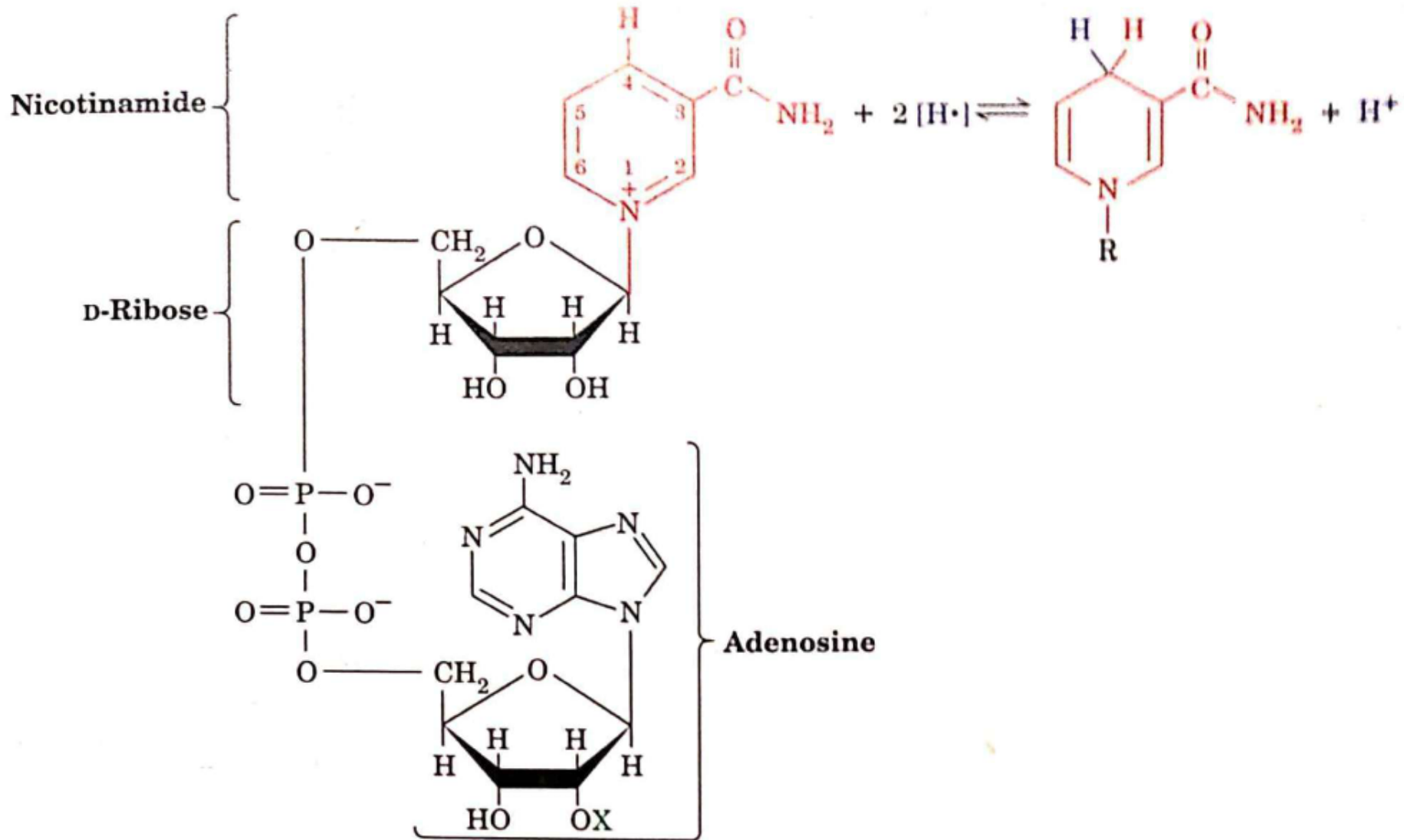


# Carbohydrates

**Metabolism: Pentose Phosphate Pathway**

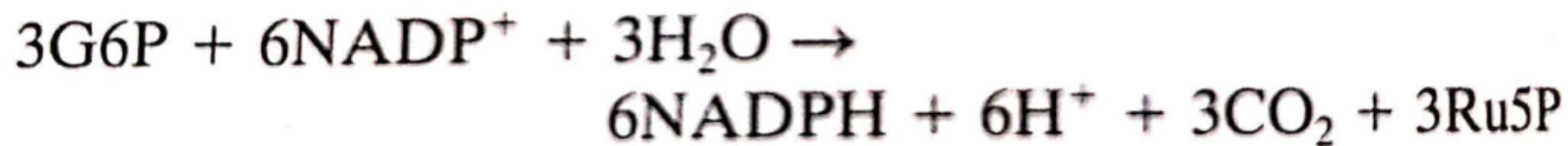
Oxidized form

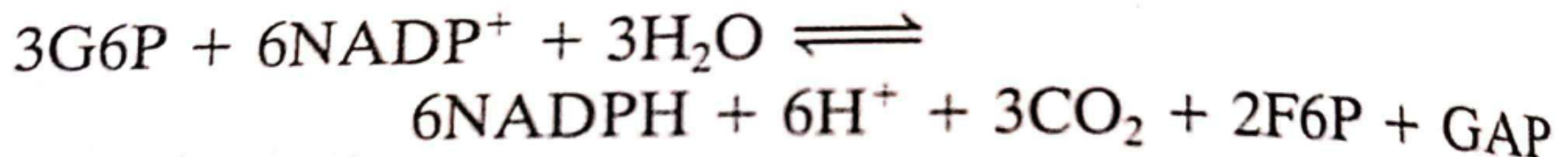
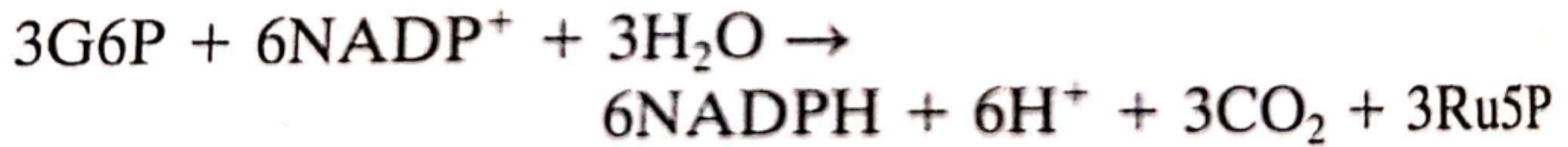
Reduced form

