Amino Acid Oxidation & Urea Cycle

I. Background

II. Dietary
- A. Digestion
  - 1. gastrin
    - a. pepsinogen
      - 1)pepsin
  - 2. food in SI
    - a. secretin
    - b. cholecystokinin (CKK)
      - a) trypsinogen
        - trypsin
      - b) chymotrypsinogen
        - chymotrypsin
    - c. intestinal wall cells
      - 1)carboxypeptidases A & B
      - 2)aminopeptidases
- B. Acute pancreatitis

III. Amino Acid Oxidation Liver
- A. Step 1
  - 1. aminotranferases
    - a. pyridoxal phosphate
- B. Step 2
  - a. oxidative deamination
  - 1. glutamate dehydrogenase

IV. Protein breakdown
- A. Transport forms
  - 1. glutamine synthetase
  - 2. Glucose-alanine cycle
    - a. alanine aminotransferase

V. Ammonia bad

VI. Urea cycle
- A. Excretory strategies
  1. Ammonotelic
  2. Ureotelic
  3. Uricotelic
- B. Pre-step
  1. carbamoyl phosphate
     a. carbamoyl phosphate synthase I (CPS I)
- C. Urea cycle
  1. Step 1
     a. carbamoyl P + ornithine —> citruline
     b. ornithine transcarbamoylase
  2. Step 2
     a. citruline + D —> argininosuccinate
     b. argininosuccinate synthase
  3. Step 3
     a. argininosuccinare <—> arginine + fumarate
     b. arginosuccinase (argininosuccinate lyase)
  4. Step 4
     a. arginine —> urea + ornithine
     b. arginase

VII. Clinical Insights
- A. Inherited defects
- B. Liver damage
- C. Hibernation