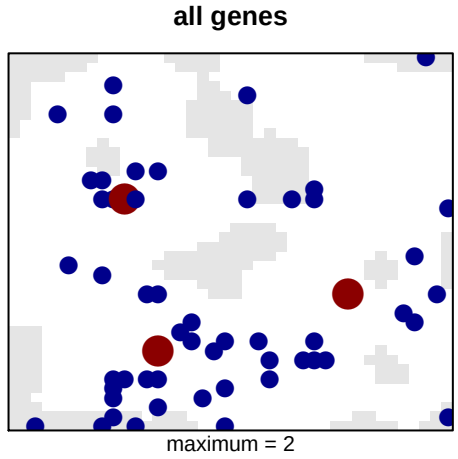
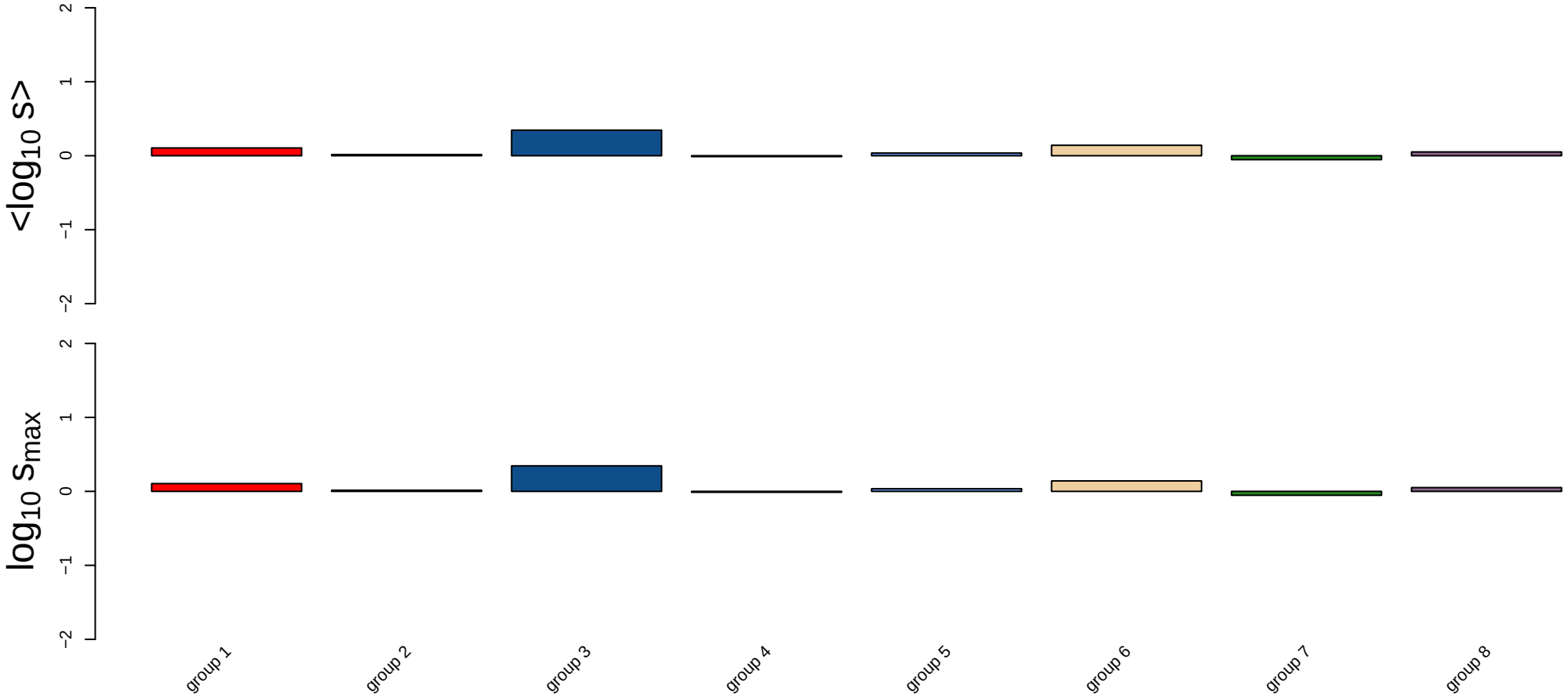
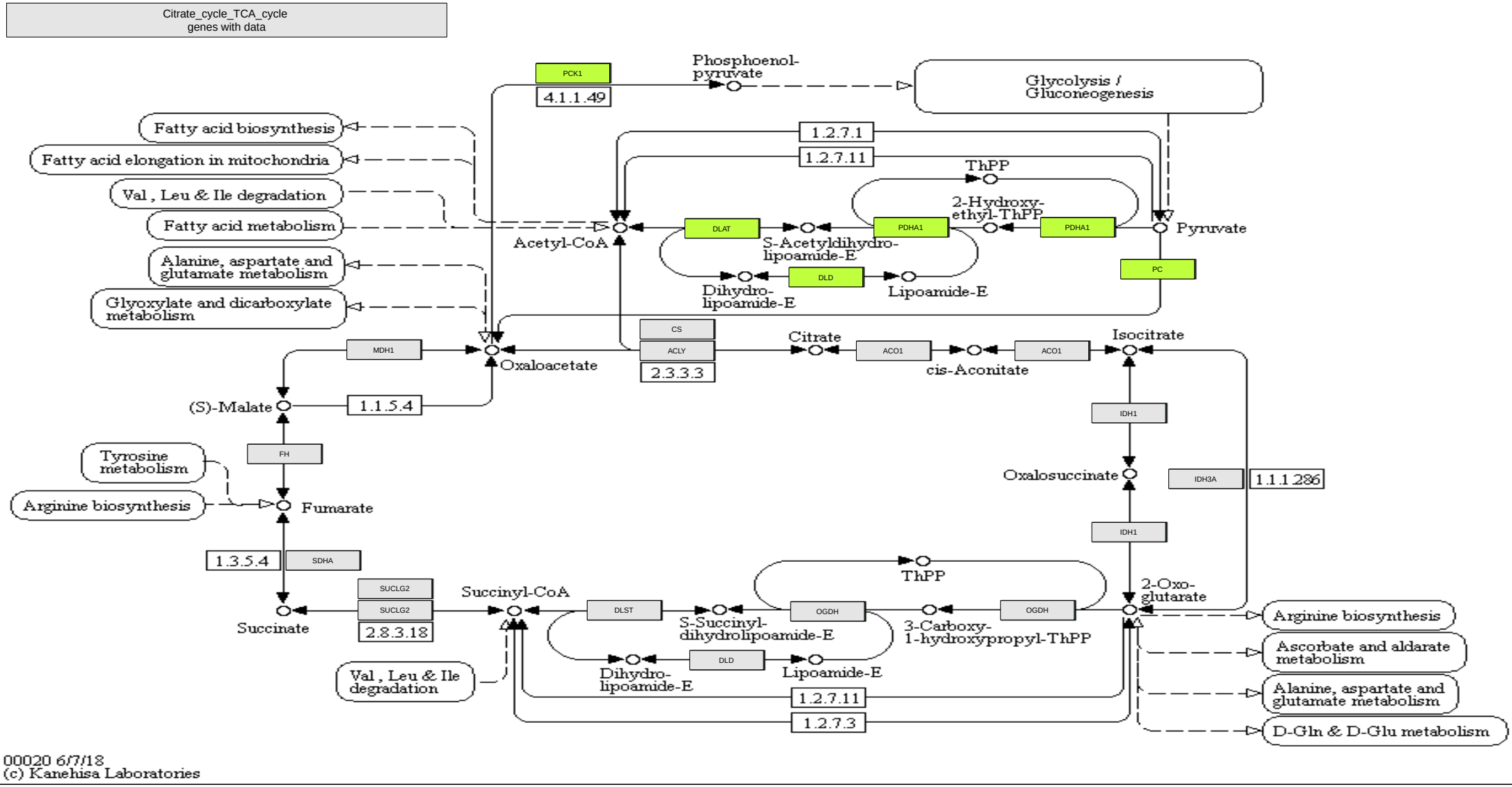
Citrate cycle (TCA cycle)



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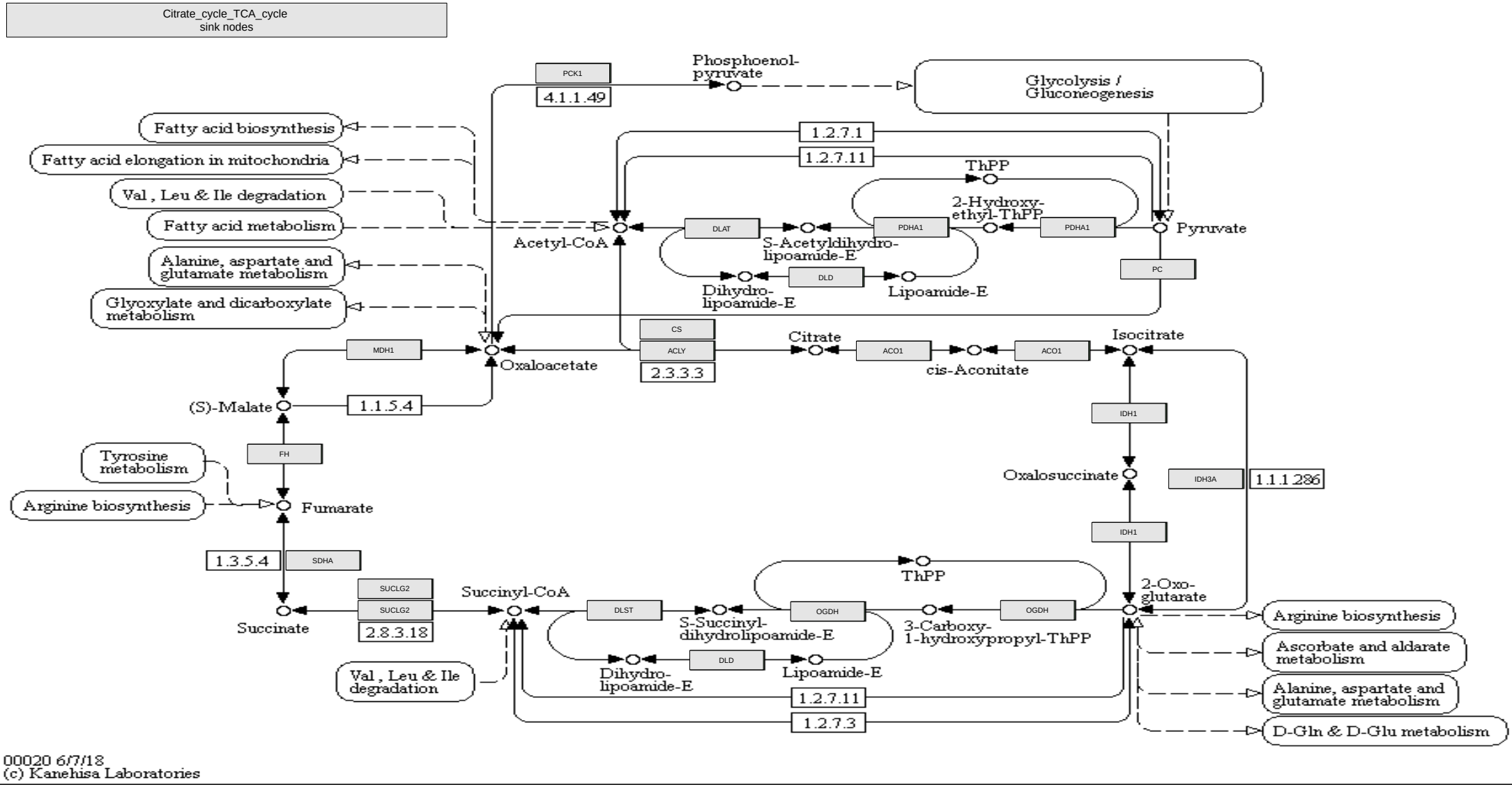
Phosphoenol-
pyruvate
Glycolysis /
Gluconeogenesis
Fatty acid biosynthesis
Fatty acid elongation in mitochondria
Val , Leu & Ile degradation
Fatty acid metabolism
Alanine, aspartate and
glutamate metabolism
Glyoxylate and dicarboxylate
metabolism
1.2.7.1
1.2.7.11
ThPP
2-Hydroxy-
ethyl-ThPP
DLAT
PDHA1
PDHA1
Pyruvate
Acetyl-CoA
S-Acetyldihydro-
lipoamide-E
DLD
PC
Dihydro-
lipoamide-E
Lipoamide-E
CS
ACLY
2.3.3.3
Citrate
ACO1
ACO1
Isocitrate
cis-Aconitate
MDH1
Oxaloacetate
(S)-Malate
1.1.5.4
IDH1
Tyrosine
metabolism
FH
Oxalosuccinate
IDH3A
1.1.1.286
Arginine biosynthesis
Fumarate
IDH1
1.3.5.4
SDHA
ThPP
2-Oxo-
glutarate
SUCLG2
SUCLG2
Succinyl-CoA
DLST
OGDH
OGDH
Arginine biosynthesis
Succinate
2.8.3.18
S-Succinyl-
dihydrolipoamide-E
3-Carboxy-
1-hydroxypropyl-ThPP
Ascorbate and aldarate
metabolism
DLD
Val , Leu & Ile
degradation
Dihydro-
lipoamide-E
Lipoamide-E
Alanine, aspartate and
glutamate metabolism
1.2.7.11
1.2.7.3
D-Gln & D-Glu metabolism
00020 6/7/18
(c) Kanehisa Laboratories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pyruvate
Glycolysis /
Gluconeogenesis
Fatty acid biosynthesis