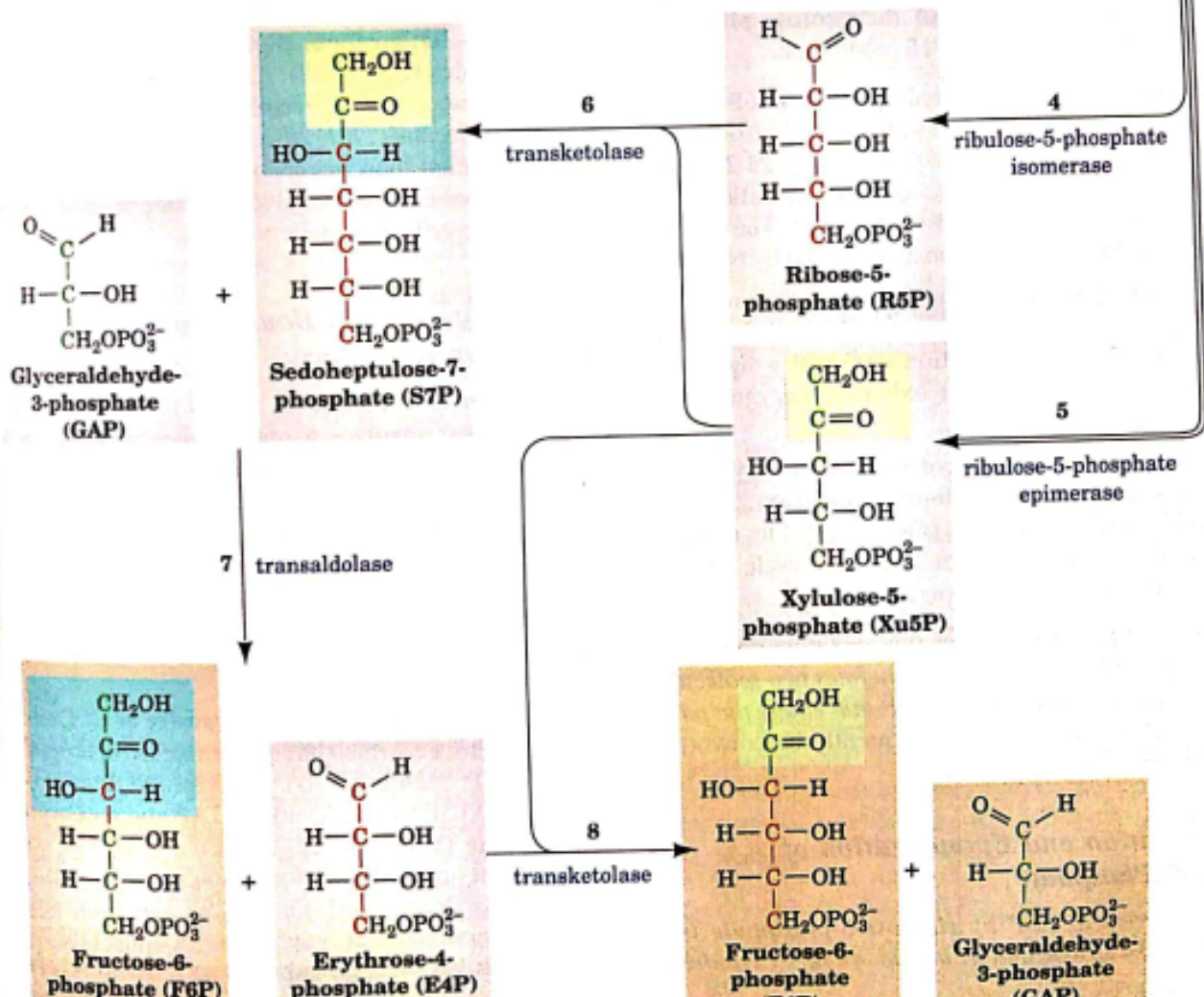
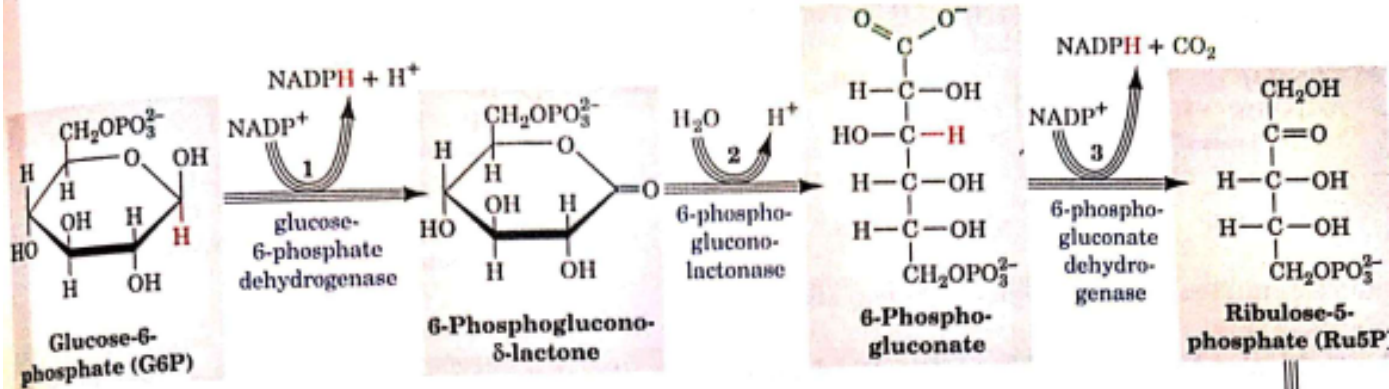


