

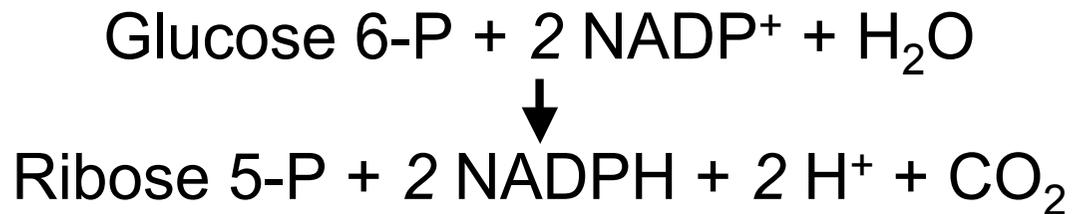
Chap IX. La voie des pentoses phosphates

- production de NADPH
- synthèse d'oses à 5 carbones

Figures tirées de

Lehninger Principles of Biochemistry
Fourth Edition

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Ribose 5-P = constituant de : ATP, CoA, NAD⁺, FAD, ARN, ADN

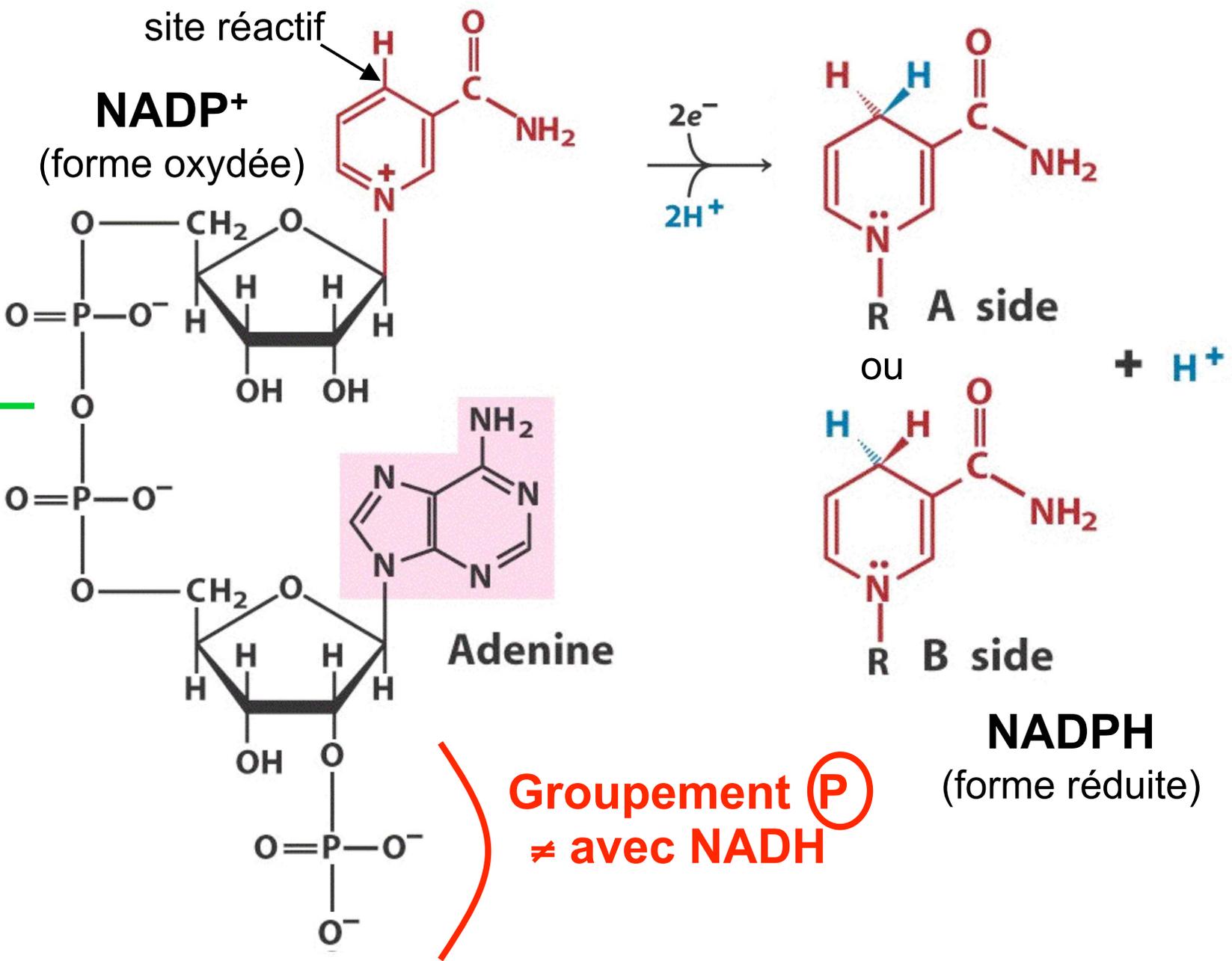
- interconversion d'oses à 3, 4, 5, 6, 7 carbones
- a lieu dans le cytosol

Autres noms : shunt des pentoses,
voie oxydative du phosphogluconate

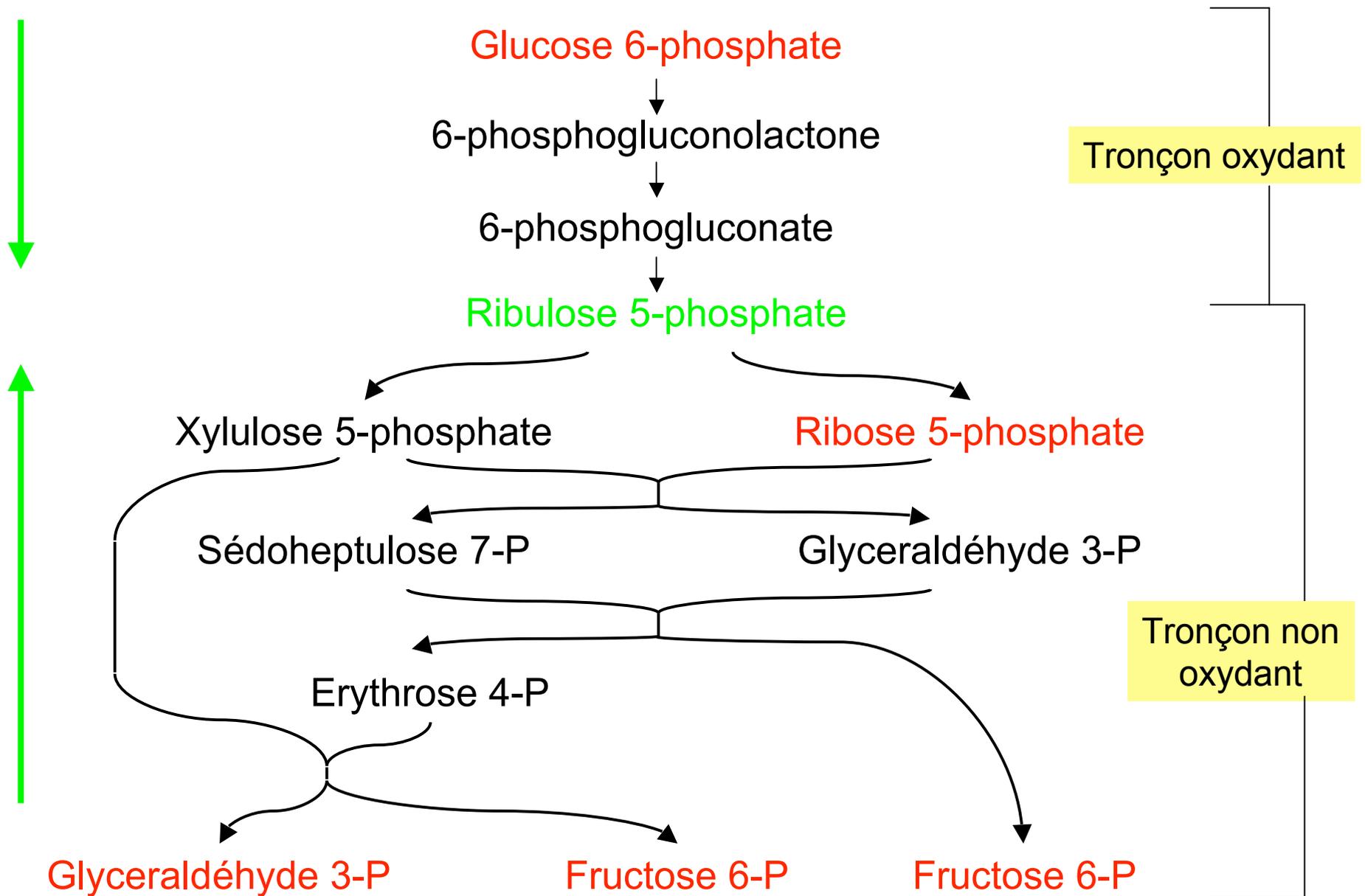
Nicotinamide Adénine Dinucléotide Phosphate

