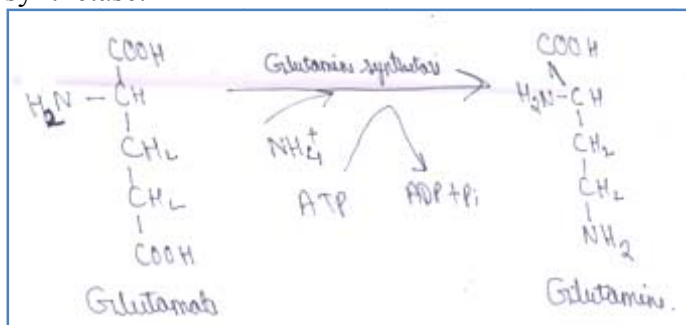


OVERVIEW OF NITROGEN METABOLISM

The molecular nitrogen cannot be used by the animals. They can use only the reduced form of nitrogen that is in the form of NH_3 that is assimilated into amino acids and other nitrogen containing biomolecules. The NH_4^+ is incorporated into glutamate by an enzyme glutamine synthetase.



The amino acids glutamate and glutamine are the important source of amino groups for the most other amino acids, nucleotides, FAD, NAD and so on.

As the NH_4^+ is toxic to a animal body, it is not circulated in body in free form but is incorporated into glutamic acid.

BIOSYNTHESIS OF AMINO ACIDS

All the amino acids are derived from intermediates of glycolysis, TCA cycle and pentose pathway. The nitrogen enters these pathways from glutamine and glutamic acid. The organisms vary in their ability to synthesize the 20 amino acids. Most bacteria and plants can synthesize all 20 amino acids while the mammals can synthesize about half of these, generally those with simple pathways.

PATHWAY OF WHICH THE INTERMEDIATE IS USED AS PRECURSOR	METABOLIC PRECURSOR	PRODUCT AMINO ACIDS
Glycolysis	3-Phospho-glyceric acid	Serine, Glycine, Cysteine
Glycolysis	Pyruvic acid	Alanine, Valine, Leucine, Isoleucine
Glycolysis and Pentose Phosphate Pathway	Phosphoenol Pyruvic Acid and Erythrose-4-Phosphate	Tryptophan, Phenylalanine, Tyrosine
Pentose Phosphate Pathway	Ribose-5-Phosphate	Histidine
TCA cycle	Oxaloacetic acid	Aspartic Acid, Asparagine, Methionine, Theronine, Lysine.
TCA cycle	α -ketoglutaric acid	Glutamic Acid, Glutamine, Proline, Arginine