

# Hexose Monophosphate Shunt (Pentose Phosphate Pathway)

**Dr Piyush Tailor**

Associate Professor

Department of Biochemistry

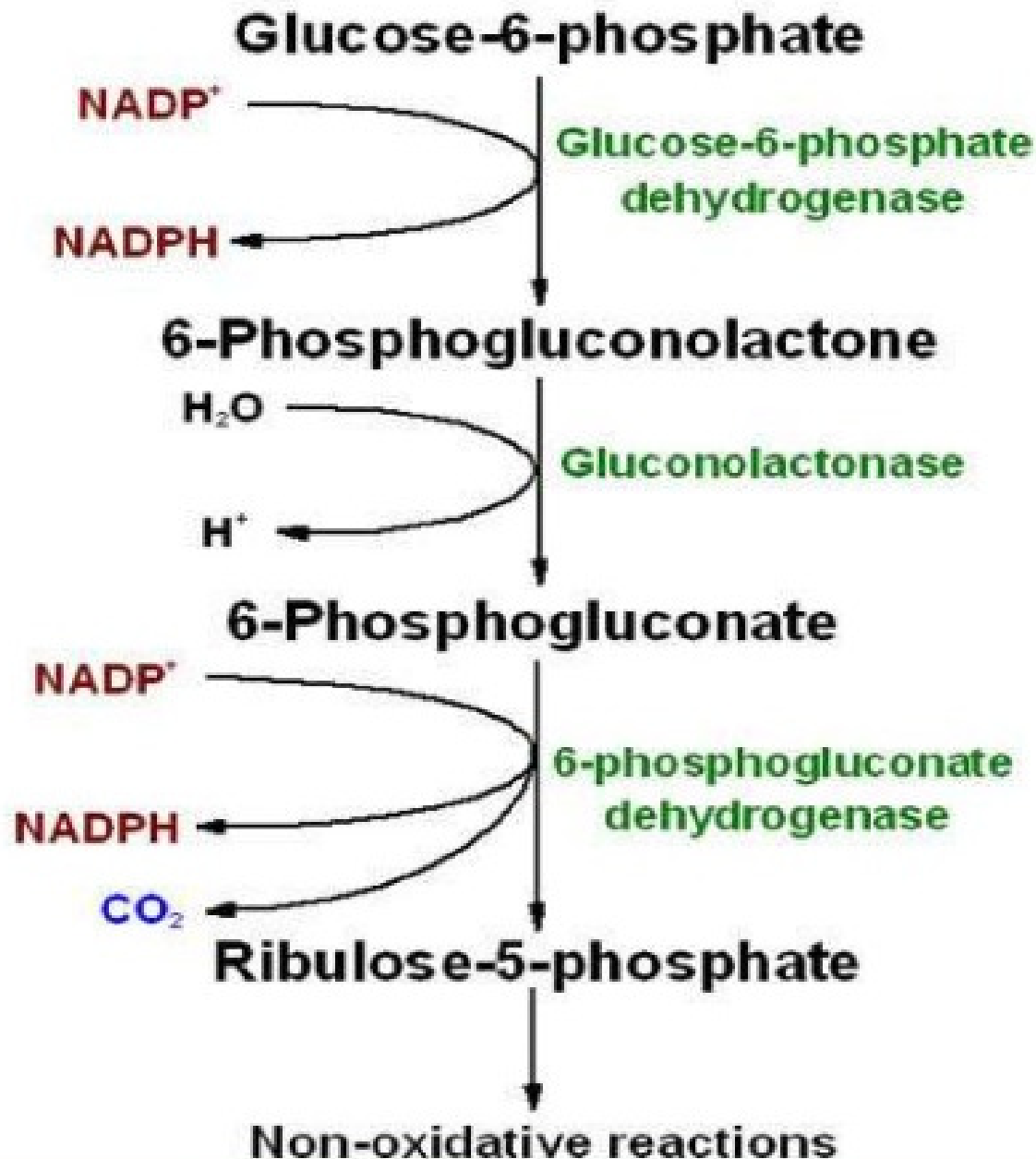
Govt. Medical College

Surat

# HMP Pathway has two main functions

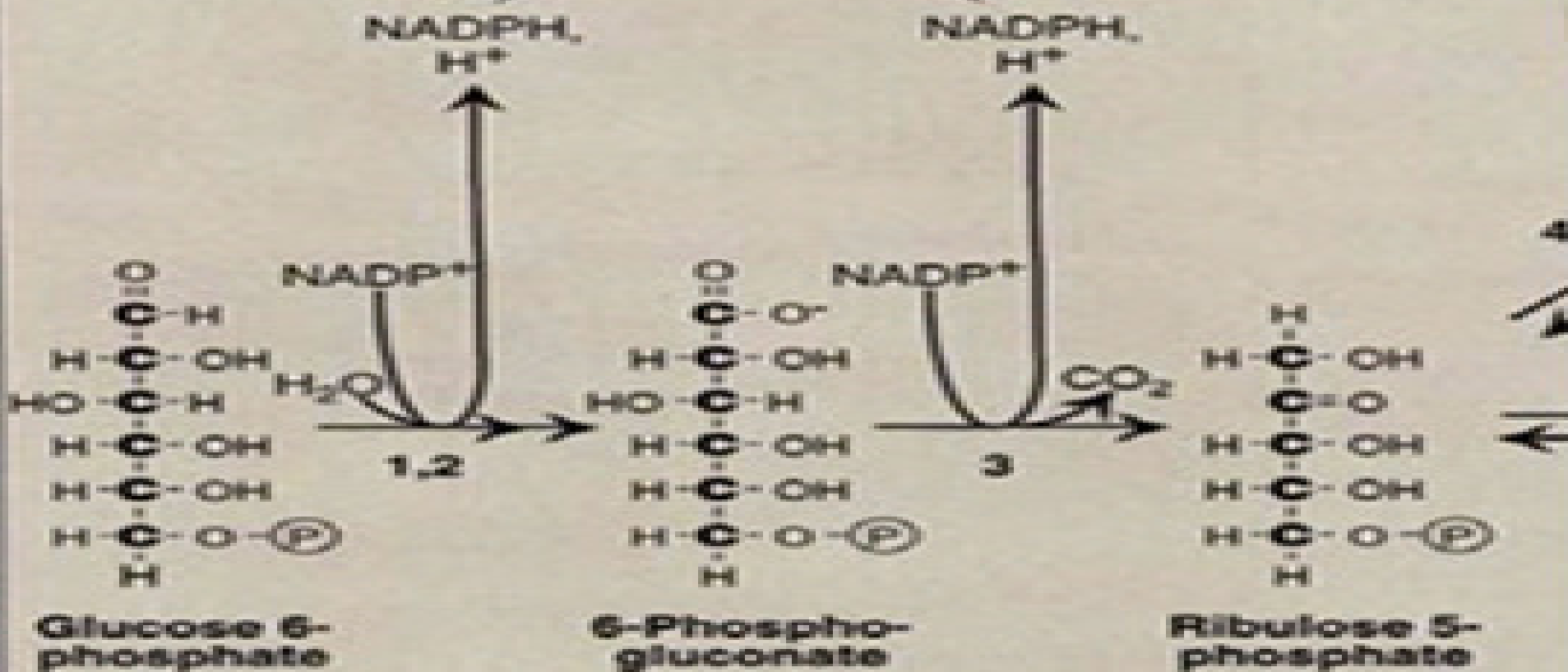
- Active in
  - liver, adipose tissue, adrenal cortex, thyroid, erythrocytes, testes.
- **Production of NADPH**
  - For syntheses of
    - Fatty acids,
    - Steroid hormones,
    - Cholesterol
  - Reduced glutathione for erythrocytes and other cells.
- **Production of Ribose sugar**
  - For nucleotide (ATP, GTP ) and nucleic acid synthesis (DNA, RNA).

