BSC 517, Stem Cell Biology (CRN: 82442)  
Fall, 2013

Instructor: Dr. Venu Cheriyath  
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Web page: http://faculty.tamuc.edu/vcheriyath/  
eCompanion Site: eCollege @ MyLeo  
Lectures: Tue, Thr 11 AM to 12.15 PM @ AGIT 255

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.

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.

   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


Class Policies:

Attendance & Participation (50 points):
I expect your attendance in ALL classes. Since this class follows active learning principles, your active participation is required in this course. You will work both in groups and individually during and after the class to complete various assignments. You may earn up to 15 extra credit points for not making more than 3 unexcused absences and 35 extra credits for active class participation. Attendance would be taken in the beginning of every class and if you are 5 min late for a class that would be counted as absence towards attendance credit. You are responsible for all material and assignments covered in class whether you are present or not.

During each lecture you will be given several opportunities to respond to questions and participate in discussions. Whether your responses to questions are correct or not, you may earn up to 35 points for your active participation in these exercises.

Engaging in discussion not only improve your retention of the course materials, but also enhance your ability to present ideas in a cogent fashion in a group setting, which is extremely important in current work environment. Failure to actively participate will negatively affect your participation grade.

Lecture Materials:
Power Point slides that I use for delivering lectures will be available at eCollege, the ecompanion site for this course. 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 (100 points of total):
After covering each chapter, 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 10 points. If you miss a quiz, there won’t be any makeup quiz.

2) Weekly Discussion (100 points of total):
For each unit a discussion board will be available in eCollege. You may discuss any topic related to that particular week’s subject matter etc. You may earn up to 100 points of total for your active participation (8 postings per unit) in weekly discussions.

3) Stem Cell Research Debate (150 points): Towards the end of the course, two debate sessions will be held, one debate will be on the ethics and guidelines of Stem Cell Research and the second session will be on the political and religious view points of Stem Cell Research. You are required work in groups for these debate sessions and are required to take either “affirmative” or “negative”
stand irrespective of your political, and/or religious viewpoint. For active participation and presentation of debates you will receive 75 points and 75 points will be awarded for written summary. 1/3rd of the presentation score (25 points) will be determined by the audience and 2/3rd of the score (50 points) will be determined by me.

Exams and Grades:
There will be three exams (150 points each) throughout the term and a cumulative final exam (150 points). The exam will consist of three parts, multiple choice (50% of the total score), essays/short answers (50% of total scores) and bonus questions (for 10% of total score). Exam questions will test critical thinking, analytical ability, and the understanding of subject matter and bonus questions will be based on problem sets. Therefore, it is important to understand the concepts to perform well in this course.

Grading Policy:

4 exams including the final = 600 points (60%)

Assignments
Weekly Quizzes = 100 points (10%)
Attendance & Participation = 50 points (5%)
Weekly Discussions = 100 points (10%)

Debate = 150 points (15%)

Total = 1000 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:

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<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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| Unit 1, Week 1 (Aug 26 - 30) | Introduction to Stem Cells  
NIH Stem Cell Primer -  
http://stemcells.nih.gov/info/basics/basics1.asp  
Stemness”: Definitions, Criteria, and Standards. |
Unit 2, Weeks 2 (Sept 2 - 6) Embryonic Stem Cells
A) PowerPoint presentation & Notes
B) Early Development, - Stem Cells Scientific Progress and Future Research Direction.

Unit 3, Week 3 & 4 (Sept 9 - 20) Pluripotency
A) StemBook: Cellular and nuclear reprogramming Ch. 1
B) A New Path: Induced Pluripotent Stem Cells - Essentials of Stem Cell Biology

Exam I, September 24 - Units 1, 2, and 3

Unit 4, Week 5 & 6 (Sept 23 - Oct 4) Molecular Bases of Pluripotency
"Chapter 6: Molecular Basis of Pluripotency" - Essentials of Stem Cell Biology

Unit 5, Week 7 (Oct 7 - Oct 11) Epigenetics and Stem Cells
StemBook: Epigenetics Ch. 2 and 3

Unit 6, Week 8 (Oct 14 - Oct 18) Adult Stem Cells and Stem Cell Niches
A) StemBook: Renewal Ch. 3
B) Chapter 7: Stem Cell Niches - Essentials of Stem Cell Biology.

Exam II, October 22 - Units 4, 5, and 6

Unit 7, Weeks 9 (Oct 21 - Oct 25) Hematopoietic Stem Cells
A) Chapter 5: Hematopoietic Stem Cells - Stem Cells: Scientific Progress and Future Research Directions.

Unit 8, Weeks 10 (Oct 28 - Nov 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 11 (Nov 4 - Nov 8) Stem Cells and Tissue Engineering
StemBook: Tissue engineering Ch. 1, 2 and 4

Exam III, Nov 14 - Units 7, 8, and 9

Unit 10, Week 12 & 13 (Nov 11 - Nov 22) Stem Cells and cancer

Unit 11, Week 14 & 15 (Nov 25 -Dec 6) The Stem Cell Debate: Politics, Religion and Ethics

Exam IV, Final Week
★ ALL DATES AND ASSIGNMENTS ARE TENTATIVE AND MAY SUBJECT TO CHANGE
**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).

**Cell Phones/Pagers/Laptop/Tablets:**
Please turn your cell phone and/or pager (and other electronic devices) off during class. If you are on-call for your work, please place the cell phone or pager on silent or vibration mode. Electronic devices are strictly prohibited in lab.

If you utilize a laptop to take class notes, please be aware of potentially distracting others around you and seat yourself accordingly. Additionally, you may be asked to leave the class if it is determined you are utilizing a computer or electronic device to do outside work, surf the web inappropriately or communicate personal conversations. Texting is prohibited and devices will be collected and kept until the end of class.

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

**Tapes and Notes:**
While recordings of this class may be made for personal use with prior permission, recordings may not be sold or distributed to others. While you may make copies of these notes for your personal use, no copy of these notes may be distributed to anyone other than persons who are currently enrolled in the class; nor may any copies be sold.

**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

**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.

Early Intervention for First Year Students: Early intervention for freshmen is designed to communicate the University’s interest in their success and a willingness to participate fully to help students accomplish their academic objectives. The university through faculty advisors and mentors will assist students who may be experiencing difficulty to focus on improvement and course completion. This process will allow students to be knowledgeable about their academic progress early in the semester and will provide faculty and staff with useful data for assisting students and enhancing retention. Grade reports will be mailed by the end of the sixth week of the semester.

Important Dates, Days, and Time

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<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Mondays @ 11.59 PM</td>
<td>Weekly Quiz Due</td>
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<tr>
<td>September 24, Tuesday</td>
<td>Exam I</td>
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<tr>
<td>October 21, Monday</td>
<td>Midterm Grade</td>
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<tr>
<td>October 22, Tuesday</td>
<td>Exam II</td>
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<td>November 14, Thursday</td>
<td>Exam III</td>
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<td>December 2nd Week</td>
<td>Final Exam</td>
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<td>December 16, 5 PM</td>
<td>Final Grade</td>
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<td>August 30</td>
<td>Last day to withdraw with 80% refund</td>
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<td>September 9</td>
<td>Last day to withdraw with 70% refund</td>
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<td>September 16</td>
<td>Last day to withdraw with 50% refund</td>
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<td>September 23</td>
<td>Last day to withdraw with 25% refund</td>
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<tr>
<td>October 31</td>
<td>Last day to withdraw with no refund, Q grade</td>
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