Fatty acid elongation in mitochondria
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Fatty acid metabolism
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metabolism
1.2.7.1
1.2.7.11
ThPP
2-Hydroxy-
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PDHA1
Pyruvate
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S-Acetyldihydro-
lipoamide-E
DLD
Dihydro-
lipoamide-E
Lipoamide-E
PC
CS
ACLY
2.3.3.3
Citrate
ACO1
ACO1
Isocitrate
cis-Aconitate
MDH1
Oxaloacetate
(S)-Malate
1.1.5.4
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Tyrosine
metabolism
FH
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Arginine biosynthesis
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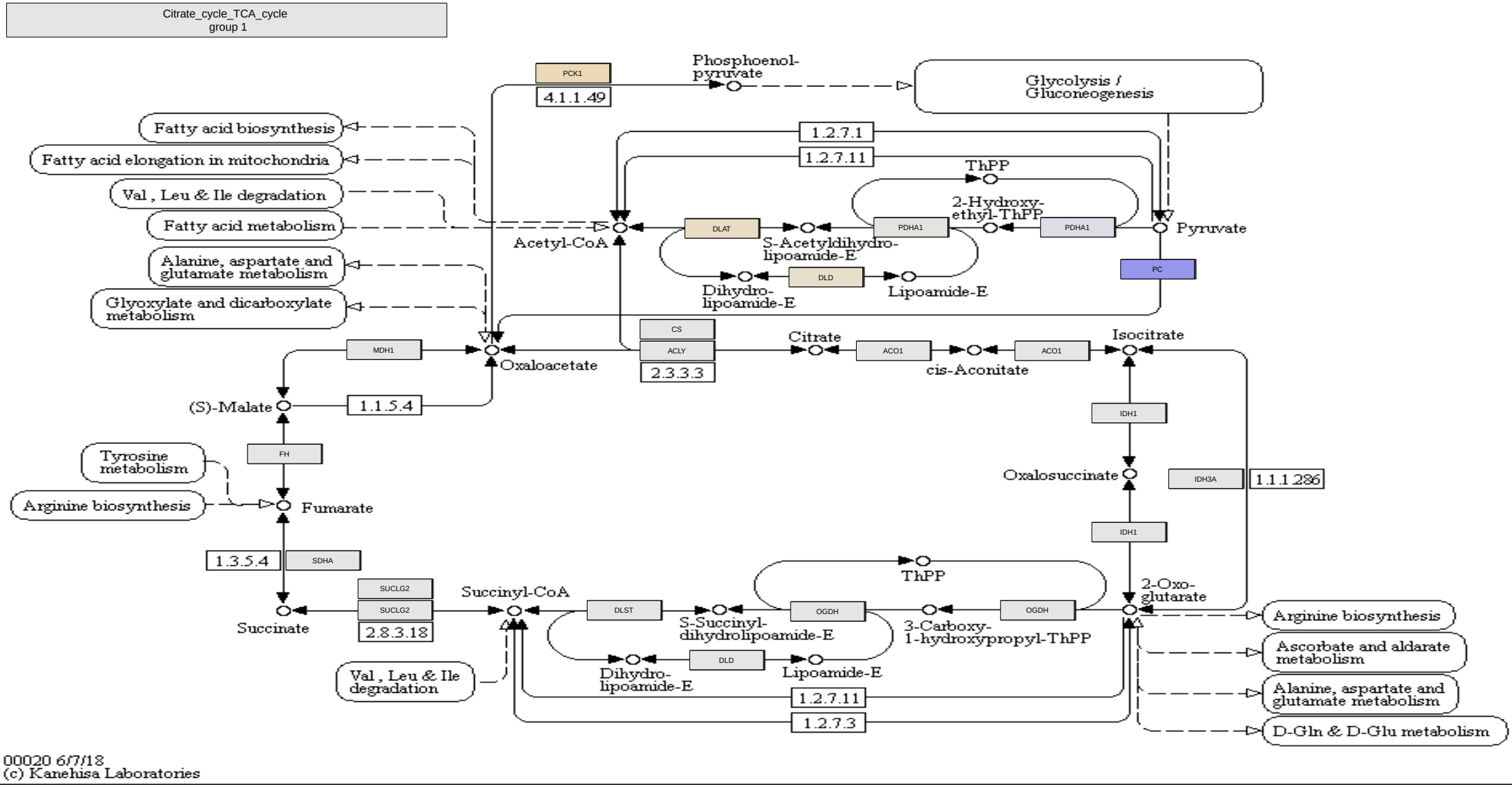
metabolism
DLD
Dihydro-
lipoamide-E
Lipoamide-E
Val , Leu & Ile
degradation
Alanine, aspartate and
glutamate metabolism
1.2.7.11
1.2.7.3
D-Gln & D-Glu metabolism
00020 6/7/18
(c) Kanehisa Laboratories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pyruvate
Glycolysis /
Gluconeogenesis
Fatty acid biosynthesis
Fatty acid elongation in mitochondria
Val , Leu & Ile degradation
Fatty acid metabolism
Alanine, aspartate and
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metabolism
1.2.7.1
1.2.7.11
ThPP
2-Hydroxy-
ethyl-ThPP
DLAT
PDHA1
PDHA1
Pyruvate
Acetyl-CoA
S-Acetyldihydro-
lipoamide-E
DLD
PC
Dihydro-
lipoamide-E
Lipoamide-E
CS