# Oxidative Stage of Pentose Phosphate Pathway

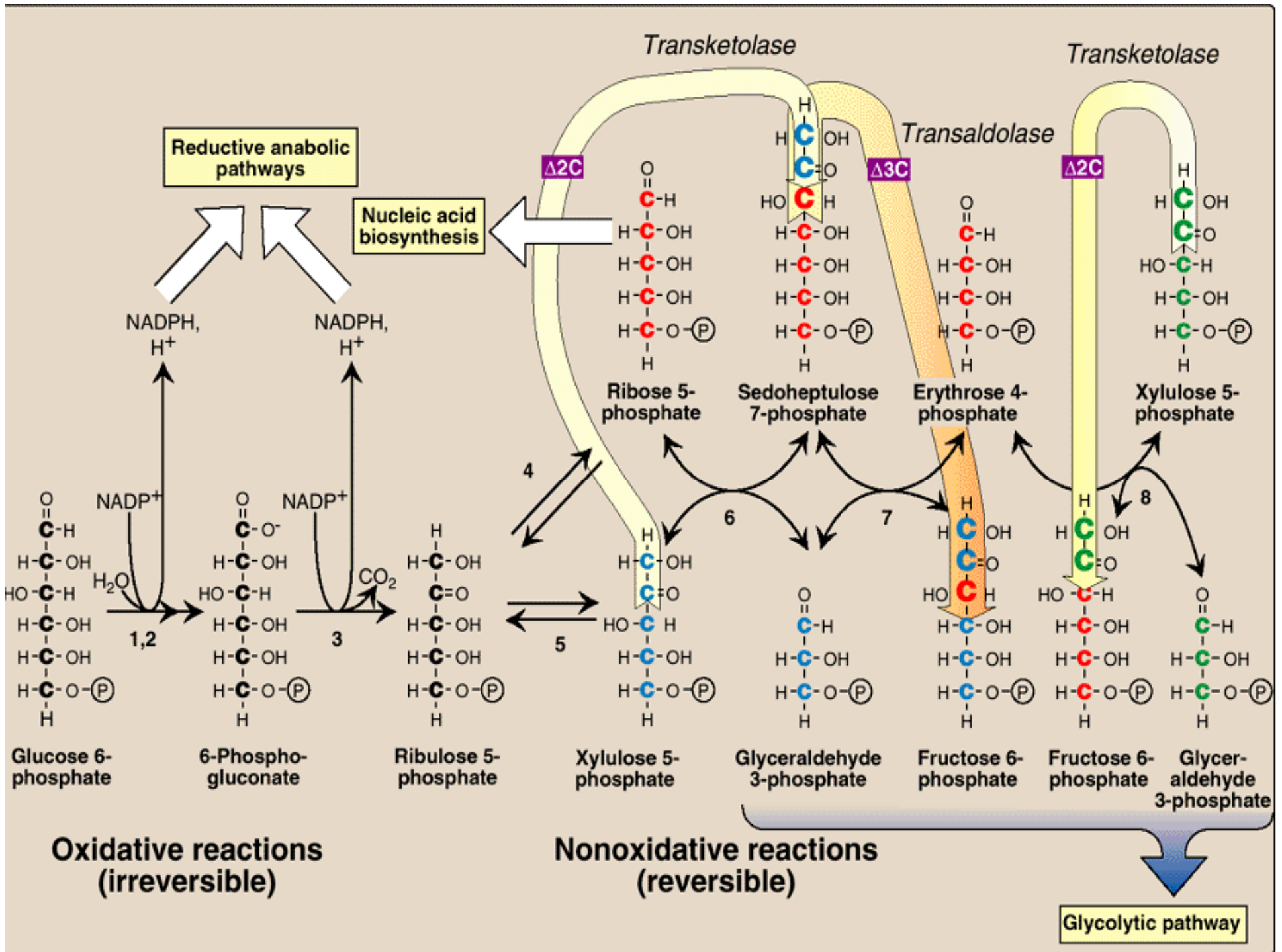


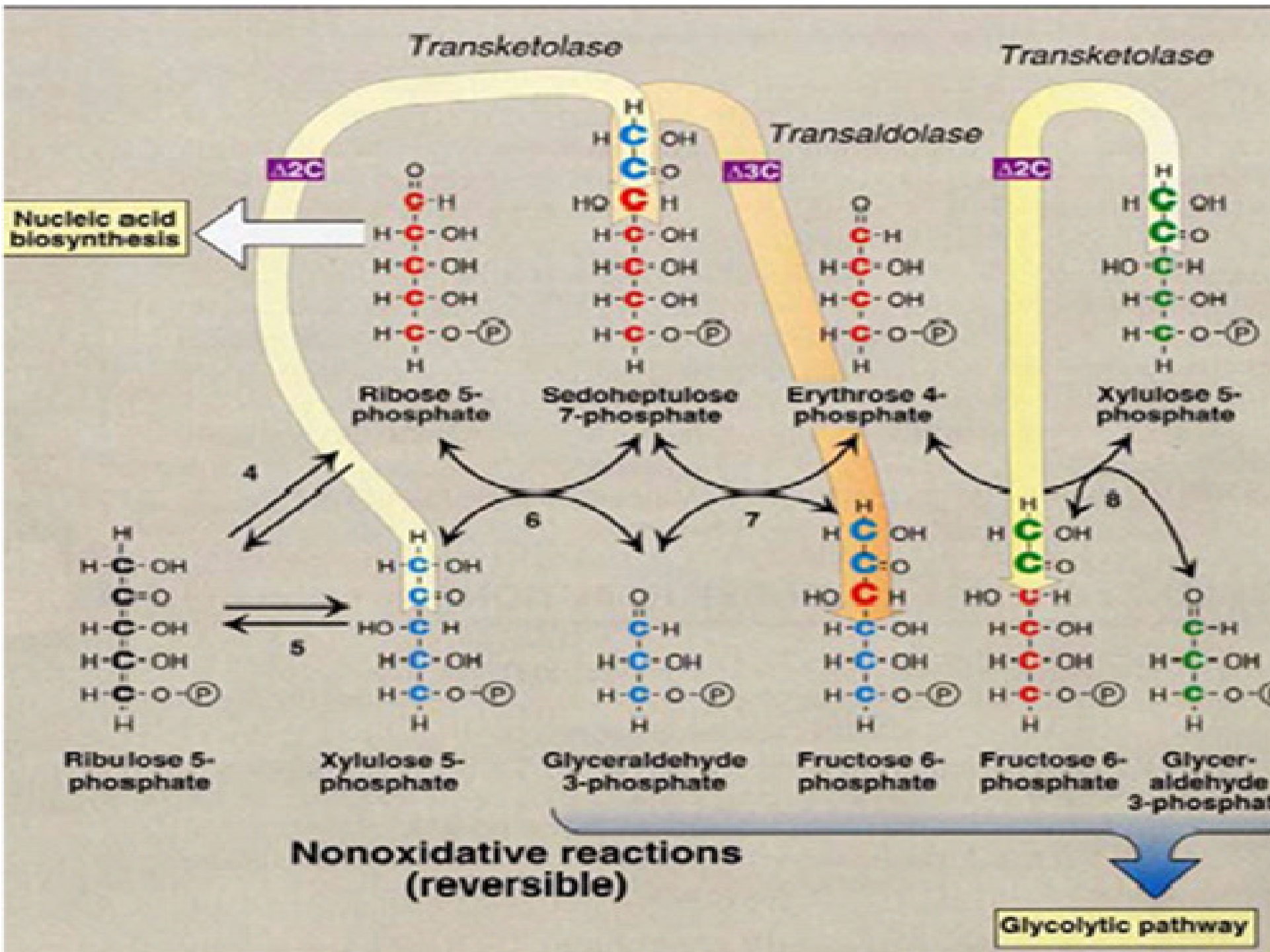
