**The Cellular Respiration C.S.I. Episode**

*Directions: You are a Cellular Detective in the Secret Department for Cellular Investigation and there are some problems with the energy production in your cell. Your job is to find out what is wrong with the process and how it can be corrected. As a group, write a detailed set of responses to each of these scenarios as you try to save the energy production in your cell!! We’re all counting on you!!*

1. You enter the mitochondria and you are seeing a large volume of NAD+ and FAD++ that are not replenished. NAD+ and FAD++ continue to add up. What processes are being effected and how so?

2. You are given a case. The evidence is as follows:

2 ATP is created

Glycogen is present

There is an aqueous (water) environment

Glucose is present

You are told by a confidential informant that there is a lower level than necessary of The Twins in the Kreb’s Cycle. What is going wrong and what is at fault?

3. Cellular respiration is moving along swiftly and energy is supplying all the cells to assure to assure the organism is functioning at peak capacity. At some point, there is a report that energy output has shifted and energy production in the cytoplasm is being produced at an alarming rate. After doing some investigation, you learn the reason for this. What would you write in your report about the reason for this shift in activity? EXPLAIN IN DETAIL.

4. There is a rogue agent in the mitochondria trying to sabotage your cellular respiration. After finding out this fact, you track this rogue agent to the inner membrane. You don’t see the rogue agent but you notice that the Kreb’s Cycle has virtually stopped. On your way there, you saw that glycolysis was operating normally and all systems were “a go”. What is it that the rogue agent is corrupting in his effort to derail energy production? Explain what would happen if the rogue agent didn’t corrupt the process.

5. There is an urgent report that there is a menace that is affecting the energy production in your cell. You jump into action. Everything in glycolysis is in order and the City of Krebs is quiet and productive. When you venture to Electron Travers City, you see that there is a near riot situation in the intermembrane space between all the H+ ions, electrons overflow within the cristae, and water production has almost ceased. What has the menace done to the cellular hardware to make this situation halt energy production? Describe in detail and what would have been the correct scenario?

6. In receiving information from a confidential informant, you learn that a seedy character has shut off the air supply to the City of Krebs. You know that there will be problems arising quickly, what is it that you can expect to happen very soon in Krebs? Why is the air supply to Krebs so important to how the city runs?

7. Dispatch has sent you a urgent message to your cellular respiration phone. It says, “The hydrogen transporters have been compromised, investigate immediately!” You find that there are very few H+ ions in the intermembrane space and the cristae is crammed with H+ and electrons. Where would you first look for fingerprints, AND WHY? What cellular hardware and process are you thinking was tampered with? If you were in Electron Travers City, what should you normally see?