

Année 2022 - 2023

Licence Science pour la Santé

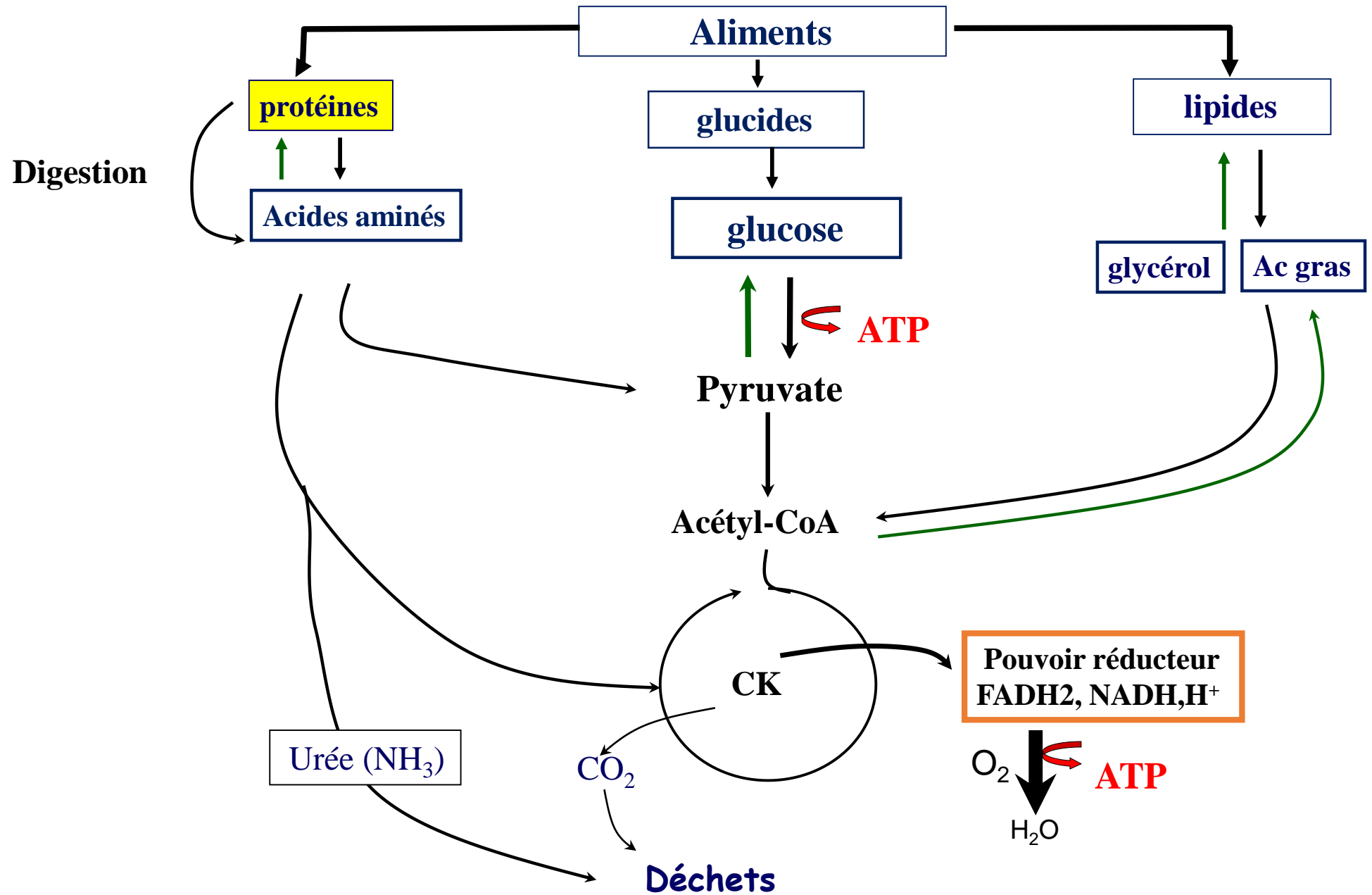
UE BASES EN SCIENCES DE LA VIE

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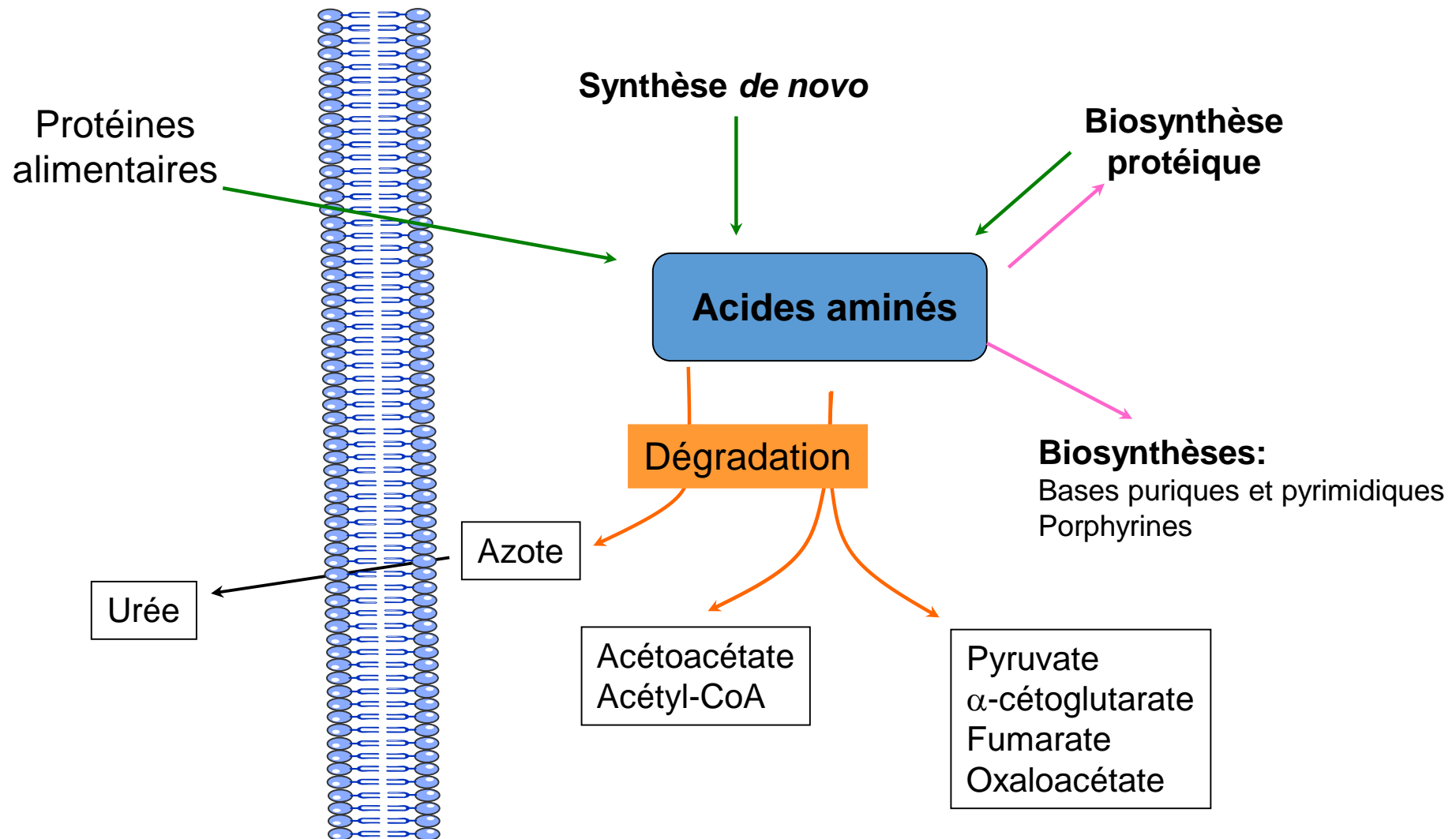
Les trois principales étapes du métabolisme énergétique



Métabolisme des acides aminés

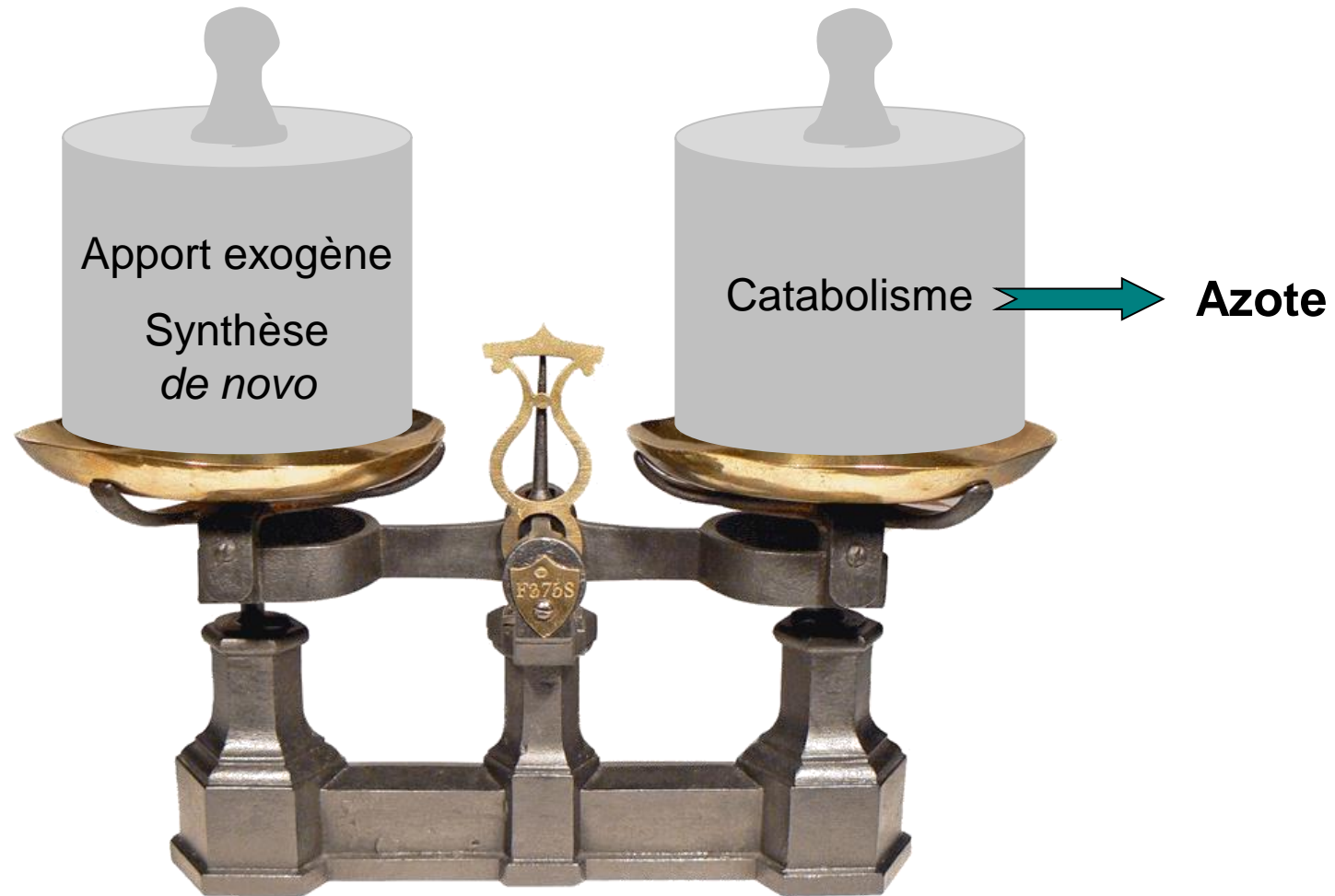
Environnement extérieur

Organisme



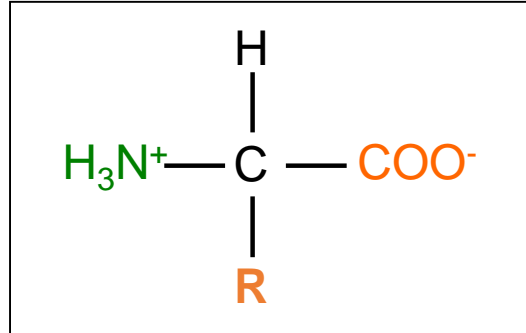
Importance des acides aminés dans l'organisme

