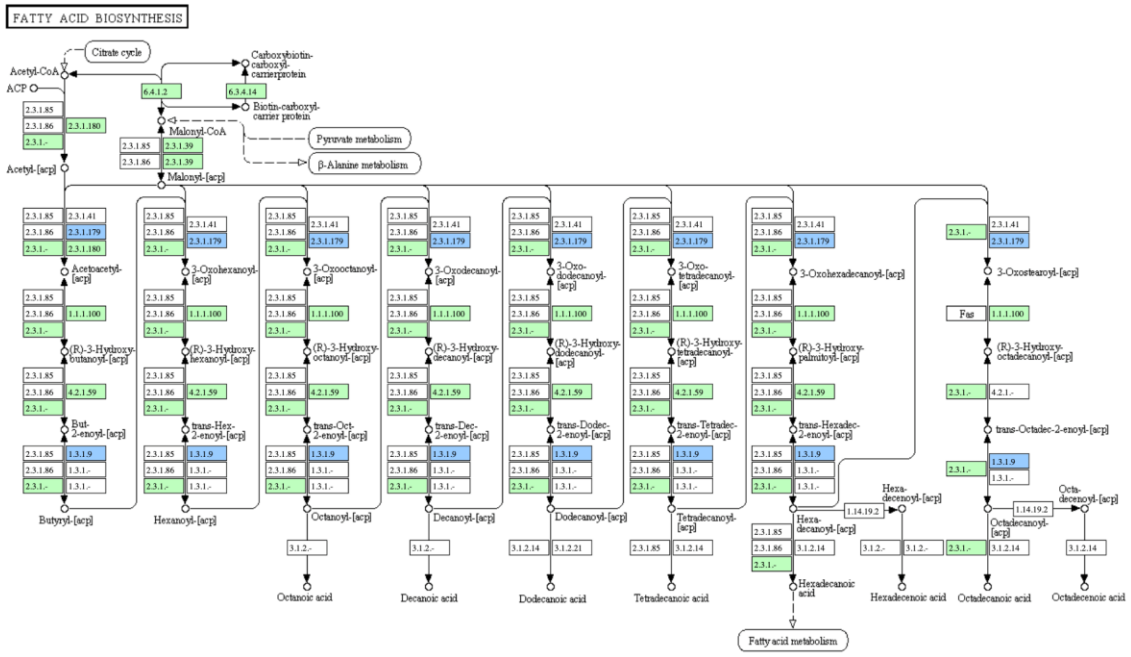
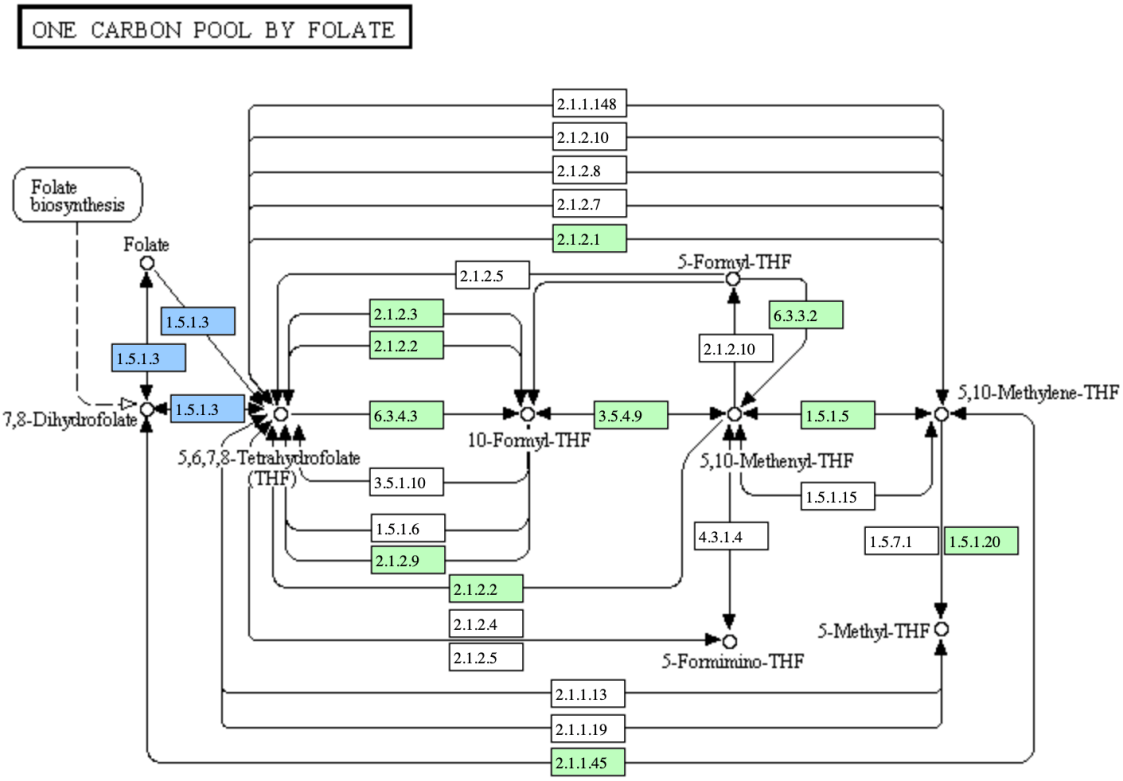
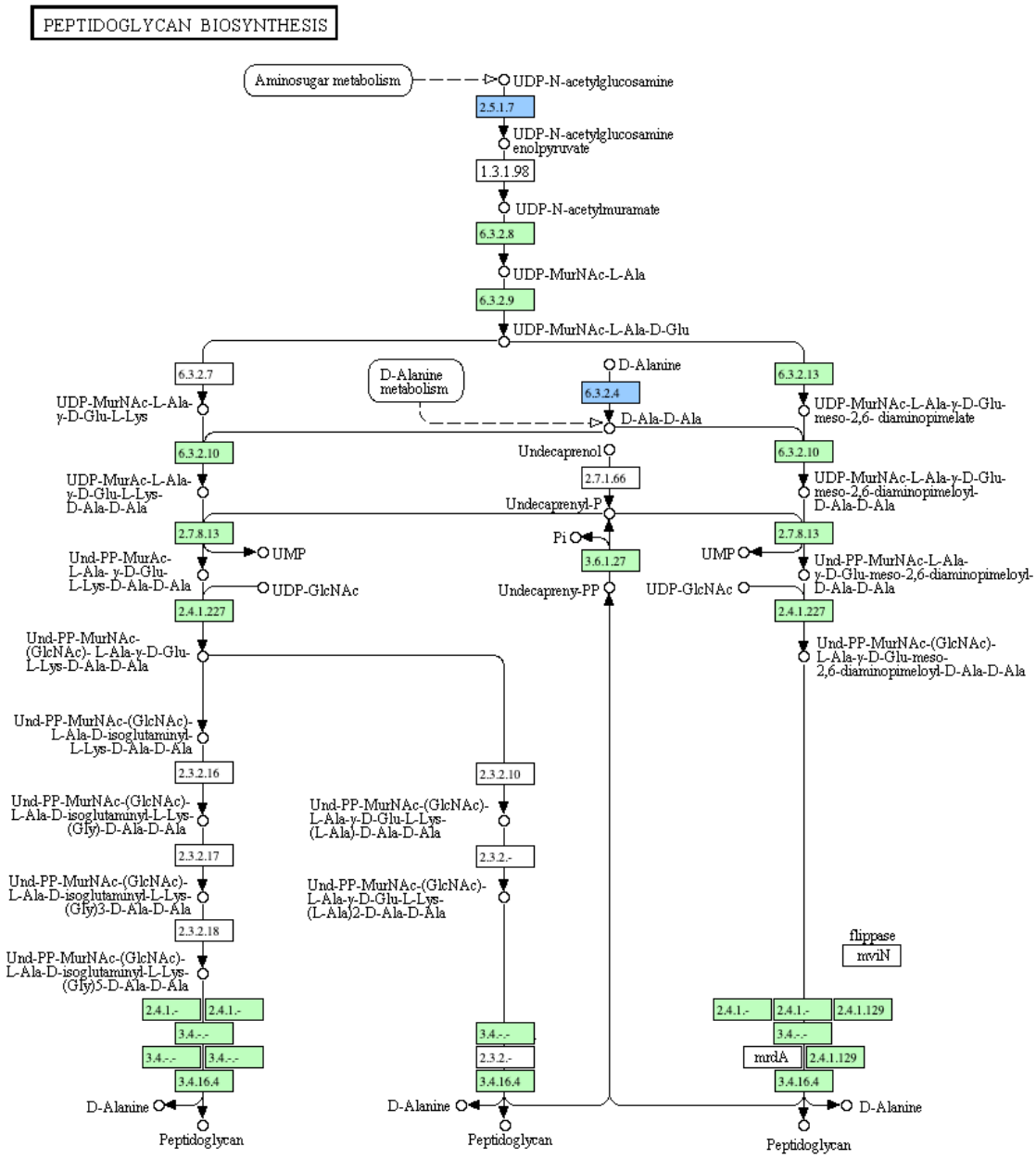
A.


