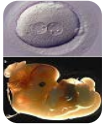
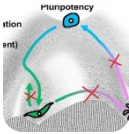


Developmental Biology



BIOL 322 lecture and lab



Fall 2020, Agnes Ayme-Southgate

Special COVID-19 online/hybrid course information: please read the entire document carefully

INSTRUCTOR CONTACT: Agnes Ayme-Southgate
e-mail: southgatea@cofc.edu

If you need an appointment, the best way to contact me is by e-mail (southgatea@cofc.edu) providing me with times when you are available. I check my e-mail frequently and will give you a specific meeting time in return that we can set up a zoom meeting.

COURSE DESCRIPTION

Lecture surveys the different stages of development from fertilization to organogenesis in both invertebrate and vertebrate model systems. Lecture covers both the descriptive nature of embryonic development, as well as the conserved molecular and cellular patterns. The laboratory covers some techniques of developmental biology, as well as histology slides of embryonic development, and research paper discussion. Lectures three hours per week; laboratory three hours per week. Prerequisites: BIOL 111/111L, BIOL112/112L, BIOL 211/211D, and BIOL305.

ELECTRONIC DEVICES

You will need your laptop or tablet for every class and lab. Make sure you have a good videocam and speaker/headphones

TEACHING PLAN

LECTURE: will be entirely online synchronous Tuesday and Thursday 9:25 to 10:40 for the whole semester. We will have Zoom meetings at that time on both T and R unless otherwise announced. Attendance is expected as we will have discussion and graded “class” exercises during the zoom.

LABORATORY:

The regularly scheduled time is Thursday 2-5.

Until September 14th, we will meet online Thursday from 2-3 to discuss the “lab” of the day. You will then have freedom to work with your teammate to complete the assignments and post them on Dropbox.

After September 14th, **if the College is back to F2F**, I will split you into 2 groups of six students. **One group (A) will be in the lab from 2 pm-3:15 pm, the second group (B) from 3:45 pm to 5 pm. We will alternate who is first and second each week.**

MASKS are mandatory during the entire lab period

While subsection A works inside the lab room at “bench” experiments, subsection B will complete computer-based exercises in a near-by classroom. This will be for 90 minutes after which the two subsections will exchange. Therefore, expect the lab to last the scheduled 3 hours even though you might be able to be done earlier. You are expected to STAY in the adjacent classroom to complete the computer-based exercises, which will have to be posted on OAKS by 5 pm on your regularly scheduled lab section unless otherwise instructed. You **CANNOT LEAVE** and complete the exercise later or from somewhere else.

You will have to complete the experiment (data documentation and analysis/report) outside of lab time.

FOR THOSE OF YOU WHO CANNOT BE F2F for personal/medical reasons, please let me know as soon as possible, and I will try and design online equivalent activities or allow you to perform lab activities individually outside of regular lab time and from a socially-distanced space.

After September 14th, if we stay online we will continue as before

Laboratory will conclude before Thanksgiving break

COURSE LEARNING OUTCOMES

The lecture and laboratory are integrated and complementary. The lecture and laboratory are designed to:

1. Describe the steps of development and tissue formation in several major animal groups (echinoderm, nematodes, insects, and several vertebrates).
2. Articulate the common features and the differences based on life history, phylogenetic position and evolution.
3. Explain the concepts of cell potency, plasticity and determination and relate to the field of stem cells
4. Describe the importance of intrinsic and extrinsic cues for early developmental specification
5. Explain the processes involved in combinatorial regulation and control of gene expression as they apply to development.
6. Describe cell biology processes such as cell communication, cell migration, and cell shape as they pertain to developmental stages
7. Demonstrate an understanding of developing hypotheses and interpreting results on the basis of their hypothesis.
8. Demonstrate competence in scientific paper analysis.

TEXT BOOK

There is no REQUIRED textbook. Any recent versions of Developmental Biology by Gilbert or Wolpert are fine. All necessary reading and notes will be posted on OAKS

LABORATORY: There is no book or manual to buy for the lab. The protocols and other information for each week will be posted on OAKS.