Balance azotée



Rappels sur Acides aminés

Structure



Rôles

- Biosynthétique
- Energétique
- Fonctionnel

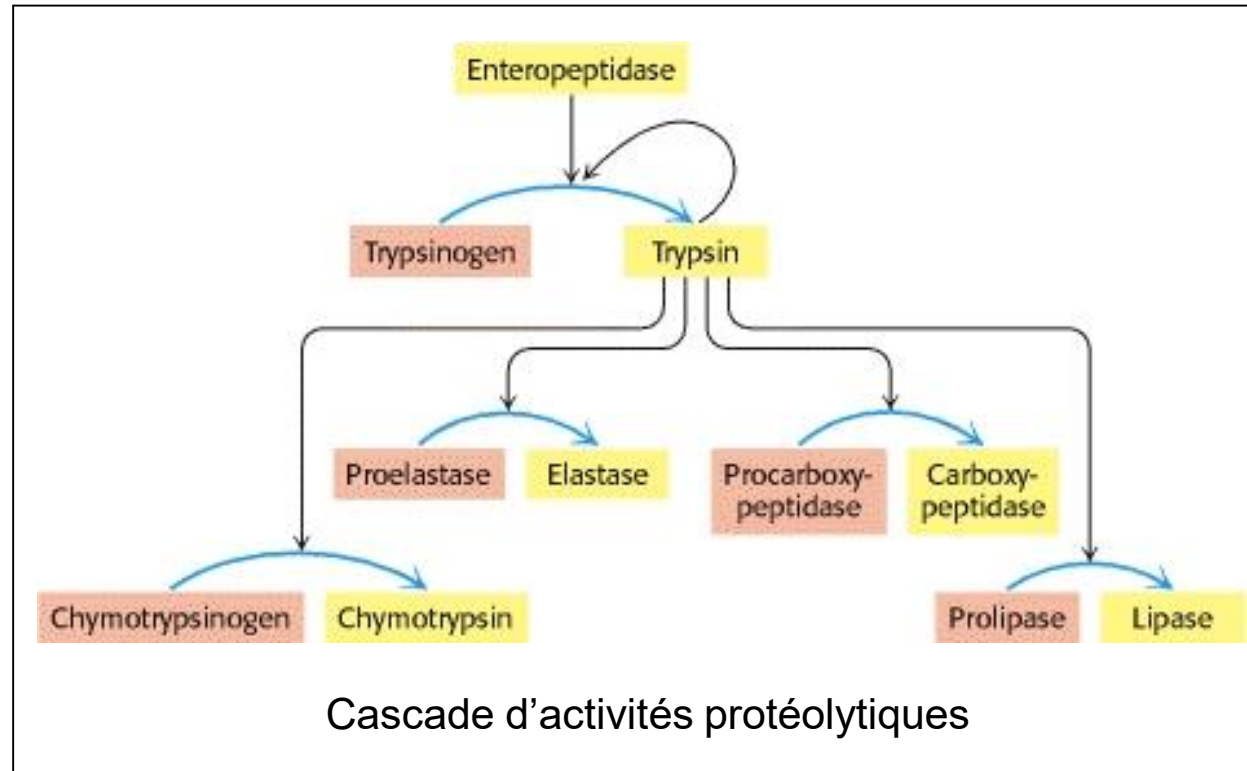
Besoins en acides aminés

Acides aminés indispensables	Acides aminés non indispensables
Leucine (Leu, L) Thréonine (Thr, T) Lysine (Lys, K) Tryptophane Phénylalanine Valine (Val, V) Méthionine (Met, M) Isoleucine (Ile, I) <i>Arginine*</i> (Arg, R) <i>Histidine*</i> (His, H)	Acide aspartique (Asp, D) Asparagine (Asp, N) Acide glutamique (Glu, E) Glutamine (Gln, Q) Alanine (Ala, A) Cystéine (Cys, C) Tyrosine (Tyr, Y) Glycine (Gly, G) Proline (Pro, P) Sérine (Ser, S)

