

Special Topics in Zoology ZOO4926 Class Number 18128

Stem Cell Biology

Location: **Bartram Hall, Biology Department rm 211**

Days: **Mondays, Wednesdays, Fridays Period 7 – 1.55pm – 2.45pm**

Instructors: Dr Malcolm Maden, email malcmaden@ufl.edu, rm 326 Bartram Hall

Dr Edward Scott, email escott@ufl.edu

Course description

The course will cover all aspects of stem cells primarily from a biological viewpoint – what are they, where do they come from during development, why are they there, where are they found, how are they regulated, what happens if they become mis-regulated, what is their role in the normal organism, what is their role in regeneration and not just considering them in mammals, but across the Metazoa. We will, towards the end of the course, examine how and why stem cells are used for medical treatments and how they have been exploited for commercial gain. In each week there will be two lectures (Monday and Wednesday) on these subjects and in the third session each week (Friday) students will make presentations about a scientific publication they have read on the subject of the week or they will present information that has been featured that week in the popular and scientific news.

Lectures will be given by the instructors and guest speakers as detailed in the lecture schedule.

Course objectives

The objective of this course is to give students a thorough understanding of the basic biology of stem cells across the animal kingdom and in the different systems of the body so that their medical relevance and potential role can be better understood. To do this we will consider development, regeneration, aging, the systems of the body: brain, blood, gut, muscle, epidermis, heart, germ line, adipose tissue and cancer.

There is no textbook for the course as all the information is taken from recent scientific publications in the primary literature and will be posted on the canvas course site. Several excellent sources of information for this course are freely available on-line at NIH regenerative medicine (2006), the Harvard Stem Cell Institute Stembook (www.stembook.org) and a recent 'Outlook' in Nature on 'Stem Cells' (Nature 597, 30th September 2021, S5-S26) describes their future potential in development and medicine.

Attendance and evaluation

Consistent and punctual attendance to all parts of the course is expected and required and a component of the marks is specifically laid aside for this. Excused absences require appropriate documentation. There will be 3 exams during the course which will consist of short answer questions to be answered during a class period. The presentations and exercises will be graded and there will be an essay to be completed by the end of the semester. These three components will be scored as

follows: SAQ exams 120 each, presentations 100, essay 100, attendance 20, total 600. The final grade which will follow the scheme of A = 100-90, B = 90-80, C = 80-70, D = 70-60.

We will have face-to-face instructional sessions to accomplish the student learning objectives of this course. In response to COVID-19, the following policies and requirements are in place to maintain your learning environment and to enhance the safety of our in-classroom interactions.

- You are required to wear approved face coverings at all times during class and within buildings. Following and enforcing these policies and requirements are all of our responsibility. Failure to do so will lead to a report to the Office of Student Conduct and Conflict Resolution.
- This course has been assigned a physical classroom with enough capacity to maintain physical distancing (6 feet between individuals) requirements. Please utilize designated seats and maintain appropriate spacing between students. Please do not move desks or stations.
- Sanitizing supplies are available in the classroom if you wish to wipe down your desks prior to sitting down and at the end of the class.
- Follow your instructor's guidance on how to enter and exit the classroom. Practice physical distancing to the extent possible when entering and exiting the classroom.
- If you are experiencing COVID-19 symptoms ([Click here for guidance from the CDC on symptoms of coronavirus](#)), please use the UF Health screening system and follow the instructions on whether you are able to attend class. [Click here for UF Health guidance on what to do if you have been exposed to or are experiencing Covid-19 symptoms](#).
- Course materials will be provided to you with an excused absence, and you will be given a reasonable amount of time to make up work. [Find more information in the university attendance policies](#).

Attendance and make-ups

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found in the online catalog at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

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Accommodations

Students who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluations

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 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 ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at gatorevals.aa.ufl.edu/public-results/.

Academic Integrity

“UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students 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.” The Honor Code (<http://www.dso.ufl.edu/sccr/process/student-conduct-honorcode/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Resources Available to Students

Health and Wellness

- *U Matter, We Care*: umatter@ufl.edu; 392-1575
- *Counseling and Wellness Center*: <http://www.counseling.ufl.edu/cwc/Default.aspx>; 392-1575
- *Sexual Assault Recovery Services (SARS)*: Student Health Care Center; 392-1161
- *University Police Department*: <http://www.police.ufl.edu/>; 392-1111 (911 for emergencies)

Academic Resources

- *E-learning technical support*: Learningsupport@ufl.edu; <https://lss.at.ufl.edu/help.shtml>; 352-392-4357 (opt. 2)
- *Career Resource Center*: Reitz Union; <http://www.crc.ufl.edu/>; 392-1601
- *Library Support*: <http://cms.uflib.ufl.edu/ask>
- *Teaching Center*: Broward Hall; 392-2010 or 392-6420
- *Writing Studio*: 302 Tigert Hall; <http://writing.ufl.edu/writing-studio/>; 846-1138

