Cells: structures and processes essay sample

Organelles & Illness – Imagine that you are part of a research team that specializes in diagnosing disorders associated with malfunctioning cellular organelles and structures. Medical doctors consult you to provide a cellular explanation for particularly difficult cases. You recently received the two patient histories outlined below – what is your diagnosis? Note – this exercise is only asking you to determine which cell structure might be responsible for the condition.

Choose (1) Patient History to Diagnose

Patient 1: Seven-year old male exhibiting fatigue, muscle weakness, low endurance, loss of coordination, and progressive difficulty walking. Physical Examination Results: Patient shows signs of muscle loss an deformity, an awkward gait, and difficulty breathing. Laboratory Results: Patients cells are of an abnormal shape, cellular division is abnormal, and there is impaired intracellular (within the cell) movement of materials.

Patient 2: Two-day old male with low birth-weight (4lbs, 5oz), has difficulty suckling/swallowing, suffers from seizures and gastrointestinal bleeding. Physical Examination Results: Enlarged liver, low muscle tone/inability to move, glaucoma, facial deformities, impaired hearing, and jaundiced skin. Laboratory results: High levels of hydrogen peroxide in cells and high levels of fats and amino acids in cells.

Diagnosis:

Patient #: patient 1

Malfunctioning Organelle: mitochondria or cytoplasmic ground substance

Rationale for Diagnosis (explain how the patient information supports your

diagnosis): The symptom the patient exhibiting indicates that muscles and organs are not provided enough APT to well function. Besides, since patient cannot generate ATP, the cellular division also cannot work well. Because it this process also need ATP to provide energy.

Mapping Cell Respiration: Discuss the structure of the mitochondria with regard to the two major sets of reactions that occur there during cell respiration. Make sure to include the following components (at minimum) in your answer: cristae, electron transport chain, intermembrane space, krebs cycle, mitochondrial matrix

Cell respiration is a process that organics are oxygenized and transformed into carbon dioxide and other things. When digesting food, the electron transport chain is triggered to generate ATP. During this procedure, energy is released to maintain body function. Cell respiration takes place in mitochondria. The mitochondria look like a capsule from outside. Inside the mitochondria, intermembrane laps to create cristae which can make more area to react. This intermembrane spaces contains, ATP , fatty acid and other substance to react. In the Enzyme catalysis, carbohydrate, lipid and amino acid go through the Krebs cycle and generate ATP in the reaction.

Mapping Photosynthesis: Discuss the structure of the chloroplast with regard to the two major sets of reactions that occur there during photosynthesis. Make sure to include the following components (at minimum) in your answer: granum, light-dependent reactions, thylakoid, stroma, and Calvin cycle.

The basic components of chloroplast are outer membrane, intermembrane, matrix and granum. There are two set of reactions that occur. The first one is

light-dependent reactions and takes palce in thylakoid. It uses the light to extract hydrogen ion from water and put into carbon reaction. In the carbon reaction which don’t require sun light, carbon dioxide and hydrogen ion went over Calvin cycle and was used to generate starch. In this procedure, ATP was converted into ADP and turned back to transport energy.