Digestion des protéines alimentaires

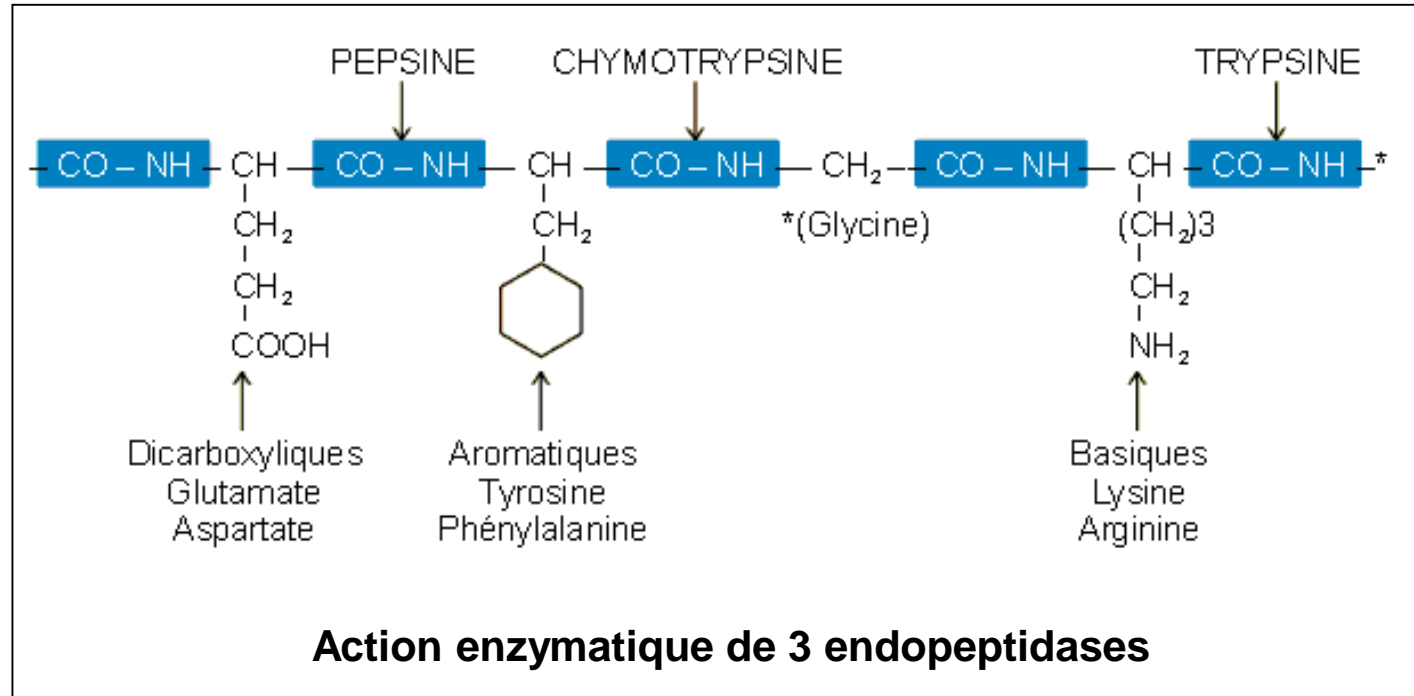
Digestion dans l'estomac

Digestion par les enzymes pancréatiques



Digestion par les enzymes de l'intestin grêle

Devenir des acides aminés libres et des dipeptides



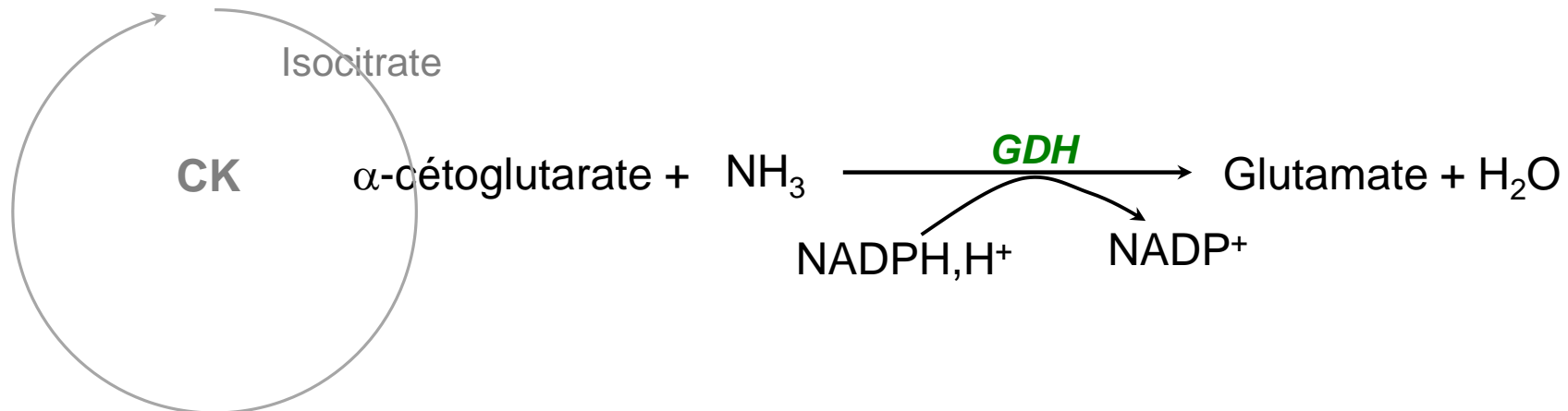
Métabolisation des acides aminés

Anabolisme des acides aminés

Origine de l'azote dans les acides aminés

Origine du squelette carboné

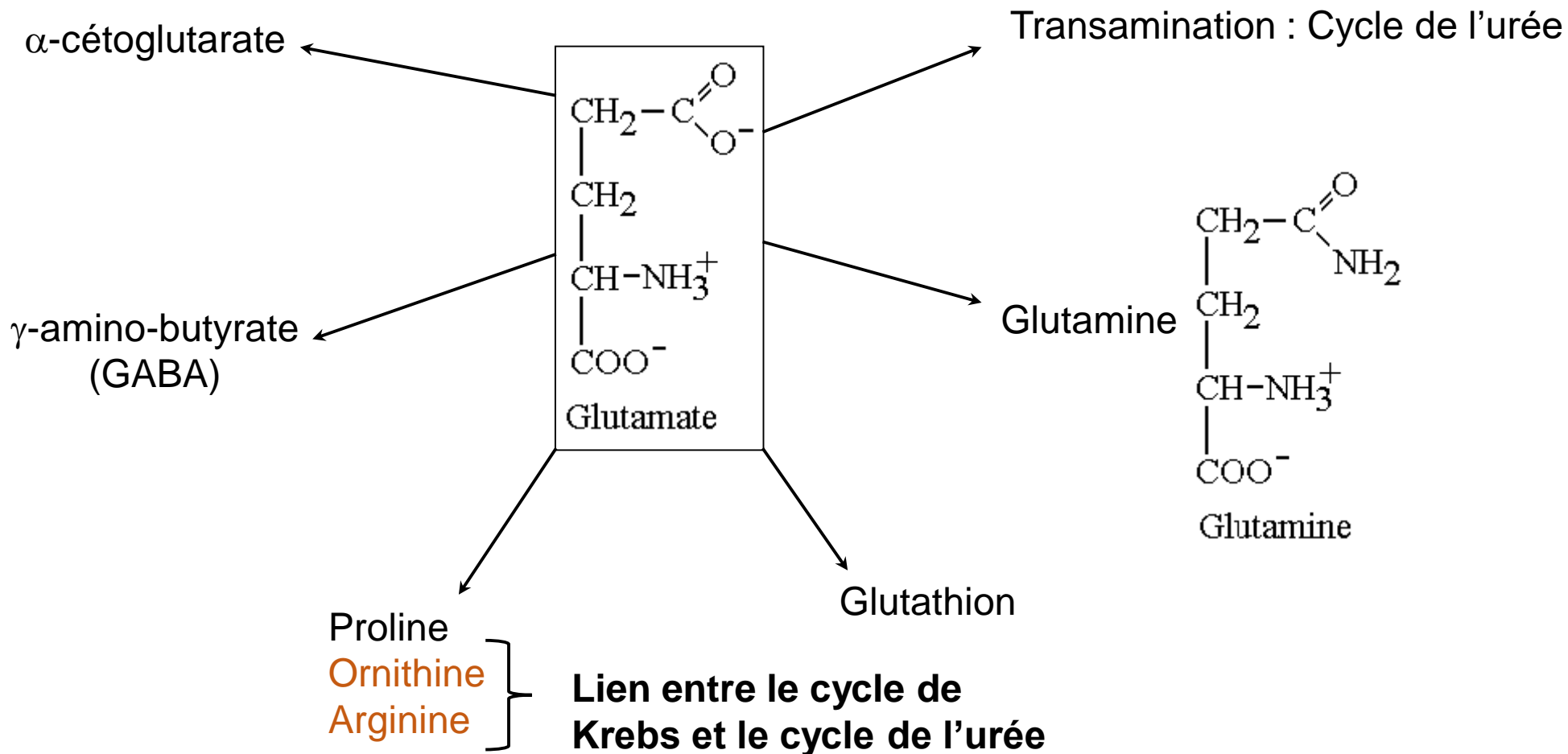
Assimilation de l'azote: mécanisme en 2 temps



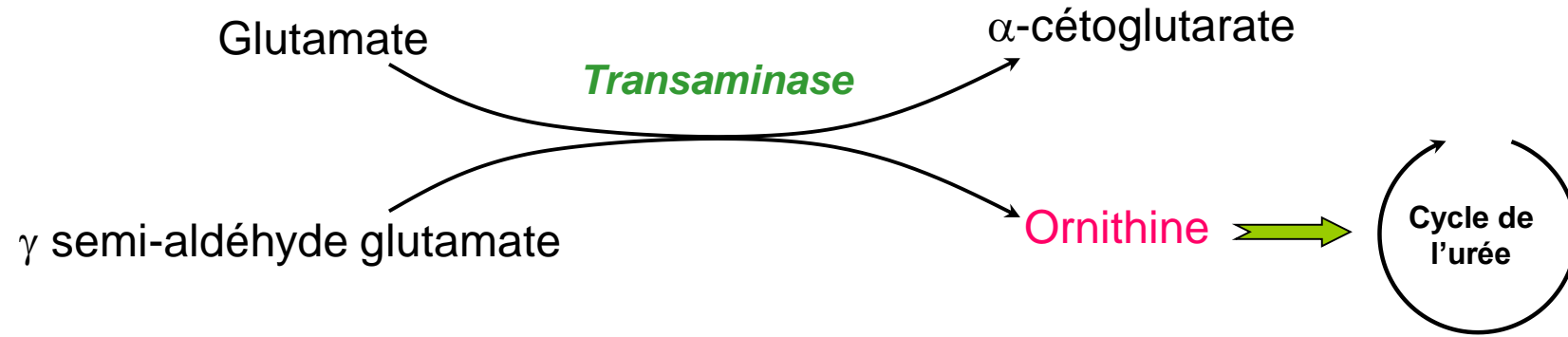
acide α-cétonique	Famille d'AA	AA
α -cétoglutarate	Glutamate	Glutamate, Glutamine, Proline Arginine, Lysine
Oxaloacétate	Aspartate	Aspartate, Asparagine, Méthionine Thréonine, Isoleucine
3-Phosphoglycérate	Sérine	Sérine, Glycine (glycocolle), cystéine
Pyruvate	Alanine	Alanine, Valine, Leucine
PEP + Erythrose-4-P		Phénylalanine, Tyrosine, tryptophane
Ribose-5-P		Histidine

