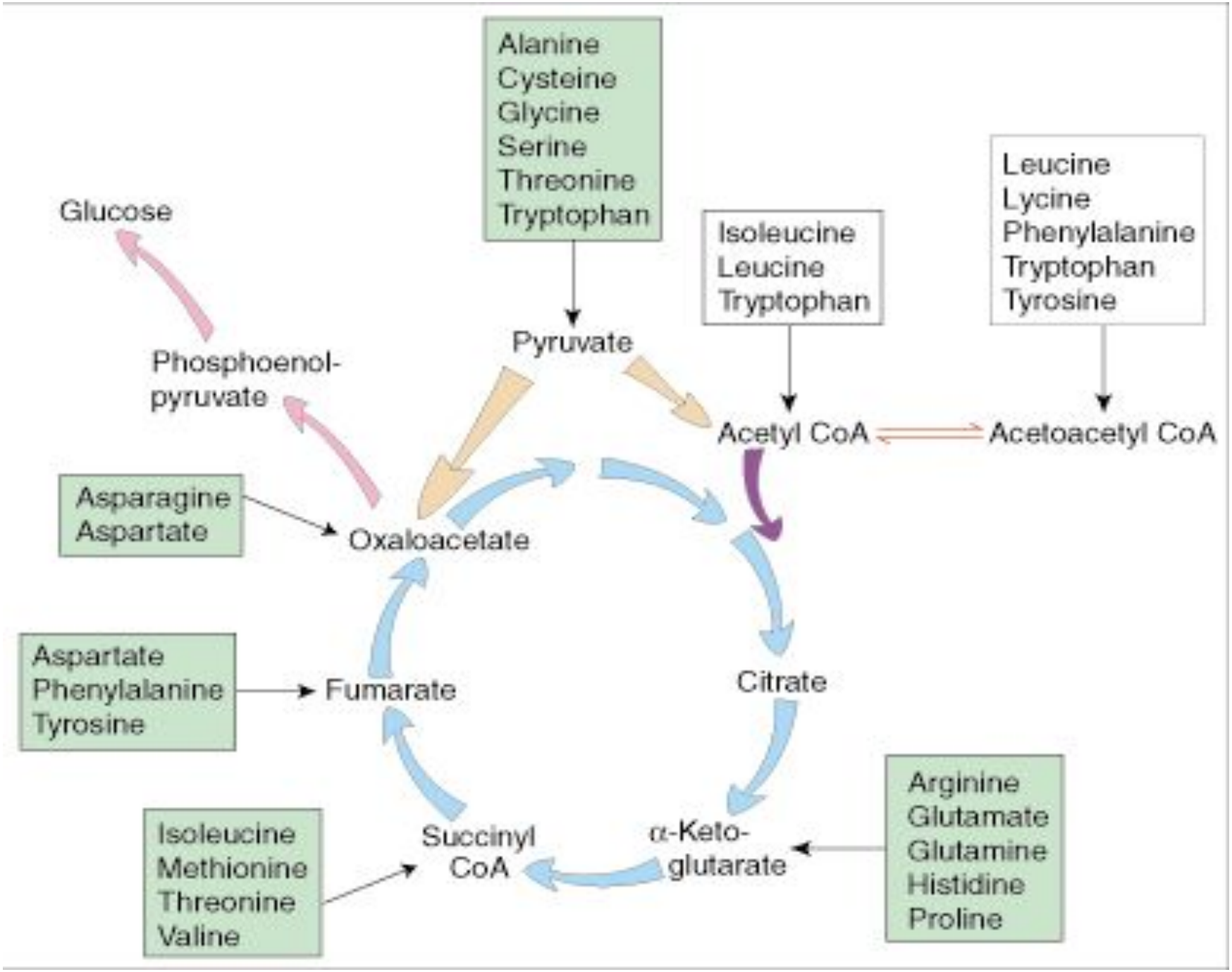
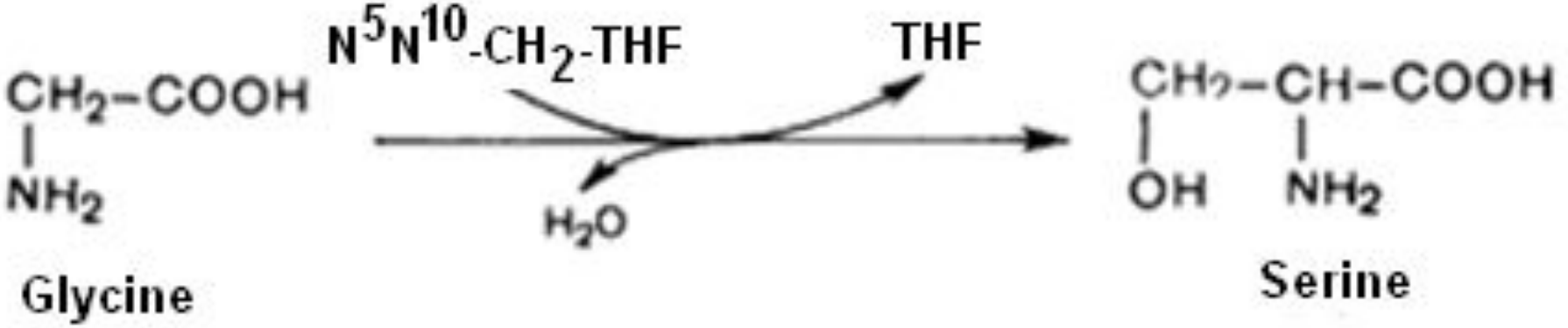
Amino acid and protein metabolism II


Alanine
Cysteine
Glycine
Serine
Threonine
Tryptophan
Glucose
Isoleucine
Leucine
Tryptophan
Leucine
Lycine
Phenylalanine
Tryptophan
Tyrosine
Pyruvate
Phosphoenol-
pyruvate
Acetyl CoA
Acetoacetyl CoA
Asparagine
Aspartate
Oxaloacetate
Aspartate
Phenylalanine
Tyrosine
Fumarate
Citrate
Arginine
Glutamate
Glutamine
Histidine
Proline
Isoleucine
Methionine
Threonine
Valine
Succinyl
CoA
α-Keto-
glutarate

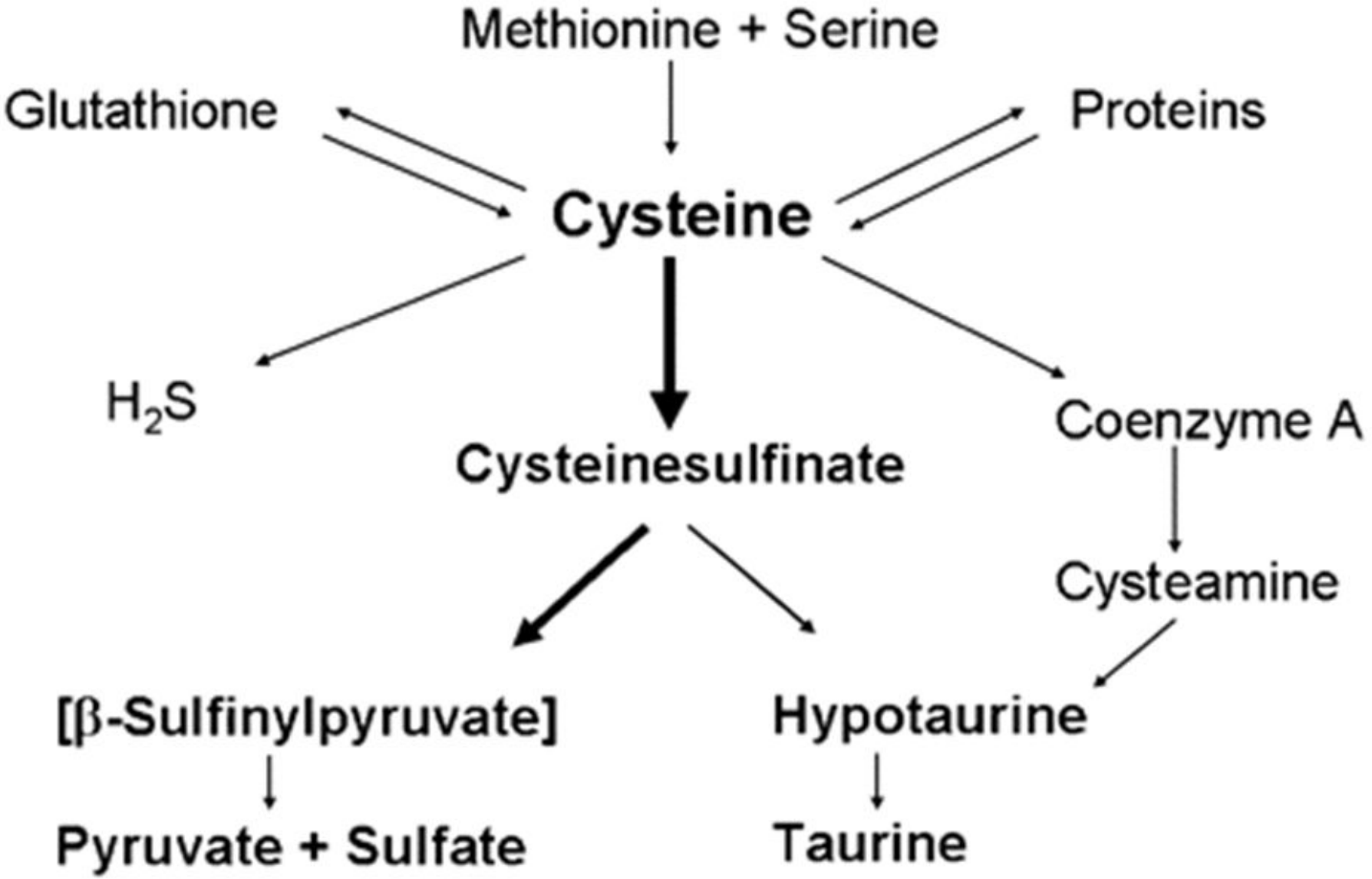
Metabolism of glycine, serine and threonine