ACLY
2.3.3.3
Citrate
ACO1
ACO1
Isocitrate
cis-Aconitate
MDH1
Oxaloacetate
(S)-Malate
1.1.5.4
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1.1.1.286
Arginine biosynthesis
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SDHA
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2-Oxo-
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SUCLG2
Succinyl-CoA
DLST
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Succinate
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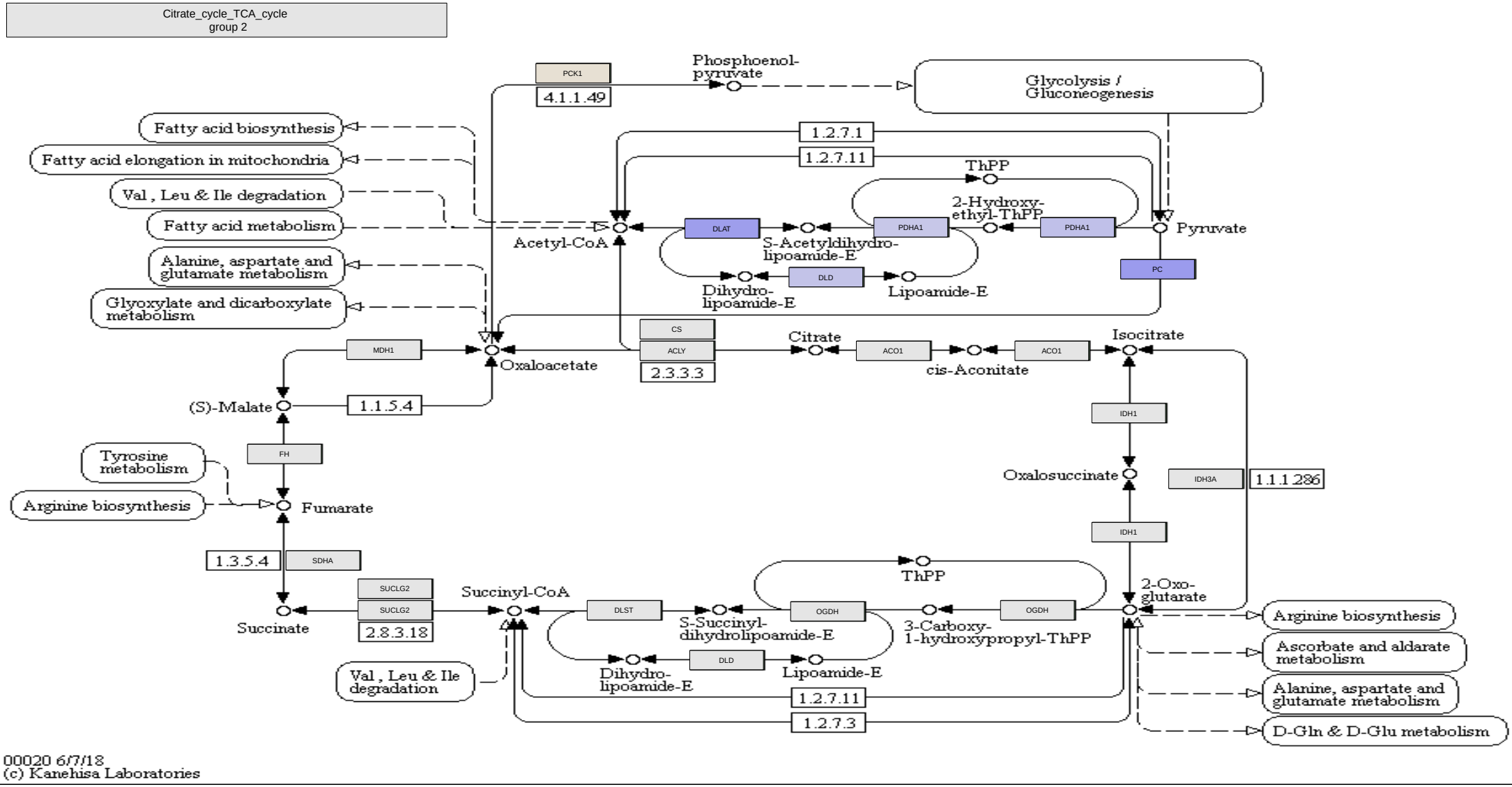
S-Succinyl-
dihydrolipoamide-E
3-Carboxy-
1-hydroxypropyl-ThPP
Ascorbate and aldarate
metabolism
DLD
Val , Leu & Ile
degradation
Dihydro-
lipoamide-E
Lipoamide-E
Alanine, aspartate and
glutamate metabolism
1.2.7.11
1.2.7.3
D-Gln & D-Glu metabolism
00020 6/7/18
(c) Kanehisa Laboratories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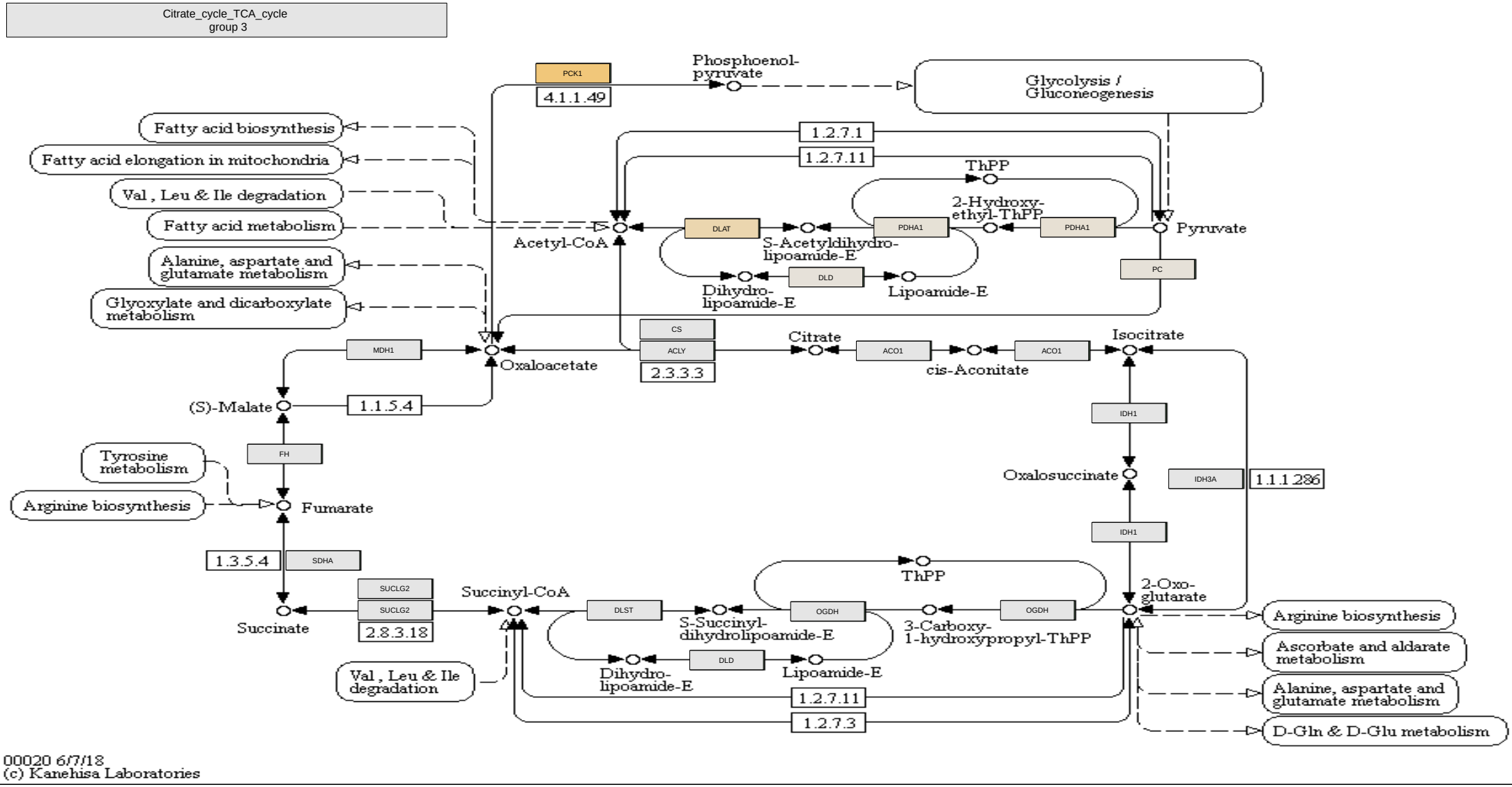
Phosphoenol-
pyruvate
Glycolysis /
Gluconeogenesis
Fatty acid biosynthesis
Fatty acid elongation in mitochondria
Val , Leu & Ile degradation
Fatty acid metabolism
Alanine, aspartate and
glutamate metabolism
Glyoxylate and dicarboxylate
metabolism
1.2.7.1
1.2.7.11
ThPP
2-Hydroxy-
ethyl-ThPP
DLAT
PDHA1
PDHA1
Pyruvate
Acetyl-CoA
S-Acetyldihydro-
lipoamide-E
DLD
PC
Dihydro-
lipoamide-E
Lipoamide-E
CS
ACLY
2.3.3.3
Citrate
ACO1
ACO1
Isocitrate
cis-Aconitate
