**Diabetes Mellitus research assignment**

Diabetes is an excellent launching-pad for learning about cellular processes.

Important: Watch the 2 short videos on Type 1 and Type 2 Diabetes posted near the bottom of Unit 2

In class we reviewed the causes of Diabetes Mellitus, and the differences between Type 1 and Type 2 Diabetes. Then we did the “Diagnosing Diabetes” lab where we performed a glucose-tolerance test on a hypothetical patient who exhibited symptoms of Diabetes.

After you eat a meal your blood glucose rises naturally, and your pancreas produces a hormone called Insulin which quickly circulates throughout the body via your bloodstream. The Insulin molecule (a 51 amino-acid protein molecule) is designed to dock at special receptor molecules (transmembrane protein molecules) which stick out from the surface of each of the cells in your body (for example muscle cells). When the Insulin docks on a receptor, a “signal cascade” takes place down below in the cell, which instructs the numerous glucose transporter proteins to open and allow glucose molecules to enter the cell so it can be used to produce energy for your body (this is an example of “facilitated transport”).

With Type 1 Diabetes, the Insulin-producing cells in the pancreas (called Beta cells) are destroyed by the person’s own immune system, resulting in Insulin dependence. Type 1 is usually diagnosed in children and younger people.

With Type 2 Diabetes, the pancreas produces Insulin, but the receptor proteins have lost the ability to respond to the Insulin. Over time, the pancreas responds by shutting down Insulin production. Type 2 is usually diagnosed in adults, and is linked to obesity, family history & genetic factors, physical inactivity, and race/ethnicity.

In the U.S. we are currently undergoing an epidemic in Type 2 diabetes in children.

**Your assignment**

Use the Internet or other resources to research an aspect of Diabetes Mellitus which is of interest to you, and prepare a 2-page summary of your findings. Include pictures, diagrams, and/or sketches. Turn in your work on Canvas by the due date. I will be sharing these with the class at an upcoming webinar, so take pride in your work!

Ideas for a topic:

1. Causes of Type 1. What exactly causes your immune system to wipe-out your own Beta cells?
2. Causes of Type 2. What exactly causes your cells to stop responding to Insulin?
3. What are the modern treatment options for either Type 1 or Type 2. Self-injections? Automatic injection pump? Others?
4. Any new drugs being developed for Diabetes which would make a person’s life easier? Go into detail about how they supposedly work… and what stage of development they are in.
5. Find a company which is developing a drug for Diabetes. Research who they are, and what exactly they hope to produce. Who is funding their research? (if you can find out)
6. Do research and develop a recommended diet plan for someone with Type 1 or Type 2.
7. Why is Diabetes an ‘epidemic’ in the U.S.? Research and elaborate…
8. What automatic pumps are available? How much do they cost? How do they work?
9. History of insulin: When did people start injecting animal insulin? Who developed it? How was it produced? What is the backstory?
10. Research the actual insulin receptor proteins, or the glucose transporter proteins, or the Insulin molecule itself; explain how they work at a molecular level… OR, explain how they are made and what gene is responsible for making them.