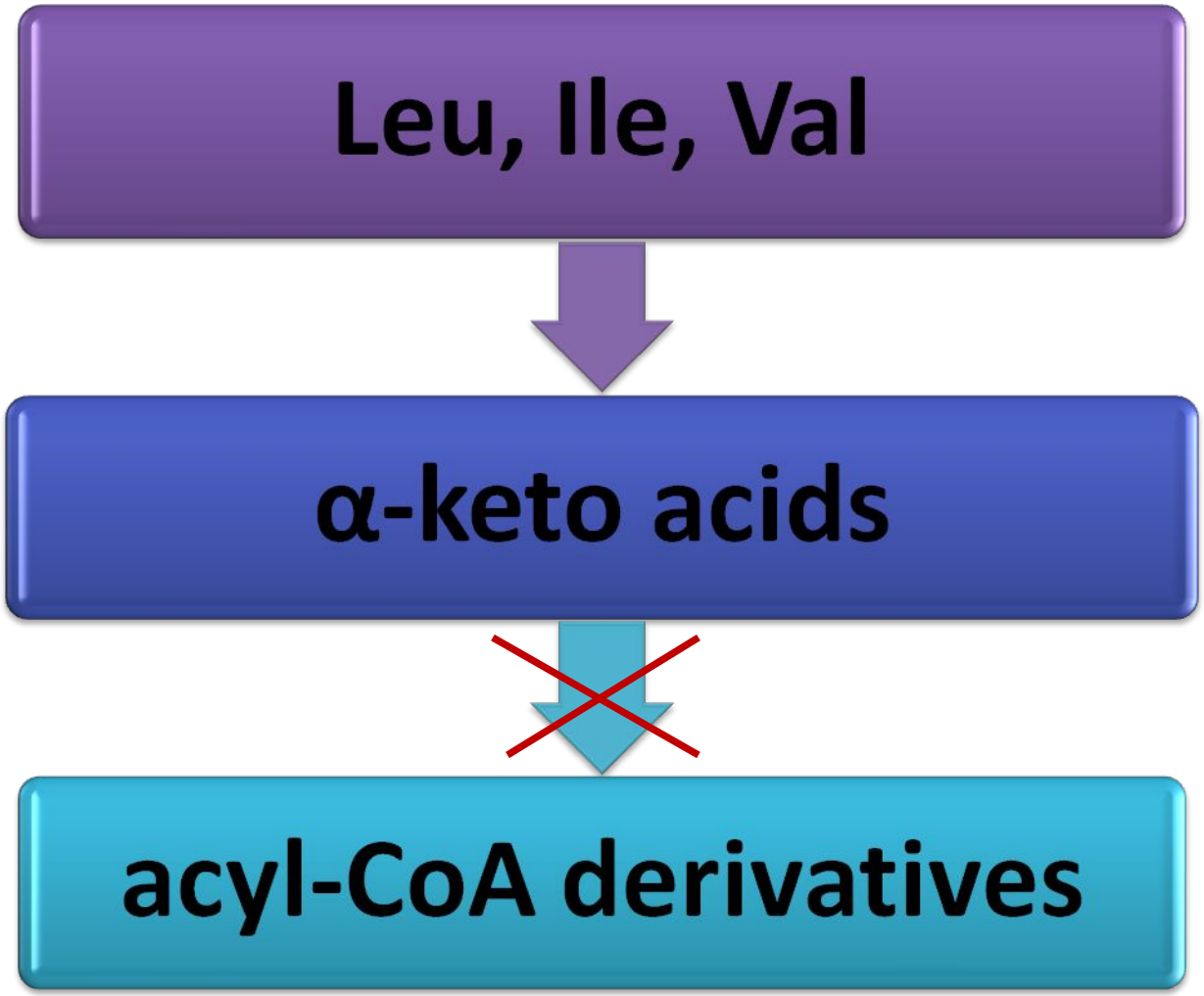
Metabolism of sulfur amino acids

Methionine + ATP →

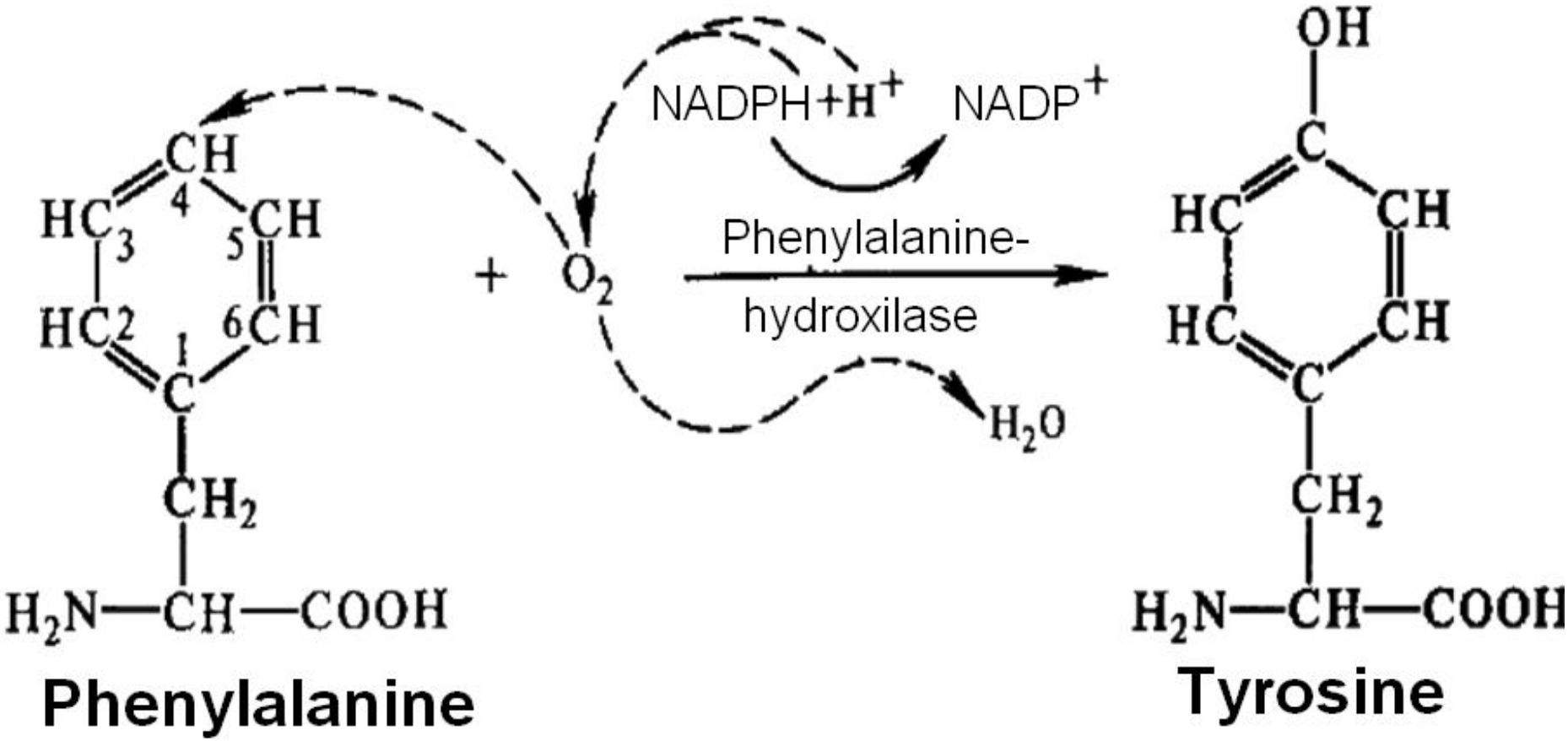
→ S- adenosylmethionine + PP_i + P_i


Methionine + Serine
Glutathione
Proteins
Cysteine
H_2S
Cysteinesulfinate
Coenzyme A
Cysteamine
[β-Sulfinylpyruvate]
Hypotaurine
Pyruvate + Sulfate
Taurine

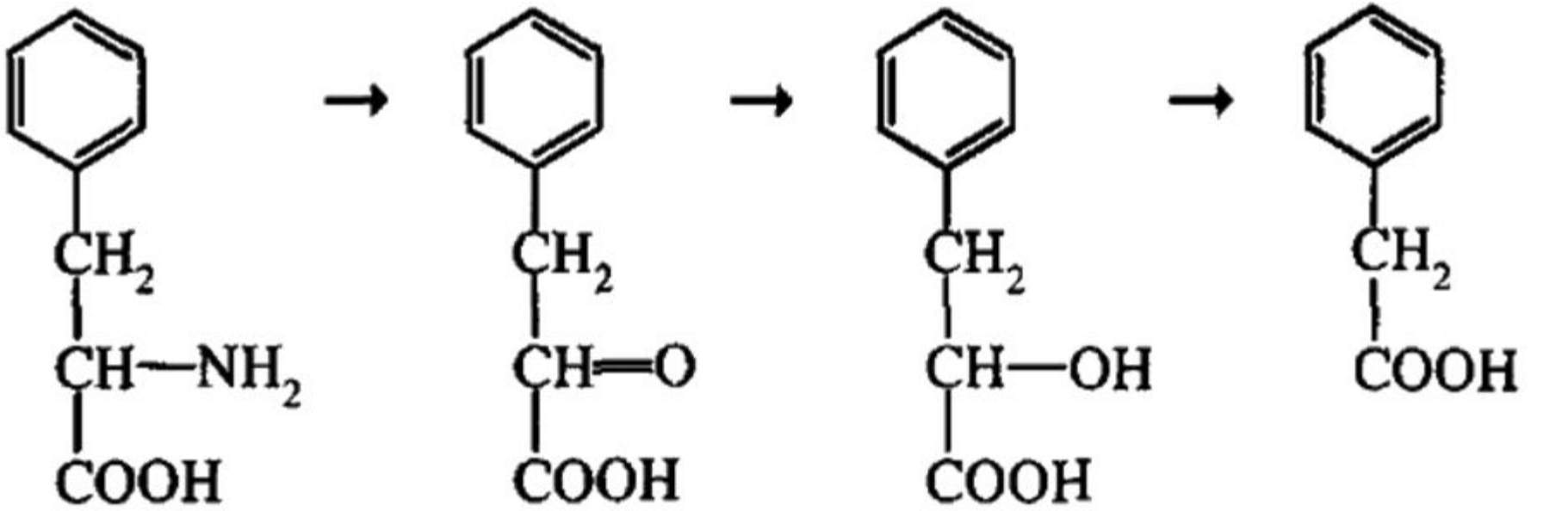
Metabolism of branched chain amino acids