I will be using OAKS to post information and announcements. Make sure to check the site **at least once every day**. If you are not familiar with OAKS, please let me know. Instruction is also available from the Library.

TESTING and GRADING:

Lecture and laboratory testing are integrated (you get only one grade)

Lecture Projects and assignments 64%

- Lecture zoom activities 8%
- Quizzes 12% **Quizzes** will be available on OAKS every Friday from 8 am to 11:59 pm. Quizzes are timed to 15 or 20 minutes. If you need time accommodation for tests let me know ASAP.
- Tests will use materials from both lecture and lab. 8% for lowest grade and 12% for the other two tests.
 - Test #1 on OAKS Friday September 25th.
 - Tests #2 and 3: The two tests will be research paper-based assignments Dates TBA , but around October 15th and November 22nd .
- Narration of short provided video. Post on VT. You will have two to do 6%
- Creation of crossword puzzles You will have two to do 6%

Lab projects and assignments 26% (breakdown will depend on the ultimate lab format)

Lab activities and reports 15%

Organ presentation project 9%

Final integrated lecture +lab 10%

GRADING SCALE:

92 and above: A

90-91.9: A-

87-89.9: B+

83-86.9: B

80-82.9: B-

77-79.9: C

74-76.9: C

70-73.9: C-

67-69.9: D+

64-66.9: D

60-63.9: D-

Below 60: F

IMPORTANT DATES

College dates:**Aug-20**

Date(s)	Description
Tuesday, August 25	Fall full semester and Express I classes begin.
Monday, August 31	Last day of Drop/Add for full semester classes. Last day for students to submit a request to Audit or apply for a Pass/Not Pass grade option full semester classes.

Sep-20

Date(s)	Description
Saturday, September 12	Storm Day virtual instruction on these days for all other courses). (SD*)
Sunday, September 13	Storm Day Makeup virtual instruction on these days for all other courses). (SD*)
Saturday, September 26	Storm Day Makeup virtual instruction on these days for all other courses). (SD*)
Sunday, September 27	Storm Day Makeup virtual instruction on these days for all other courses). (SD*)

Oct-20

Date(s)	Description
Thursday, October 1	Last day to submit an Undergraduate Application to Graduate in Fall 2020.
Saturday, October 17	Storm Day Makeup virtual instruction on these days for all other courses). (SD*)
Sunday, October 18	Storm Day Makeup virtual instruction on these days for all other courses). (SD*)
Tuesday, October 20	Midterm and Express I final grades due at noon.
Wednesday, October 28	Last day for students to withdraw with a status indicator of "W" from full semester classes.

Nov-20

Date(s)	Description
Tuesday, November 3	Election Day. No Classes. College Closed. Students should remain in Charleston.
Wednesday, November 4	All classes resume.
Tuesday, November 24	Deadline for in-person skills assessments in PE Activity Courses, labs, studio, performance courses.
Tuesday, November 24	Last day for on-campus instruction.
November 25-28	Thanksgiving Holiday. No Classes. College Closed
Monday, November 30	All classes resume with online instruction (see each course syllabus for details).

Dec-20

Date(s)	Description
Friday, December 4	Last day of online instruction full semester and Express II classes.

Monday, December 7	Reading Day.
Tuesday, December 8	Full semester and Express II final exams begin.
Monday, December 14	Full semester and Express II final exams end.
Wednesday, December 16	Full semester and Express II final grades due by 5:00 pm (EST).
Thursday, December 17	Final grades for full semester and Express II classes available to students on MyCharleston by 5:00 pm (EST).

