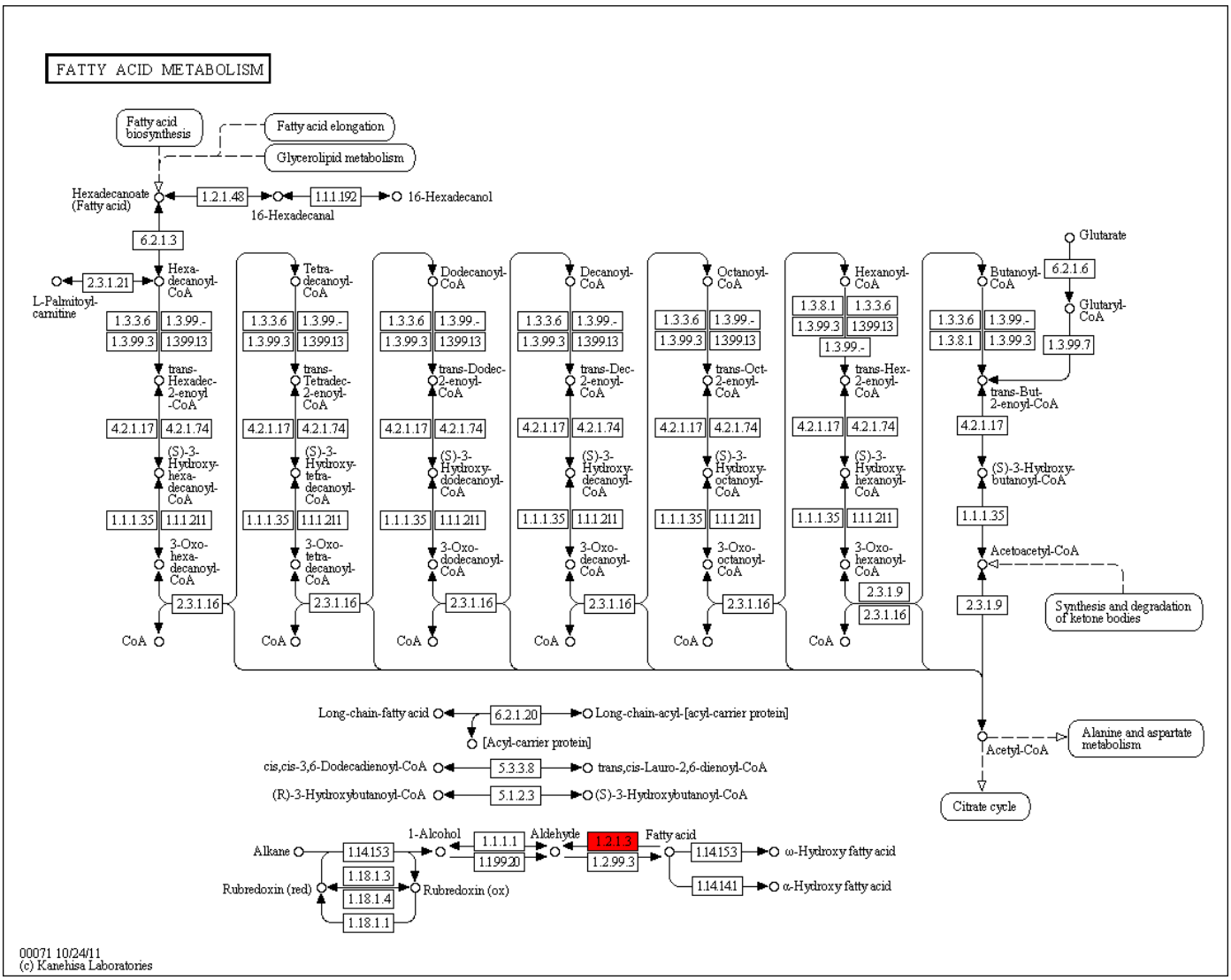

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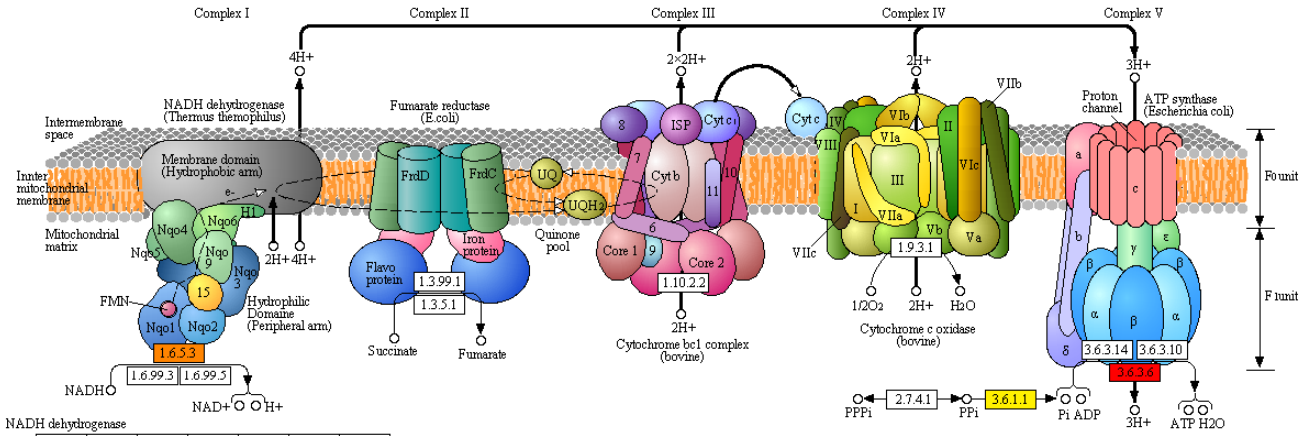
OXIDATIVE PHOSPHORYLATION



NADH dehydrogenase

E	ND1	ND2	ND3	ND4	ND4L	ND5	ND6
E	Ndufs1	Ndufs2	Ndufs3	Ndufs4	Ndufs5	Ndufs6	Ndufs7	Ndufs8	Ndufv1	Ndufv2	Ndufv3
B/A	NuoA	NuoB	NuoC	NuoD	NuoE	NuoF	NuoG	NuoH	NuoI	NuoJ	NuoK	NuoL	NuoM	NuoN
B/A	NdhC	NdhK	NdhJ	NdhH	NdhA	NdhI	NdhG	NdhE	NdhF	NdhD	NdhB	NdhL	NdhM	NdhN	HoxE	HoxF	HoxU
E	Ndufa1	Ndufa2	Ndufa3	Ndufa4	Ndufa5	Ndufa6	Ndufa7	Ndufa8	Ndufa9	Ndufa10	Ndufab1	Ndufa11	Ndufa12	Ndufa13
E	Ndufb1	Ndufb2	Ndufb3	Ndufb4	Ndufb5	Ndufb6	Ndufb7	Ndufb8	Ndufb9	Ndufb10	Ndufb11	Ndufc1	Ndufc2

Succinate dehydrogenase / Fumarate reductase

E	SDHC	SDHD	SDHA	SDHB
B/A	SdhC	SdhD	SdhA	SdhB
			FrdA	FrdB	FrdC	FrdD

Cytochrome c reductase

E/B/A	ISP	Cyt b	Cyt 1						
E				COR1	QCR2	QCR6	QCR7	QCR8	QCR9	QCR10

Cytochrome c oxidase

E	COX10		COX3	COX1	COX2	COX4	COX5A	COX5B	COX6A	COX6B	COX6C	COX7A	COX7B	COX7C	COX8	E/B/A		COX17
																COX11	COX15	
B/A	CyoE	CyoD	CyoC	CyoB	CyoA													
		CoxD	CoxC	CoxA	CoxB													
		QoxD	QoxC	QoxB	QoxA													

Cytochrome c oxidase , cbb3-type

B	I	II	IV	III

Cytochrome bd complex

B/A	CydA	CydB

F-type ATPase (Bacteria)

beta	alpha	gamma	delta	epsilon	c	a	b

F-type ATPase (Eukaryotes)

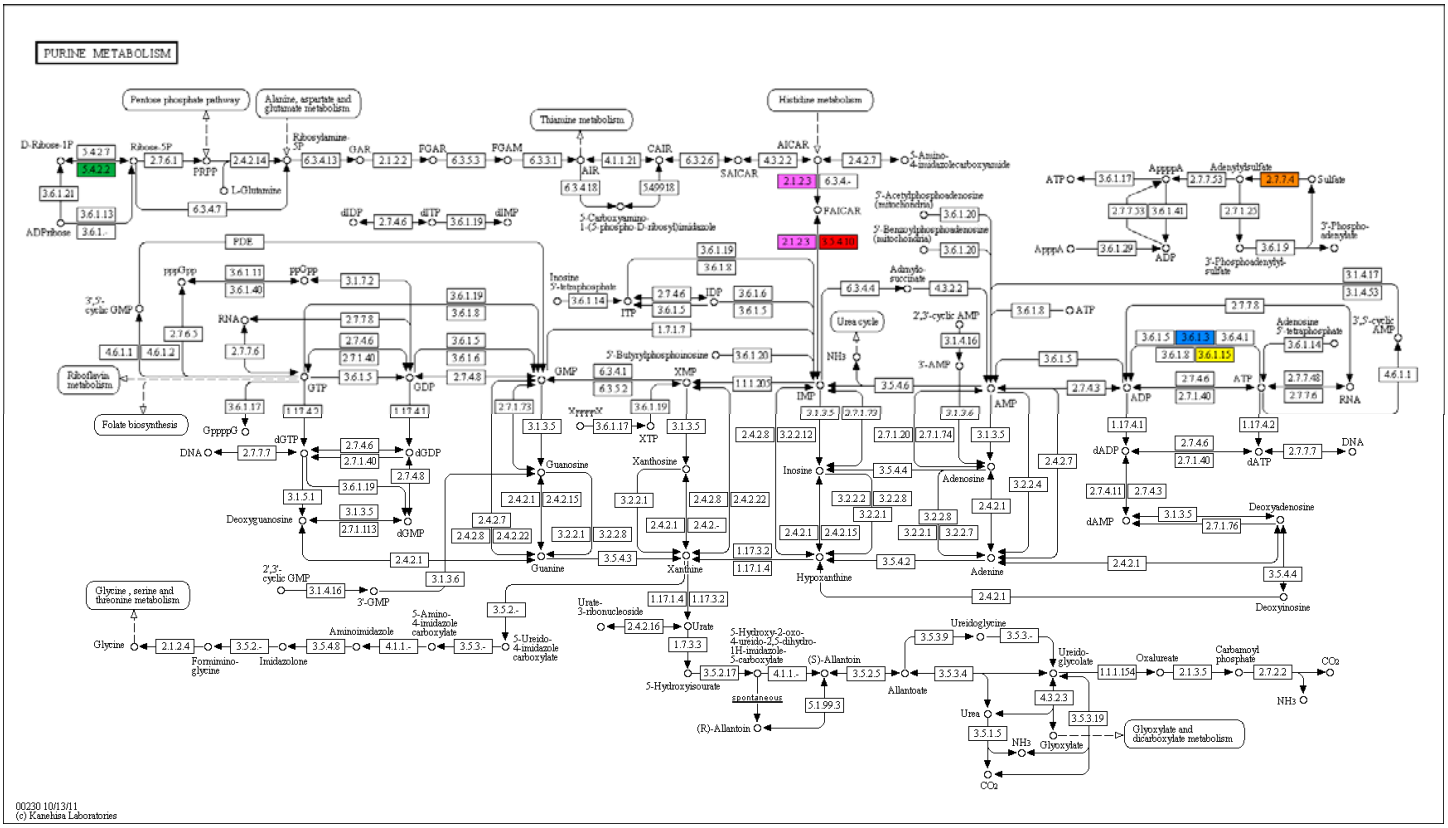
beta	alpha	gamma	OSCP	delta	epsilon	c	a
b	e	f6	f	8			
d	f	h	j	k	g		

V-type ATPase (Prokaryotes)

A	B	C	D	E	F	I	K

V-type ATPase (Eukaryotes)

A	B	C	D	E	F	G	H
I	AC39	54kD	S1	lipid			


PURINE METABOLISM
Pentose phosphate pathway
Alanine, aspartate and glutamate metabolism
Thiamine metabolism
Histidine metabolism
D-Ribose-1P
Ribose-5P
PRPP
L-Glutamine
Ribosylamine-5P
GAR
FGAR
FGAM
AIR
CAIR
AIRC
SAICAR
AICAR
5-Amino-4-imidazolecarboxyamide
5-Carboxyamino-1-(5-phospho-D-ribosyl)imidazole
5'-Acetylphosphoadenosine (mitochondria)
5'-Benzoylphosphoadenosine (mitochondria)
FAICAR
ATP
ADP
AppppA
Adenylylsulfate
Sulfate
3'-Phospho-adenylate
3'-Phosphoadenylyl-sulfate
PDE
pppGpp
ppGpp
3',5'-cyclic GMP
RNA
Riboflavin metabolism
Folate biosynthesis
GTP
GDP
GMP
Inosine 5'-triphosphate
ITP
IDP
IMP
5'-Butyrylphosphoinosine
Urea cycle
NH3
Adenylo-succinate
2',3'-cyclic AMP
3'-AMP
AMP
ADP
ATP
Adenosine 5'-triphosphate
3',5'-cyclic AMP
RNA
GppppG
dGTP
dGDP
DNA
dGMP
Deoxyguanosine
Guanosine
Xanthosine
XMP
XTP
Inosine
Adenosine
dADP
dATP
dAMP
Deoxyadenosine
Guanine
Xanthine
Hypoxanthine
Adenine
Deoxyinosine
2',3'-cyclic GMP
3'-GMP
Glycine, serine and threonine metabolism
Glycine
Formimino-glycine
Aminoimidazole
Imidazolone
5-Amino-4-imidazole carboxylate
5-Ureido-4-imidazole carboxylate
Urate-3-ribonucleoside
Urate
5-Hydroxy-2-oxo-4-ureido-2,5-dihydro-1H-imidazole-5-carboxylate
(S)-Allantoin
5-Hydroxyisourate
spontaneous
(R)-Allantoin
Allantoate
Ureidoglycine
Ureido-glycolate
Oxalureate
Carbamoyl phosphate
Urea
Glyoxylate
Glyoxylate and dicarboxylate metabolism
CO2
NH3
00230 10/13/11
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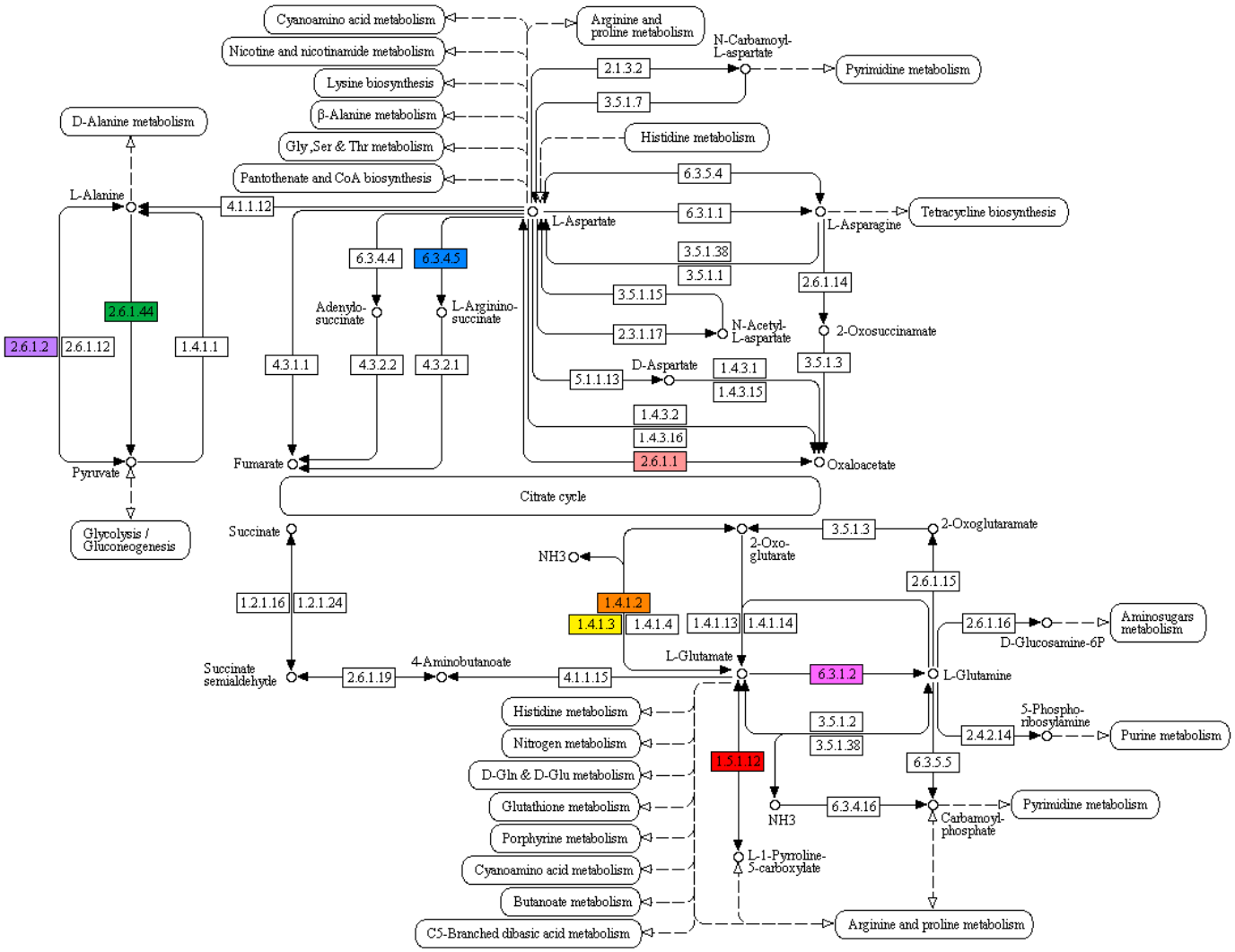
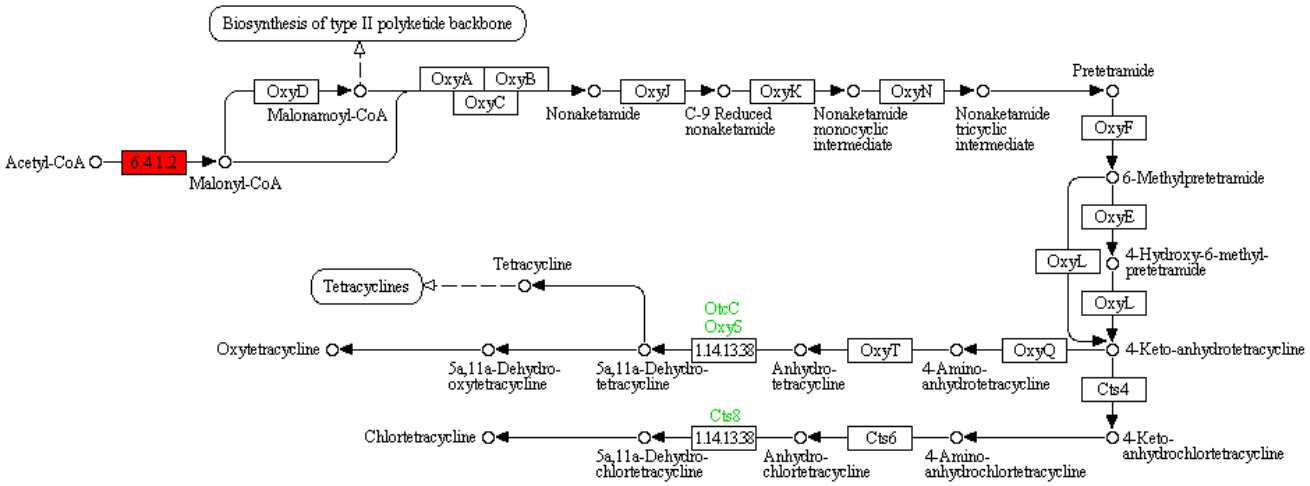
ALANINE, ASPARTATE AND GLUTAMATE METABOLISM



