Biology H Cell Structure Case Study

1. Case 1: Erythrocytes (red blood cells) have no nucleus, mitochondria, or other organelles at maturity. These organelles are ejected when the RBC enters the bloodstream, or shortly thereafter. Should this still be considered a cell? What will be the effect of having no nucleus? Explain how in these cells, the lack of mitochondria is an advantage

2. Pompe’s disease is one of a class of lysosomal storage diseases (accumulation of materials in Lysosomes) in which one or more enzymes that are normally found in the lysosomes are defective or absent. In Pompe’s disease, the enzyme that normally breaks down glycogen is absent. Describe what you would see in an electron micrograph of a liver cell from an individual with Pompe’s disease. What are some possible consequences of having such a disease? Can you think of an effective way to treat it?

3. Case 3: You are studying a biopsy of the liver of an alcoholic. What cellular organelle might you expect to see in larger than normal quantities? Explain

4. Cyanide stops the ETC in the mitochondria. A person dies within minutes after ingesting cyanide. Explain why.

5. “Imagine a major city with half its power plants shut down. At best, such conditions would produce a ‘brown out’ with large sections of the city working far below optimum efficiency. Now imagine your body with one-half of its energy producing facilities shut down. The brain would be impaired, vision would be dim, muscles would twitch spastically or would be too weak to allow your body to walk or write, your heart would be weakened, and you would not be able to eat and digest your food.” Which organelle is being referred to in this description? What is its normal function in the cell?