FATTY ACID BIOSYNTHESIS
Citrate cycle
Acetyl-CoA
ACP
Carboxybiotin-carboxyl-carrierprotein
Biotin-carboxyl-carrier protein
Malonyl-CoA
Pyruvate metabolism
β-Alanine metabolism
Acetyl-[acp]
Malonyl-[acp]
Butyryl-[acp]
Hexanoyl-[acp]
Octanoyl-[acp]
Decanoyl-[acp]
Dodecanoyl-[acp]
Tetradecanoyl-[acp]
Hexadecanoyl-[acp]
Octadecanoyl-[acp]
Octanoic acid
Decanoic acid
Dodecanoic acid
Tetradecanoic acid
Hexadecanoic acid
Hexadecenoic acid
Octadecanoic acid
Octadecenoic acid
Fatty acid metabolism

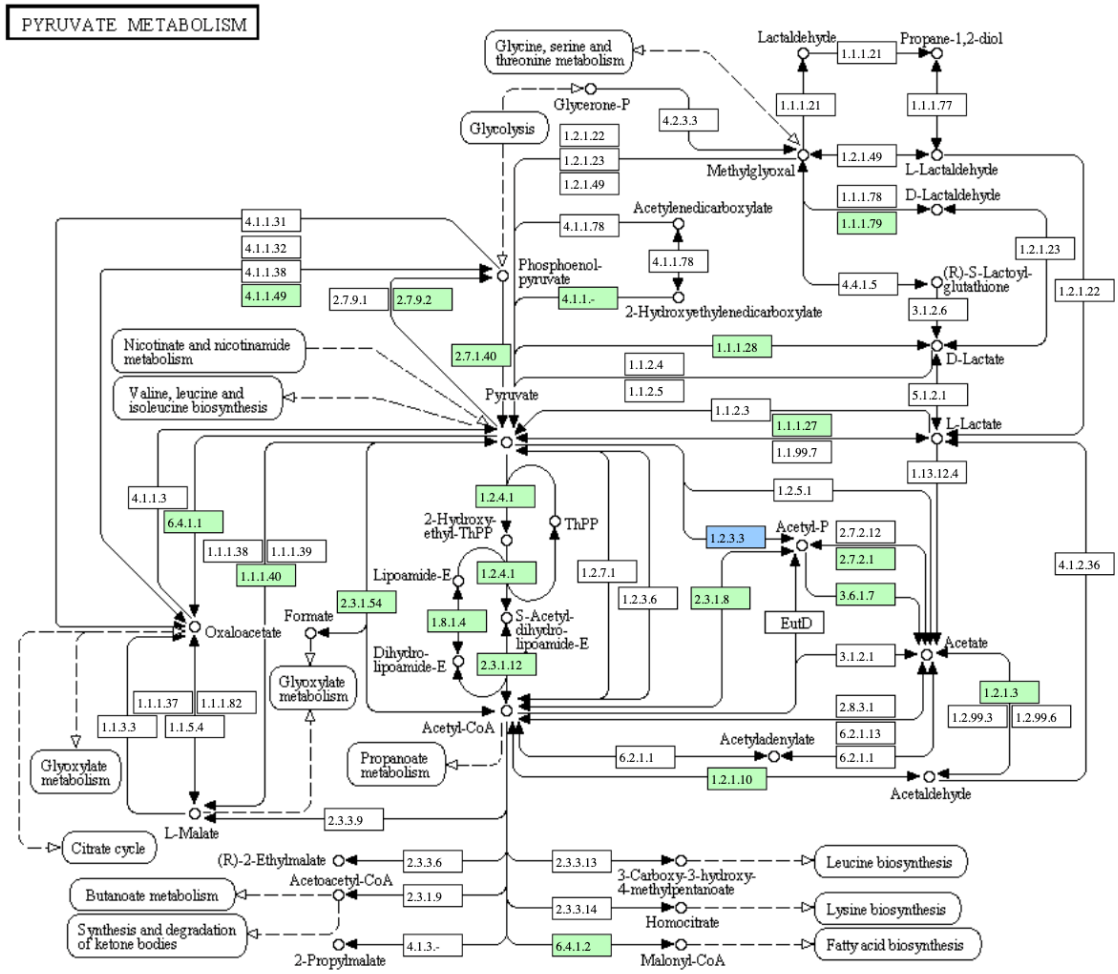
B.


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
1.5.1.5
6.3.3.2
2.1.2.10
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