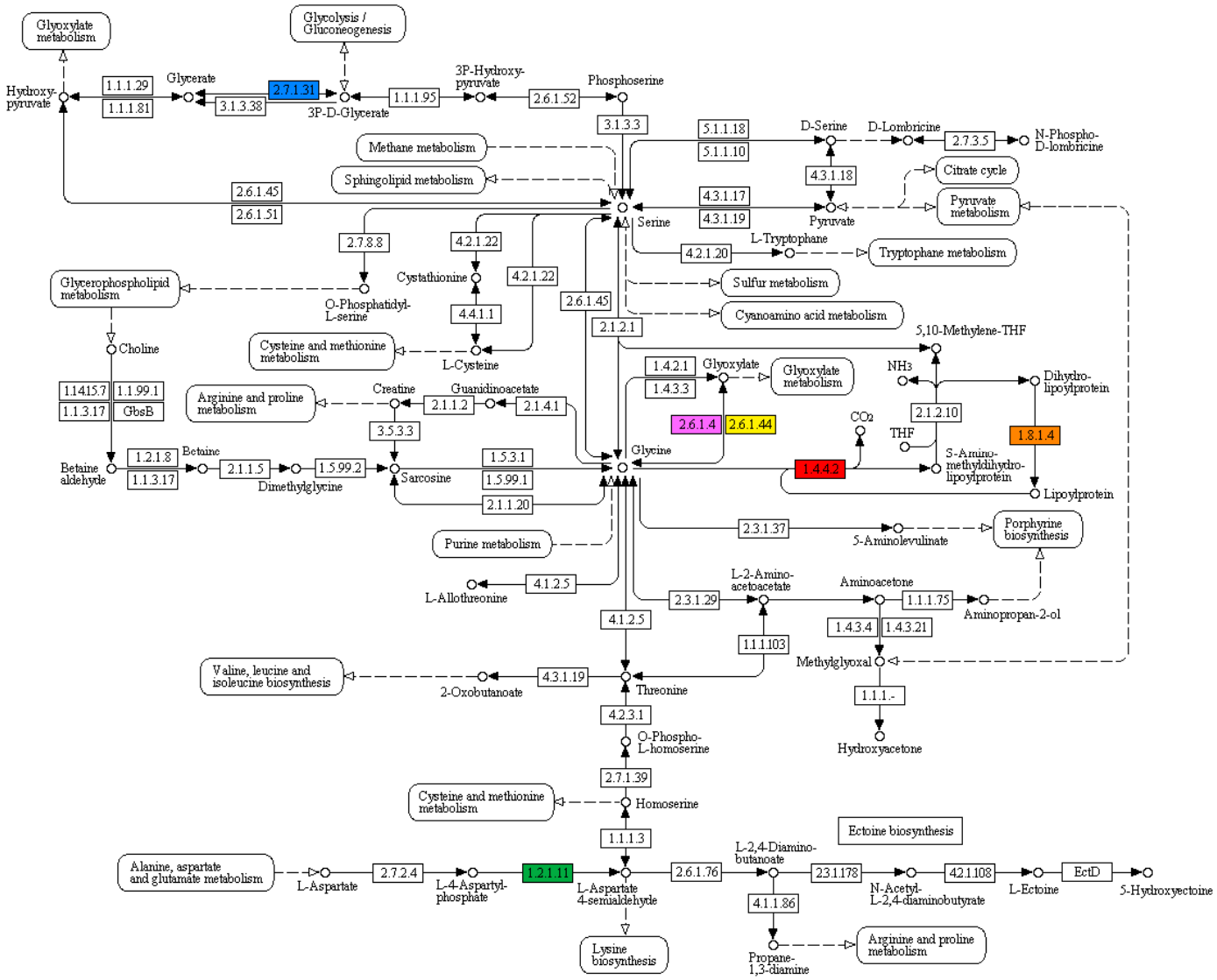
00250 6/14/11

TETRACYCLINE BIOSYNTHESIS



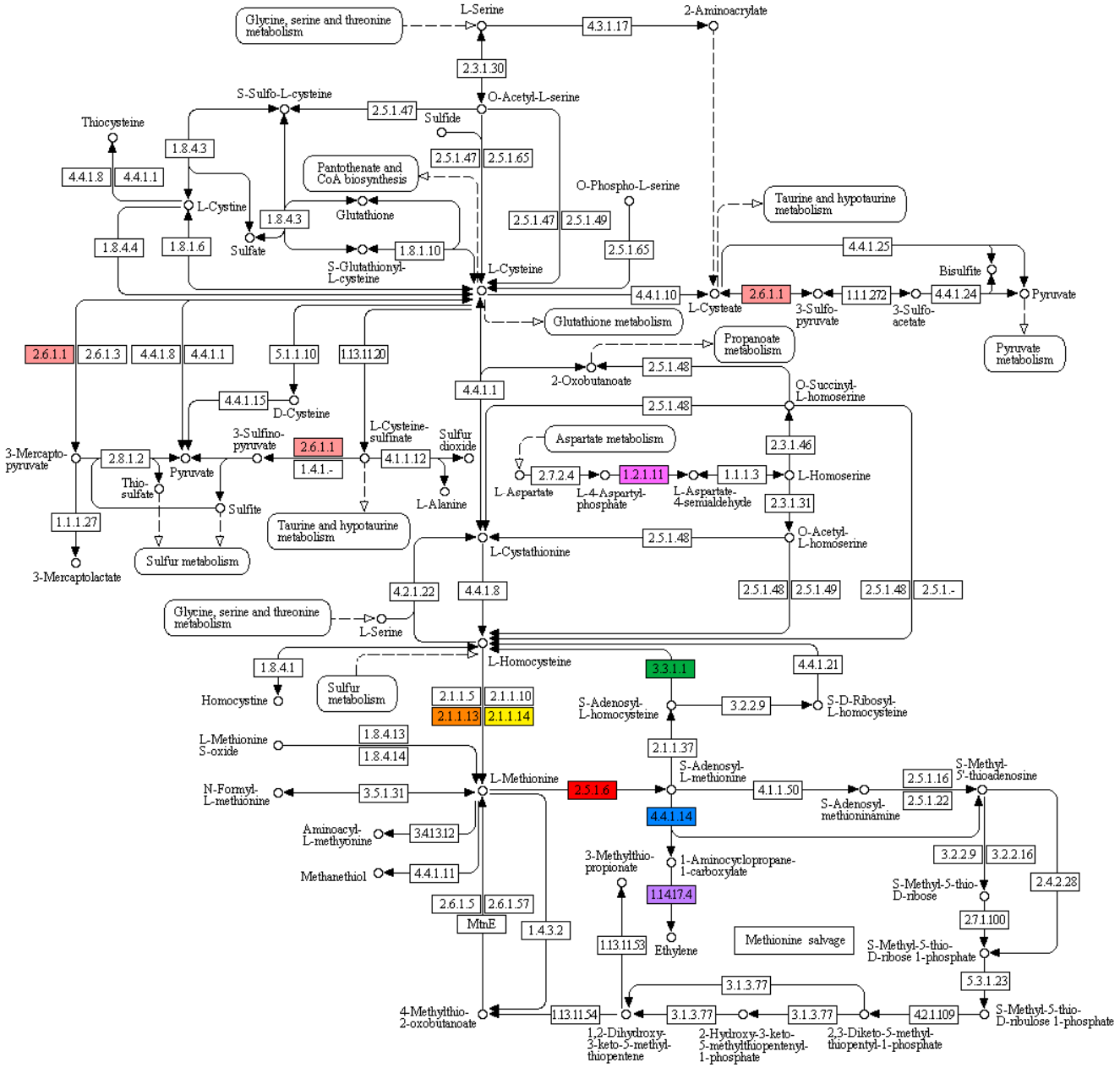
00253 11/12/10

GLYCINE, SERINE AND THREONINE METABOLISM

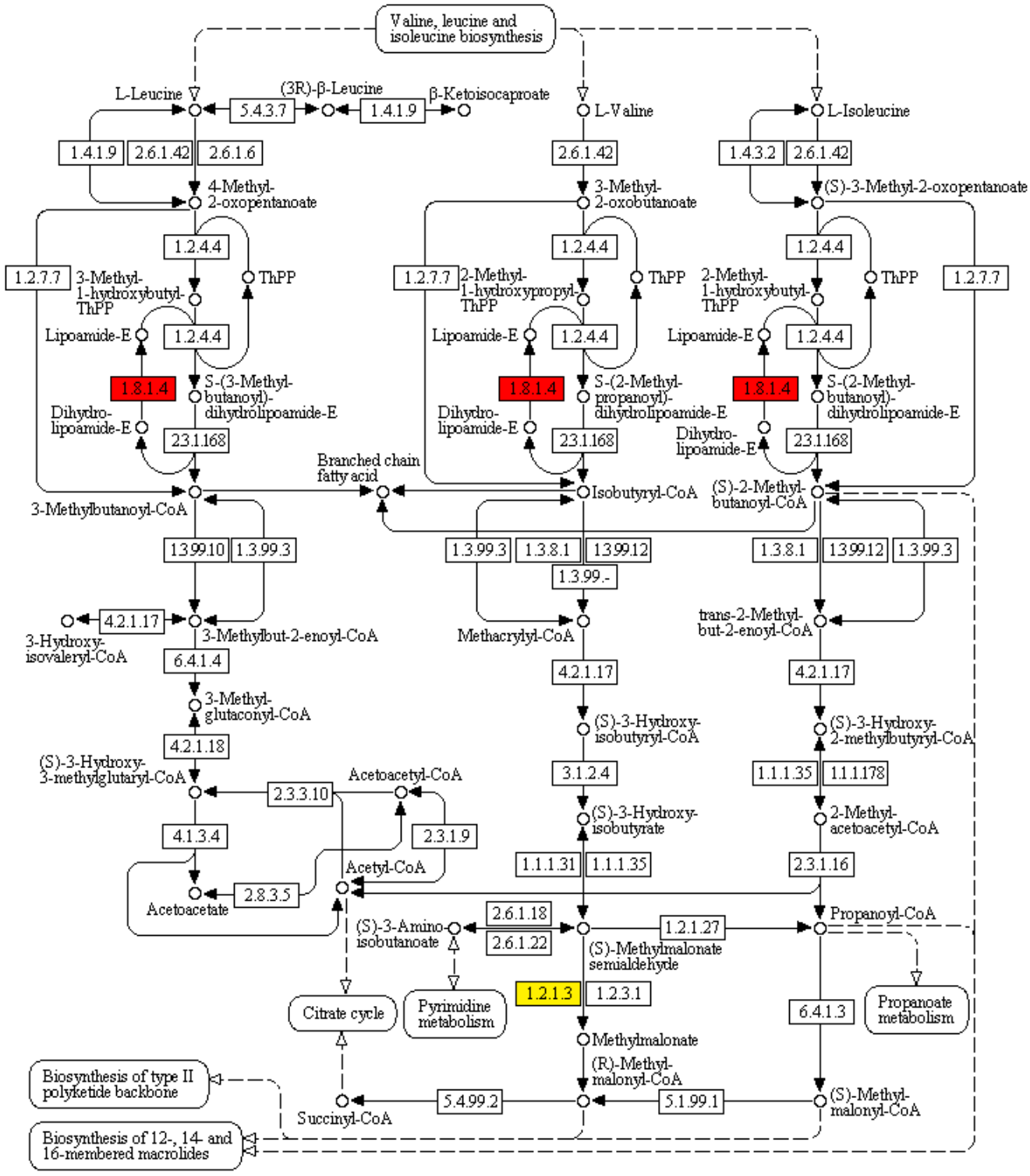


00260 2/2/11

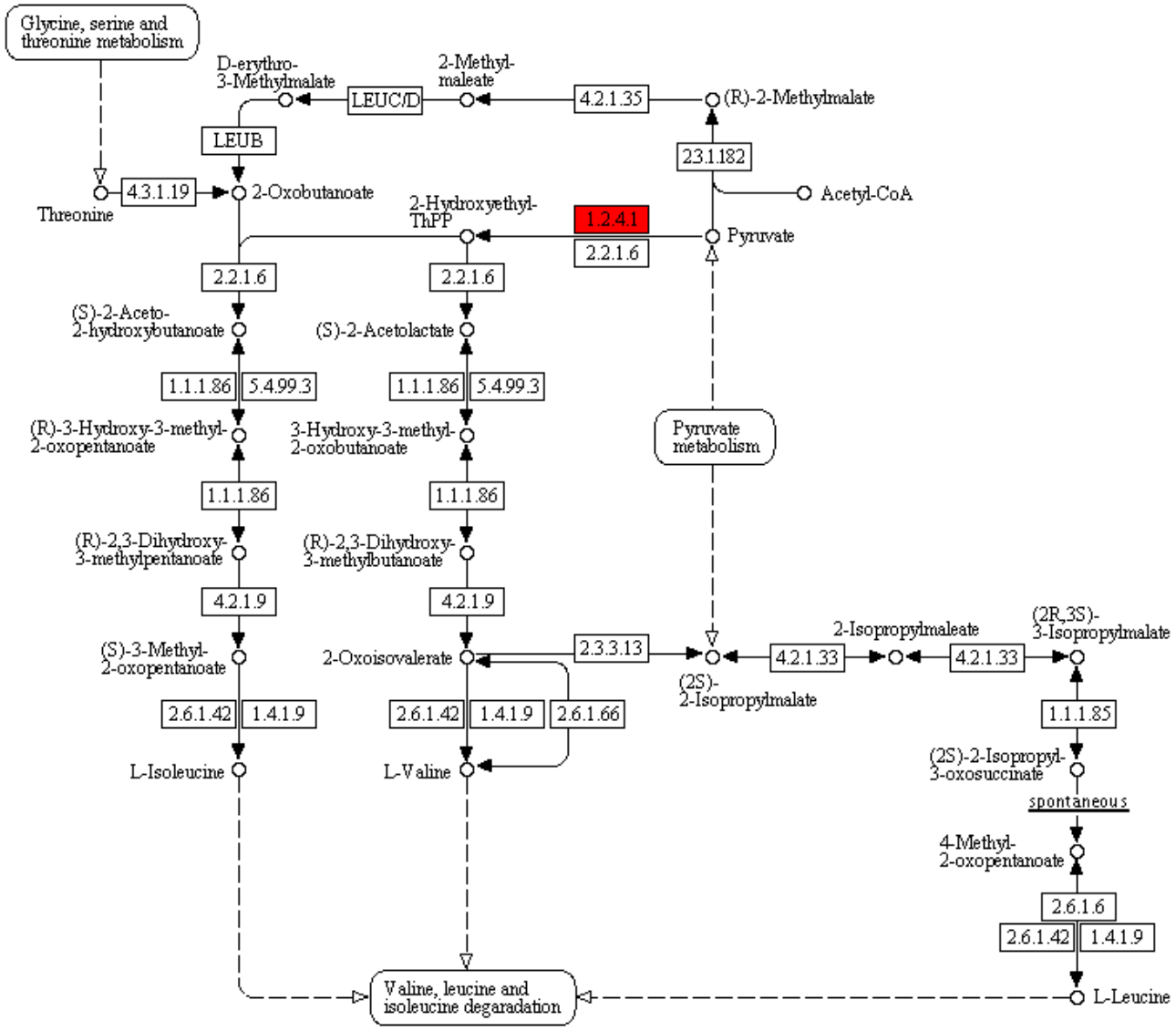
CYSTEINE AND METHIONINE METABOLISM



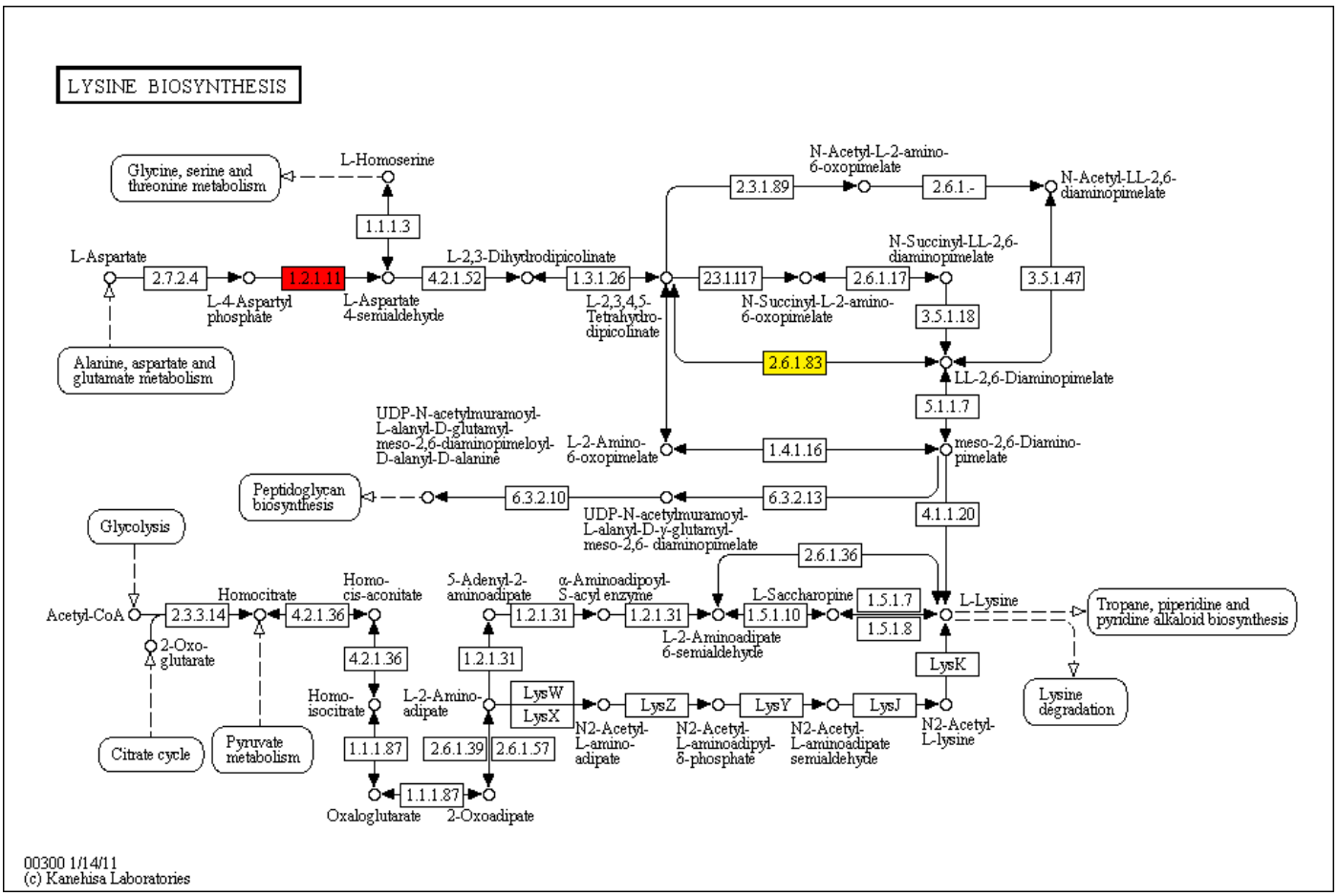
VALINE, LEUCINE AND ISOLEUCINE DEGRADATION



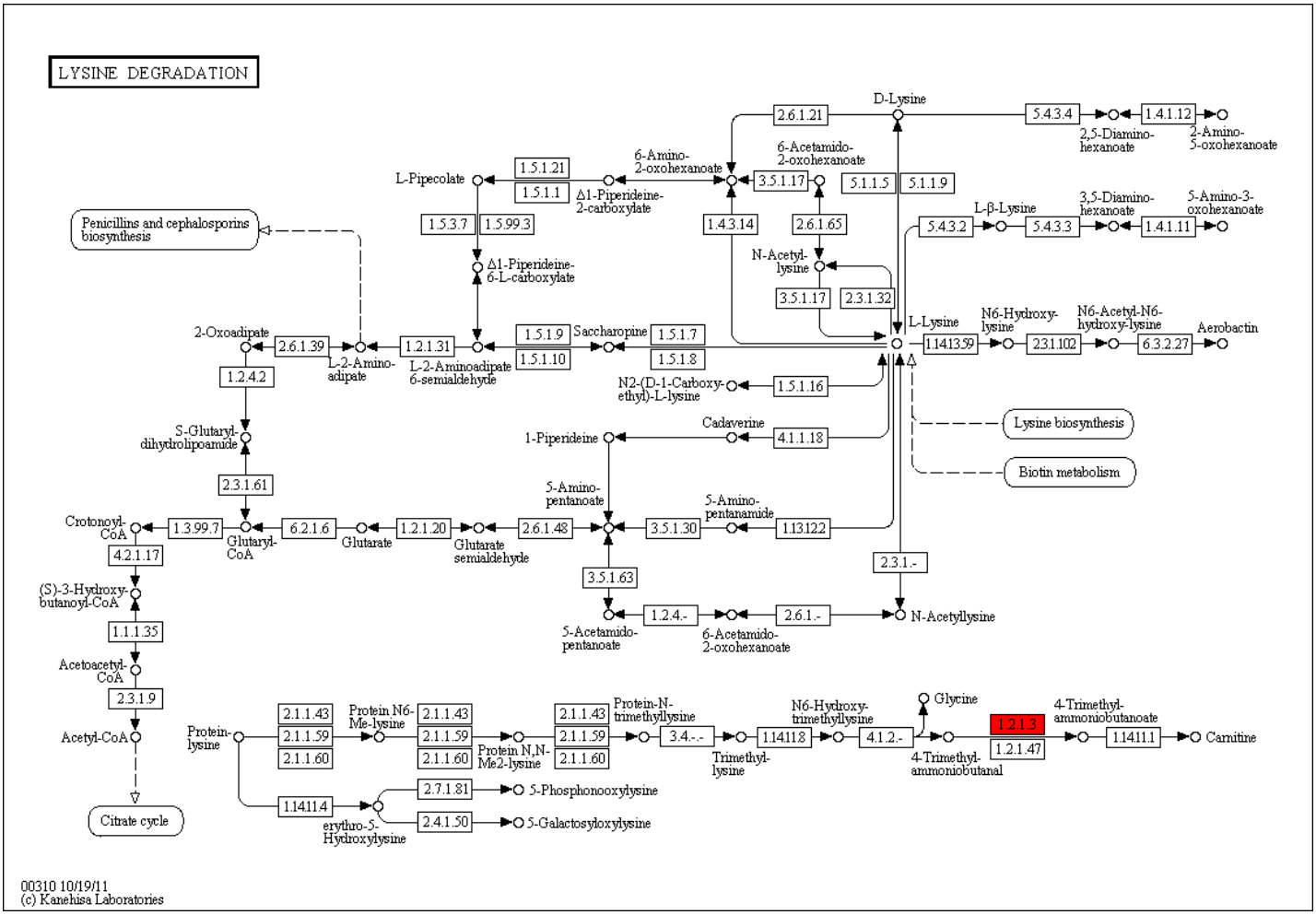
VALINE, LEUCINE AND ISOLEUCINE BIOSYNTHESIS



00290 7/28/11



00300 1/14/11



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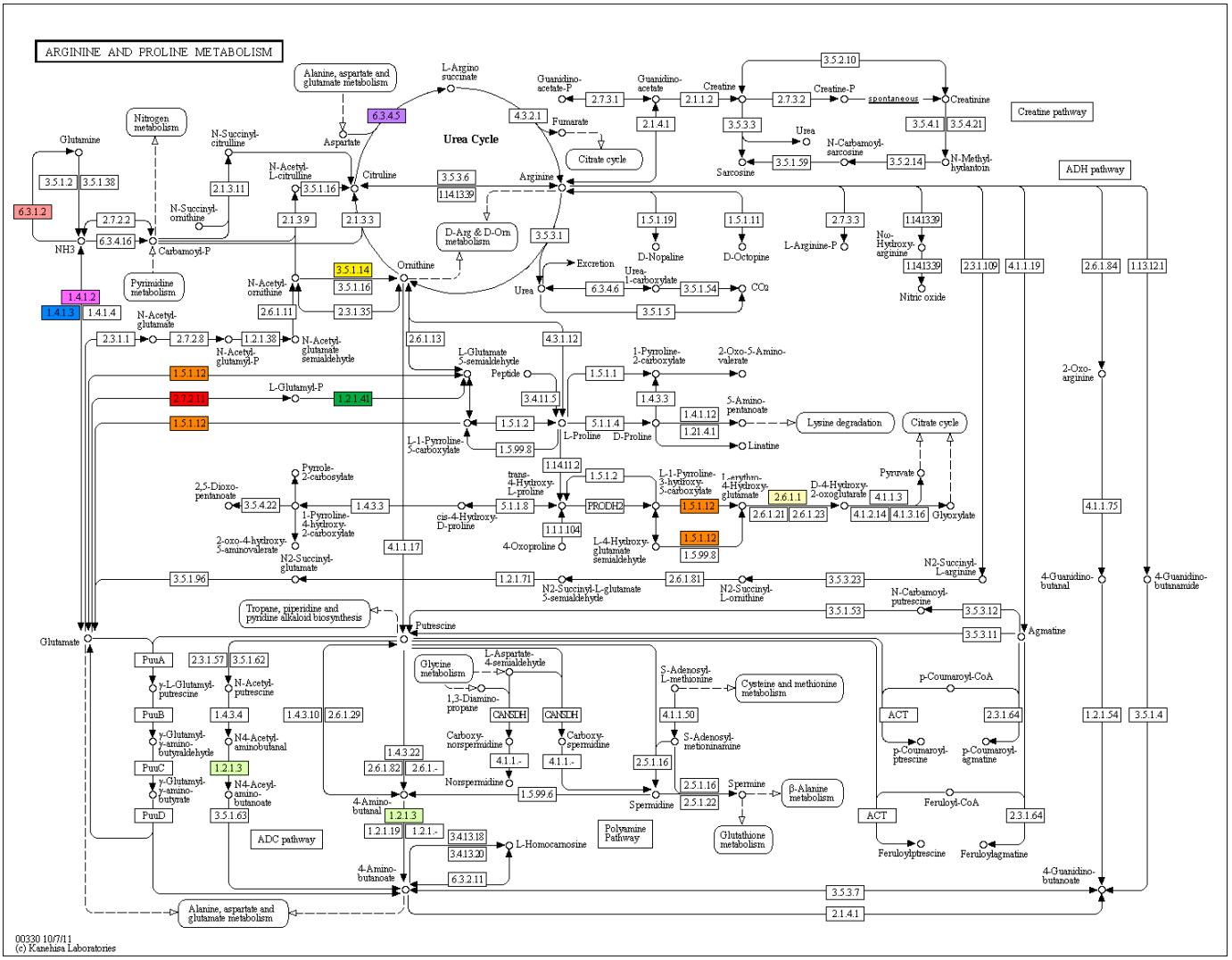
ARGININE AND PROLINE METABOLISM
Urea Cycle
Creatine pathway
ADH pathway
ADC pathway
Polyamine Pathway
Nitrogen metabolism
Pyrimidine metabolism
Tropane, piperidine and pyridine alkaloid biosynthesis
Alanine, aspartate and glutamate metabolism
Glycine metabolism
Cysteine and methionine metabolism
β-Alanine metabolism
Glutathione metabolism
Lysine degradation
Citrate cycle
Glutamine
Glutamate
Aspartate
Arginine
Ornithine
Citrulline
Urea
Creatine
Creatinine
Creatine-P
Guanidino-acetate
Guanidino-acetate-P
Sarcosine
Urea
N-Carbamoyl-sarcosine
N-Methyl-hydantoin
L-Argino succinate
Fumarate
N-Succinyl-citrulline
N-Acetyl-L-citrulline
N-Succinyl-ornithine
N-Acetyl-ornithine
Carbamoyl-P
NH3
N-Acetyl-glutamate
N-Acetyl-glutamyl-P
N-Acetyl-glutamate semialdehyde
L-Glutamate 5-semialdehyde
Peptide
L-Glutamyl-P
1-Pyrroline-2-carboxylate
2-Oxo-5-Amino-valerate
5-Amino-pentanoate
L-Proline
D-Proline
L-1-Pyrroline-5-carboxylate
Linatine
trans-4-Hydroxy-L-proline
cis-4-Hydroxy-D-proline
4-Oxoproline
L-1-Pyrroline-3-hydroxy-5-carboxylate
L-erythro-4-Hydroxy-glutamate
L-4-Hydroxy-glutamate semialdehyde
D-4-Hydroxy-2-oxoglutarate
Pyruvate
Glyoxylate
Pyrrole-2-carbosylate
2,5-Dioxo-pentanoate
1-Pyrroline-4-hydroxy-2-carboxylate
2-oxo-4-hydroxy-5-aminovalerate
N2-Succinyl-glutamate
N2-Succinyl-L-glutamate 5-semialdehyde
N2-Succinyl-L-ornithine
N2-Succinyl-L-arginine
N-Carbamoyl-putrescine
Agmatine
Putrescine
L-Aspartate-4-semialdehyde
1,3-Diamino-propane
CANSDH
Carboxy-norspermidine
Carboxy-spermidine
Norspermidine
Spermidine
Spermine
S-Adenosyl-L-methionine
S-Adenosyl-methioninamine
PuuA
PuuB
PuuC
PuuD
γ-L-Glutamyl-putrescine
N-Acetyl-putrescine
γ-Glutamyl-γ-amino-butyraldehyde
N4-Acetyl-aminobutanal
γ-Glutamyl-γ-amino-butyrate
N4-Acetyl-amino-butanoate
4-Amino-butanal
4-Amino-butanoate
L-Homocarnosine
p-Coumaroyl-CoA
p-Coumaroyl-ptrescine
p-Coumaroyl-agmatine
Feruloyl-CoA
Feruloylptrescine
Feruloylagmatine
ACT
Nω-Hydroxy-arginine
Nitric oxide
L-Arginine-P
D-Nopaline
D-Octopine
Excretion
Urea-1-carboxylate
CO2
2-Oxo-arginine
4-Guanidino-butanal
4-Guanidino-butanamide
4-Guanidino-butanoate
Pyrroline-4-hydroxy-2-carboxylate
Alanine, aspartate and glutamate metabolism
00330 10/7/11
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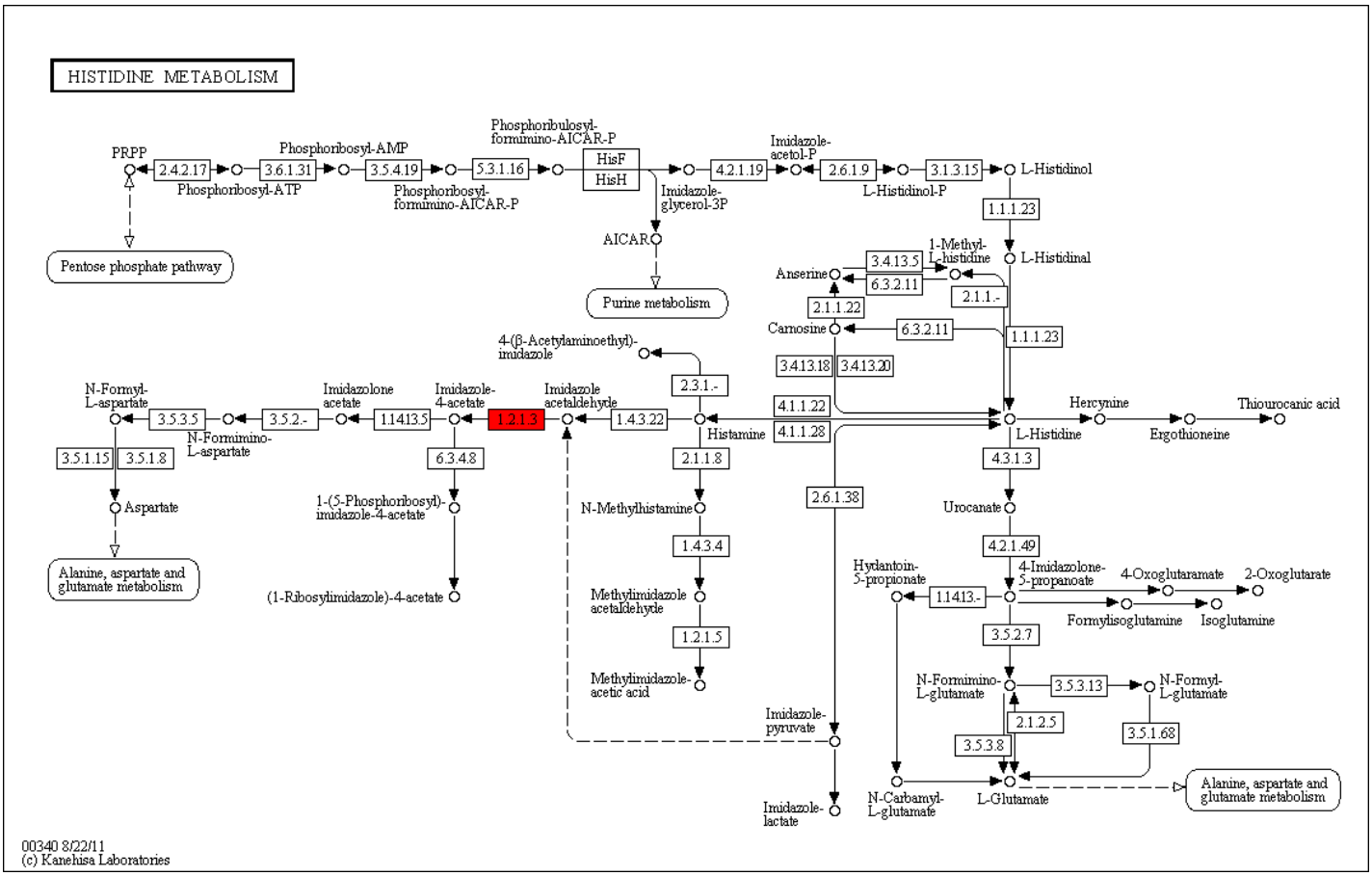
HISTIDINE METABOLISM
PRPP
2.4.2.17
Phosphoribosyl-ATP
3.6.1.31
Phosphoribosyl-AMP
3.5.4.19
Phosphoribosyl-formimino-AICAR-P
5.3.1.16
Phosphoribulosyl-formimino-AICAR-P
HisF
HisH
Imidazole-glycerol-3P
4.2.1.19
Imidazole-acetol-P
2.6.1.9
L-Histidinol-P
3.1.3.15
L-Histidinol
1.1.1.23
L-Histidinal
Pentose phosphate pathway
AICAR
Purine metabolism
1-Methyl-L-histidine
3.4.13.5
6.3.2.11
Anserine
2.1.1.22
2.1.1.-
Carnosine
6.3.2.11
1.1.1.23
4-(β-Acetylaminoethyl)-imidazole
3.4.13.18
3.4.13.20
2.3.1.-
N-Formyl-L-aspartate
3.5.3.5
N-Formimino-L-aspartate
3.5.2.-
