

Fall 2003 Biology 111 Exam #3 – BioEnergetics

There is no time limit on this test, though I have tried to design one that you should be able to complete within 3 hours, except for typing. There are three pages for this test, including this cover sheet. You are not allowed to use your notes, old tests, the internet, or any books, nor are you allowed to discuss the test with anyone until all exams are turned in at 11:30 am on Monday November 24. **EXAMS ARE DUE AT CLASS TIME ON MONDAY NOVEMBER 24.** You may use a calculator and/or ruler. The **answers to the questions must be typed on a separate sheet of paper** unless the question specifically says to write the answer in the space provided. If you do not write your answers in the appropriate location, I may not find them.

-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.

Staple all your pages (INCLUDING THE TEST PAGES) together when finished with the exam.

Name (please print):

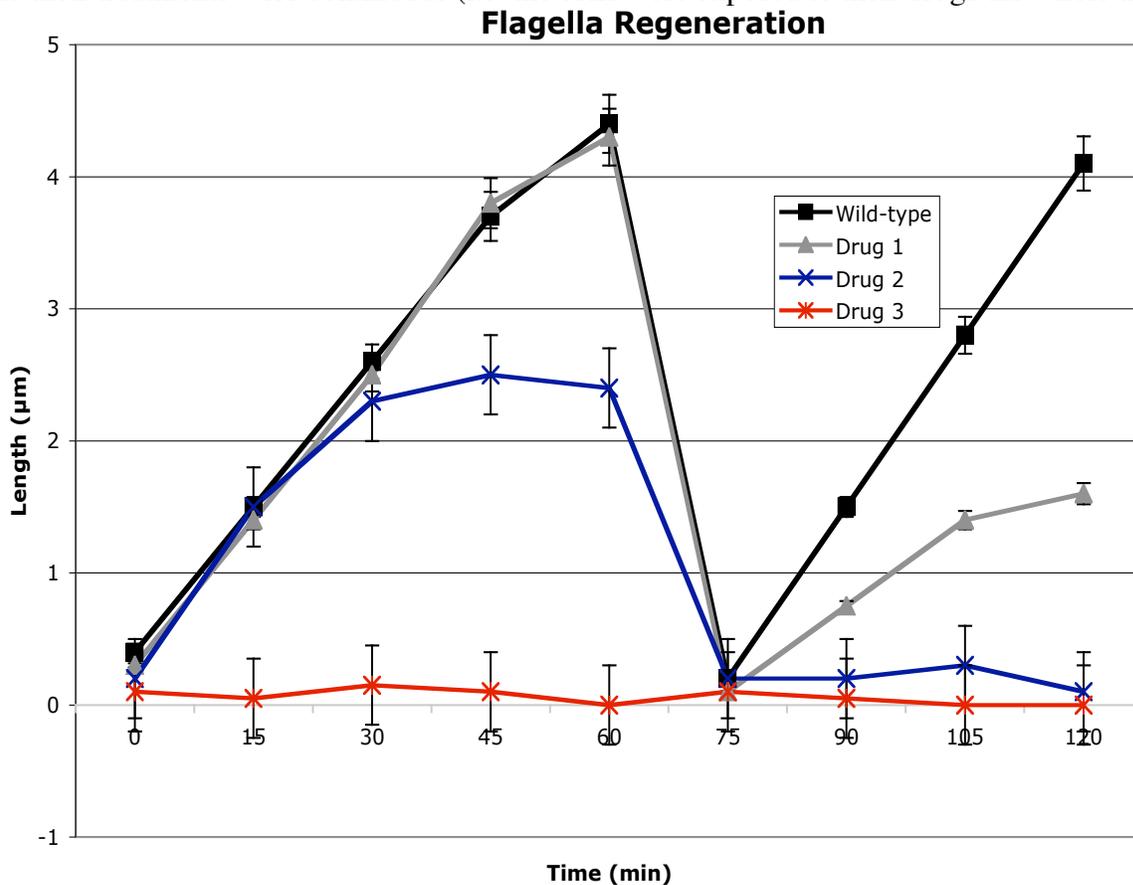
Write out the full pledge and sign:

How long did this exam take you to complete (excluding typing)?

Lab Question:

10 pts.

1) Interpret these data for the four cell populations as shown in the graph. This was a normal flagella regeneration experiment except at 60 minutes, all cells were deflagellated a second time and their treatments were continuous (i.e. the cells were exposed to their drugs the whole time).



Lecture Questions:

4 pts.

2) Using your own body as an example, provide distinctions between potential and kinetic energies.

10 pts.

3) Diagram the flow of energy in the light reactions of photosynthesis.

6 pts.

4) a) Why does the absorption spectrum for chlorophyll a differ from the absorption spectrum of a chloroplast?

b) Do chlorophyll a and chloroplast absorption spectra have any features in common? Explain your answer.

12 pts.

5) Explain how the products of the light reaction are consumed in the dark reaction. Keep track of the proportions of energy sources. To receive full credit, you must diagram the dark reaction and keep track of the carbons. Simple figures are sufficient (i.e. you do not need chemical structures).

6 pts.

- 6) a) What are the two raw material components legumes use to produce amino acids?
b) How do the plants obtain these two components?

4 pts.

7) Describe how muscle cells acquire the glucose they need for energy.

15 pts.

8) Cellular respiration has three main parts. Make a three column table with each catabolic part heading a different column. In your table, list the products for each of these three parts of cellular respiration.

5 pts.

- 9) a) Why do humans need oxygen to produce ATP?
b) Are there any exceptions to this requirement of oxygen for ATP production? Explain your answer.

8 pts.

- 10) a) How does cyanide kill?
b) Why was there concern for pot smokers whose marijuana was contaminated with paraquat?

6 pts.

- 11) a) Draw the chemical structure of pyruvate.
b) List and briefly describe as many ways to metabolize pyruvate as you can.

6 pts.

12) NADH is an essential metabolite that can kill you. Explain this statement

8 pts.

13) Explain how can *Chlostridium tetanii* can kill a human?