Phenylalanin oxidation

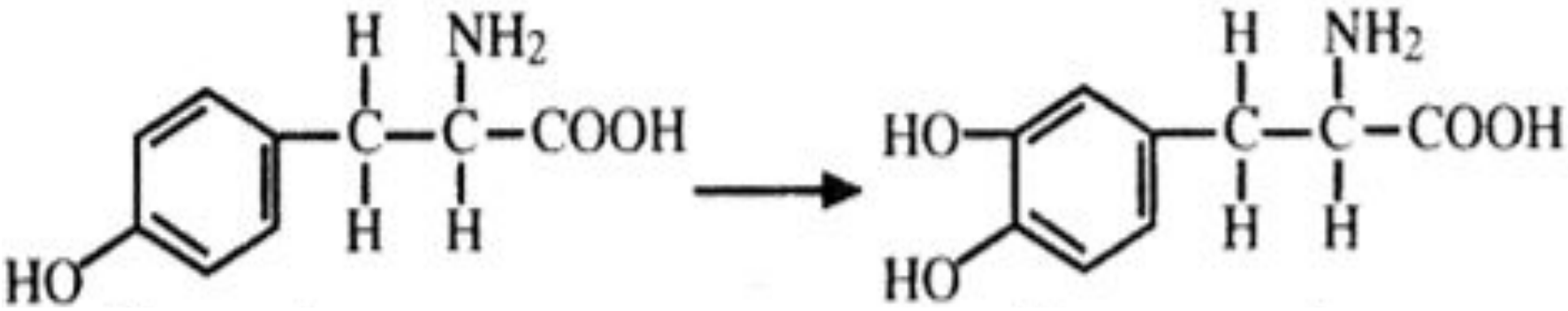


Phenylketonuria



Phenylalanine **Phenylpyruvate** **Phenyllactate** **Phenylacetate**

Tyrosine metabolism

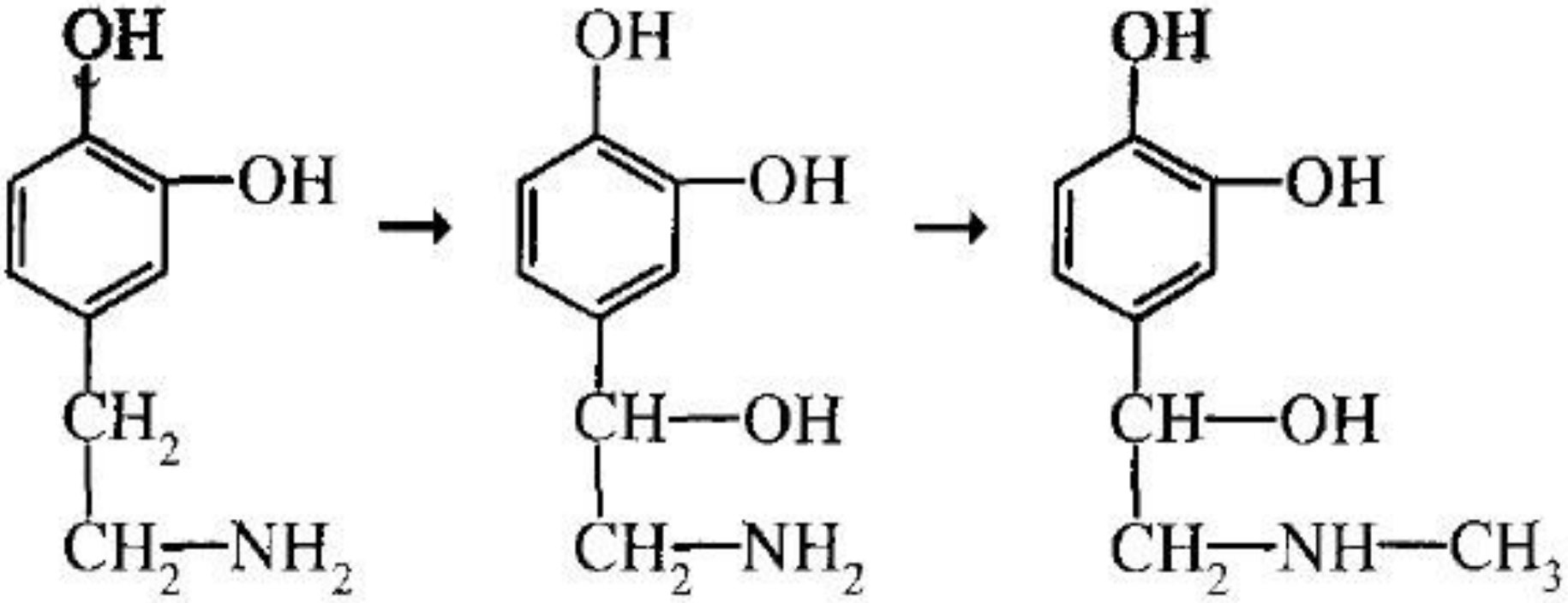


Tyrosine

Dihydroxyphenyl alanine (DOPA)