Imidazolone acetate
1.14.13.5
Imidazole-4-acetate
1.2.1.3
Imidazole acetaldehyde
1.4.3.22
4.1.1.22
4.1.1.28
Histamine
Hercynine
Thiourocanic acid
L-Histidine
Ergothioneine
3.5.1.15
3.5.1.8
Aspartate
Alanine, aspartate and glutamate metabolism
6.3.4.8
1-(5-Phosphoribosyl)-imidazole-4-acetate
(1-Ribosylimidazole)-4-acetate
2.1.1.8
N-Methylhistamine
1.4.3.4
Methylimidazole acetaldehyde
1.2.1.5
Methylimidazole-acetic acid
2.6.1.38
Imidazole-pyruvate
Imidazole-lactate
4.3.1.3
Urocanate
4.2.1.49
Hydantoin-5-propionate
1.14.13.-
4-Imidazolone-5-propanoate
4-Oxoglutaramate
2-Oxoglutarate
Formylisoglutamine
Isoglutamine
3.5.2.7
N-Formimino-L-glutamate
3.5.3.13
N-Formyl-L-glutamate
2.1.2.5
3.5.3.8
3.5.1.68
N-Carbamyl-L-glutamate
L-Glutamate
Alanine, aspartate and glutamate metabolism
00340 8/22/11
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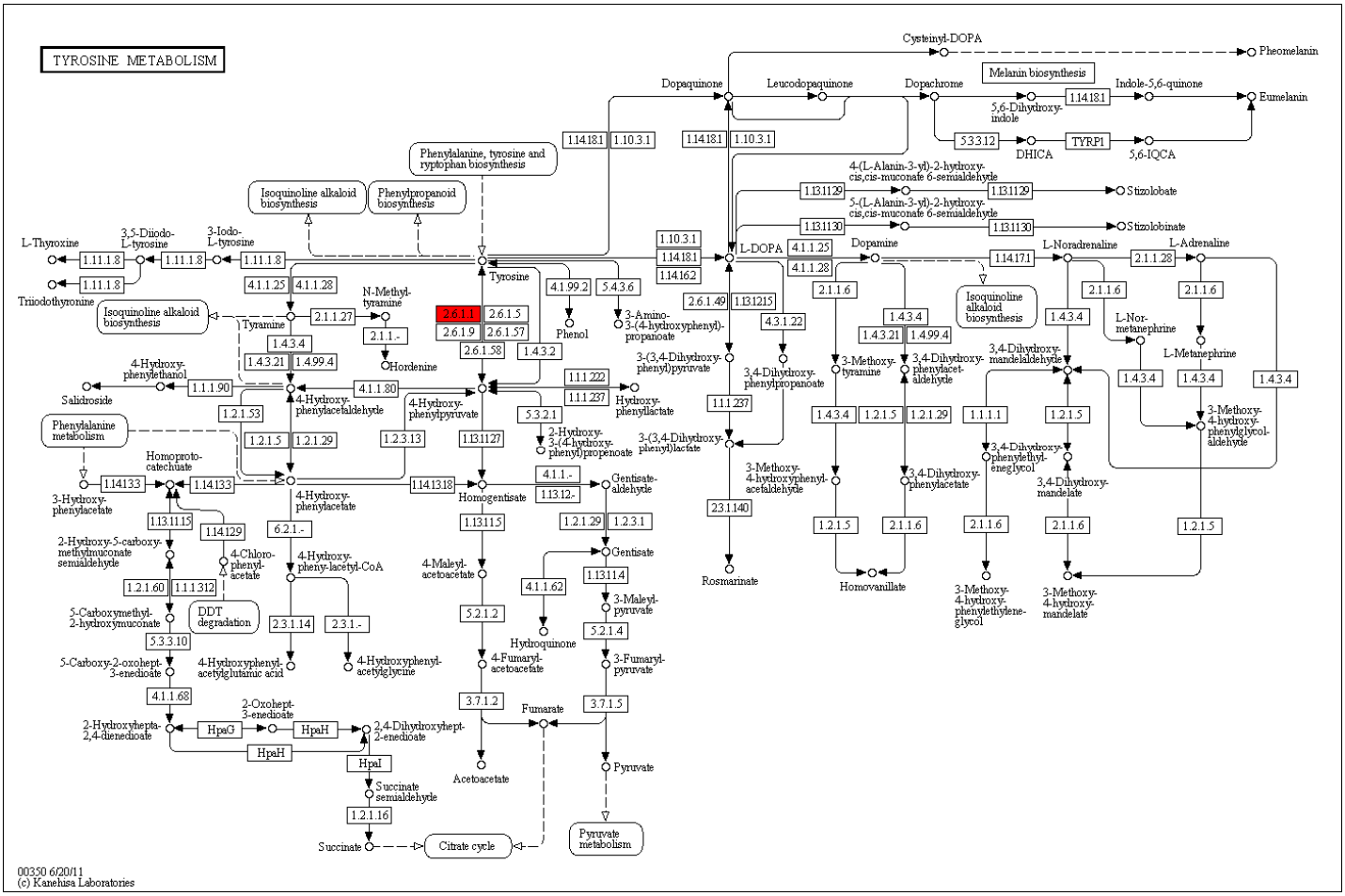
TYROSINE METABOLISM
Cysteinyl-DOPA
Pheomelanin
Dopaquinone
Leucodopaquinone
Dopachrome
Melanin biosynthesis
Indole-5,6-quinone
Eumelanin
5,6-Dihydroxy-indole
DHICA
TYRP1
5,6-IQCA
Phenylalanine, tyrosine and ryptophan biosynthesis
Isoquinoline alkaloid biosynthesis
Phenylpropanoid biosynthesis
4-(L-Alanin-3-yl)-2-hydroxy-cis,cis-muconate 6-semialdehyde
5-(L-Alanin-3-yl)-2-hydroxy-cis,cis-muconate 6-semialdehyde
Stizolobate
Stizolobinate
L-Thyroxine
3,5-Diiodo-L-tyrosine
3-Iodo-L-tyrosine
Triiodothyronine
L-DOPA
Dopamine
L-Noradrenaline
L-Adrenaline
Tyrosine
N-Methyl-tyramine
Tyramine
Hordenine
Phenol
3-Amino-3-(4-hydroxyphenyl)-propanoate
3-(3,4-Dihydroxy-phenyl)pyruvate
3,4-Dihydroxy-phenylpropanoate
3-Methoxy-tyramine
3,4-Dihydroxy-phenylacet-aldehyde
3,4-Dihydroxy-mandelaldehyde
L-Normetanephrine
L-Metanephrine
4-Hydroxy-phenylethanol
Salidroside
4-Hydroxy-phenylacetaldehyde
4-Hydroxy-phenylpyruvate
Hydroxy-phenyllactate
2-Hydroxy-3-(4-hydroxy-phenyl)propenoate
3-(3,4-Dihydroxy-phenyl)lactate
3-Methoxy-4-hydroxyphenyl-acetaldehyde
3,4-Dihydroxy-phenylacetate
3,4-Dihydroxy-phenylethyl-eneglycol
3,4-Dihydroxy-mandelate
3-Methoxy-4-hydroxy-phenylglycol-aldehyde
Phenylalanine metabolism
Homoproto-catechuate
3-Hydroxy-phenylacetate
4-Hydroxy-phenylacetate
Homogentisate
Gentisate-aldehyde
Gentisate
2-Hydroxy-5-carboxy-methylmuconate semialdehyde
4-Chloro-phenyl-acetate
4-Hydroxy-phenyl-acetyl-CoA
4-Maleyl-acetoacetate
3-Maleyl-pyruvate
Hydroquinone
5-Carboxymethyl-2-hydroxymuconate
DDT degradation
5-Carboxy-2-oxohept-3-enedioate
4-Hydroxyphenyl-acetylglutamic acid
4-Hydroxyphenyl-acetylglycine
4-Fumaryl-acetoacetate
3-Fumaryl-pyruvate
Fumarate
2-Oxohept-3-enedioate
2-Hydroxyhepta-2,4-dienedioate
HpaG
HpaH
2,4-Dihydroxyhept-2-enedioate
HpaI
Succinate semialdehyde
Acetoacetate
Pyruvate
Succinate
Citrate cycle
Pyruvate metabolism
Rosmarinate
Homovanillate
3-Methoxy-4-hydroxy-phenylethylene-glycol
3-Methoxy-4-hydroxy-mandelate
00350 6/20/11
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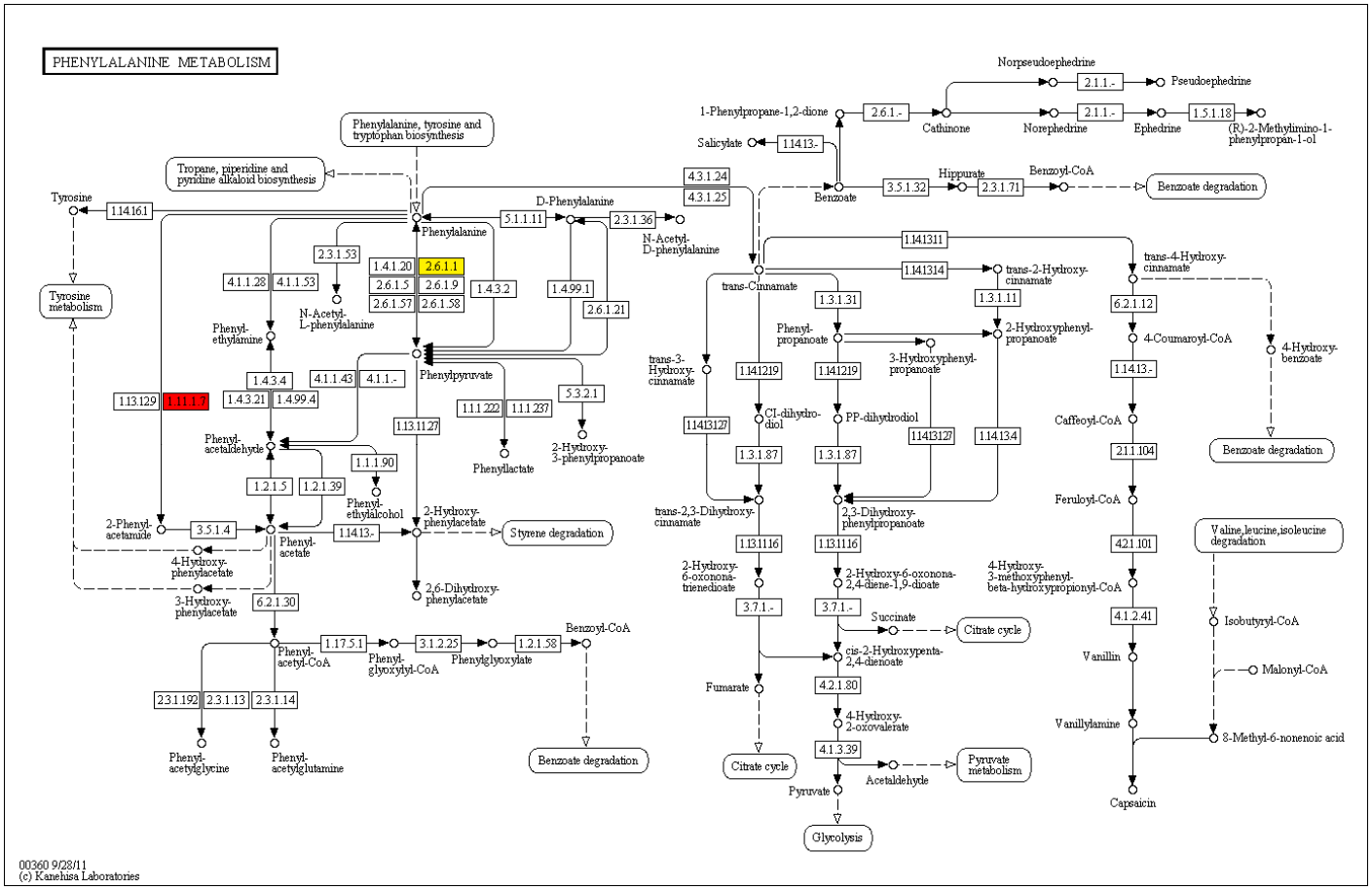
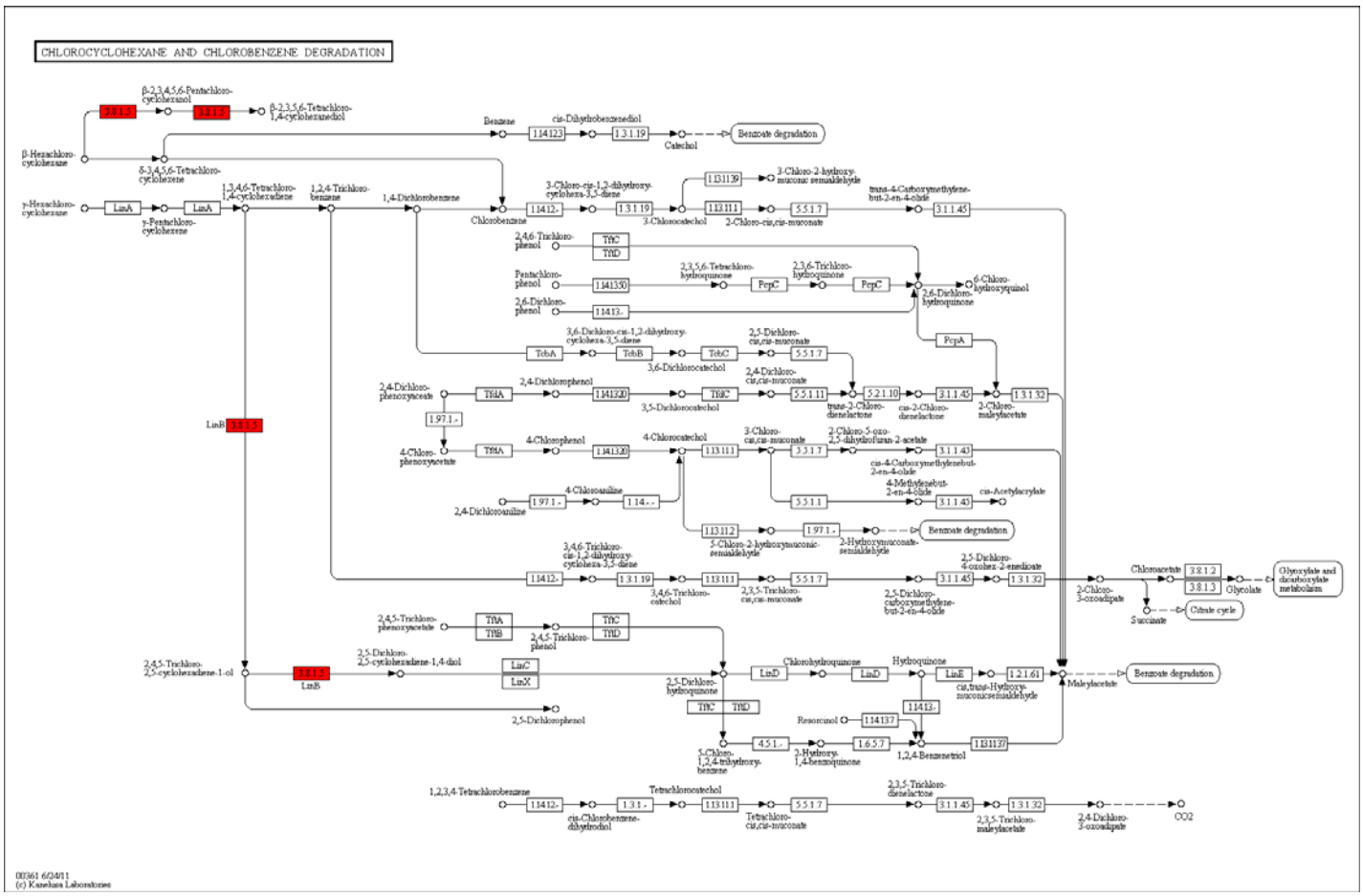


00360 9/28/11


CHLOROCYCLOHEXANE AND CHLOROBENZENE DEGRADATION
Benzoate degradation
Glycolate
Citrate cycle
Succinate
Maleylacetate
Chloroacetate
Resorcinol
1,2,4-Benzenetriol
2,5-Dichlorophenol
Tetrachlorocatechol
Tetrachloro-cis,cis-muconate
2,3,5-Trichloro-maleylacetate
2,4-Dichloro-3-oxoadipate
CO2
00361 6/24/11
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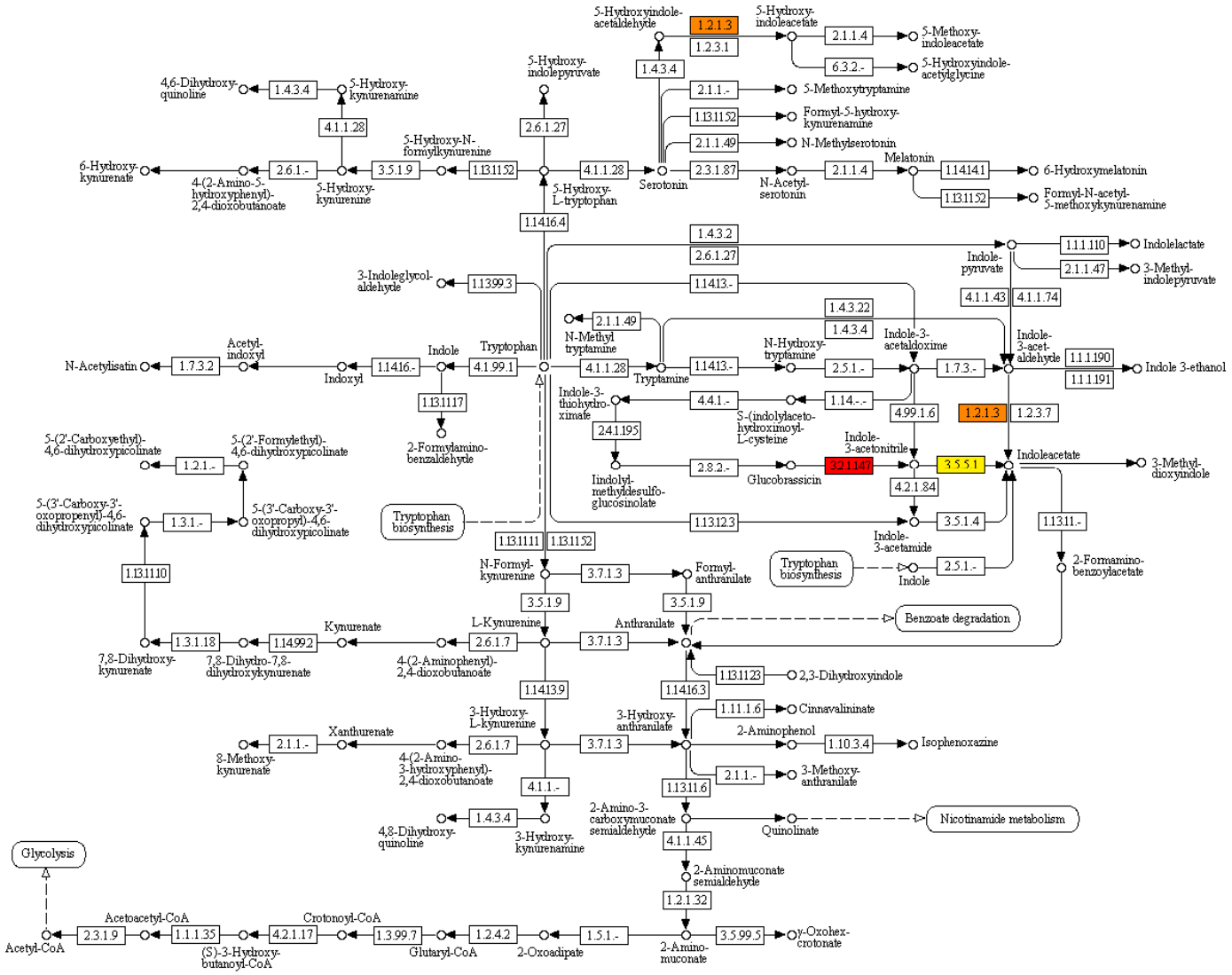
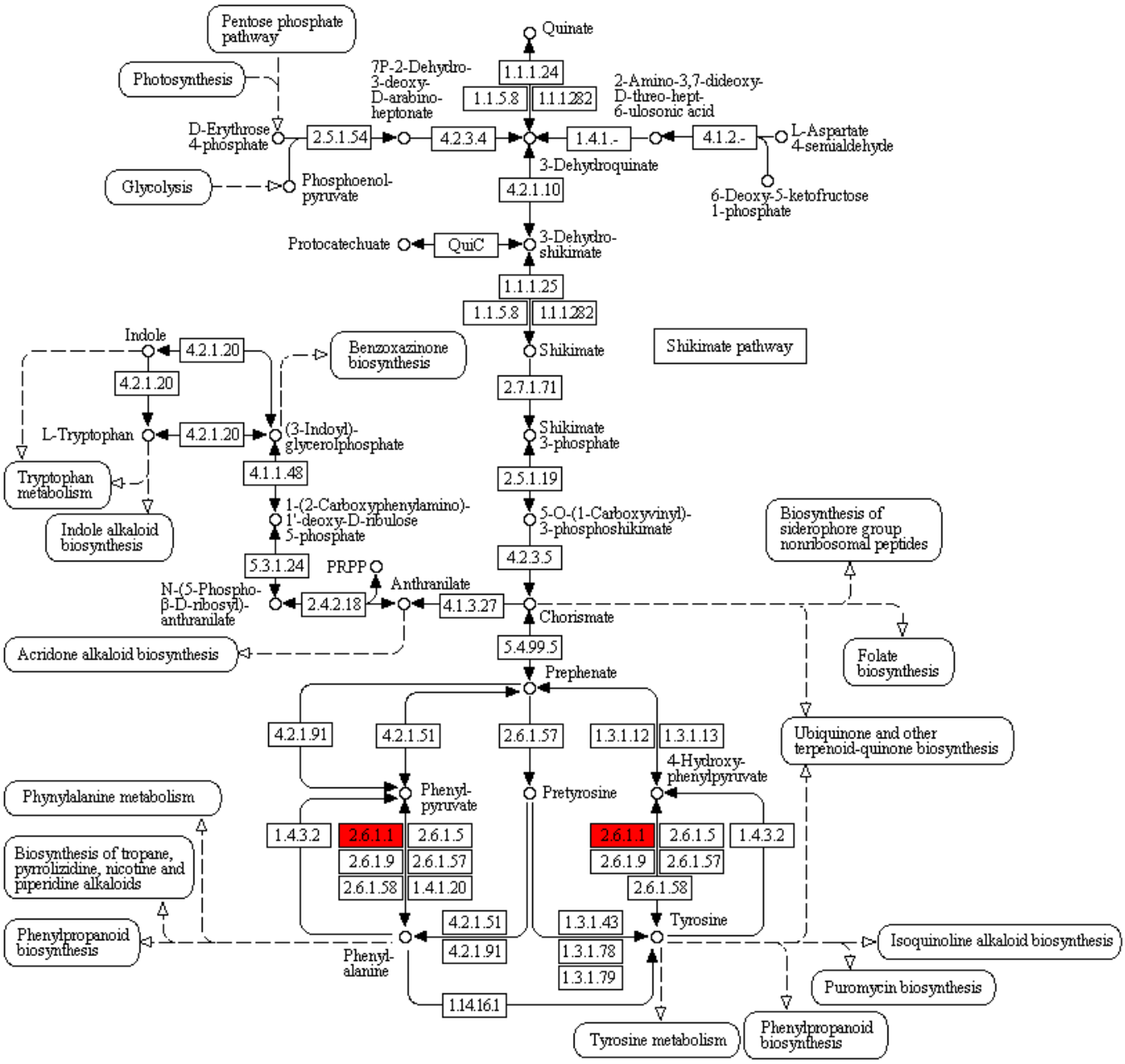
TRYPTOPHAN METABOLISM