Les glucides sont les principaux fournisseurs du carbone

Rôle central du glutamate

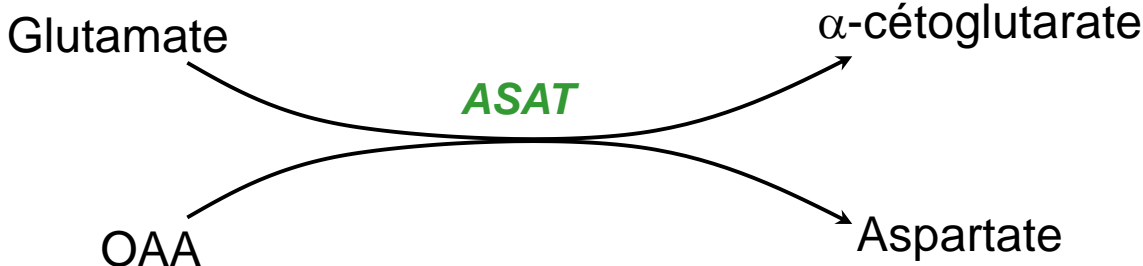


Ornithine

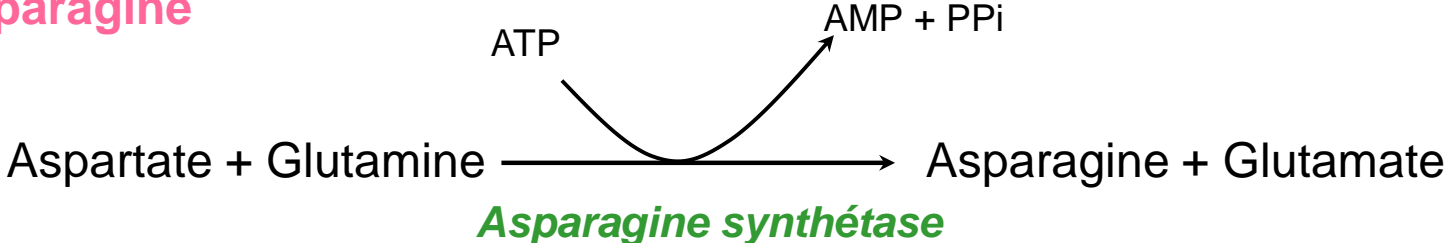


Famille de l'aspartate

Aspartate

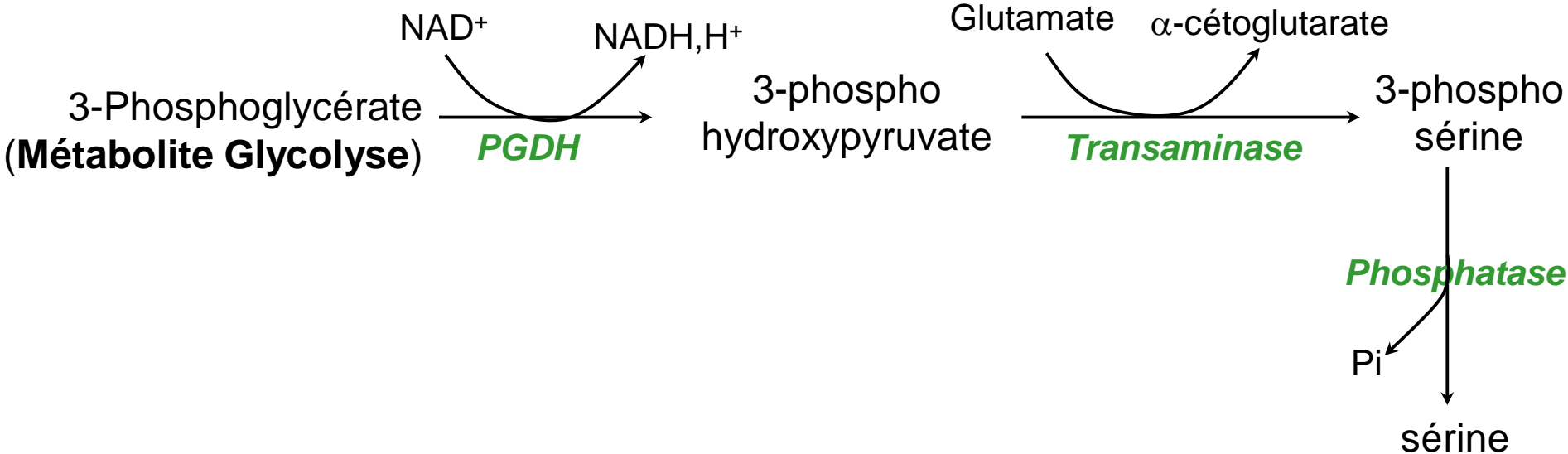


Asparagine

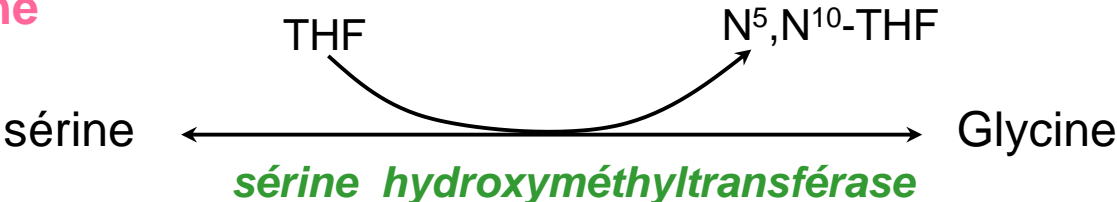


Famille de la sérine

Sérine

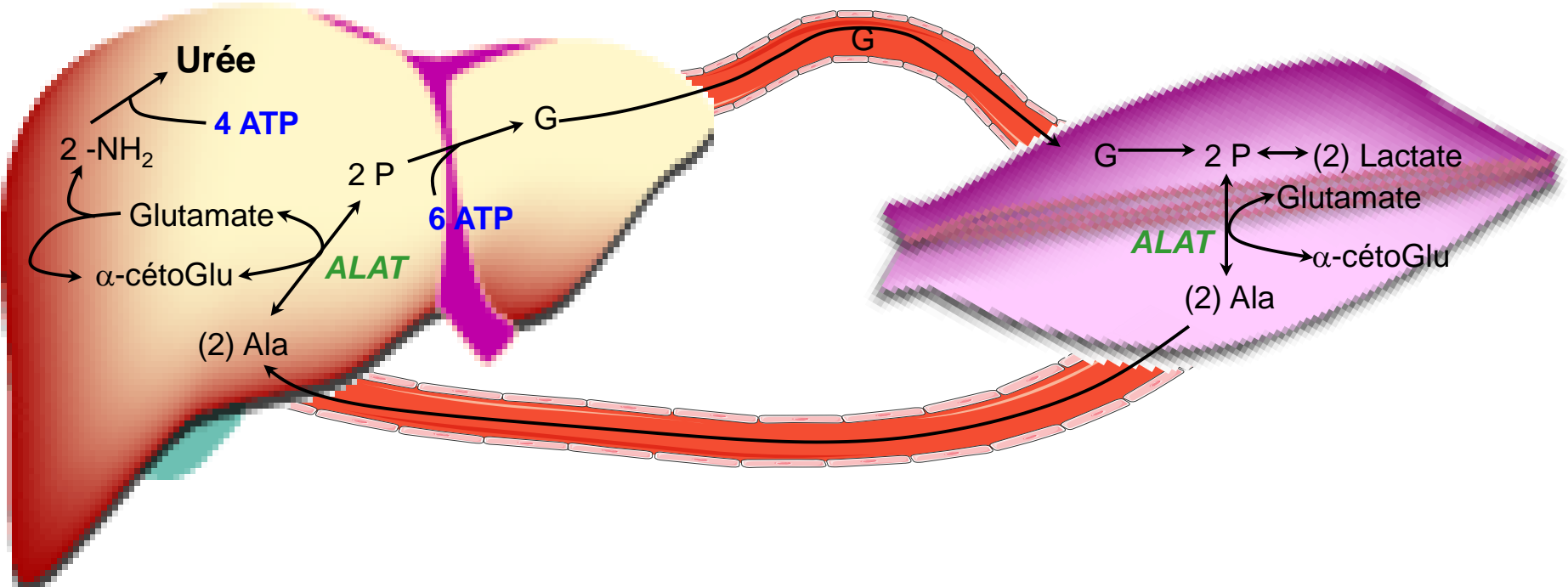
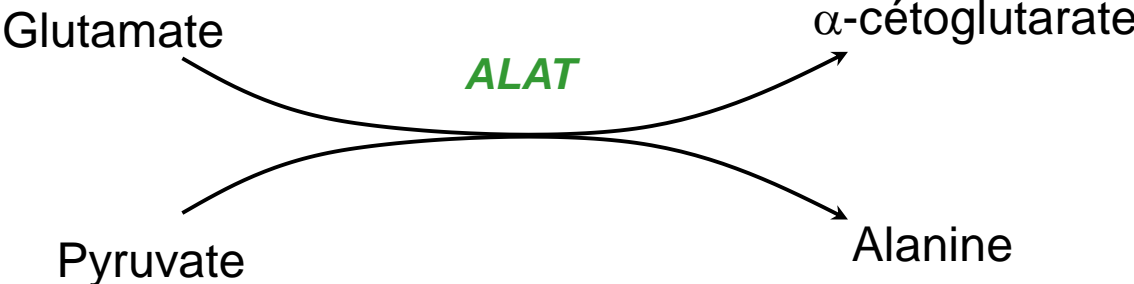


Glycine



Famille de l'alanine

Alanine



Catabolisme des acides aminés

Généralités

Phe } H Thyroïdiennes
Tyr } Cathécolamine

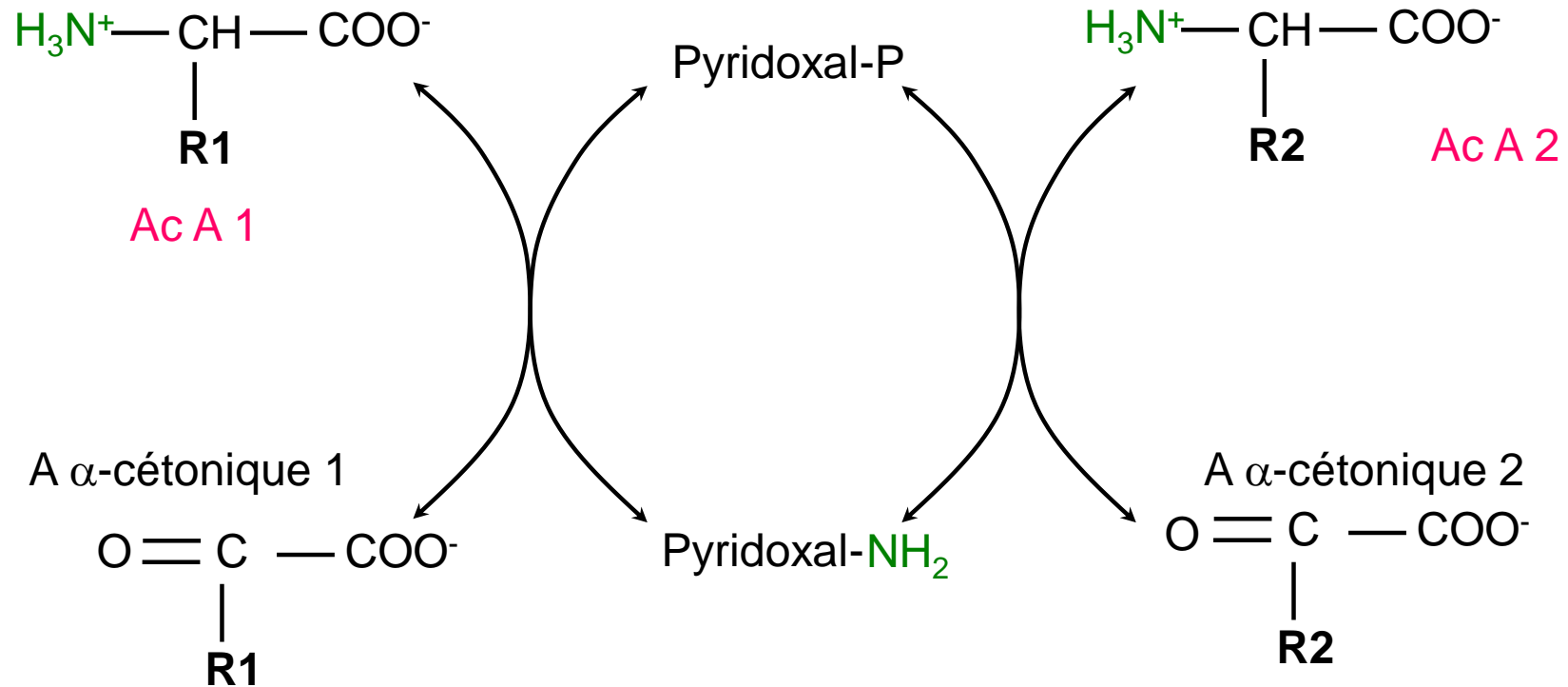
His → Histamine

Arg → NO

Glu → GABA

Asp }
Gly } B. Puriques et pyrimidiques
Glu }

Transamination

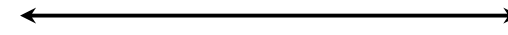


AA 1 :
Glutamate



acide α -cétonique 2 :
 α -cétoglutarate

acide α -cétonique 1



AA 2 :