N u c l é o t i d e

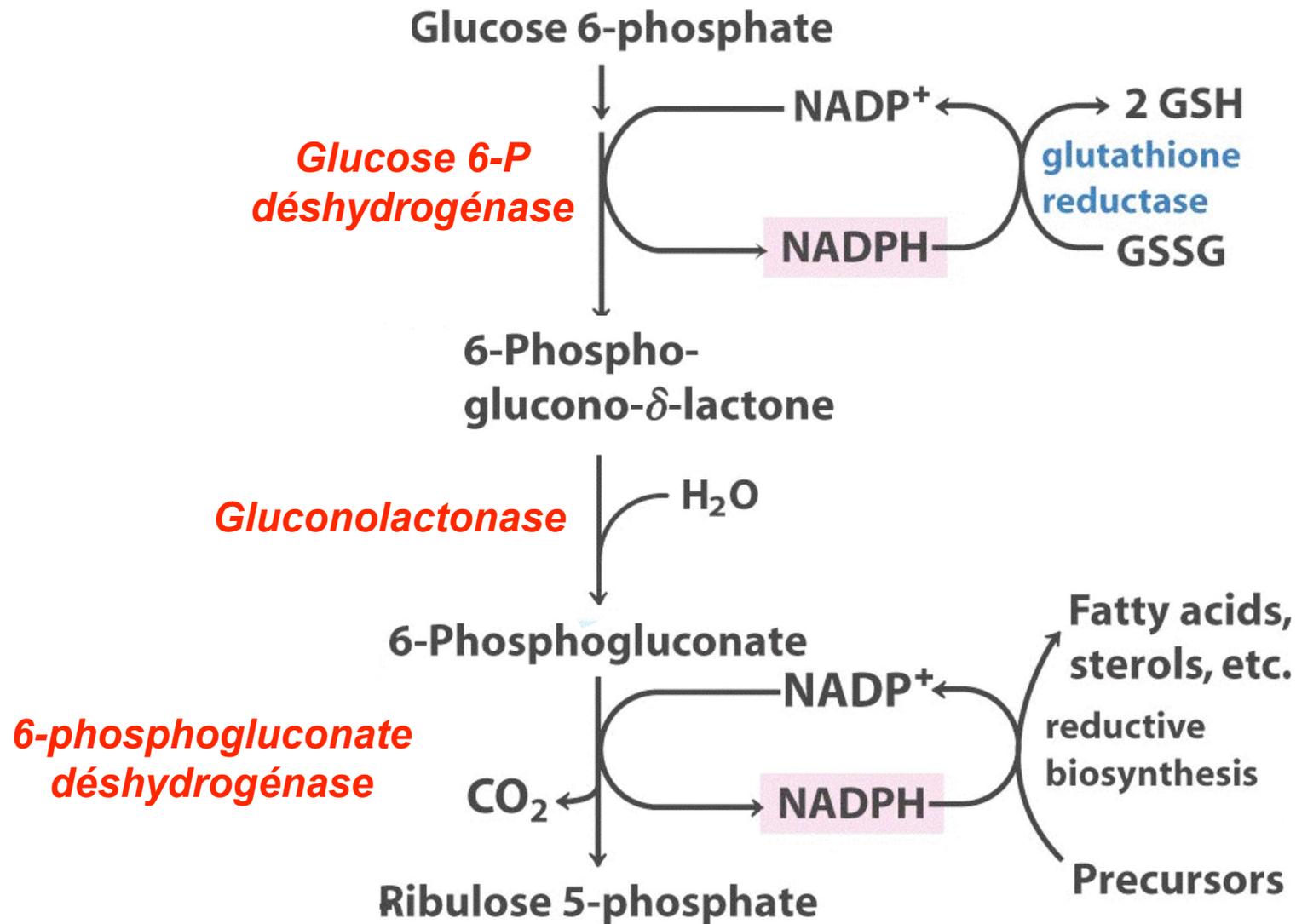
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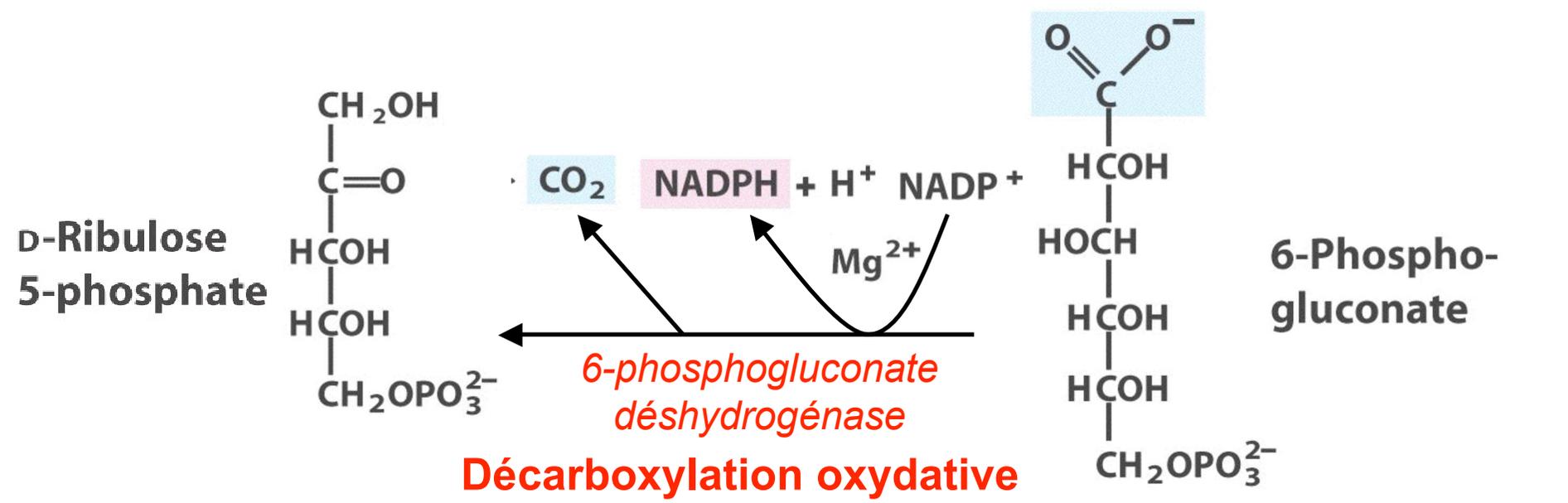
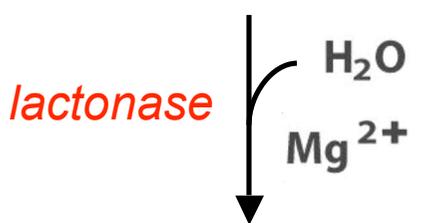
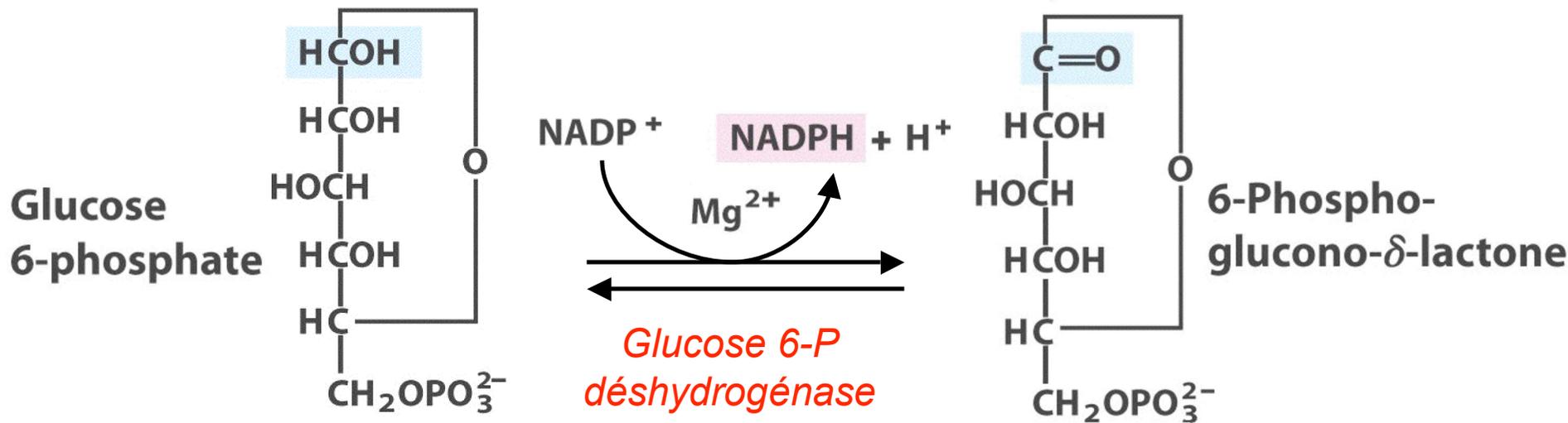


