

## **Syllabus for BIOL 313L- Cell Biology Lab. FALL 2017. 08-28-2017.**

**COURSE TIME:** Wednesday (BIOL-313L-01) and Thursday (Biol-313L-03) at 2 -5 pm in Room QF403 in the College of Pharmacy (MUSC Pharmacy Quad Building F (4<sup>th</sup> floor)), go down the corridor to the end from the entrance of the building, take either the stairs [next to the elevator] or the elevator itself (that is somewhat slow but looking nice compared to the last three years) to the 4<sup>th</sup> floor, turn right and the next door on the right will be QF403.

**INSTRUCTOR:** Dr. Richard Southgate. Biology PhD., U. Geneva, Switzerland, 1984.

**OFFICE:** HWWE 308, Harbor Walk, 360 Concord Street, Charleston SC 29401. Tel.: 843-953-0340 is not very reliable as I am largely not in this room due to my 12 hours of teaching per week, and in this semester in three different locations in Charleston that includes these 2 labs., so it would be far better if you e-mail me at [southgater@cofc.edu](mailto:southgater@cofc.edu) first for the quickest replies.

**OFFICE HOURS:** 11:25am – 12:30 pm on Mondays and Fridays in HWWE 308 or an appointment (via by e-mail) or before or after lab. sessions (for class issues as well) but I do reserve the right to change the office times as I have an elderly parent at home and sometimes I have to help this person more than you and I cannot be in two places at the same time. In these rare situations, I will inform of the change on OAKS and e-mail and I will offer a make-up time for the impacted students.

**LEARNING OBJECTIVES.** In this lab you will gain firsthand experience with the techniques commonly used in current cell biological research that includes quantitative microscopy, histochemistry, spectrophotometry, cell fractionation and centrifugation, organelle isolation, enzyme assays, and protein electrophoresis when studying mitosis, DNA, etc. This will allow students to explore, propose and actually test hypotheses, that will result in novel data. The methods that are used in the Cell Biology Labs. are common techniques that are also used in molecular, biochemistry and plant research labs. but specified to each topic.

**Upon completion of this course, students will be expected to:**

- Understand the principles and concepts behind basic techniques used by cell biologists, and apply your knowledge of these techniques to novel experiments probing cell structure and function.
- Be able to read primary journal articles within the field of cell biology, interpret the author's findings, and communicate your insights orally and verbally.
- Be able to maintain a detailed and accurate laboratory notebook, and communicate your lab results in the format of a scientific paper to anyone else.

**Co-Requisite or Pre-Requisite:** Biology 313 (Cell Biology). **required text and lab. information on oaks.**

### **Course materials:**

1. A Lab coat,
2. A Laboratory notebook,
- 3) All information for the CBL course is on OAKS, Contents.

No textbook is required for the CB Lab.

All Cell Biology activity procedures will be posted on OAKS and you will be responsible to **download** and read the lab protocol **BEFORE** you come to the lab. as there will be a paper or socrative quiz. To replace a quiz, two students can also talk to the lab. members at the beginning of the particular activity (your choice i.e. no obligation). Details will be given in the first lab., but the idea is to have 9 quizzes (10 points each) and if you wish, 2 students in the lab. course can replace the quiz with a one time, **5 - 6-minute lab. "talk" for 25 points (your choice).**

**BIOL-313L-01 can have 5 such talks (10 students) and Biol-313L-03 can have 6 such talks (12 students) on explanations of lab 2 to lab. 10, your choice. We will talk in lab.**

