

BMB 401 Lecture 30b Self Assessment KEY: Endogenous Protein and Amino Acid Catabolism

- 1) Endogenous proteins are tagged with this protein ubiquitin through formation of this type of bond to epsilon amino groups on the targeted protein isopeptide bond. These tagged proteins are then brought to this multimeric protein for destruction proteasome

- 2) Please show the reactants and products of Aspartate Aminotransferase in the catabolism of aspartate.
Aspartate + alpha-keoglutarate yield Oxaloacetate + Glutamate

- 3) When the amino acid alanine is deaminated, what alpha-ketoacid is formed?
pyruvate

- 4) Please name the 7 major metabolites formed from the carbon skeletons of amino acids during amino acid catabolism.
 - a) Fumarate
 - b) Pyruvate
 - c) Acetyl Co A
 - d) Acetoacetyl CoA
 - e) Succinyl Co A
 - f) Oxalaoacetate
 - g) alpha-keoglutarate

- 5) Please name the cofactor that functions in amino transferase reactions to form a protonated Schiff base with the incoming amino acid Pyridoxal Phosphate

- 6) Please list the ketoacid product of Glutamate dehydrogenase and explain how this enzyme functions α -ketoglutarate is the α -ketoacid. Glutamate is oxidized to form a Schiff-base. The amino group is hydrolyzed to yield a free ammonium ion and α -ketoglutarate.

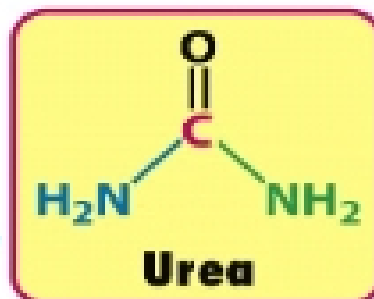
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7) Please explain the glucose-alanine cycle. ___Branched chain amino acids are transaminated, with pyruvate as the acceptor to form alanine and carbon skeletons in the muscles. Carbon skeletons can be used in the muscle as fuel. The alanine travels to the liver and is transaminated to form pyruvate and the amino group acceptor α -ketoglutarate is converted to glutamate - the amino group can be oxidized to provide nitrogen for the urea cycle. Pyruvate can be used to generate glucose through gluconeogenesis. The glucose produced by the liver is sent out and can be used by the muscles. _____

8) What are the metabolites that produce carbamoyl phosphate? __Two ATP, CO_2 (bicarbonate ion) and ammonium _____

9) What intermediate links the TCA and Urea cycles? __Fumarate_____

10) Please draw urea and identify the source of each group.



The first amino group comes from **Ammonia**

The second amino group comes from **Aspartate**

The carbon and oxygen come from Bicarbonate