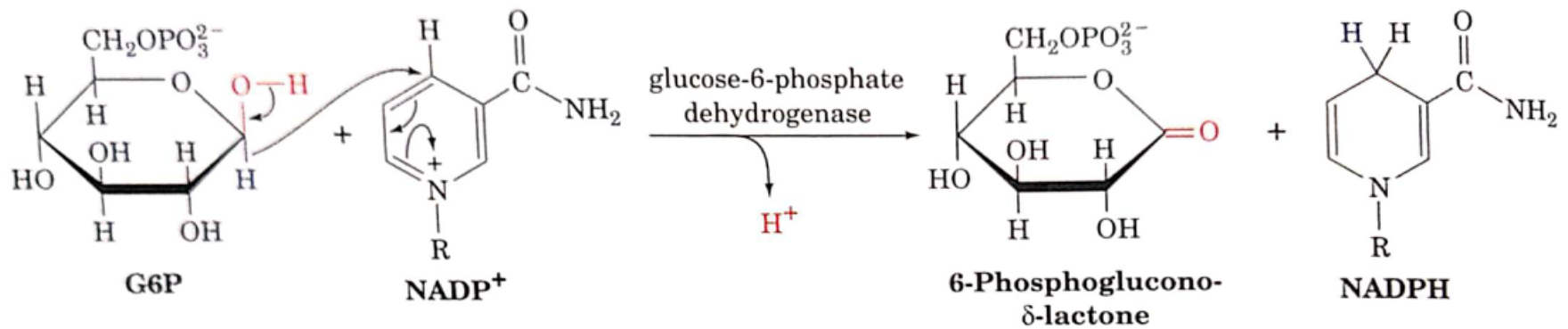
X = H      **Nicotinamide adenine dinucleotide (NAD<sup>+</sup>)**

X = PO<sub>3</sub><sup>2-</sup>      **Nicotinamide adenine dinucleotide phosphate (NADP<sup>+</sup>)**

