

BI410/510

Stem Cells: Disease and Regenerative Medicine, Fall 2022

Instructor:

Anne E. Zemper, Ph.D. Assistant Professor of Biology

Classroom Hours: Tues/Thurs 2-3:20

Classroom Location: 199 Esslinger

Office hours: By appointment only. Email me to set up a time.

Email: Please include “Bi410/510” in the subject line, so your email can be attended to in time. I will try to answer your email in a timely manner; however, I do not often check our email in the evenings or during weekends.

Course Overview:

Stem cells exist in all living organisms, are critical for your everyday life and have a much longer life span than other cell types in your body. In the past 20 years, they have been both glorified and vilified in the popular media. This course will take a closer look at these cells from the developmental, cellular and molecular angle. We will look more closely at the scientific possibilities that these cells provide, as well as explore their potential in regenerative medicine. In addition, we will explore what happens when these cells are improperly regulated, which can lead to cancer. In our final lecture, we will explore the scientific and ethical debates surrounding using stem cells in regenerative medicine.

The course approach will be very different from lecture--based classes. Material learned in Bi320 Molecular Genetics, Bi328 Developmental Biology Bi428/538 Developmental Genetics will help you relate basic principles and experimental methods to primary research papers. Be prepared to challenge yourself, participate, and explore one of the most exciting areas of biology.

Class Format:

Classes are held Tuesdays and Thursdays, from 2-3:20am. The Monday class will consist of a lecture relevant to the week’s selected paper. These lectures will cover stem cell-related principles, background on the week’s paper, and an introduction to techniques used in the paper. On Wednesdays, we will have a brief in-class quiz on the material covered in the previous lecture and the paper being discussed. The quiz could also cover material from earlier weeks. Following the quiz, student groups will present the week’s paper in a “journal club” format and encourage discussion among all members of the class. Some weeks, we will be accompanied by the senior author from the selected publication, either in person or via Skype, where we will be able to ask them questions about the selected publication. The quiz will be briefly reviewed the following Monday.

Technical Requirements:

Log into canvas.uoregon.edu using your DuckID to access our class. If you have questions about accessing and using Canvas, visit the [Canvas support page](#). Canvas and Technology Support also is available by phone or live chat: [541-346-4357](tel:541-346-4357) | livehelp.uoregon.edu

If you face Internet access challenges: companies are offering free access during this challenging time. To learn more about options visit Information Services’ [web page on going remote](#).

Our class will communicate through our Canvas site. Announcements and emails are archived there and automatically forwarded to your UO email, and can even reach you by text. Check and adjust your settings under:

Account

>

Notifications.

Office Hours:

The instructor will host office hours by appointment. We also have a running discussion forum on our Canvas called “Class Questions and Answers” for the entire group to ask and answer.

If you contact me with a question, I will try to respond within one business day. I typically provide feedback on assignments within one week.

Why should you reach out to me?

Talking with my students about our course material is a true pleasure—confused or excited about something? Wondering how what we’re learning relates to current events, career choices, or other classes you can take UO? Please be in touch! **Please also be in touch to tell me how you are doing in these difficult times**—are you having a tough week? Having troubling with some aspect of the course? I would like to strategize with you. You are my student in a term that I suspect you and I will always remember. I will do everything I can to help you succeed.

Reading Materials:

There is no required textbook. The primary literature paper for each week will be available in PDF format on Canvas (including supplemental material). All the chosen papers (including high resolution figures) are also available online through UO library institutional access. Use the digital object identifier (doi) in the schedule below to quickly link to each paper (<http://dx.doi.org/>). Any other supporting papers (reviews, etc.) will also be uploaded to Canvas.

The lectures will be posted on Canvas the day they are given.