MDH1
Oxaloacetate
(S)-Malate
1.1.5.4
IDH1
Tyrosine
metabolism
FH
Oxalosuccinate
IDH3A
1.1.1.286
Arginine biosynthesis
Fumarate
IDH1
1.3.5.4
SDHA
ThPP
2-Oxo-
glutarate
SUCLG2
SUCLG2
Succinyl-CoA
DLST
OGDH
OGDH
Arginine biosynthesis
Succinate
2.8.3.18
S-Succinyl-
dihydrolipoamide-E
3-Carboxy-
1-hydroxypropyl-ThPP
Ascorbate and aldarate
metabolism
DLD
Val , Leu & Ile
degradation
Dihydro-
lipoamide-E
Lipoamide-E
Alanine, aspartate and
glutamate metabolism
1.2.7.11
1.2.7.3
D-Gln & D-Glu metabolism
00020 6/7/18
(c) Kanehisa Laboratories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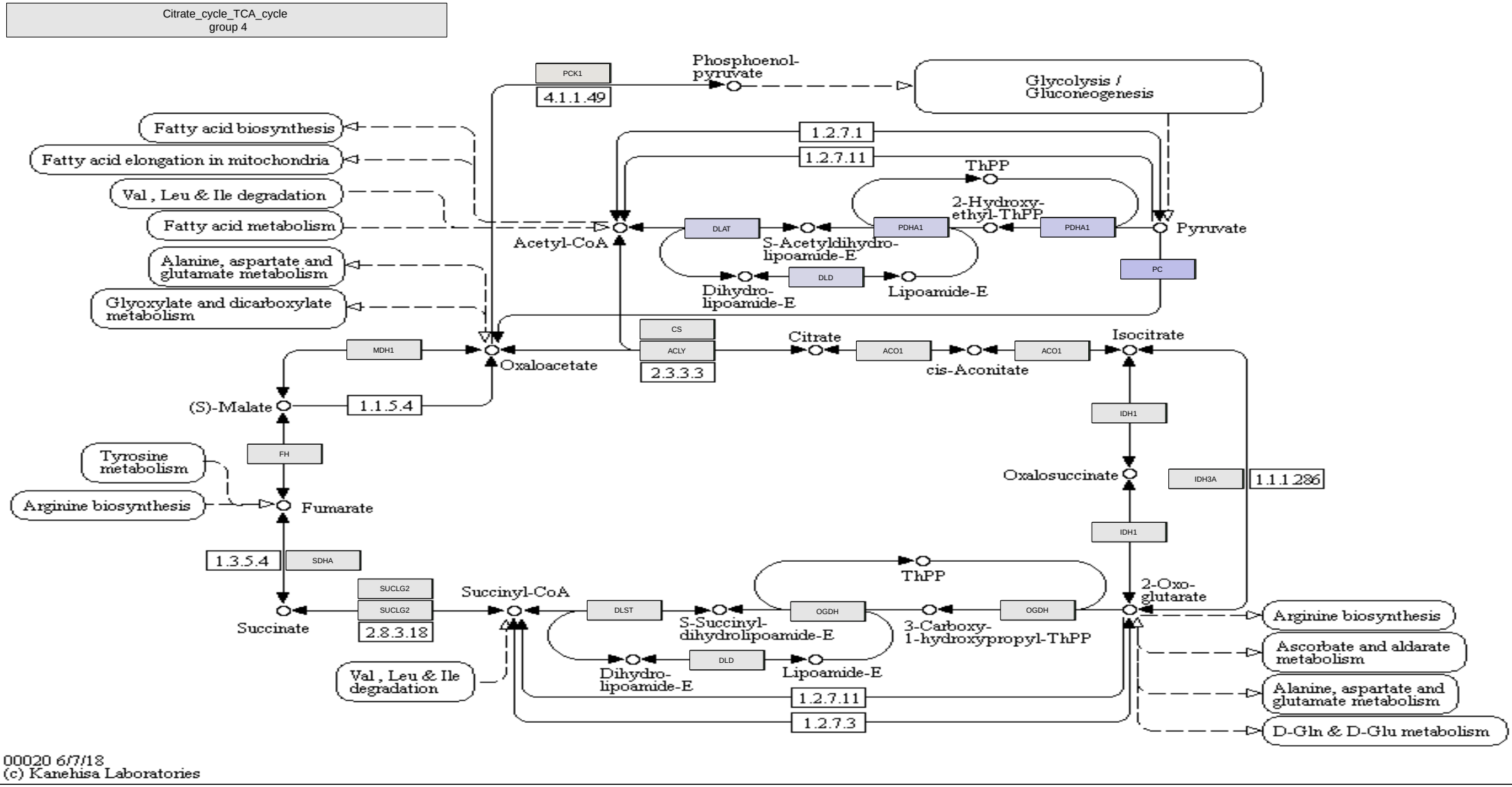
Phosphoenol-
pyruvate
Glycolysis /
Gluconeogenesis
Fatty acid biosynthesis
Fatty acid elongation in mitochondria
Val , Leu & Ile degradation
Fatty acid metabolism
Alanine, aspartate and
glutamate metabolism
Glyoxylate and dicarboxylate
metabolism
1.2.7.1
1.2.7.11
ThPP
2-Hydroxy-
ethyl-ThPP
DLAT
PDHA1
PDHA1
Pyruvate
Acetyl-CoA
S-Acetyldihydro-
lipoamide-E
DLD
Dihydro-
lipoamide-E
Lipoamide-E
PC
CS
ACLY
2.3.3.3
Citrate
ACO1
ACO1
Isocitrate
cis-Aconitate
MDH1
Oxaloacetate
(S)-Malate
1.1.5.4
IDH1
Tyrosine
metabolism
FH
Oxalosuccinate
IDH3A
1.1.1.286
Arginine biosynthesis
Fumarate
IDH1
1.3.5.4
SDHA
ThPP
2-Oxo-
glutarate
SUCLG2
SUCLG2
Succinyl-CoA
DLST
OGDH
OGDH
Arginine biosynthesis
Succinate
2.8.3.18
S-Succinyl-
dihydrolipoamide-E