oxaloacétate

ASAT

Asp

pyruvate

ALAT

Ala

α -céto- β -méthyl valérate

Ile

α -céto isovalérate

Val

phénylpyruvate

Phe

4-hydroxyphényl pyruvate

Tyr

préphénate

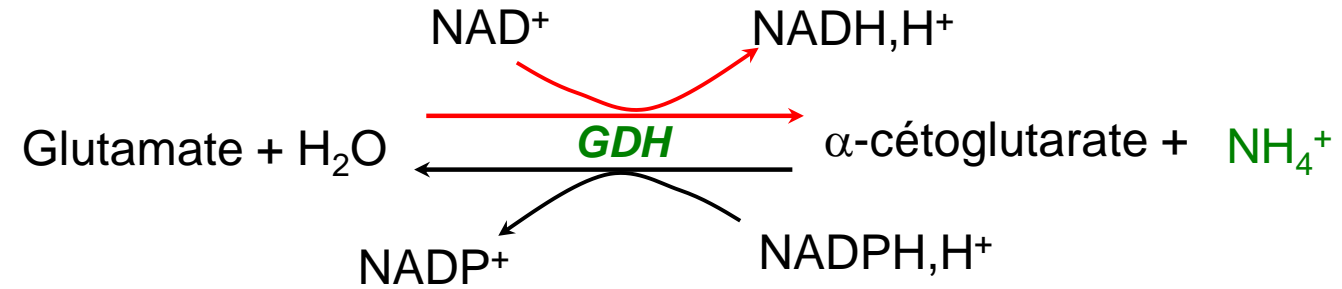
Arogénate

3-phosphohydroxy pyruvate

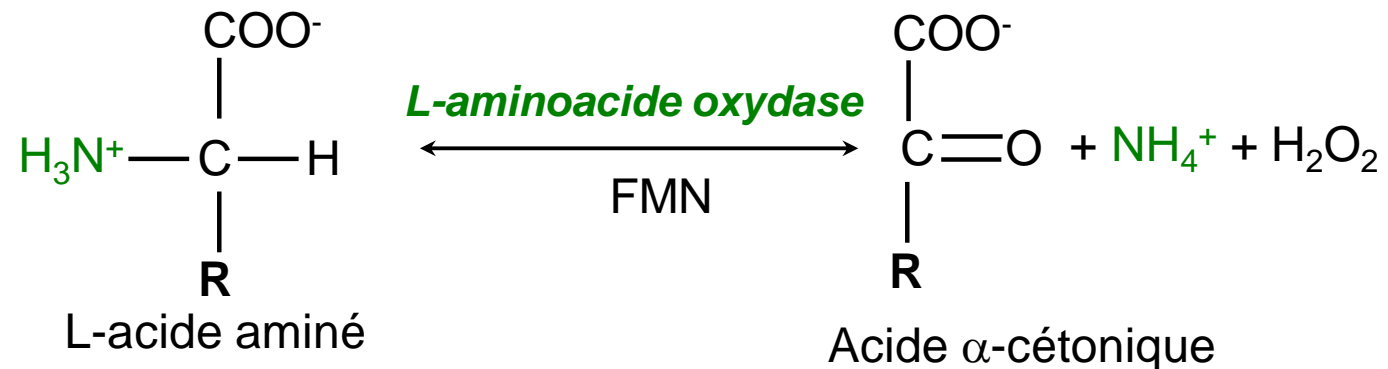
3-phosphosérine

Désamination oxydative

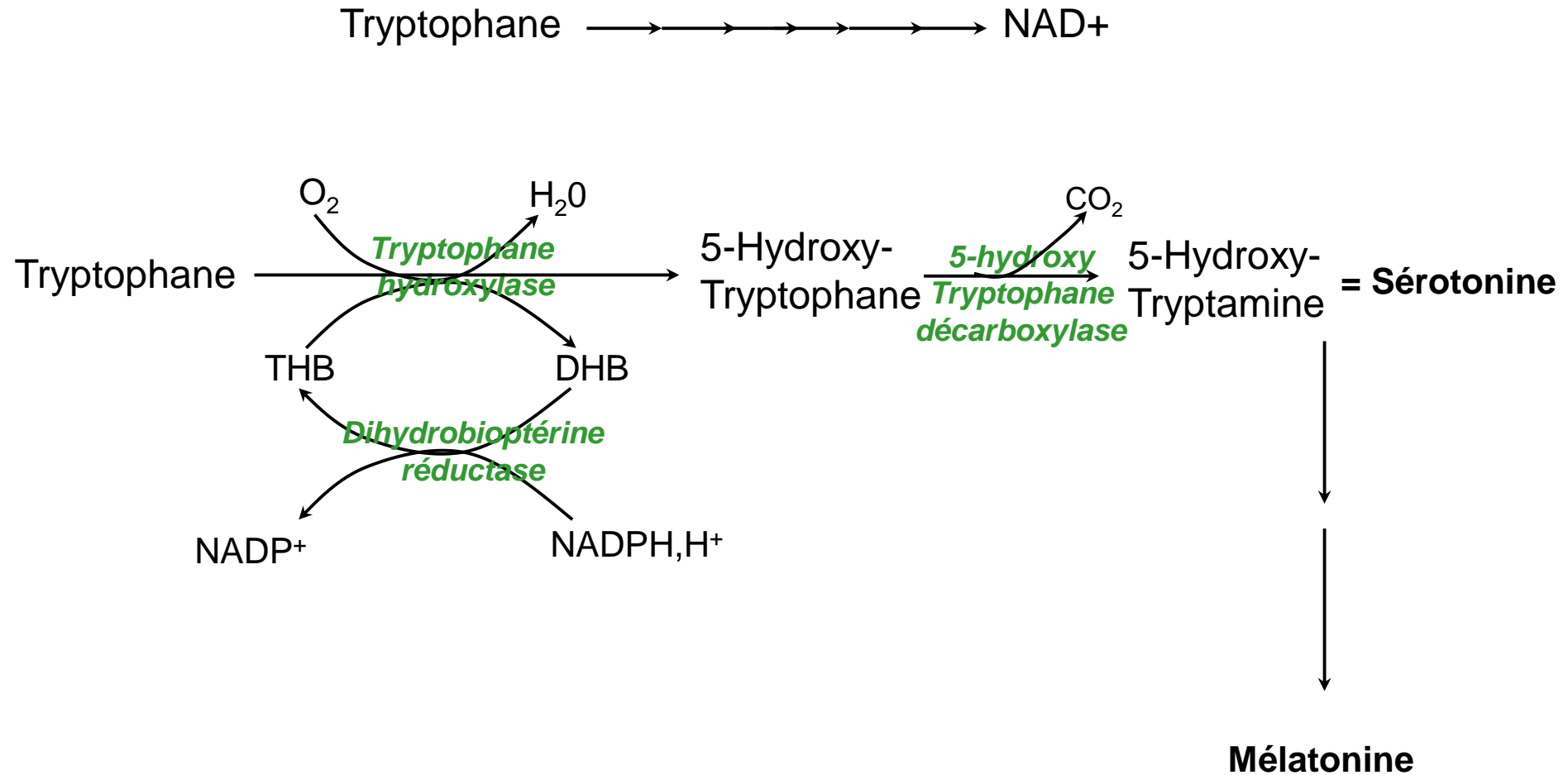
Glutamate déshydrogénase



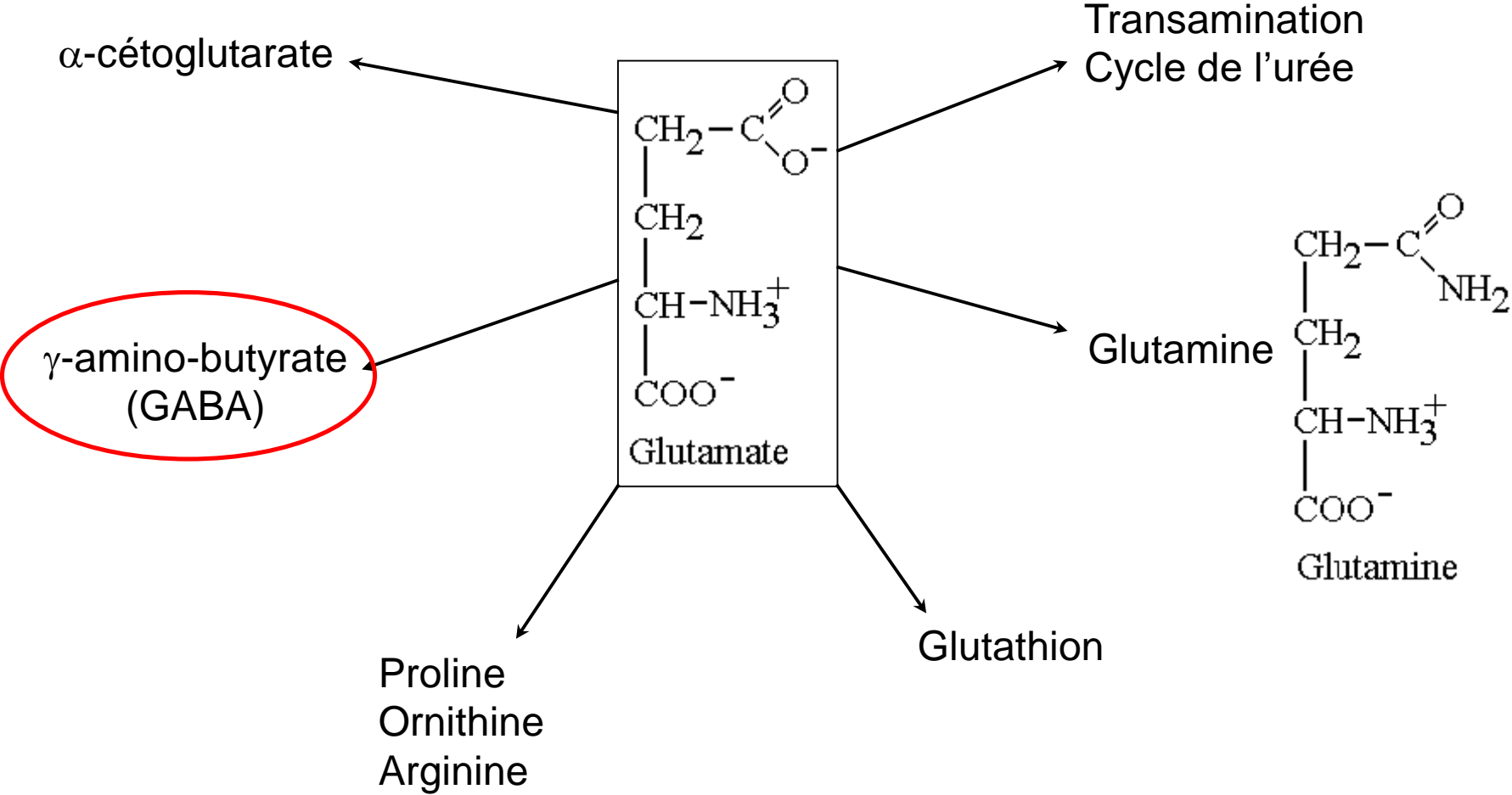
Oxydases des acides aminés



Catabolisme du tryptophane



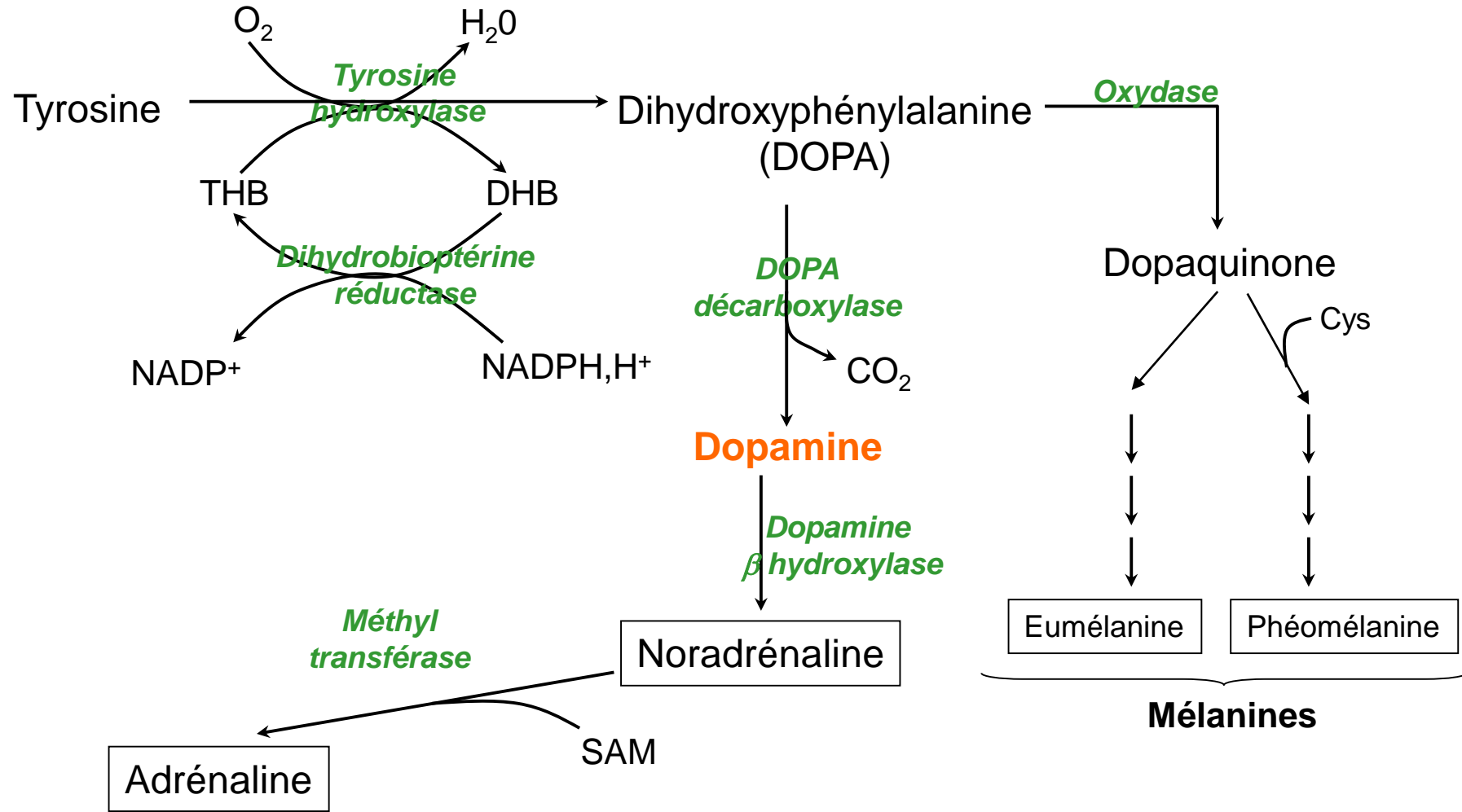
Rôle central du glutamate



Production de produits spécialisés

Dérivés de la tyrosine

