

Special Topics in Zoology      ZOO4926

Stem Cell Biology      Class Number 21283

Location: Bartram Hall (Biology Department) rm 211

Days: Mondays, Wednesdays, Fridays Period 6 – 12.50pm – 1.40pm

Instructor: Malcolm Maden, email [malcmaden@ufl.edu](mailto:malcmaden@ufl.edu), rm 326 Bartram Hall.

### **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 one or two lectures on these subjects and in the third session each week 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 instructor and guest speakers.

### **Course objectives**

The objectives 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. Two excellent sources of information for this course are freely available on-line at NIH regenerative medicine (2006) and the Harvard Stem Cell Institute Stembook ([www.stembook.org](http://www.stembook.org)).

### **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.

Lecture Schedule,

Location - Bartram Hall rm 211,

Time - 12.50 – 1.40pm

| WEEK | DATE                       | TOPIC                         |
|------|----------------------------|-------------------------------|
| 1    | Mon Jan 7 <sup>th</sup>    | Introduction – MM             |
|      | Wed Jan 9 <sup>th</sup>    | Embryology – MM               |
|      | Fri Jan 11 <sup>th</sup>   | Discussions/presentations     |
| 2    | Mon 14 <sup>th</sup> Jan   | ES cells – NT                 |
|      | Wed Jan 16 <sup>th</sup>   | IPS cells – NT                |
|      | Fri Jan 18 <sup>th</sup>   | Discussions/presentations     |
| 3    | Mon 21st                   | HOLIDAY                       |
|      | Wed Jan 23 <sup>rd</sup>   | Epidermal SCs – MM            |
|      | Fri Jan 25 <sup>th</sup>   | Discussions/presentations     |
| 4    | Mon Jan 28 <sup>th</sup>   | NSCs – BR                     |
|      | Wed Jan 30th               | NSCs – BR                     |
|      | Fri Feb 1st                | Discussions/presentations     |
| 5    | Mon Feb 4 <sup>th</sup>    | <b>EXAM I</b> (in classroom)  |
|      | Wed Feb 6 <sup>th</sup>    | MSCs – ES                     |
|      | Fri Feb 8 <sup>th</sup>    | Discussions/presentations     |
| 6    | Mon Feb 11 <sup>th</sup>   | HSCs – ES                     |
|      | Wed Feb 13 <sup>th</sup>   | HSCs – ES                     |
|      | Fri Feb 15 <sup>th</sup>   | Discussions/presentations     |
| 7    | Mon Feb 18 <sup>th</sup>   | Heart                         |
|      | Wed Feb 20th               | Colon                         |
|      | Fri Feb 22nd               | Discussions/presentations     |
| 8    | Mon Feb 25 <sup>th</sup>   | ADSCs - KM                    |
|      |                            |                               |
|      | Wed Feb 27th               | Revision                      |
|      | Fri March 1st              | Discussions/presentations     |
| 9    |                            | <b>SPRING BREAK</b>           |
|      |                            | <b>SPRING BREAK</b>           |
|      |                            | <b>SPRING BREAK</b>           |
| 10   | Mon March 11 <sup>th</sup> | <b>EXAM II</b> (in classroom) |
|      | Wed March 13 <sup>th</sup> | Germ cells                    |
|      | Fri March 15 <sup>th</sup> | Discussions/presentations     |
| 11   | Mon March 18 <sup>th</sup> | Cancer – DO                   |
|      | Wed March 20th             | Cancer - DO                   |
|      | Fri March 22nd             | Discussions/presentations     |
| 12   | Mon March 25 <sup>th</sup> | Regeneration in Inverts - MM  |
|      | Wed March 27 <sup>th</sup> | Regeneration of teeth - GF    |
|      | Fri March 29 <sup>th</sup> | Discussions/presentations     |
| 13   | Mon April 1st              | Regeneration in mammals - MM  |
|      | Wed April 3rd              | Aging                         |
|      | Fri April 5 <sup>th</sup>  | Discussions/presentations     |
| 14   | Mon April 8 <sup>th</sup>  | Laws                          |
|      | Wed April 10 <sup>th</sup> | Companies                     |
|      | Fri April 12th             | Discussions/presentations     |
| 15   | Mon April 15 <sup>th</sup> |                               |
|      | Wed April 17th             |                               |
|      | Fri April 19th             | Discussions/presentations     |

|    |                |                 |
|----|----------------|-----------------|
| 16 | Mon April 22nd | <b>EXAM III</b> |
|    | Wed April 24th | Reading days    |
|    | Fri April 26th | Reading days    |

MM = Dr Malcolm Maden - malcmaden@ufl.edu

NT = Dr Nao Terada - [terada@pathology.ufl.edu](mailto:terada@pathology.ufl.edu)

BR = Dr Brent Reynolds – brent.reynolds@neurosurgery.ufl.edu

ES = Dr Edward Scott – edscott@ufl.edu

KM = Dr Keith March – Keith.March@medicine.ufl.edu

DO = Dr David Oppenheimer – oppenhe@ufl.edu

GF = Dr Gareth Fraser – g.fraser@ufl.edu