3-Carboxy-
1-hydroxypropyl-ThPP
Ascorbate and aldarate
metabolism
DLD
Dihydro-
lipoamide-E
Lipoamide-E
Val , Leu & Ile
degradation
Alanine, aspartate and
glutamate metabolism
1.2.7.11
1.2.7.3
D-Gln & D-Glu metabolism
00020 6/7/18
(c) Kanehisa Laboratories


Citrate_cycle_TCA_cycle
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Phosphoenol-
pyruvate
Glycolysis /
Gluconeogenesis
Fatty acid biosynthesis
Fatty acid elongation in mitochondria
Val , Leu & Ile degradation
Fatty acid metabolism
Alanine, aspartate and
glutamate metabolism
Glyoxylate and dicarboxylate
metabolism
1.2.7.1
1.2.7.11
ThPP
2-Hydroxy-
ethyl-ThPP
DLAT
PDHA1
PDHA1
Pyruvate
Acetyl-CoA
S-Acetyldihydro-
lipoamide-E
DLD
PC
Dihydro-
lipoamide-E
Lipoamide-E
CS
ACLY
2.3.3.3
Citrate
ACO1
ACO1
Isocitrate
cis-Aconitate
MDH1
Oxaloacetate
(S)-Malate
1.1.5.4
IDH1
Tyrosine
metabolism
FH
Oxalosuccinate
IDH3A
1.1.1.286
Arginine biosynthesis
Fumarate
IDH1
1.3.5.4
SDHA
ThPP
2-Oxo-
glutarate
SUCLG2
SUCLG2
Succinyl-CoA
DLST
OGDH
OGDH
Arginine biosynthesis
Succinate
2.8.3.18
S-Succinyl-
dihydrolipoamide-E
3-Carboxy-
1-hydroxypropyl-ThPP
Ascorbate and aldarate
metabolism
DLD
Val , Leu & Ile
degradation
Dihydro-
lipoamide-E
Lipoamide-E
Alanine, aspartate and
glutamate metabolism
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1.2.7.3
D-Gln & D-Glu metabolism
00020 6/7/18
