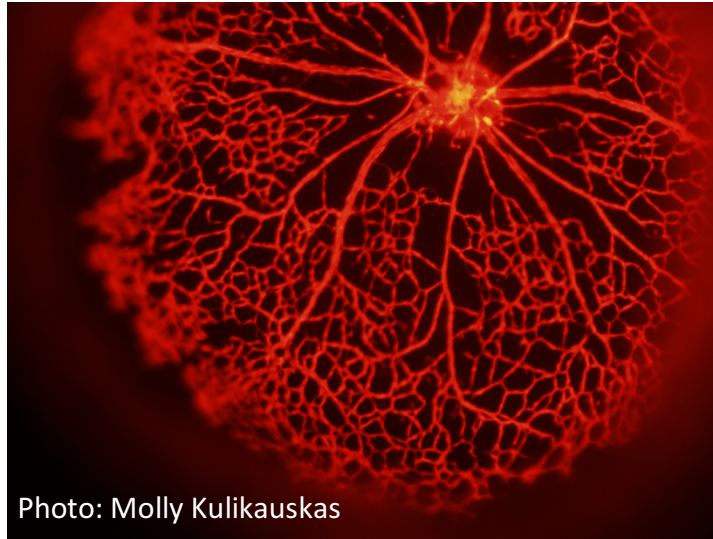


490H Cardiovascular Biology Fall 2019
Tues -Thurs 2:00-3:15 pm, 1374 GSB



Course Description:

An experimental approach to understanding cardiovascular development, function, and disease. This class will cover development of the cardiovascular system (heart, blood vasculature, lymphatic vasculature), and cardiovascular function as linked to selected diseases. We will cover the molecular, genetic, cell biological, and biochemical techniques used to study the cardiovascular system, with an emphasis on the genes and signaling pathways involved in cardiovascular development and disease. It is

assumed that students will have some familiarity with animal development and cell and molecular biology. This course will focus deeply on selected aspects of cardiovascular development, function and disease rather than taking a superficial approach to the subject. To facilitate a deeper understanding of the scientific method, most topics will be paired with a research paper from the primary literature.

Expectations:

Students will be expected to do assigned readings before class. Participation is a must in this course. You will be expected to contribute to class discussions on a daily basis, and you will be expected to work in groups on occasion.

Course Objectives:

Upon completion of the course, students will be able to...

- articulate the big questions being addressed in cardiovascular biology, such as those related to development and patterning, genetic signaling pathways, and links between development and disease.
- read and interpret primary literature in basic cardiovascular biology.
- understand the tools used by researchers to investigate the mechanisms underlying basic cardiovascular biology and selected diseases/pathologies.
- know the criteria for proof, and recognize good and bad experimental design.
- propose solutions to address unanswered questions in basic cardiovascular biology.

Textbook

This course will not use a textbook. I will provide reading assignments in the form of reviews, articles, and primary research papers, as well as information from other forms of media.

Course Policies:

1. General

Please note that I reserve the right to make changes to the syllabus, including project due dates and test dates (excluding the officially scheduled final examination), when unforeseen circumstances occur. These changes will be announced as early as possible so that students can adjust their schedules.

2. Grading

The course grade will be based on 2 in-class exams (20%, 20%), final exam (25%), a poster presentation (15%), and participation in class paper discussions, poster discussions, and other in-class discussion (20%). Grading will be on a curve. Final will be cumulative with emphasis on untested material.

3. Attendance

All registered students are expected to:

- be on time for all class periods.
- attend all classes (more than two unexcused absences will incur grade penalties).
- meet assignment deadlines

4. Participation

Participation during the class period is required. Every student should participate verbally in every class. This would include asking a question, commenting on other student's comments (respectfully), responding when asked questions directly, and participating in small group work.

Students are expected to:

- be courteous and respectful to other participants and ideas.
- actively contribute in a substantial way to class discussions and small group work.
- honor the Honor Code.

5. Assignments outside class

Reading and other assignments will be assigned in advance as much as possible; however, the flexible and dynamic nature of this class may make it difficult to do so far in advance.

HONOR CODE: *All work done in this class must be carried out within the letter and spirit of the UNC Honor Code. You must sign a pledge on all graded work certifying that no unauthorized assistance has been given or received. You are expected to maintain the confidentiality of examinations by divulging no information about any examination to a student who has not yet taken that exam. You are also responsible for consulting with your professors if you are unclear about the meaning of plagiarism or about whether any*



particular act on your part constitutes plagiarism. Please talk with the professor if you have any questions about how the Honor Code pertains to this course.



Photo: Lyndsay Wylie

Course Copyright Information:

All course materials including your notes and assignments are covered by University Copyright Policy

<http://policies.unc.edu/files/2013/05/Copyright.pdf>

Unauthorized sale, duplication, or posting is a violation of the Honor Code.

Date	TOPIC
Aug 20 (Tu)	LECT1: Introduction to cardiovascular biology
Aug 22 (Th)	LECT2: Heart development
Aug 27 (Tu)	Heart development - PAPER 1
Aug 29 (Th)	LECT3: Great arteries development
Sep 3 (Tu)	Great arteries development - PAPER 2
Sep 5 (Th)	LECT4: Congenital heart disease
Sep 10 (Tu)	Congenital heart disease - PAPER 3
Sep 12 (Th)	LECT5: Vascular development and function 1
Sep 17 (Tu)	LECT6: Vascular development and function 2
Sep 19 (Th)	Vascular development and function - Group Presentation: PAPER 4
Sep 23 (Tu)	LECT7: Vascular diseases
Sep 26 (Th)	Vascular disease - Group Presentation: PAPER 5
Oct 1 (Tu)	EXAM 1 (in class)
Oct 3 (Th)	LECT8: Neurovascular development and disease
Oct 8 (Tu)	Neurovascular development - Group Presentation: PAPER 6
Oct 10 (Th)	LECT9: Cardiovascular stem/progenitor cells
Oct 15 (Tu)	LECT10: Aging and the cardiovascular system
Oct 17 (Th)	NO CLASS - FALL BREAK
Oct 22 (Tu)	LECT11: Atherosclerosis
Oct 24 (Th)	Atherosclerosis - Group Presentation: PAPER 7

Oct 29 (Tu) LECT12: Cardiovascular aging (Dr. J Schisler, guest lecturer)

Oct 31 (Th) LECT13: Cardiac regeneration (Dr. L Qian, guest lecturer)

Nov 5 (Tu) LECT14: Lymphangiogenesis - development and disease

Nov 7 (Th) **EXAM 2 (in class)**

Nov 12 (Tu) **Presentations - Group 1 (student posters)**

Nov 14 (Th) Lymphangiogenesis - **Group Presentation: PAPER 9**

Nov 18 (Tu) **Presentations - Group 2 (student posters)**

Nov 21 (Th) LECT15: SPECIAL TOPICS - Mechanical forces in cardiovascular development (Dr. W Polacheck, guest lecturer)

Nov 26 (Tu) **Presentations - Group 3 (student posters)**

Nov 28 (Th) NO CLASS - THANKSGIVING BREAK

Dec 3 (Tu) LECT16: SPECIAL TOPICS - Blood hemostasis and thrombosis - integration with heart and vessels (Dr. A Wolberg, guest lecturer)

FINAL EXAM: Sat Dec 7th, noon

PLEASE NOTE THE SCHEDULE IS SUBJECT TO CHANGE