**Reductive anabolic pathways**

**Nucleic acid biosynthesis**

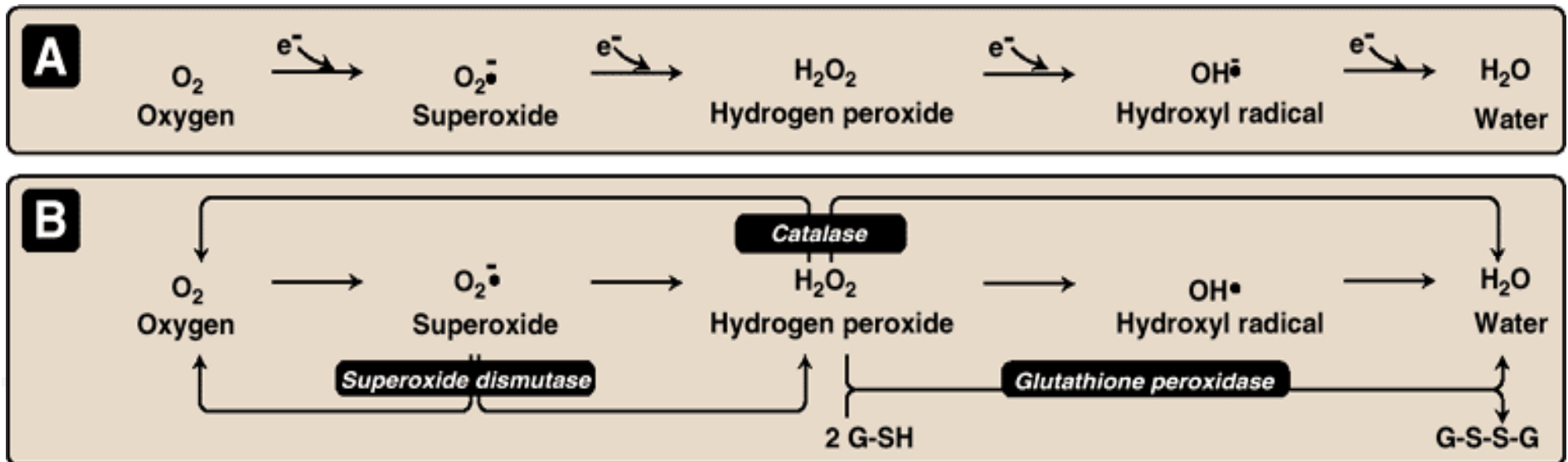


**Oxidative reactions (irreversible)**



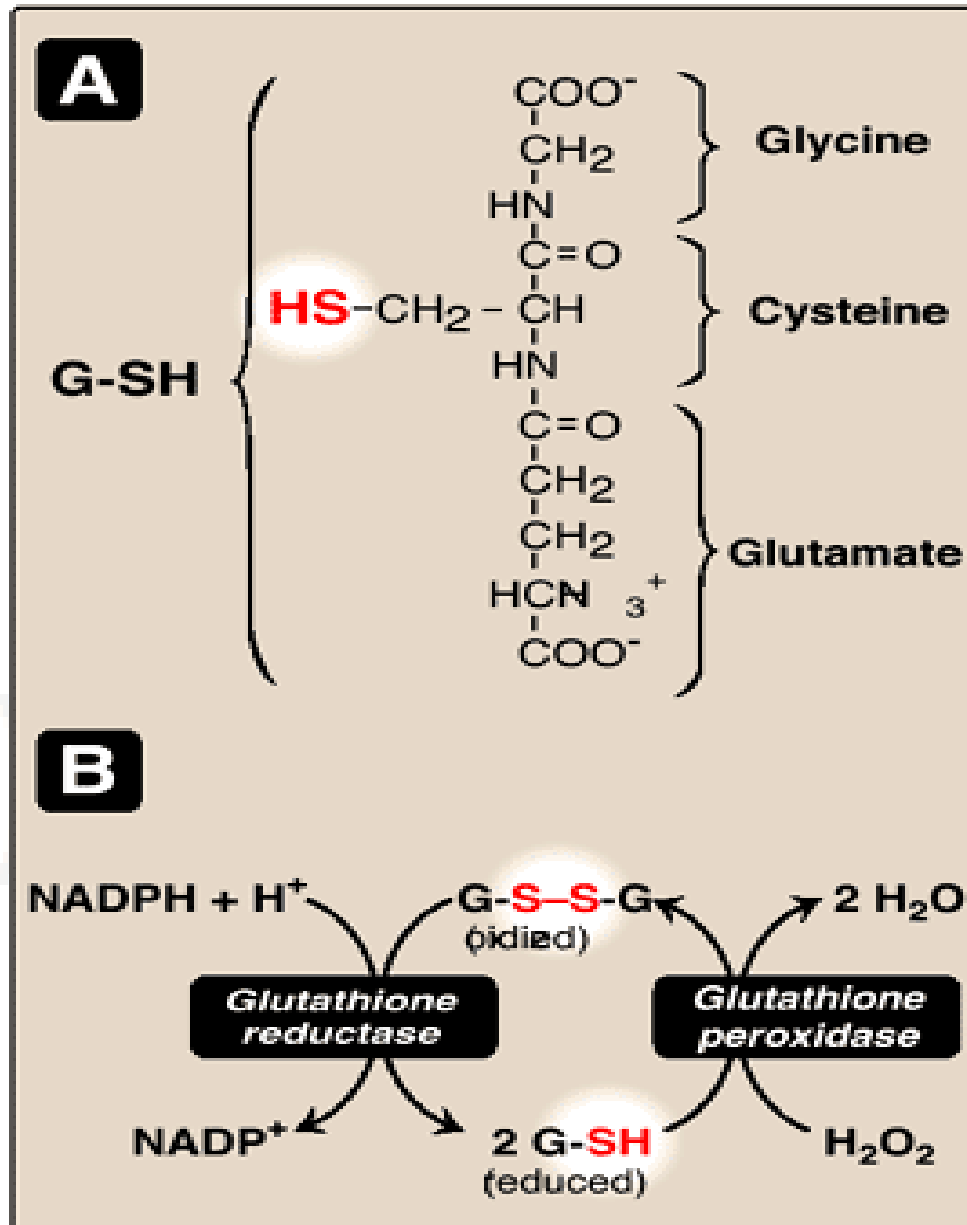


# Glutathione as Anti-oxidant



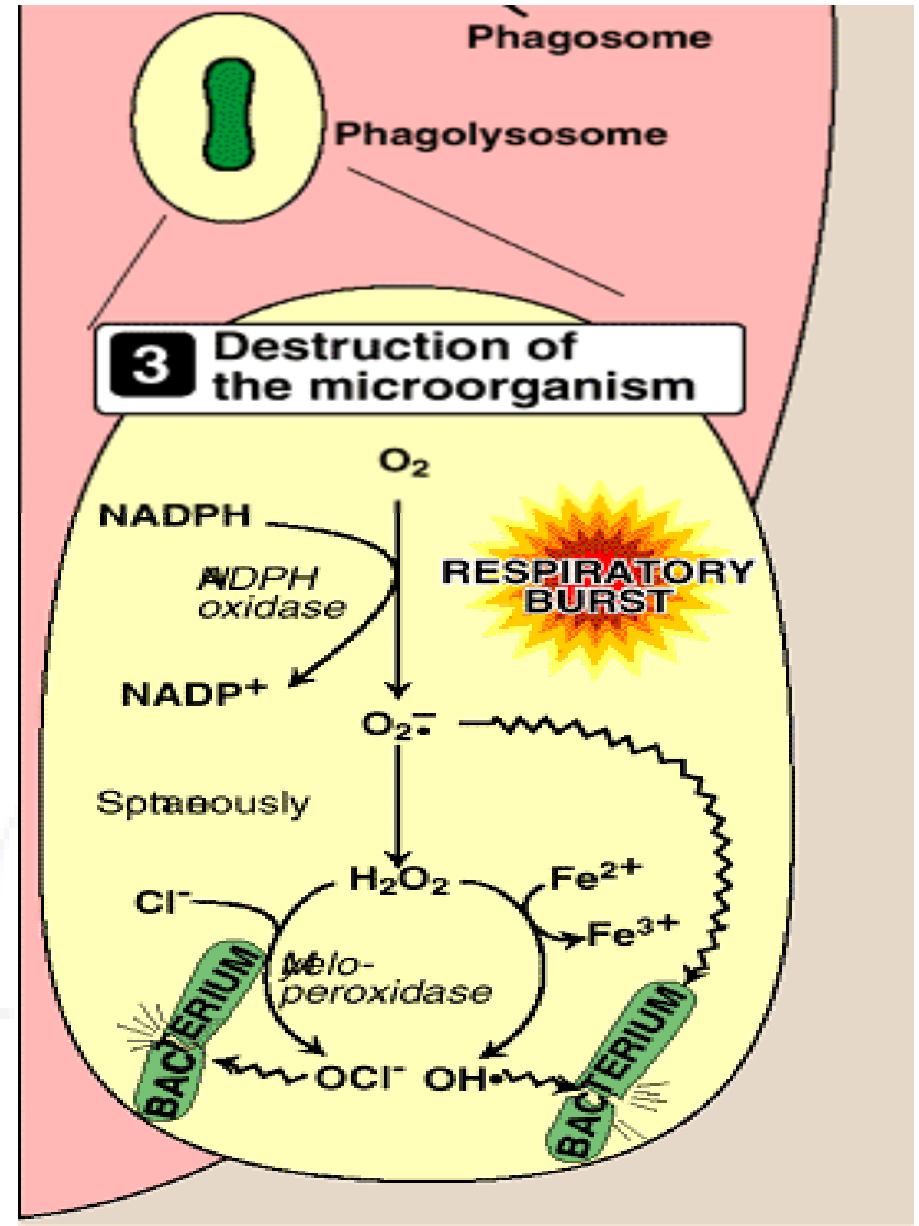