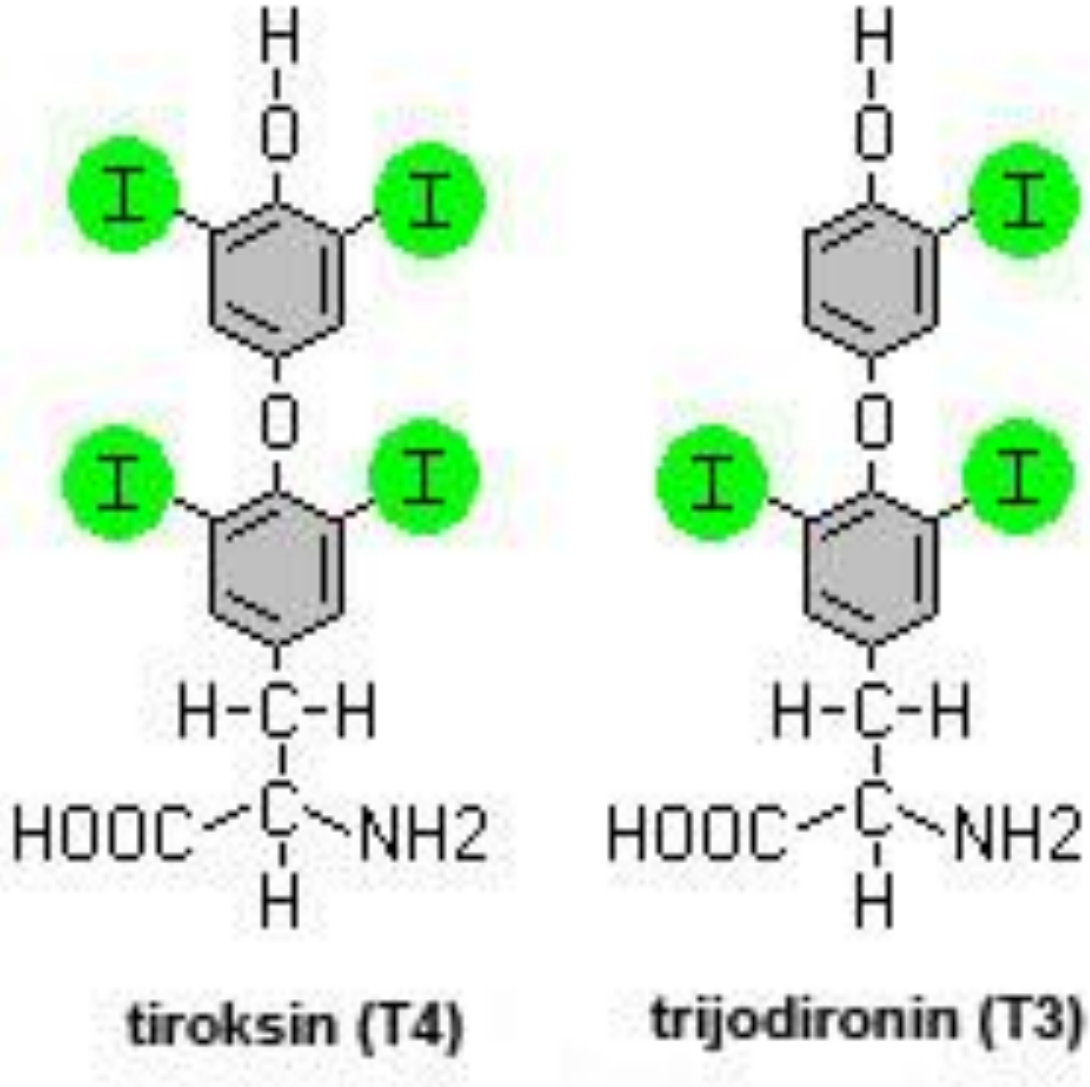
Albinism

Catecholamines

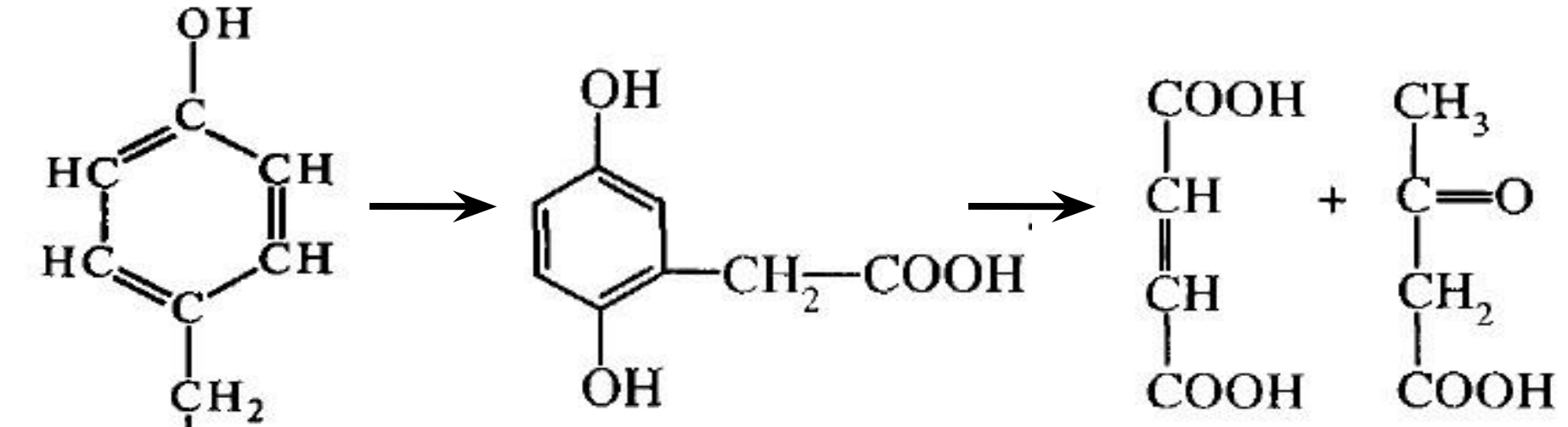


dopamine **noradrenaline** **adrenaline**

Thyroid Hormones



Tyrosine metabolism



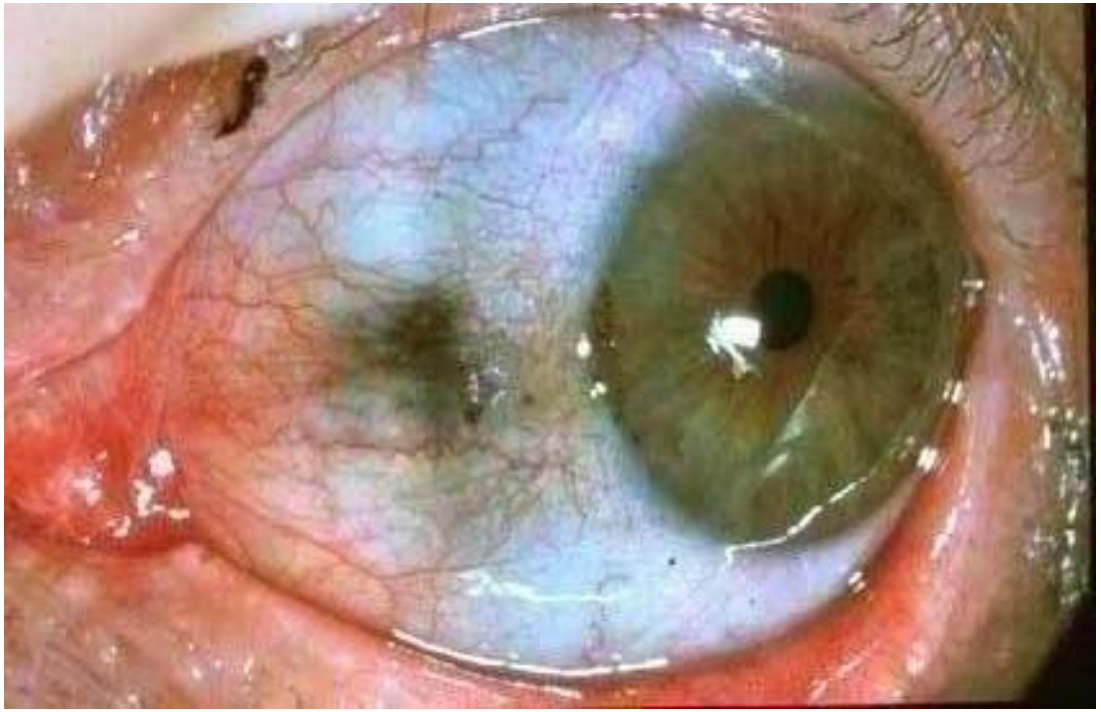
Tyrosine

Homogentisic acid

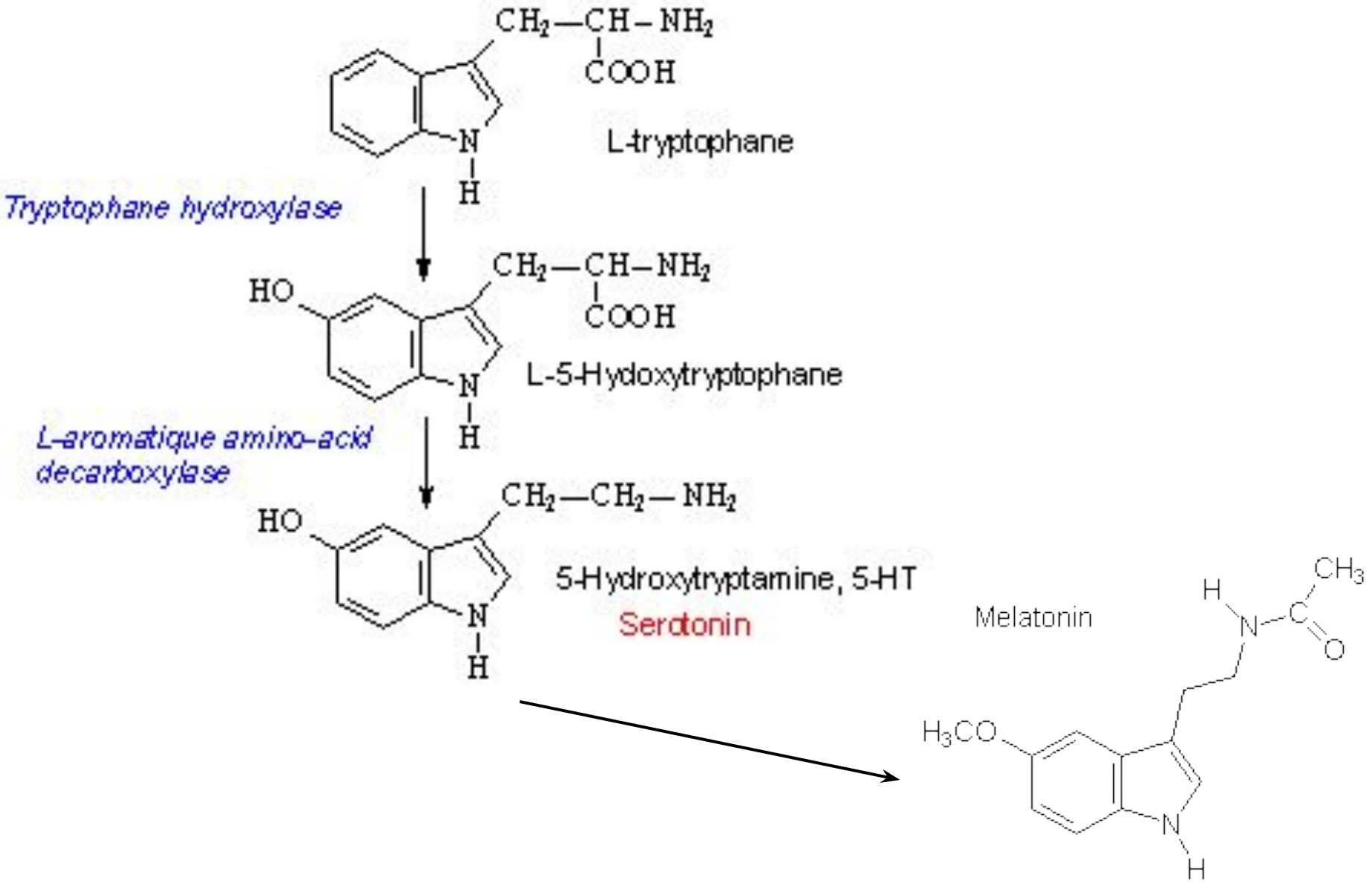
Fumarate

Acetoacetate

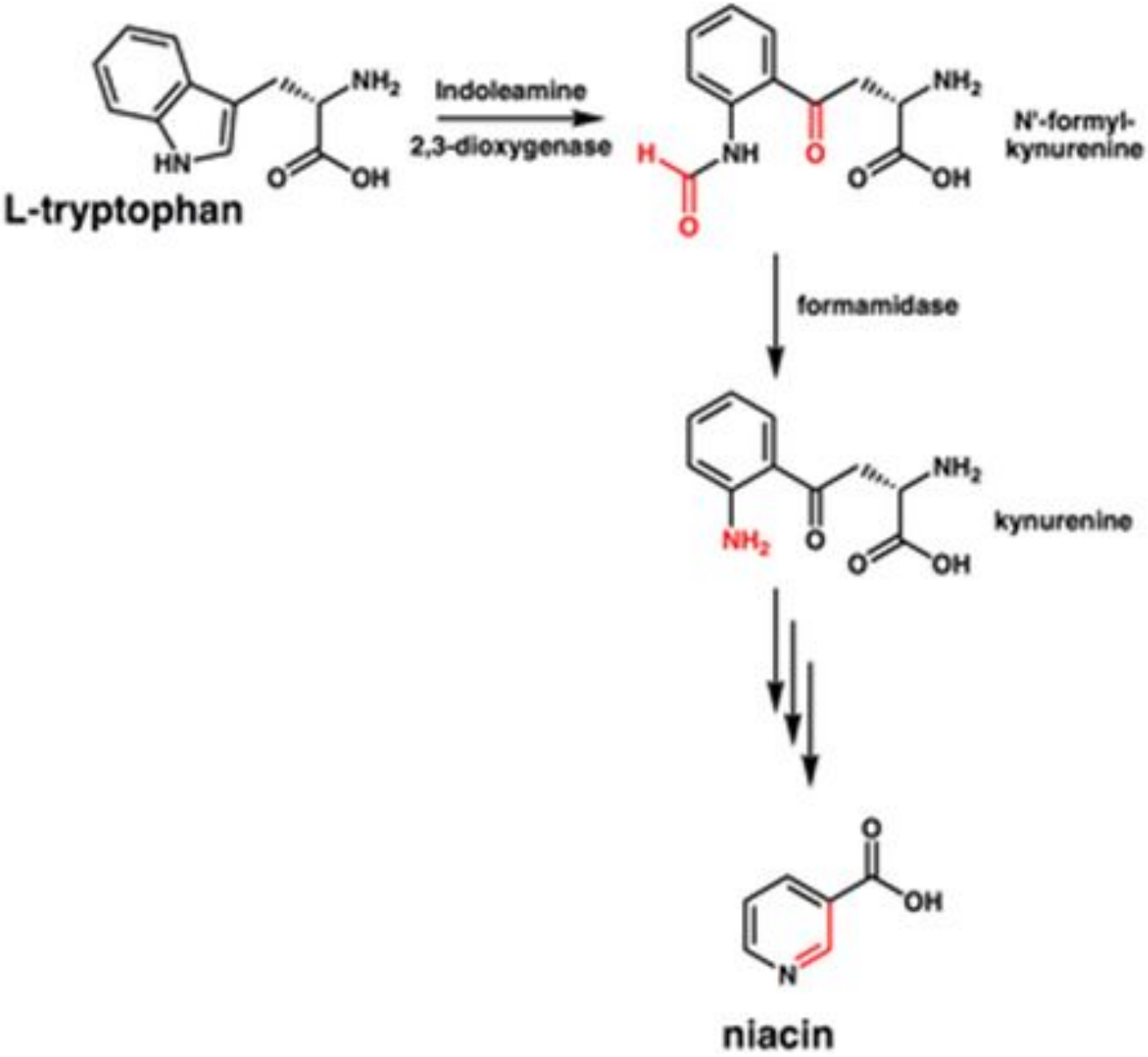
Homogentisuria



