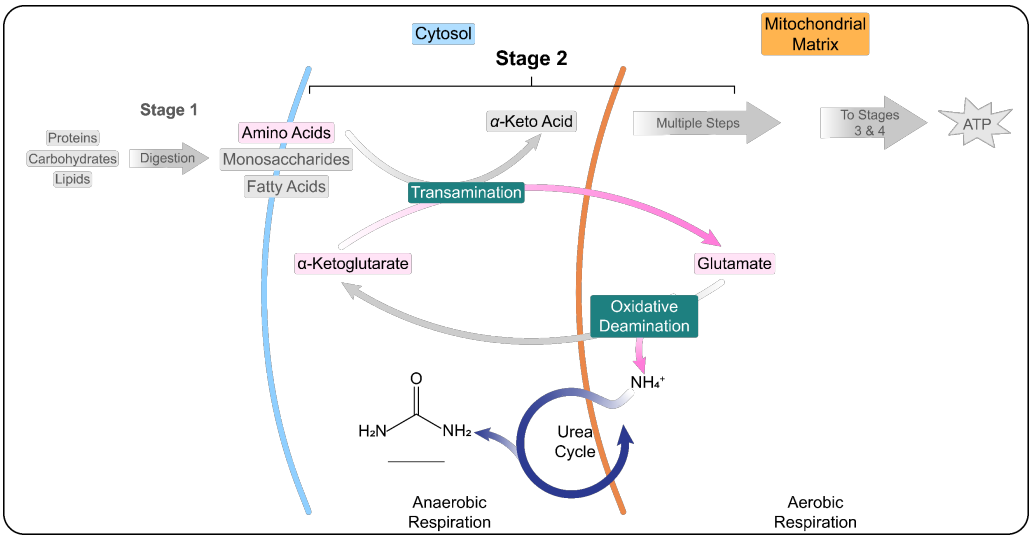
CONCEPT: INTRO TO THE UREA CYCLE

- The urea cycle converts the toxic ammonium ion into _____ for excretion into urine.
  - □ Energy-spending pathway
  - □ Uses energy from hydrolysis of _____.



- NH_4^+ ions are _____ for the pathway in the mitochondrial matrix.
  - □ Cycle concludes in the _____, producing urea.

EXAMPLE: What is the source of energy that drives the urea cycle?

a) Oxidation of electron carriers (NADH and $FADH_2$).

b) Hydrolysis of Acetyl CoA.

c) Hydrolysis of ATP.

d) No energy is required to run the urea cycle.

CONCEPT: INTRO TO THE UREA CYCLE

Phases of the Urea Cycle

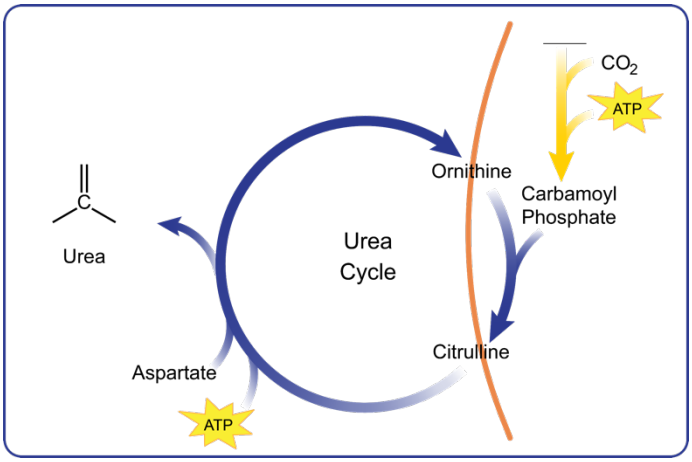
- The urea cycle takes place in ___ phases.

A **Preparation:** converts NH_4^+ ions into carbamoyl phosphate.

□ Consumes _____. □ Uses CO_2 from the mitochondrial matrix.

B **Conversion:** produces urea from carbamoyl phosphate and _____.

□ Consumes _____.



EXAMPLE: Which of the following statements is correct about the urea cycle?

a) Carbamoyl phosphate is produced in the cytosol from oxidation of amino acids.

b) Ammonium ions from oxidative deamination are fed directly to the urea cycle.

c) The urea cycle produces energy in the form of ATP molecules.

d) Urea is produced from carbamoyl phosphate and aspartate.

PRACTICE: Which of the following statements accurately describes the structure of urea?

a) A carbonyl group bonded to two $–NH_2$ groups.

b) A C atom double bonded to two N atoms.

c) A carbonyl group bonded to a $–CH_3$ group and a $–NH_2$ group.

d) A carbonyl group bonded to two –OH groups.