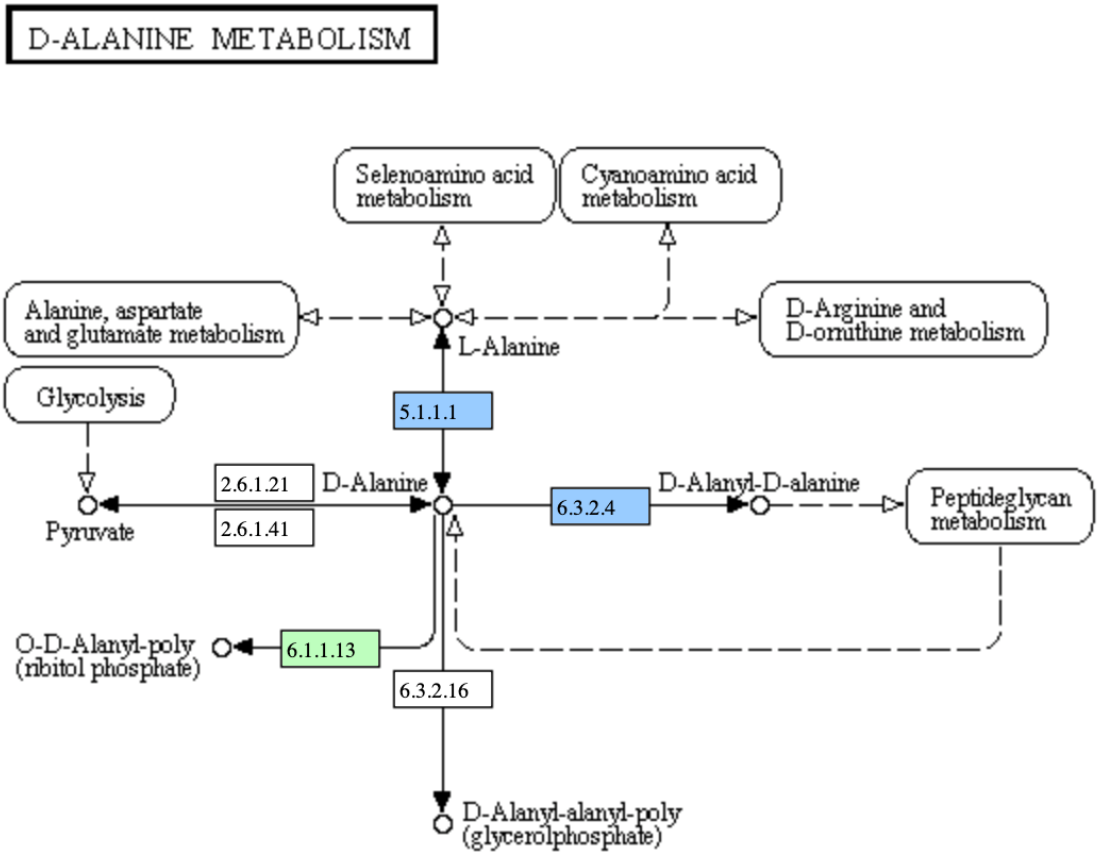
C.


PEPTIDOGLYCAN BIOSYNTHESIS
Aminosugar metabolism
UDP-N-acetylglucosamine
2.5.1.7
UDP-N-acetylglucosamine enolpyruvate
1.3.1.98
UDP-N-acetylmuramate
6.3.2.8
UDP-MurNAc-L-Ala
6.3.2.9
UDP-MurNAc-L-Ala-D-Glu
6.3.2.7
UDP-MurNAc-L-Ala-γ-D-Glu-L-Lys
D-Alanine metabolism
D-Alanine
6.3.2.4
D-Ala-D-Ala
6.3.2.13
UDP-MurNAc-L-Ala-γ-D-Glu-meso-2,6- diaminopimelate
6.3.2.10
UDP-MurAc-L-Ala-γ-D-Glu-L-Lys-D-Ala-D-Ala
Undecaprenol
2.7.1.66
Undecaprenyl-P
6.3.2.10
UDP-MurNAc-L-Ala-γ-D-Glu-meso-2,6-diaminopimeloyl-D-Ala-D-Ala
2.7.8.13
UMP
Und-PP-MurAc-L-Ala-γ-D-Glu-L-Lys-D-Ala-D-Ala
UDP-GlcNAc
2.4.1.227
Pi
3.6.1.27
Undecapreny-PP
2.7.8.13
UMP
Und-PP-MurNAc-L-Ala-γ-D-Glu-meso-2,6-diaminopimeloyl-D-Ala-D-Ala
UDP-GlcNAc
2.4.1.227
Und-PP-MurNAc-(GlcNAc)-L-Ala-γ-D-Glu-L-Lys-D-Ala-D-Ala
Und-PP-MurNAc-(GlcNAc)-L-Ala-γ-D-Glu-meso-2,6-diaminopimeloyl-D-Ala-D-Ala
Und-PP-MurNAc-(GlcNAc)-L-Ala-D-isoglutaminyl-L-Lys-D-Ala-D-Ala
2.3.2.16
Und-PP-MurNAc-(GlcNAc)-L-Ala-D-isoglutaminyl-L-Lys-(Gly)-D-Ala-D-Ala
2.3.2.17
Und-PP-MurNAc-(GlcNAc)-L-Ala-D-isoglutaminyl-L-Lys-(Gly)3-D-Ala-D-Ala
2.3.2.18
Und-PP-MurNAc-(GlcNAc)-L-Ala-D-isoglutaminyl-L-Lys-(Gly)5-D-Ala-D-Ala
2.4.1.-
2.4.1.-
3.4.-.-
3.4.-.-
3.4.-.-
3.4.16.4
D-Alanine
Peptidoglycan
2.3.2.10
Und-PP-MurNAc-(GlcNAc)-L-Ala-γ-D-Glu-L-Lys-(L-Ala)-D-Ala-D-Ala
2.3.2.-
Und-PP-MurNAc-(GlcNAc)-L-Ala-γ-D-Glu-L-Lys-(L-Ala)2-D-Ala-D-Ala
3.4.-.-
2.3.2.-
3.4.16.4
D-Alanine
Peptidoglycan
flippase
mviN
2.4.1.-
2.4.1.-
2.4.1.129
3.4.-.-
mrdA
2.4.1.129
3.4.16.4
D-Alanine
Peptidoglycan

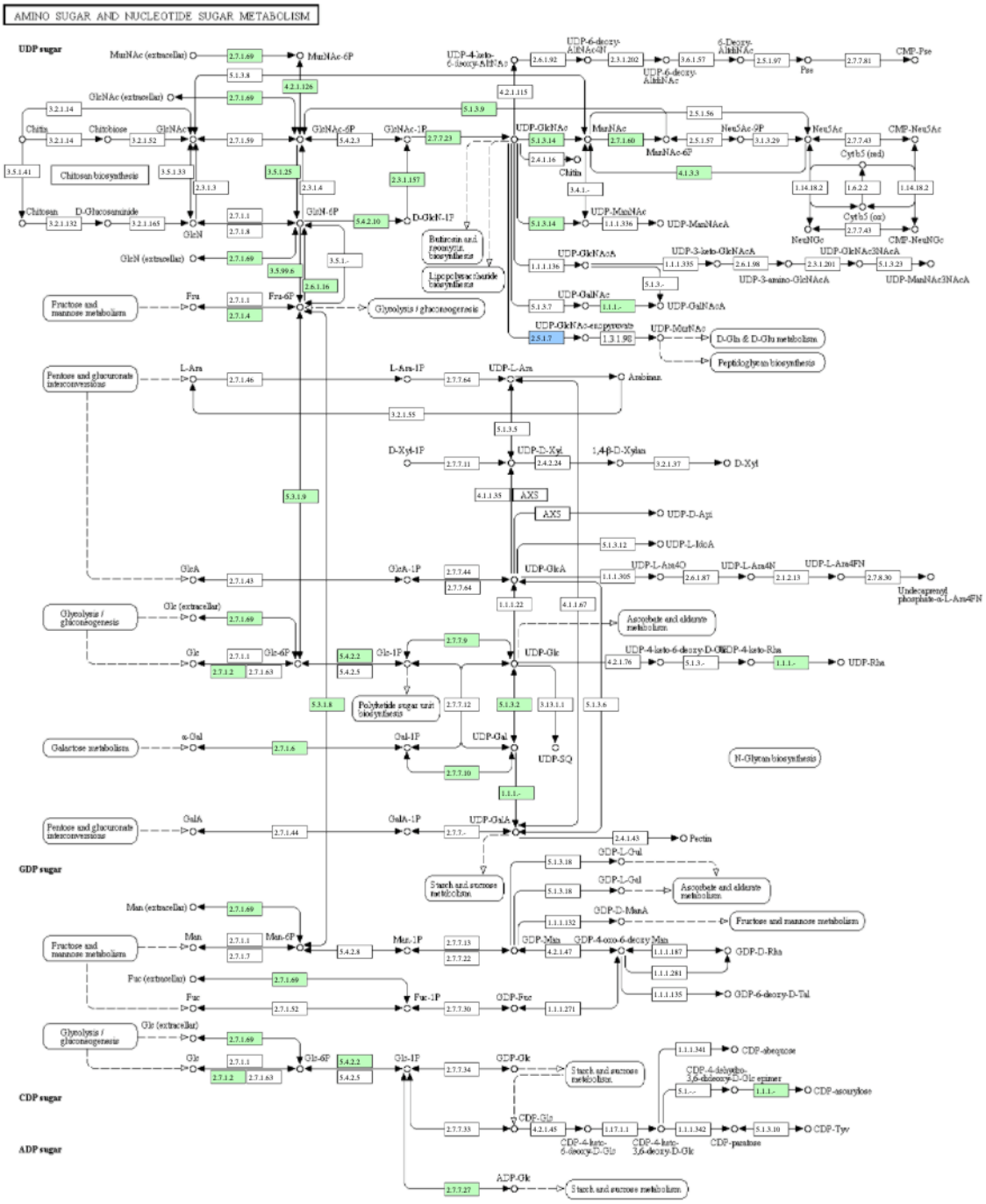
D.