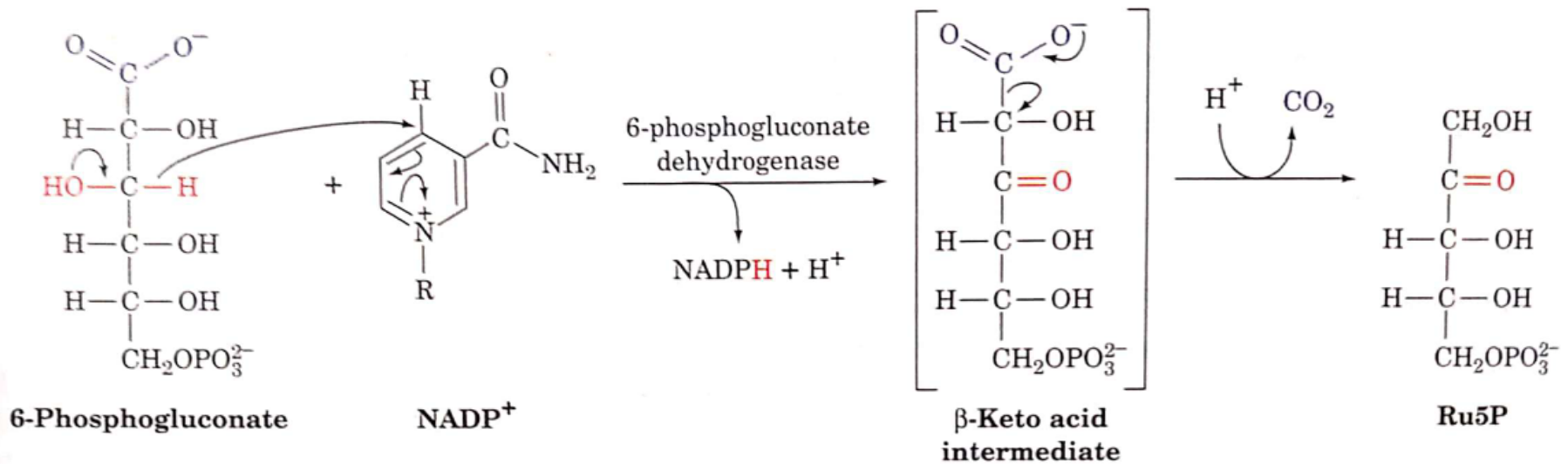






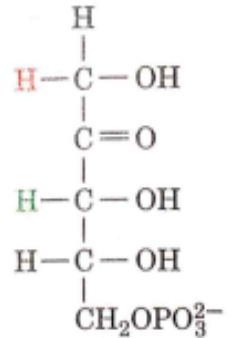


**FIGURE 23-26** The glucose-6-phosphate dehydrogenase reaction.



**FIGURE 23-27 The phosphogluconate dehydrogenase reaction.** Oxidation of the OH group forms an easily decarboxylated

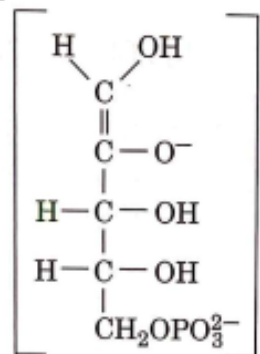
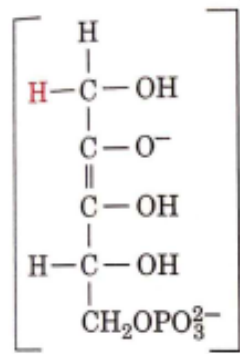
β-keto acid (although the proposed intermediate has not been isolated).