TOPICS

Introduction and developmental biology concepts

Early cleavage in model systems: sea urchin, *C. elegans*, and *Xenopus laevis*

Cell polarity and asymmetric cell division

Cell adhesion, sorting and epithelial barriers Review cell adhesion-ECM

Cues in early cell specification: intrinsic maternal products, morphogenetic gradients

- Discussion of sea urchin, *C. elegans*, and *Xenopus laevis* axis establishment
- Overview of *Drosophila* early cleavage

Review control of gene expression: transcriptional control, Concept of combinatorial regulation

Early cleavage in other systems: *Danio rerio*, chicken, and mammals

Cues in early cell specification: intrinsic maternal products, morphogenetic gradients

- Discussion of axis establishment

Gastrulation in sea urchin, *Drosophila*, and *Xenopus laevis*

Review cytoskeleton and cell movement

Gastrulation in *Danio rerio*, chicken, and mammals

Axis and germ layer specification process: induction and organizer Review cell communication

DNA constancy concept: Cell fate, potency and specification, cell differentiation

Neurulation: movements and molecular induction

Field formation and homeotic gene

Ectoderm derivatives including nervous system and neural crest cells

Eye development

Mesoderm derivatives

Endoderm derivatives

Limb formation

Possible wrapping up discussions:

- how do cells acquire and use information for specification
- how do cells know where to move to and when to stop
- how do cell layers form tubes and lumina
- others?

COURSE POLICIES

Attendance and absence

I will NOT enforce a strict attendance policy as it may inadvertently send the message that attending class is more important than our shared responsibility for community wellness by staying home when we are sick. However, I will trust you to tell me directly any time you miss class and in return I will trust that the explanation you give me for the absence is honest and truthful. In the eventuality that your absence is prolonged, I will work with you to provide alternative learning and assessments.

In case we are back on campus these are special Classroom Policies (from “back on the bricks”) Read them carefully

All students, faculty and staff will be required to pass a daily health self-screening using a free smart phone application or an alternative method prior to coming on campus or entering campus facilities.

Students will be required to show their professors that they have completed and passed this daily health self-screening before entering class. Anyone exhibiting COVID-19 symptoms or who is feeling ill should not physically report to class.

All students must wear masks or face coverings inside classrooms. **NO MASK, NO CLASS!**
Zoom class sessions will be recorded.

Classroom seats will be marked to help students and faculty maintain proper social distancing.
Please do not move chairs around in the lab

Faculty, staff and students are responsible for cleaning their respective areas and desks when entering the classroom and before leaving.

Lab Safety:

A list of safety policy and procedures will be discussed if we are back on campus during that initial class. The official SSM lab safety policy document is posted on OAKS and needs to be reviewed. A lab safety quiz will need to be PASSED before you are allowed to work in the lab. Observance of all safety regulations is expected. There will be **NO EXCEPTIONS. Failure to follow the safety guidelines will debar you from performing the experiment** on the given day and you will **not** receive any grades for the same. Repeated offenses will lead to withdrawal from the course.

Continuity of Learning (for hybrid classes with face-to-face meetings)

Due to social distancing requirements, this class will include a variety of online and technology enhanced components to reinforce continuity of learning for all enrolled students. Before the drop/add deadline, students should decide whether the course plan on the syllabus matches their own circumstances.

OAKS, including Gradebook, will be used for this course throughout the semester to provide the syllabus, class materials, announcements, and grades for each assignment, which will be regularly posted. It is your responsibility to check OAKS for updates each day.

Recording of Classes (via ZOOM)

Class sessions will be recorded via both voice and video recording. **By attending and remaining in this class, the student consents to being recorded.** Recorded class sessions are for instructional use only and may not be shared with anyone who is not enrolled in the class.

Inclement Weather, Pandemic or Substantial Interruption of Instruction

If in-person classes are suspended, faculty will announce to their students a detailed plan for a change in modality to ensure the continuity of learning. **All students must have access to a computer equipped with a web camera, microphone, and Internet access.** Resources are available to provide students with these essential tools.

Honor Code and Academic Integrity: <http://deanofstudents.cofc.edu/honor-system/pdf/honor-code-sample-language-for-syllabi.pdf>

“Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when suspected, are investigated. Each incident will be examined to determine the degree of deception involved.

Incidents where the instructor determines the student’s actions are related more to misunderstanding and confusion will be handled by the instructor. The instructor designs an intervention or assigns a grade reduction to help prevent the student from repeating the error. The response is recorded on a form and signed both by the instructor and the student. It is forwarded to the Office of the Dean of Students and placed in the student’s file.