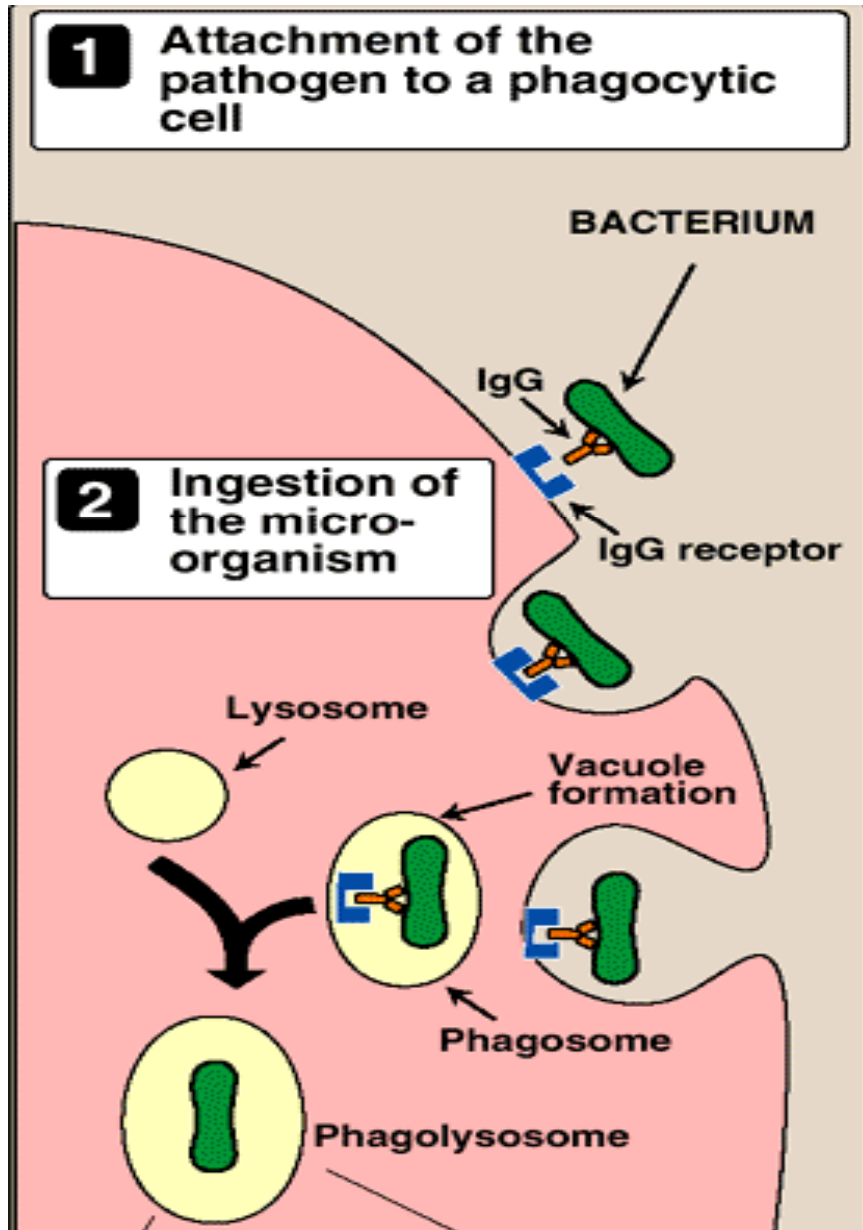
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# Glutathione as Reducing substance

