BIOL 411: Developmental Biology
Discussion Sections

AA: Tu 2:30-3:20 MGH 287
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Office Hours: Mon 12:30-1:30, Fri 10:30-11:30 or by appointment.

Awarding of points in discussion sections:
Participation (20 points total): Two points will be awarded each week; one for attendance, and one for preparing to discuss the paper for the week by writing down notes/answers to the questions included in this handout (on the back).
Papers (2 x 25 points = 50 points total): You will write two essays over the quarter discussing particular research papers. The first is due February 11 and will analyze one paper chosen for the whole class. The second is due March 4 and will analyze a paper chosen by you from several options given as a list. The research papers will not be longer than five pages; please limit the essays to five single-sided, double-spaced pages written in a 10 or 12-point font.

The following criteria will be used in grading the papers:
• Presentation of the hypothesis (5 points): What is it, is it clearly stated, and is it testable?
• Summary of the background of the paper (5 points): What history led to the experiments and why were they performed?
• Explanation of the experimental techniques (5 points): How were the experiments done? What techniques were used, and were the controls correct? Use specific examples.
• Analysis of the results and discussion (5 points): Do the data support the conclusions? Justify your reasoning.
• Synthesis of the research (5 points): How could the paper be improved? What hypothesis should be tested next? What experiments would you perform to test them?
The preparation each week for verbal discussion will help you develop the critical thinking skills needed to read research papers on your own (and decide what you will write in the essays).

**Worksheet for Discussing the Paper of the Week**

*Use this as a template for writing notes on your own paper to show me at the beginning of the discussion section. I will return them for you to use during class and while studying on your own. Feel free to add to your notes during the discussion.*

**Date:**

**Citation:**

*Before attending discussion, briefly summarize the paper. Then answer the following questions and be prepared to share them.*

1. Is the hypothesis stated? If so, what is it? Is it falsifiable?
2. Background of the paper: what is the context of the experiment(s)? Why are they performed? If this is not adequately explained, what information should be included?
3. What techniques are used in the experiment(s)? What is/are the control(s)? Do the methods test the hypothesis? If not, why not?
4. What conclusions are drawn from the data? Do the data support them? Are there alternative conclusions you can think of? (Note particular figures to support your argument.)
5. What else can be done to improve the paper? Consider both experimental design and written communication. For example, is the title appropriate? Does the abstract summarize the paper accurately? Are the references comprehensive, up-to-date, and appropriate?
6. What would be the next set of tests of the hypothesis or the next hypothesis to test? How would you design (an) experiment(s) to test your hypothesis?
7. What is your overall opinion of the contribution this paper makes to the field of developmental biology? Why?
8. If you think of anything else to add to the discussion, go ahead!