

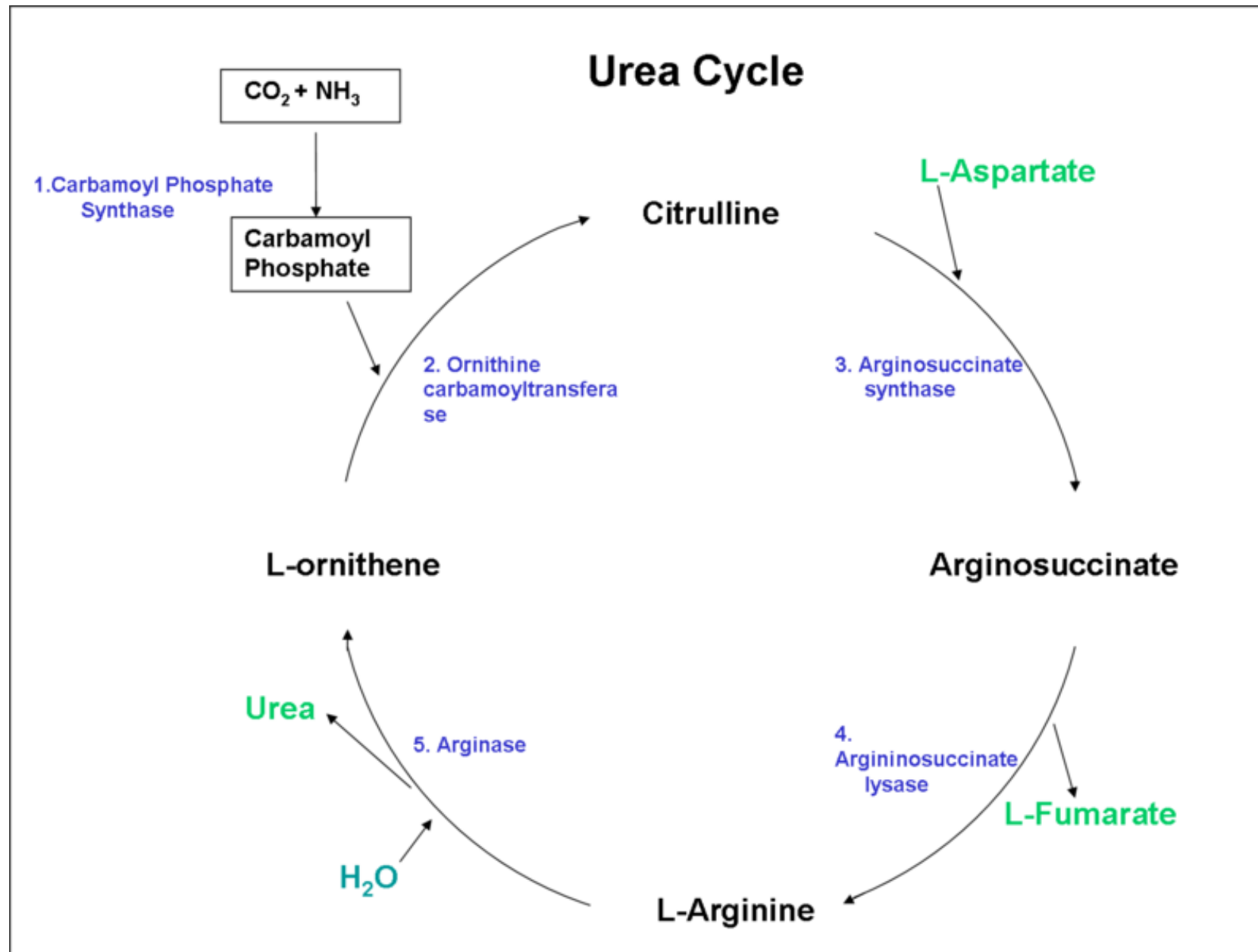


BCH 447

Estimation Of Arginase Activity In Liver Extract

- Introduction:

- Ammonia is a product of oxidative deamination of amino acids.
- It is toxic in even small amount and it must be removed from the body.
- Arginase is one of the important enzymes in urea cycle which is the major disposal form of amino groups derived from amino acids.
- Urea cycle catalyzed by a set of enzymes (Five enzymes) present in the liver ,and then is transported in the blood to the kidneys for excretion.



- Principle:

-The arginase enzyme catalyzes the fifth reaction in the urea cycle, the enzyme is present **exclusively in the liver** .

-Arginase catalyzes the hydrolytic cleavage of the guanidine group of Arginine to regenerate ornithine and urea.



-Two isozymes of this Enzyme exist ,

-First ; Arginase I (**In cytoplasm**) for functions of urea cycle,

- Second; Arginase II to regulate the arginine/ornithine concentration in the cell (**In mitochondria**).

- Arginase requires a two-molecules metal of **Co²⁺ and Mn²⁺** for it's activation while **ornithine and lysine** are potent inhibitors.

-The activity of the enzyme is determined by **measuring the amount of urea produced**, urea is reacted with the reagent iso-nitrosopropiophenone and heated in boiling water, leading to the production of a red color compound which is measured by spectrophotometry at 520nm.

Urea + iso-nitrosopropiophenone boiling water bath **→ red color compound**

- Question:

- What are the causes of high blood ammonia level?**