

**S3 Table. Reaction list 2.** It contains the list of reduced 28 reactions for mammalian CCM pathway under consideration. Here the reaction numbers correspond to the same serial numbers in S5 Table.

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1. Glucose + ATP  $\Rightarrow$   $\alpha$ -D glucose 6P + ADP
  2.  $\alpha$ -D glucose 6P  $\Rightarrow$   $\beta$ -D fructose 6P
  3.  $\beta$ -D fructose 6P + ATP  $\Rightarrow$   $\beta$ -D fructose 1,6P<sub>2</sub> + ADP
  4.  $\beta$ -D fructose 1,6P<sub>2</sub>  $\Rightarrow$  D-Glyceraldehyde 3P + NADH
  5. D-Glyceraldehyde 3P  $\Rightarrow$  Glycerate 2P
  6. Glycerate 2P  $\Rightarrow$  Phosphoenolpyruvate (PEP)
  7. Phosphoenolpyruvate (PEP) + ADP  $\Rightarrow$  Pyruvate + ATP
  8. Pyruvate  $\Rightarrow$  Acetyl-CoA
  9. Pyruvate  $\Rightarrow$  Oxaloacetate
  10. Oxaloacetate  $\Rightarrow$  PEP
  11. Oxaloacetate + Acetyl-CoA  $\Rightarrow$  Citrate
  12. Citrate  $\Rightarrow$  Succinyl-CoA + NADH
  13. Succinyl-CoA  $\Rightarrow$  Oxaloacetate + NADH + GTP (ATP)
  14. Oxaloacetate  $\Rightarrow$  Succinyl-CoA
  15. D-Glyceraldehyde 3P  $\Rightarrow$   $\beta$ -D fructose 1,6P<sub>2</sub>
  16. PEP  $\Rightarrow$  Glycerate 2P
  17. Glycerate 2P  $\Rightarrow$  D-Glyceraldehyde 3P
  18.  $\beta$ -D fructose 1,6P<sub>2</sub>  $\Rightarrow$   $\beta$ -D fructose 6P
  19.  $\beta$ -D fructose 6P  $\Rightarrow$   $\alpha$ -D glucose 6P
  20.  $\alpha$ -D glucose 6P  $\Rightarrow$  Glucose
  21. Pyruvate + NADH  $\Rightarrow$  Lactate
  22. Pyruvate  $\Rightarrow$  Alanine
  23.  $\beta$ -D fructose 6P  $\Rightarrow$   $\beta$ -D fructose 2,6P<sub>2</sub>
  24.  $\beta$ -D fructose 2,6P<sub>2</sub>  $\Rightarrow$   $\beta$ -D fructose 6P
  25.  $\alpha$ -D glucose 6P  $\Rightarrow$  6-phosphogluconate + NADPH
  26. 6-phosphogluconate  $\Rightarrow$  D-ribose-5P + NADPH
  27. D-ribose-5P  $\Rightarrow$   $\beta$ -D fructose 6P
  28. D-ribose-5P  $\Rightarrow$  D-Glyceraldehyde 3P
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