- Dopamine et dérivés



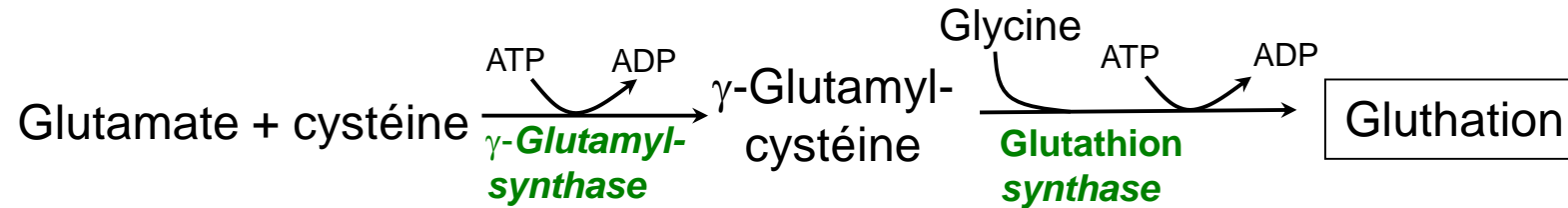
- Hormones thyroïdiennes

Dérivés du glutamate

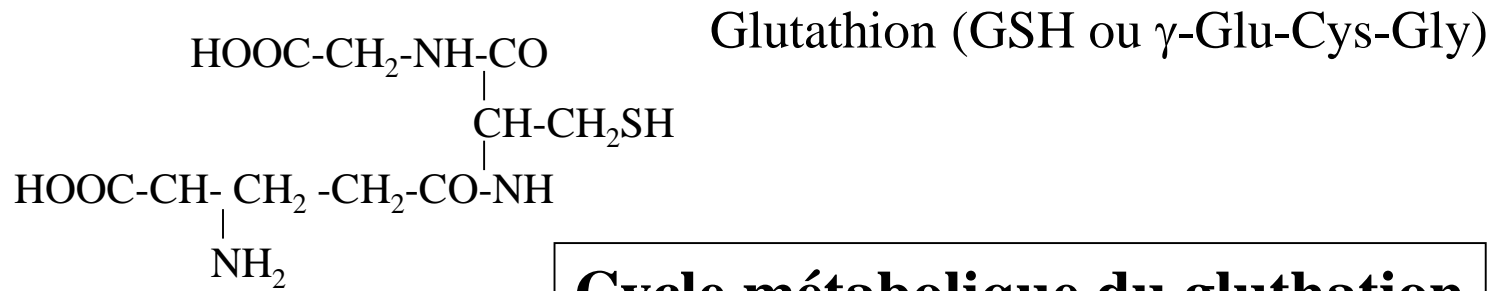
- γ -amino-butyrat (GABA)



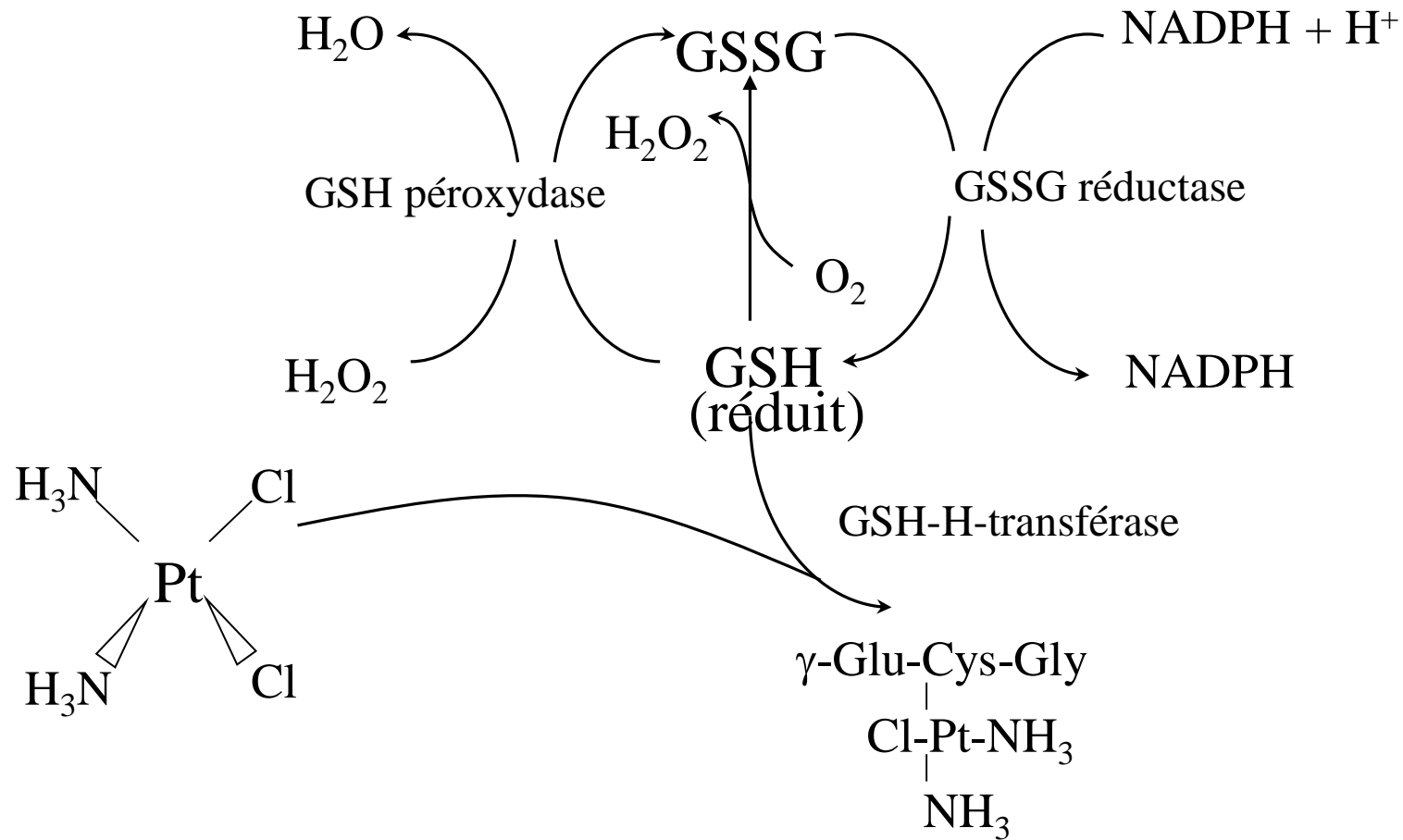
- Glutathion



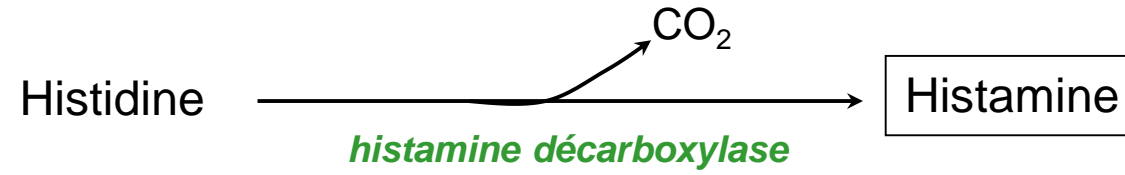
Glutathion : rôle de détoxification...



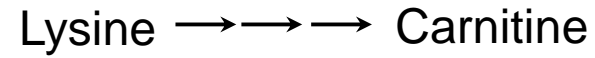
Cycle métabolique du glutathion



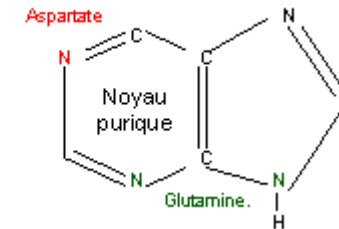
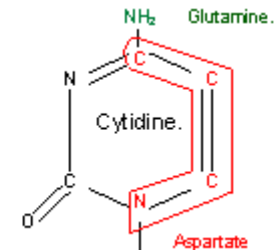
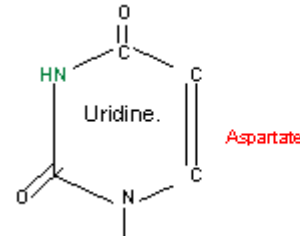
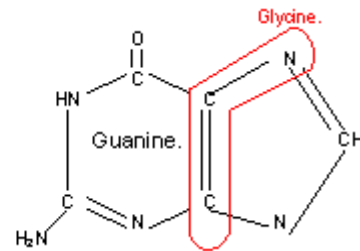
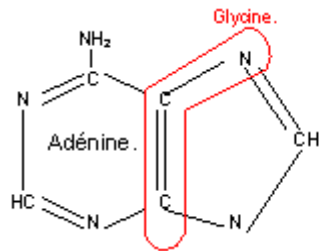
Dérivé de l'histidine