Weekly Quizzes:

There will be seven weekly quizzes of 15 minutes duration, and worth 50 points. Quizzes will be administered in person. You may refer to a copy of the paper and any hand-written notes during the quizzes. Your six highest scores will count towards your final grade. Combined, the quizzes will comprise **30% of your grade. (300 points)**

Paper Presentation and Discussion:

In small groups, students will be responsible for presenting and leading discussions on the week’s paper. This requires preparing a presentation (Powerpoint, PDF, or otherwise) of the figures in the paper. You will need to present the significance, background, the questions being addressed, hypotheses, aims, and conclusions derived from the paper. Each group **MUST** meet with me in advance to discuss their preparation. At that meeting, you will bring a draft of your presentation and discussion points your group intends to raise that week. It is your responsibility to coordinate a meeting time. Your grade will be assigned based on your ability to present the content of the paper in a clear and concise manner and to encourage discussion. All group members must participate. **20% of your course grade will be based on this presentation. (200 points)**

Research Proposal:

As individuals, each student will prepare a 3-page research proposal on a topic of interest in the field of stem cell biology. *This requires identifying an interesting unresolved question, proposing a hypothesis to explain it, and describing an experimental approach to test that hypothesis. The written proposal is due on the date of the course final exam.* You will also defend your proposal, with slides, through a presentation to the rest of the class. **20% of your grade will be based on the written proposal (200 points) and 15% for the oral presentation (150 points).**

Participation:

This course depends on productive discussions among the entire group. Those who consistently

participate in both paper discussions and in Q/A sessions during the student presentations will be rewarded with full credit worth 15% of your final grade. (150 points)

Grade	%
A+	97-100
A	93-96.9
A-	90-92.9
B+	87-89.9
B	83-86.9
B-	80-82.9
C+	77-77.9
C	73-76.9
C-	70-72.9
D+	67-69.9
D	60-66.9
F	0-59.9

General policy on participation and assignments:

As the university community adjusts to teaching back in person in the context of the COVID-19 pandemic, course requirements, deadlines, and grading percentages are subject to change. I will be mindful of the many impacts the unfolding events related to COVID-19 may be having on you. Though attendance and participation account for 15% of students' grades, I can develop and post to canvas make-up activities, which may be used up to two times by any student for any reason. During this unusual time, I encourage you to talk with me about what you are experiencing so we can work together to help you succeed in this course.

No Extra Credit

There will be no opportunities for extra credit. Please do not ask for exceptions.

Please notify me if there are aspects of the instruction or design of this course that result in disability-related barriers to your participation. You are also encouraged to contact the Accessible Education Center at 541-346-1155 or uoaec@uoregon.edu.

Academic Honesty:

Academic dishonesty includes various forms of "cheating" and will not be tolerated. Academic dishonesty includes but is not limited to:

1. Copying another person's answers to exam and quiz questions.
2. Utilizing materials otherwise not allowed on exam (e.g. textbooks, more than the allocated pages of notes, internet access, etc.).
3. Having someone else take your exams.
4. Altering an exam for a regrade.
5. Copying problem set answers from others.
6. Obtaining/distributing previous exams if those exams are not made available by the instructor to everyone in the class.
7. Obtaining/distributing/copying previous problem sets if are not made available by the instructor to everyone in the class.
8. Misrepresenting circumstances leading to missed classes, exams, or quizzes.
9. Working together online (either in the same room or in different rooms) to collaborate on any material that does not permit collaboration.

All such activities will be reported to the Dean of Students office and will result in a failing grade in the class if academic dishonesty is confirmed. For further definitions of cheating and its penalties, consult the University of Oregon Student Conduct Code <https://policies.uoregon.edu/vol-3-administration-student-affairs/ch-1-conduct/student-conduct-code>.

Learning Environment:

The University of Oregon and I are working to create inclusive learning environments. Please notify me if there are aspects of the instruction or design of this course that result in barriers to your participation. You may also wish to contact the UO Accessible Education Center in 164 Oregon Hall at 346-1155 or uoaec@uoregon.edu

Reporting:

The instructor of this class is a Student-Directed Employee. As such, if you disclose to me, I will respond to you with respect and kindness. I will listen to you, and will be sensitive to your needs and desires. I will not judge you. I will support you. As part of that support, I will direct students who disclose sexual harassment or sexual violence to resources that can help. I will only report the information shared to the university administration when you as the student requests that the information be reported (unless someone is in imminent risk of serious harm or is a minor). Please note the difference between 'privacy' and 'confidentiality.' As a Student-Directed Employee I can offer privacy because I am not required to report certain information to the university. However, I cannot be bound by confidentiality in the same way that a counselor or attorney is. Confidential resources such as these means that information shared is protected by federal and state laws. Any information that I as a student-directed employee receive may still be accessed by university or court proceedings. This means, for example, that I could still be called as a witness or required to turn over any related documents or notes I keep.

