

ANS 6932 – Stem Cells: Biology and Applications (2 Cr) – Fall 2023

Course Instructor

Feng Yue, Ph.D.

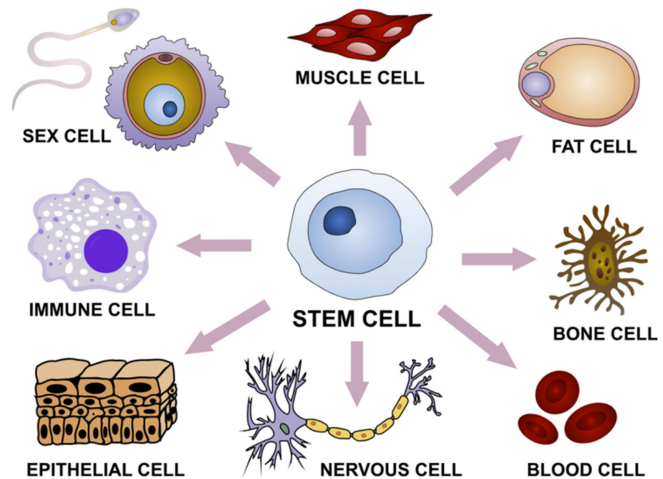
Assistant Professor in Stem Cell Research

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Office hours: Monday – Friday, 8:30 am – 5:00 pm.



Note: We have an open-door policy, and you are welcome to send us an e-mail to set up an in person appointment on demand. I will respond to emails within 2 working days.

Class Days, Time, and Location

Days: Wednesday (W).

Time: 9:35 am – 11:30 am (Period 3-4).

Location: Animal Science Building 459, Room 102

Course Description & Objectives

ANS 6932 – Stem Cells: Biology and Applications is a two-credit course, designed for graduate students to learn the fundamentals of stem cell biology and the potential applications of stem cells (embryonic stem cells, induced pluripotent stem cells, and adult stem cells) in human and animal health. The course will cover basic knowledge and insights of current research in the field and offer the approaches of advanced stem cell technology in regenerative medicine. The first and last two classes are general introduction by Dr. Yue. For all other classes, there is first a 60-minute didactic lecture on the subject, followed by a 10- to 15-min break and a 40-minute "case study" of an original paper presented by an assigned student with class discussion.

At the end of the course, the student will be able to:

- ✓ Define the core concepts of stem cells, and explain routine methods used in stem cell research;
- ✓ Understand the embryonic and induced pluripotent stem cells and their potential for regenerative medicine;
- ✓ Describe the developmental origin, identification, differentiation, self-renewal, and senescence of various tissue-specific stem cells and their function in tissue growth and maintenance;
- ✓ Discuss the fundamentals of stem cell biology, and identify the genetic control of stem cells;
- ✓ Illustrates the diverse applications in tissue regeneration, disease therapeutics, aging and cancer.

Prerequisites

Undergraduate level cell biology, molecular biology, and genetics.

Supporting Texts

There is no textbook required. Some reading assignments and suggestions will be provided and will come from research and popular press articles, online resources, and book chapters. However, we recommend the following textbooks, which the student may wish to consult:

- *Concepts and Applications of Stem Cell Biology: A Guide for Students*, Springer; 1st Edition. 2020, Gabriela Rodrigues, Bernard A. J. Roelen, ISBN-13: 978-3030439385;
- *Stem Cells Biology and Application*, Garland Science, 1st Edition. 2020, Mary Clarke, Jonathan Frampton, ISBN 9780815345114.
- *Essentials of Stem Cell Biology*, Elsevier, 3rd Edition, 2013, Robert Lanza, Anthony Atala, ISBN: 9780124095038.

Course Website on Canvas

Our course Canvas website (login via <https://elearning.ufl.edu/>) will be the communication and information hub for this course. Syllabus, resources, and lesson material, provided as *PowerPoint* or *pdf* files, will be posted in CANVAS. The lesson material will be organized by topic within modules. The lesson material will have blanks and missing information that need to be completed by you during the lectures. We will not post completed lesson material. The completion will be your responsibility!

- ✓ To make sure you are not missing any announcement or email, your CANVAS settings must be set to receive emails and announcements related to this class as soon as possible. To change these settings: Go to your general *CANVAS Settings* (upper right corner within CANVAS) > *Notifications* (left menu bar) > *Notification Preferences*: here set to “*ASAP*” (at least) the following activities: Announcements and Conversations (all three subcategories).
- ✓ For more information on how to use Canvas, see [Canvas Student Guide](#). The e-learning site and the CANVAS site also provide links to more help options.