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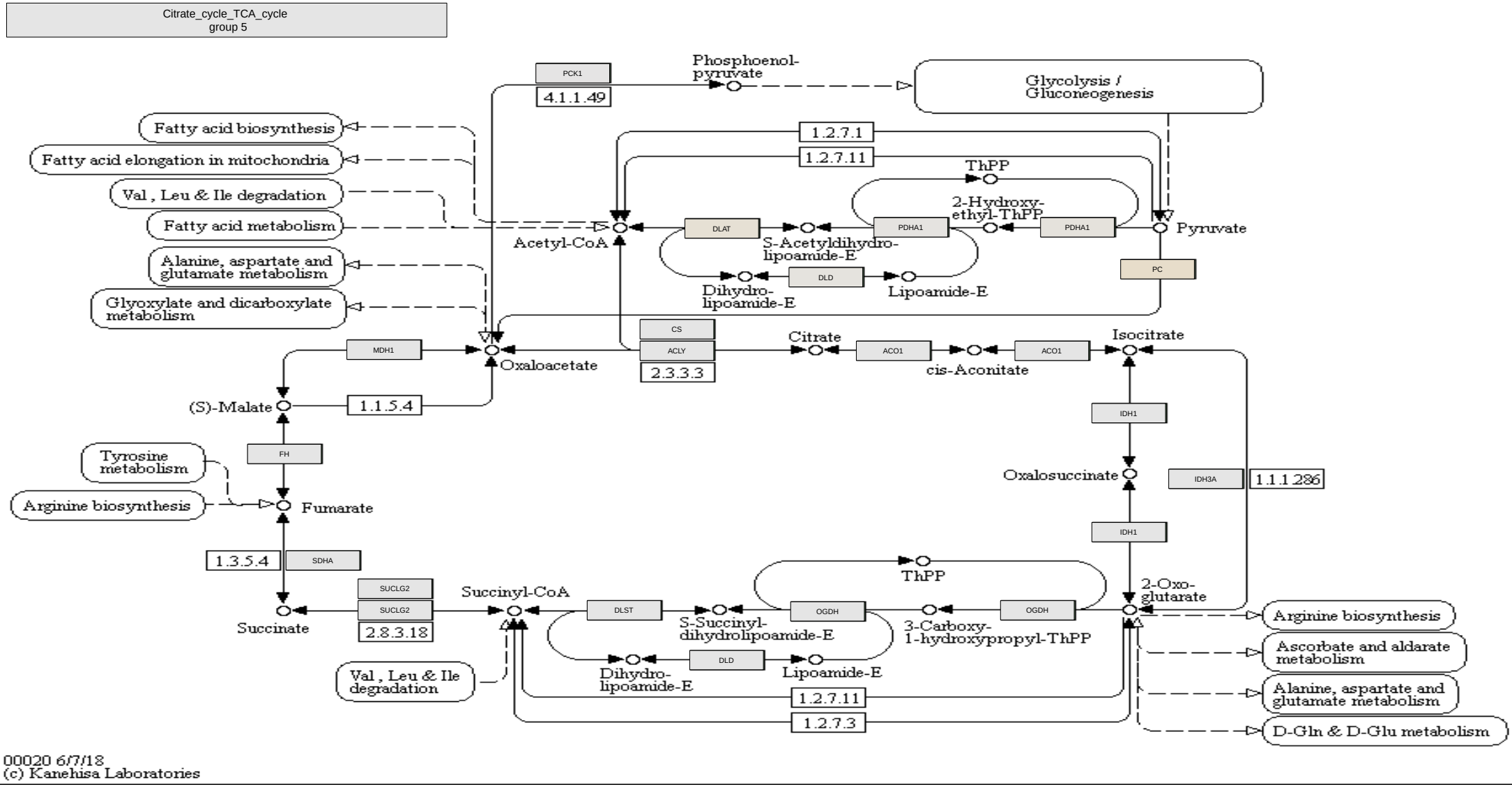
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Gluconeogenesis
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Fatty acid elongation in mitochondria
Val , Leu & Ile degradation
Fatty acid metabolism
Alanine, aspartate and
glutamate metabolism
Glyoxylate and dicarboxylate
metabolism
1.2.7.1
1.2.7.11
ThPP
2-Hydroxy-
ethyl-ThPP
DLAT
PDHA1
PDHA1
Pyruvate
Acetyl-CoA
S-Acetyldihydro-
lipoamide-E
DLD
PC
Dihydro-
lipoamide-E
Lipoamide-E
CS
ACLY
2.3.3.3
Citrate
ACO1
ACO1
Isocitrate
cis-Aconitate
MDH1
Oxaloacetate
(S)-Malate
1.1.5.4
IDH1
Tyrosine
metabolism
FH
Oxalosuccinate
IDH3A
1.1.1.286
Arginine biosynthesis
Fumarate
IDH1
1.3.5.4
SDHA
ThPP
2-Oxo-
glutarate
SUCLG2
SUCLG2
Succinyl-CoA
DLST
OGDH
OGDH
Arginine biosynthesis
Succinate
2.8.3.18
S-Succinyl-
dihydrolipoamide-E
3-Carboxy-
1-hydroxypropyl-ThPP
Ascorbate and aldarate
metabolism
DLD
Val , Leu & Ile
degradation
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lipoamide-E
Lipoamide-E
Alanine, aspartate and
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1.2.7.3
D-Gln & D-Glu metabolism
00020 6/7/18
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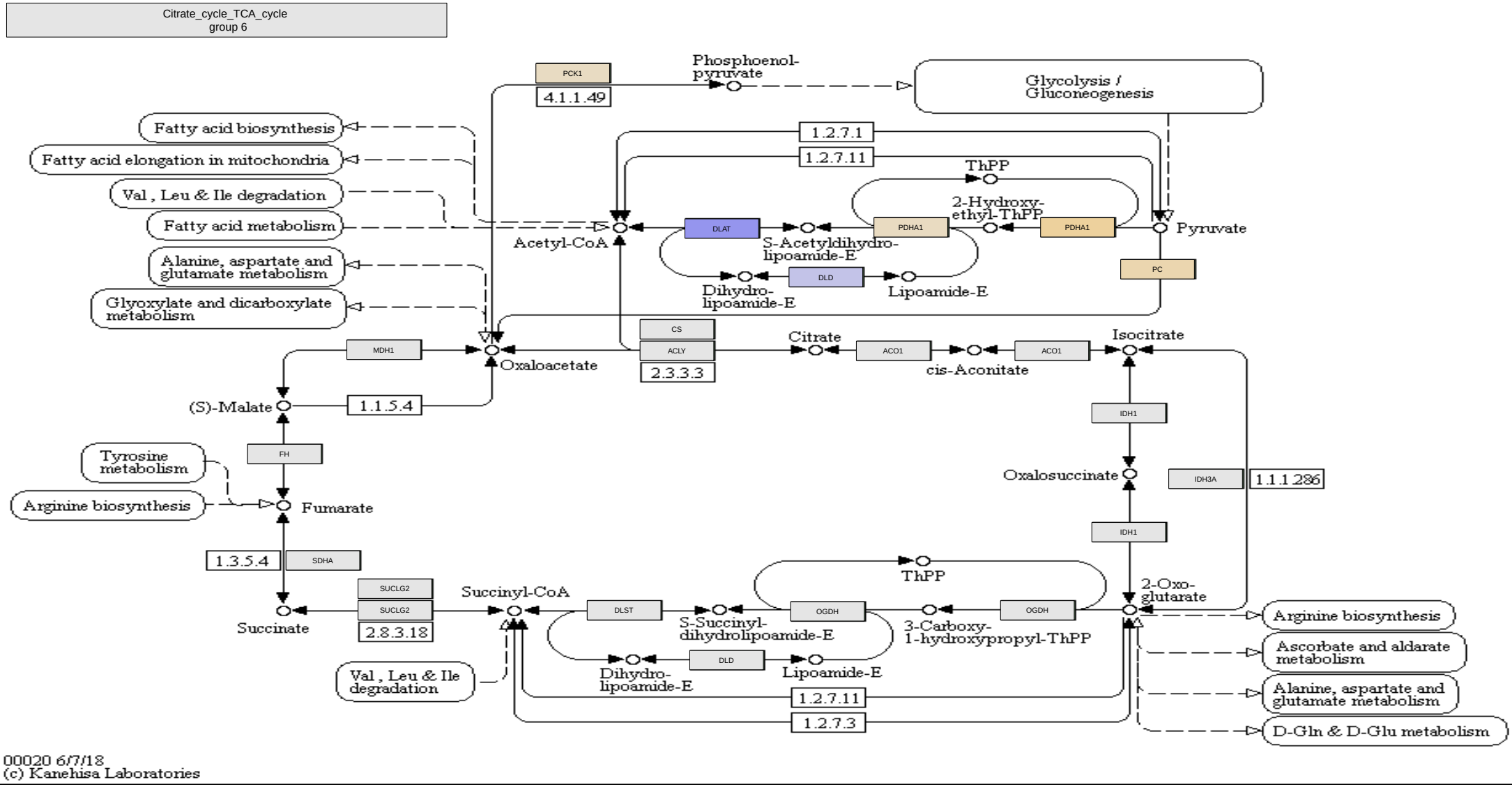
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Gluconeogenesis
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Fatty acid elongation in mitochondria
