

FIGURE 1

Scheme 1. Production of acetyl-CoA from glucose-6-phosphate via the phosphoketolase pathway, representative Case 1

- 1a.) $2 \text{ D-glucose-6-phosphate} = 2 \text{ D-fructose-6-phosphate}$ (EC 5.3.1.9)
- 1b.) $\text{D-fructose-6-phosphate} + \text{phosphate} = \text{acetyl phosphate} + \text{D-erythrose-4-phosphate} + \text{H}_2\text{O}$ (EC 4.1.2.22)
- 1c.) $\text{D-erythrose-4-phosphate} + \text{D-fructose-6-phosphate} = \text{sedoheptulose-7-phosphate} + \text{D-glyceraldehyde-3-phosphate}$ (EC 2.2.1.2)
- 1d.) $\text{Sedoheptulose-7-phosphate} + \text{D-glyceraldehyde-3-phosphate} = \text{D-ribose-5-phosphate} + \text{D-xylulose-5-phosphate}$ (EC 2.2.1.1)
- 1e.) $\text{D-ribose-5-phosphate} = \text{D-ribulose-5-phosphate}$ (EC 5.3.1.6)
- 1f.) $\text{D-ribulose-5-phosphate} = \text{D-xylulose-5-phosphate}$ (EC 5.1.3.1)
- 1g.) $2 \text{ D-xylulose-5-phosphate} + 2 \text{ phosphate} = 2 \text{ acetyl phosphate} + 2 \text{ D-glyceraldehyde-3-phosphate} + 2 \text{ H}_2\text{O}$ (EC 4.1.2.22 and/or EC 4.1.2.9)
- 1h.) $3 \text{ acetyl phosphate} + 3 \text{ CoA} = 3 \text{ acetyl-CoA} + 3 \text{ phosphate}$ (EC 2.3.1.8)

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- 1.) $2 \text{ D-glucose-6-phosphate} + 3 \text{ CoA} = 3 \text{ acetyl-CoA} + 2 \text{ D-glyceraldehyde-3-phosphate} + 3 \text{ H}_2\text{O}$

Scheme 2. Production of Acetyl-CoA from glucose-6-phosphate via the phosphoketolase pathway, representative Case 2

- 2a.) $2 \text{ D-glucose-6-phosphate} = 2 \text{ D-fructose-6-phosphate}$ (EC 5.3.1.9)
- 2b.) $\text{D-fructose-6-phosphate} + \text{D-glyceraldehyde-3-phosphate} = \text{D-xylulose-5-phosphate} + \text{D-erythrose-4-phosphate}$ (EC 2.2.1.1)
- 2c.) $\text{D-erythrose-4-phosphate} + \text{D-fructose-6-phosphate} = \text{sedoheptulose-7-phosphate} + \text{D-glyceraldehyde-3-phosphate}$ (EC 2.2.1.2)
- 2d.) $\text{Sedoheptulose-7-phosphate} + \text{D-glyceraldehyde-3-phosphate} = \text{D-ribose-5-phosphate} + \text{D-xylulose-5-phosphate}$ (EC 2.2.1.1)
- 2e.) $\text{D-ribose-5-phosphate} = \text{D-ribulose-5-phosphate}$ (EC 5.3.1.6)
- 2f.) $\text{D-ribulose-5-phosphate} = \text{D-xylulose-5-phosphate}$ (EC 5.1.3.1)
- 2g.) $3 \text{ D-xylulose-5-phosphate} + 3 \text{ phosphate} = 3 \text{ acetyl phosphate} + 3 \text{ D-glyceraldehyde-3-phosphate} + 3 \text{ H}_2\text{O}$ (EC 4.1.2.9 and/or EC 4.1.2.22)

2h.) 3 acetyl phosphate + 3 CoA = 3 acetyl-CoA + 3 phosphate (EC 2.3.1.8)

2.) 2 D-glucose-6-phosphate + 3 CoA = 3 acetyl-CoA + 2 D-glyceraldehyde-3-phosphate + 3 H₂O