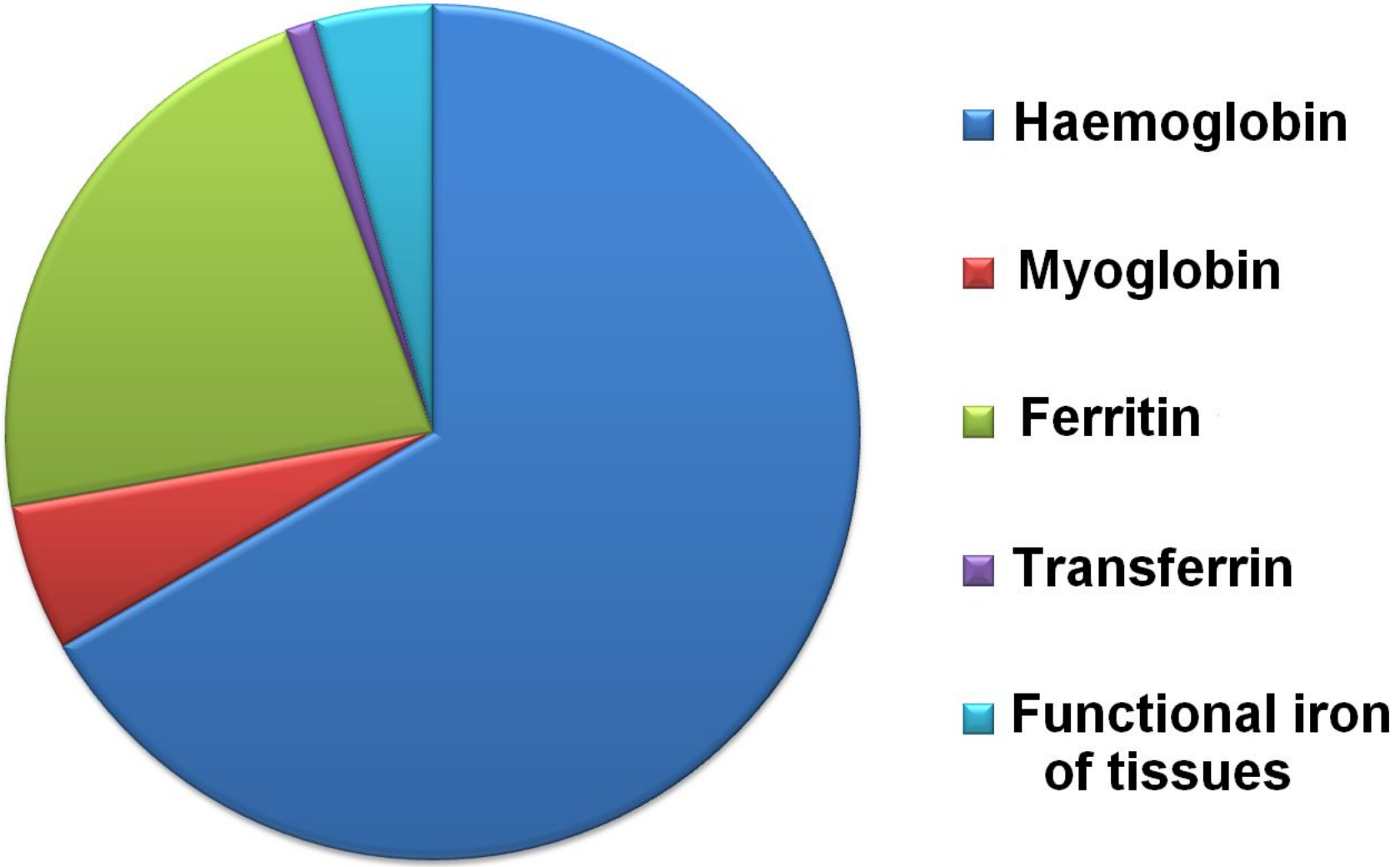
Tryptophan metabolism



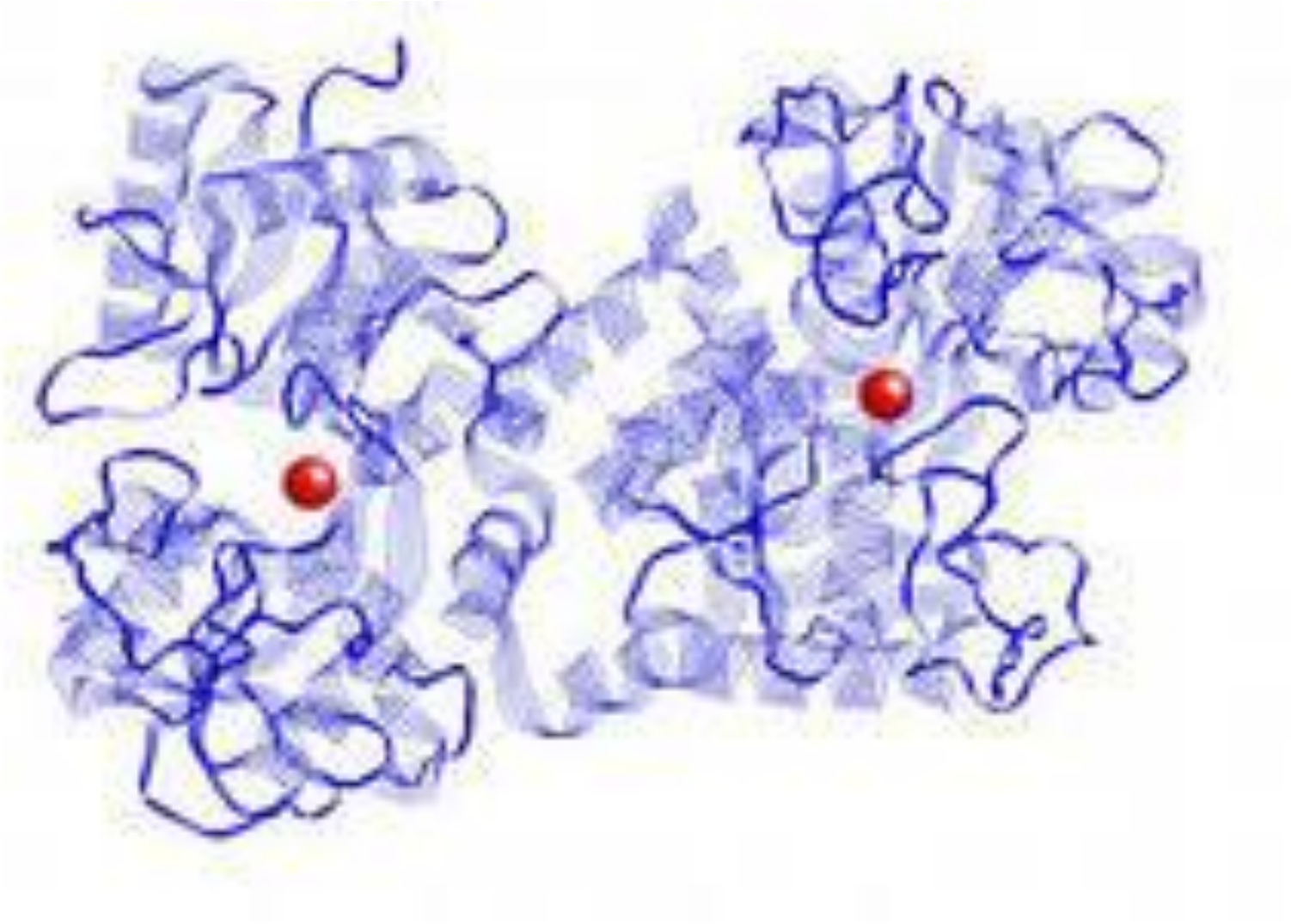
Tryptophan metabolism



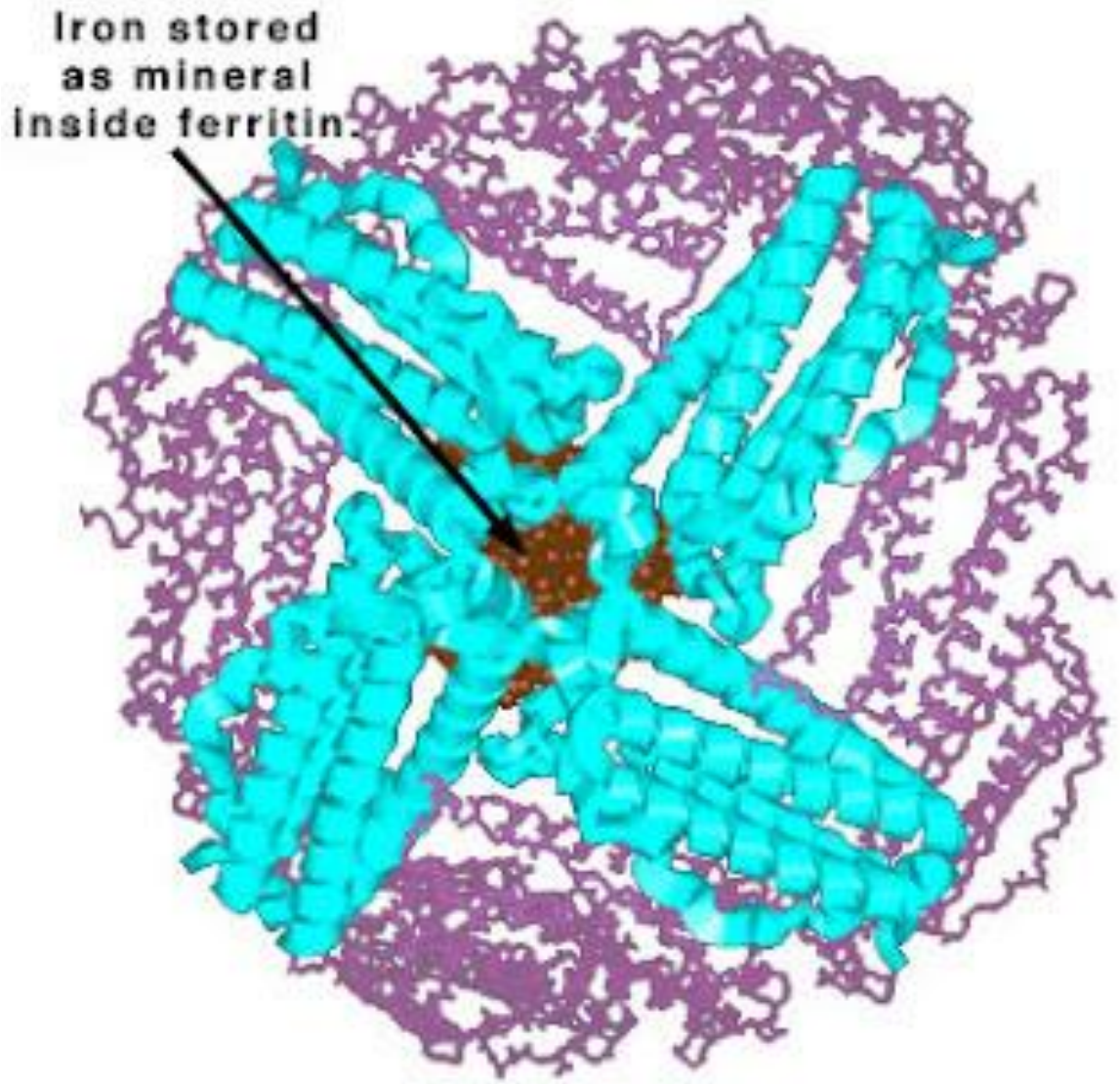
Iron


Haemoglobin
Myoglobin
Ferritin
Transferrin
Functional iron of tissues

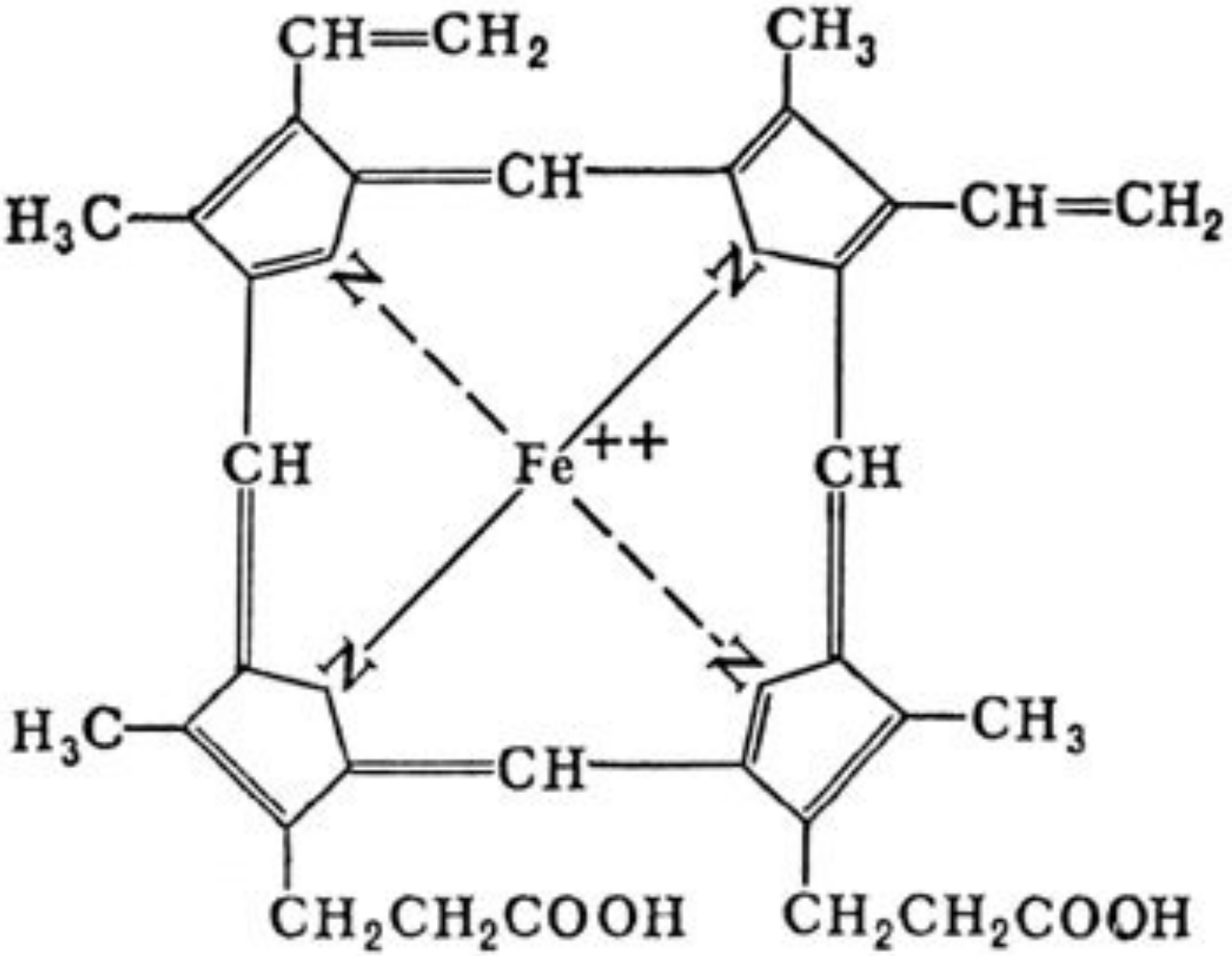
Transferrin

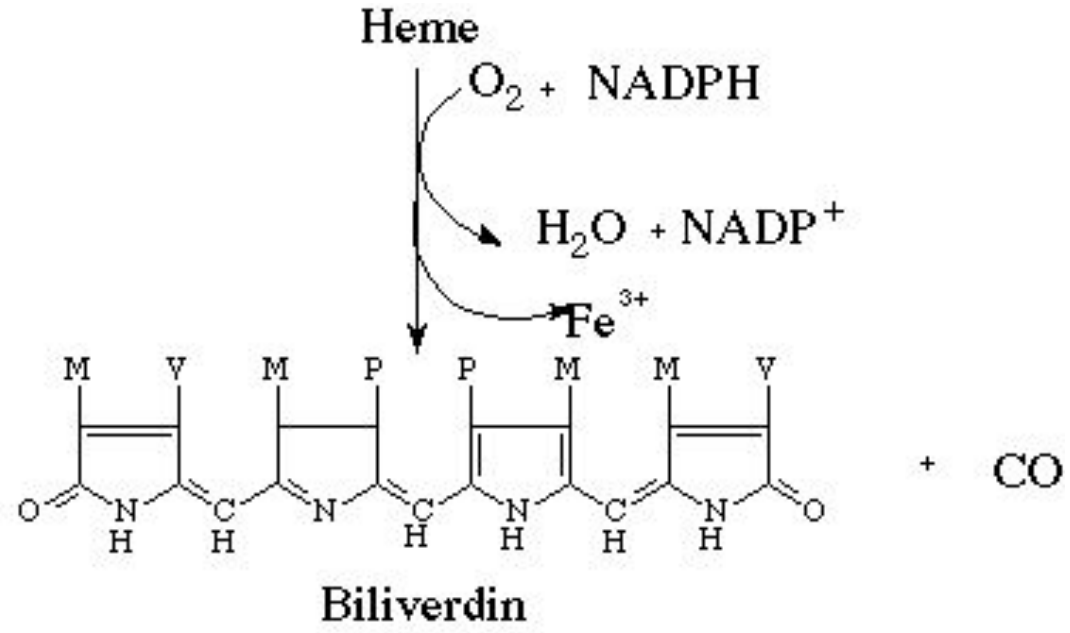


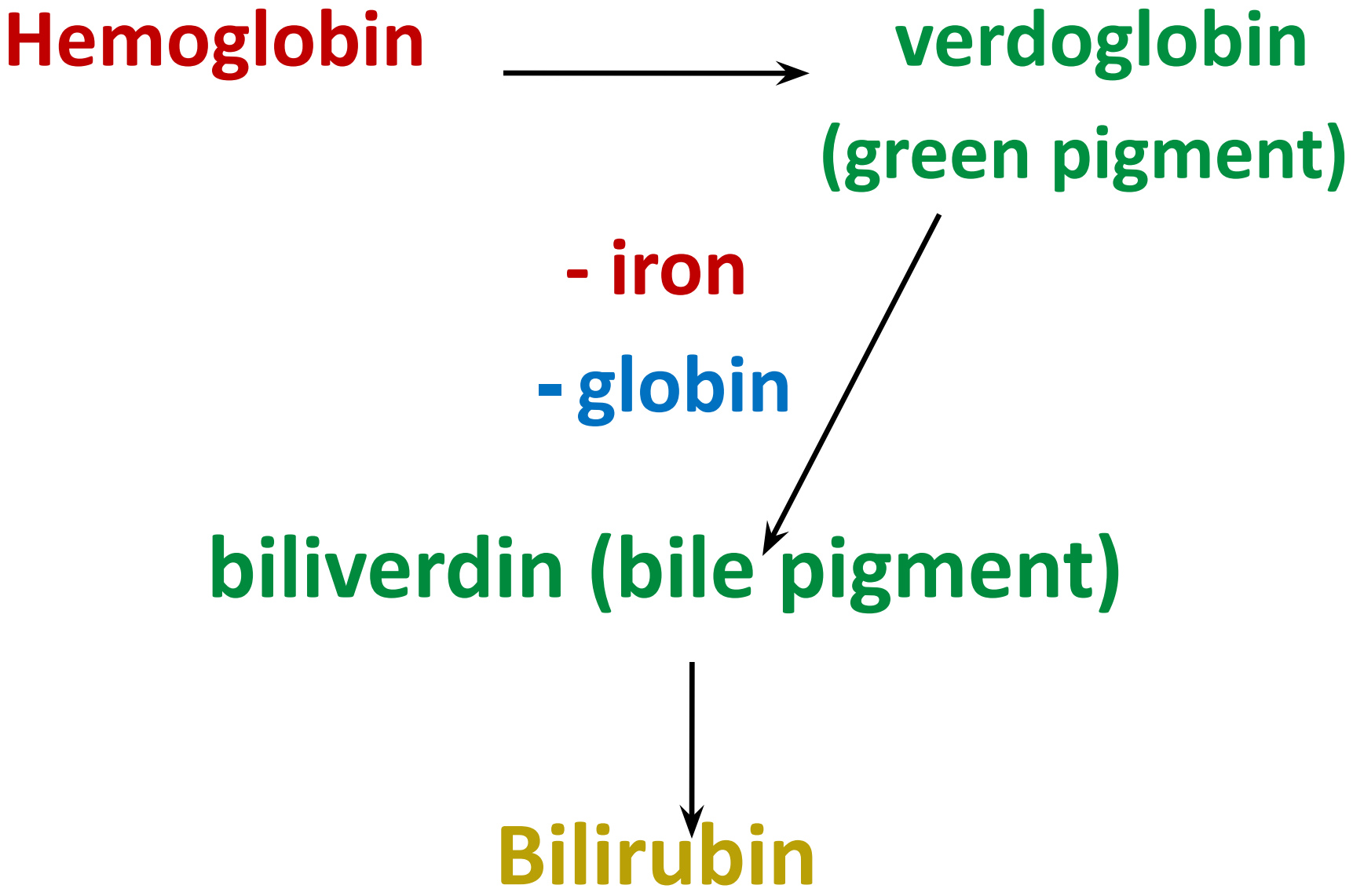