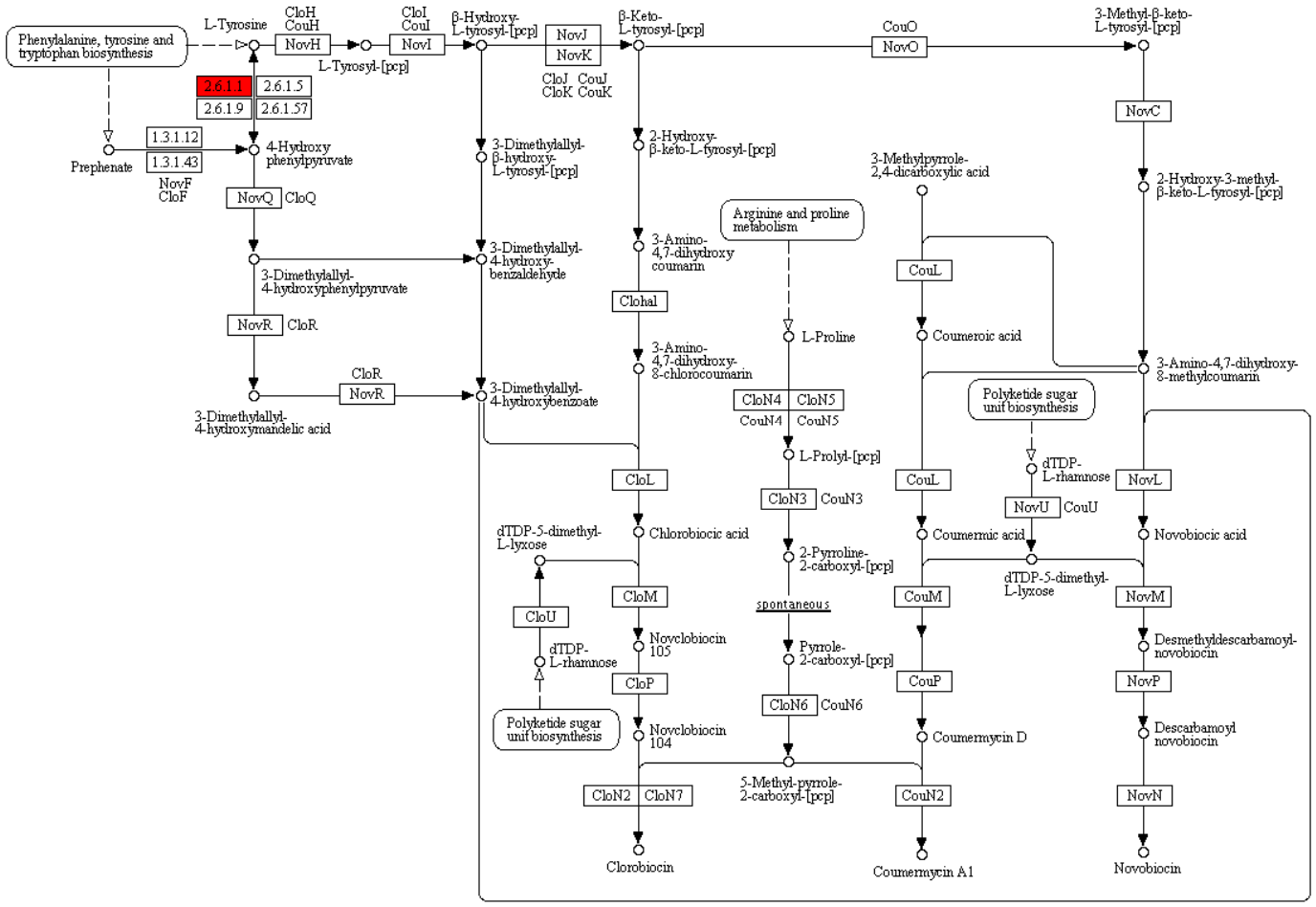
00380 7/28/11

PHENYLALANINE, TYROSINE AND TRYPTOPHAN BIOSYNTHESIS

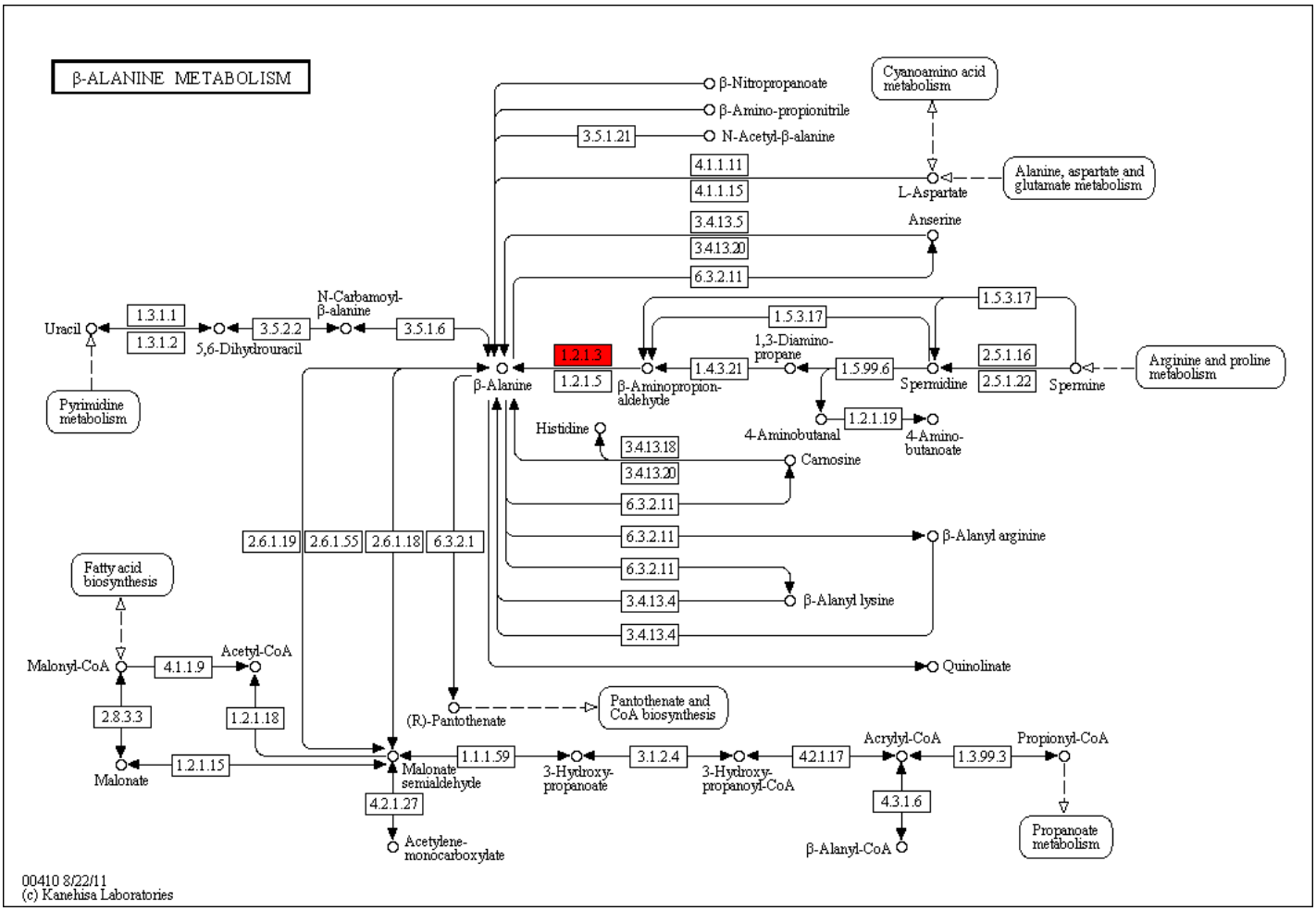


00400 6/21/11

NOVOBIOCIN BIOSYNTHESIS



00401 6/21/11


β-ALANINE METABOLISM
β-Nitropropanoate
β-Amino-propionitrile
N-Acetyl-β-alanine
3.5.1.21
4.1.1.11
4.1.1.15
L-Aspartate
Cyanoamino acid metabolism
Alanine, aspartate and glutamate metabolism
Anserine
3.4.13.5
3.4.13.20
6.3.2.11
N-Carbamoyl-β-alanine
Uracil
1.3.1.1
1.3.1.2
5,6-Dihydrouracil
3.5.2.2
3.5.1.6
1.2.1.3
1.2.1.5
β-Alanine
β-Aminopropion-aldehyde
1.4.3.21
1,3-Diamino-propane
1.5.3.17
1.5.99.6
Spermidine
2.5.1.16
2.5.1.22
Spermine
Arginine and proline metabolism
Pyrimidine metabolism
Histidine
4-Aminobutanal
1.2.1.19
4-Amino-butanoate
3.4.13.18
3.4.13.20
Carnosine
6.3.2.11
2.6.1.19
2.6.1.55
2.6.1.18
6.3.2.1
6.3.2.11
β-Alanyl arginine
6.3.2.11
β-Alanyl lysine
3.4.13.4
3.4.13.4
Quinolinate
Fatty acid biosynthesis
Malonyl-CoA
4.1.1.9
Acetyl-CoA
2.8.3.3
1.2.1.18
(R)-Pantothenate
Pantothenate and CoA biosynthesis
Malonate
1.2.1.15
Malonate semialdehyde
1.1.1.59
3-Hydroxy-propanoate
3.1.2.4
3-Hydroxy-propanoyl-CoA
4.2.1.17
Acrylyl-CoA
1.3.99.3
Propionyl-CoA
4.2.1.27
Acetylene-monocarboxylate
4.3.1.6
β-Alanyl-CoA
Propanoate metabolism
00410 8/22/11
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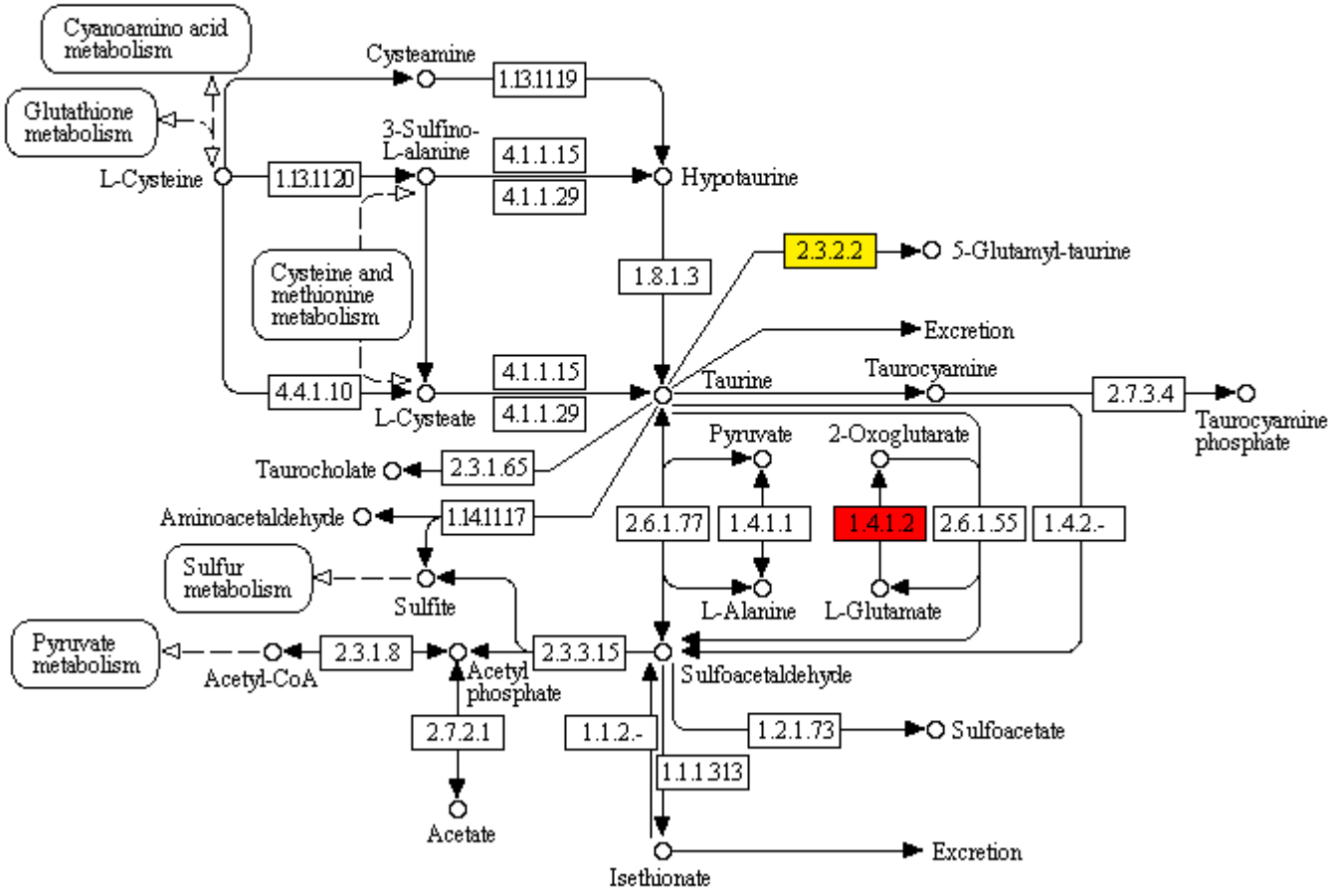
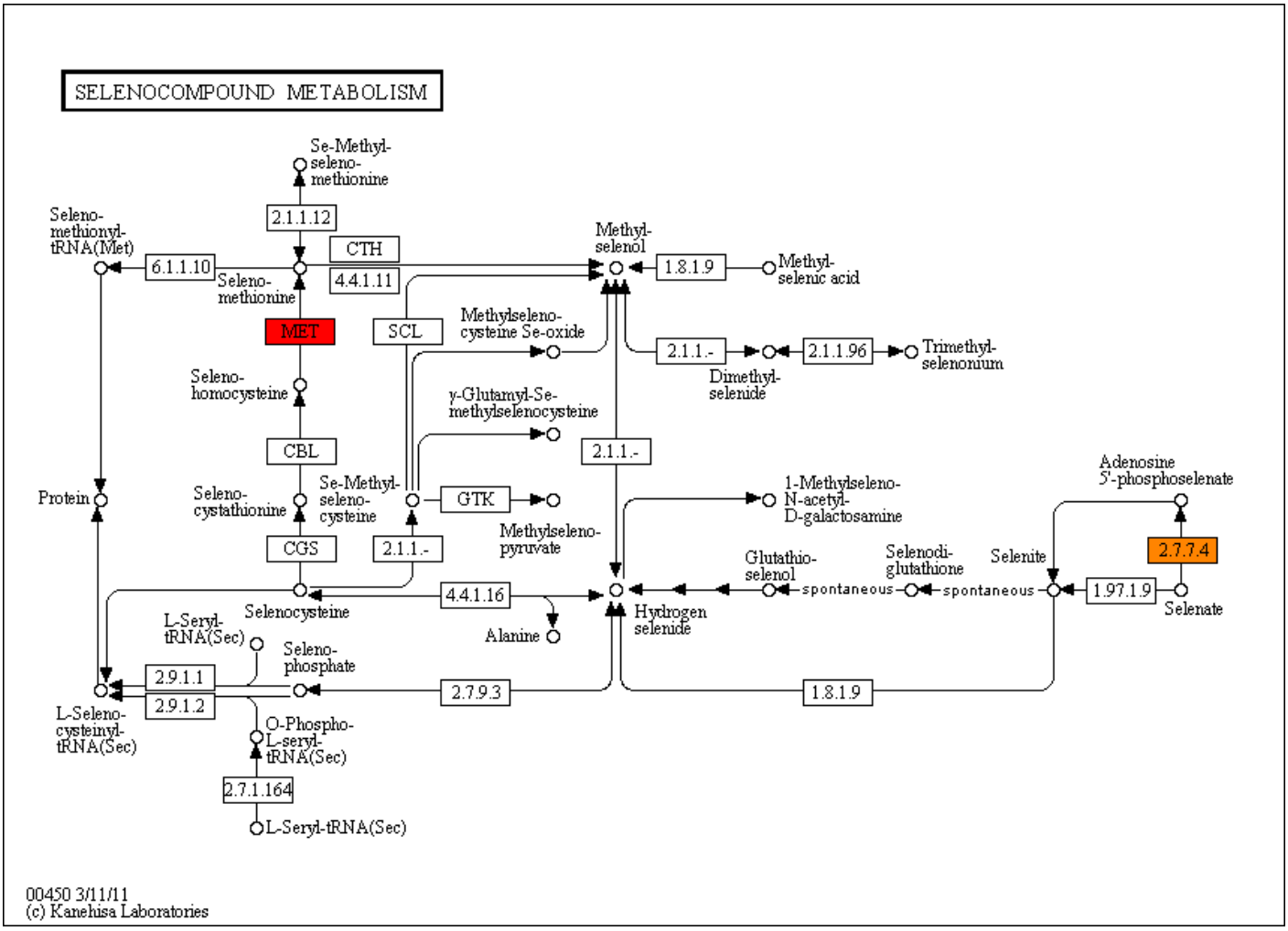
TAURINE AND HYPOTAURINE METABOLISM



00430 7/29/11



00450 3/11/11
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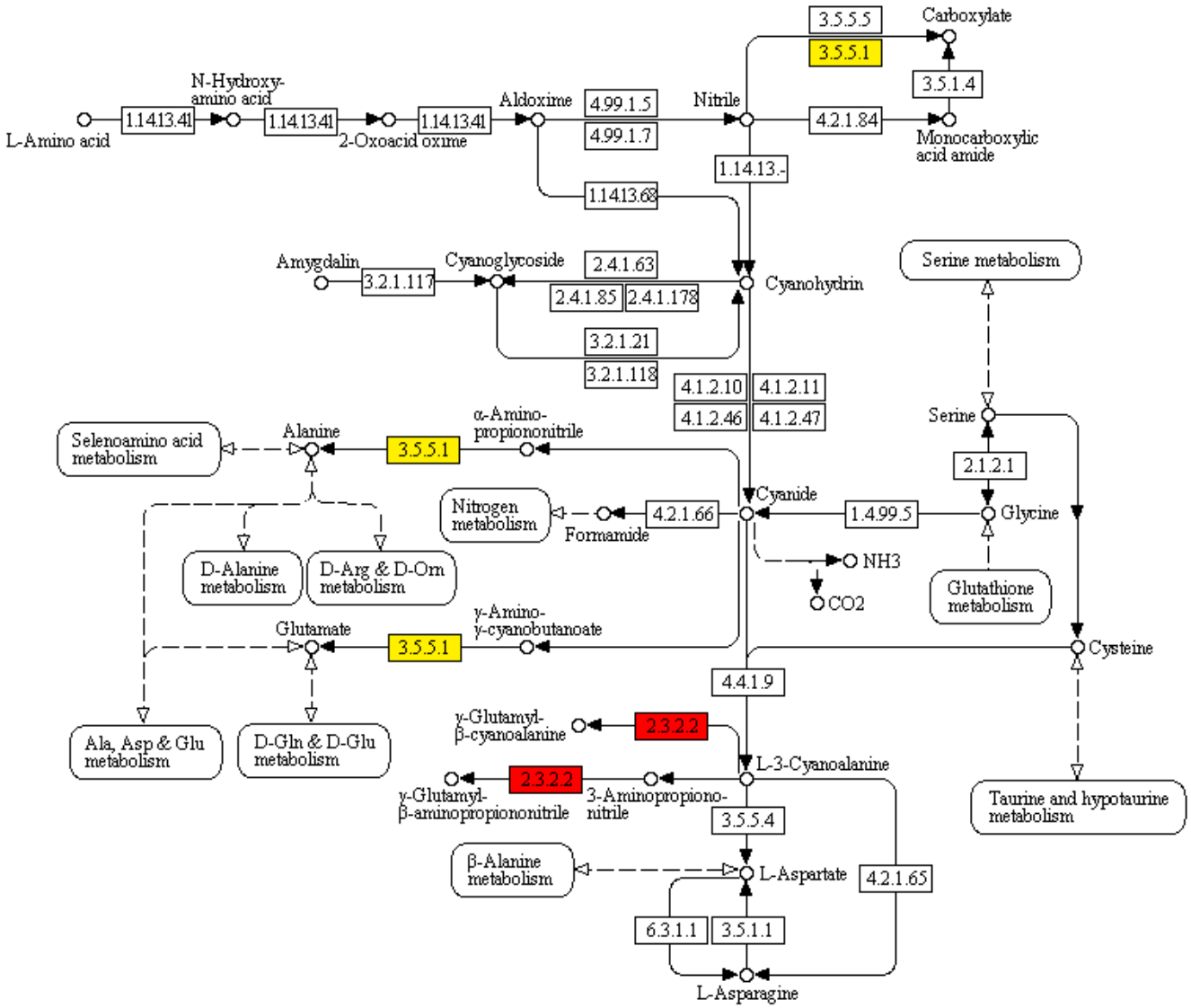
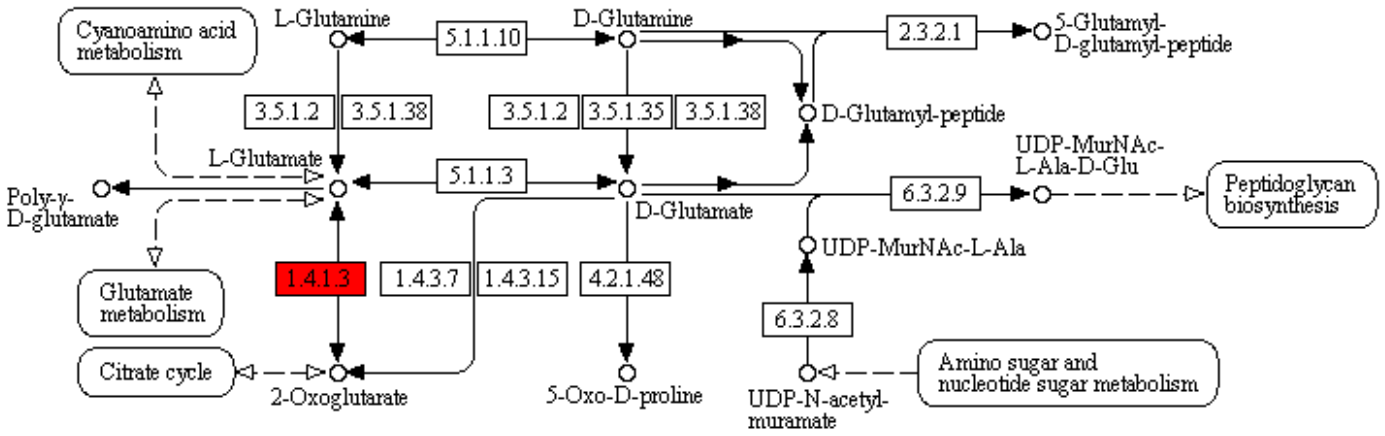
CYANOAMINO ACID METABOLISM

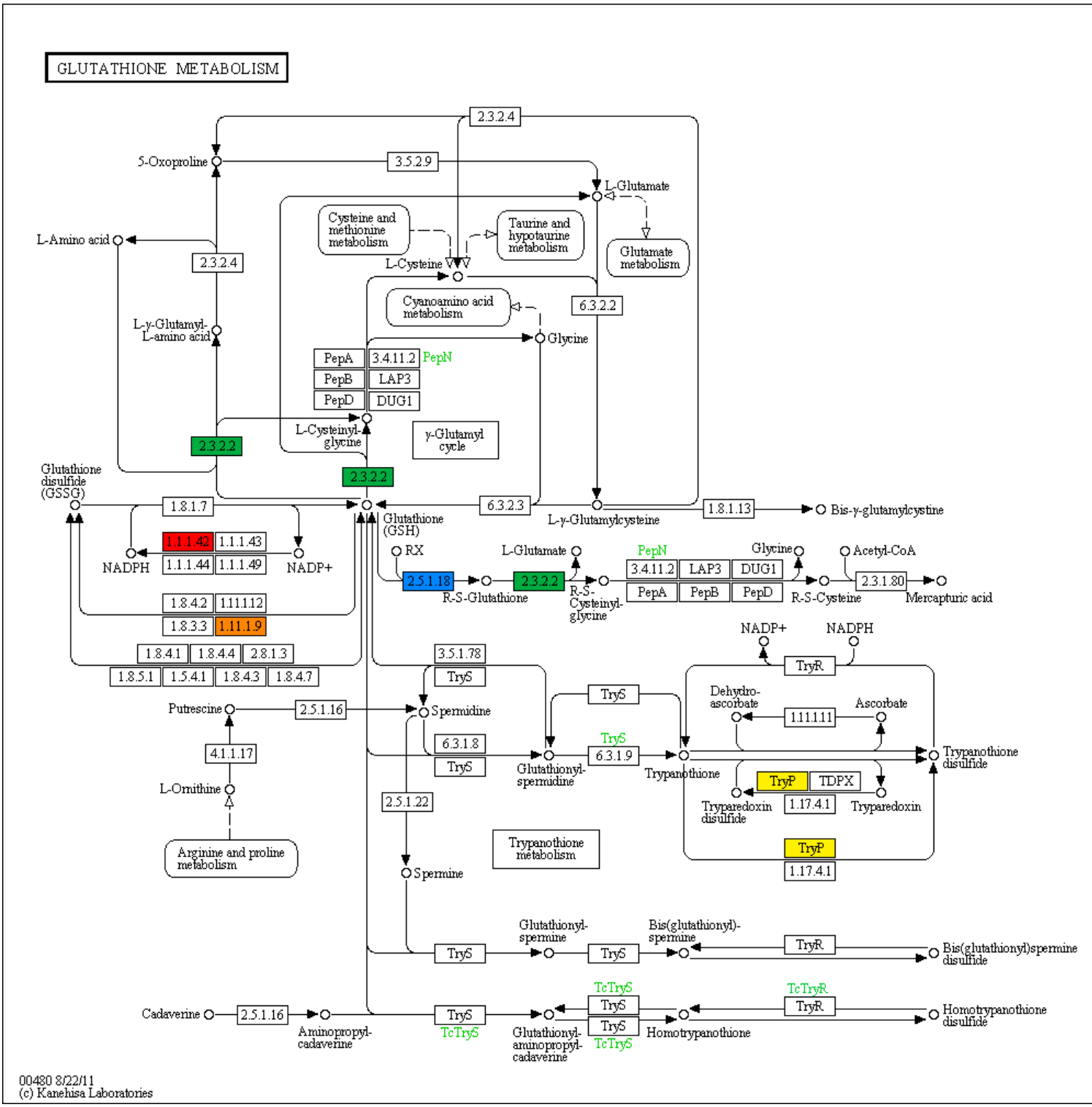


00460 6/21/11

D-GLUTAMINE AND D-GLUTAMATE METABOLISM



00471 3/14/11


GLUTATHIONE METABOLISM
2.3.2.4
5-Oxoproline
3.5.2.9
L-Glutamate
Cysteine and methionine metabolism
Taurine and hypotaurine metabolism
Glutamate metabolism
L-Amino acid
2.3.2.4
L-Cysteine
Cyanoamino acid metabolism
6.3.2.2
L-γ-Glutamyl-L-amino acid
Glycine
PepA
PepB
PepD
3.4.11.2
PepN
LAP3
DUG1
L-Cysteinyl-glycine
γ-Glutamyl cycle
2.3.2.2
2.3.2.2
Glutathione disulfide (GSSG)
1.8.1.7
6.3.2.3
L-γ-Glutamylcysteine
1.8.1.13
Bis-γ-glutamylcystine
Glutathione (GSH)
1.1.1.42
1.1.1.43
1.1.1.44
1.1.1.49
NADPH
NADP+
RX
L-Glutamate
PepN
Glycine
Acetyl-CoA
2.5.1.18
2.3.2.2
3.4.11.2
LAP3
DUG1
PepA
PepB
PepD
2.3.1.80
R-S-Glutathione
R-S-Cysteinyl-glycine
R-S-Cysteine
Mercapturic acid
1.8.4.2
1.11.1.12
1.8.3.3
1.11.1.9
1.8.4.1
1.8.4.4
2.8.1.3
1.8.5.1
1.5.4.1
1.8.4.3
1.8.4.7
3.5.1.78
TryS
NADP+
NADPH
TryR
TryS
Dehydro-ascorbate
1.11.1.11
Ascorbate
Putrescine
2.5.1.16
Spermidine
6.3.1.8
TryS
TryS
6.3.1.9
Glutathionyl-spermidine
Trypanothione
Trypanothione disulfide
4.1.1.17
L-Ornithine
TryP
TDPX
Tryparedoxin disulfide
1.17.4.1
Tryparedoxin
2.5.1.22
Arginine and proline metabolism
Trypanothione metabolism
Spermine
TryP
1.17.4.1
Glutathionyl-spermine
Bis(glutathionyl)-spermine
TryS
TryS
TryR
Bis(glutathionyl)spermine disulfide
TcTryS
TcTryR
Cadaverine
2.5.1.16
Aminopropyl-cadaverine
TryS
TcTryS
TryS
TcTryS
Glutathionyl-aminopropyl-cadaverine
Homotrypanothione
TryR
Homotrypanothione disulfide
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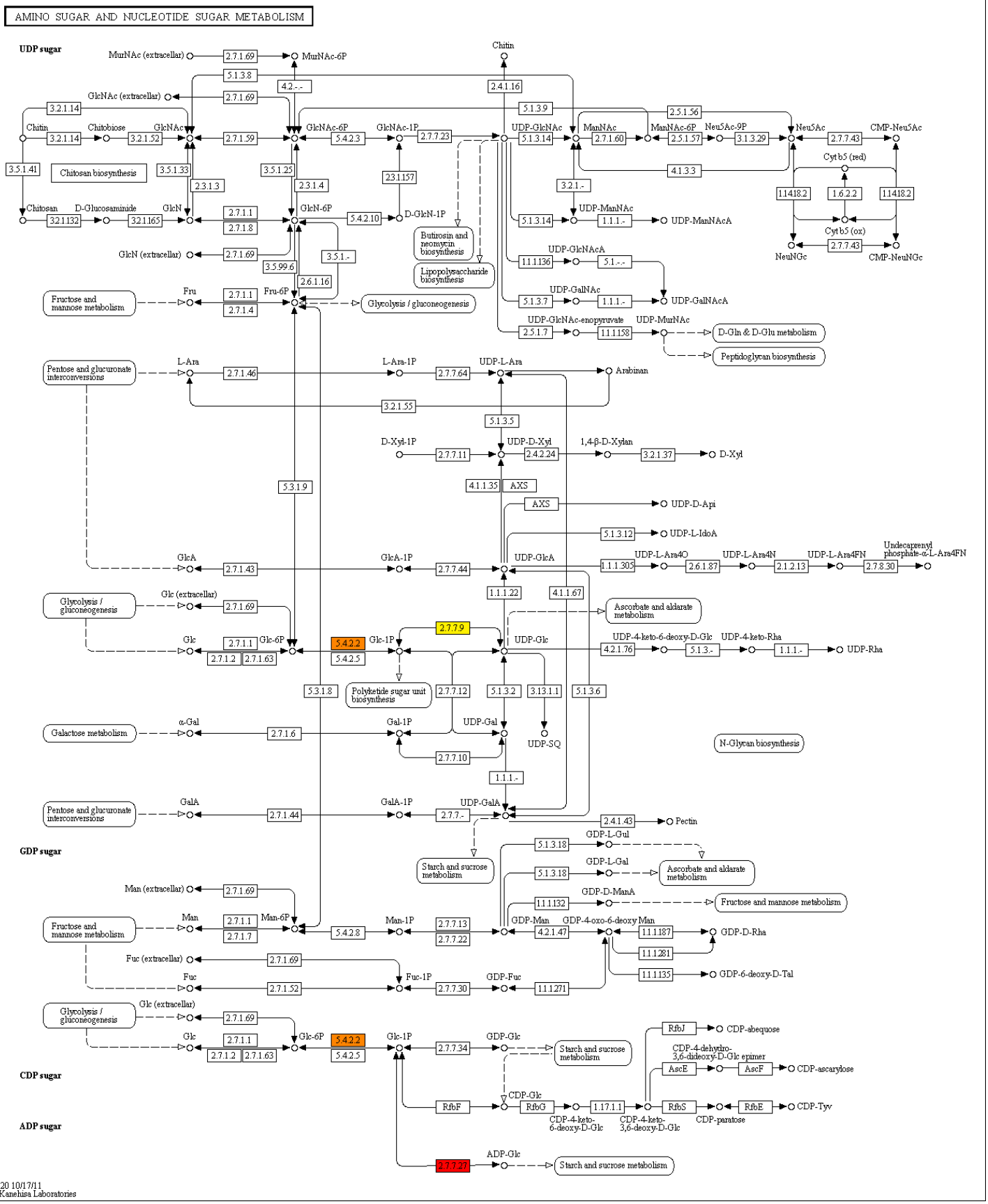