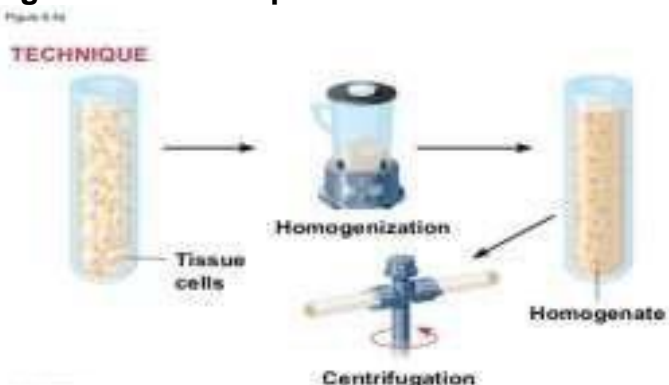
**Everyone in the lab. should have understand the OAKS instructions before coming to the lab. so there will a quiz, starting in lab. 2 for 9 times and the 2 students giving the talk on the topic in that lab. are excused from the same day quiz.**

To find the lab protocols go to: 1) OAKS, 2) Select this lab. section, 3) Click on CONTENT (I have cross-linked my 2 labs in to one for convenience as the two sections should be identical...).

**HOW TO DO WELL IN THIS LAB:** This is an upper division lab. It is expected you come to lab prepared, follow the protocols, and **ACTIVELY PARTICIPATE IN THE EXPERIMENTS.** This requires preparation, attention, and some fun, yes within the lab. safety rules .... (see below).

Attendance in these labs is **REQUIRED.**, since it is impossible to re-prep a lab. activity, especially now with the greater distance from Harbor Walk to MUSC, there will no lab. make- ups but if you were ill, or had medical school interviews or sport activities etc. with "documented proof"! A make-up questionnaire, oral test etc. or a modified lab. report will be used to gauge your understanding of the missed lab's topic for a grade in my office at HWWE 308 or another location. This means you have to answer these questions as if you were about to do the lab. activity.

It's a good idea to put all your lab stuff in a notebook and I will periodically check the "quality" of your notes. A good way to understand the various lab activities is to also make a flow chart in your notebook, detailing the lab's chemical components, procedures, and its general goals. This is especially important as some of the later labs will be multitasking i.e. more than one protocol at the same time, so you need to be well organized.... example:



If you are to be a doctor, dentist etc. your job requires good documentation of your patient's medical status .... A notebook can reinforce this idea of "quality" note making, which will be reflected in your lab. grade and your final grade if they are not up to code.

**YOU ARE RESPONSIBLE FOR DOWNLOADING and PRINTING THE LAB. PROTOCOL** in question as I have seen many students struggling to see the protocol details on a cell phones ... If you wish to only use a cell phone etc., **AT LEAST MAKE A PAPER COPY OF THE LAB. PROTOCOL TABLES** (you need to write results down and often you will not have enough time to look on your iPad etc. I-pads, laptops and cell phones on a lab. bench are considered very "endangered" toys/tools" due to a very high chance of water spills..... so keep them close for calculations etc. but not on the lab. bench.

The quizzes will be relatively easy, as it tests 90% what you have read in the protocol.

I will also try to add certain VOICE THREAD presentations to help with the protocols. (<http://voicethread.com/about/features>) The first time you use it, you have to sign in with your student ID and password. More info: <http://blogs.cofc.edu/tltutorials/2012/02/24/voicethread/>,

**STUDENTS WITH DISABILITIES** who have the proper documentation through SNAP services for extended exam times will be required to take the exams through SNAP services (assuming you want to use the additional time, if not, you are welcome to take the exam with your classmates). Those students who wish to take exams in the SNAP office must schedule their exams and inform me when they will be taken before the event. See Center for Disability Services (SNAP) for more info. <http://disabilityservices.cofc.edu>. Please contact me at [southgater@cofc.edu](mailto:southgater@cofc.edu) or in person ASAP to make sure you receive all the help by law.

#### **REQUIREMENTS:**

**You must wear a lab coat in the lab. and there are no exceptions as both CofC and MUSC dictates the safety rules in this small lab. small.**

●You cannot eat **FOOD** or **DRINK** in the lab. and there should be no **SANDALS, PERFORATED SHOES, FLIP-FLOPS** or **HIGH HEELS** in the lab as well.

●Wear gloves and goggles when instructed to do so.

●**WASH YOUR HANDS FREQUENTLY DURING AND WHEN YOU LEAVE THE LAB.**

We follow the College lab safety policy posted on OAKS and MUSC safety polices as well (see below).

