

## Spring 2008 Biology 111 In-Class Exam #1 - Cellular Communications

The in-class portion of this exam is designed so that you can complete it in 20 minutes, but you may use the full 50 minutes. There are 4 pages for this exam, including this cover sheet. You are not allowed to use your notes, consult old tests, look at another person's test, check the internet, or any books, nor are you allowed to discuss the test with anyone until the in-class exam is completed at 1:20 pm on Monday February 11. You may use a calculator and/or ruler for the in-class exam. The **answers to the in-class exam must be hand written very neatly. If I cannot read your writing, then you will lose points because I cannot determine whether you have the right answer or not.**

**-3 pts if you do not follow this direction.**

**Please do not write or type your name on any page other than this cover page.**

Name (please print): **ANSWER KEY**

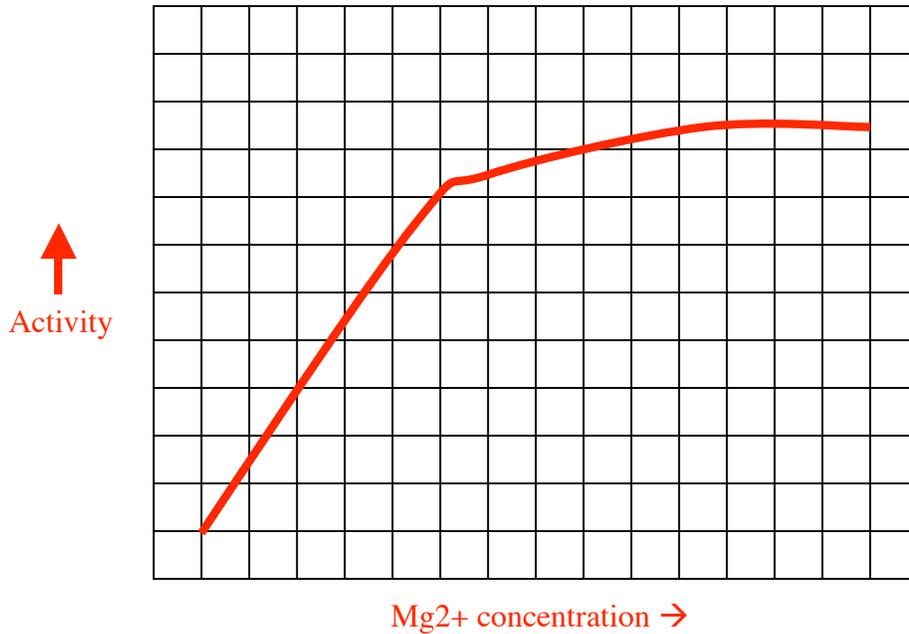
Write out the pledge and sign:

"On my honor I have neither given nor received unauthorized information regarding this work, I have followed and will continue to observe all regulations regarding it, and I am unaware of any violation of the Honor Code by others."

Lab Questions:

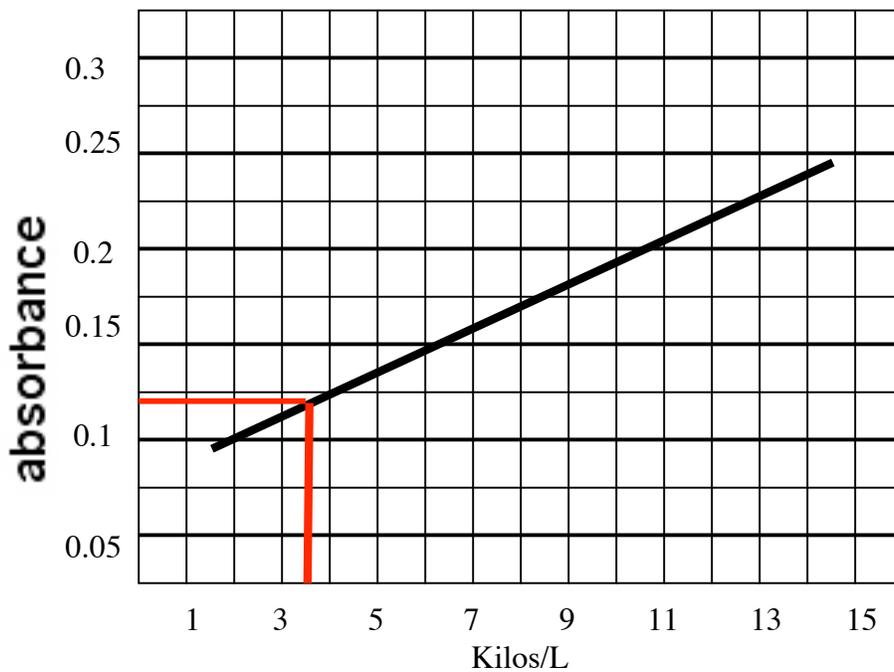
**4 pts.**

Draw a graph in the space provided to show what would happen to the rate of reaction for isocitrate dehydrogenase if you gradually added more coenzyme  $Mg^{2+}$ . Be sure to label your axes.



**3 pts.**

1) How much of the chemical is present in this solution:  $OD_{590}$  of the chemical = 0.123? Below, is a standard curve for this same chemical. **something above 3 kilos/L**



**2 pts.**

2) What is the final concentration of the enzyme if I have a stock bottle of the enzyme wildcatase that is 14.3 mg in 49.6 mL, and I put 253  $\mu\text{L}$  of this stock into 3.1 mL of buffer? You must show your work to receive credit.

$$14.3/49.6 = 0.288 \text{ mg/mL} = 0.288 \mu\text{g} / \mu\text{L}$$

$$0.288 \mu\text{g} / \mu\text{L} * 253 \mu\text{L} = 72.864 \mu\text{g}$$

$$72.864 \mu\text{g} / 3100 \mu\text{L} \text{ or } 3353 \mu\text{L} = \text{about } 0.024 \mu\text{g} / \mu\text{L}$$

Lecture Questions:

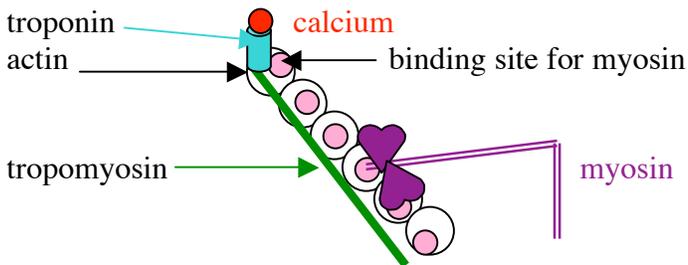
**3 pts.**

3) List 3 polymers of glucose produced by living systems that store energy. Describe the chemical linkage between monomers.

NAME	Linkage
1. glycogen	$\alpha$ 1 - 4
2. starch	$\alpha$ 1 - 4
3. cellulose	$\beta$ 1 - 4

**5 pts.**

4) In the space provided, draw a picture of troponin, tropomyosin, actin, myosin, and calcium when a muscle cell is depolarized. Be sure to label each of these five objects.



**4 pts.**

5) List two reasons why it is adaptive for glycogen phosphorylase NOT to be activated directly by the epinephrine receptor. Write one sentence for each reason.

1. amplification of cascade
2. multitasking of components of cascade

**3 pts.**

6) List 3 types of stimuli that can gate an ion channel to open.

1. ligand
2. voltage
3. stretch

**3 pts.**

7) List 3 molecules that we have studied so far that can recognize and interact with Na<sup>+</sup> ions.

1. Na/H exchanger
2. Na/K pump
3. Na channel

**4 pts.**

8) Draw a picture of diacylglycerol. Label as many atoms as you can.

Similar to what is in the study guide.