Mid term assignment DPT marks 30

1. Write down the componenet of extracellular matrix? 4

Ans: The following are the component of extracellular matrix.

* **Proteoglycans**
* **Water**
* **Minerals**
* **Fibrous proteins** including Collagen, elastin.
* The **extracellular matrix** helps cells to bind together and regulates a number of cellular **functions**, such as adhesion, migration, proliferation (growth)

1. How much collegen protein present in mamals and what is the function of collegen in body? 5

Ans: Collegen protein is present in mammals about **30 %** of the protein in body.

Function of Collegen in body:

* Promotes heart health
* Could boost muscle mass
* Could prevent bone loss
* Helps relieve joint pain
* Can improve skin health
* Collagen I- found in bones,tendons,organs
* Collagen II- found mainly in cartilage
* Collagen III- found mainly in reticular fibres
* Collagen IV- found in the basement membrane of cell membranes
* Collagen V- found in hair,nails

1. Write down the functions of proteoglycan? 5

Ans: Functions of proteoglycans

* Proteoglycans are a major component of the animal **extracellular matrix**, the "filler" substance existing between cells in an organism. Here they form large complexes, both to other proteoglycans and to fibrous matrix **proteins**, such as collagen
* PGs play important roles in organizing the **bone** extracellular matrix, taking part in the structuring of the tissue itself as active regulators of **collagen** fibrillogenesis
* In **teeth**, PGs also play an essential role, as many of its components have elaborate ECM structures.
* They are **found** in all connective tissues, extracellular matrix (ECM) and on the surfaces of many cell types.

1. How many proteins involve in electron transport chain? Write down their names? 4

Answer: There are four proteins involve in the electron transport chain. Following are there names:

* Complex 1 [FMN(flavin mononucleotide)]
* Complex 2 [Fe.S (iron, sulphur protein)]
* Complex 3 (Ubiquinone Q)
* Complex 4 [Cytochrome (Cytochrome c,b,a.a3)]

1. Name the four steps of glycogenesis? 2

Answer: Glycogenesis means synthesis of Glycogen. Following are the steps involve in glycogenesis:

Step 1: Synthesis of UDP-G (Uridine diphosphate)

Step 2: Glycogen Prime Synthesis

Step 3: Elongation of Chain

Step 4: Formation of Branches

1. Write down the steps of glycolysis? 5

Answer: Glycolysis means break down of Glucose into two molecules of pyruvate.

Step 1: The Enzyme **Hexokinase Phosphorylates** or adds a phosphate group to glucose in cell’s Cytoplasm. In the process, a phosphate group from ATP is transferred to glucose producing glucose 6-phosphate or G6P. One molecule of ATP is consumed during this Phase

Step 2: The enzyme **phosphoglucomutase isomerizes** G6P into its isomer fructose 6-phosphate or F6P. Isomers have the same molecular formula as each other but different atomic arrangements.

Step 3: The **kinase Phosphofructokinase** uses another ATP molecule to transfer a Phosphate ghroup to F6P in order to from fructose 1,6-bisphosphate or FBP. Two ATP molecules have been used so far.

Step 4: The enzyme Aldolase splits fructose 1,6-bisphosphate into a ketone and an aldehyde molecule. These sugars, dihydroxyacetone phosphate (DHAP) and glyceraldehyde 3-phosphate (GAP), are isomers of each other.

Step 5: The enzyme triose-phosphate isomerase rapidly converts DHAP into GAP (these isomers can inter-convert). GAP is the substrate needed for the next step of glycolysis.

Step 6: The enzyme **glyceraldehyde 3-phosphate dehydrogenase (GAPDH)** serves two function in this reaction. First, it dehydrogenates GAP by transferring one of its hydrogen (H+) molecues to the oxidizing agent nicotinamide adenine dinucleotide (NAD+) to form NADH + H+.

Next, GAPDH adds a phosphate from the cytosol to the oxidizied GAP to form 1,3-bisphosphoglycerate (BPG). Both molecules of GAP produced in the previous step undergo this process of dehydrogenation and phosphorylation.

Step 7: The enzyme **phosphoglycerokinase** transfers a phosphate from BPG to a molecule of ADP to form ATP. This happens to each molecule of BPG. This reaction yields two 3-phosphoglycerate (3 PGA) Molecules and two ATP molecules.

Step 8: The enzyme **phosphoglyceromutase** relocates the P of the two 3 PGA molecules from the third to the second carbon to form two 2-phosphoglycerate (2PGA) moleculse.

Step 9: The enzyme **enolase**  removes a molecule of water from 2-phosphoglycerate to form phosphoenolpyruvate (PEP). This happens for each molecule of 2 PGA from the step 8.

Step 10: The enzyme **pyruvate kinase** transfers a P from PEP to ADP to form Pyruvate and ATP. This happens for each molecule of PEP. This reaction yields two molecules of Pyruvate and two ATP molecules.

1. How isocitrate is converted to succinyl CoA in krebs cycle? Write in one step reaction? 5

Answer: It is the step of which is involves in the Kreb Cycle in which:

Isocitrate + NAD BY the enzyme **isocitrate dehydrogenase** converts to α-Ketoglutarate+Co2 +NADH

Then α-Ketoglutarate + NAD+ Acetyl Co.enzyme A by the enzyme **α-Ketoglutarate dehydrogenase complex** converts to succinyl CoA +NADH + Co2