PYRUVATE METABOLISM
Glycine, serine and threonine metabolism
Glycerone-P
Glycolysis
Lactaldehyde
Propane-1,2-diol
Methylglyoxal
L-Lactaldehyde
D-Lactaldehyde
Acetylenedicarboxylate
2-Hydroxyethylenedicarboxylate
Phosphoenol-pyruvate
(R)-S-Lactoyl-glutathione
Nicotinate and nicotinamide metabolism
Valine, leucine and isoleucine biosynthesis
Pyruvate
D-Lactate
L-Lactate
2-Hydroxy-ethyl-ThPP
ThPP
Acetyl-P
Lipoamide-E
S-Acetyl-dihydro-lipoamide-E
Dihydro-lipoamide-E
Formate
Oxaloacetate
EutD
Acetate
Glyoxylate metabolism
Acetyl-CoA
Propanoate metabolism
Acetyladenylate
Acetaldehyde
L-Malate
Citrate cycle
(R)-2-Ethylmalate
Acetoacetyl-CoA
Butanoate metabolism
Synthesis and degradation of ketone bodies
2-Propylmalate
3-Carboxy-3-hydroxy-4-methylpentanoate
Homocitrate
Malonyl-CoA
Leucine biosynthesis
Lysine biosynthesis
Fatty acid biosynthesis

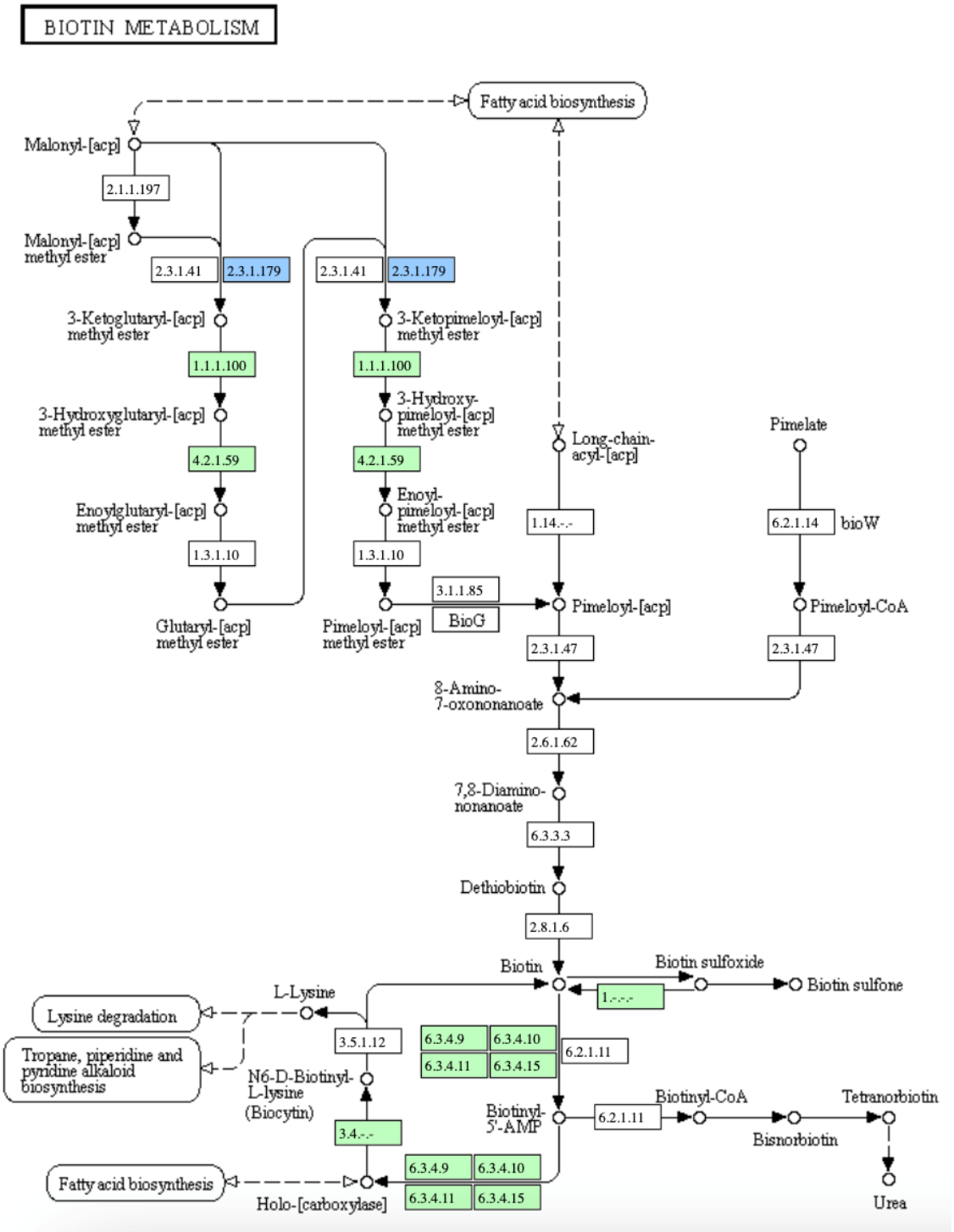
E.