Cases of suspected academic dishonesty will be reported directly by the instructor and/or others having knowledge of the incident to the Dean of Students. A student found responsible by the Honor Board for academic dishonesty will receive a XXF in the course, indicating failure of the course due to academic dishonesty. This status indicator will appear on the student’s transcript for two years after which the student may petition for the XX to be expunged. The F is permanent.

Students can find the complete Honor Code and all related processes in the Student Handbook at: <http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php>.”

Disability/Access Statements:

Any student eligible for and needing accommodations because of a disability is requested to speak with the professor during the first two weeks of class or as soon as the student has been approved for services so that reasonable accommodations can be arranged.

Center for Student Learning:

The Center for Student Learning's (CSL) academic support services provide assistance in study strategies, speaking & writing skills, and course content. Services include tutoring, Supplemental Instruction, study skills appointments, and workshops. Students of all abilities have become more successful using these programs throughout their academic career and the services are available to you at no additional cost. For more information regarding these services please visit the CSL website at <http://csl.cofc.edu> or call (843) 953-5635.

Inclusion:

The College of Charleston offers many resources for LGBTQ+ students, faculty and staff along with their allies.

[Preferred Name and Pronoun Information](#)

[On Campus Gender Inclusive facilities](#)

[Campus Resources](#)

[College of Charleston Reporting Portals](#)

[National Resources for Faculty & Staff](#)

[GSEC Reports](#)

[Documenting LGBTQ Life in the Lowcountry](#) (CofC Adlestone Library Special Collections Project)

[College of Charleston Quality Enhancement Plan \(QEP\)](#)

[Articles about CofC and LGBTQ+ Issues](#)

Statement on “Religious Accommodation for Students”

The College of Charleston community is enriched by students of many faiths that have various religious observances, practices, and beliefs. We value student rights and freedoms, including the right of each student to adhere to individual systems of religion. The College prohibits discrimination against any student because of such student's religious belief or any absence thereof.

The College acknowledges that religious practices differ from tradition to tradition and that the demands of religious observances in some traditions may cause conflicts with student schedules. In affirming this diversity, like many other colleges and universities, the College supports the concept of “reasonable accommodation for religious observance” in regard to class attendance, and the scheduling of examinations and other academic work requirements, unless the accommodation would create an undue hardship on the College. Faculty are required, as part of their responsibility to students and the College, to ascribe to this policy and to ensure its fair and full implementation.

The accommodation request imposes responsibilities and obligations on both the individual requesting the accommodation and the College. Faculty members are expected to reasonably accommodate individual religious practices. Examples of reasonable accommodations for student absences might include: rescheduling of an exam or giving a make-up exam for the student in question; altering the time of a student's presentation; allowing extra-credit assignments to substitute for missed class work or arranging for an increased flexibility in assignment dates. Regardless of any accommodation that may be granted, students are

responsible for satisfying all academic objectives, requirements and prerequisites as defined by the instructor and by the College.

2020 Religious Holidays¹

Date	Holiday	Religion
September 18 2020	Rosh Hashanah ²	Jewish
September 28, 2020	Yom Kippur ²	Jewish
October 2 – October 9, 2020	Sukkot ²	Jewish
October 9, 2020	Shemini Atzeret ²	Jewish
October 19 - October 26, 2020	Navaratri	Hindu
October 19, 2020	Birth of Baha'u'llah	Baha'i

Mental & Physical Wellbeing:

At the college, we take every students' mental and physical wellbeing seriously. If you find yourself experiencing physical illnesses, please reach out to student health services (843.953.5520). And if you find yourself experiencing any mental health challenges (for example, anxiety, depression, stressful life events, sleep deprivation, and/or loneliness/homesickness) please consider contacting either the Counseling Center (professional counselors at <http://counseling.cofc.edu> or 843.953.5640 3rd Robert Scott Small Building) or the Students 4 Support (certified volunteers through texting "4support" to 839863, visit <http://counseling.cofc.edu/cct/index.php>, or meet with them in person 3rd Floor Stern Center). These services are there for you to help you cope with difficulties you may be experiencing and to maintain optimal physical and mental health.