Assessments

We will use exam, presentation and assignments to assess your performance and knowledge. **Only one take-home final exam will be provided**, which contributes to 40% of the final grade. The assignment will consist of short essay answers, multiple choices, fill-in the blanks, and labeling of drawing and schemes.

Presentation will be assigned after the first two lectures and contributes to 40% of the final grade. Every student will present at 1 or 2 times dependent on the class size. All students are required to read the article and participate in the in-class discussion. **Table 1** outlines the assessments and their respective point and % values.

Table 1. Assessment types and points

Assessment type	Number per semester	Points for each	Total points per assessment type	% of overall grade
Exam	1	40	40	40
Presentation	1 to 2	TBD	40	40
Assignment	4	5	20	20
			Total pts: 100	Total score: 100%

Request to re-grade an assignment or exam must be made **within one week** from the date the grades were assigned. Grade challenges must be submitted in writing and returned to the instructor. If for any reason you are having problems understanding the course material and/or are having other academic, university, or

personal problems that are affecting your performance in class, please make an appointment with us as early in the semester as possible so the problems can be addressed.

Assessment Schedule

1. Exam schedule:

Table 2. Fall 2023 Schedule

Assessment	Due Date
Assignment 1	S., Sep. 10, 2023
Assignment 2	S., Oct. 1, 2023
Assignment 3	S., Nov. 5, 2023
Assignment 4	S., Dec. 3, 2023
Final Exam Due	W., Dec. 6, 2023

Other important dates

First class: Wed., Aug. 23th

Last class: Wed., Dec. 6th (Final Exam due)

No class: Nov. 22th – 25th (Thanksgiving Holiday)

Grades and Grading Policy

Grades are based on performance in the assessments (exams, presentation and assignment). Grade assignment and corresponding percentage and point ranges are shown in **Table 3**.

Table 3. Grade assignment and Score range

Grade	Score range
A	90.0 – 100.0
B+	85.0 – 89.99
B	80.0 – 84.99
C+	75.0 – 79.99
C	70.0 – 74.99
D+	65.0 – 69.99
D	60.0 – 64.99
E	≤ 59.99

* Please note that no minus grades will be used. For information on current UF policies for assigning grade points: <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>.

Attendance and Make-Up Work

Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>.

It is **highly recommended** that you attend class. If attendance becomes an issue we reserve the right to give announced or unannounced assignments for points throughout the semester.

Course Topics

Week* ¹	Date	Topic	Guest Lecturer	Student Presenter
1	Aug. 23	Introduction to the course	Dr. Yue, Feng	NA
		Embryonic vs adult stem cells, stem cell research ethics		
2	Aug. 30	Stem cell research tools and techniques	Dr. Yue, Feng	NA
		Stem cell pluripotency, self-renewal and differentiation		
3	Sep. 6	Germ line stem cells - Lecture	Dr. Yue, Feng	TBD
		Germ line stem cells - Paper discussion 1		
4	Sep. 13	Embryonic stem cells - Lecture	Dr. Jiang, Carl	TBD
		Embryonic stem cells - Paper discussion 2		
5	Sep. 20	Induced pluripotent stem cells (iPSCs) - Lecture	Invited	TBD
		Induced pluripotent stem cells (iPSCs) - Paper discussion 3		
6	Sep. 27	Genetic and Epigenetic regulation of stem cells - Lecture	Dr. Yue, Feng	TBD
		Epigenetic regulation of stem cells - Paper discussion 4		
7	Oct. 4	Mesenchymal stem cells (MSC) - Lecture	Dr. Yue, Feng	TBD
		Mesenchymal stem cells (MSC) - Paper discussion 5		
8	Oct. 11	Neural stem cells - Lecture	Dr. Reynolds, Brent	TBD
		Neural stem cells - Paper Discussion 6		
9	Oct. 18	Cardiac stem cells - Lecture	Dr. Yue, Feng	TBD
		Cardiac stem cells - Paper discussion 7		
10	Oct. 25	Skeletal muscle stem cells (satellite cells) - Lecture	Dr. Yue, Feng	TBD
		Skeletal muscle stem cells - Paper discussion 8		
11	Nov. 1	Adipose (brown and white fat) Stem Cells - Lecture	Dr. Yue, Feng	TBD
		Adipose Stem Cells - Paper discussion 9		
12	Nov. 8	Epithelial hair follicle and intestinal stem cells - Lecture	Dr. Yue, Feng /Invited	TBD
		Epithelial hair follicle - Paper discussion 10		
13	Nov. 15	Haematopoietic stem cells (HSC) - Lecture	Dr. Qian, Zhijian	TBD
		Haematopoietic stem cells (HSC) - Paper discussion 11		
14	Nov. 22	<i>Thanksgiving Holiday - No Class</i>		
15	Nov. 29	Pancreatic and liver stem cells - Lecture	Dr. Yue, Feng /Invited	TBD
		Pancreatic stem cells - Paper discussion 12		
16	Dec. 6	Clinical applications of stem cells - Lecture	Dr. Yue, Feng /Invited	NA
		Bioengineering stem cells - Lecture		

! *¹: Please note that the syllabus is an evolving animal. Contents, topics and timeline listed in the syllabus may therefore be subject to slight modifications, in part tailored to you.