Ferritin



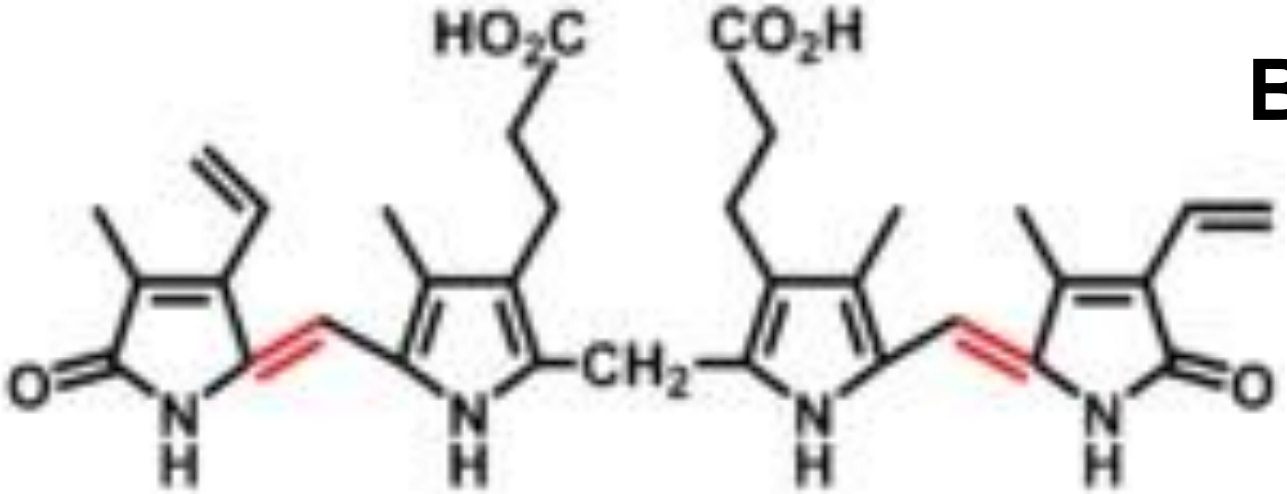
Heme


CH=CH2
CH3
H3C
CH
CH=CH2
Fe++
CH
CH
H3C
CH
CH3
CH2CH2COOH
CH2CH2COOH

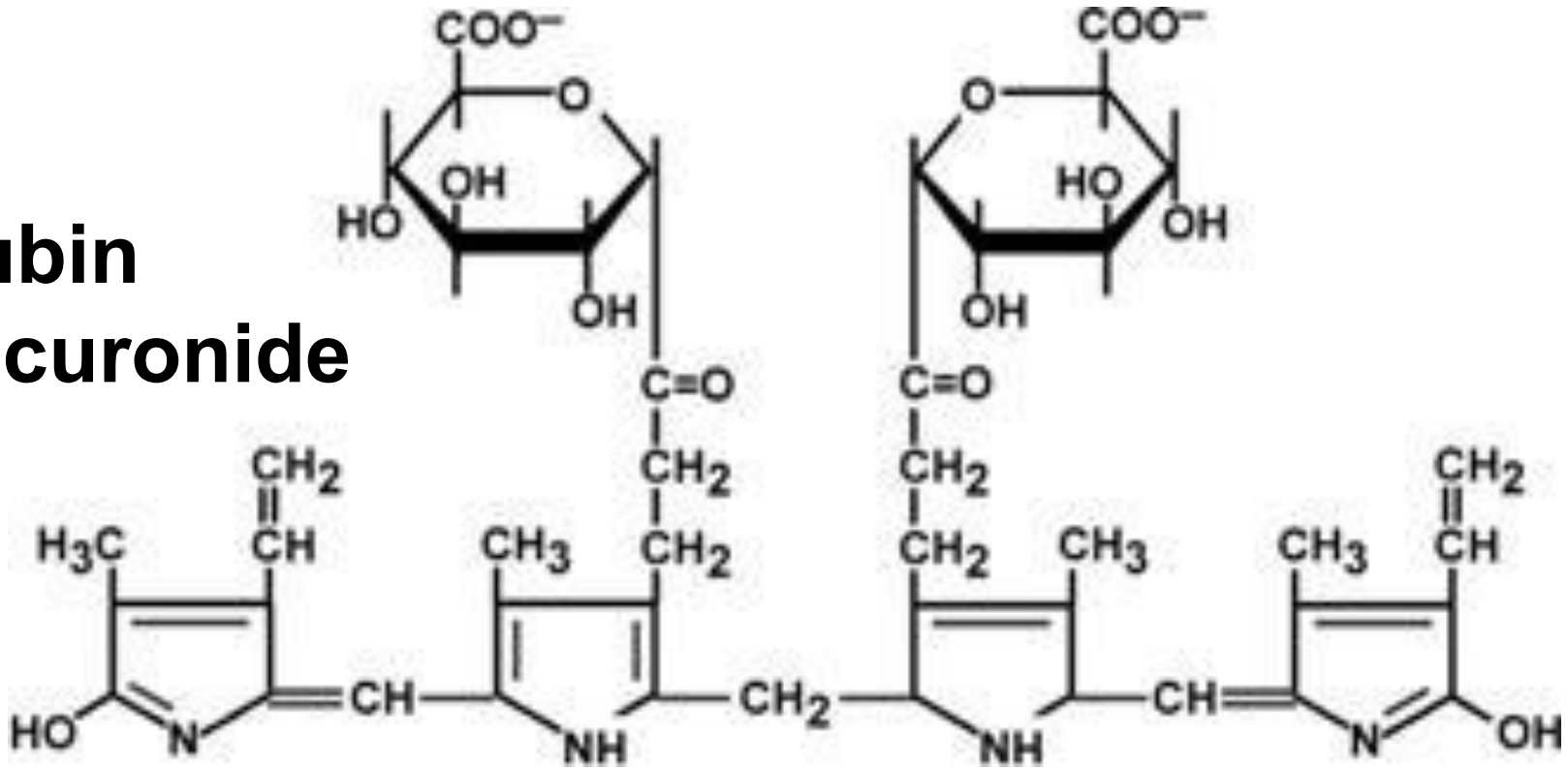

Heme
O_2 + NADPH
H_2O + $NADP^+$
Fe^{3+}
M V M P P M M V
+ CO
Biliverdin
NADPH + H^+
$NADP^+$
M V M P P M M V
Bilirubin


Hemoglobin
verdoglobin
(green pigment)
- iron
- globin
biliverdin (bile pigment)
Bilirubin

