



BSC 517, Stem Cell Biology (CRN: 50317 & 50464) Summer II, 2014

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eCompanion Site: eCollege @ MyLeo

Webinars: Thursday and Friday Nights 7:00 PM to 9:00 PM CST

Electronic Office hours: Wednesdays 7:00 PM

Course overview:

This course will provide graduate students with an in-depth account of stem cell biology, various forms of stem cells and their application to regenerative medicine. Special reference will be made to molecular, epigenetic, and genetic control of stem cell differentiation and specializations. Existing and potential clinical use of stem cells, its derivatives, and induced pluripotent stem cells also will be discussed. Since this is rapidly developing field with sweeping social implications, strong emphasis will be placed on understanding the current controversies surrounding stem cell research.

Student Learning Outcomes (SLO):

At the completion of this course students will be able to:

1. Describe the difference between embryonic, adult and induced pluripotent stem cells and how they differ from fully differentiated cells.
2. Describe the properties and use of stem cells.
3. Gain a knowledge of the intrinsic and extrinsic factors important for stem cell renewal and differentiation.
4. Understand the clinical significance of stem cell research and the possible problems that need to be overcome.
5. **Could discuss the ethical issues associated with embryonic stem cells and stem cell therapy with a global bioethics perspective. (G)**

Textbook: You are not required to buy text book for this course. I will post PDF versions of the materials covered in the course in eCollege. You could also download the electronic version of the following books from internet.

1. **Essentials of Stem Cell Biology**, Second Edition, 2009, Edited by Robert Lanza, M.D.,

ISBN: 978-0-12-374729-7, Elsevier Inc.

2. **StemBook**. Open-access collection of original, peer-reviewed chapters covering topics related to stem cell biology. Chapters required for class will be specified in the course schedule. StemBook can be accessed @ <http://www.stembook.org>
3. **NIH Stem Cell Information Home Page**. In Stem Cell Information [World Wide Web site]. Bethesda, MD: National Institutes of Health, U.S. Department of Health and Human Services. Available @ <http://stemcells.nih.gov/Pages/Default.aspx>

INSTRUCTION METHOD

This syllabus is a suggested outline. It represents the minimum material that we will cover in this course. Dates are approximate and subject to change. If there is any major changes to the syllabus it will be posted in e-College and the syllabus will be updated accordingly. You are responsible for keeping up with any changes made to the syllabus. Additional topics and materials may be discussed as our webinar discussions warrant.

You may be tested on any material listed in the syllabus, on your class page and discussed in class.

Web-Based Course: The structure of this course is predicated at student attending the webinars, watching recording sessions and learning of the materials posted in Docsharing. You are expected to look at all materials discussed in webinars and posted in Docsharing. Since it is a summer course it will be rather intense and 2 chapters of reading will be required per week. I will also include animations, videos and PowerPoint slides to help your learning.

Webinars: This course has a twice weekly 2 hr webinars offered on Thursday and Friday nights from 7:00 pm CST to 9:00 pm CST. You are required to participate live or watch the recorded session. The webinar is your opportunity to have a live and interactive session with me and to check and extend your knowledge in this course. You can access to webinar through by clicking "Chat", then "Class Live." You will need the following accessories to participate in webinars.

1) **A Highspeed Internet Connection:** To connect you must have a cable, DSL, or a high speed modem connection. Dial-up connection will not work and is not sufficient.

2) **Web Camera and a Head Set with a microphone:** Since we are using Voice-Over-IP, you will need a head set with earphone and microphone and a good web camera. The headset combo may be purchased for less than \$20.00 at any electronic shops.

How to Succeed in the Class: As an online class on stem cell biology, I expect that you have a through back ground in molecular and cellular biology. You must read chapters prescribed for each week and go through additional Powerpoint and videos. Attend webinars and/or watch recordings of the webinars to enhance your understandings or clear any doubts that you may have. From my prior experience, online-discussions and exchanging e-mails are poor strategies of online learning.