D-ALANINE METABOLISM
Selenoamino acid metabolism
Cyanoamino acid metabolism
Alanine, aspartate and glutamate metabolism
L-Alanine
D-Arginine and D-ornithine metabolism
Glycolysis
5.1.1.1
2.6.1.21
D-Alanine
D-Alanyl-D-alanine
Peptideglycan metabolism
Pyruvate
2.6.1.41
6.3.2.4
O-D-Alanyl-poly (ribitol phosphate)
6.1.1.13
6.3.2.16
D-Alanyl-alanyl-poly (glycerolphosphate)

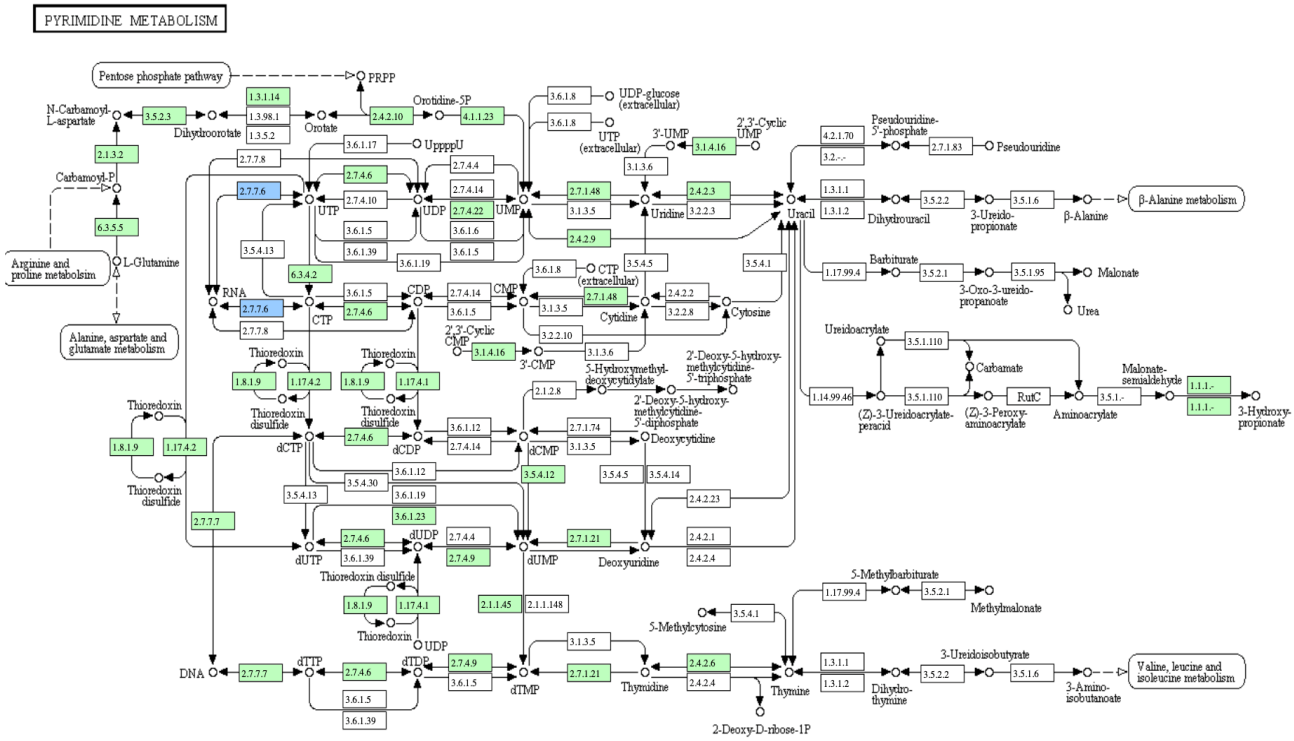
F.


AMINO SUGAR AND NUCLEOTIDE SUGAR METABOLISM
UDP sugar
GDP sugar
CDP sugar
ADP sugar
Fructose and mannose metabolism
Glycolysis / gluconeogenesis
Galactose metabolism
Pentose and glucuronate interconversions
Chitin
Chitobiose
Chitosan
D-Glucosaminide
Chitosan biosynthesis
Butirosin and neomycin biosynthesis
Lipopolysaccharide biosynthesis
Peptidoglycan biosynthesis
D-Glu & D-Glu metabolism
Arabinan
AXS
Polyketide sugar unit biosynthesis
Ascorbate and aldarate metabolism
Starch and sucrose metabolism
N-Glycan biosynthesis
Pectin
Undecaprenyl phosphate-α-L-Ara4FN
UDP-sq
UDP-Rha
GDP-D-Rha
GDP-6-deoxy-D-Tal
CDP-abequose
CDP-ascarylose
CDP-tyvelose
CDP-paratose

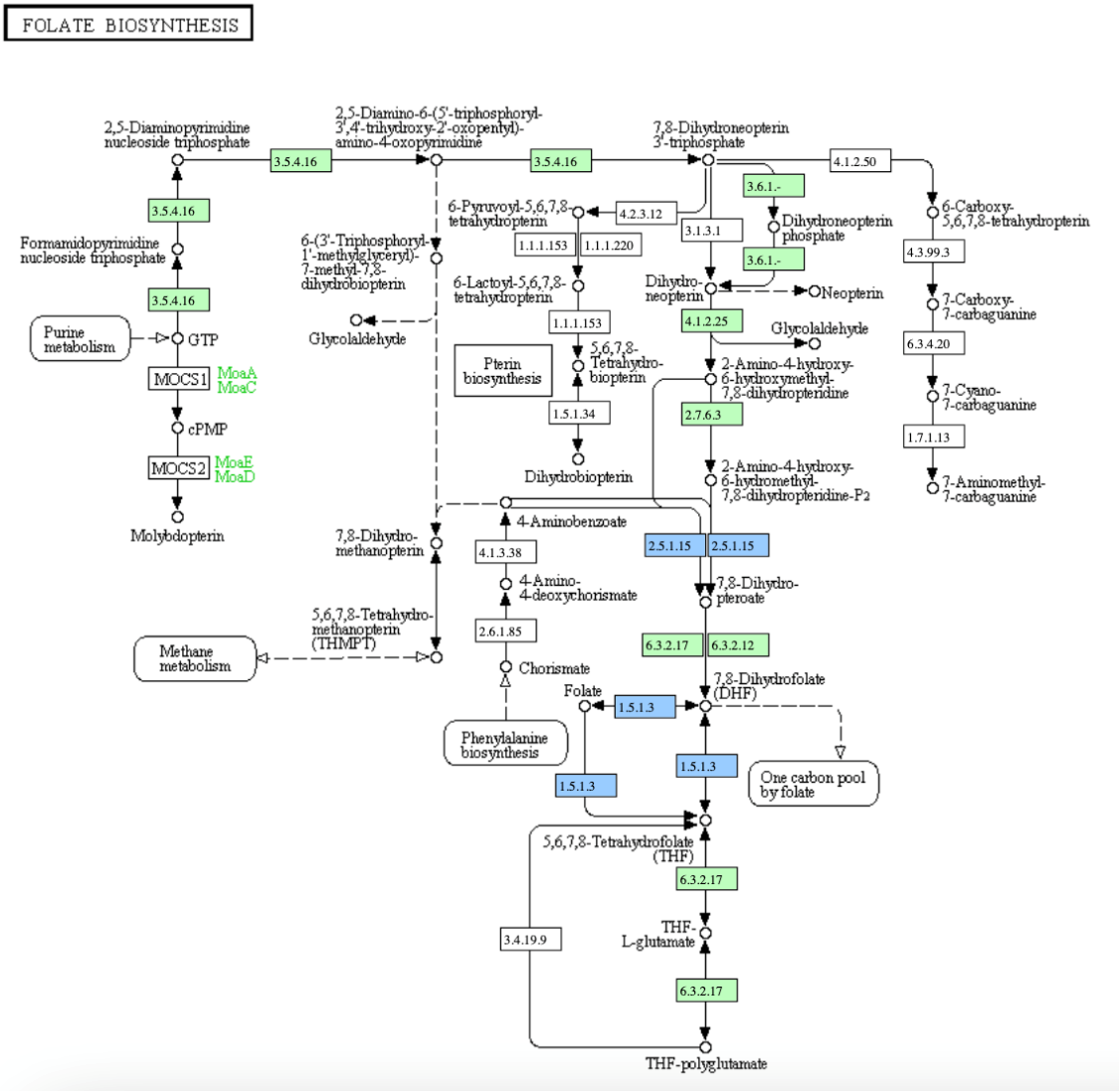
G.