Val , Leu & Ile degradation
Fatty acid metabolism
Alanine, aspartate and
glutamate metabolism
Glyoxylate and dicarboxylate
metabolism
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1.2.7.11
ThPP
2-Hydroxy-
ethyl-ThPP
DLAT
PDHA1
PDHA1
Pyruvate
Acetyl-CoA
S-Acetyldihydro-
lipoamide-E
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PC
Dihydro-
lipoamide-E
Lipoamide-E
CS
ACLY
2.3.3.3
Citrate
ACO1
ACO1
Isocitrate
cis-Aconitate
MDH1
Oxaloacetate
(S)-Malate
1.1.5.4
IDH1
Tyrosine
metabolism
FH
Oxalosuccinate
IDH3A
1.1.1.286
Arginine biosynthesis
Fumarate
IDH1
1.3.5.4
SDHA
ThPP
2-Oxo-
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SUCLG2
Succinyl-CoA
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OGDH
Arginine biosynthesis
Succinate
2.8.3.18
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dihydrolipoamide-E
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DLD
Dihydro-
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Val , Leu & Ile
degradation
Alanine, aspartate and
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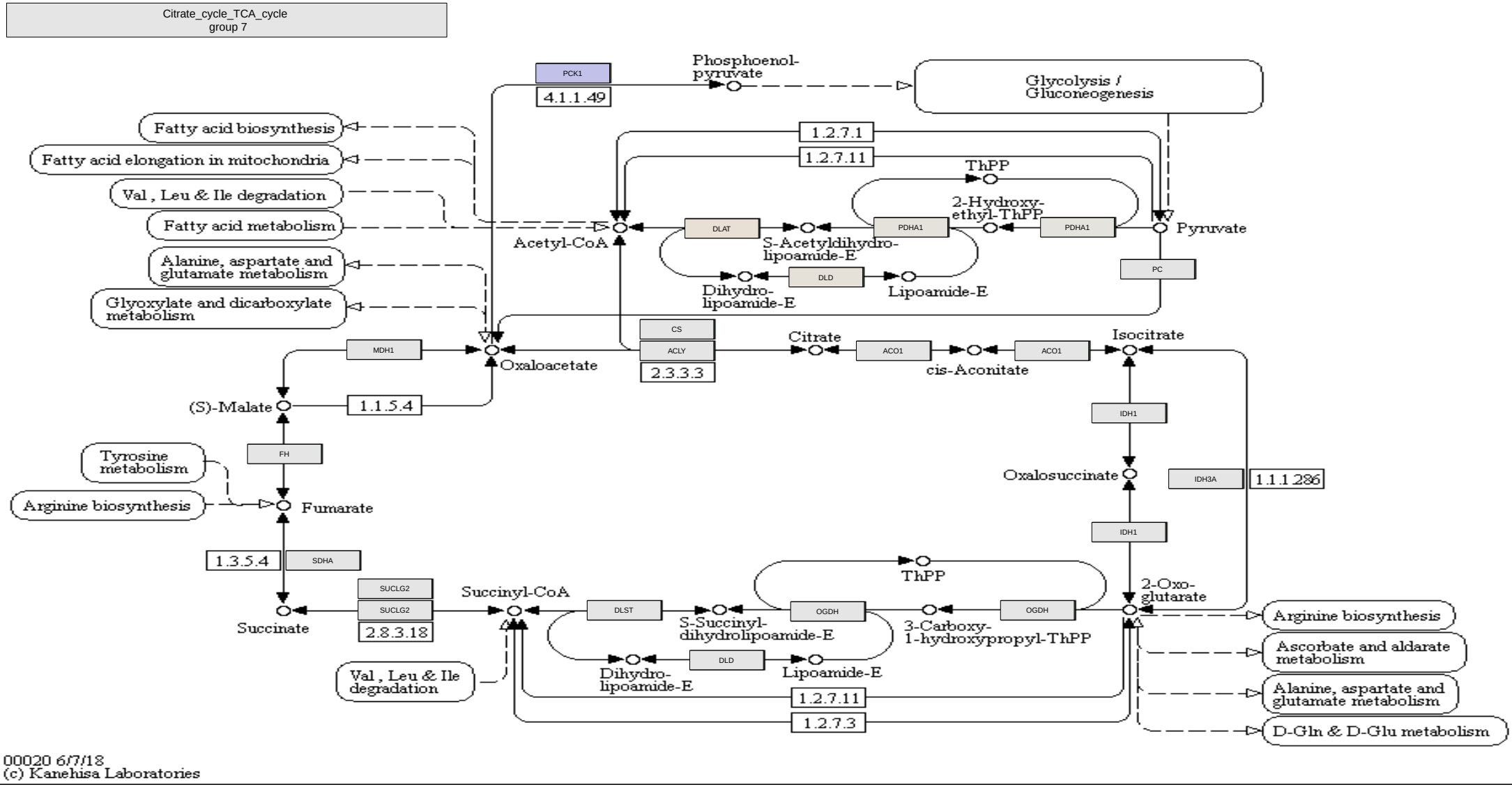
1.2.7.3
D-Gln & D-Glu metabolism
00020 6/7/18
(c) Kanehisa Laboratories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Gluconeogenesis
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Val , Leu & Ile degradation
