

Vertebrate Evolution Anatomy lab

Anatomy is interesting because it reflects both evolutionary history and ecological necessity. This observation might lead you to predict that anatomy is exactly the same between all members of the same species. But this is not, in fact, the case. Furthermore, anatomy is not destiny—even organisms with severely “sub-optimal” anatomical structures can thrive, given appropriate environmental conditions or additional strengths that other individuals may not have. Understanding what animals need to do in order to thrive (ingest, digest, excrete, perceive their environment, produce gametes, mate, avoid getting eaten...) allows an appreciation of the anatomical structures that allow them to accomplish these tasks. Some of the lab’s themes will include:

- What systems are variable between organisms, and why?
- What systems are not variable between organisms? How do environmental constraint and adaptation combine to create systems, such as the skull foramina (holes in the head) of cats, that are both precise and practically invariable?
- When did jaws evolve, and how did that affect other features of jawed organisms?

We will be doing nine weeks of anatomy labs, plus a final in week 10. In weeks 1-3 we will focus on skeletal, specifically skull, materials. In weeks 4-9, you will be dissecting cats and sharks, and will learn much of the visceral, circulatory, muscle, and neuro anatomy of these organisms. There will necessarily be a lot of memorization, but you will learn a lot, and hopefully have fun doing so.

My expectations of you in this lab include that you:

- Think.
- Be creative. Despite the large amount of memorization that will be required in this lab, there is always room for creativity in science—for instance, in your dissection techniques, and in how you apply theory you have learned to the anatomy that you observe.
- Ask questions (of me and Dane and of each other).
- Read and try to comprehend the lab materials (handouts and assigned pages from Kardong & Zalisko) before coming to class.

Mundane stuff to keep the lab running

Every two lab partners must clean up after themselves. Specimens can be greasy, and pieces of preserved animal are not the janitorial staff’s cup of tea. It is imperative that you leave 10-15 minutes at the end of each period to fully clean your workspace. This means returning your animals to their homes (such as they are), and scrubbing your dissection trays, lab benches, and the floors around you, if necessary. Sponges and abrasive cleanser are available and in ample supply. Use them. If you don’t, or if you do so poorly, I have to clean up after you. This puts me in a very bad mood, and I will probably bar you from the lab, and thus from the learning experience (and the four credits that would forever after symbolize the learning experience).

Access to the lab

The lab is reserved for Vertebrate Evolution students from 1 – 5 on Wednesdays, and Dane will be in the lab then to help you. The lab is also reserved for us on Thursdays after class, Friday mornings, and you will have access after hours, but you'll be on your own at those times. You will need to take advantage of open lab times, as three hours a week is not sufficient to internalize this kind of information.

Evaluation of learning

There will be one lab practical quiz mid-quarter (May 5), and a final, cumulative lab practical on June 2. Both will begin at 12:00 pm **SHARP**. Do not be late. If you are late, and miss even part of either practical, you will not be able to make it up, which will affect your final evaluation. Lab practicals are incredibly time-consuming to put together, and can not be replicated. I will go over the exams with you when the class has finished, and then they will be dismantled.

In addition, you need to do good and careful dissections, in part because this is one of the skills that you are learning in this lab, in part because it is your dissections that will be used for the lab practicals. The lab practicals can only be as good as your dissections are.

I will not collect or look at your lab notebooks. This doesn't mean that you shouldn't keep one, just that you have the flexibility not to. Figure out how you personally are best able to learn and retain the material, and keep whatever appropriate drawings, notes, cladograms, photographs, etc, work best for you.

Schedule for Vertebrate Evolution Anatomy Lab, Spring 2008

Date	Lab topic	Assigned Reading
Mar 31 (week 1)	Vertebrate diversity	Handouts, K&Z chap 1
Apr 7 (week 2)	Skulls 1 of 2	K&Z p65-85
Apr 14 (week 3)	Skulls 2 of 2	Review wk 2 readings & lab
Apr 21 (week 4)	Lampreys, and visceral anatomy of cats & sharks	K&Z chapters 3, 7 & 9
Apr 28 (week 5)	Shark muscles	K&Z pp 86 - 96
May 5 (week 6)	Lab Practical Quiz, then: Cat muscles	K&Z p86-87 & 102-125
May 12 (week 7)	Shark circulatory & respiratory	K&Z pp 141- 149
May 19 (week 8)	Mammal circulatory & respiratory (cat & sheep)	K&Z pp 155 - 166
May 28 (week 9)	Shark & sheep neuroanatomy	K&Z chapter 10
Jun 2 (week 10)	Comprehensive Lab Practical	