Food & Housing Resources:

Many CofC students report experiencing food and housing insecurity. If you are facing challenges in securing food (such as not being able to afford groceries or get sufficient food to eat every day) and housing (such as lacking a safe and stable place to live), please contact the Dean of Students for support (<http://studentaffairs.cofc.edu/about/salt.php>). Also, you can go to <http://studentaffairs.cofc.edu/student-food-housing-insecurity/index.php> to learn about food and housing assistance that is available to you. In addition, there are several resources on and off campus to help. You can visit the Cougar Pantry in the Stern Center (2nd floor), a student-run food pantry that provides dry-goods and hygiene products at no charge to any student in need. Please also consider reaching out to Professor ABC if you are comfortable in doing so.

COLLEGE of CHARLESTON

SCHOOL OF SCIENCES
AND MATHEMATICS

SAFETY POLICY AND PROCEDURES

The School of Sciences and Mathematics of the College of Charleston understands that the safety of our students, staff and faculty is of paramount importance. Engendering a safety culture is an important part of our mission in teaching and doing science. Each department, course of instruction, or research lab may require higher standards or procedures. The policies and procedures set forth below are understood to be minimum requirements across our departments.

In this document, the term “laboratory” is meant for a work space/facility where chemicals, biological agents, or equipment is used for research and/or instruction.

No one (student, staff, faculty, or visitor) will be allowed in a laboratory (teaching or research) to perform experiments or where experiments may be in progress unless these regulations are followed.

Students dismissed from a teaching lab due to violations of the safety procedures will not be allowed to re-enter the laboratory until authorized to do so by their supervisor (instructor) and, in the case of research laboratories, by the department chair or designee. Any course work missed because of a violation of these guidelines cannot be made up at another time (or by an extension of the lab period) and will be treated as an unexcused absence.

1. You are responsible for knowing the biological, chemical, electrical, ergonomic, mechanical, and physical hazards associated with the equipment and materials that are being utilized in the laboratory. Listen to all instructions and ask questions about that which you do not understand.
2. Know the location of safety equipment: telephones, emergency shower, eyewash, fire extinguisher, fire alarm pull.
3. Know the appropriate emergency response procedures. If there is an injury or emergency, call 953-5611.
4. Do not work alone in the laboratory if you are working with hazardous materials or equipment.
5. Use hazardous chemicals, equipment, and biological agents only as directed and for their intended purpose.
6. Do not engage in horseplay, pranks or other acts of mischief while in lab.
7. Drinking, eating, and application of cosmetics is forbidden in laboratories where chemicals or biohazards are present. Smoking is forbidden in all College buildings.

8. Appropriate personal protective equipment shall be worn. The dress code for laboratory work when using chemicals, biological or physical hazards, or when instructed to do so by the laboratory supervisor is as follows:

- a) Wear safety glasses or goggles at all times.
- b) No exposed skin on arms, legs or torso.
- c) Wear lab coats or other approved protective garments.
- d) Wear gloves or other personal protective equipment (PPE) as directed by the instructor or mandated by prudent practices based on the chemicals being handled. If in doubt, wear appropriate gloves. Latex is not permitted. Avoid cross-contamination.
- e) Remove PPE (gloves and lab coat) when exiting the laboratory.
- f) Wash your hands, even if gloves were used, before leaving a lab where you did any lab work.
- g) Closed toe shoes are required. The heel and top of foot must be covered. High heeled shoes, sandals, and perforated shoes are not permitted.
- h) Confine long hair and loose clothing.

9. Inspect equipment or apparatus for damage before adding chemical reagents or biological samples or energizing electrical equipment. Do not use damaged equipment.

10. Never remove chemicals, biological samples, or laboratory equipment from a lab without proper authorization.

11. Presume that all chemicals and biological samples used in the laboratory are hazardous for you and the environment, unless instructed otherwise.

12. Never leave an experiment unattended unless proper safety precautions are in place.

13. Read all labels on chemicals twice before using them in the lab. Read all instructions twice for the operation of any equipment or machinery.

