

# List of Processes (Reactions and Transport Processes)

No. and Name of Processes (compartment)		Substrate	Product	KEGG#
1 Hexokinase	(c)	D-Glucose + ATP	→ D-Glucose 6-P + ADP	R00299
2 Phosphohexose isomerase	(c)	D-Glucose 6-P	→ D-Fructose 6-P	R00771
3 Phosphofructokinase	(c)	D-Fructose 6-P + ATP	→ D-Fructose 1,6-P2 + ADP	R00756
4 Aldolase	(c)	D-Fructose 1,6-P2	→ Dihydroxyacetone P + Glyceraldehyde 3-P	R01068
5 Triose phosphate isomerase	(c)	Dihydroxyacetone P	→ Glyceraldehyde 3-P	R01015*
6 Glyceraldehyde-3-P dehydrogenase	(c)	Glyceraldehyde 3-P + Pi + NAD+	→ 1,3-Bisphospho-D-glycerate + NADH + H+	R01061
7 Phosphoglycerate kinase	(c)	1,3-Bisphospho-D-glycerate + ADP	→ 3-Phospho-D-glycerate + ATP	R01512*
8 Phosphoglycerate mutase	(c)	3-Phospho-D-glycerate	→ 2-Phospho-D-glycerate	R01518*
9 Enolase	(c)	2-Phospho-D-glycerate	→ Phosphoenolpyruvate + H2O	R00658
10 Pyruvate kinase	(c)	Phosphoenolpyruvate + ADP	→ Pyruvate + ATP	R00200*
11 L-Lactate dehydrogenase	(c)	Pyruvate + NADH + H+	→ Lactate + NAD+	R00703*
12 Pyruvate dehydrogenase complex	(m)	Pyruvate + CoA + NAD+	→ Acetyl-CoA + CO2 + NADH + H+	R00209**
13 Pyruvate carboxylase	(m)	Pyruvate + HCO3- + ATP	→ Oxaloacetate + ADP + Pi	R00344
14 Citrate synthase	(m)	Acetyl-CoA + H2O + Oxaloacetate	→ Citrate + CoA	R00351*
15 Aconitase	(m)	Citrate	→ cis-Aconitate + H2O	R01325
16 Aconitase	(m)	cis-Aconitate + H2O	→ Isocitrate	R01900*
17 Isocitrate dehydrogenase	(m)	Isocitrate + NAD+	→ 2-Oxoglutarate + CO2 + NADH + H+	R00709
18 2-Oxoglutarate dehydrogenase complex	(m)	2-Oxoglutarate + CoA + NAD+	→ Succinyl-CoA + CO2 + NADH + H+	
19 Succinyl-CoA synthetase	(m)	Succinyl-CoA + GDP + Pi	→ Succinate + CoA + GTP	R00432*
20 Succinate dehydrogenase	(m)	Succinate + FAD	→ Fumarate + FADH2	R00408
21 Fumarase	(m)	Fumarate + H2O	→ Malate	R01082*
22 Malate dehydrogenase	(m)	Malate + NAD+	→ Oxaloacetate + NADH + H+	R00342
23 Glucose-6-phosphate dehydrogenase	(c)	D-Glucose 6-P + NADP+	→ D-Glucono-1,5-lactone 6-P + NADPH + H+	R00835**
24 6-Phosphogluconolactonase	(c)	D-Glucono-1,5-lactone 6-P + H2O	→ 6-Phospho-D-gluconate	R02035
25 6-Phosphogluconate dehydrogenase	(c)	6-Phospho-D-gluconate + NADP+	→ D-Ribulose 5-P + CO2 + NADPH + H+	R01528
26 Ribulose-5-phosphate 3-epimerase	(c)	D-Ribulose 5-P	→ D-Xylulose 5-P	R01529
27 Ribose-5-phosphate ketoisomerase	(c)	D-Ribulose 5-P	→ D-Ribose 5-P	R01056*
28 Transketolase	(c)	D-Ribose 5-P + D-Xylulose 5-P	→ Sedoheptulose 7-P + Glyceraldehyde 3-P	R01641*
29 Transaldolase	(c)	Sedoheptulose 7-P + Glyceraldehyde 3-P	→ D-Erythrose 4-P + D-Fructose 6-P	R01827
30 Transketolase	(c)	D-Erythrose 4-P + D-Xylulose 5-P	→ D-Fructose 6-P + Glyceraldehyde 3-P	R01067*
31 Transport	-	Malate mitochondrial	→ Malate cytosolic	
32 Malate dehydrogenase	(c)	Malate + NAD+	→ Oxaloacetate + NADH + H+	R00342
33 Phosphoenolpyruvate carboxykinase	(c)	Oxaloacetate + GTP	→ Phosphoenolpyruvate + CO2 + GDP	R00431
34 Glucose-6-phosphatase	(c)	D-Glucose 6-P + H2O	→ D-Glucose + Pi	R00303
35 D-Fructose-1,6-bisphosphatase	(c)	D-Fructose 1,6-P2 + H2O	→ D-Fructose 6-P + Pi	R00762

As for letters in parentheses, see "List of Metabolites and Carbon Species". The following processes were treated as reversible: 2,4-9,11,15-17,19-22,23,26-30,31,32.