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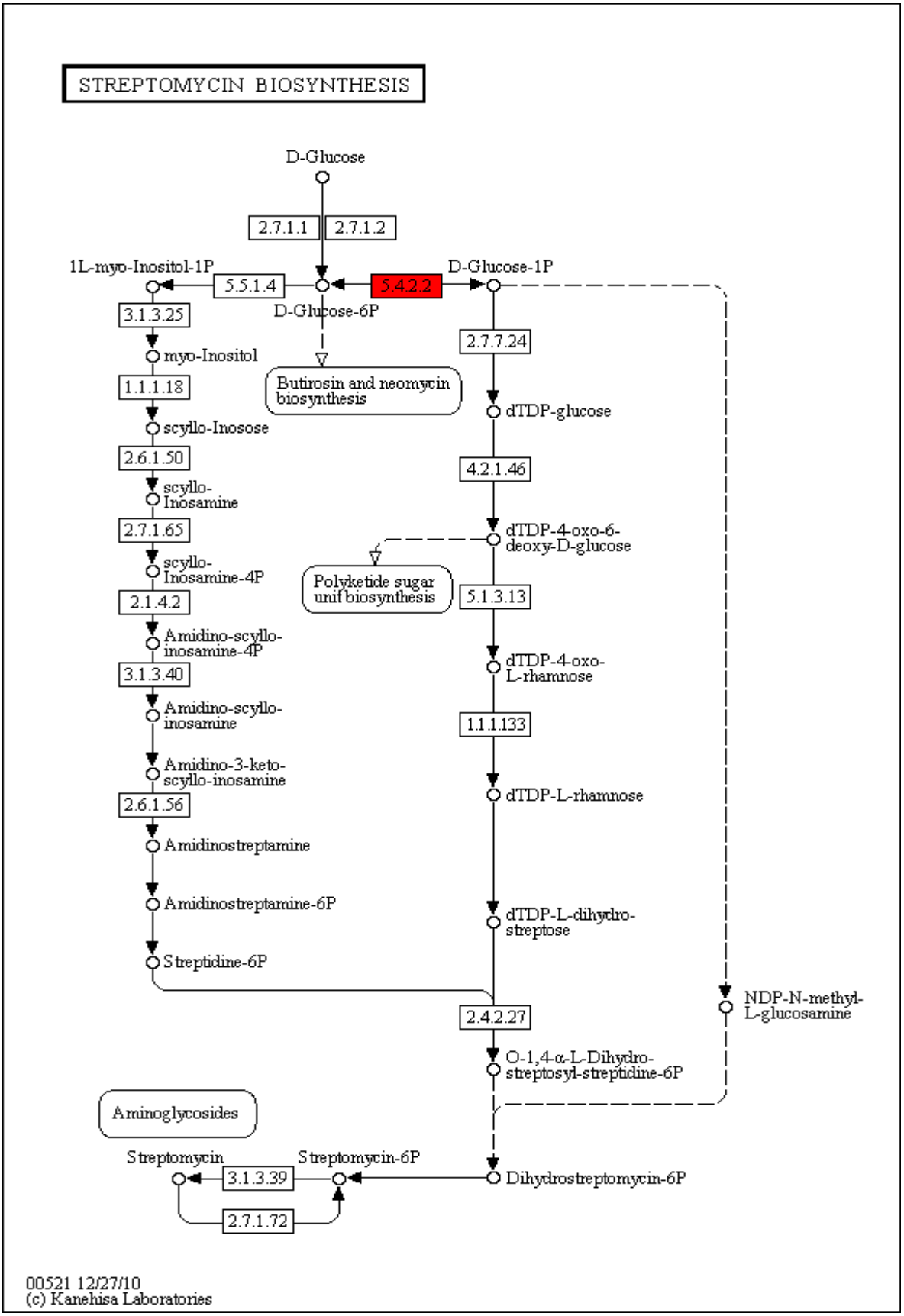

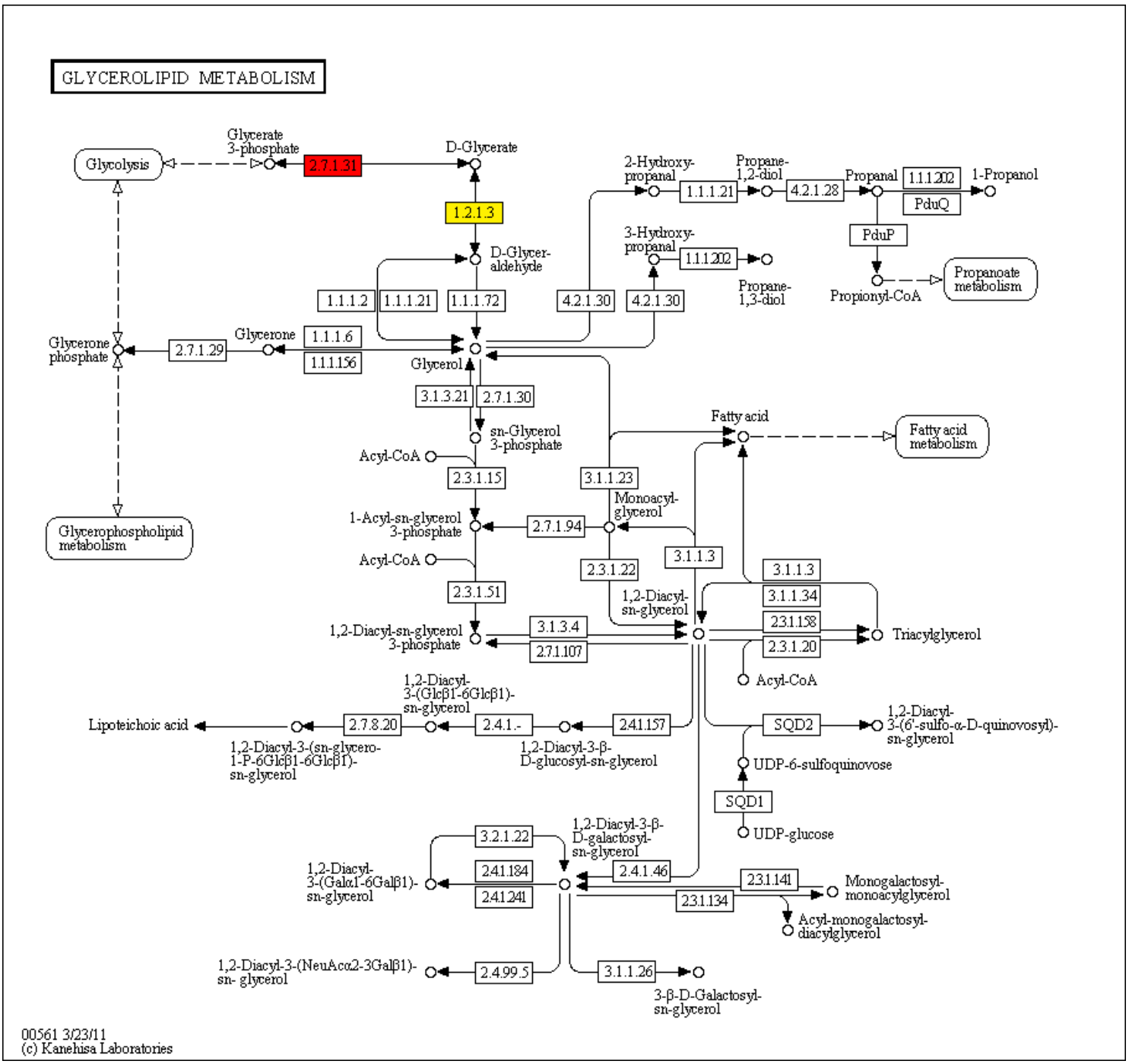
GLYCEROLIPID METABOLISM
Glycolysis
Glycerate 3-phosphate
2.7.1.31
D-Glycerate
1.2.1.3
D-Glycer-aldehyde
1.1.1.2
1.1.1.21
1.1.1.72
Glycerone phosphate
2.7.1.29
Glycerone
1.1.1.6
1.1.1.156
Glycerol
3.1.3.21
2.7.1.30
sn-Glycerol 3-phosphate
Acyl-CoA
2.3.1.15
1-Acyl-sn-glycerol 3-phosphate
2.7.1.94
Monoacyl-glycerol
3.1.1.23
Acyl-CoA
2.3.1.22
2.3.1.51
1,2-Diacyl-sn-glycerol
1,2-Diacyl-sn-glycerol 3-phosphate
3.1.3.4
2.7.1.107
Glycerophospholipid metabolism
2-Hydroxy-propanal
1.1.1.21
Propane-1,2-diol
4.2.1.28
Propanal
1.1.1.202
1-Propanol
PduQ
PduP
Propionyl-CoA
Propanoate metabolism
3-Hydroxy-propanal
1.1.1.202
Propane-1,3-diol
4.2.1.30
4.2.1.30
Fatty acid
Fatty acid metabolism
3.1.1.3
3.1.1.34
23.1.158
2.3.1.20
Triacylglycerol
Acyl-CoA
Lipoteichoic acid
2.7.8.20
1,2-Diacyl-3-(Glcβ1-6Glcβ1)-sn-glycerol
2.4.1.-
2.4.1.157
1,2-Diacyl-3-(sn-glycero-1-P-6Glcβ1-6Glcβ1)-sn-glycerol
1,2-Diacyl-3-β-D-glucosyl-sn-glycerol
SQD2
1,2-Diacyl-3-(6'-sulfo-α-D-quinovosyl)-sn-glycerol
UDP-6-sulfoquinovose
SQD1
UDP-glucose
3.2.1.22
1,2-Diacyl-3-β-D-galactosyl-sn-glycerol
2.4.1.46
1,2-Diacyl-3-(Galα1-6Galβ1)-sn-glycerol
2.4.1.184
2.4.1.241
23.1.141
Monogalactosyl-monoacylglycerol
23.1.134
Acyl-monogalactosyl-diacylglycerol
1,2-Diacyl-3-(NeuAcα2-3Galβ1)-sn- glycerol
2.4.99.5
3.1.1.26
3-β-D-Galactosyl-sn-glycerol
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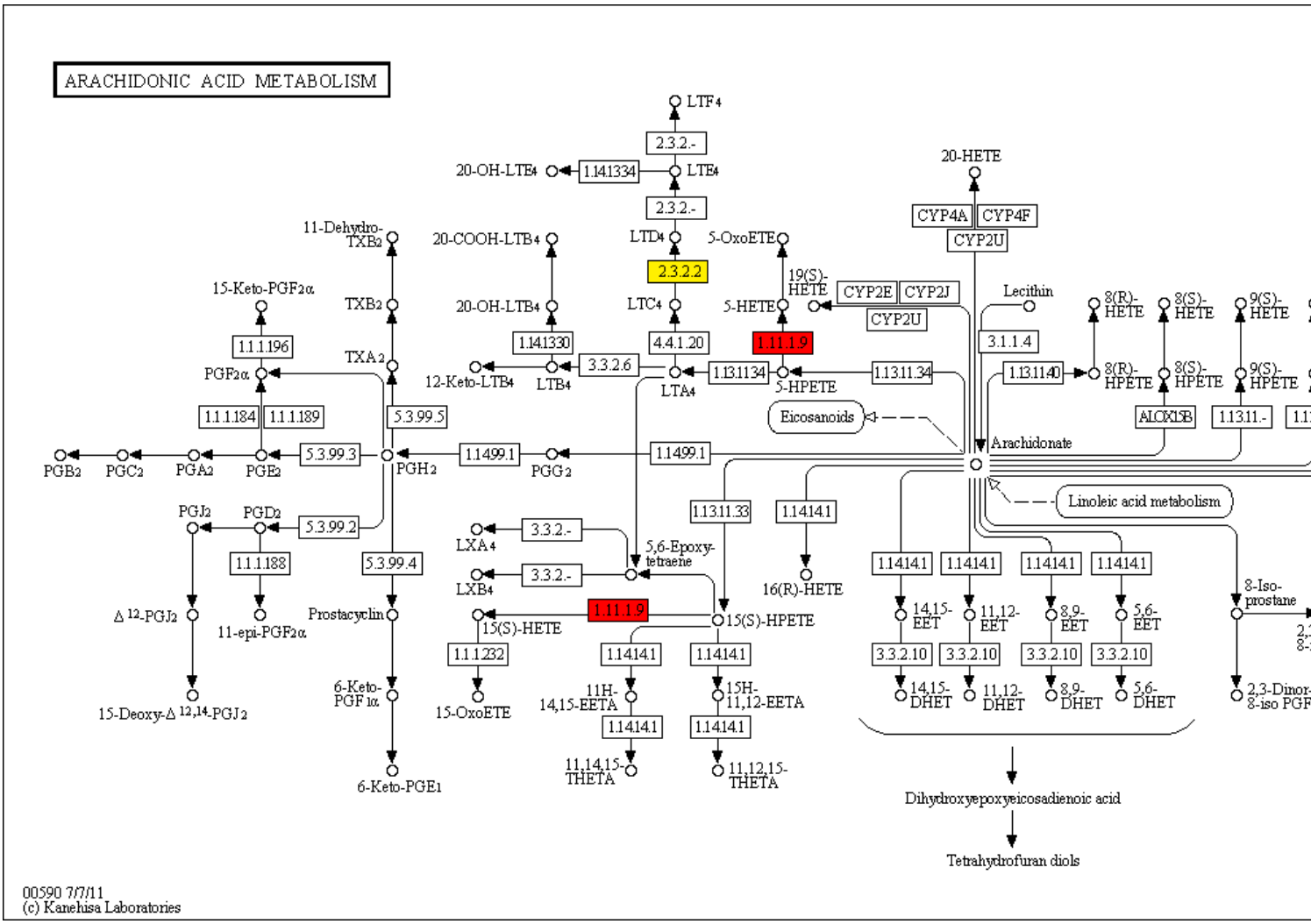
ARACHIDONIC ACID METABOLISM
LTF4
2.3.2.-
20-OH-LTE4
1.14.13.34
LTE4
2.3.2.-
20-HETE
CYP4A
CYP4F
CYP2U
11-Dehydro-TXB2
20-COOH-LTB4
LTD4
5-OxoETE
2.3.2.2
19(S)-HETE
CYP2E
CYP2J
CYP2U
15-Keto-PGF2α
TXB2
20-OH-LTB4
LTC4
5-HETE
Lecithin
8(R)-HETE
8(S)-HETE
9(S)-HETE
1.1.1.196
TXA2
1.14.13.30
4.4.1.20
1.11.1.9
3.1.1.4
PGF2α
12-Keto-LTB4
LTB4
3.3.2.6
1.13.11.34
1.13.11.40
8(R)-HPETE
8(S)-HPETE
9(S)-HPETE
1.1.1.184
1.1.1.189
5.3.99.5
LTA4
5-HPETE
Eicosanoids
ALOX15B
1.13.11.-
PGB2
PGC2
PGA2
PGE2
5.3.99.3
PGH2
1.14.99.1
PGG2
1.14.99.1
Arachidonate
Linoleic acid metabolism
PGJ2
PGD2
5.3.99.2
1.13.11.33
1.14.14.1
LXA4
3.3.2.-
5,6-Epoxy-tetraene
1.14.14.1
1.14.14.1
1.14.14.1
1.14.14.1
8-Iso-prostane
1.1.1.188
5.3.99.4
LXB4
3.3.2.-
16(R)-HETE
14,15-EET
11,12-EET
8,9-EET
5,6-EET
Δ12-PGJ2
11-epi-PGF2α
Prostacyclin
1.11.1.9
15(S)-HETE
15(S)-HPETE
3.3.2.10
3.3.2.10
3.3.2.10
3.3.2.10
1.1.1.232
1.14.14.1
1.14.14.1
14,15-DHET
11,12-DHET
8,9-DHET
5,6-DHET
15-Deoxy-Δ12,14-PGJ2
6-Keto-PGF1α
15-OxoETE
11H-14,15-EETA
15H-11,12-EETA
1.14.14.1
1.14.14.1
11,14,15-THETA
11,12,15-THETA
6-Keto-PGE1
Dihydroxyepoxyeicosadienoic acid
Tetrahydrofuran diols
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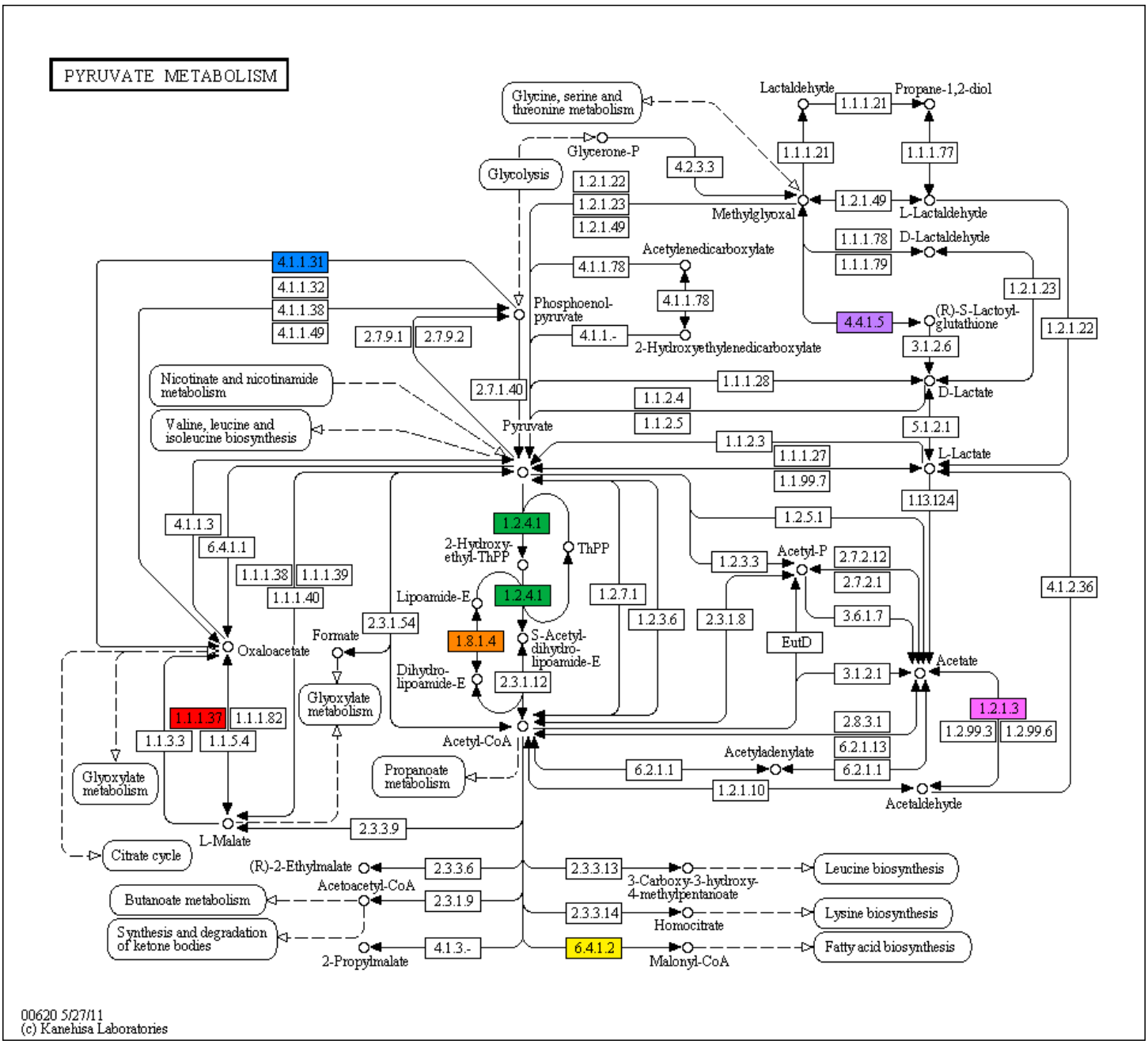
PYRUVATE METABOLISM
Glycine, serine and threonine metabolism
Glycerone-P
Glycolysis
Lactaldehyde
Propane-1,2-diol
1.1.1.21
1.1.1.77
4.2.3.3
1.2.1.22
1.2.1.23
1.2.1.49
Methylglyoxal
L-Lactaldehyde
1.1.1.78
D-Lactaldehyde
1.1.1.79
Acetylenedicarboxylate
4.1.1.78
4.1.1.31
4.1.1.32
4.1.1.38
4.1.1.49
Phosphoenol-pyruvate
4.1.1.-
2-Hydroxyethylenedicarboxylate
4.4.1.5
(R)-S-Lactoyl-glutathione
3.1.2.6
1.2.1.23
1.2.1.22
2.7.9.1
2.7.9.2
Nicotinate and nicotinamide metabolism
2.7.1.40
1.1.1.28
D-Lactate
1.1.2.4
1.1.2.5
Valine, leucine and isoleucine biosynthesis
Pyruvate
5.1.2.1
1.1.2.3
1.1.1.27
1.1.99.7
L-Lactate
1.13.12.4
1.2.5.1
4.1.1.3
6.4.1.1
1.2.4.1
2-Hydroxy-ethyl-ThPP
ThPP
1.2.3.3
Acetyl-P
2.7.2.12
2.7.2.1
4.1.2.36
1.1.1.38
1.1.1.39
1.1.1.40
Lipoamide-E
1.2.4.1
1.2.7.1
1.2.3.6
2.3.1.8
EutD
3.6.1.7
2.3.1.54
Formate
1.8.1.4
S-Acetyl-dihydro-lipoamide-E
Oxaloacetate
Dihydro-lipoamide-E
2.3.1.12
Acetate
3.1.2.1
Glyoxylate metabolism
1.2.1.3
1.1.1.37
1.1.1.82
1.2.99.3
1.2.99.6
1.1.3.3
1.1.5.4
2.8.3.1
Acetyl-CoA
6.2.1.13
Acetyladenylate
Glyoxylate metabolism
Propanoate metabolism
6.2.1.1
6.2.1.1
1.2.1.10
Acetaldehyde
2.3.3.9
L-Malate
Citrate cycle
(R)-2-Ethylmalate
2.3.3.6
2.3.3.13
3-Carboxy-3-hydroxy-4-methylpentanoate
Leucine biosynthesis
Acetoacetyl-CoA
2.3.1.9
Butanoate metabolism
2.3.3.14
Homocitrate
Lysine biosynthesis
Synthesis and degradation of ketone bodies
2-Propylmalate
4.1.3.-
6.4.1.2
Malonyl-CoA
Fatty acid biosynthesis
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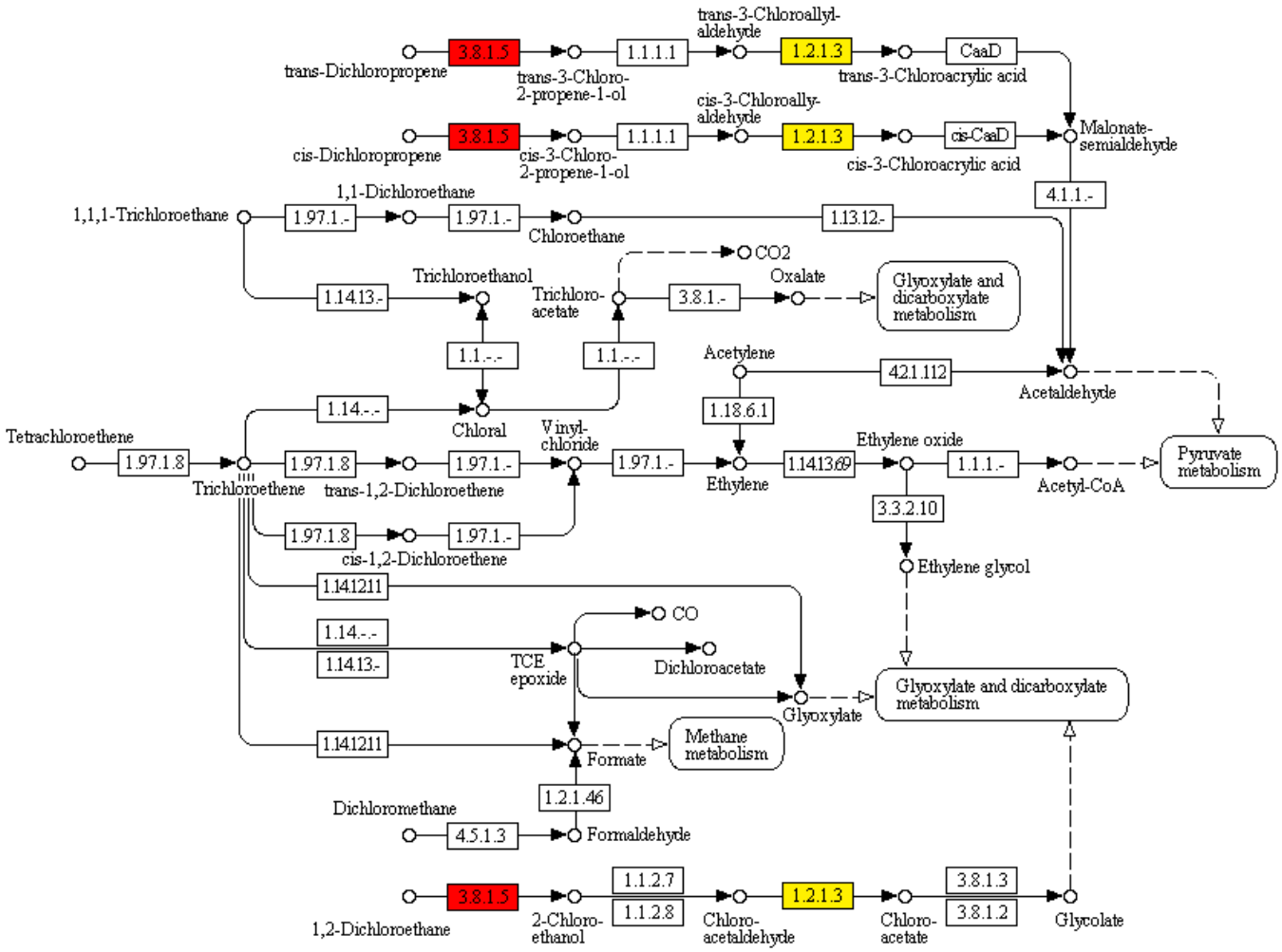
CHLOROALKANE AND CHLOROALKENE DEGRADATION



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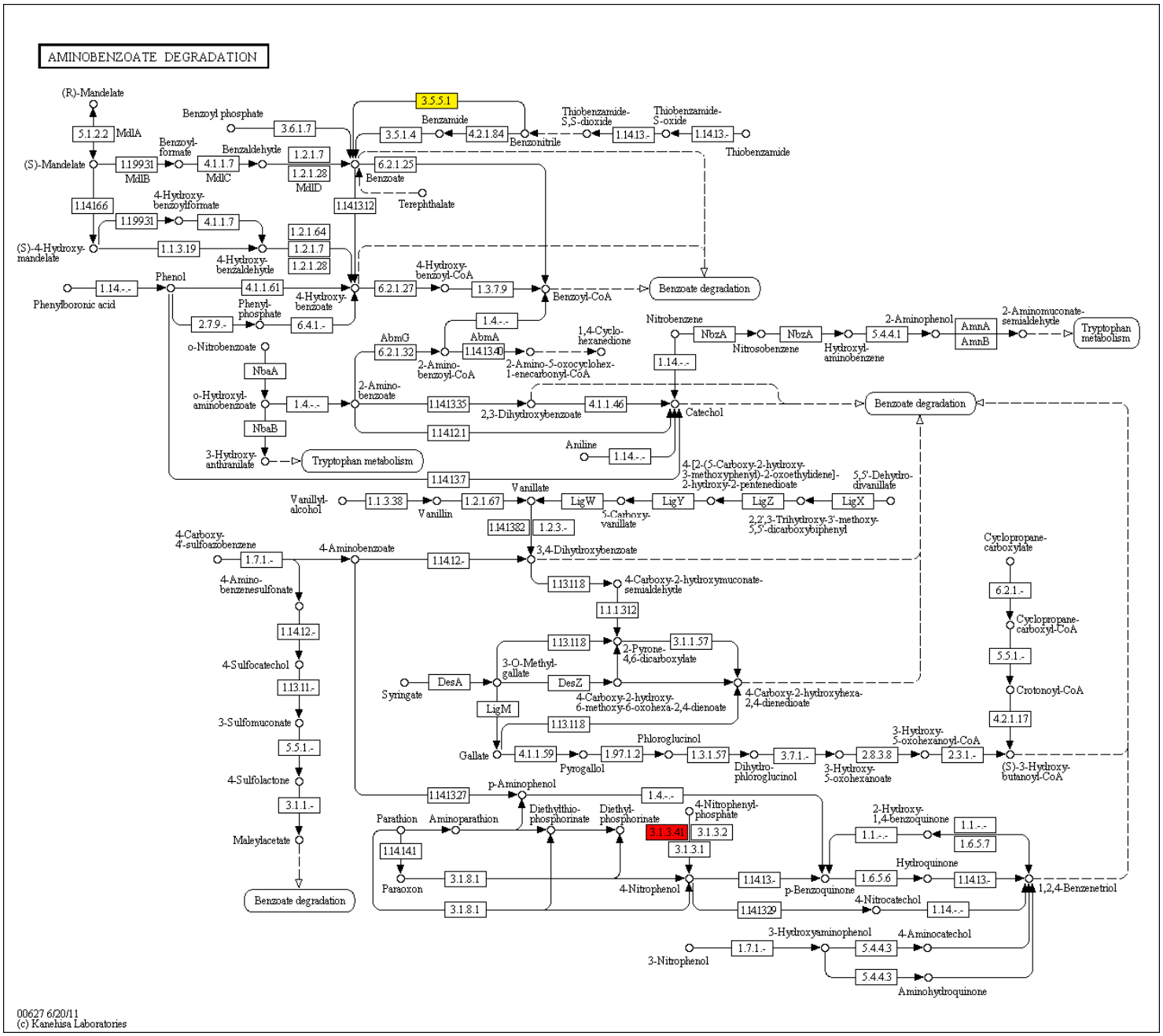