Missing an assessment

An assignment or exam must not be missed without an excused absence or prior consent of the instructor. All requests to miss an assessment must be submitted in writing and signed by the student regardless of the reason. Any assessment missed for reasons other than those listed below or as outlined in the UF attendance policy will not be excused and a grade of zero will be recorded. In general, acceptable reasons for absence from or failure to participate in class include illness, serious family emergencies, special curricular requirements (e.g., field trips and professional conferences), military obligation, severe weather conditions, religious holidays and participation in official university activities such as music performances, athletic competition or debate. Absences from class for court-imposed legal obligations (e.g., jury duty or subpoena) must be excused. Other reasons also may be approved.

Online Course Evaluation Process

Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at: <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at: <https://gatorevals.aa.ufl.edu/public-results/>.

Academic Honesty

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: *"We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity."* You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: *"On my honor, I have neither given nor received unauthorized aid in doing this assignment."*

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code>.

Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Services for Students with Disabilities

The Disability Resource Center (DRC) coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

0001 Reid Hall, 352-392-8565, <https://disability.ufl.edu/>.

Class Expectations and Mutual Respect

The foundation of this class will be based on developing mutual respect between students and instructor. I value our diverse identities and would like to create a positive learning environment for my students that supports a diversity of thoughts, perspectives and experiences, and honors your identities (including race, gender, class, sexuality, religion, ability, etc.). To facilitate the accomplishment of this:

- I will work as diligently as possible to insure all individuals are treated fairly, all opinions and personalities are respected, and everyone has an equal opportunity to succeed in this class.
- Professional 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.
- You are expected to treat your instructor, teaching assistant, and all other participants in the course with courtesy and respect. Your comments to others should be factual, constructive, and free from harassing statements.
- You are encouraged to disagree with other students, but such disagreements need to be based upon facts and documentation (rather than prejudices and personalities).
- I expect that you participate in in- and out-of-class activities, such as discussions, peer evaluations, group exercises and general participation.
- If you feel like your performance in the class is being impacted by your experiences outside of class, please do not hesitate to come and talk with me. I want to be a resource for you.

This class can be challenging for some, and may require some extra effort on your side. If you don't recall much from your Biology classes you may want to be prepared for having to catch up on some biology, physiology and cell biology alongside the provided lecture material. This extra effort will be advantageous for a better understanding of stem cell biology.

Other Course Policies

Student Feedback: ALL types of feedback are welcome. You can send me an email or drop a note into the "ANS6932 Suggestion envelope" that I will keep in the book shelf in the front of my office door (Bldg. 459, Room 202D).

Advice for Success:

- Attend the lectures in person.
- Arrive in class on time. The first 5 minutes of each lecture will be used to revise the key points of the previous lecture. This is a good time to clarify concepts and ask questions.

- Take notes. Not all the information will be listed on the slides because I expect you to pay attention to the class and make some notes.
- Ask your questions! You can ask questions in the classroom, by email or stop by my office.
- Revise the lecture materials after each class and before the exam.
- Keep in mind the lecture objectives.
- Study with a classmate.
- Be active. Eat well. Get enough sleep. Enjoy your loved ones.

Campus Helping Resources

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- *University Counseling & Wellness Center*, 3190 Radio Road, 352-392-1575, www.counseling.ufl.edu,
Counseling Services
Groups and Workshops
Outreach and Consultation
Self-Help Library
Wellness Coaching
- *U Matter We Care*, www.umatter.ufl.edu/.
- *Career Connections Center*, First Floor JWRU, 392-1601, <https://career.ufl.edu/>.
- *Student Success Initiative*, <http://studentsuccess.ufl.edu>.
- *Student Complaints On-Campus*: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>.

Other Academic Resources

- ***E-learning technical support:*** Contact the [UF Computing Help Desk](#) at 352-392-4357 or via e-mail at helpdesk@ufl.edu.
- ***Library Support:*** Various ways to receive assistance with respect to using the libraries or finding resources.
- ***Teaching Center:*** Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.
- ***Writing Studio***, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. <https://writing.ufl.edu/writing-studio/>.
- ***Student Health Care Center:*** Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website.
- ***University Police Department:*** Visit UF Police Department website or call 352-392-1111 (or 9-1-1 for emergencies).

Welcome to our Stem Cells Class!