14. Properly and safely dispose of all waste materials.

15. Treat sharps and broken glassware containers carefully.

- a) Broken glass should be disposed of in properly marked safety containers. All sharps (needles, razor blades, etc.) used for any purpose must be disposed of in specially labeled SHARPS containers.
- b) Do not place contaminated glass in the broken glassware container. Consult your supervisor.
- c) Waste chemicals and contaminated PPE should be discarded as directed.

16. When using a reagent, replace the lid immediately. Never return unused reagents to stock bottles. Take only the amount needed for your experiment.

17. All chemicals and biological samples/media are to be disposed of in appropriately labeled containers. Specific instructions for each material will be provided. Pay attention to waste container labels before adding the material to be discarded.

18. Use good personal hygiene. Keep your hands and face clean. Wash hands thoroughly with soap and water after handling any chemical or biological agent.

19. Keep the work area clean and uncluttered with chemicals and equipment. Clean up the

work area on completion of an operation or an experiment. Before leaving the laboratory, you are responsible for making sure your lab area is clean and organized.

20. Never store a chemical or biological specimen in an unlabeled container.

20. Always have your College of Charleston identification and insurance information with you when working in a laboratory. MedicAlert identification must be worn if you have any potential life-threatening chemical sensitivities or medical conditions.

21. Report any accident or injury, however minor, to your teaching assistant, instructor, or lab supervisor immediately. An accident report form must be completed and forwarded to the department chair, dean, and to the Director of Environmental Health and Safety.

If you have questions/concerns about safety in the lab please first consult your instructor. If these are not answered, please see the department chair. Finally, you may consult the director of Environmental Health and Safety, Randy Beaver at 3-6802 or beaverr@cofc.edu

Adopted: March 7, 2012

CougarAlert

The College of Charleston has an agreement with the Blackboard Connect Inc. [formerly The NTI Group, Inc. (NTI)] to use its Connect-ED communication software to provide an emergency notification system that is capable of reaching students, faculty, staff and parents within minutes of a campus crisis. This system is called **CougarAlert**.

Information for Students

The CougarAlert emergency notification system will contact up to six phone numbers for the student. Students may include family member numbers in their address and phone number information.

All students should log onto [MyCharleston](#) to review their address and telephone information and update as needed.

To access the address and telephone information, follow these steps:

1. Log on to [MyCharleston](#)
2. Click on the Academic Services tab
3. Click on the Banner Self-Service link in the third column
4. Click on the Personal Information link
5. Click on the Update Address and Phones and Cougar Alert link

The CougarAlert system will pull the phone number in the following order – cell phone with text messaging option, cell phone without text messaging option, residence hall room phone number, mailing phone number, home phone number, parent phone number and parent 2 phone number.

If you do not have one of these numbers in your student record, the system will select the next number on the list. To avoid issues related to timely communication of emergency messages to the proper places, every student must update his or her contact information in [MyCharleston](#) with current accurate information.

CougarAlert Display Information

When you receive an emergency message from the College of Charleston's CougarAlert System, the return e-mail address will be displayed as cougaralert@cofc.edu, and Caller ID will be displayed as 843.725.7246 (this is the College's Emergency Information Hotline).

Testing and Implementation

Testing will be conducted each semester to verify all systems are operating properly. The campus community will be notified via e-mail and web page postings when testing of the system will be conducted.

Blackboard Connect Software

[Blackboard Connect](#) is an emergency communication software that sends notification before, during and after an emergency. With this new system, the College will be able to communicate in many modes, including voice messages to home, work and cell phones; text messages to cell phones, PDAs and other devices; written messages to e-mail accounts; and messages to teletypewriters and telecommunication devices (TTY/TDD) for the hearing impaired. In combination with our existing communications methods and emergency response plans, this new notification system will significantly enhance the College of Charleston's ability to maintain a learning environment in which students are safe, secure and comfortable.

In an emergency, communications to the campus will be issued in the following priority order:

1. Message to the [Blackboard Connect](#) Emergency Notification System (phone and e-mail).
 2. Recorded message to the College's Emergency Information Hotline, 843.725.7246.
 3. Update to the Website.
 4. Printed update sheets to be distributed and posted on campus (if necessary).
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The CougarAlert system will only be used to notify you in the event of a campus crisis or emergency.