Vue générale de la voie des pentoses phosphates

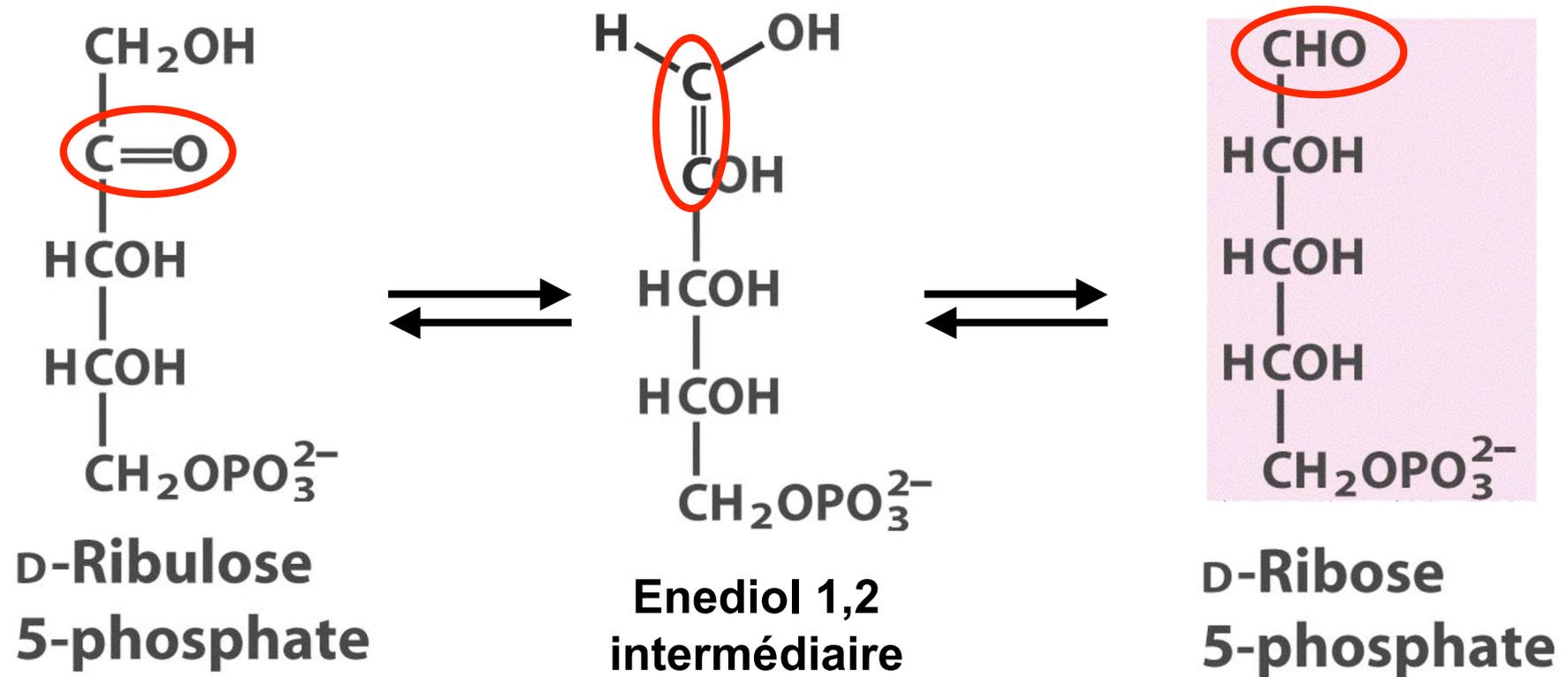


I. Partie oxydative de la voie des pentoses





II. Partie non oxydative

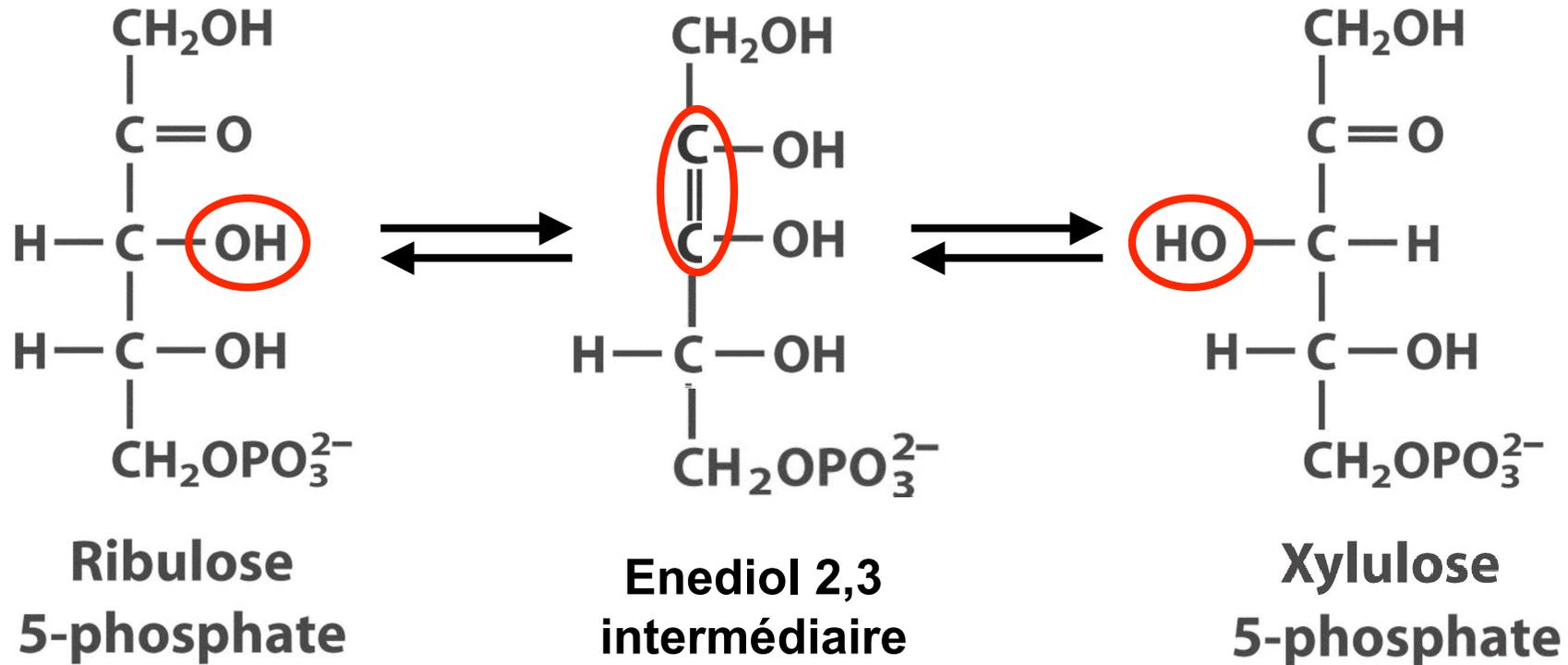


Phosphopentose isomérase



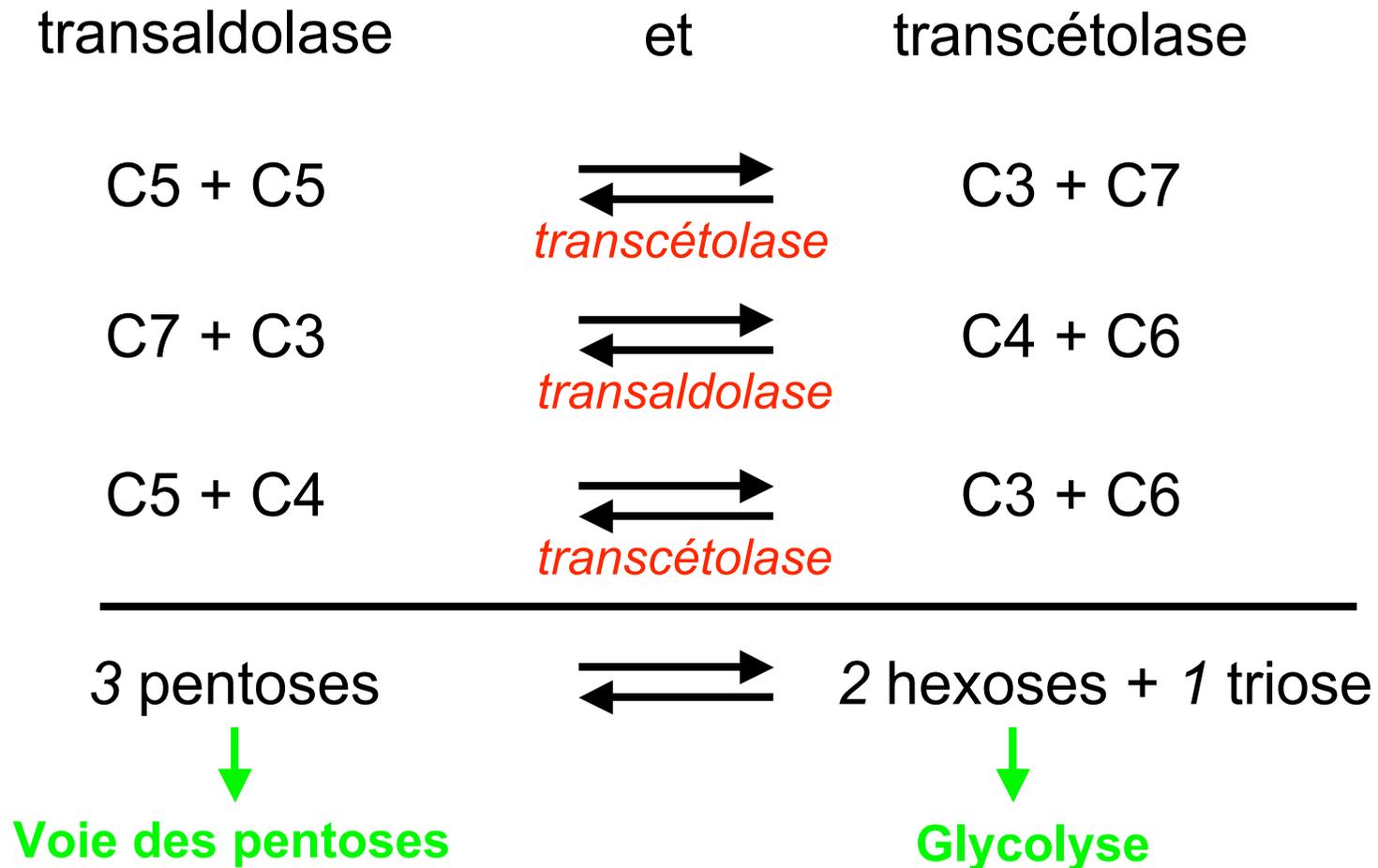
Intermédiaire = énediol

Epimérisation



épimérase

III. Lien entre la voie des pentoses et la glycolyse :

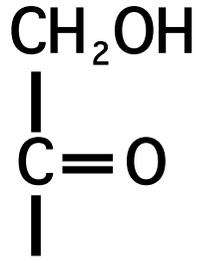


Transcétolase : transfère des unités de **2 C**

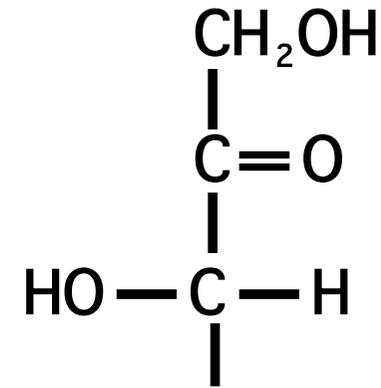
Transaldolase : transfère des unités de **3 C**

