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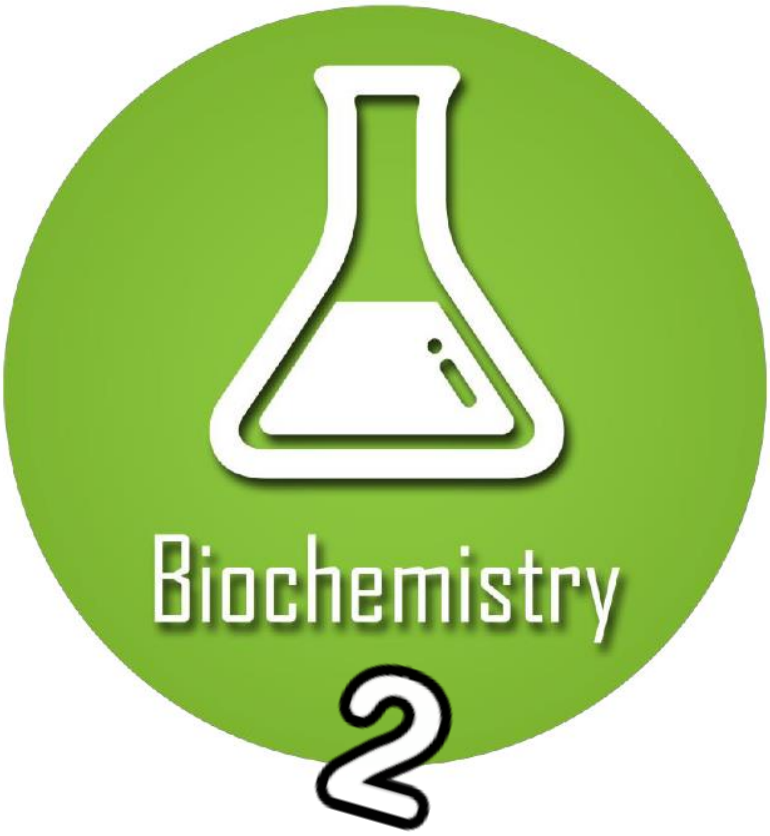
Medical Committee
The University Of Jordan



◉Sheet ○Slides

Number: 21

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Corrected by: ***

Subject:AA Metabolism

Doctor: Dr.Diala

-AAs are the building units of proteins
- we have twenty AAs in proteins.
-Alpha AAs : alpha related to the alpha-carbon with four bonds are attached to (H, amino group, carboxyl group and R-group) . Changes in R-groups result in different metabolic pathways.
- when huge amounts of nitrogen are taken as in body-building supplements , they may produce ammonia (toxic base), and this effect can be reduced through dilution and elimination as uria in the urine or using nitrogen to build other substrates needed for the body.

-the first step in AAs metabolism is transamination: transfer the amino group from on AA to an alpha-keto acid which converted spontaneously to glutamate.
- alpha- keto acids or glutamate may go through two pathways , either to produce other compounds or to remove the amino group completely and ammonia is produced that can be eliminated through urine .

-Nonessential amino acids are 11 while the essential AAs are 9.

•AAs are depleted by 3 routes:
•1) synthesis of body protein: the free AAs are carried on the tRNA that is attached to specific codons on the mRNA.
•2) AAs consumed as precursors of nitrogen-containing small molecules: as thyroxine , histamine, catecholamines and small peptides (like glutathione GSH and كيفلينز)
•3) conversion of AAs to glucose, glycogen, fatty acids, A-CoA (produces ketone bodies), or $CO_2 + H_2O$

-turnover : the net is constant , depends on the function and the site of protein.

- most of the body compounds in our bodies are proteins

-misfolded proteins are short-lived unless there is a disease that results in the accumulation of these proteins as in Alzheimer.

-collagen is found in the connective tissue

-rate of turnover :
protein expression :

a) always active for certain portions and unless there is a need to stop it stops.
b)active only when needed by specific signals.

degradation :
ubiquitin acts as a chemical signal that tags misfolded proteins for degradation in the proteasomes in the cytosol (labeling is done by several Ub units)

Ub units are not consumed and they recycled to tag more misfolded proteins.

ATP-independent :in endocytosis the coated vesicles have specific coatings for lysosomes, and after fusion denaturation occurs due to the acidic media followed by digestion . note that the receptor needed for endocytosis that is associated with the ligand is recycled .
-modifications of the new synthesized proteins occur in Golgi then they are packed to their fates

Chymotrypsin ,trypsin and elastase are entero/endo peptidases

pancreatic enzymes are either endopeptidases or exopeptidases.