BIOTIN METABOLISM
Fatty acid biosynthesis
Malonyl-[acp]
2.1.1.197
Malonyl-[acp] methyl ester
2.3.1.41
2.3.1.179
2.3.1.41
2.3.1.179
3-Ketoglutaryl-[acp] methyl ester
3-Ketopimeloyl-[acp] methyl ester
1.1.1.100
1.1.1.100
3-Hydroxyglutaryl-[acp] methyl ester
3-Hydroxy-pimeloyl-[acp] methyl ester
4.2.1.59
4.2.1.59
Enoylglutaryl-[acp] methyl ester
Enoyl-pimeloyl-[acp] methyl ester
1.3.1.10
1.3.1.10
Glutaryl-[acp] methyl ester
Pimeloyl-[acp] methyl ester
3.1.1.85
BioG
Long-chain-acyl-[acp]
1.14.-.-
Pimeloyl-[acp]
2.3.1.47
Pimelate
6.2.1.14
bioW
Pimeloyl-CoA
2.3.1.47
8-Amino-7-oxononanoate
2.6.1.62
7,8-Diamino-nonanoate
6.3.3.3
Dethiobiotin
2.8.1.6
Biotin
Biotin sulfoxide
1.-.-.-
Biotin sulfone
L-Lysine
Lysine degradation
Tropane, piperidine and pyridine alkaloid biosynthesis
3.5.1.12
6.3.4.9
6.3.4.10
6.3.4.11
6.3.4.15
6.2.1.11
N6-D-Biotinyl-L-lysine (Biocytin)
3.4.-.-
Biotinyl-5'-AMP
6.2.1.11
Biotinyl-CoA
Tetranorbiotin
Bisnorbiotin
Urea
Fatty acid biosynthesis
6.3.4.9
6.3.4.10
6.3.4.11
6.3.4.15
Holo-[carboxylase]

H.


PYRIMIDINE METABOLISM
Pentose phosphate pathway
PRPP
N-Carbamoyl-L-aspartate
Dihydroorotate
Orotate
Orotidine-5P
UDP-glucose (extracellular)
UTP (extracellular)
3'-UMP
2',3'-Cyclic UMP
Pseudouridine-5'-phosphate
Pseudouridine
Carbamoyl-P
Arginine and proline metabolism
L-Glutamine
Alanine, aspartate and glutamate metabolism
UTP
UDP
UMP
Uridine
Uracil
Dihydrouracil
3-Ureido-propionate
β-Alanine
β-Alanine metabolism
Barbiturate
3-Oxo-3-ureido-propanoate
Malonate
Urea
RNA
CTP
CDP
CMP
CTP (extracellular)
Cytidine
Cytosine
2',3'-Cyclic CMP
3'-CMP
5-Hydroxymethyl-deoxycytidylate
2'-Deoxy-5-hydroxy-methylcytidine-5'-triphosphate
2'-Deoxy-5-hydroxy-methylcytidine-5'-diphosphate
Ureidoacrylate
Carbamate
(Z)-3-Ureidoacrylate-peracid
(Z)-3-Peroxy-aminoacrylate
RutC
Aminoacrylate
Malonate-semialdehyde
3-Hydroxy-propionate
Thioredoxin
Thioredoxin disulfide
dCTP
dCDP
dCMP
Deoxycytidine
dUTP
dUDP
dUMP
Deoxyuridine
Thioredoxin disulfide
Thioredoxin
UDP
DNA
dTTP
dTDP
dTMP
Thymidine
Thymine
2-Deoxy-D-ribose-1P
5-Methylbarbiturate
Methylmalonate
5-Methylcytosine
3-Ureidoisobutyrate
Dihydro-thymine
3-Amino-isobutanoate
Valine, leucine and isoleucine metabolism

I.


FOLATE BIOSYNTHESIS
2,5-Diaminopyrimidine nucleoside triphosphate
2,5-Diamino-6-(5'-triphosphoryl-3',4'-trihydroxy-2'-oxopentyl)-amino-4-oxopyrimidine
7,8-Dihydroneopterin 3'-triphosphate
3.5.4.16
3.5.4.16
4.1.2.50
3.6.1.-
Dihydroneopterin phosphate
6-Carboxy-5,6,7,8-tetrahydropterin
4.3.99.3
7-Carboxy-7-carbaguanine
6.3.4.20
7-Cyano-7-carbaguanine
1.7.1.13
7-Aminomethyl-7-carbaguanine
3.5.4.16
Formamidopyrimidine nucleoside triphosphate
3.5.4.16
Purine metabolism
GTP
MOCS1
MoaA
MoaC
cPMP
MOCS2
MoaE
MoaD
Molybdopterin
6-(3'-Triphosphoryl-1'-methylglyceryl)-7-methyl-7,8-dihydrobiopterin
Glycolaldehyde
6-Pyruvoyl-5,6,7,8-tetrahydropterin
4.2.3.12
1.1.1.153
1.1.1.220
3.1.3.1
6-Lactoyl-5,6,7,8-tetrahydropterin
1.1.1.153
Dihydro-neopterin
Neopterin
4.1.2.25
Glycolaldehyde
Pterin biosynthesis
5,6,7,8-Tetrahydro-biopterin
1.5.1.34
Dihydrobiopterin
2-Amino-4-hydroxy-6-hydroxymethyl-7,8-dihydropteridine
2.7.6.3
2-Amino-4-hydroxy-6-hydromethyl-7,8-dihydropteridine-P2
4-Aminobenzoate
2.5.1.15
2.5.1.15
7,8-Dihydro-pteroate
7,8-Dihydro-methanopterin
4.1.3.38
4-Amino-4-deoxychorismate
2.6.1.85
5,6,7,8-Tetrahydro-methanopterin (THMPT)
Methane metabolism
6.3.2.17
6.3.2.12
Chorismate
Folate
1.5.1.3
7,8-Dihydrofolate (DHF)
Phenylalanine biosynthesis
1.5.1.3
1.5.1.3
One carbon pool by folate
5,6,7,8-Tetrahydrofolate (THF)
6.3.2.17
3.4.19.9
THF-L-glutamate
6.3.2.17
THF-polyglutamate

J.