Donneur d'unités C = CETOSE

Accepteur d'unités C = ALDOSE

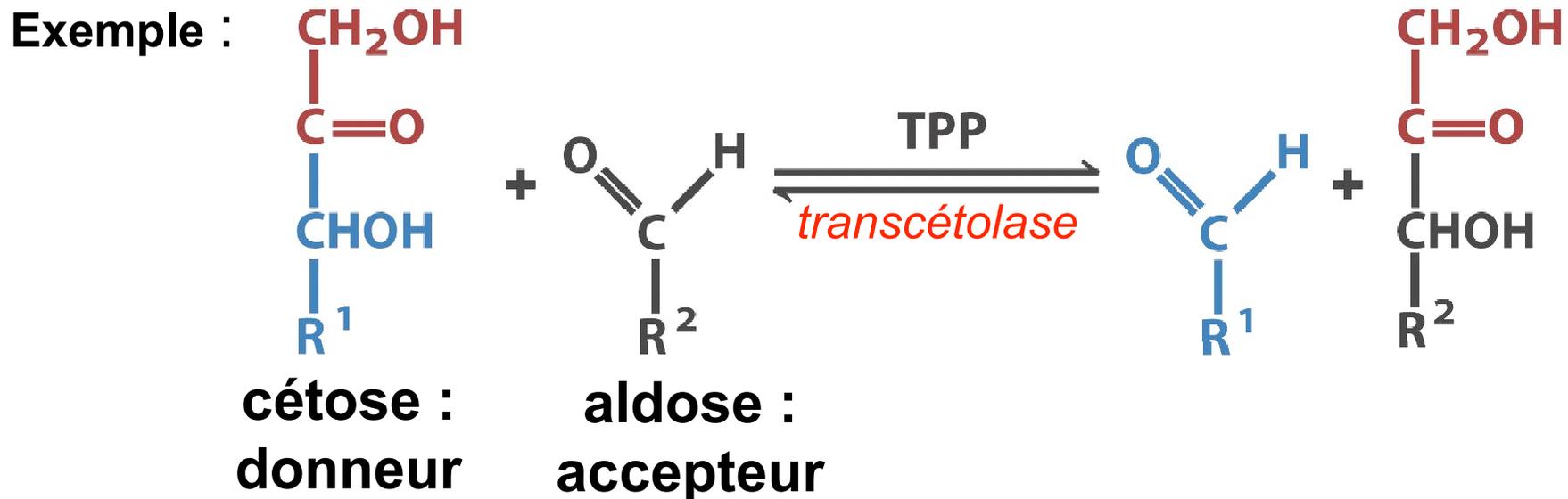


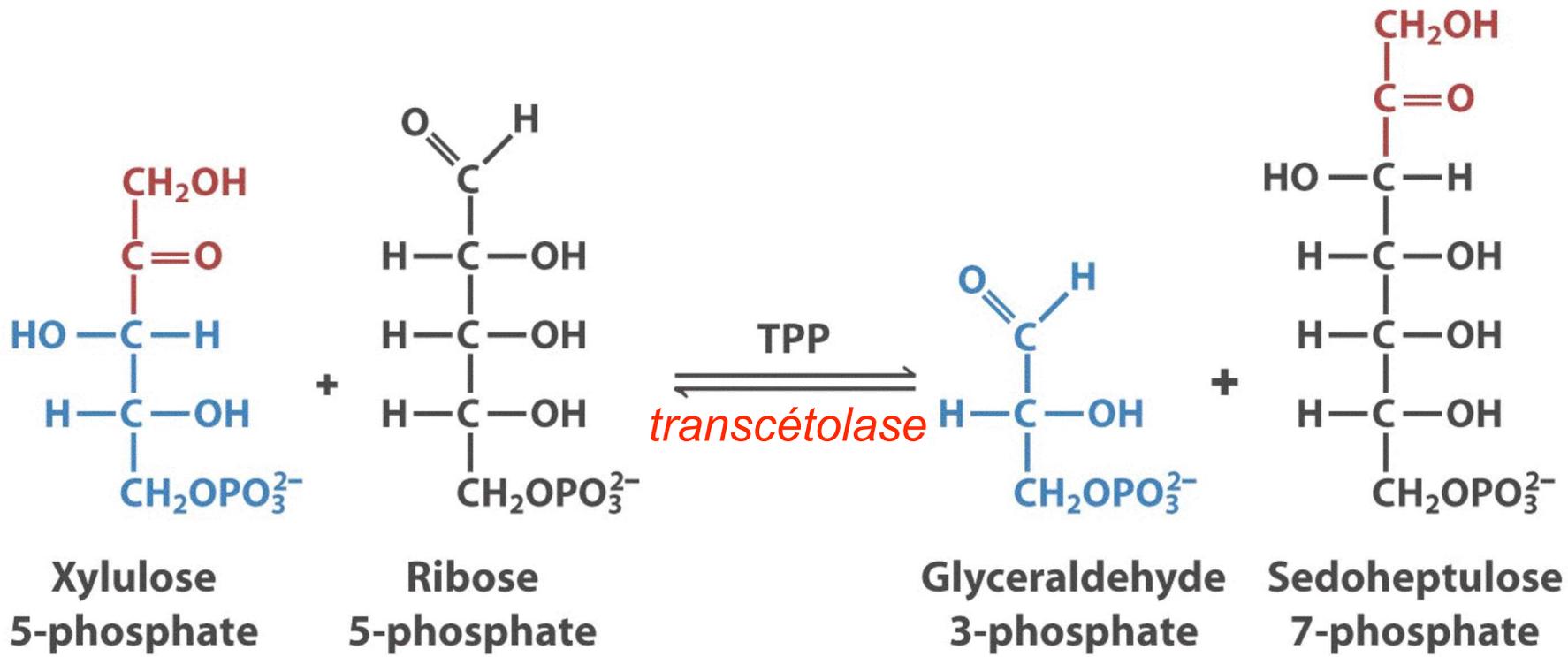
Transféré par
transcétolase

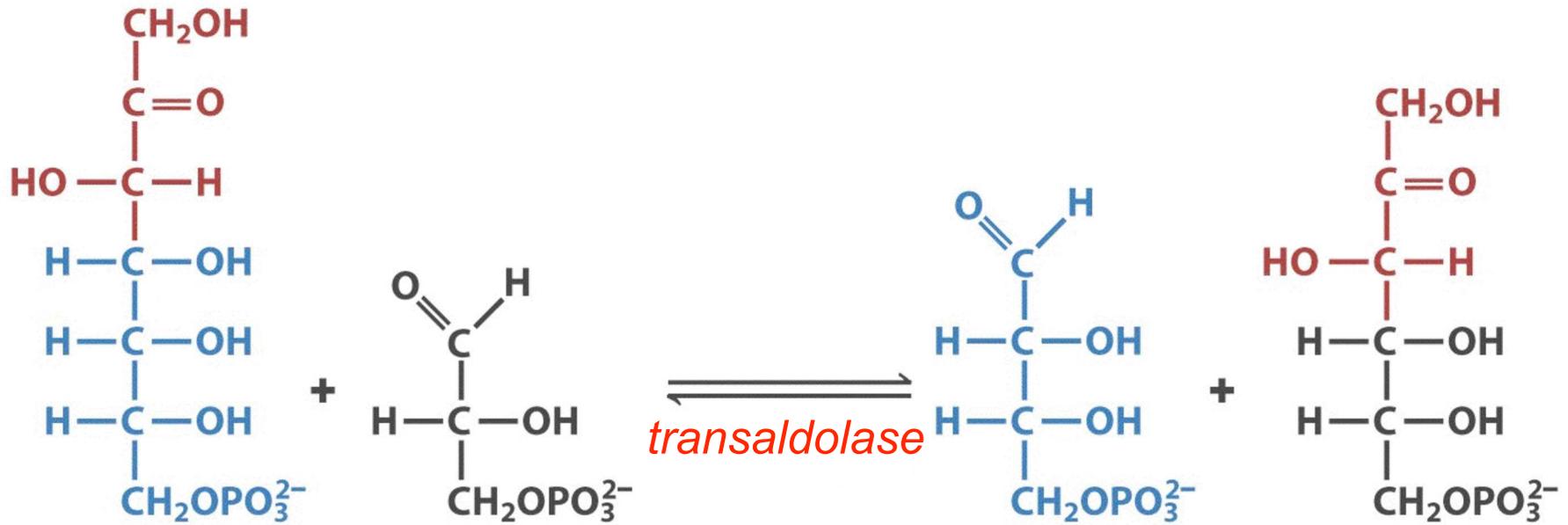


Transféré par
transaldolase

- C3 avec configuration du xylulose et non du ribulose
- Conversion de l'un en l'autre par *phosphopentose épimérase*