Dérivé de la lysine

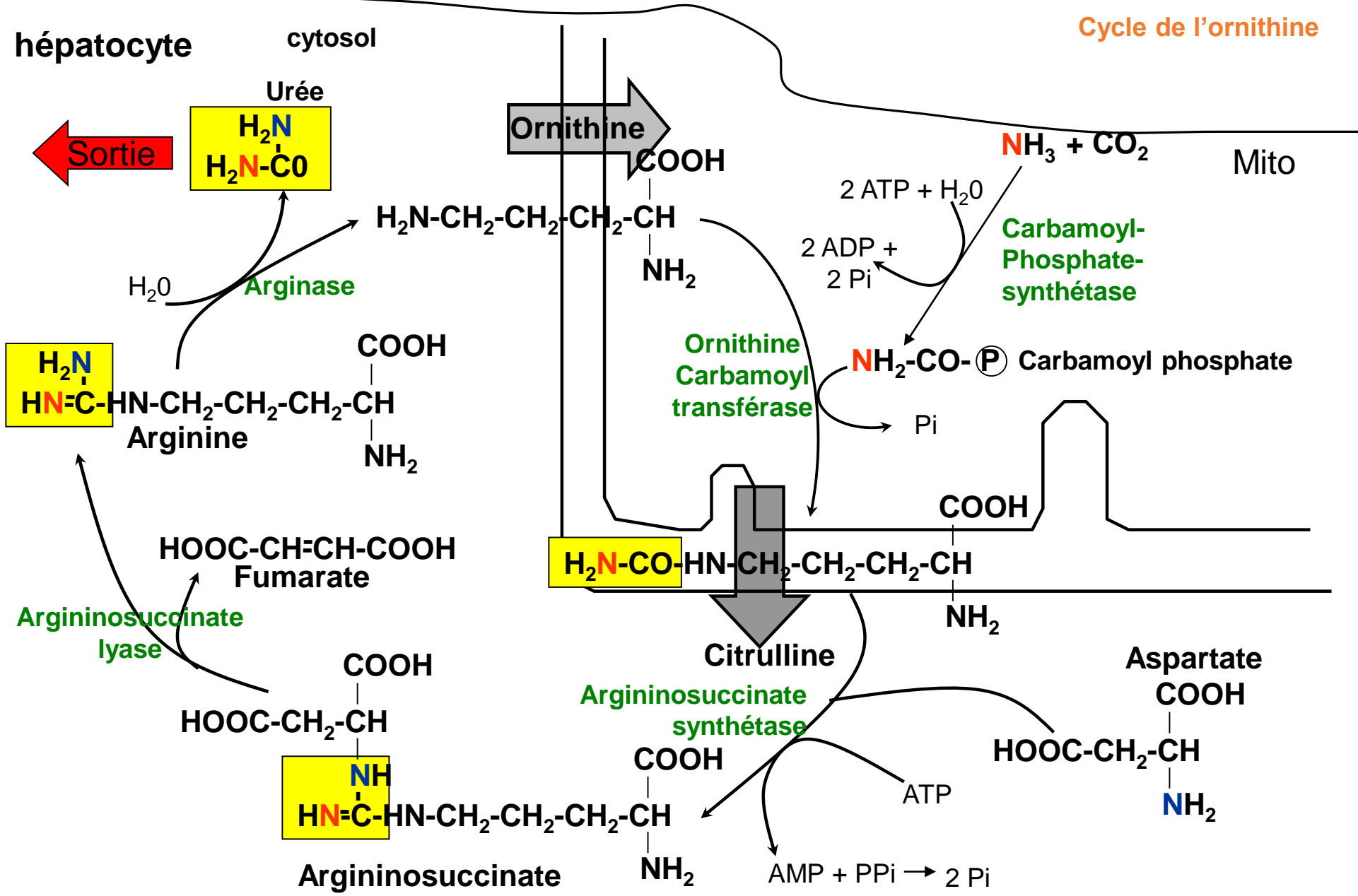


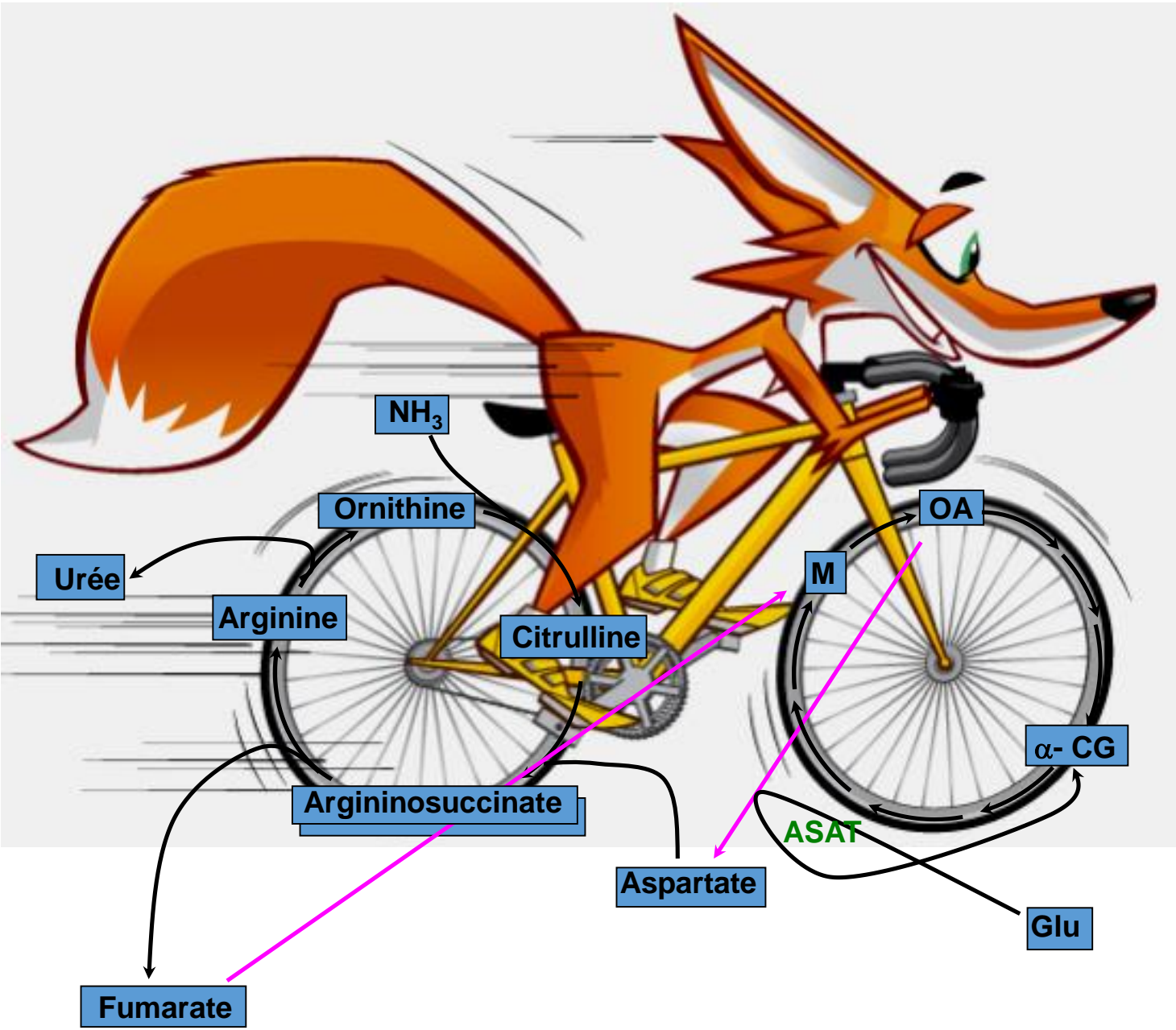
• Bases puriques et pyrimidiques



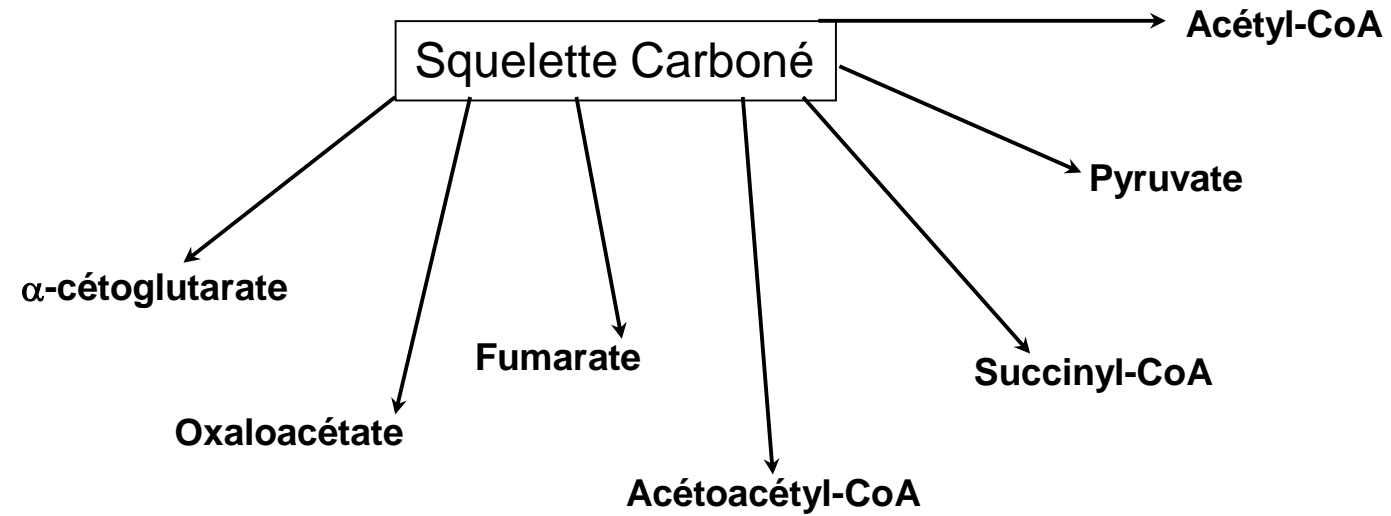
Ici le 29 septembre

ELIMINATION DE L'ION AMMONIUM: uréogénèse : cycle de l'urée



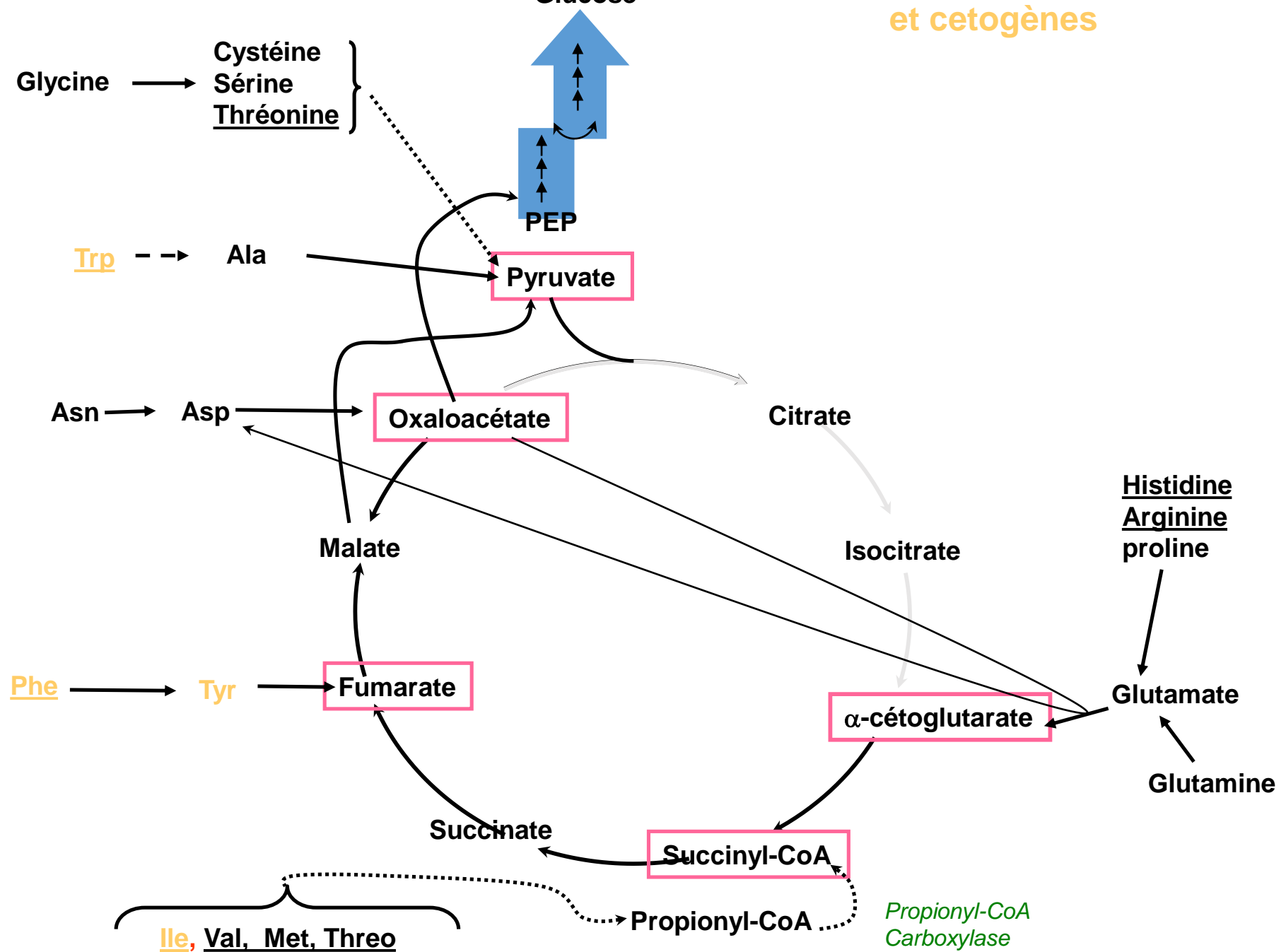


Devenir du squelette carboné

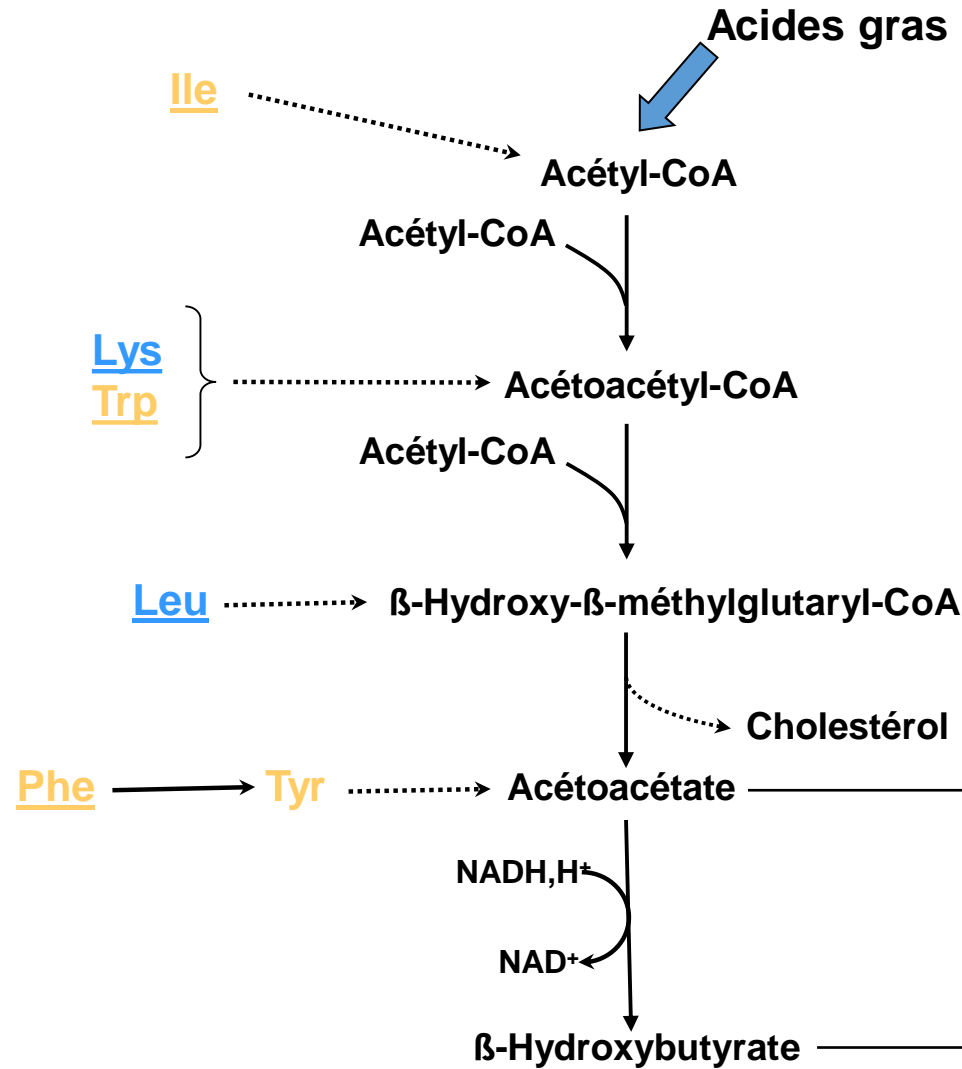


Acides aminés glucoformateurs