Since a lot of materials are covered in 5 weeks, you need to spend a considerable amount of

time in studying and integrating the materials on your own. Progress in the class can be monitored using Gradebook in eCollege

Class Policies:

In an online class students are required to be self learners and self-directed. The fact that you might be taking several online classes and working full time may put additional pressure on you, but would not be considered as a reason for diluting the rigor of this course. This class will keep the rigor, time line, and standards of a face-to-face class.

E-mail and Communication: If you are e-mailing me please use your university e-mail account and put BSC 517, Stem Cell Biology in subject line. If you use an e-mail account without .edu extension, it may end up in my spam folder. During work days, I will respond to e-mails that I receive within 24 hrs. Since I check e-mails occasionally on weekends, e-mails received on weekends will be responded on the next working day. Most of the correspondence will be announced on the course homepage, therefore check course homepage as-often-as possible.

Electronic Office Hours: You may access office hours on Wednesdays at 7 pm CST through the "Chat" feature in e-College. I will go offline, if no students are in office hours by 7.15 pm CST. This is a live and interactive way for you to talk with me.

Lecture Materials:

Power Point slides that I use for delivering lectures are available at eCollege. However, I would like to stress the point that **Power Point slides are meant for me to deliver lectures and not be treated as lecture notes. You may use it as a reference or guide to read the book but not as study material.** If you just use the PowerPoint slides for study, you may not perform good in tests.

Overview of Assignments:

1) Weekly Quizzes (20% of Total):

After covering each unit, there will be a quiz which needs to be taken online in eCollege. Quizzes are due @11.59 PM on every Monday. Each quiz will contain 10 questions and worth of 20 points. **If you miss a quiz or perform poorly, there won't be any makeup quiz.**

Exams and Grades:

There will be two exams including the final (40% each of the total). The exam will consist of two parts, multiple choice (20% of the total) and essays/short answers (20% of total). Exam questions will test critical thinking, analytical ability, and the understanding of subject matter. Therefore, it is important to understand the concepts to perform well in this course. **Make up exams would not be allowed, If you miss an exam other than the reasons of university-approved emergencies. In the event of a make up examination, it will be provided only in the TAMUC campus, that means you need to travel to the campus**

Grading Policy:

| | |
|------------------------------|---------------------|
| Weekly Quizzes | = 100 points (20%) |
| Exam I - Multiple Choice | = 25 points (20%) |
| Exam I - Short Answers | = 25 points (20%) |
| Final Exam - Multiple Choice | = 25 points (20%) |
| Final Exam - Short Answer | = 25 points (20%) |
| Total | = 200 points |

Grading Scale:

| |
|-------------------------------|
| A = 900 to 1000 points (>90%) |
| B = 800 to 899 points (>80%) |
| C = 700 to 799 points (>70%) |
| D = 580 to 699 points (>58%) |
| F = 579 or fewer (<58%) |

To calculate where you stand:

Your up to date scores and percentage will be available in the grade book of eCollege. Add your 3 exam scores, scores in assignments, and your final score of lab and assignment plus any extra credit points that you have, which will be your total score in 1000. Calculate the percentage. This will be your grade.

Course Calendar and Exam Schedule:

| Date | Topic |
|-------------------------------|---|
| Unit 1, Week 1 (July 7 - 11) | Introduction to Stem Cells NIH Stem Cell Primer - http://stemcells.nih.gov/info/basics/basics1.asp Stemness": Definitions, Criteria, and Standards. |
| Unit 2, Week 1 (July 7 - 11) | Embryonic Stem Cells A) PowerPoint presentation & Notes B) Early Development, - Stem Cells Scientific Progress and Future Research Direction. |
| Unit 3, Week 2 (July 14 - 18) | Pluripotency A) StemBook: Cellular and nuclear reprogramming Ch. 1 B) A New Path: Induced Pluripotent Stem Cells- Essentials of Stem Cell Biology |
| Unit 4, Week 2 (July 14 - 18) | Molecular Bases of Pluripotency "Chapter 6: Molecular Basis of Pluripotency" - Essentials of Stem Cell Biology |
| Unit 5, Week 3 (July 21 - 25) | Epigenetics and Stem Cells StemBook: Epigenetics Ch. 2 and 3 |