Bilirubin

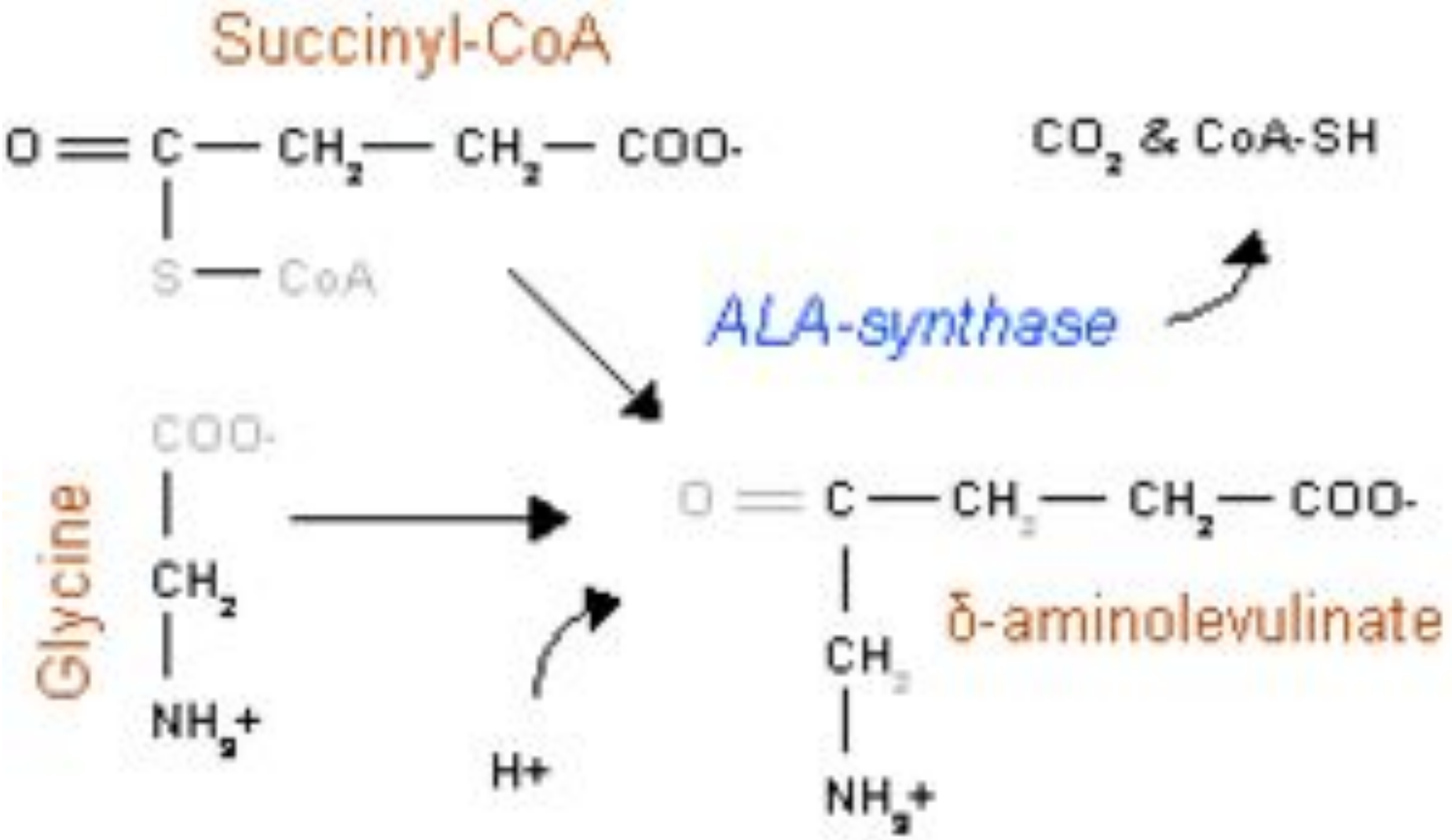


Bilirubin diglucuronide

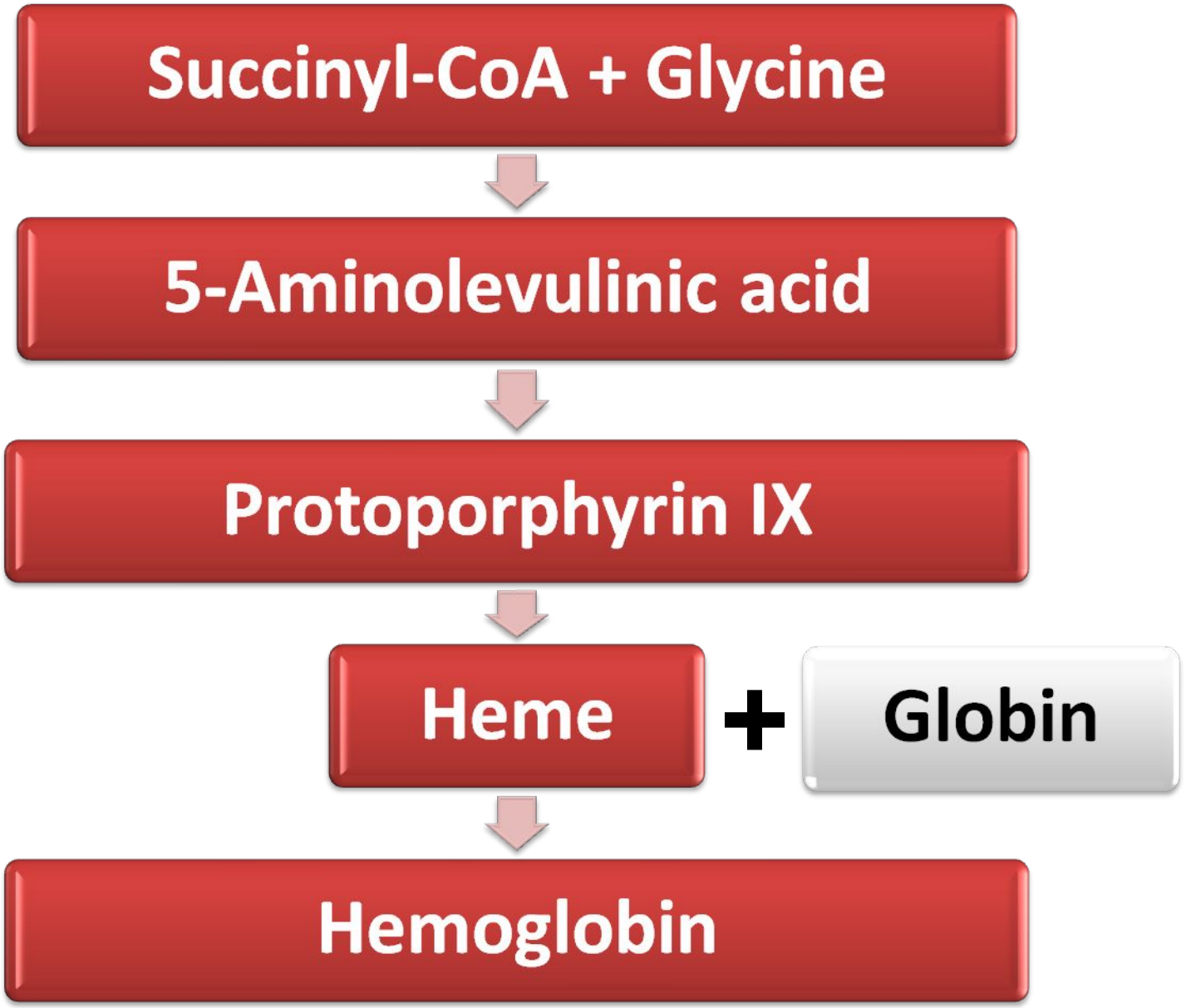


Jaundice

Hemoglobin synthesis



Hemoglobin synthesis



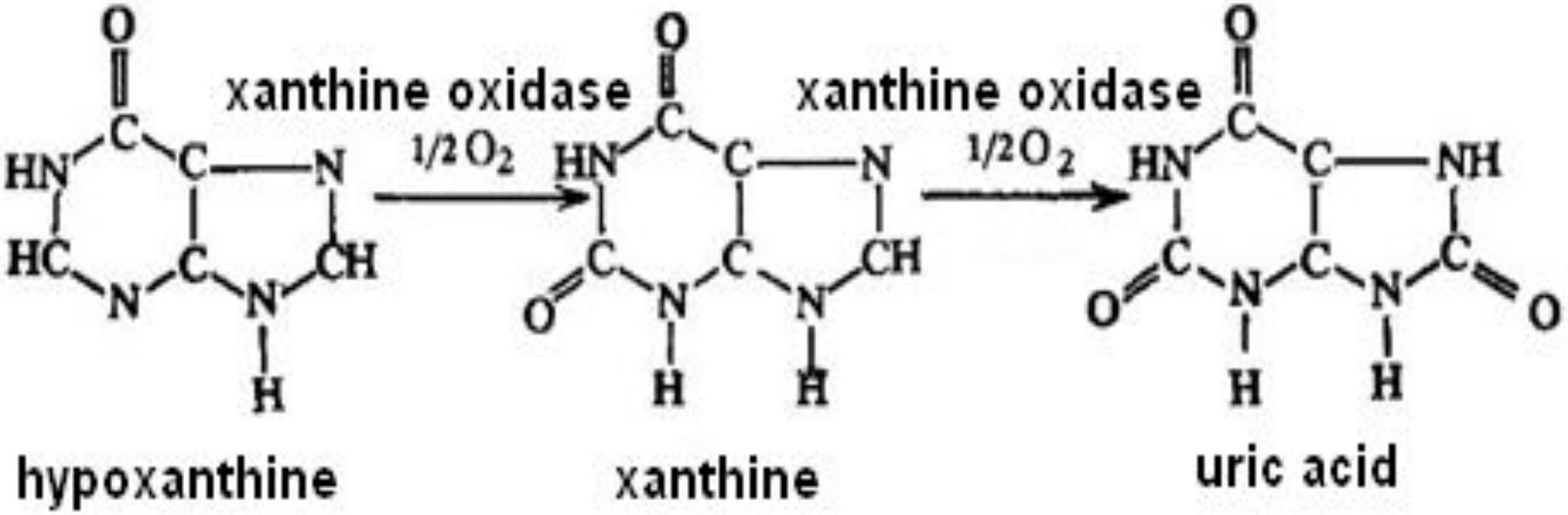
Porphyria

NUCLEOPROTEIN AND NUCLEIC ACID METABOLISM

Purines catabolism

adenine → hypoxanthine

guanine → xanthine

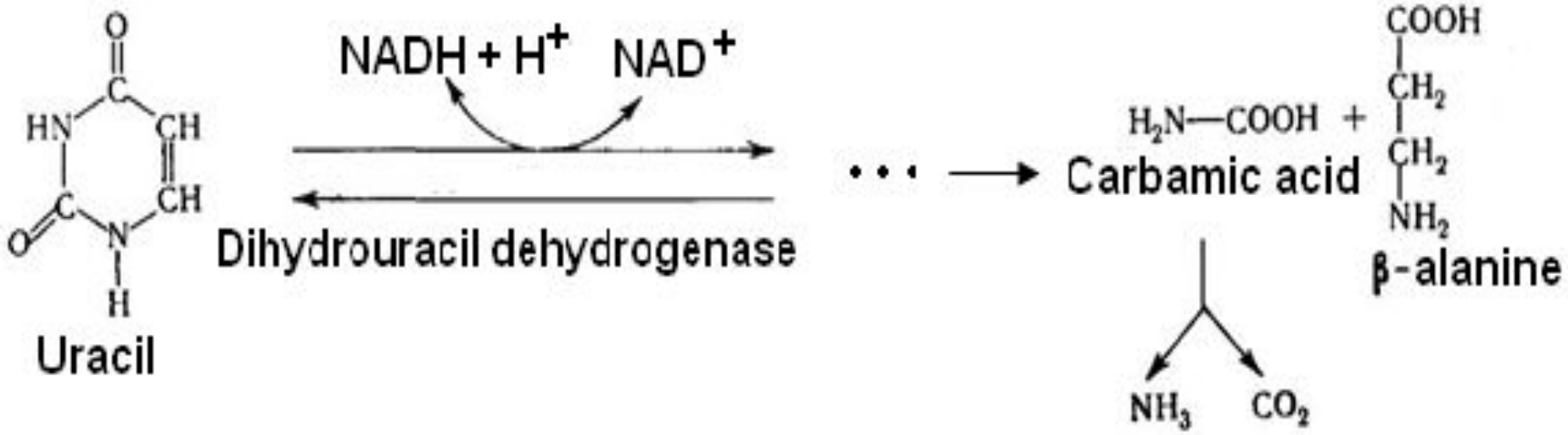


Gout


Uric Acid
Build up
Inflamed
Joint
Sharp Needle Like
Uric Acid Crystals

Gout

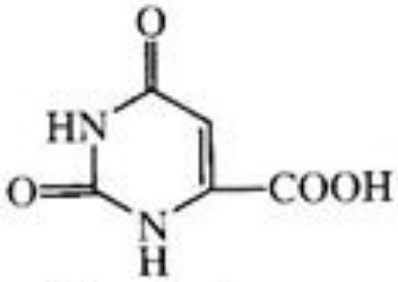
Pyrimidines catabolism



Pyrimidine synthesis

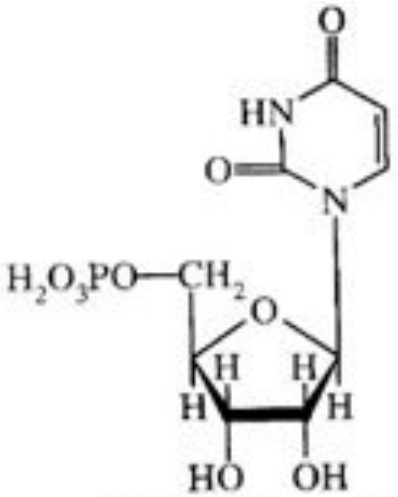
$$CO_2 + \text{Glutamine} + 2\ ATP + H_2O \rightarrow$$