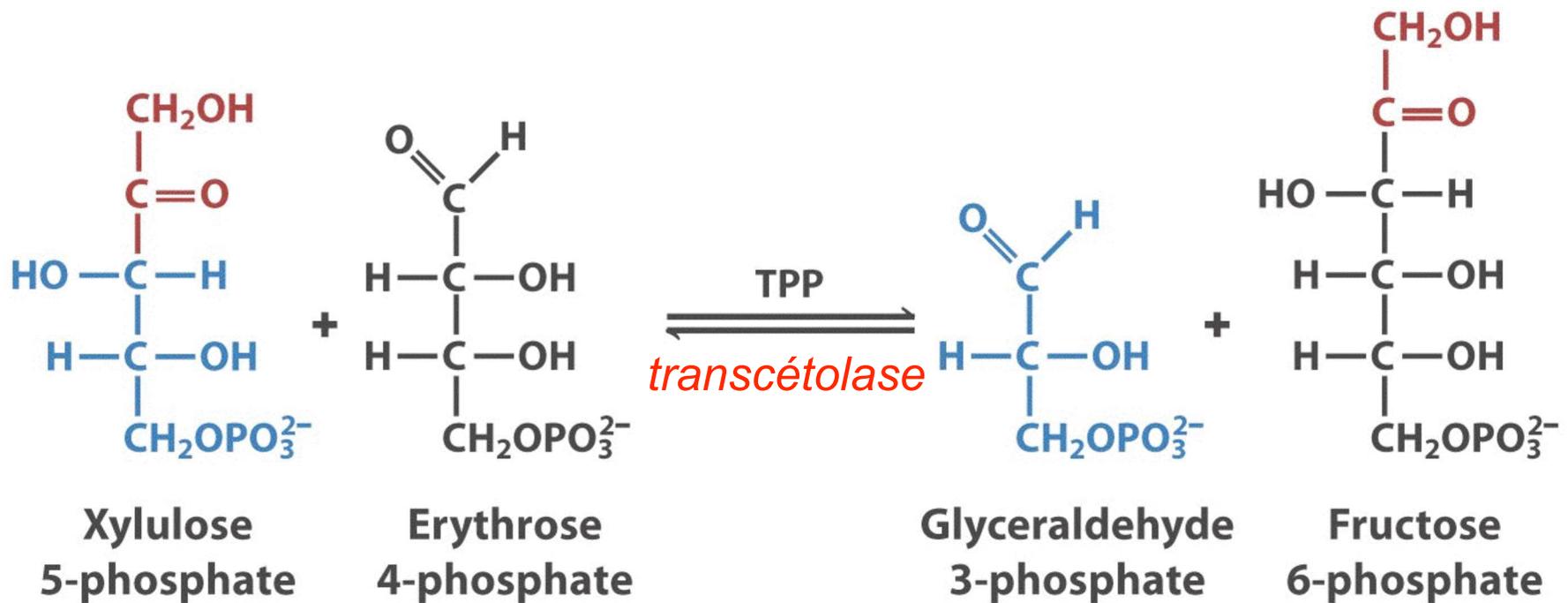


**Sedoheptulose
7-phosphate**

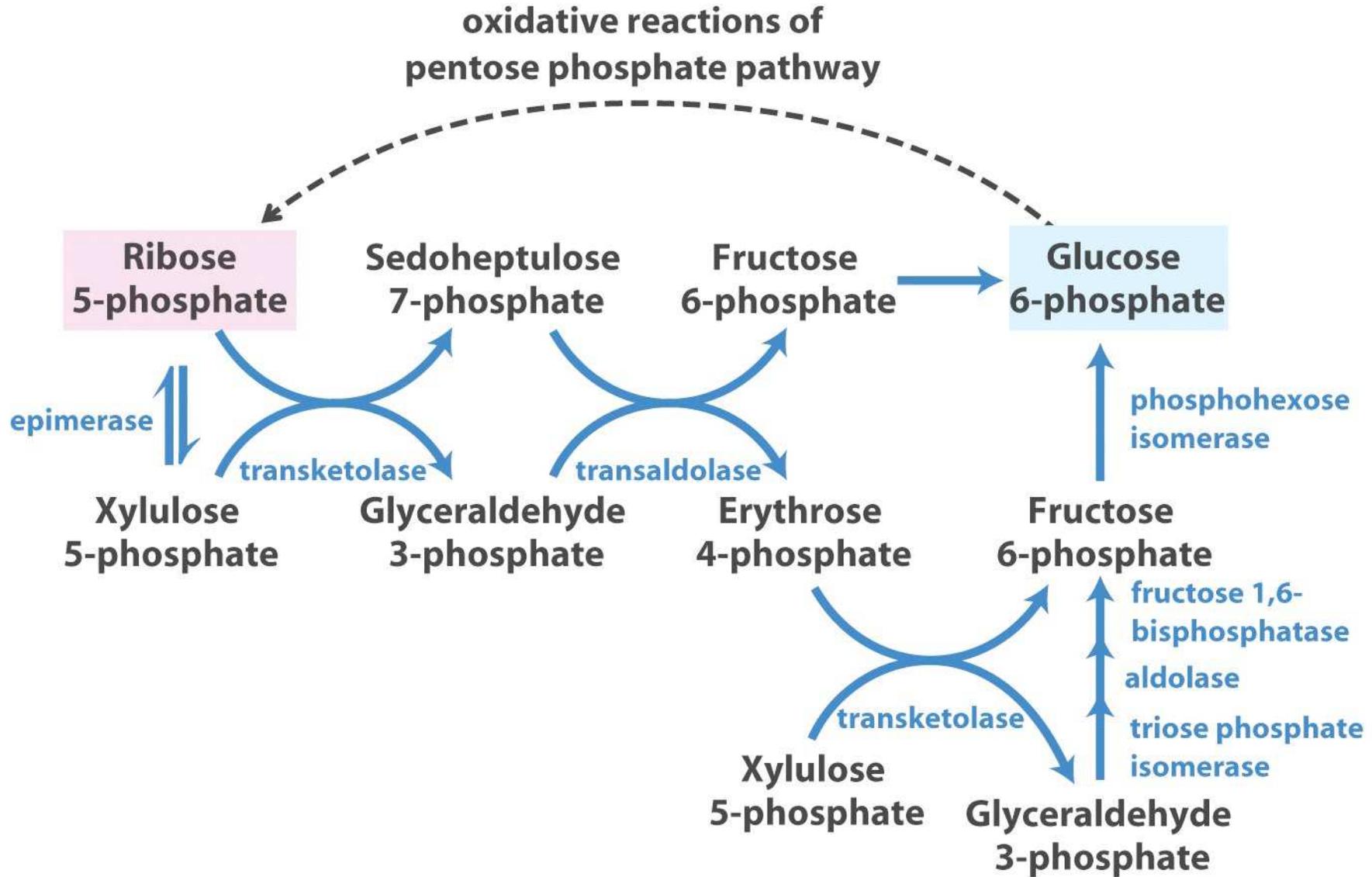
**Glyceraldehyde
3-phosphate**

**Erythrose
4-phosphate**

**Fructose
6-phosphate**



Bilan des interconversions :



IV. Bilan

2 xylulose 5-P + ribose 5-P



2 fructose 6-P + glyceraldéhyde 3-P

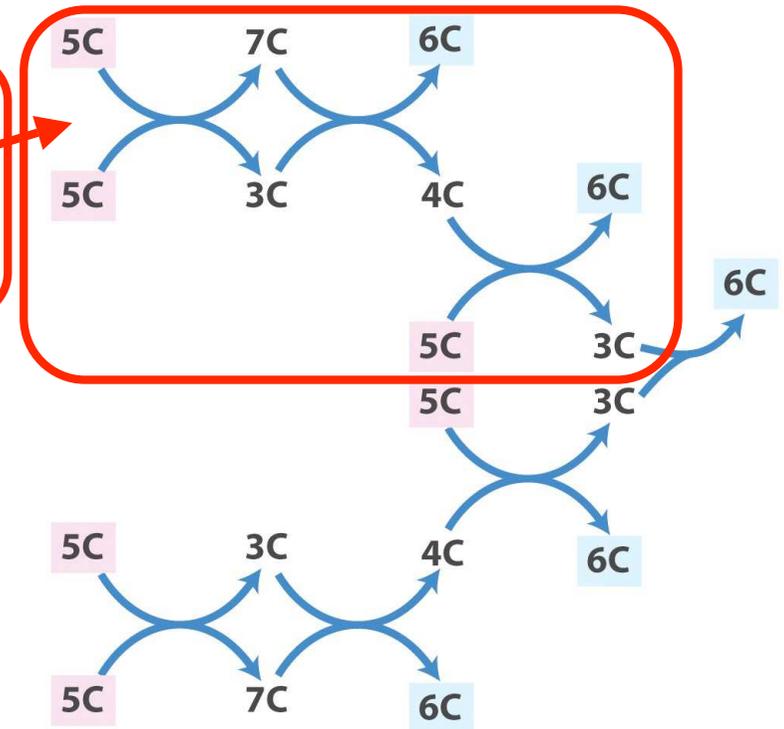
or xylulose 5-P \rightleftharpoons ribose 5-P