Procedure for Conflict Resolution

Any classroom issues, disagreements or grade disputes should be discussed first between the instructor and the student. If the problem cannot be resolved, please contact the Undergraduate Coordinator or the Department Chair. Be prepared to provide documentation of the problem, as well as all graded materials for the semester. Issues that cannot be resolved departmentally will be referred to the University Ombuds Office (<http://www.ombuds.ufl.edu>; 392-1308) or the Dean of Students Office (<http://www.dso.ufl.edu>; 392-1261). For further information refer to

https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf (for residential classes) or
<http://www.distance.ufl.edu/student-complaintprocess> (for online classes).

Special Topics in Zoology ZOO4926

GMS 6336, GMS 6331.

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WEEK	DATE	TOPIC/LECTURER
SECTION 1 – THE BIOLOGY OF STEM CELLS		
1	Mon Jan 10 th	Introduction/Embryology – MM
	Wed Jan 12 th	ES cells – ES
	Fri Jan 14 th	IPS cells – ES
2	Mon Jan 18 th	HOLIDAY
	Wed Jan 19 th	Neural stem cells – BR
	Fri Jan 21 st	Neural stem cells – BR
3	Mon Jan 24 th	Hydra and stem cells – CS
	Wed Jan 26 th	Planarians and stem cells – MM
	Fri Jan 28 th	Discussions/presentations
4	Mon Jan 31 st	Limb regeneration in salamanders, are stem cells involved? - MM
	Wed Feb 2 nd	Stem cells and regeneration of teeth - GF
	Fri Feb 4 th	Discussions/presentations

SECTION 2 – STEM CELLS IN MAMMALS

5	Mon Feb 7th	EXAM I (in class)
	Wed Feb 9 th	Epidermal stem cells – MM
	Fri Feb 11th	Discussions/presentations
6	Mon Feb 14th	Haematopoetic stem cells I – ES
	Wed Feb 16 th	Haematopoetic stem cells II – ES
	Fri Feb 18 th	Discussions/presentations
7	Mon Feb 21st	Mesenchymal stem cells - ES
	Wed Feb 23rd	Muscle stem cells – DK
	Fri Feb 25th	Discussions/presentations
8	Mon Feb 28th	Primary cilia in adult stem cells - DK
	Wed March 2nd	Adipose derived stem cells - KM
	Fri March 4 th	Discussions/presentations
9	Mon Mar 7 th	SPRING BREAK
	Wed Mar 9 th	SPRING BREAK
	Fri Mar 11 th	SPRING BREAK
10	Mon Mar 14 th	Oocyte stem cells - MM
	Wed Mar 16 th	Organoids – what stem cells can do together – MM
	Fri Mar 18 th	EXAM II (in class)

SECTION 3 - MEDICINE AND STEM CELLS

11	Mon Mar 21st	Stem cell therapy for scoliosis - NM
	Wed Mar 23rd	Cardiac stem cells and MI - MM
	Fri Mar 25 th	Discussions/presentations
12	Mon Mar 28 th	Cancer stem cells I - DO
	Wed Mar 30 th	Cancer stem cells II - DO
	Fri April 1st	Discussions/presentations
13	Mon April 4 th	Breast cancer and stem cells - ES
	Wed April 6 th	Colon cancer and colitis - ES
	Fri April 8 th	Discussions/presentations
14	Mon April 11 th	Stem cells and regeneration in mammals - MM
	Wed April 13 th	Companies - ES
	Fri April 15 th	Discussions/presentations
15	Mon April 18 th	Group assignment
	Wed April 20 th	EXAM III (in class)
	Fri April 22 nd	Reading day

MM = Dr Malcolm Maden (Biology) - malcmaden@ufl.edu

ES = Dr Edward Scott (Molecular Genetics & Microbiology) – edscott@ufl.edu

CS = Dr Christine Schnitzler (Whitney Laboratory) – christine.schnitzler@whitney.ufl.edu

GF = Dr Gareth Fraser (Biology) - g.fraser@ufl.edu

BR = Dr Brent Reynolds (McKnight Brain Institute) – brent.reynolds@neurosurgery.ufl.edu

DK = Dr Daniel Kopinke (Pharmacology & Therapeutics) dkopinke@ufl.edu

NM = Dr Nadja Makki (Anatomy & Cell Biology) – nadia.makki@ufl.edu

KM = Dr Keith March (UF Center for Regenerative Medicine) – Keith.March@medicine.ufl.edu

DO = Dr David Oppenheimer (Biology) – oppenhe@ufl.edu