

**S2 Table. Reaction list 1.** It contains the list of 47 reactions from KEGG database for mammalian CCM pathway under consideration. Here the reaction numbers correspond to the same serial numbers in S4 Table.

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1. Glucose + ATP  $\Rightarrow$   $\alpha$ -D glucose 6P + ADP
  2.  $\alpha$ -D glucose 6P  $\Rightarrow$  Glucose
  3.  $\beta$ -D glucose 6P  $\Rightarrow$   $\alpha$ -D glucose 6P
  4.  $\beta$ -D glucose 6P  $\Rightarrow$   $\beta$ -D fructose 6P
  5.  $\alpha$ -D glucose 6P  $\Rightarrow$   $\beta$ -D fructose 6P
  6.  $\beta$ -D fructose 6P + ATP  $\Rightarrow$   $\beta$ -D fructose 1,6P<sub>2</sub> + ADP
  7.  $\beta$ -D fructose 6P  $\Rightarrow$   $\beta$ -D fructose 2,6P<sub>2</sub>
  8.  $\beta$ -D fructose 2,6P<sub>2</sub>  $\Rightarrow$   $\beta$ -D fructose 6P
  9.  $\beta$ -D fructose 1,6P<sub>2</sub>  $\Rightarrow$  D-Glyceraldehyde 3P + NADH
  10.  $\beta$ -D fructose 1,6P<sub>2</sub>  $\Rightarrow$  Glycerone P
  11. Glycerone P  $\Rightarrow$  D-Glyceraldehyde 3P
  12. D-Glyceraldehyde 3P  $\Rightarrow$  Glycerate 1,3P<sub>2</sub>
  13. Glycerate 1,3P<sub>2</sub> + ADP  $\Rightarrow$  Glycerate 3P + ATP
  14. Glycerate 3P  $\Rightarrow$  Glycerate 2P
  15. Glycerate 2P  $\Rightarrow$  Phosphoenolpyruvate (PEP)
  16. Phosphoenolpyruvate (PEP) + ADP  $\Rightarrow$  Pyruvate + ATP
  17. Oxaloacetate  $\Rightarrow$  PEP
  18. Pyruvate  $\Rightarrow$  2-hydroxy-ethyl-ThPP
  19. 2-hydroxy-ethyl-ThPP  $\Rightarrow$  S-acetyldihydro-lipoamide-E
  20. S-acetyldihydro-lipoamide-E  $\Rightarrow$  Acetyl-CoA
  21. Pyruvate  $\Rightarrow$  Oxaloacetate
  22. Oxaloacetate + Acetyl-CoA  $\Rightarrow$  Citrate
  23. Citrate  $\Rightarrow$  Cis Aconitate
  24. Cis Aconitate  $\Rightarrow$  Isocitrate
  25. Isocitrate  $\Rightarrow$  Oxalosuccinate
  26. Oxalosuccinate  $\Rightarrow$  2-oxoglutarate ( $\alpha$ -ketoglutarate) + NADH
  27. 2-oxoglutarate  $\Rightarrow$  3-carboxy-1-hydroxypropyl-ThPP
  28. 3-carboxy-1-hydroxypropyl-ThPP  $\Rightarrow$  S-succinyl-dihydrolipoamide-E
  29. S-succinyl-dihydrolipoamide-E  $\Rightarrow$  Succinyl-CoA + NADH
  30. Succinyl-CoA  $\Rightarrow$  Succinate + GTP (ATP)
  31. Succinate  $\Rightarrow$  Fumarate
  32. Fumarate  $\Rightarrow$  (S)-malate
  33. (S)-malate  $\Rightarrow$  Oxaloacetate + NADH
  34.  $\alpha$ -D glucose 6P  $\Rightarrow$   $\beta$ -D glucose 6P
  35.  $\beta$ -D glucose 6P  $\Rightarrow$  D-glucono-1,5-lactone-6P
  36. D-Glucono-1,5-lactone-6P  $\Rightarrow$  6-phosphogluconate + NADPH
  37. 6-phosphogluconate  $\Rightarrow$  Ribulose 5-phosphate + NADPH
  38. Ribulose 5-phosphate  $\Rightarrow$  D-ribose-5P
  39. Ribulose 5-phosphate  $\Rightarrow$  Xylulose 5-phosphate
  40. D-ribose-5P + Xylulose 5-phosphate  $\Rightarrow$  D-Glyceraldehyde 3P + Sedoheptulose 7-phosphate
  41. D-Glyceraldehyde 3P  $\Rightarrow$   $\beta$ -D fructose 1,6P<sub>2</sub>
  42.  $\beta$ -D fructose 1,6P<sub>2</sub>  $\Rightarrow$   $\beta$ -D fructose 6P
  43.  $\beta$ -D fructose 6P  $\Rightarrow$   $\alpha$ -D glucose 6P
  44. Sedoheptulose 7-phosphate + D-Glyceraldehyde 3P  $\Rightarrow$  Erythrose 4-phosphate +  $\beta$ -D fructose 6P
  45. Xylulose 5-phosphate + Erythrose 4-phosphate  $\Rightarrow$   $\beta$ -D fructose 6P + D-Glyceraldehyde 3P
  46. Pyruvate + NADH  $\Rightarrow$  Lactate
  47. Pyruvate  $\Rightarrow$  Alanine
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