donc

3 ribose 5-P

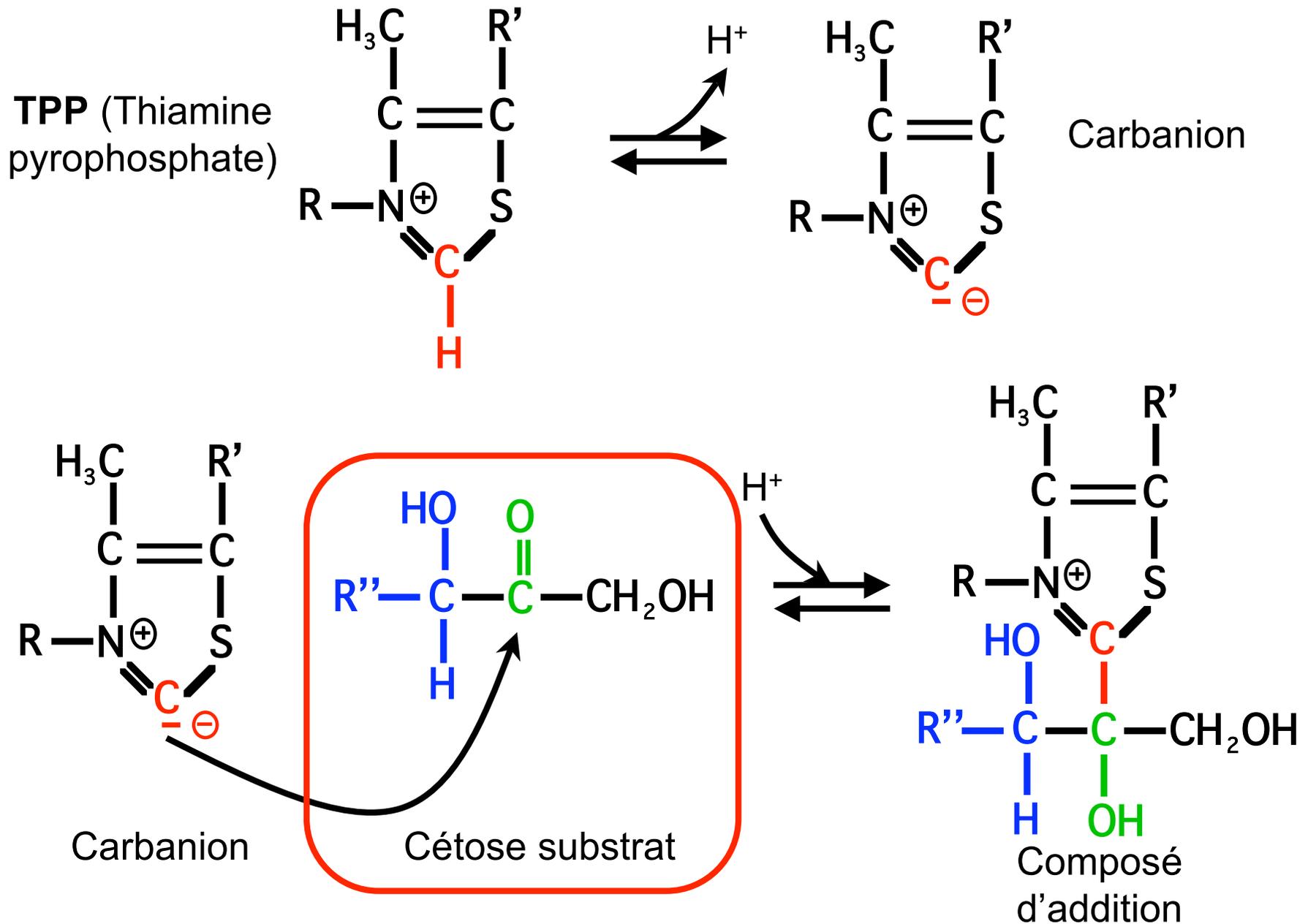


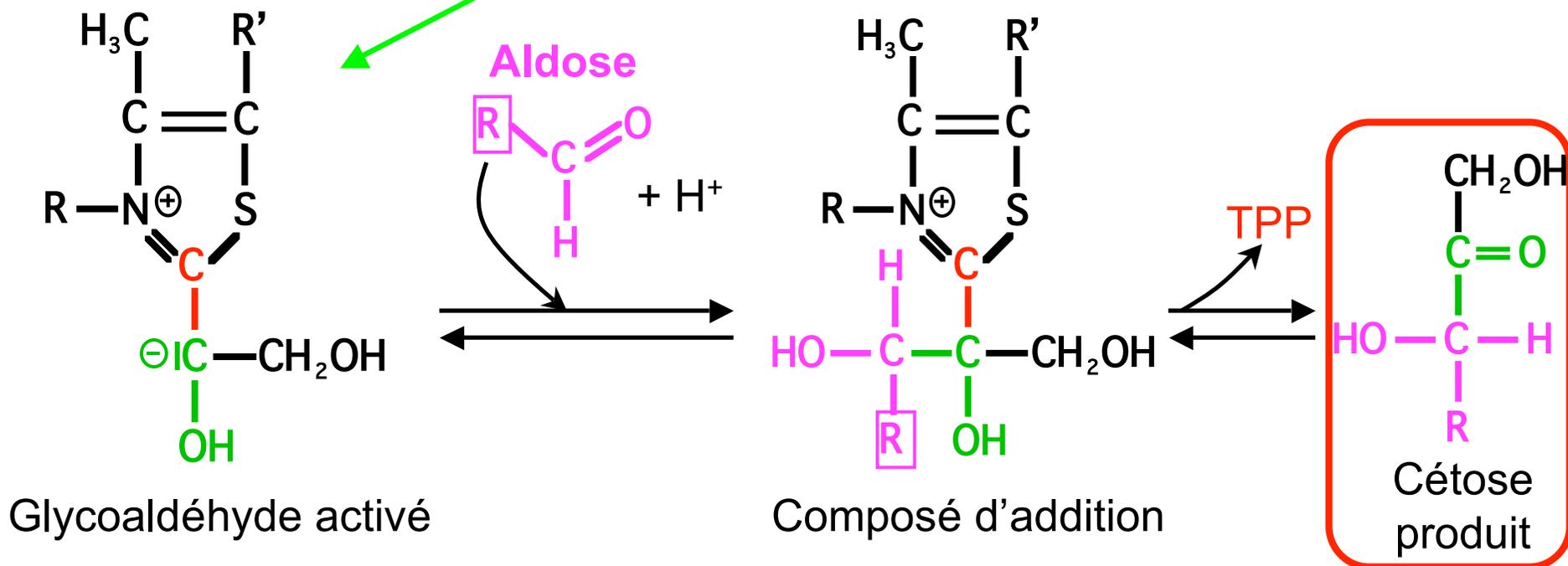
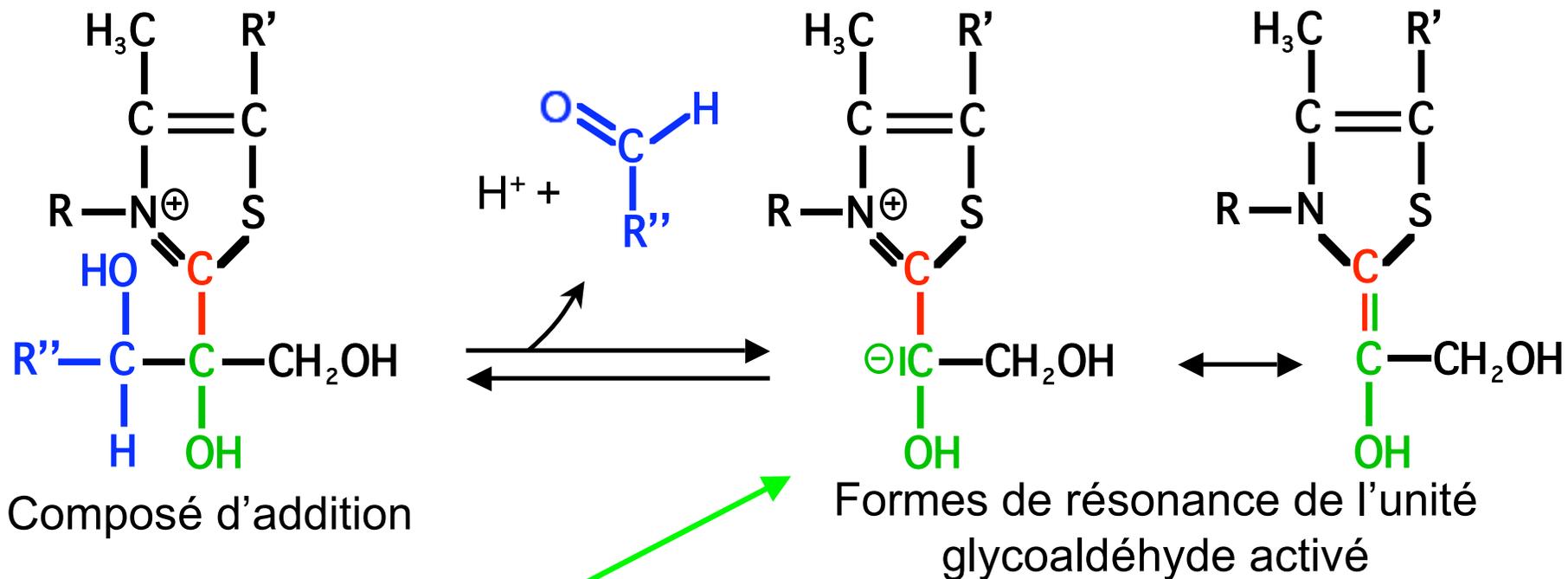
2 fructose 6-P + 1 glyceraldéhyde 3-P



