

# Biol 4181: Developmental Biology

Spring 2013

## Instructor

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## Textbooks

*Principles of Development*  
by Lewis Wolpert *et al.* (any edition will do)

*Endless Forms Most Beautiful*  
by Sean Carroll

## Lecture Schedule

Classroom: 2185 Science, MW 8:00-9:05

Lab: 2135 Science, M 1:00-3:00, 3:30-5:30

Note: this is developmental biology, so you'll be at the mercy of the timing of your organisms. Plan on spending a few hours each week in the lab, but it may not be at the scheduled hours.

## Topics

An Overview of Evo-Devo  
History & Basic Concepts of Embryology  
Vertebrate Patterning  
The Invertebrate Body Plan  
Morphogenesis  
Cell Differentiation  
Organogenesis  
Current Controversies in Evolution and Development

While we will cover the basics of each of these topics, you are encouraged to suggest diversions — please do shape the course as we go!

We will be alternating lectures/discussions on the basics of developmental biology with a chapter by chapter reading of Carroll; I will also occasionally hand out research papers from the evo-devo literature for in-class dissection and discussion. Paper suggestions are welcome.

## Two-Day Essays and Final Essay

There will be a total of 4 take-home exams. I'm calling these two-day essays because that's how long you have to write them (except for the final, which although in the same format, I will allow extra time) . In each exam, I will be giving you a choice of three rather broad questions on the topics covered in the several previous weeks, and you will have two days to put together a 2500 word essay that elegantly elaborates on developmental ideas.

## Term Paper

A 5-10 page term paper will be due on the last day of class. This paper should focus on a **concept** in developmental biology. By focusing on a concept, I mean that I do **not** want you to write a paper by picking a gene or a syndrome or an organism and tracing it through the literature. Instead of a gene, tell me about 'Redundancy in Developmental Regulatory Genes' or 'NK Networks as a Model of Gene Regulation' . Instead of a syndrome, how about 'Symmetry Breaking Events' or 'Control of Digit Number' . Don't tell me about your favorite organism, but do discuss 'Morphogenesis in Single-celled Organisms' or 'Eggs, Embryos, and Larvae in the Paleontological Record' . Don't panic yet, we'll discuss specific paper ideas for you early in the term.

## Attendance/Discussion

This one is easy. Just showing up is worth one point every day, with bonuses on some days. Show up and **contribute!**

## Online work

Everyone in this class will set up a public blog for weekly writing assignments. Some of you may already have a blog; if you don't, create one at <http://blog.lib.umn.edu/> or at <https://www.blogger.com/>, and email the url to me. I expect you to post something on the fields of evolution or developmental biology at least once a week. These articles should be at least a solid paragraph long, and be more than just a link or a mention of something in the field; demonstrate some insight about what you are discussing.

Your engagement with the field of developmental biology should not be restricted to the class times and your specific assignments. I also want you to be looking for articles on development in the scientific literature, in the news, on the web, and even on television. When you see something cool and relevant, write a paragraph or two. Set yourself the goal of finding something interesting in the field beyond the material covered in the class once a week.

I will also occasionally announce a topic I'd like you all to write about that week; in particular, if I hand out a research paper in class I may ask you all to write a short summary for your blogs to be posted *before* our discussion.

## Grading

Assignment	points
Two-Day Essays:	3x60
Final Essay:	60
Term Paper:	100
Attendance:	30
Lab:	240
Online work:	14x5

To get: You need:

<b>A</b>	<b>620</b>
<b>B</b>	<b>560</b>
<b>C</b>	<b>500</b>
<b>D</b>	<b>450</b>

I'm using an absolute number of points to achieve a certain grade rather than a percentage score. This means that if you are particularly industrious and score well on the work, you could conceivably get the 620 points you need to earn that 'A' before the end of the term—which would allow you to blow off the final essay or one of the labs. What a deal!