Please note also that I am required to report all other forms of prohibited discrimination or harassment to the university administration. Specific details about confidentiality of information and reporting obligations of employees can be found at titleix.uoregon.edu.

Class Courtesy

Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the quarter (or before) so that I may address you properly.

Open inquiry, freedom of expression, and respect for difference are fundamental to a comprehensive and dynamic education. We are committed to upholding these ideals by encouraging the exploration, engagement, and expression of divergent perspectives and diverse identities. Classroom courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. Our classroom is a learning environment, and as such should be a safe, inclusive and respectful place. Being respectful also includes using preferred pronouns for your classmates. Disrespecting fellow students as well as combative approaches, tones and/or actions are not acceptable. Please make me aware if there are classroom dynamics that impede your (or someone else's) full engagement.

COVID Containment Plan

The key to keeping our community healthy and safe involves prevention, containment, and support. Here is information critical to how the UO is responding to COVID-19.

- **Prevention:** *To prevent or reduce the spread of COVID-19 in classrooms and on campus, all students and employees:*

1. *Must to be comply with vaccination policy*
2. *Mask wearing is not required but encouraged: The UO supports the personal choice to wear a mask as an effective strategy for individuals seeking to protect themselves from COVID-19. We encourage anyone who wishes to wear a mask to do so. Masks are welcome though optional in most indoor spaces on UO campuses.*

KN95 masks are available here:

- EMU - O Desk
- Lillis - Atrium reception desk
- Global Scholars Hall - Service center
- Knight Library - Check out and reserve desk
- Price Science Commons - Service desk

3. *Wash hands frequently and practice social distancing when possible*

4. *Stay home/do not come to campus if feeling symptomatic*

5. *Visit this website for vaccine information, symptom management and reporting information:*

<https://coronavirus.uoregon.edu>

Good Classroom Citizenship:

- *Stay home if you're sick*
- *Get to know your neighbors in class, and let them know if you test positive*
- *Watch for signs and symptoms with the daily symptom self-check*
- **Wash your hands** frequently or use hand sanitizer

Life at College

Life at college can be very complicated. Students often feel overwhelmed or stressed, experience anxiety or depression, struggle with relationships, or just need help navigating challenges in their life. If you're facing such challenges, you don't need to handle them on your own--there's help and support on campus.

As your instructor if I believe you may need additional support, I will express my concerns, the reasons for them, and refer you to resources that might be helpful. It is not my intention to know the details of what might be bothering you, but simply to let you know I care and that help is available. Getting help is a courageous thing to do—for yourself and those you care about.

University Health Services help students cope with difficult emotions and life stressors. If you need general resources on coping with stress or want to talk with another student who has been in the same place as you, visit the Duck Nest (located in the EMU on the ground floor) and get help from one of the specially trained Peer Wellness Advocates. Find out more at health.uoregon.edu/ducknest.

University Counseling Services (UCS) has a team of dedicated staff members to support you with your concerns, many of whom can provide identity-based support. All clinical services are free and confidential. Find out more at counseling.uoregon.edu or by calling 541-346-3227 (anytime UCS is closed, the After-Hours Support and Crisis Line is available by calling this same number).

Discussion and Engagement Guidelines for Remote Participation

Participate and Contribute: Students are expected to participate by sharing ideas and contributing to the collective learning environment. This entails preparing, following instructions, and engaging respectfully and thoughtfully with others. More specific participation guidelines and criteria for contributions will be provided for each specific activity.