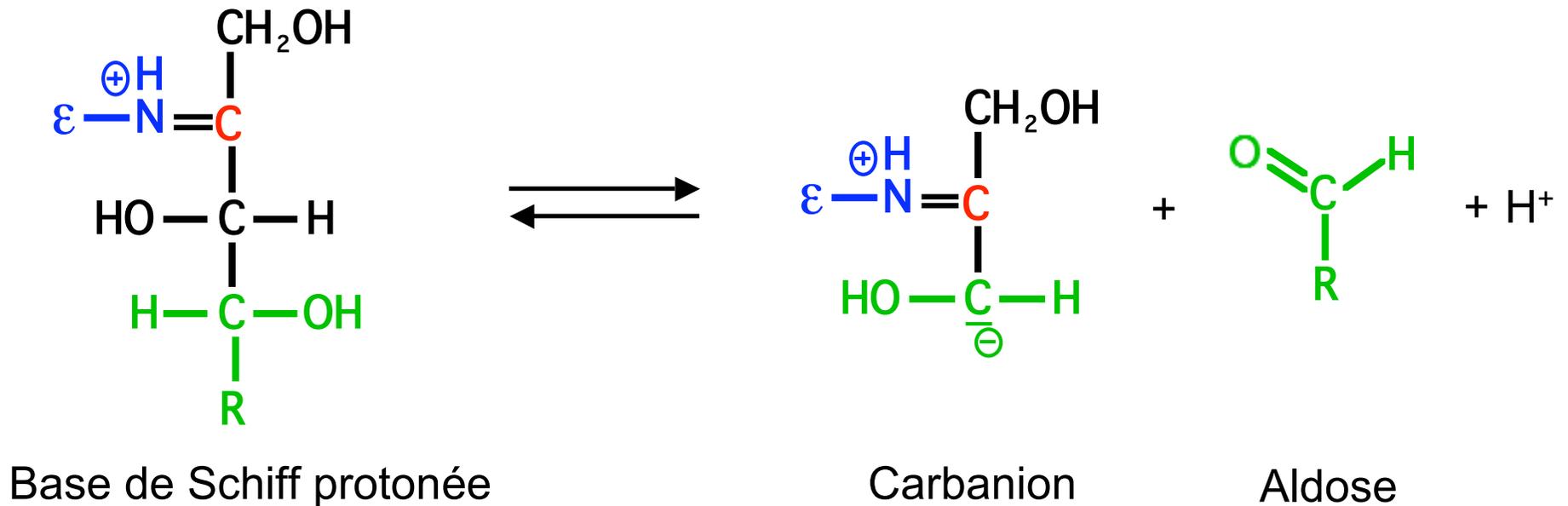
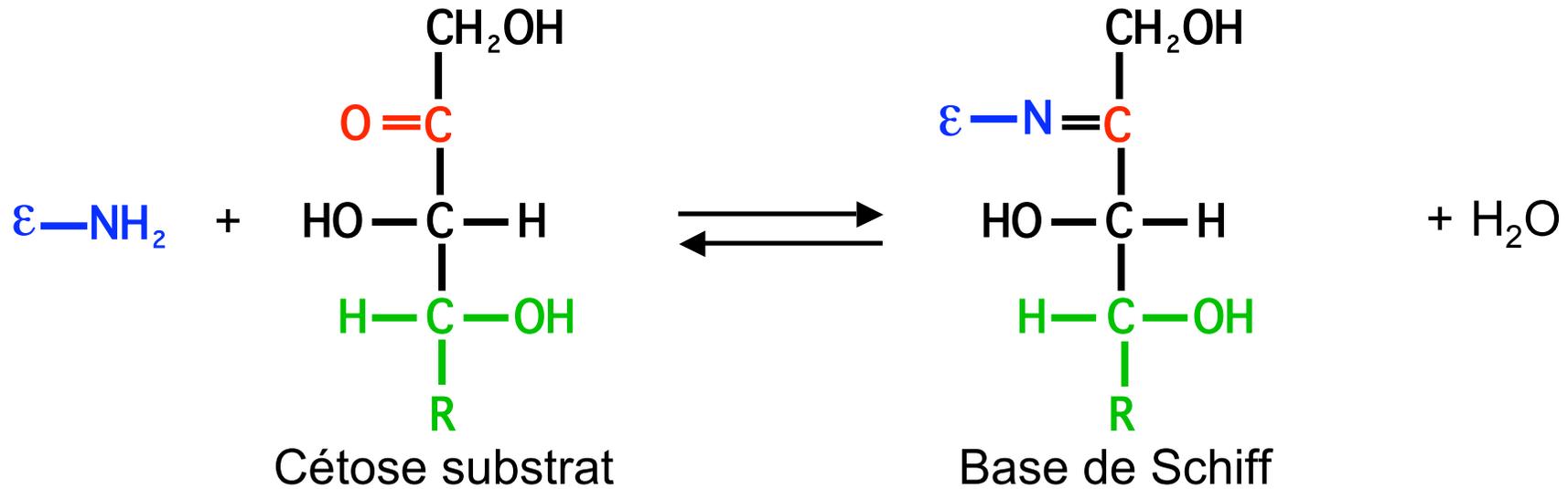
➤ L'excès de ribose 5-P produit par la voie des pentoses peut être utilisé par la glycolyse

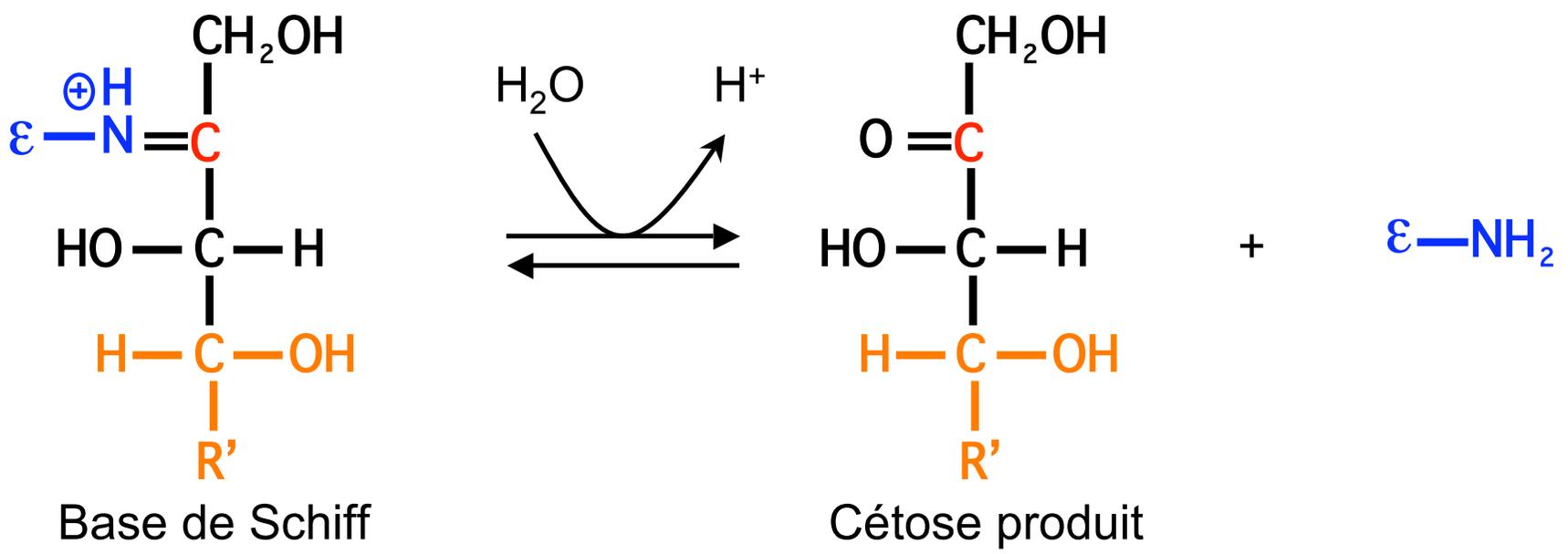
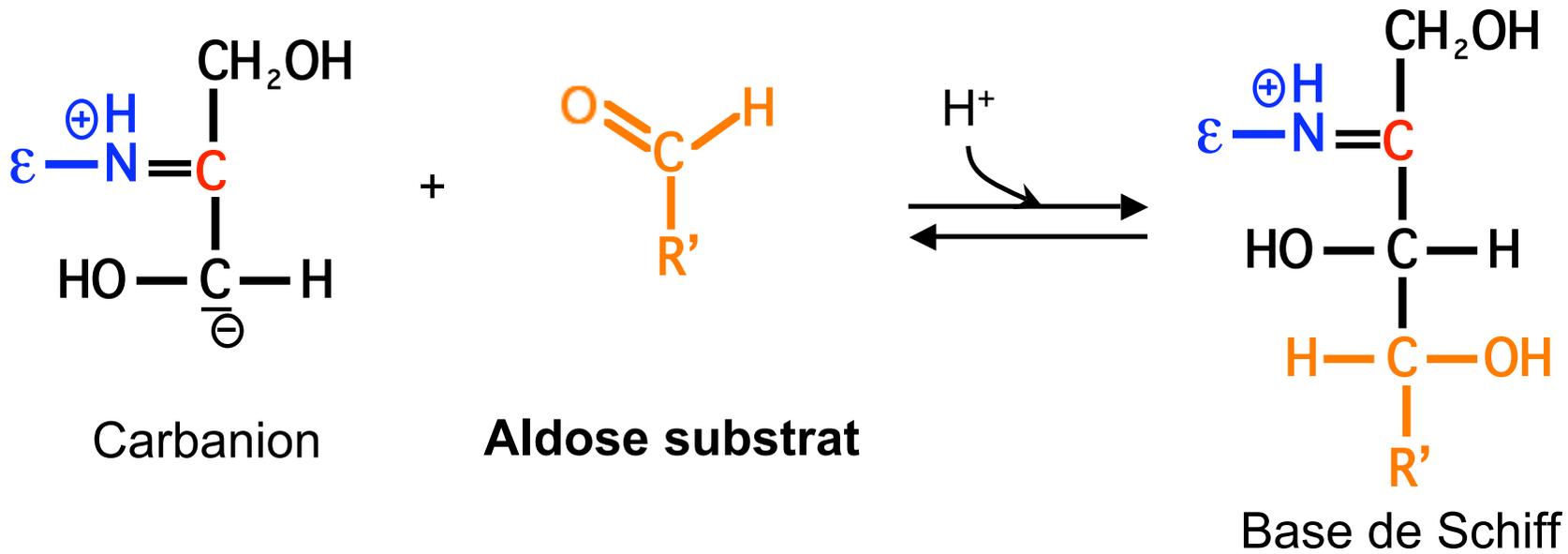
V. Mécanisme de transcétolisation





VI. Mécanisme de la transaldolisation





VII. Régulation globale de la voie des pentoses

Partie oxydative :

par taux NADP^+ / NADPH

si NADP^+ élevé, stimulation

Partie non oxydative :

par la disponibilité des substrats

(pas bien élucidé)