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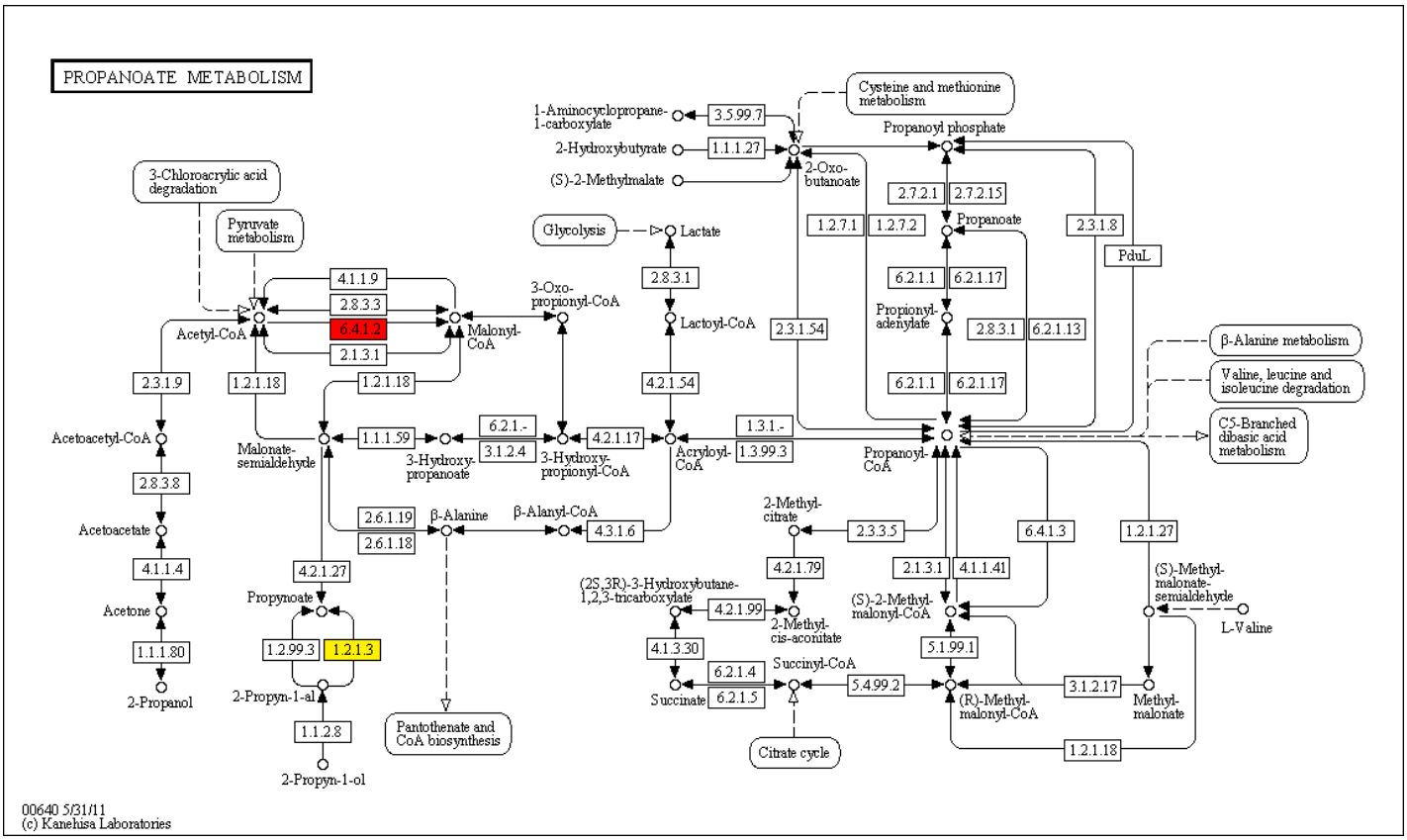
PROPANOATE METABOLISM
Cysteine and methionine metabolism
1-Aminocyclopropane-1-carboxylate
3.5.99.7
2-Hydroxybutyrate
1.1.1.27
(S)-2-Methylmalate
2-Oxo-butanoate
Propanoyl phosphate
3-Chloroacrylic acid degradation
Pyruvate metabolism
Glycolysis
Lactate
2.7.2.1
2.7.2.15
1.2.7.1
1.2.7.2
Propanoate
2.3.1.8
PduL
4.1.1.9
2.8.3.3
6.4.1.2
2.1.3.1
Acetyl-CoA
Malonyl-CoA
3-Oxo-propionyl-CoA
2.8.3.1
Lactoyl-CoA
2.3.1.54
6.2.1.1
6.2.1.17
Propionyl-adenylate
2.8.3.1
6.2.1.13
β-Alanine metabolism
Valine, leucine and isoleucine degradation
C5-Branched dibasic acid metabolism
2.3.1.9
1.2.1.18
1.2.1.18
4.2.1.54
6.2.1.1
6.2.1.17
Acetoacetyl-CoA
Malonate-semialdehyde
1.1.1.59
6.2.1.-
3.1.2.4
3-Hydroxy-propanoate
4.2.1.17
3-Hydroxy-propionyl-CoA
Acryloyl-CoA
1.3.99.3
1.3.1.-
Propanoyl-CoA
2.8.3.8
Acetoacetate
2.6.1.19
2.6.1.18
β-Alanine
β-Alanyl-CoA
4.3.1.6
2-Methyl-citrate
2.3.3.5
6.4.1.3
1.2.1.27
4.1.1.4
4.2.1.27
4.2.1.79
2.1.3.1
4.1.1.41
(S)-Methyl-malonate-semialdehyde
Propynoate
(2S,3R)-3-Hydroxybutane-1,2,3-tricarboxylate
4.2.1.99
2-Methyl-cis-aconitate
(S)-2-Methyl-malonyl-CoA
L-Valine
Acetone
1.1.1.80
1.2.99.3
1.2.1.3
4.1.3.30
5.1.99.1
Succinyl-CoA
6.2.1.4
5.4.99.2
3.1.2.17
2-Propanol
2-Propyn-1-al
Succinate
6.2.1.5
(R)-Methyl-malonyl-CoA
Methyl-malonate
1.1.2.8
Pantothenate and CoA biosynthesis
Citrate cycle
1.2.1.18
2-Propyn-1-ol
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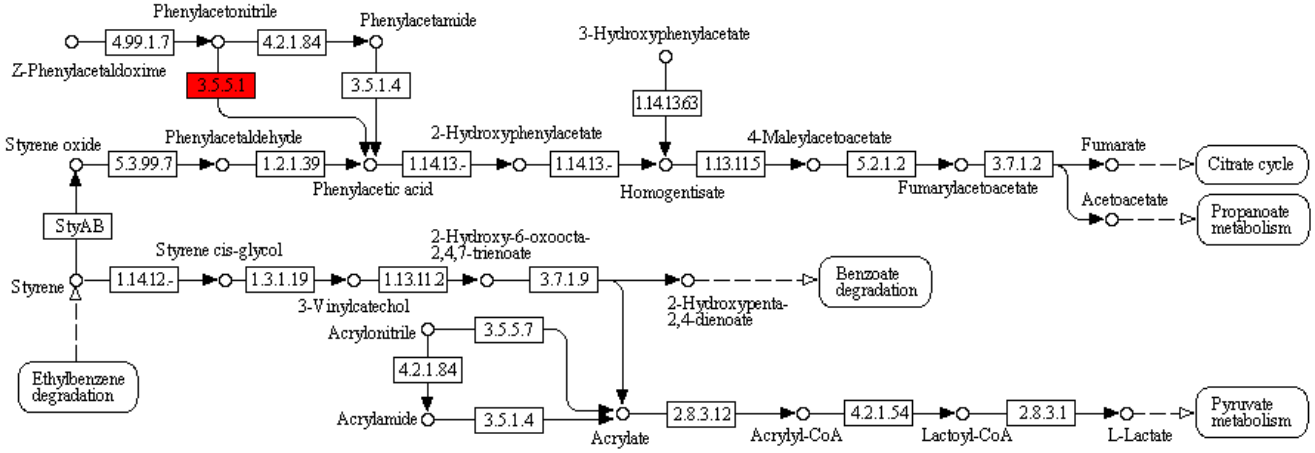
STYRENE DEGRADATION



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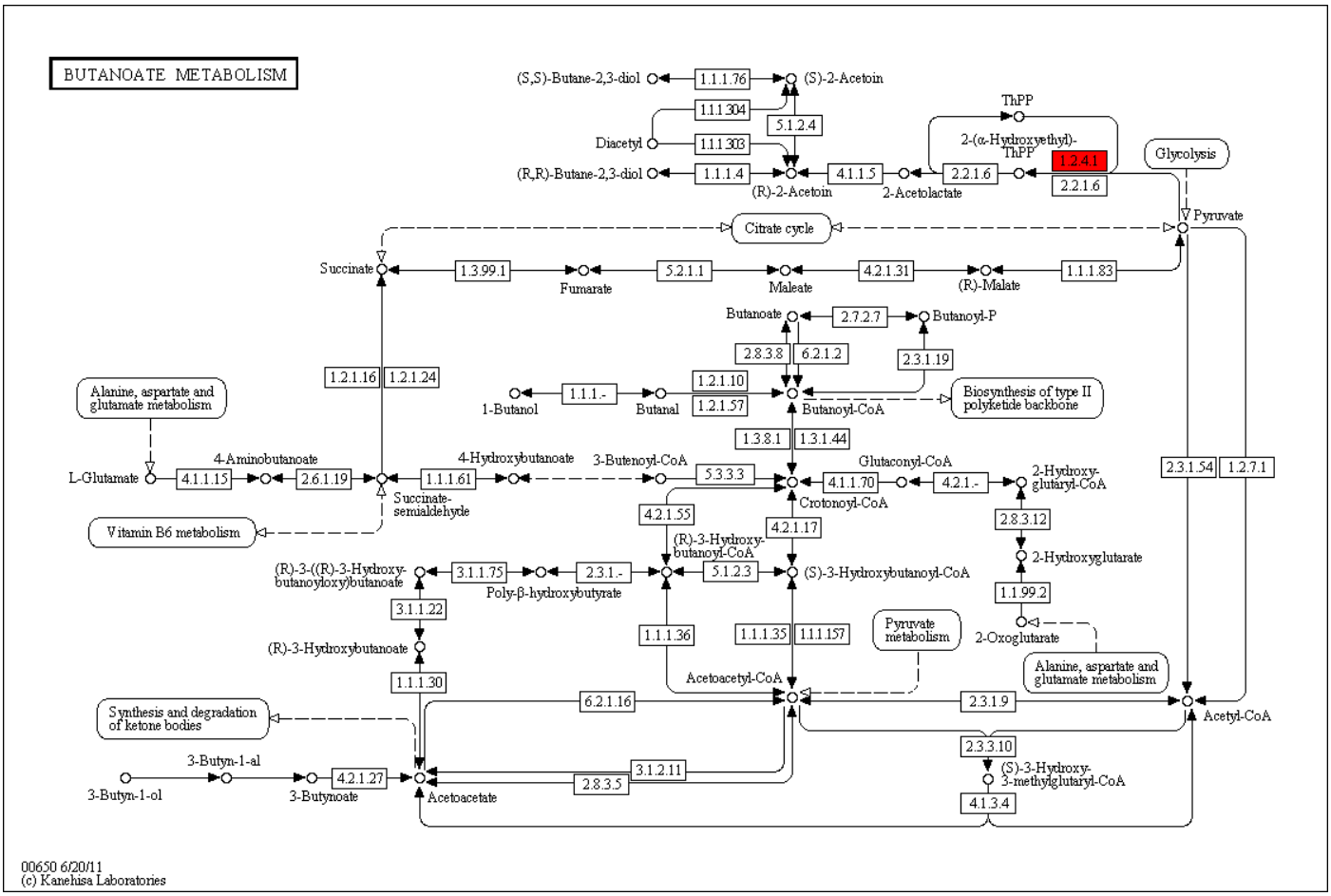

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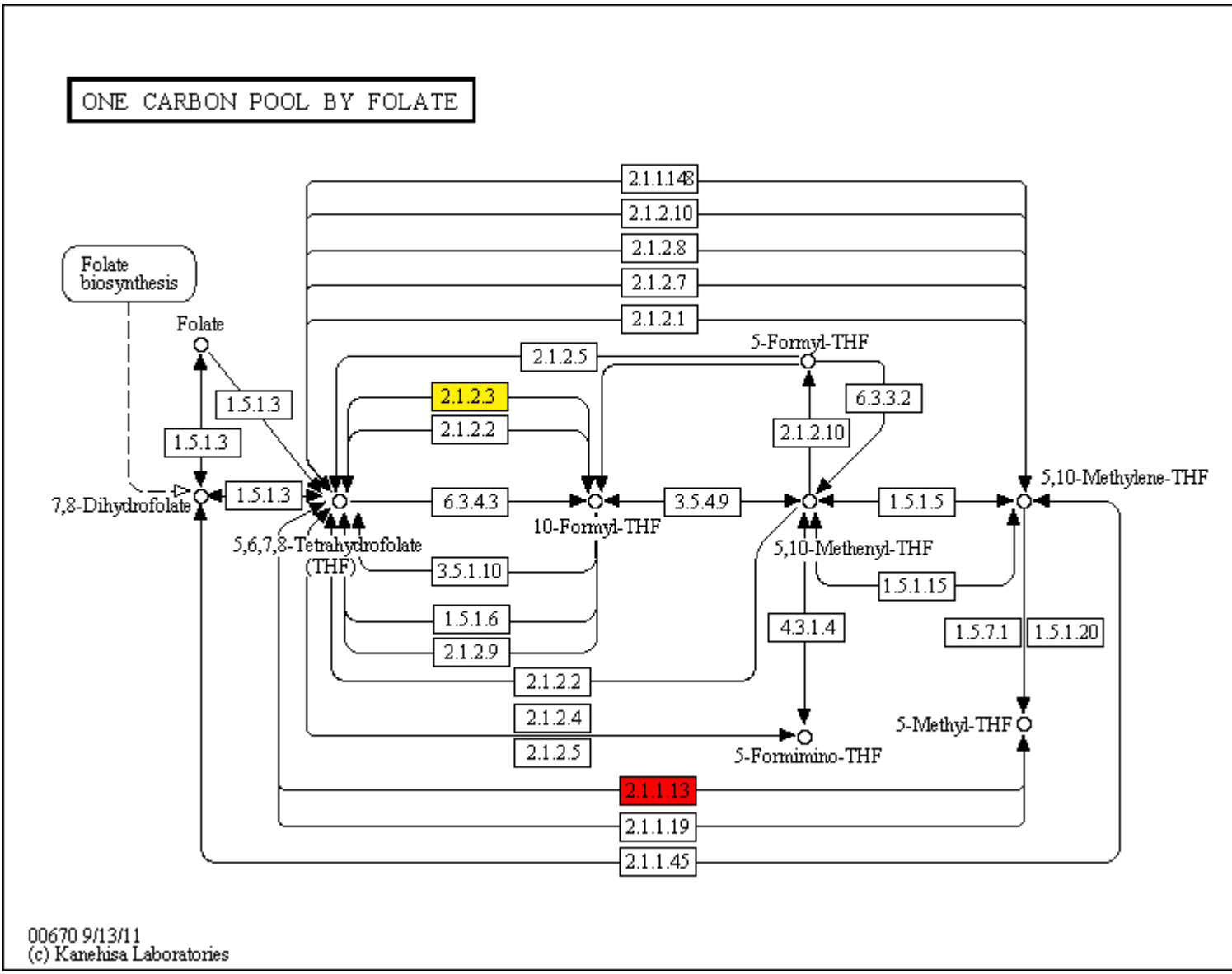
ONE CARBON POOL BY FOLATE
Folate biosynthesis
Folate
7,8-Dihydrofolate
5,6,7,8-Tetrahydrofolate (THF)
10-Formyl-THF
5-Formyl-THF
5,10-Methenyl-THF
5,10-Methylene-THF
5-Methyl-THF
5-Formimino-THF
2.1.1.148
2.1.2.10
2.1.2.8
2.1.2.7
2.1.2.1
2.1.2.5
2.1.2.3
2.1.2.2
1.5.1.3
1.5.1.3
1.5.1.3
6.3.4.3
3.5.4.9
6.3.3.2
2.1.2.10
1.5.1.5
3.5.1.10
1.5.1.6
2.1.2.9
2.1.2.2
2.1.2.4
2.1.2.5
4.3.1.4
1.5.1.15
1.5.7.1
1.5.1.20
2.1.1.13
2.1.1.19
2.1.1.45
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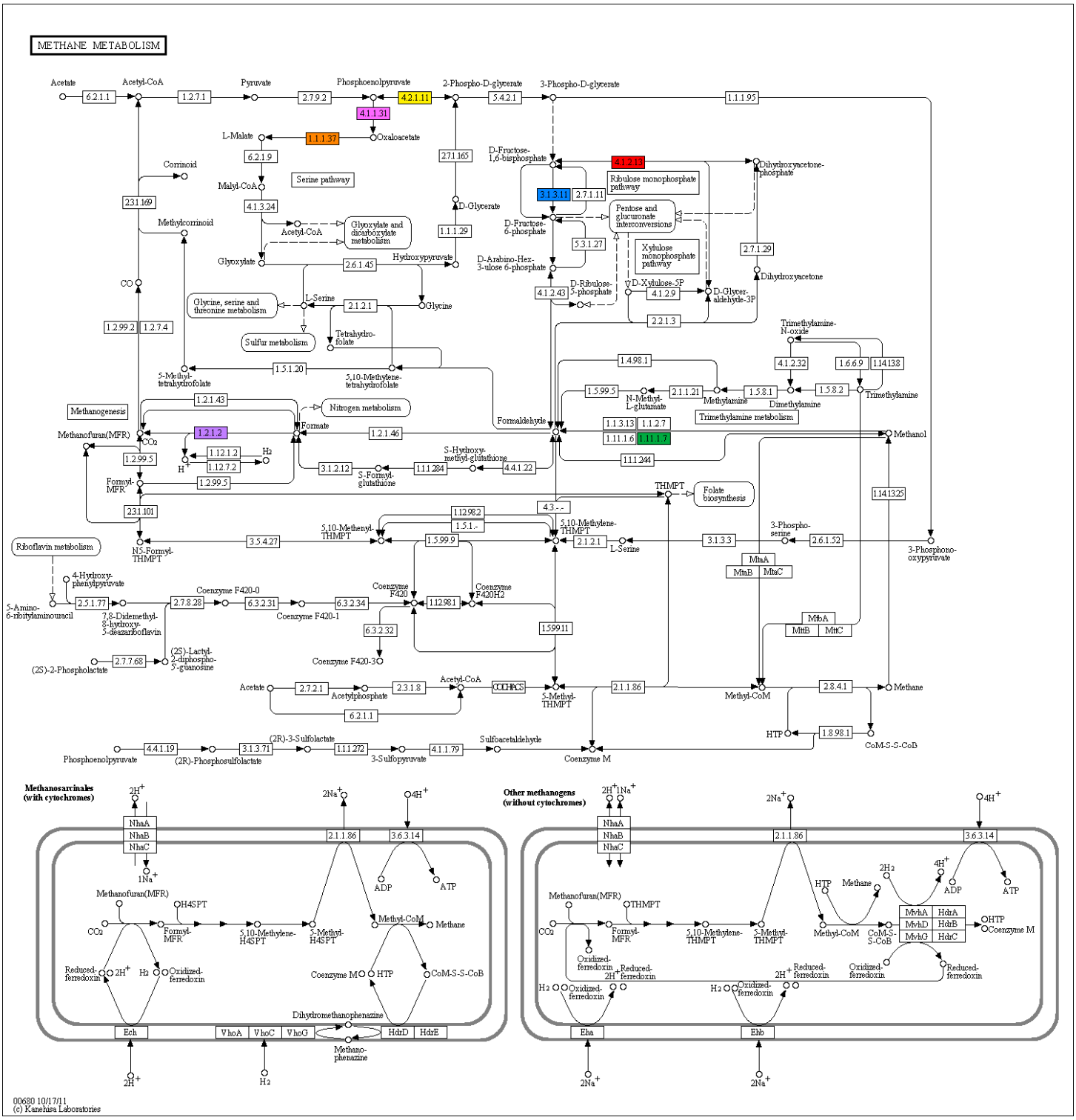
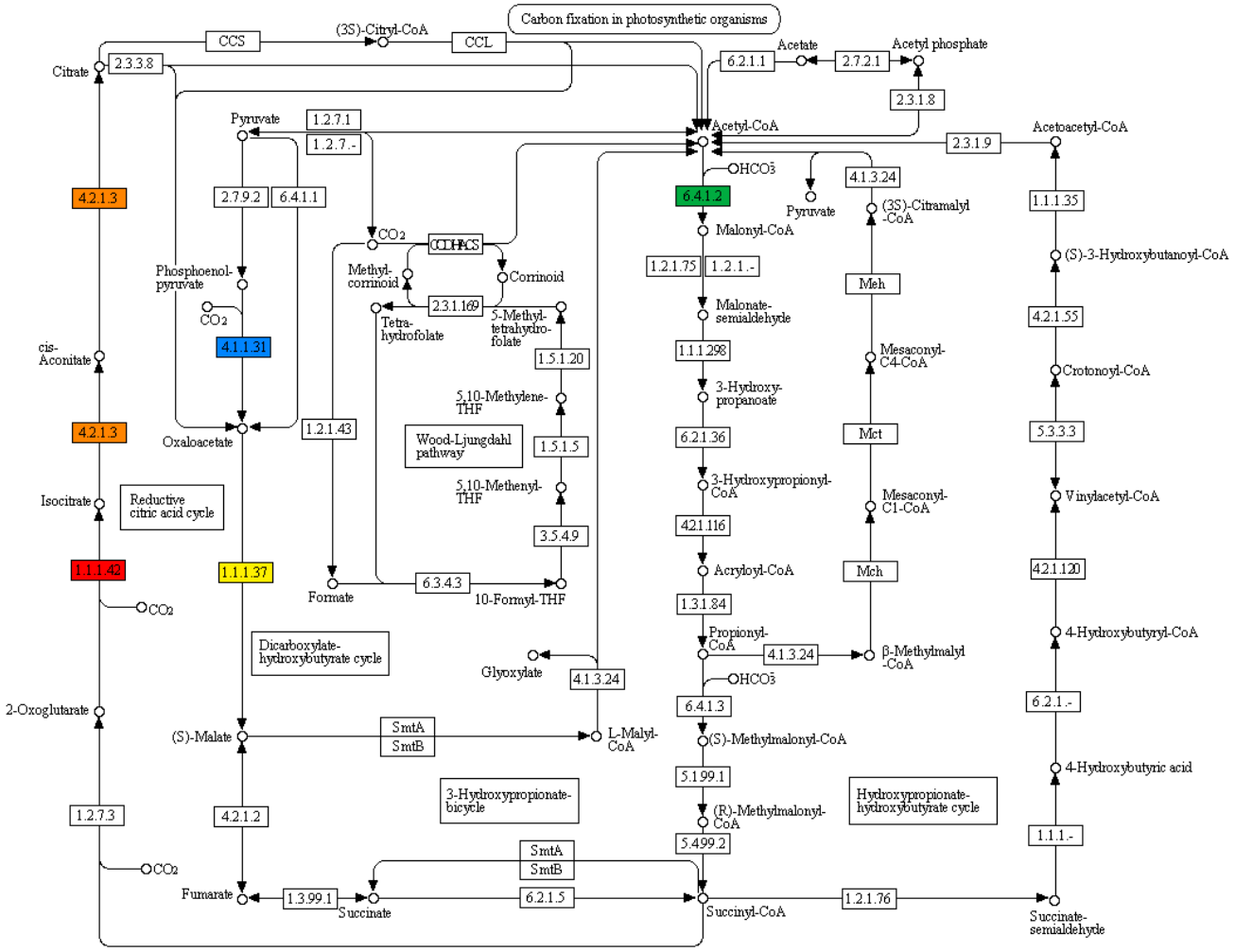
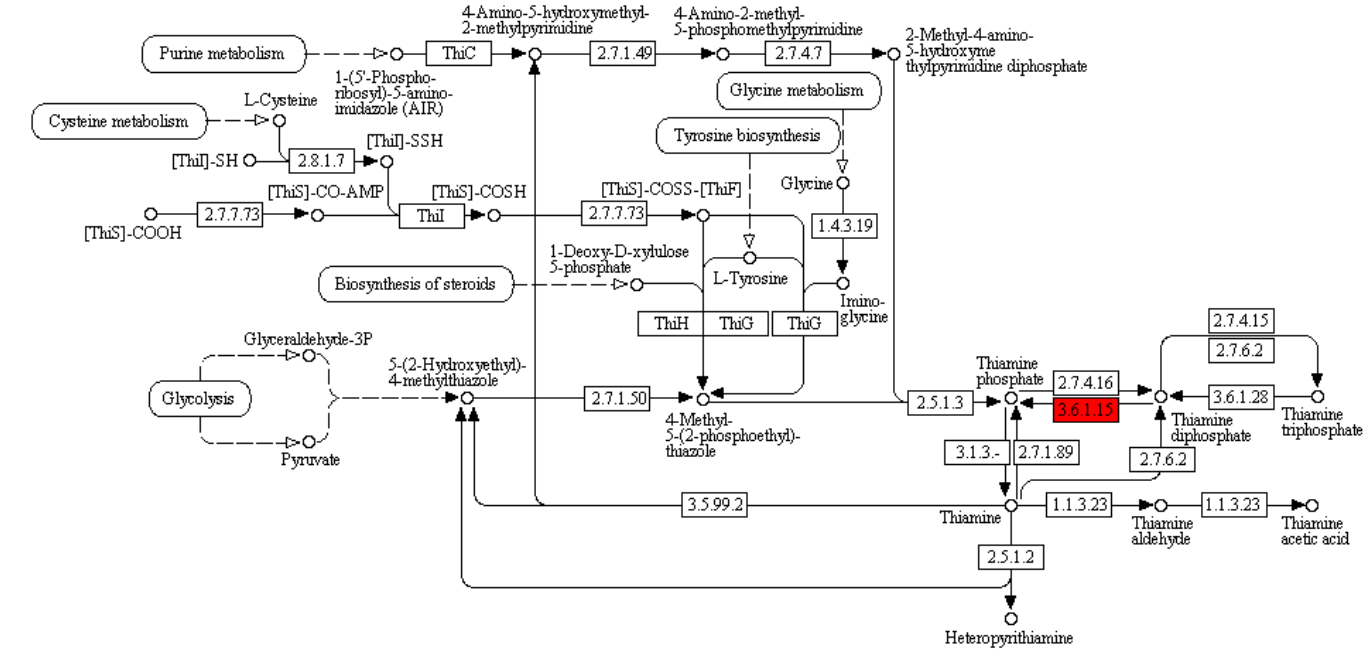