**Ru5P**

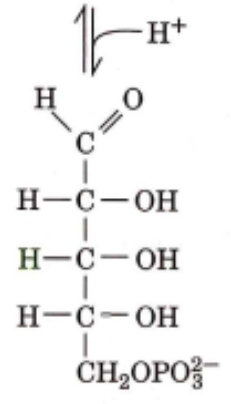
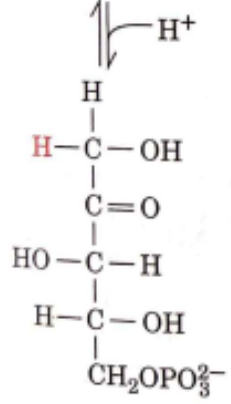
ribulose-5-phosphate epimerase

ribulose-5-phosphate isomerase



**2,3-Enediolate intermediate**

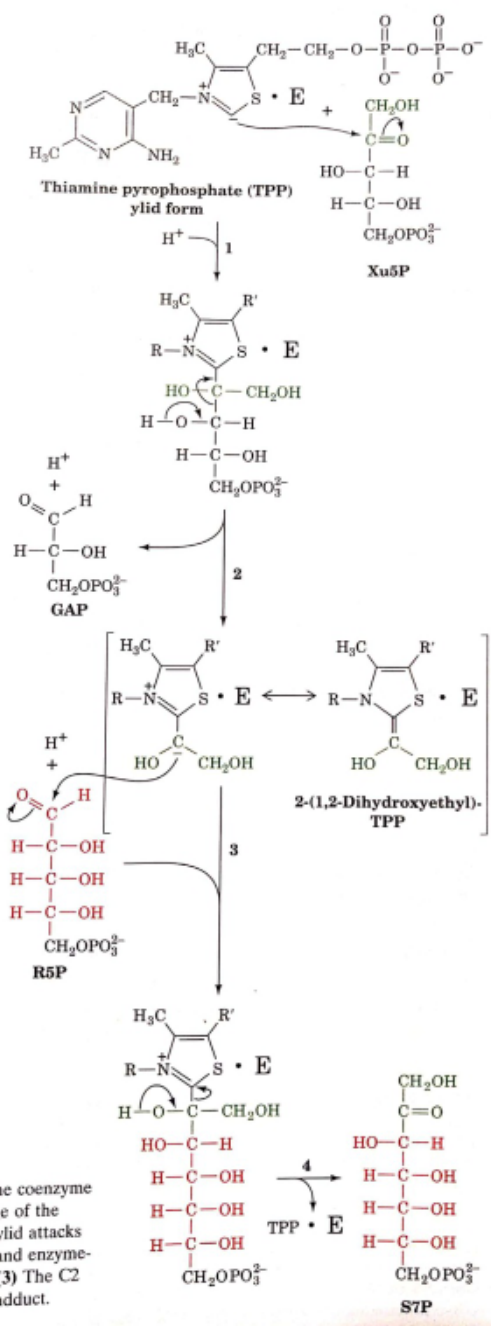
**1,2-Enediolate intermediate**



**Xu5P**

**R5P**





the coenzyme  
 age of the  
 P ylid attacks  
 P and enzyme-  
 l. (3) The C2  
 P adduct.  
 ie.

