

## Table 26.1 Pathways requiring NADPH

### Synthesis

- Fatty acid biosynthesis
- Cholesterol biosynthesis
- Neurotransmitter biosynthesis
- Nucleotide biosynthesis

### Detoxification

- Reduction of oxidized glutathione
- Cytochrome P450 monooxygenases

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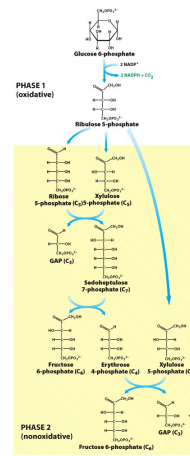


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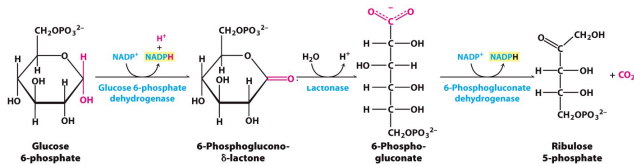
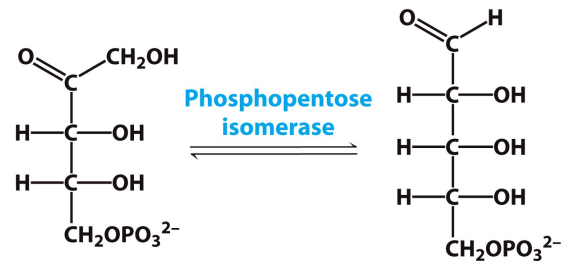


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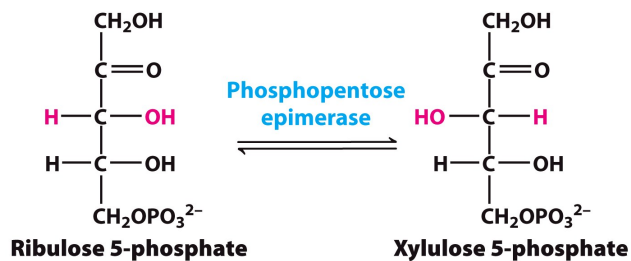


**Ribulose 5-phosphate**

**Ribose 5-phosphate**

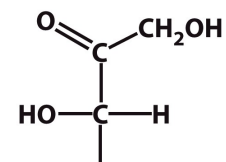
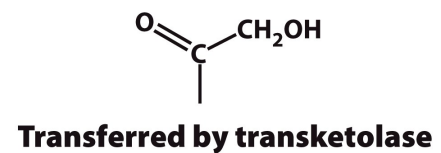
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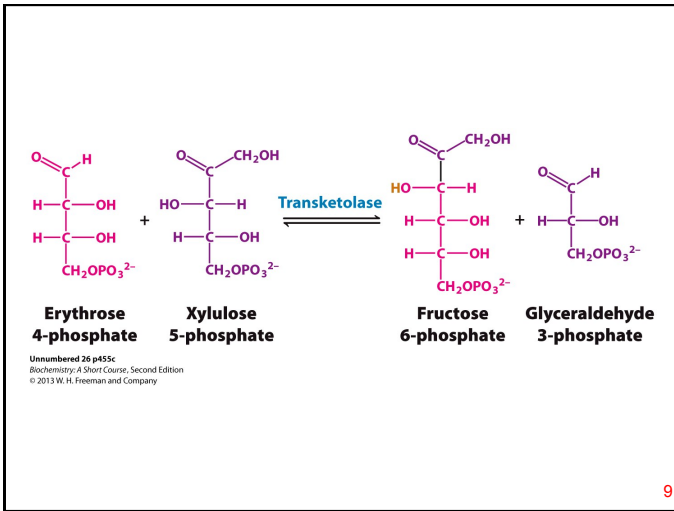
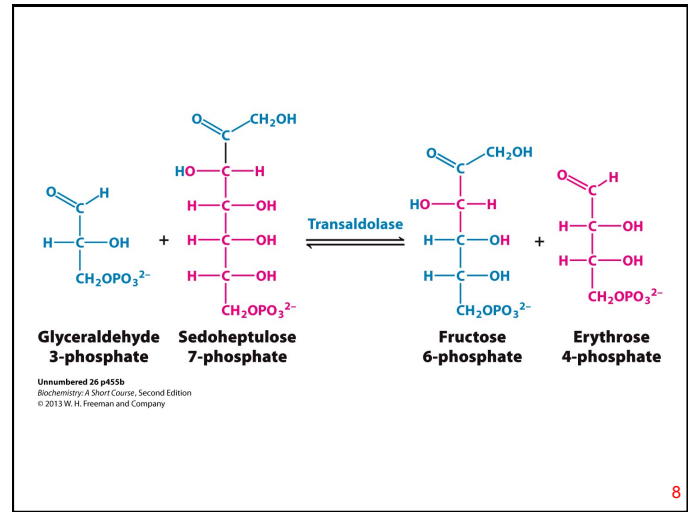
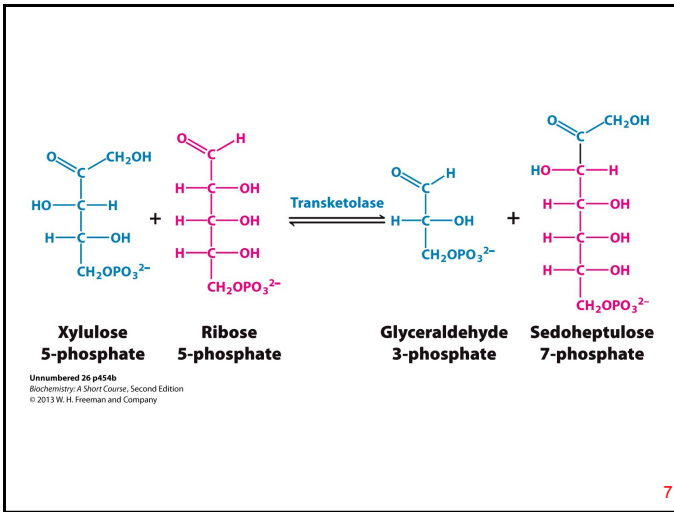
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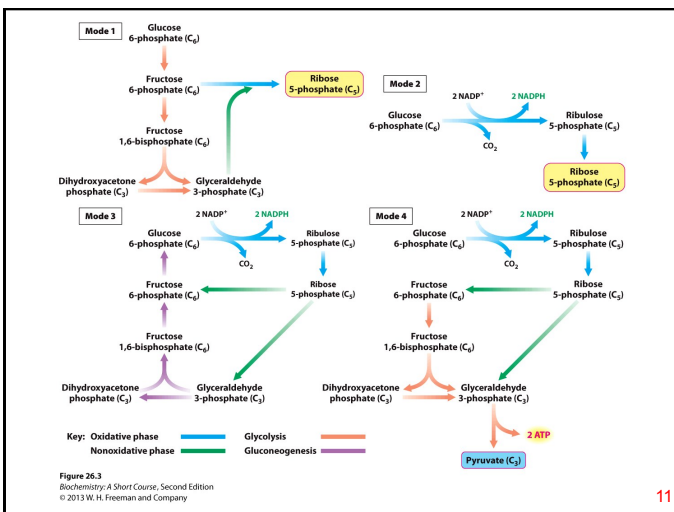