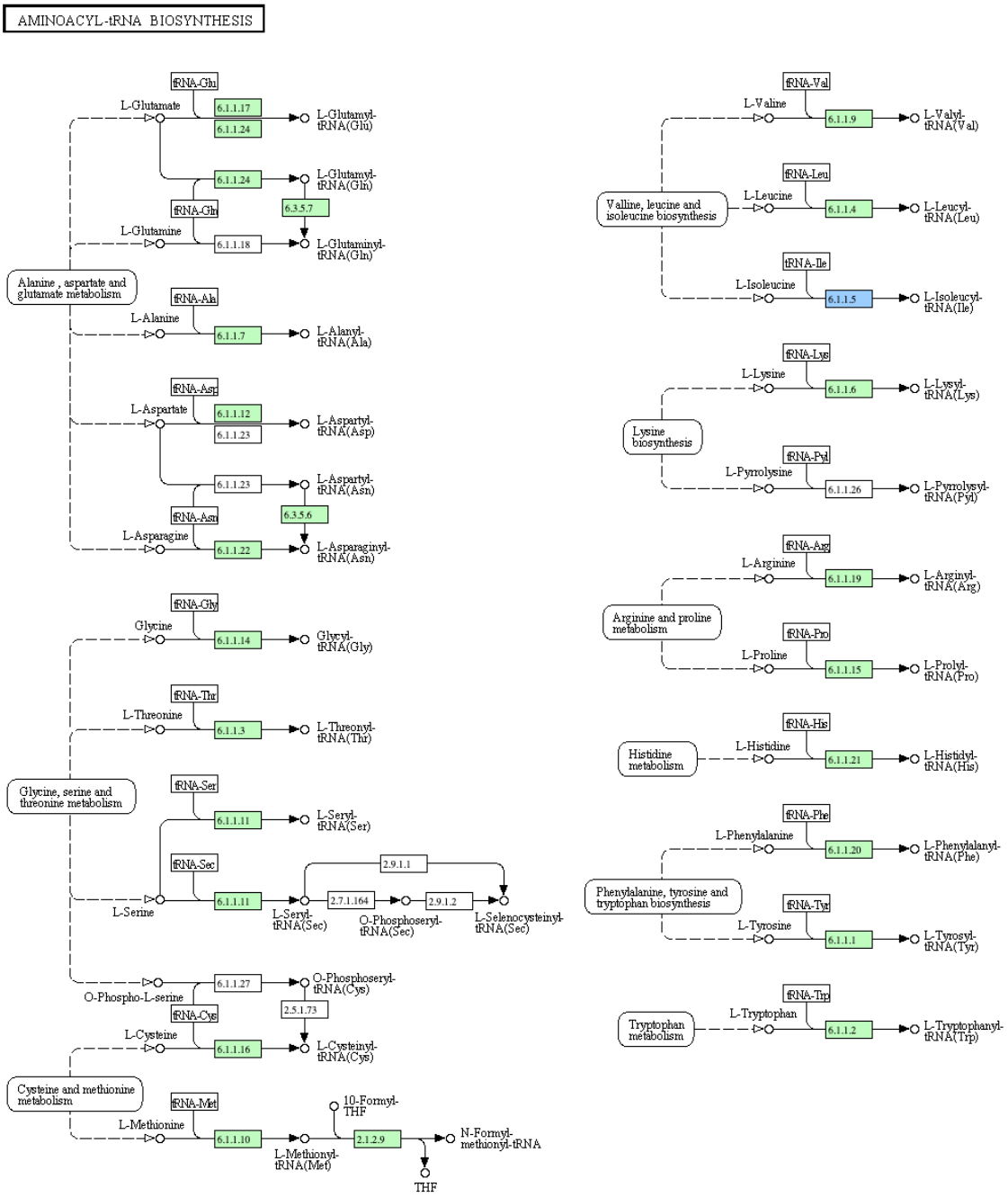


Figure S1: Pathways involved in the immune stress response and intestinal bowl diseases improvement. (A). Fatty acid biosynthesis (B). One carbon pool by Folate (C). Peptidoglycan Biosynthesis (D). Pyruvate metabolism (E). D-alanine metabolism (F). Amino sugar and nucleotide sugar metabolism (G). Biotin metabolism (H). Pyrimidine metabolism (I). Folate biosynthesis (J). Aminoacyl tRNA Biosynthesis.

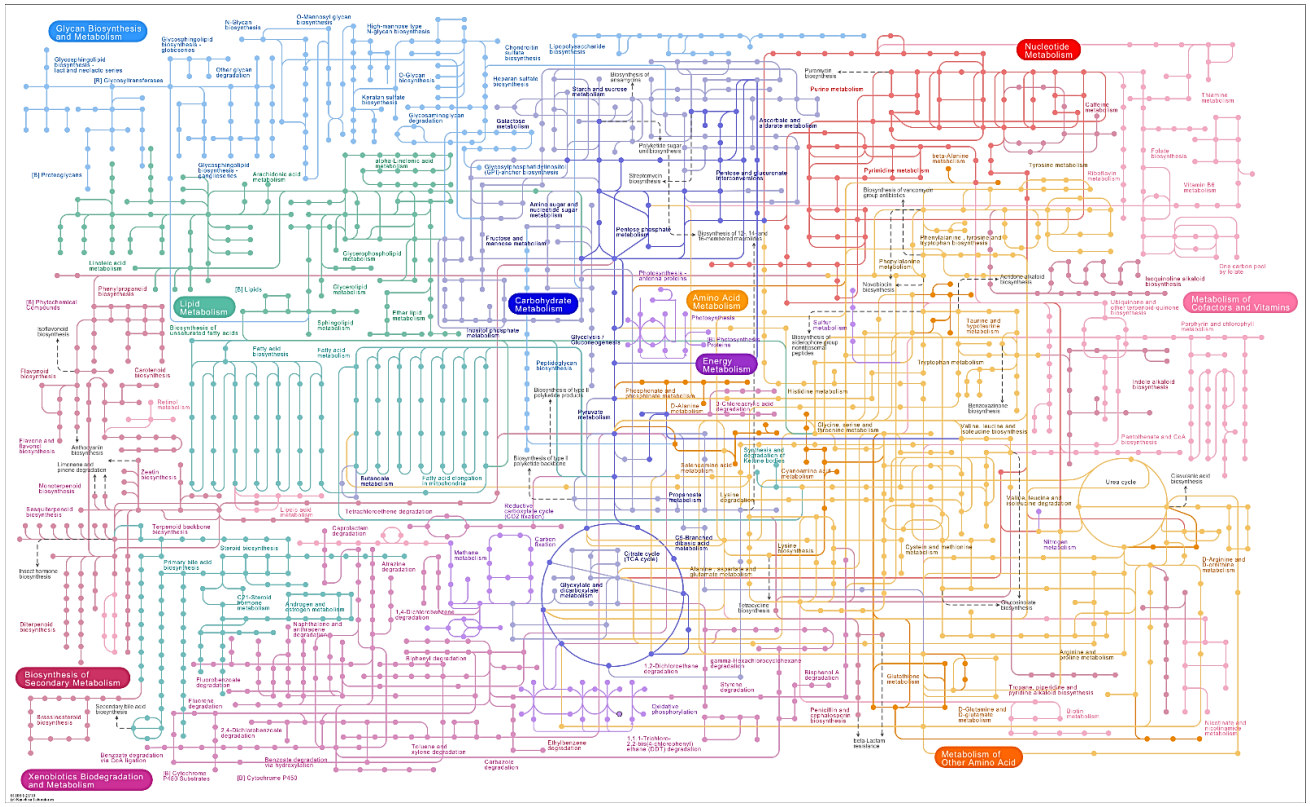


Figure S2: KEGG pathway for the synthesis of secondary metabolites and carbohydrates.