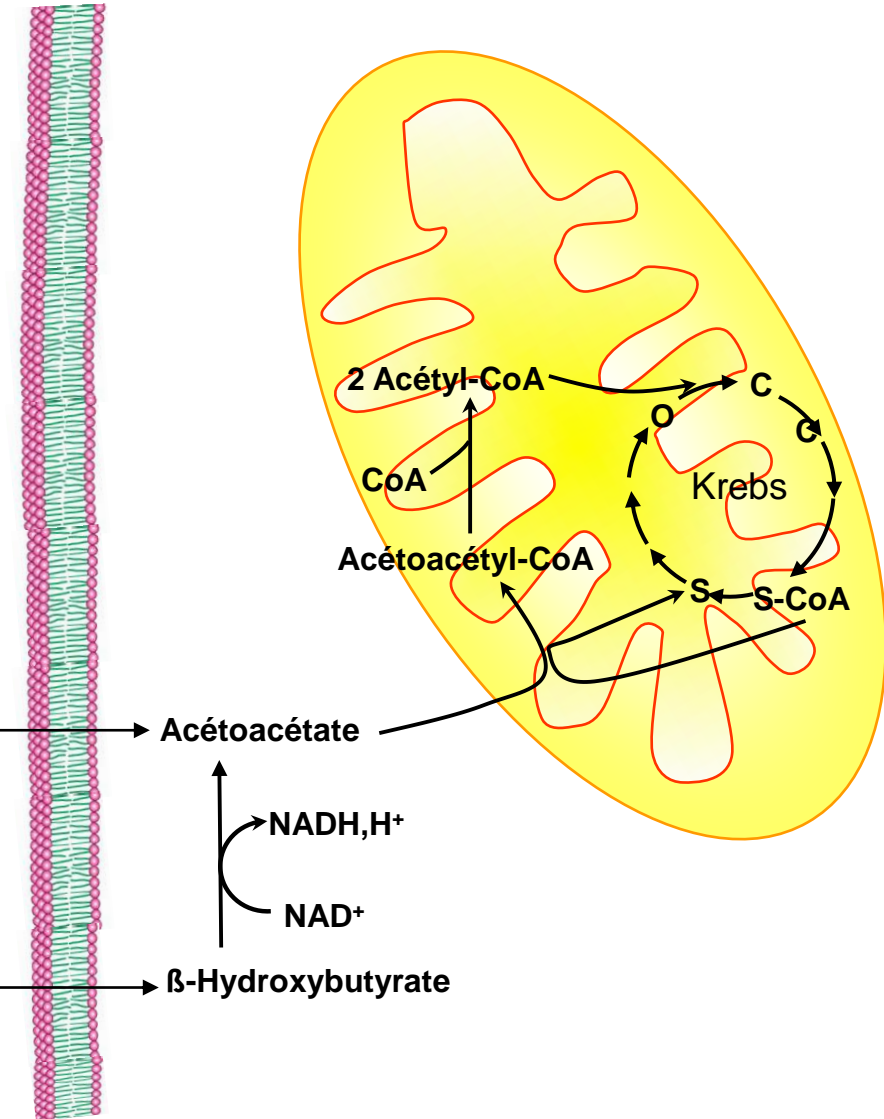
Acides aminés glucoformateurs et cétogènes



Acides aminés cétoformateurs



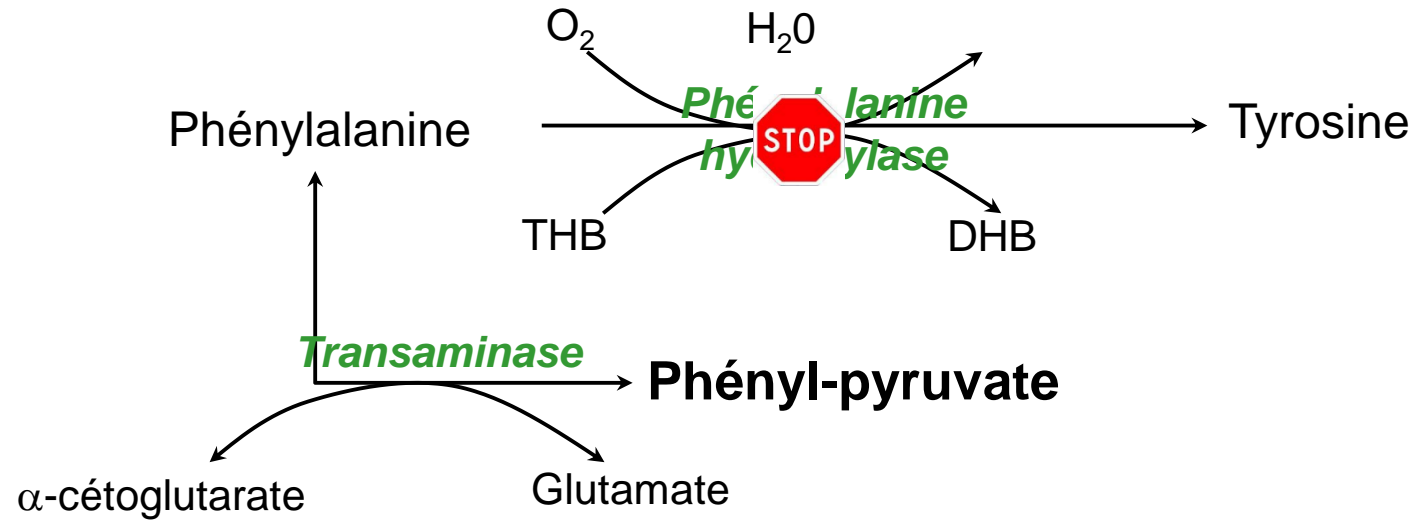
Acides aminés glucoformateurs et cétogènes



*: Acides Aminés céto et glucoformateurs
En rouge: Acides Aminés indispensables

Métabolisme des acides aminés: Déficience innée

Phénylcétonurie



Schema des principales interconversions Glucides-lipides-protéines