METHANE METABOLISM
Acetate
Acetyl-CoA
Pyruvate
Phosphoenolpyruvate
2-Phospho-D-glycerate
3-Phospho-D-glycerate
6.2.1.1
1.2.7.1
2.7.9.2
4.2.1.11
4.1.1.31
5.4.2.1
1.1.1.95
L-Malate
1.1.1.37
Oxaloacetate
6.2.1.9
2.7.1.65
D-Fructose-1,6-bisphosphate
4.1.2.13
Dihydroxyacetone-phosphate
Corrinoid
Serine pathway
Malyl-CoA
4.1.3.24
3.1.3.11
2.7.1.11
Ribulose monophosphate pathway
2.3.1.169
D-Glycerate
1.1.1.29
Pentose and glucuronate interconversions
Methylcorrinoid
Acetyl-CoA
Glyoxylate and dicarboxylate metabolism
D-Fructose-6-phosphate
5.3.1.27
Xylulose monophosphate pathway
2.7.1.29
Glyoxylate
2.6.1.45
Hydroxypyruvate
D-Arabino-Hex-3-ulose 6-phosphate
Dihydroxyacetone
CO
Glycine, serine and threonine metabolism
L-Serine
2.1.2.1
Glycine
4.1.2.43
D-Ribulose-5-phosphate
4.1.2.9
D-Glycer-aldehyde-3P
1.2.99.2
1.2.7.4
Sulfur metabolism
Tetrahydro-folate
2.2.1.3
Trimethylamine-N-oxide
1.5.1.20
5,10-Methylene-tetrahydrofolate
5-Methyl-tetrahydrofolate
1.4.98.1
4.1.2.32
1.6.6.9
1.14.13.8
1.5.99.5
2.1.1.21
1.5.8.1
1.5.8.2
Trimethylamine
N-Methyl-L-glutamate
Methylamine
Dimethylamine
1.2.1.43
Nitrogen metabolism
Trimethylamine metabolism
Methanogenesis
Formate
Formaldehyde
1.1.3.13
1.1.2.7
1.11.1.6
1.11.1.7
Methanofuran(MFR)
CO2
1.2.1.2
1.2.1.46
Methanol
1.2.99.5
1.12.1.2
H2
H+
1.12.7.2
S-Hydroxy-methyl-glutathione
1.1.1.244
3.1.2.12
S-Formyl-glutathione
1.1.1.284
4.4.1.22
Formyl-MFR
1.2.99.5
THMPT
Folate biosynthesis
1.14.13.25
23.1.101
4.3.-.-
1.12.98.2
1.5.1.-
5,10-Methenyl-THMPT
5,10-Methylene-THMPT
Riboflavin metabolism
3.5.4.27
1.5.99.9
2.1.2.1
L-Serine
3.1.3.3
3-Phospho-serine
2.6.1.52
3-Phospho-oxypyruvate
N5-Formyl-THMPT
MtaA
MtaB
MtaC
4-Hydroxy-phenylpyruvate
Coenzyme F420-0
Coenzyme F420
Coenzyme F420H2
5-Amino-6-ribitylaminouracil
2.5.1.77
2.7.8.28
6.3.2.31
6.3.2.34
1.12.98.1
7,8-Didemethyl-8-hydroxy-5-deazariboflavin
Coenzyme F420-1
MtbA
MtbB
MttC
6.3.2.32
1.5.99.11
Coenzyme F420-3
(2S)-2-Phospholactate
2.7.7.68
(2S)-Lactyl-2-diphospho-5'-guanosine
Acetate
2.7.2.1
Acetylphosphate
2.3.1.8
Acetyl-CoA
CODHACS
5-Methyl-THMPT
2.1.1.86
Methyl-CoM
2.8.4.1
Methane
6.2.1.1
HTP
1.8.98.1
CoM-S-S-CoB
Phosphoenolpyruvate
4.4.1.19
(2R)-Phosphosulfolactate
3.1.3.71
(2R)-3-Sulfolactate
1.1.1.272
3-Sulfopyruvate
4.1.1.79
Sulfoacetaldehyde
Coenzyme M
Methanosarcinales (with cytochromes)
Other methanogens (without cytochromes)
2H+
2Na+
4H+
NhaA
NhaB
NhaC
1Na+
2.1.1.86
3.6.3.14
ADP
ATP
Methanofuran(MFR)
H4SPT
CO2
Formyl-MFR
5,10-Methylene-H4SPT
5-Methyl-H4SPT
Methyl-CoM
Methane
Reduced-ferredoxin
2H+
H2
Oxidized-ferredoxin
Coenzyme M
HTP
CoM-S-S-CoB
Dihydromethanophenazine
Methano-phenazine
Ech
VhoA
VhoC
VhoG
HdrD
HdrE
THMPT
Formyl-MFR
5,10-Methylene-THMPT
5-Methyl-THMPT
Methyl-CoM
CoM-S-S-CoB
2H2
MvhA
MvhD
MvhG
HdrA
HdrB
HdrC
Coenzyme M
Eha
Ehb
00680 10/17/11
(c) Kanehisa Laboratories

CARBON FIXATION PATHWAYS IN PROKARYOTES



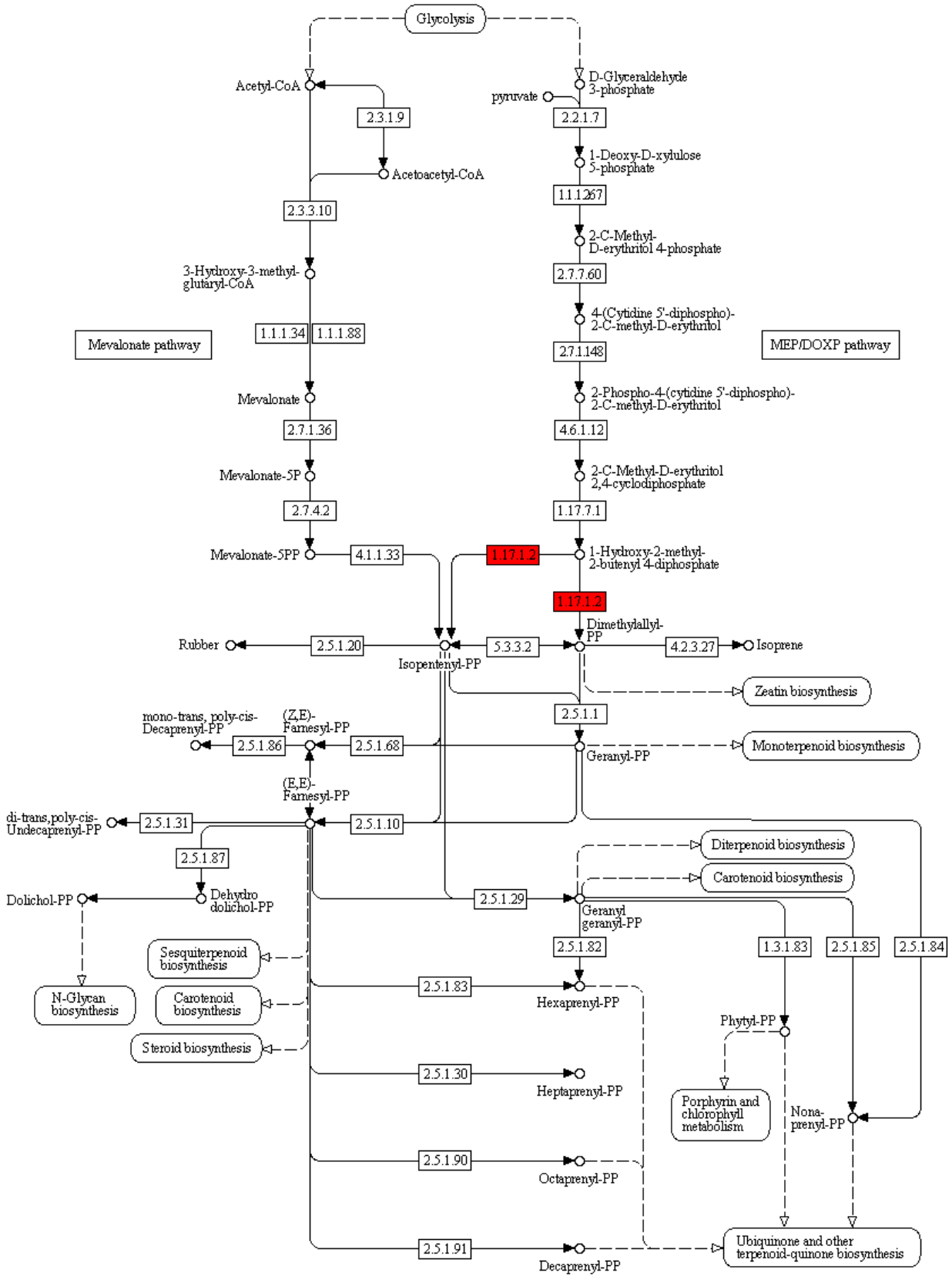
00720 10/17/11

THIAMINE METABOLISM



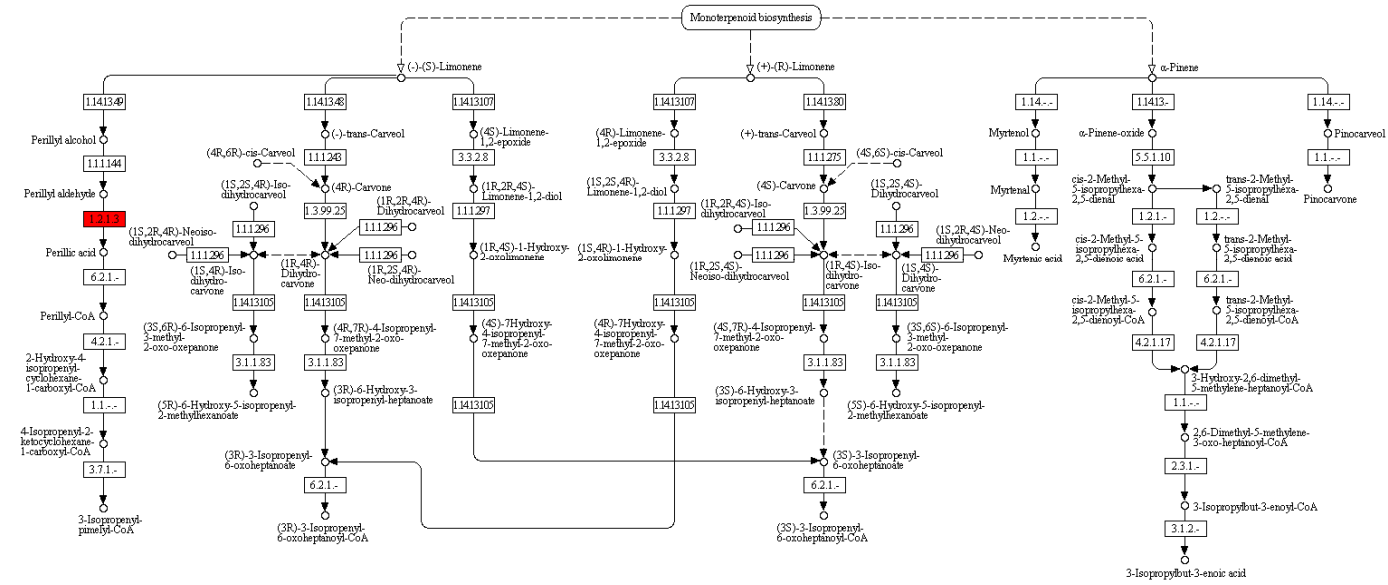
00730 10/13/11

TERPENOID BACKBONE BIOSYNTHESIS

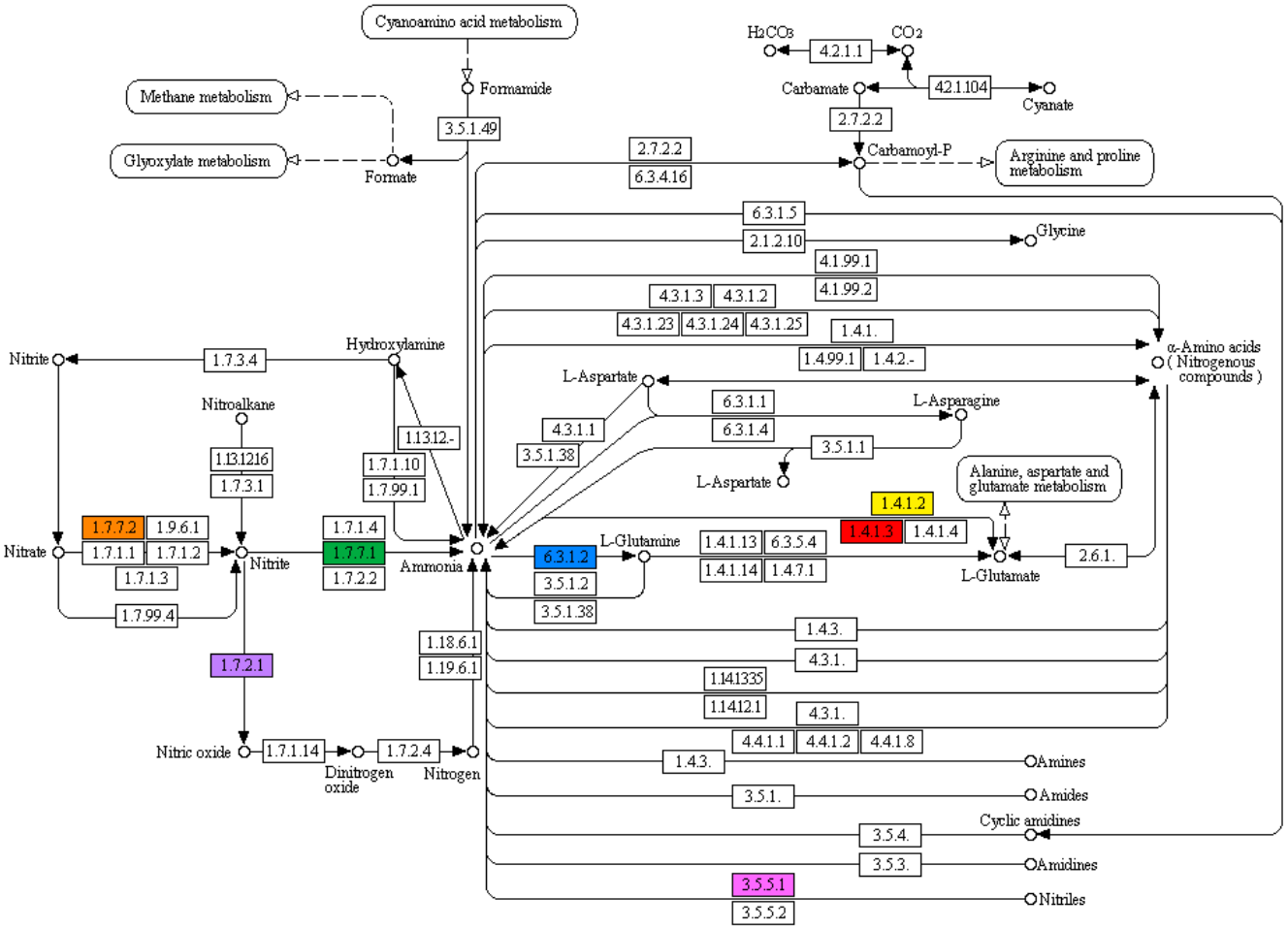


00900 5/11/11

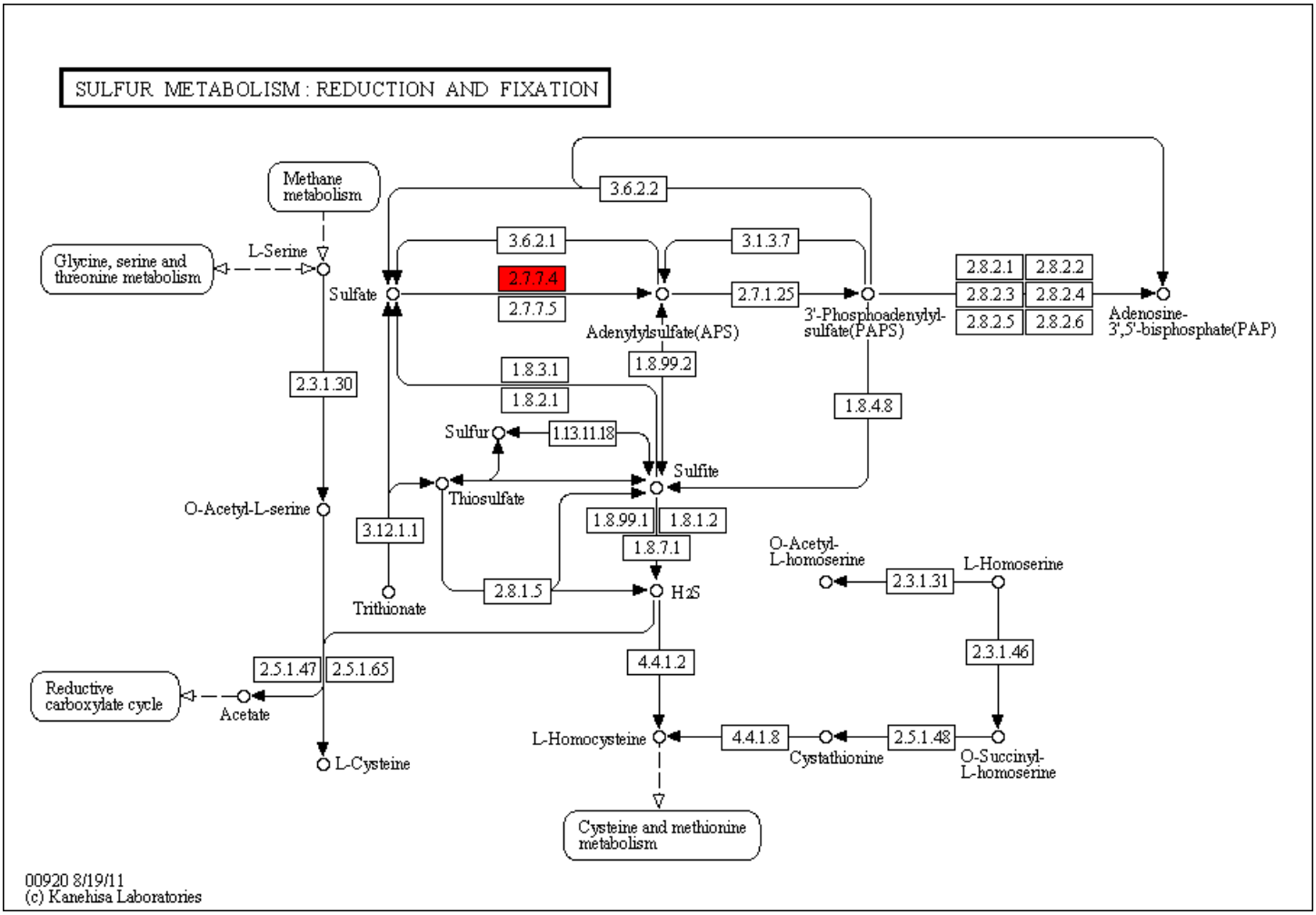
LIMONENE AND PINENE DEGRADATION



NITROGEN METABOLISM : REDUCTION AND FIXATION



00910 9/28/11


SULFUR METABOLISM : REDUCTION AND FIXATION
Methane metabolism
Glycine, serine and threonine metabolism
L-Serine
Sulfate
3.6.2.2
3.6.2.1
3.1.3.7
2.7.7.4
2.7.7.5
2.7.1.25
2.8.2.1
2.8.2.2
2.8.2.3
2.8.2.4
2.8.2.5
2.8.2.6
Adenylylsulfate(APS)
3'-Phosphoadenylyl-sulfate(PAPS)
Adenosine-3',5'-bisphosphate(PAP)
2.3.1.30
1.8.3.1
1.8.2.1
1.8.99.2
1.8.4.8
Sulfur
1.13.11.18
Sulfite
O-Acetyl-L-serine
Thiosulfate
3.12.1.1
1.8.99.1
1.8.1.2
1.8.7.1
O-Acetyl-L-homoserine
2.3.1.31
L-Homoserine
Trithionate
2.8.1.5
H2S
2.3.1.46
4.4.1.2
2.5.1.47
2.5.1.65
Reductive carboxylate cycle
Acetate
L-Homocysteine
4.4.1.8
Cystathionine
2.5.1.48
O-Succinyl-L-homoserine
L-Cysteine
Cysteine and methionine metabolism
00920 8/19/11
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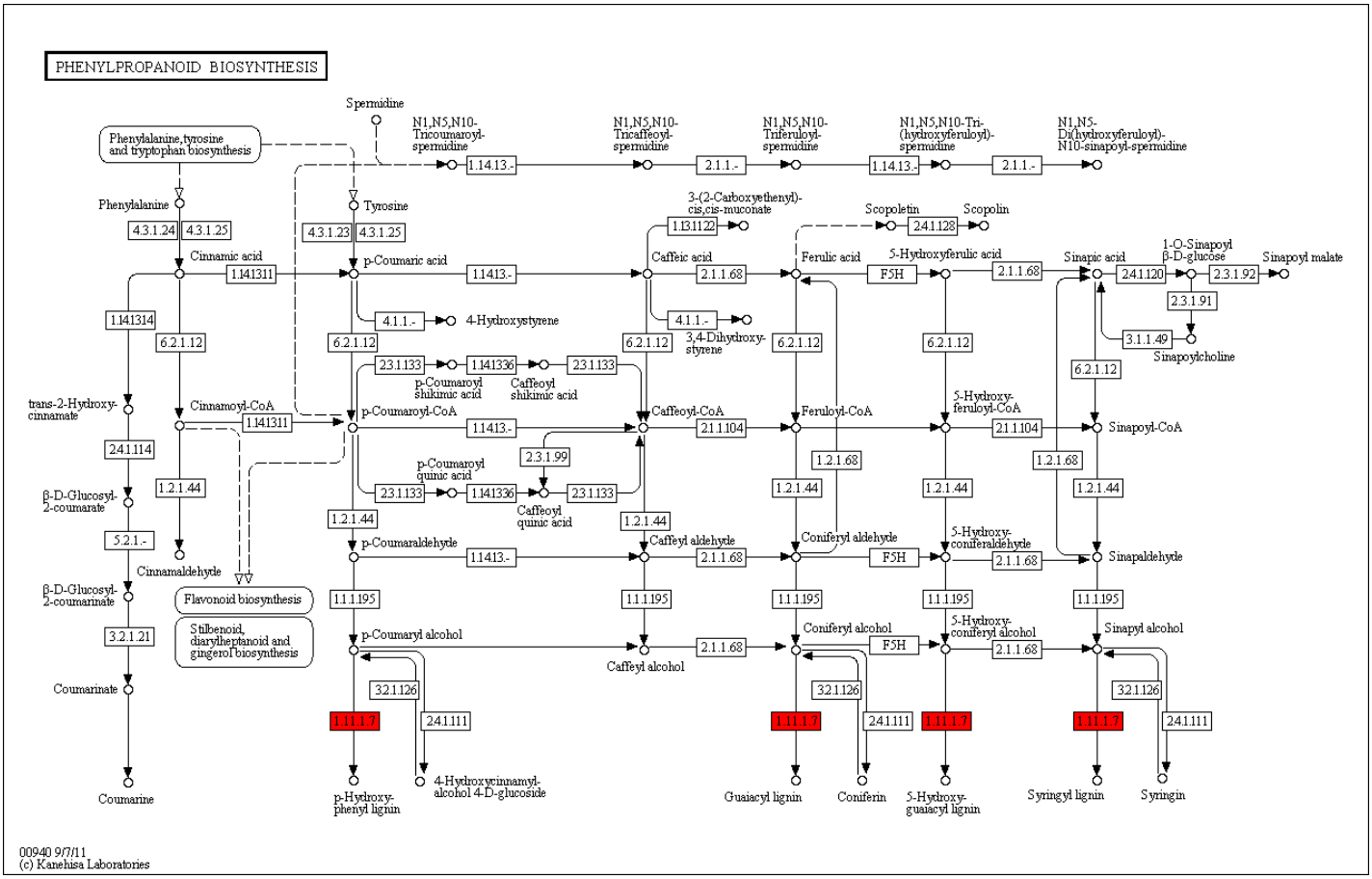

00940 9/7/11
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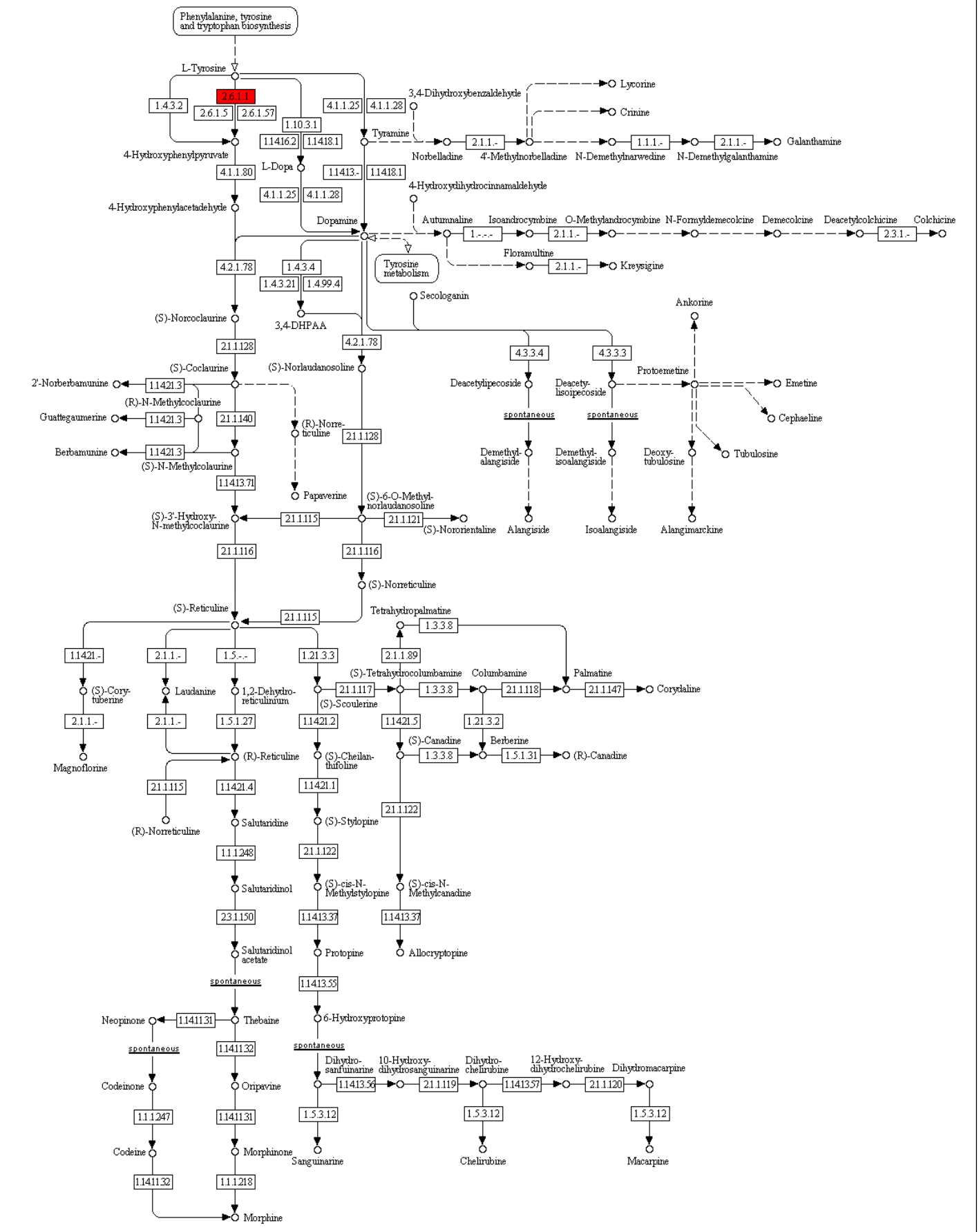
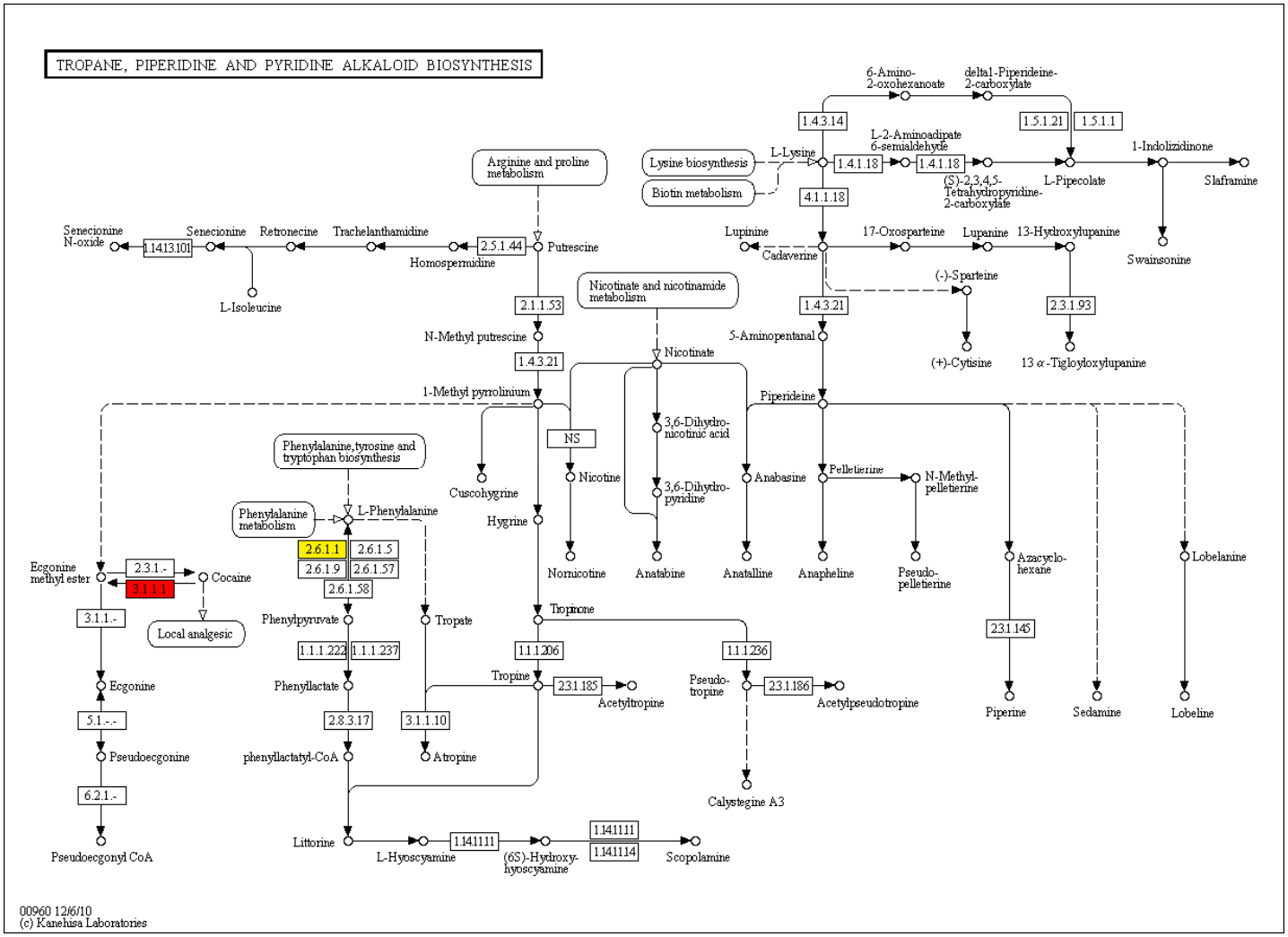
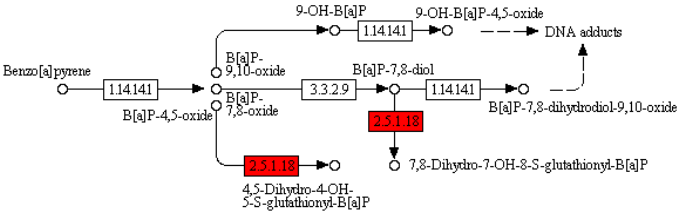
ISOQUINOLINE ALKALOID BIOSYNTHESIS