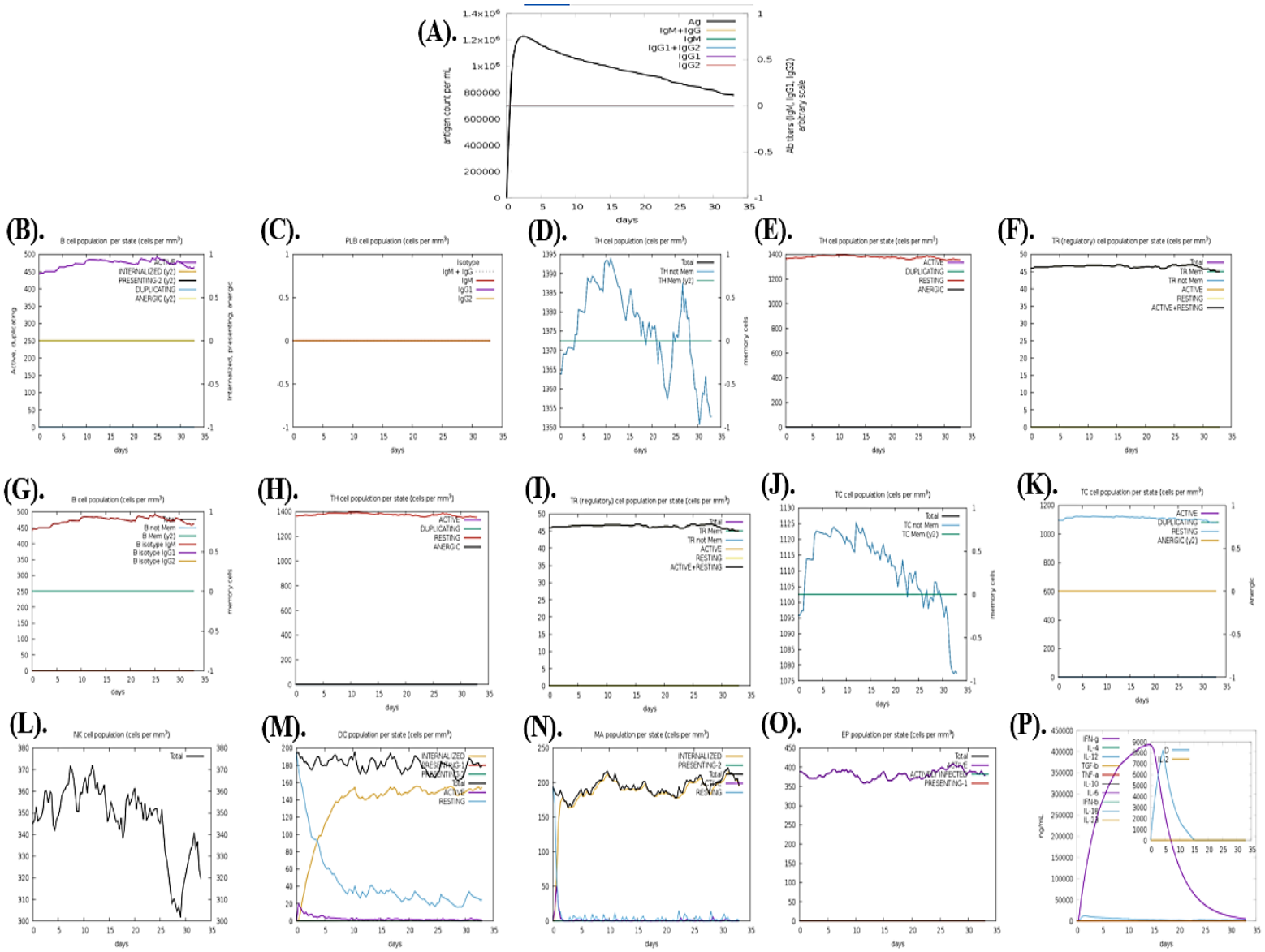


Figure S3. Immunomodulatory response after streptin dosage.

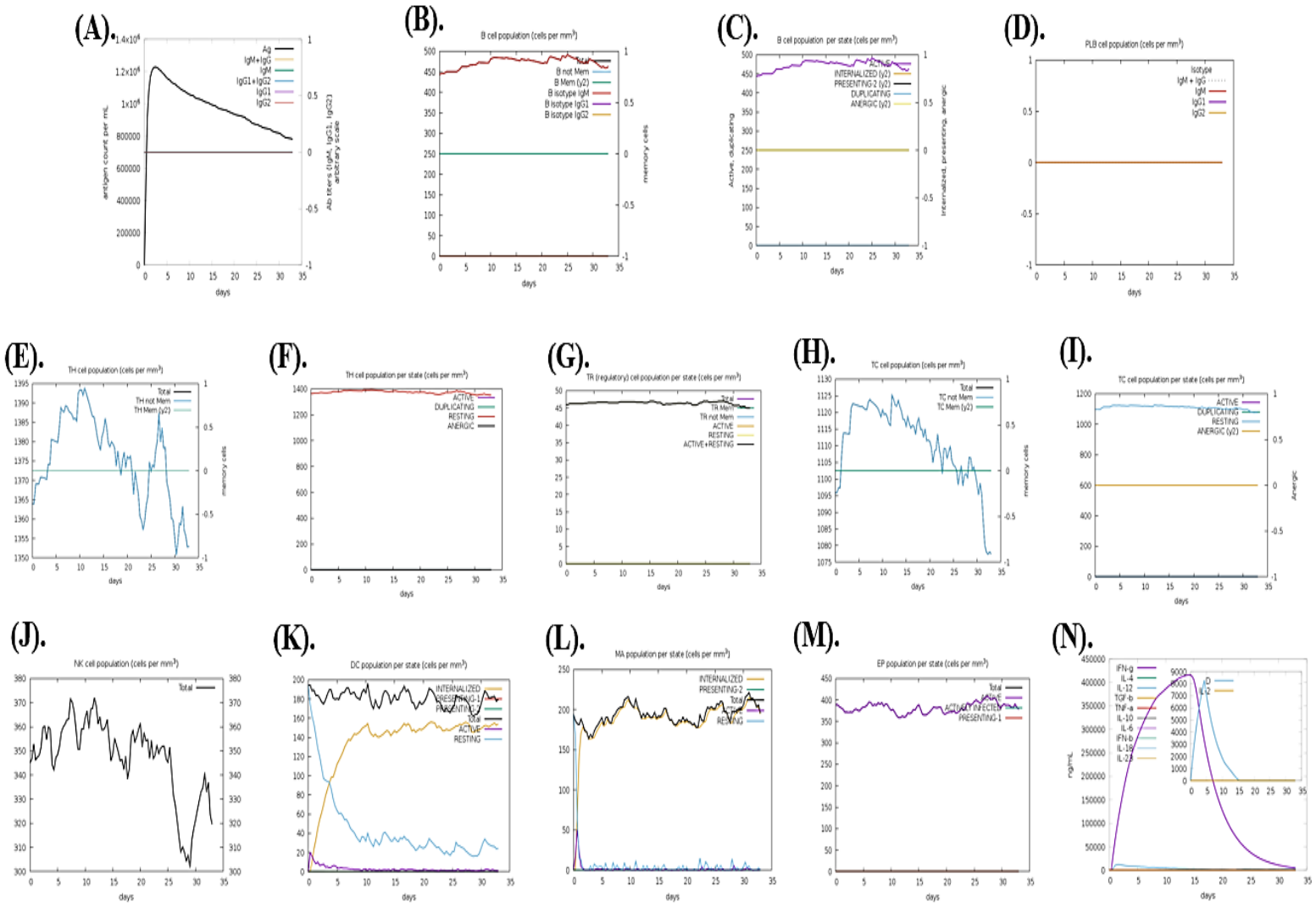


Figure S4. Immunomodulatory response after Ruminococcin-A dosage.