**SYLLABUS: A TENTATIVE CBL SYLLABUS for FALL 2017 (BIOL-313L-01 and -03).**

<b>DATE</b>	<b>TOPIC</b>	<b>LAB REPORTS</b>
AUG W 30 + R 31, 2017	Lab 1 – Microscopy, Microscope Use, Safety Instructions and looking at different cells (live or slides) including <i>Tetrahymena</i> feeding	
SEPT W 06 + R 07, 2017	Lab 2 – Histochemistry, Q1	Lab 1 report
SEPT W 13 + R 14, 2017	Lab 3 –Enzyme Kinetics, Q2	Lab 2 report
SEPT W 20 + R 21, 2017	Lab 4 – Photosynthesis, Q3	Lab 3 report
SEPT W 27 + R 28, 2017	Lab 5 – DNA concentrations in different species, Q4	Lab 4 report
OCT W 04 + R 05, 2017	Lab 6 – Cell fractionation, Q5	Lab 5 report
OCT W 11 + R 12, 2017	Lab 7 - Polyacrylamide gel electrophoresis, Q6	Lab 6 report
OCT W 18 + R 19, 2017	Lab 8 – Immunoblot, Q7	Lab 7 report
OCT W 25 + R 26, 2017	Lab 9 – A mystery lab. activity and Information will be given later. Q8	Lab 8 report
NOV W 01 + R 02, 2017	Lab 10- Mitosis, Q9	Lab 9 report
NOV W 08 + R 09, 2017	Student Literature Presentations part 1 at Harbor Walk (Info. where / classroom will be finalized later)	Lab 10 report
NOV W 15 + T 16, 2017	Student Literature Presentations part 2 at Harbor Walk (Info. where / classroom will be finalized later)	
<b>THANKSGIVING HOLIDAY</b>	<b>WED NOV 22 – SUN NOV 26</b>	
NOV W 29 + R 30, 2017	<b>FINAL Comprehensive EXAM, 100 points – the end (at MUSC or Harbor Walk), decided by lab. vote).</b>	

**GRADES:** Grades for this course is determined from lab quizzes or your talk, your written reports, your two team or solo literature presentations on an article or a none CB research topic not talked in this course.

9 Lab quizzes or talks: 10 points per quiz or talk X = 90 points, based on the upcoming lab. activity if you do not give a talk. If you do, you will have 8 quizzes, 10 points each = 80 pts. plus a max. 25 pt. 5 – 6-minute talk. (5 students in BIOL-313L-01 and 12 in BIOL-313L-03.

**YOUR QUIZ GRADE COULD BE EITHER:  
MAX. 90 PTS IF YOU ONLY DID JUST THE QUIZZES OR  
MAX. 105 PTS (IF YOU TOOK THE 8 QUIZZES AND ONE TALK).**

10 Lab reports: @ 25 points each = 250 points. Reports are aimed to demonstrate your understanding of the lab material and its conceptual background and we will use a rubric (given in lab. 2).

Lab reports are due at the beginning of the following lab. Due to different writing styles in the labs. ALL reports have to be printed with font size 12 and with a pleasant reading font (e.g. Arial) AS WELL AS on OAKS DROPBOX.

**There will also be a 5-point penalty, per day, for late reports!!! unless you have a documented excused (illness, sports, interviews etc.).**

●LAB. 1 report will be a traditional, duo student (you and your partner).

●Due to the more restricted conditions in the Cell Biology Labs. at MUSC, I am proposing a new lab. report system. Normally 2 students (who worked together) would produce a duo report. My modification will be a group report of 4 students per bench to produce a single report.:

1) All 4 students can work together to write the INTRODUCTION section and a brief MATERIALS/METHOD section of the report. There is no point repeating word for word the lab's protocol, so describe the materials/methods very briefly, highlighting the most important summary of this section.

All 4 students i.e. 2 x 2 student groups will describe their individual RESULTS section of the lab. activity in question, i.e. 2 RESULT PARTS for each bench per report.