Unit 6, Week 3 (July 21 - 25)

Adult Stem Cells and Stem Cell Niches

A) StemBook: Renewal Ch. 3

B) Chapter 7: Stem Cell Niches -
Essentials of Stem Cell Biology.

Exam I

Unit 7, Weeks 4 (Jul 28 - Aug 1)

Hematopoietic Stem Cells

A) Chapter 5: Hematopoietic Stem Cells -
Stem Cells: Scientific Progress and Future Research Directions.

Unit 8, Weeks 4 (July 28 - Aug 1)

Stem Cells and Diabetes

A) Chapter 7: Stem Cells and Diabetes - Stem Cells: Scientific
Progress and Future Research Directions.

Chapter 35 and 57 from Essential Stem Cell Biology.

Unit 9, Week 5 (Aug 1 - Aug 8)

Stem Cells and Tissue Engineering

StemBook: Tissue engineering Ch. 1, 2 and 4

Unit 10, Week 5 (Aug 1 - Aug 8)

Stem Cells and cancer

Unit 11, Week 5 (Aug 1 - Aug 8)

The Stem Cell Debate: Politics, Religion and Ethics

A) The Pew Forum on Religion & Public Life Issues: Bioethics.
<http://pewforum.org/bioethics>

B) Chapter 67: Stem Cell Research, Religious Consideration.
Essential Stem Cell Biology. PDF article in Doc Sharing.

Final Exam

★ **ALL DATES AND ASSIGNMENTS ARE TENTATIVE AND MAY SUBJECT TO CHANGE**

Sample Study Week:

While I will be available live during webinars, electronic office hours and scheduled one-on-one's, these are few steps that you may employ for self-directed study,

Step 1 - Download reading and supporting materials from DocSharing.

Step 2 - **Critically** read chapters and supporting materials, make notes; simply going through the materials are not going to be enough, focus on concepts, molecular mechanisms etc..

Step 3 - Attend webinars, ask questions during webinars and office hours to clear any concepts that you didn't understand.

Step 4 - Review materials and your notes from webinars.

Step 5 - Take online quizzes in e-College when they are due.

Step 6 - Review again before the test due date and take online tests.

Academic Integrity:

A Texas A&M University - Commerce student does not lie, cheat, steal, and does not tolerate those who do. A violation of the Texas A&M honor code and academic integrity involves any of the following offenses: cheating, fabrication, falsification, multiple submissions, plagiarism, and complicity in any of these offenses. The first instance of cheating will result in "ZERO" on the exam and/or on the assignment. The second instance of cheating will result in "ZERO" on the course. Cheating involves copying information from another student, non-allowable materials or source and plagiarism. Once again, violations of academic integrity will not be tolerated. This class will be conducted in strict observance of the Honor Code. Refer to your Student Handbook for details.

Conduct Policy:

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. (See Student's Guide Handbook, Policies and Procedures, Conduct).

Behavior: *All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment." (See Student's Guide Handbook, Policies and Procedures, Conduct).*

Plagiarism: Plagiarism is a criminal activity. You must cite all sources of information. Unreferenced copying of material, whether parts of sentences, whole sentences, paragraphs, or entire articles can result in a score of zero for your assignment and may result in further disciplinary action.

Students with Disabilities/Reasonable Accommodation: *The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact: Office of Student Disability Resources and Services, Texas A&M University-Commerce
Gee Library, Room 132
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
StudentDisabilityServices@tamuc.edu*

If you have not taken a course in e-College before, please use the tutorial provided for students. It will save you a lot of time and frustration and a lot faster than trial and error.