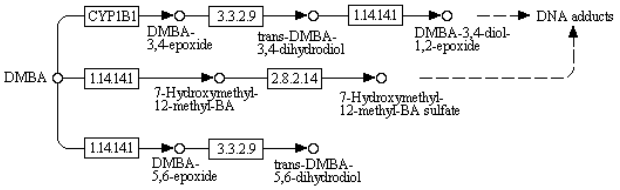


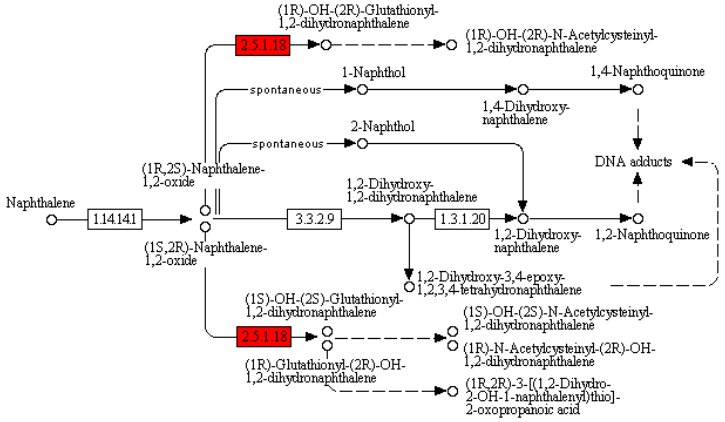


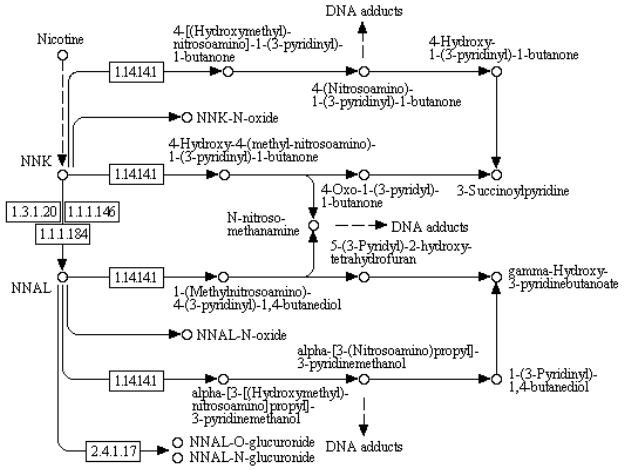
00960 12/6/10

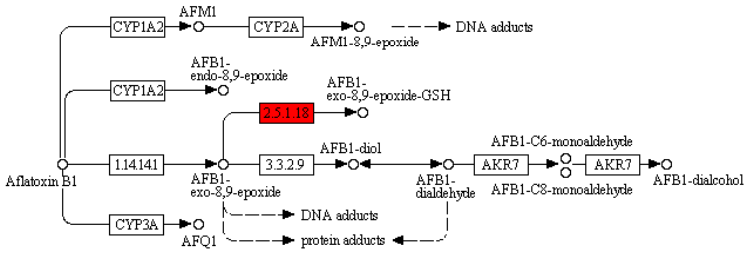
METABOLISM OF XENOBIOTICS BY CYTOCHROME P450

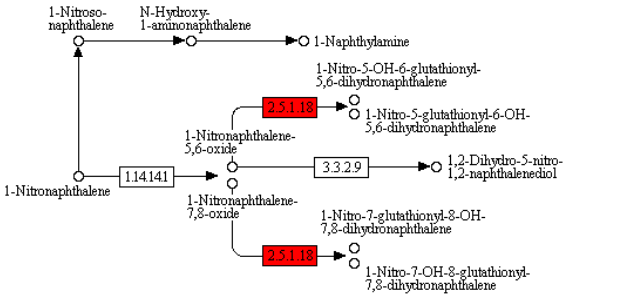


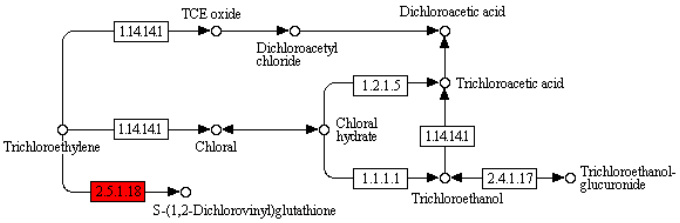


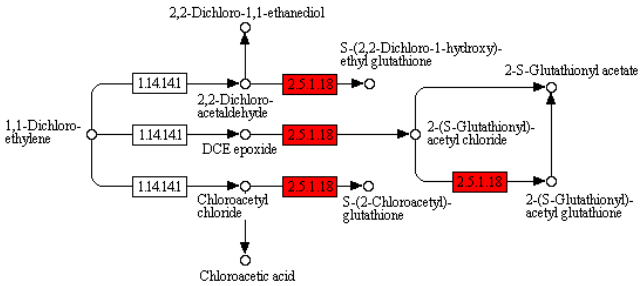


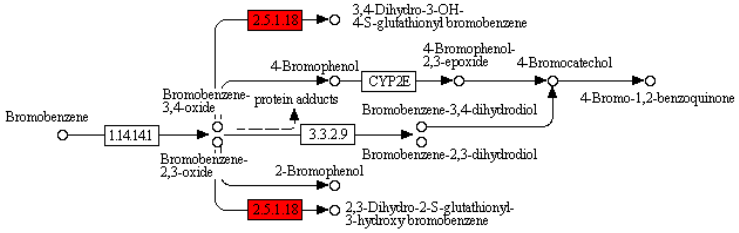


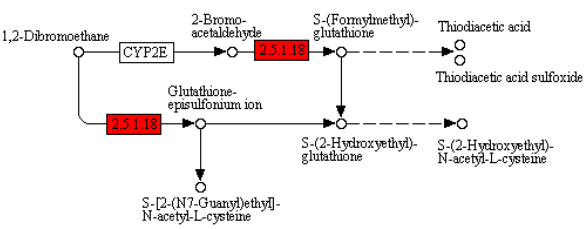




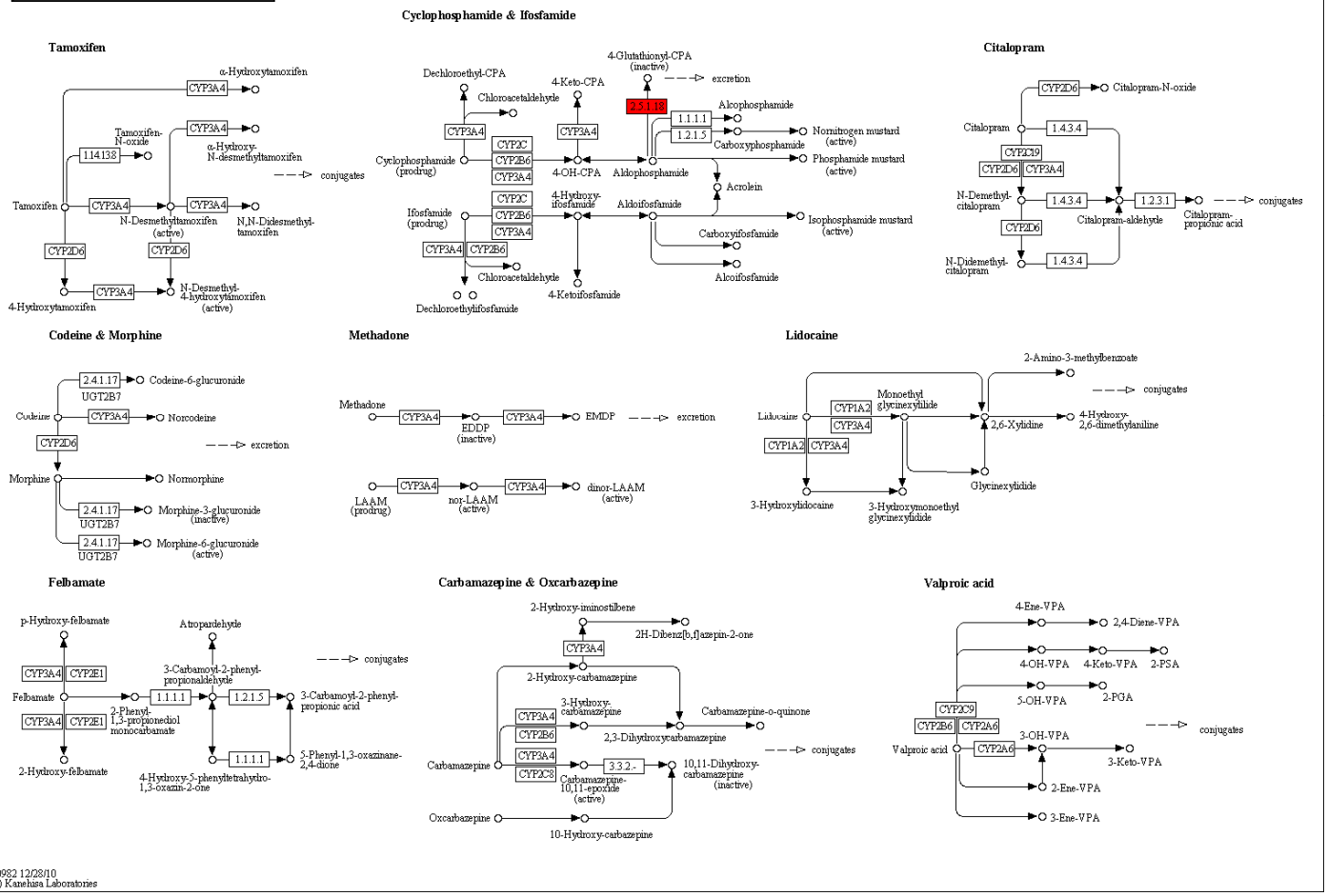






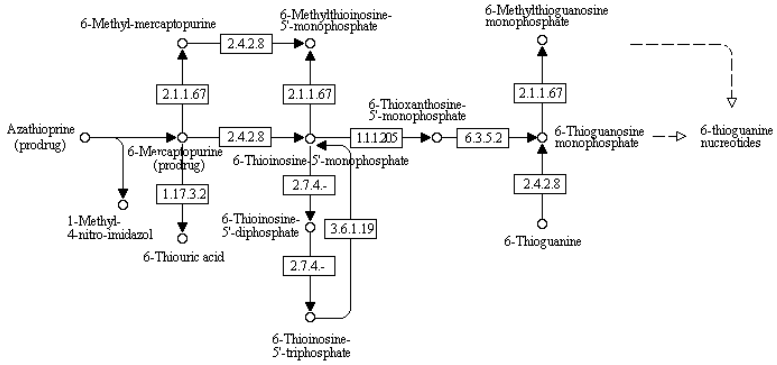


DRUG METABOLISM - CYTOCHROME P450

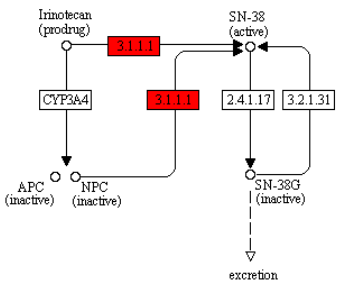


DRUG METABOLISM - OTHER ENZYMES

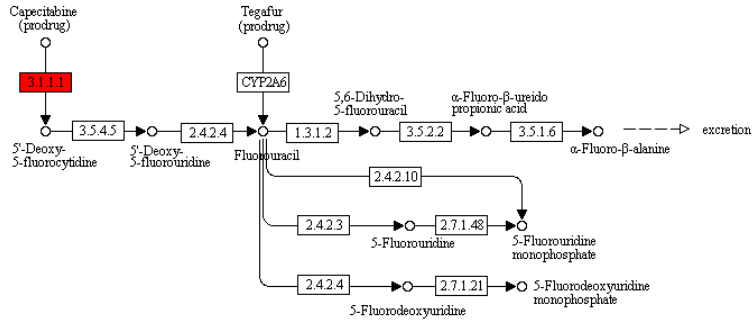
Azathioprine & 6-Mercaptopurine



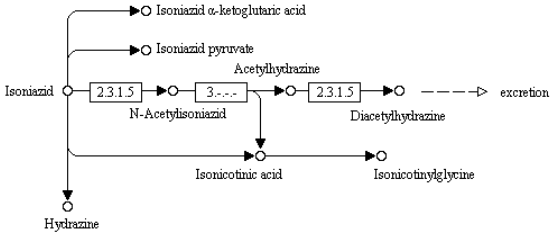
Irinotecan

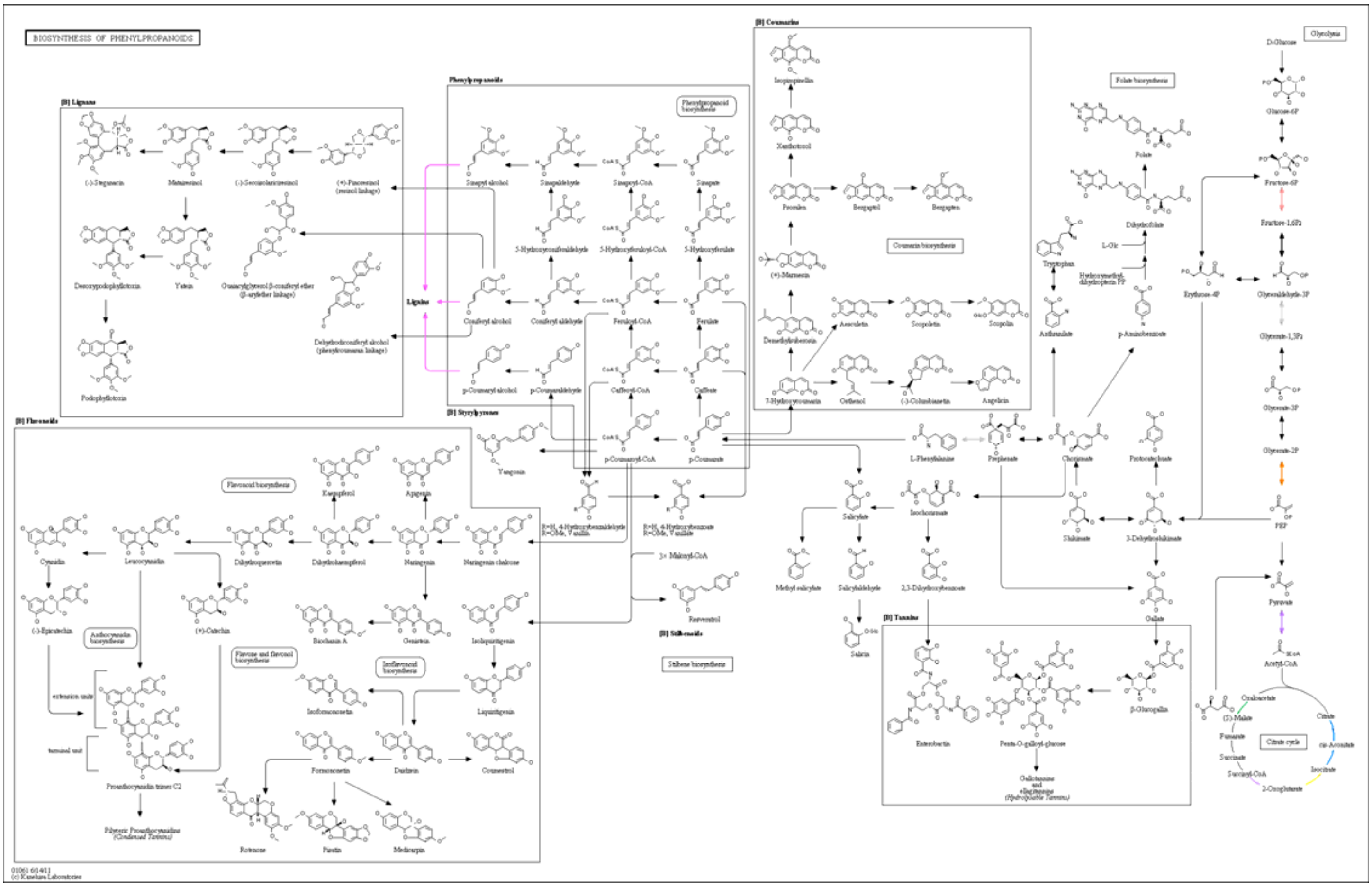


Fluorouracil



Isoniazid




BIOSYNTHESIS OF PHENYLPROPANOIDS
[B] Lignans
Phenylpropanoids
Phenylpropanoid biosynthesis
[B] Coumarins
Coumarin biosynthesis
[B] Flavonoids
Flavonoid biosynthesis
Anthocyanin biosynthesis
Flavone and flavonol biosynthesis
Isoflavonoid biosynthesis
[B] Styrylpyrones
[B] Stilbenoids
Stilbene biosynthesis
[B] Tannins
Folate biosynthesis
Glycolysis
Citrate cycle
(-)-Steganacin
Matairesinol
(-)-Secoisolariciresinol
(+)-Pinoresinol (resinol linkage)
Deoxypodophyllotoxin
Yatein
Guaiacylglycerol β-coniferyl ether (β-arylether linkage)
Dehydrodiconiferyl alcohol (phenylcoumaran linkage)
Podophyllotoxin
Lignins
Sinapyl alcohol
Sinapaldehyde
Sinapoyl-CoA
Sinapate
5-Hydroxyconiferaldehyde
5-Hydroxyferuloyl-CoA
5-Hydroxyferulate
Coniferyl alcohol
Coniferyl aldehyde
Feruloyl-CoA
Ferulate
p-Coumaryl alcohol
p-Coumaraldehyde
Caffeoyl-CoA
Caffeate
p-Coumaroyl-CoA
p-Coumarate
Yangonin
R=H, 4-Hydroxybenzaldehyde
R=OMe, Vanillin
R=H, 4-Hydroxybenzoate
R=OMe, Vanillate
3× Malonyl-CoA
Resveratrol
Isopimpinellin
Xanthotoxol
Psoralen
Bergaptol
Bergapten
(+)-Marmesin
Demethylsuberosin
Aesculetin
Scopoletin
Scopolin
7-Hydroxycoumarin
Osthenol
(+)-Columbianetin
Angelicin
Kaempferol
Apigenin
Cyanidin
Leucocyanidin
Dihydroquercetin
Dihydrokaempferol
Naringenin
Naringenin chalcone
(-)-Epicatechin
(+)-Catechin
Biochanin A
Genistein
Isoliquiritigenin
Liquiritigenin
extension unit
terminal unit
Isoformononetin
Formononetin
Daidzein
Coumestrol
Proanthocyanidin trimer C2
Polymeric Proanthocyanidins
(Condensed Tannins)
Rotenone
Pisatin
Medicarpin
L-Phenylalanine
Prephenate
Chorismate
Protocatechuate
Salicylate
Isochorismate
Methyl salicylate
Salicylaldehyde
2,3-Dihydroxybenzoate
Salicin
Shikimate
3-Dehydroshikimate
Gallate
Enterobactin
Penta-O-galloyl-glucose
β-Glucogallin
Gallotannins and ellagitannins
(Hydrolyzable Tannins)
Tryptophan
Anthranilate
p-Aminobenzoate
Folate
Dihydrofolate
L-Glu
Hydroxymethyl-dihydropterin PP
Erythrose-4P
D-Glucose
Glucose-6P
Fructose-6P
Fructose-1,6P2
Glyceraldehyde-3P
Glycerate-1,3P2
Glycerate-3P
Glycerate-2P
PEP
Pyruvate
Acetyl-CoA
Oxaloacetate
(S)-Malate
Fumarate
Succinate
Succinyl-CoA
2-Oxoglutarate
Isocitrate
cis-Aconitate
Citrate
01061 6/14/11
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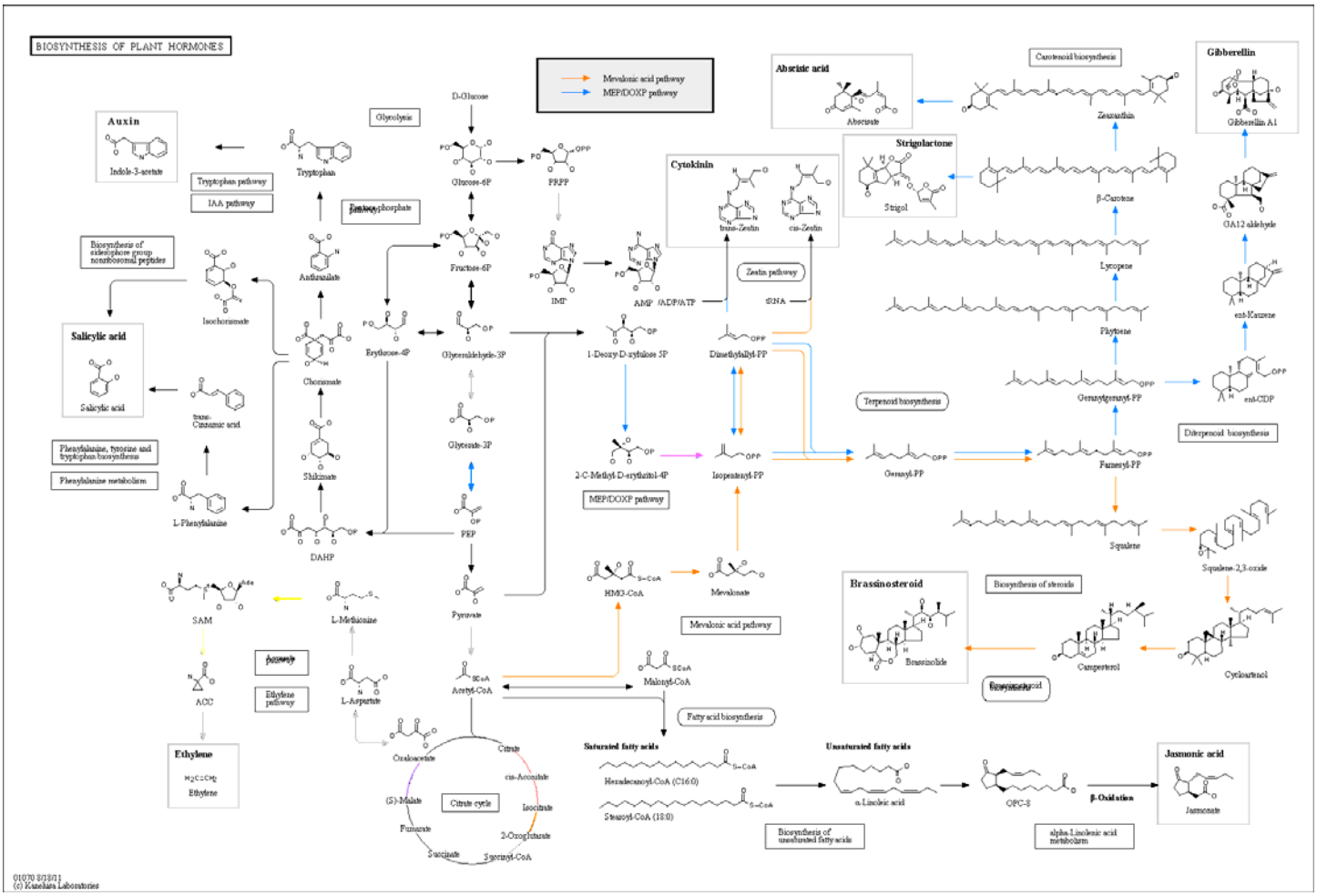
BIOSYNTHESIS OF PLANT HORMONES
Mevalonic acid pathway
MEP/DOXP pathway
Auxin
Indole-3-acetate
Tryptophan pathway
IAA pathway
Tryptophan
Glycolysis
D-Glucose
Glucose-6P
Fructose-6P
Erythrose-4P
Glyceraldehyde-3P
Glycerate-3P
PEP
Pyruvate
DAHP
Shikimate
Chorismate
Anthranilate
Isochorismate
Salicylic acid
Salicylic acid
trans-Cinnamic acid
L-Phenylalanine
Phenylalanine, tyrosine and tryptophan biosynthesis
Phenylalanine metabolism
Biosynthesis of siderophore group nonribosomal peptides
SAM
L-Methionine
ACC
Ethylene
Ethylene
Ethylene pathway
L-Aspartate
Acetyl-CoA
Malonyl-CoA
Citrate
cis-Aconitate
Isocitrate
2-Oxoglutarate
Succinyl-CoA
Succinate
Fumarate
(S)-Malate
Oxaloacetate
Citrate cycle
FPP
IMP
AMP /ADP/ATP
tRNA
Zeatin pathway
Cytokinin
trans-Zeatin
cis-Zeatin
1-Deoxy-D-xylulose 5P
2-C-Methyl-D-erythritol-4P
MEP/DOXP pathway
HMG-CoA
Mevalonate
Mevalonic acid pathway
Dimethylallyl-PP
Isopentenyl-PP
Geranyl-PP
Farnesyl-PP
Geranylgeranyl-PP
Terpenoid biosynthesis
Fatty acid biosynthesis
Saturated fatty acids
Hexadecanoyl-CoA (C16:0)
Stearoyl-CoA (18:0)
Unsaturated fatty acids
α-Linolenic acid
Biosynthesis of unsaturated fatty acids
OPC-8
β-Oxidation
alpha-Linolenic acid metabolism
Jasmonic acid
Jasmonate
Abscisic acid
Abscisate
Carotenoid biosynthesis
Zeaxanthin
β-Carotene
Lycopene
Phytoene
Strigolactone
Strigol
Gibberellin
Gibberellin A1
GA12 aldehyde
ent-Kaurene
ent-CDP
Diterpenoid biosynthesis
Squalene
Squalene-2,3-oxide
Cycloartenol
Campesterol
Biosynthesis of steroids
Brassinosteroid
Brassinolide
01070 8/18/11
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