Fatty acid metabolism
Alanine, aspartate and
glutamate metabolism
Glyoxylate and dicarboxylate
metabolism
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1.2.7.11
ThPP
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PDHA1
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lipoamide-E
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Lipoamide-E
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2.3.3.3
Citrate
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ACO1
Isocitrate
cis-Aconitate
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(S)-Malate
1.1.5.4
IDH1
Tyrosine
metabolism
FH
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1.1.1.286
Arginine biosynthesis
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D-Gln & D-Glu metabolism
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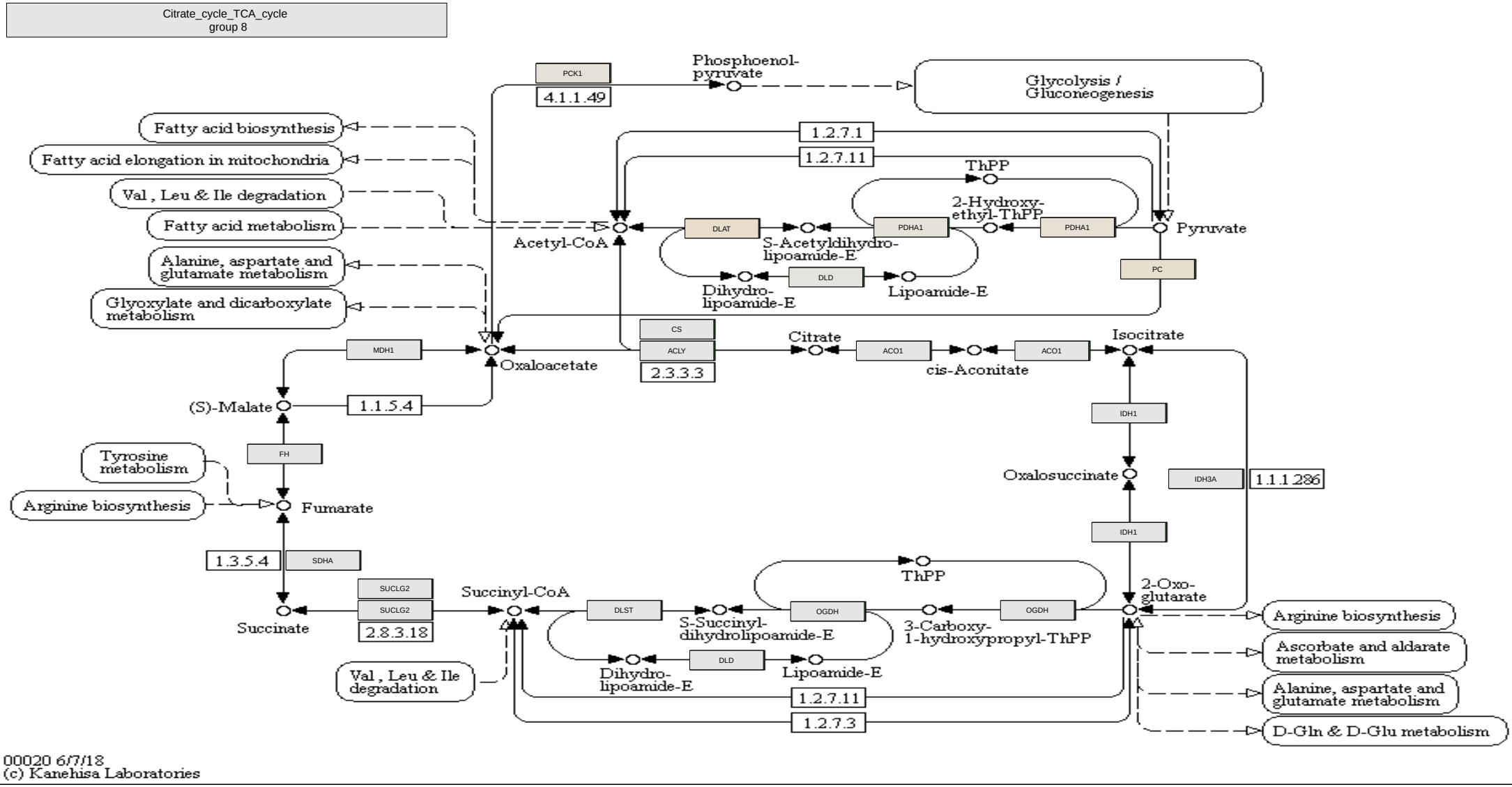
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pyruvate
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PDHA1
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lipoamide-E
Lipoamide-E
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metabolism
FH
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IDH3A
1.1.1.286
Arginine biosynthesis
Fumarate
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1.2.7.3
D-Gln & D-Glu metabolism
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