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DEPARTMENT: MEDICAL LABORATORY SCIENCE

COURSE: BCH 202

MATRIC NUMBER: 18/MHS06/004

1a. ANSWER--- SHOCK ABSORBER

1b. ANSWER— Fatty Acids are CARBOXYLIC ACIDS

2. ANSWER— The Sterol Nucleus of Steroids is called CORE RINGS

3. ANSWER— CHYLOMICRONS transport Dietary Fat and Lipids from the Intestine to Cardiac and Skeletal muscles.

4. Write concisely on the functional characteristics of Nucleus, Mitochondria and Endoplasmic reticulum.

NUCLEUS

The nucleus is a membrane-bound organelle that contains genetic material (DNA) of eukaryotic organisms. As such, it serves to maintain the integrity of the cell by facilitating transcription and replication processes. It's the largest organelle inside the cell taking up about a tenth of the entire cell volume.

The primary functions of the nucleus are to store the cell's DNA, maintain its integrity, and facilitate its transcription and replication. The nuclear contents, which include the genetic material and the many proteins required for its processing, are enclosed within a double membrane known as the nuclear envelope, but remain functionally connected to the cytoplasm via nuclear pores. It is through these pores that RNA can be transported to the cytoplasm for further processing.

MITOCHONDRIA

Mitochondria are known as the powerhouses of the cell. They are organelles that act like a digestive system which takes in nutrients, breaks them down, and creates energy rich molecules for the cell. The biochemical processes of the cell are known as cellular respiration. Mitochondria are found in all eukaryotes, which are all living things that are not bacteria or archaea. It is

thought that mitochondria arose from once free-living bacteria that were incorporated into cells. Mitochondria produce ATP through process of cellular respiration—specifically, aerobic respiration, which requires oxygen. The citric acid cycle, or Krebs cycle, takes place in the mitochondria. This cycle involves the oxidation of pyruvate, which comes from glucose, to form the molecule acetyl-CoA. Acetyl-CoA is then oxidized and ATP is produced.

ENDOPLASMIC RETICULUM

The endoplasmic reticulum is a type of organelle made up of two subunits **rough endoplasmic reticulum and smooth endoplasmic reticulum**. The

endoplasmic reticulum is found in most eukaryotic cells and forms an interconnected network of flattened, membrane-enclosed sacs known as cisternae in the **ROUGH ENDOPLASMIC RETICULUM** and tubular structures in

the **SMOOTH ENDOPLASMIC RETICULUM**. The membranes of the endoplasmic

reticulum are continuous with the outer nuclear membrane. The endoplasmic reticulum is not found in red blood cells, or spermatozoa. Proteins that are transported by the endoplasmic reticulum throughout the cell are marked with an address tag called a signal sequence. The endoplasmic reticulum serves many general functions, including the folding of protein molecules in sacs called cisternae and the transport of synthesized proteins in vesicles to the Golgi apparatus.

5. Explain the various classes of glycolipids and draw the structure of one.

1. Glyceroglycolipids: a sub-group of glycolipids characterized by an acetylated or non-acetylated glycerol with at least one fatty acid as the lipid complex. Glyceroglycolipids are often associated with photosynthetic membranes and their functions. The subcategories of glyceroglycolipids depend on the carbohydrate attached.

SUBCATEGORIES OF GLYCEROLIPIDS:

a. Galactolipid

b. Sulfolipids

2. Glycosphingolipids: a sub-group of glycolipids based on sphingolipids.

Glycosphingolipids are mostly located in nervous tissue and are responsible for cell signaling.

Cerebrosides: a group glycosphingolipids involved in nerve cell membranes.

TYPES OF CEREBROSIDES

- a. Galactocerebrosides
- b. Glucocerebroside
- c. Sulfatides

3. Gangliosides: This is the most complex animal glycolipids. They contain negatively charged oligosaccharides with one or more sialic acid residues; more than 200 different gangliosides have been identified. They are most abundant in nerve cells.