**Biology 241 Final: Essay Portion.**

Directions: You can answer this however you like. You can write your answers in below each question (as in case studies) or you can write me an elaborate story. You can even include pictures or diagrams if you feel so compelled. Just makes sure you adequate answer each question with sufficient explanation and physiological detail.

# Oh NOOOOO……..

It’s morning. You need coffee. You walk into your kitchen, and perusing the contents of your fridge there is….A BEAR! Assuming you are a normal person (unlike Monica, who would probably shout in glee, and run towards the bear with a camera…. ) what is your physiological response?

1. Let’s start with sensing the bear. What is happening in your eyes? How do you sense the bear? You may also smell and hear the bear – what is happening there?
2. Where is your visual information processed? What is the difference between the visual cortex and the visual association area, where are they and what are they doing?
3. How did information get there? Discuss the local potential, action potential, synaptic activity, and neural integration that happened along the way.
4. Did visual information ONLY go to the visual area of the brain? What other places in the brain did this information go to? What is the role of the thalamus? What does the superior colliculi do? What about the hippocampus, amygdala, cingulate gyrus, etc.?
5. Lets discuss the hypothalamus in detail. What type of information processing with this area of the brain do, and what type of responses is it responsible for coordinating? Do you think this will process information faster or slower than the visual area of your brain?
6. Discuss the sympathetic nervous system response. Track where the neurons go and how they get to different area of your body. How many synapse to get to an effector cell? Discuss which synapses use acetylcholine and epinephrine/norepinephrine. What about epinephrine/ norepinephrine as a hormone, how did that happen?
7. What is the effect of epinephrine/ norepinephrine on different tissues? Describe not only what happens, but the purpose of this response in surviving a bear in your kitchen. How is it that different tissues can respond in so many different ways to the same chemical?
8. You reflexively duck and hide and reach for your phone and call 911. What is a reflex? Which of these responses would be innate and which would be learned? What is the difference?

**And for a little extra:**

1. You decide that rather than run away or fight the bear, you will try to “neutralize” the bear. First – you find a carton of cigarettes. You throw the entire carton at the bear, hoping he will choose to eat them all. If he does, what would happen to his nervous system?
2. That doesn’t work. He’s not a nicotine addict. But you know bears like mushrooms! So you find some toadstools in the yard – YES!! Amanitas! You pick all the you can find and throw them at the bear. He eats them!! But OH NO!!!!!!! While yes, he is debilitated, he is also creating a giant mess. What is happening to the poor bear?