Use Proper Netiquette: Please use good “net etiquette”: identify yourself with your real name and use a subject line that clearly relates to your contribution. Write or speak in the first person when sharing your opinions and ideas but when addressing other students or discussing their ideas, use their names (e.g. "I think red is the most important term in the poem, but I also think Kate is correct that blue is important, too"). Respect the privacy of your classmates and what they share in class. Understand that we may disagree and that exposure to other people's opinions is part of the learning experience. Good netiquette also means using humor or sarcasm carefully, remembering that non-verbal cues (such as facial expressions) are not always possible or clear in a remote context. In addition, your language should be free of profanity, appropriate for an academic context, and exhibit interest in and courtesy for others' contributions. Be aware that typing in all capital letters indicates shouting. Certain breaches of netiquette can be considered disruptive behavior.

Interact Professionally: Our learning environment provides an opportunity to practice being professional and rigorous in our contributions. As much as possible, use correct spelling, grammar, and style for academic and professional work. Use discussions and activities as opportunities to practice the kind and quality of work expected for assignments. Moreover, seize the chance to learn from others and develop your interpersonal skills, such as mindful listening and awareness of one's own tendencies (e.g. Do I contribute too much? Too little?).

Expect and Respect Diversity: All classes at the University of Oregon welcome and respect diverse experiences, perspectives, and approaches. What is not welcome are behaviors or contributions that undermine, demean, or marginalize others based on race, ethnicity, gender, sex, age, sexual orientation, religion, ability, or socioeconomic status. We will value differences and communicate disagreements with respect. We may establish more specific guidelines and protocols to ensure inclusion and equity for all members of our learning

community.

Help Everyone Learn: Our goal is to learn together by learning from one another. As we move forward learning during this challenging time, it is important that we work together and build on our strengths. Not everyone is savvy in remote learning, including your instructor, and this means we need to be patient with each other, identify ways we can assist others, and be open-minded to receiving help and advice from others. No one should hesitate to contact me to ask for assistance or offer suggestions that might help us learn better.

Academic integrity:

The University Student Conduct Code defines academic misconduct, which includes unauthorized help on assignments and examinations and the use of sources without acknowledgment. Academic misconduct is prohibited at UO. I will report misconduct to the Office of Student Conduct and Community Standards—consequences can include failure of the course. Exams are timed and Canvas automatically varies the questions students receive. I will adjust times to support students with accommodations through the Accessible Education Center.

Date	Class content	Week's Paper/Quiz the Expert
September 27	Lecture #1: Introduction, Course Goals and Syllabus, Scientific Process and Paper Analysis , Discuss Paper Sign ups	
September 29	Lecture #2: Review: Stem Cells and Plasticity, Stem Cell--Related Disease Mechanisms	Nat Cell Biol. 2016 Apr;18(4):349--55. doi: 10.1038/ncb3332. Epub 2016 Mar 21. Tissue--specific designs of stem cell hierarchies.
Oct 4	Lecture #3: Homeostatic Stem Cells: Developmental Programs and Coordinated regulation	
Oct 6	Quiz #1 Paper Discussion 1	Development 2018 doi: 10.1242/dev.166579 Published 27 November 2018 Transcriptional response to Wnt activation regulates the regenerative capacity of the mammalian cochlea
Oct 11	15' Review / Lecture #4: Homeostatic Stem Cells: Adult Maintenance Programs Niche requirements	
Oct 13	Quiz #2 Paper Discussion 2	Paper TBA
Oct 18	15' Review / Lecture #5: Are Niche's required? Generation of organisms from stem cells ex vivo	
Oct 20	Quiz #3 Paper Discussion 3	Paper TBA
Oct 25	15' Review / Lecture #6: A do--over: Recapitulating Development to Fix Disease	
Oct 27	Quiz #4 Paper Discussion 4	Paper TBA

Date	Class content	Week's Paper/Quiz the Expert
Nov 1	15' Review / Lecture #7: 'You-go, I-go': What triggers stem cells to divide?	
Nov 3	Quiz #5 Paper Discussion 5	Paper TBA
Nov 8	15' Review / Lecture #8: Intrinsic regenerative Power--Organ and Organismal Differences	
Nov 10	Quiz #6 Paper Discussion 6	Paper TBA
Nov 15	15' Review / Lecture in Guest paper topic ("Ask the Expert")	
Nov 17	Quiz #7 Paper Discussion 7	PAPER: TBA- from our Ask the Expert
Nov 22, 29, Dec 1, 8	Student Presentations/Due date for written research proposal	