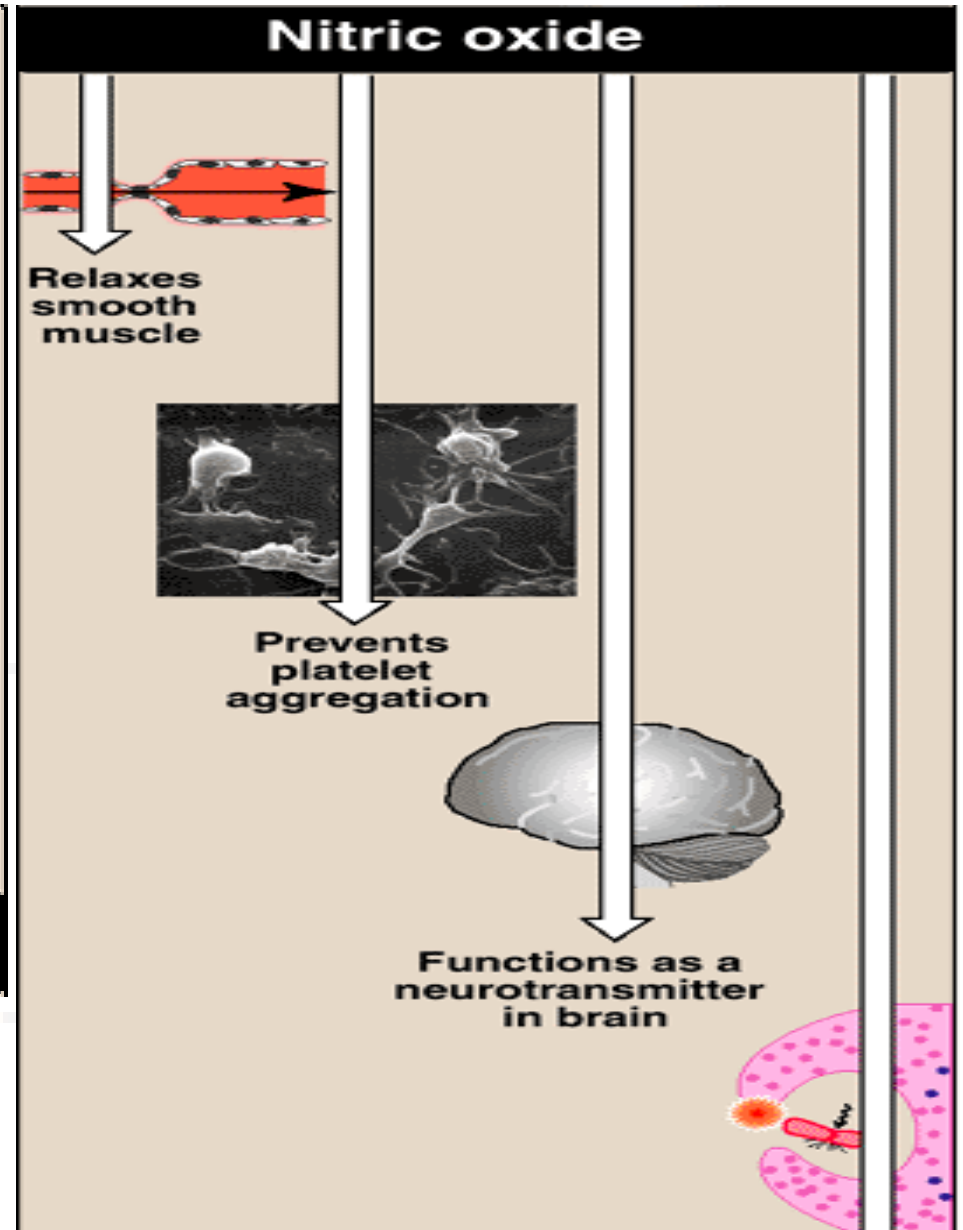
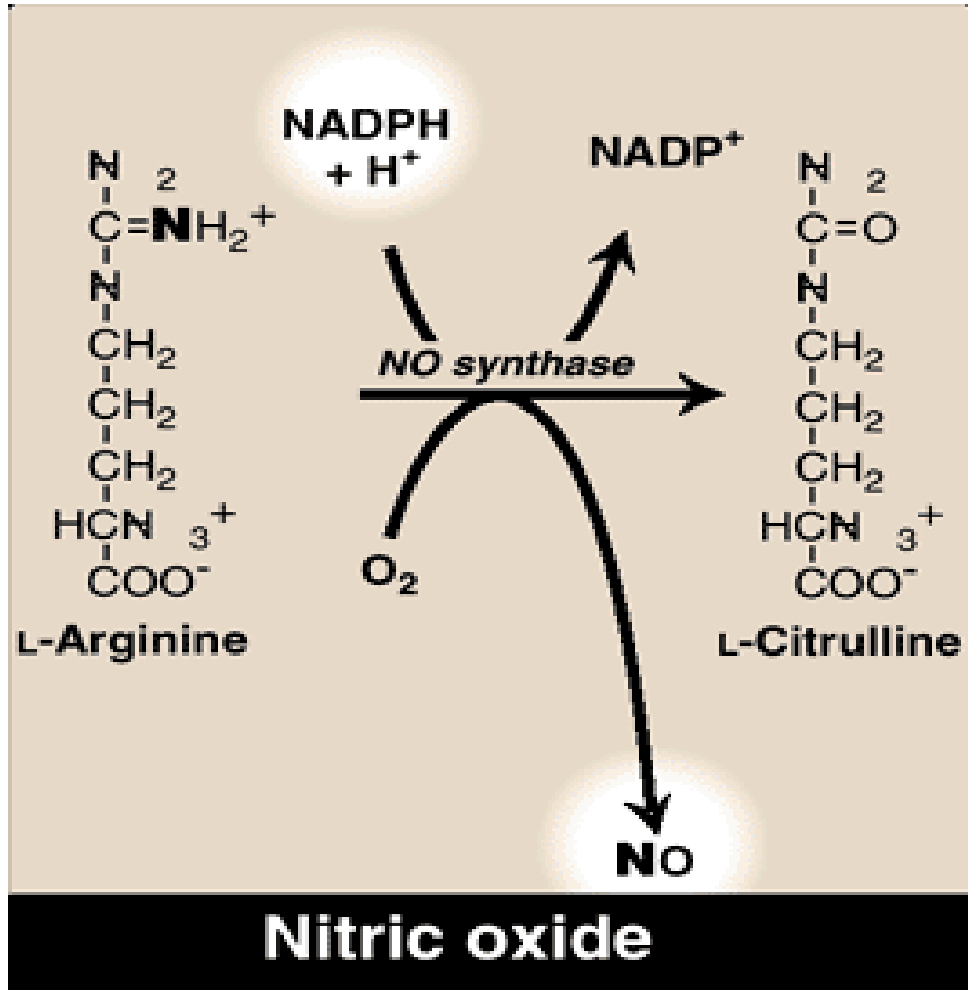