$$\rightarrow H_2N{-}CO{-}\ OPO_3H_2 + 2\ ADP + H_3PO_4$$

CP + Asp → …–



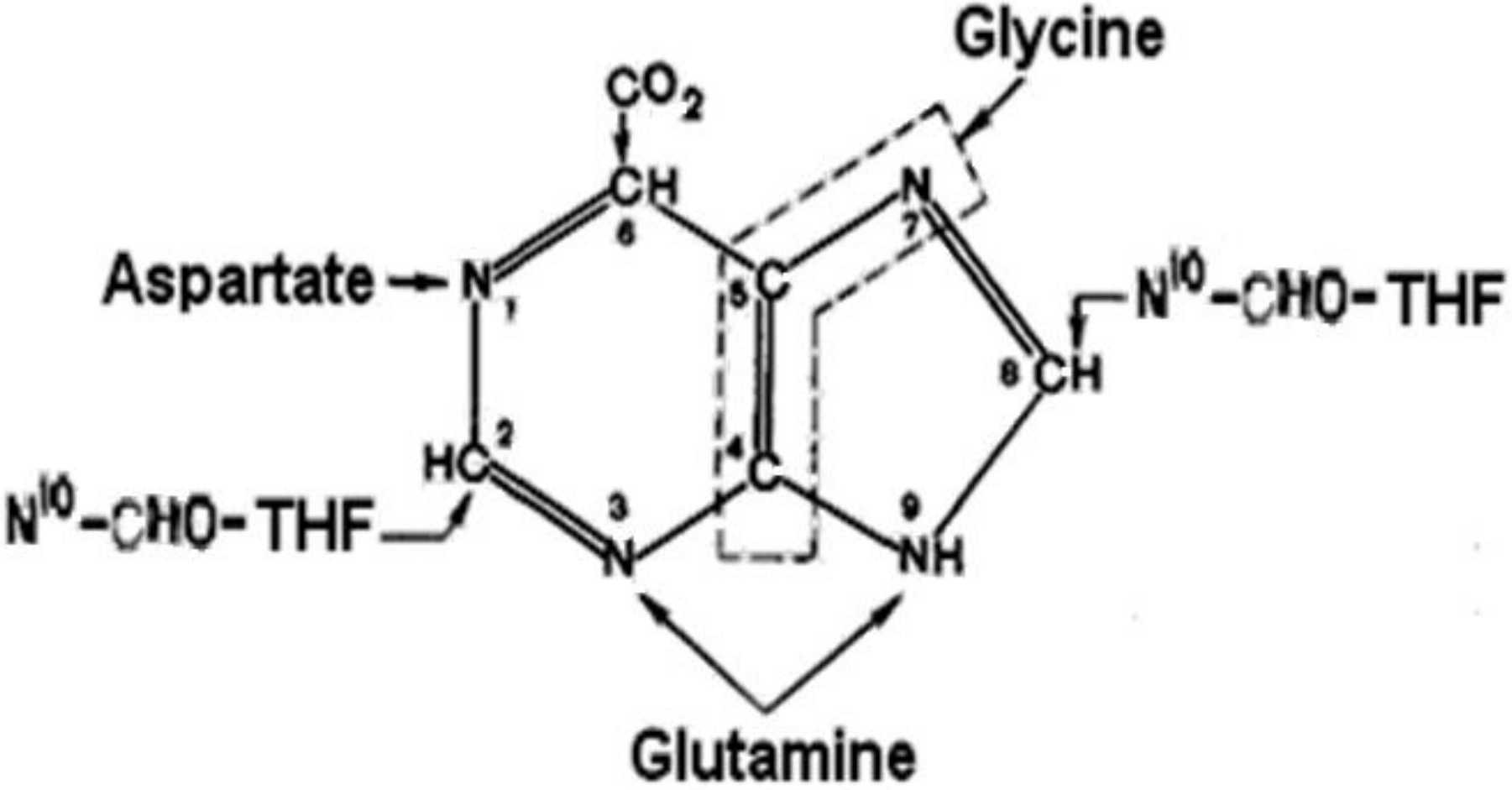
Orotate

→ orotydylic acid

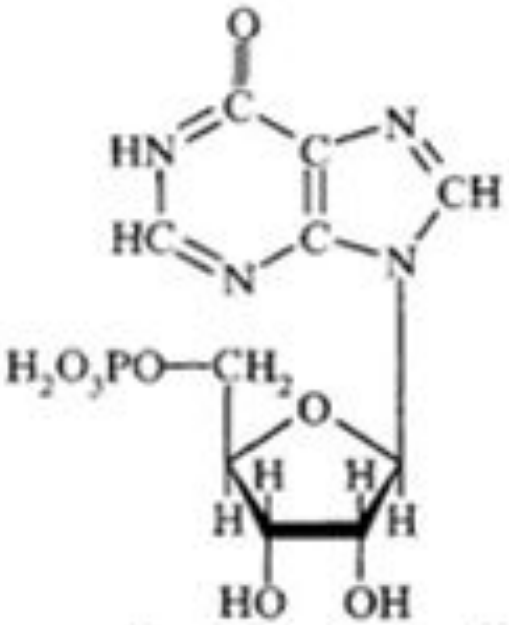


Uridylic acid

Purine synthesis



Purine synthesis



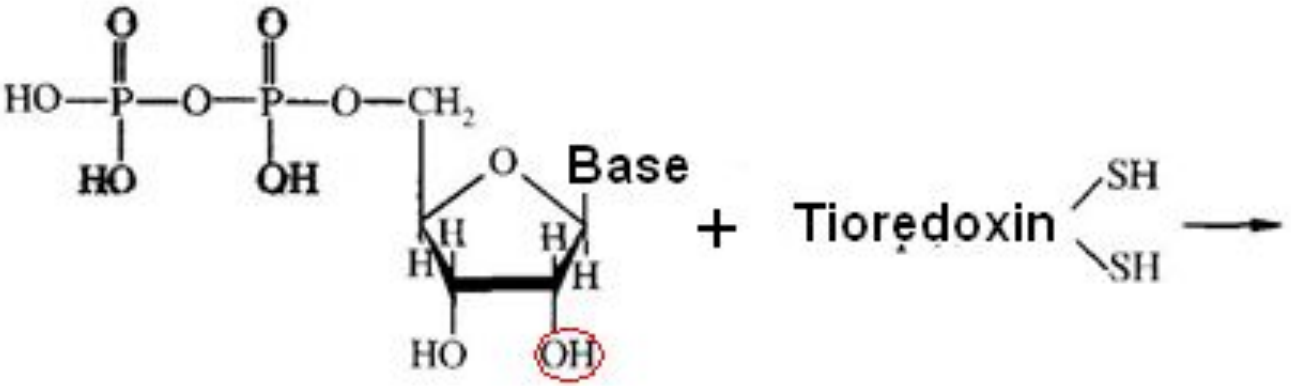
inosinic acid

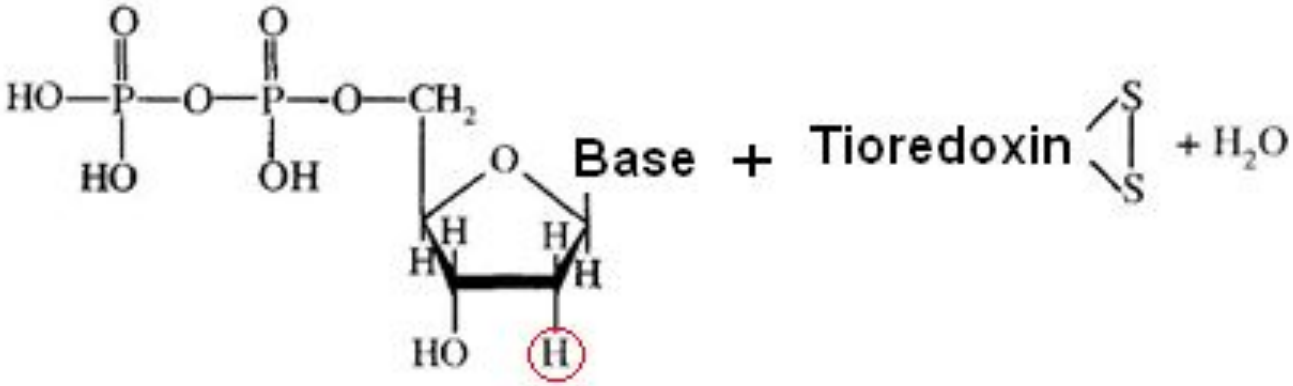
Inosine-5'-phosphate $\xrightarrow{NAD^+}$ **Xantozin-5'-phosphate**

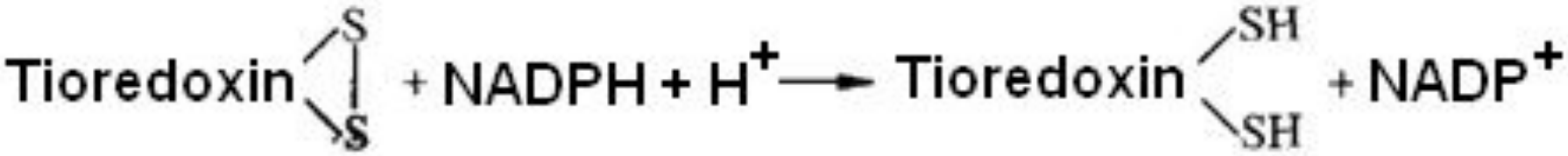
+ Asp ↓ **- fumarate** **+ Gln** ↓ **- Glu**

+ GTP ↓ **- GDP, -P_i** **+ ATP** ↓ **- AMP, -PP_i**

Adenosine-5'-phosphate **Guanosine-5'-phosphate**







dGDF + ATP → dGTP + ADP