2) For the discussion, all 4 students can work TOGETHER to describe the basis for this cell lab. activity, concepts etc. to generate a single, joint discussion.

Any DIFFERENCES in the two groups results as well as, and even more important, the best SCIENTIFIC EXPLANATIONS as to why something did not work out as planned has to be in the discussion. It would be great if there were no problems but any researcher knows this is not the case ....

Research and fact finding on the internet are also allowed but if you borrow information from the internet, you have to document it with web sites (PLAGIARISM IS NOT ALLOWED ANYWHERE)....

So, each report will have:

- the 4 students write the Introduction and Materials/Methods,
- all 4 students, each in a group of two, will generate 2 different results, and then
- all 4 students will work together to generate a joint discussion with explanations for any possible discrepancies.

● Each lab. report will be a COLLECTIVE GRADE of all the four students per bench with the hope that this will result in better reports, greater understanding and greater reasoning. You will have to trust the other 2 students will work well together to explain any differences between the two results and then to explain the scientific basis of these, hopefully small, inconsistencies in the discussion section.

● Probable reasons: human error, miscalculated volumes, leaving the protein (for example) on the bench too long at room temperature etc.

**NOTES:**

Individual notes will be looked on random times in the next three months for a total of 20 points to ascertain the completeness quality of your original note taking i.e. neither copies of your partner's notes nor the lab. protocol! You have to create your notes by reason and observation i.e. not copying from someone else...., and your organization (e.g. flow + readable English) will be tested as well. If your notes are not up to the College's "standards", you can lose up to 20 points, not catastrophic but ....

**LITERATURE PRESENTATION (60 points).** Duo (or solo) student pairs will produce a minimal 15-minute power point presentation plus a ~5+ minutes for questions from the other students in the particular lab. The article has to be recognized topic in CELL BIOLOGY and related to the BIOL-313-01 class and OAKS lectures. It also has to be based on primary research literature (PUBMED etc.) i.e. PEER-REVIEWED and published within the last 3 – 4 years' maximum. Details on this project will be given at the end of lab 7 and you need to select your paper subject, **AND GET IT APPROVED BY YOUR INSTRUCTOR (i.e. me)** by lab 9. No article = a loss of 80 pts....

You will need to also supply an electronic copy of your chosen article and power point presentation (OAKS, Dropbox) plus a paper copy of your power point presentation (2-3 images per page) for grading purposes that should be given to your instructor **BEFORE YOU START YOUR PRESENTATION**, and as many students in the past did not do this small task, there will be a penalty of 10 points if this copy is not given to me before your talk.....

<b>SUMMARY: QUIZZES 1 LAB. TALK</b>	<b>90 points or 105 points 9 quizzes or 8 quizzes and 1 talk.</b>
<b>Notes grade</b>	<b>20 points</b>
<b>Lab. Reports</b>	<b>250 points (10 X 25 pts.)</b>
<b>PPT PRESENTATIONS</b>	<b>60 points</b>
<b>CUMULATIVE FINAL</b>	<b>100 points</b>
<b>TOTAL:</b>	<b>520 points (only quizzes or. 535 points (8 quizzes and one talk).</b>

**Grades:** Your final grade is determined as a % of the 520 or 535 points depending on your choice as follows:

<b>A</b>	<b>93-100</b>	<b>C</b>	<b>73-76</b>
<b>A-</b>	<b>90- 92</b>	<b>C-</b>	<b>70-72</b>
<b>B+</b>	<b>87-89</b>	<b>D+</b>	<b>67-69</b>
<b>B</b>	<b>83-86</b>	<b>D</b>	<b>63-66</b>
<b>B-</b>	<b>80-82</b>	<b>D-</b>	<b>60-62</b>
<b>C+</b>	<b>77-79</b>	<b>F</b>	<b>0-59</b>

If you have 92.8 points, this will be an A-, if your grade is 92.9 or higher, you will have an A.