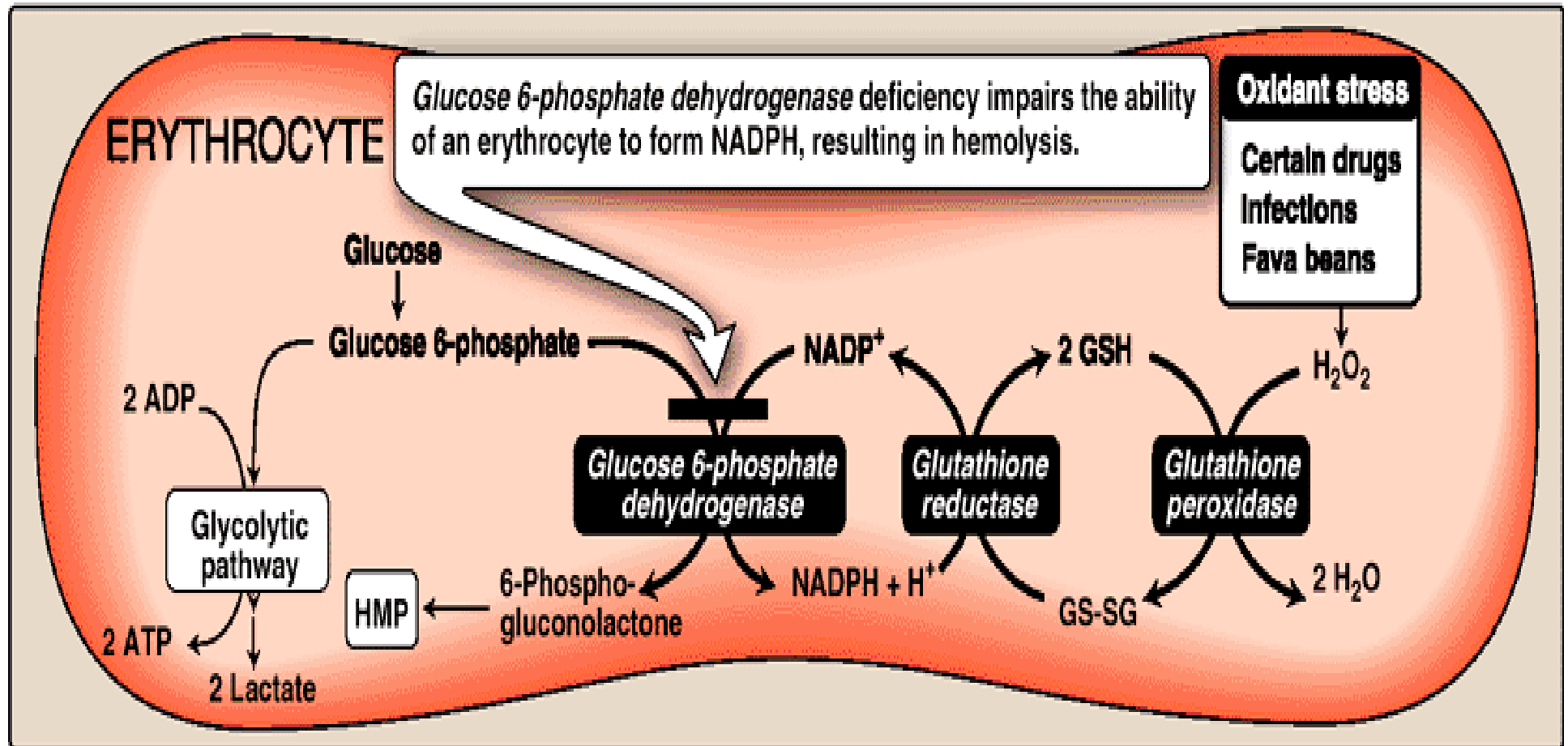
# NADPH in Phagocytosis



# NADPH in NO synthesis



# NADPH to RBC membrane



# NADPH Significant

## 1. Synthesis of

1. Fatty acid
2. Cholesterol
3. Steroidal hormones
4. Reduce glutathione
5. Nitric oxide

## 2. Maintaining RBC membrane integrity

3. Phagocytosis of bacteria
4. Provide anti-oxidant activity
5. Maintain lens transparency

# G6PD deficiency

- ????????

Dr Piyush Tailor