**Table 26.2 The pentose phosphate pathway**

Reaction	Enzyme
<b>Oxidative phase</b>	
Glucose 6-phosphate + NADP <sup>+</sup> → 6-phosphoglucono-δ-lactone + NADPH + H <sup>+</sup>	Glucose 6-phosphate dehydrogenase
6-Phosphoglucono-δ-lactone + H <sub>2</sub> O → 6-phosphogluconate + H <sup>+</sup>	Lactonase
6-Phosphogluconate + NADP <sup>+</sup> → ribulose 5-phosphate + CO <sub>2</sub> + NADPH	6-Phosphogluconate dehydrogenase
<b>Nonoxidative phase</b>	
Ribulose 5-phosphate ⇌ ribose 5-phosphate	Phosphopentose isomerase
Ribulose 5-phosphate ⇌ xylulose 5-phosphate	Phosphopentose epimerase
Xylulose 5-phosphate + ribose 5-phosphate ⇌ sedoheptulose 7-phosphate + glyceraldehyde 3-phosphate	Transketolase
Sedoheptulose 7-phosphate + glyceraldehyde 3-phosphate ⇌ fructose 6-phosphate + erythrose 4-phosphate	Transaldolase
Xylulose 5-phosphate + erythrose 4-phosphate ⇌ fructose 6-phosphate + glyceraldehyde 3-phosphate	Transketolase

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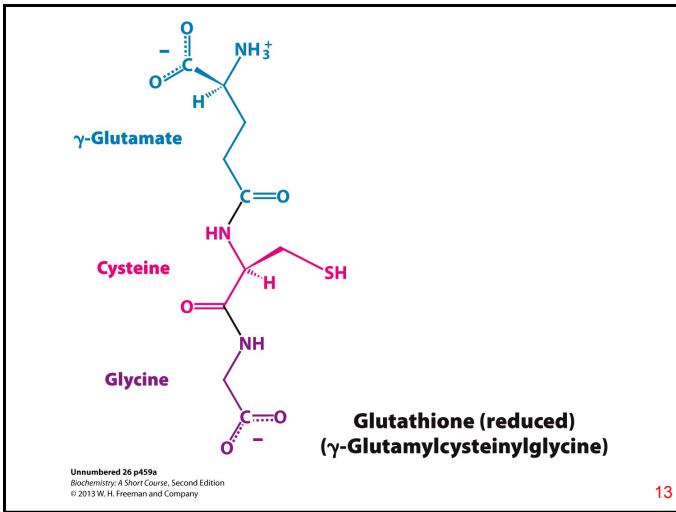


**Table 26.3 Tissues with active pentose phosphate pathways**

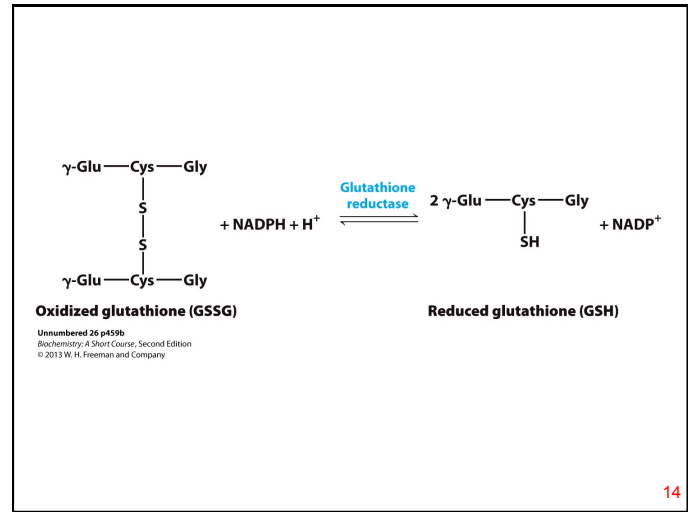
Tissue	Function
Adrenal glands	Steroid synthesis
Liver	Fatty acid and cholesterol synthesis
Testes	Steroid synthesis
Adipose tissue	Fatty acid synthesis
Ovaries	Steroid synthesis
Mammary glands	Fatty acid synthesis
Red blood cells	Maintenance of reduced glutathione

Table 26.3  
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