

Urea - Introduction

- Urea cycle reactions converts toxic NH_3 into non-toxic and water soluble urea.
- Urea is the principle end product of the protein or amino acid metabolism in humans.
- 80-90% of urinary nitrogen excreted is in the form of urea nitrogen.

Urea synthesis

- Krebs and Henseleit were the first to elucidate the steps. Hence **Krebs Henseleit cycle**
- Other name -- **Urea cycle, Ornithine cycle.**
- Site of urea synthesis- **Liver**
- First two reactions occur in the **mitochondria**
- and later three reactions occur **in cytosol**

Requirements of urea synthesis

- **Substrate:**
 - CO_2 --- from HCO_3
 - NH_4 --- Deamination of amino acids
 - Aspartic acid --- Transamination of OAA
- **Energy: ATP 3molecules**
- **Modulators:**
 - Mg^{+2} , N Acetyl Glutamate (NAG)

Steps in the urea cycle are

Step 1: Formation of carbamoyl phosphate

Step 2: Formation of citrulline

Mitochondria

Step 3: Synthesis of Argininosuccinate

Step 4: Synthesis of Arginine

Step 5: Release of urea and Ornithine

Cytosol

Step 1 : Synthesis of carbamoyl phosphate

Step 1: Takes place in mitochondria