Student conduct and safety issues in this course is governed by the College of Charleston Honor Code, no plagiarism etc... and now MUSC Honor Code

as well...

<http://studentaffairs.cofc.edu/honor-system/> and  
<http://academicdepartments.musc.edu/esl/studentprograms/honorcode/>  
<http://www.lib.usm.edu/legacy/plag/plagiarismtutorial.php>  
<http://studentaffairs.cofc.edu/honor-system/faqs.php>  
<http://iinr.people.cofc.edu/honorcode.pdf>  
<http://studentaffairs.cofc.edu/honor-system/index.php>

I will give you a copy of the safety policy in the first lab. and we will briefly discuss its meaning. At the beginning of the second lab. you will have to sign this policy, no signature means no future labs in this semester ....., so take the week to fully understand its contents and sign it and one of the lab 2 quiz questions will be on one of these safety issues.

**IMPORTANT: College of Charleston Honor Code and Academic Integrity**

Students can find the complete Honor Code and all related processes in the *Student Handbook* at <http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php>

#### **SUMMARY OF THE COLLEGE OF CHARLESTON HONOR CODE**

##### **Reporting violations and the XF Sanction– Instructor Guide**

Instructors, with any necessary assistance from the Dean of Students (953-5522), will assess whether the behavior of the student falls into one of three classes and then follow the affiliated procedures:

**Class 1** – act involves significant premeditation; conspiracy and/or intent to deceive, e.g., purchasing a research paper.

- **Penalties for Class 1:** XF and either suspension or expulsion assigned if student found responsible for this class of offense by Honor Board.

**Class 2** – act involves deliberate failure to comply with assignment directions, some conspiracy and/or intent to deceive, e.g., camouflaged use of the Internet when prohibited, fabricated endnotes or data, copying several answers from another student's test.

- **Penalties for Class 2:** XF and other sanctions assigned if student found responsible for this class of offense by Honor Board.

**Class 3** – act mostly due to ignorance, confusion and/or poor communication between instructor and class, e.g., unintentional violation of the class rules on collaboration.

- **Penalties for Class 3:** Zero on the assignment/test, resubmission of assignment, etc. The complete XF policy can be found in Appendix A of the [Student Handbook 2012-2013](#).

#### **CLASSROOM DISRUPTION INFORMATION:**

Check out if you are thinking of being one of these students:

<http://deanofstudents.cofc.edu/policies-and-procedures/classroom-disruption.php>

The bottom line to do well in this lab.

1) You need to be ORGANIZED,

2) Understanding the protocol BEFORE coming to the lab. for the same day quiz,

3) During the lab. experiments, please remember the SAFETY RULES (below) and THINK FIRST before potentially messing up your (and your partner's) experiment, it happens but if you know the concepts and the major features of the protocol, you and your partner will do so much better. Team work is not so bad.

4) Preparing a good report in old-style good flowing English and grammar (bad grammar etc. means considerable lower points and can easily be minimized with a word-speller...), and too short or very unpolished and/or choppy sentences and fact/spelling errors will all result in lower points.

LOGIC: every career requires good communication skills and apart the proper biological learning and understanding in these labs, you also have the real opportunity to improve your writing skills by practice.

5) To answer the quiz questions and the final correctly by using Sherlock Holmes's logic.

TIP: read aloud out your team's report with your partner or others to hear how the "report" actually sounds, because if it is not easily flowing, you can immediately understand it feels ugly and how you can lose many points.

'You see, but you do not observe. The distinction is clear.'  
Sherlock Holmes Quote, - *A Scandal in Bohemia*

"The world is full of obvious things which nobody by any chance ever observes."  
Sherlock Holmes Quote, - *The Hound of the Baskervilles*

**'How often have I said to you that when you have eliminated the impossible, whatever remains, however improbable, must be the truth?'**  
Sherlock Holmes Quote - *The Sign of Four*

IF YOU SEE A MISTAKE IN THIS SYLLABUS PLEASE LET ME KNOW  
([southgater@cofc.edu](mailto:southgater@cofc.edu))