

CEDAR CREST COLLEGE
Reese Laboratory Research - Spring 2010

RESEARCH ADVISOR INFORMATION

Advisor: Dr. Amy J. Reese
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Office hours: Weekly lab meetings. Individual and sub-group meetings by appointment.

INFORMATION YOU MIGHT FIND USEFUL

I. Course Website: <http://www2.cedarcrest.edu/academic/bio/areese/>

II. Course Prerequisites:

1. **BIO 243:** Successful completion of Principles of Biology BIO 121 and BIO 122 and/or my permission.
2. **BIO 353:** Successful completion of Principles of Biology BIO 121 and BIO 122, BIO 227, Bio 350 Junior Colloquium and my permission.
3. **BIO 354:** Biology thesis is not required and is separate from research. It requires completion of four credits of BIO 353 (two may be concurrent) and my permission.

III. Course Descriptions:

1. These research courses involve student participation in my research program. They may fulfill a research requirement for some science majors.
2. **BIO 243:** I usually design these research projects. They may be parts of current projects, general lab projects, or other exploratory lab projects. One credit of research is recommended at this stage, especially for first year students.
3. **BIO 353:** These research projects are generally BIO 350 proposals that are being carried out in the laboratory, adapted as needed and guided by me. Taking two credits of research is most common and is preferred, but one may be appropriate in some cases.
4. **BIO 354:** For this course, you write a thesis detailing your Bio 353 work and present your final project at a biology department seminar talk or poster.
5. **HONORS:** If you are also doing an Honors thesis, you would register for both BIO 353 and BIO 354 for zero credits while registering for Honors thesis for credit. The Honors component of your project must also reflect cross-disciplinary information.

IV. Objectives and Goals:

1. The objectives of research in this lab are to help prepare you for the work of graduate school, technical, pharmaceutical, laboratory or other related science work and to expose you to the questions of scientific research and the mechanisms of scientific experiments, analysis and communication.

2. The goal of your research in the lab is for you to design, carry out, interpret, trouble-shoot, and communicate scientifically sound research on microbiology-related project with my guidance and the constructive feedback from the laboratory group and the Cedar Crest College Department of Biological Sciences.
3. As a member of my research lab, you are responsible for:
 - a. a research project that is independent from others (save for Bio 243)
 - b. communication with me about your laboratory work
 - c. project notebook and sample maintenance
 - d. attendance of research meetings
 - e. presentation of research progress both informally and formally
 - f. participation in laboratory up-keep and clean-up
 - g. reading preparation and presentation of literature as discussed
 - h. maintenance of protocols relating to your research project
 - i. constructive interactions with labmates

V. Course Outcomes:

1. You should develop critical thinking laboratory skills in the design and analysis of your experiments. This ability will be assessed through the evaluation of progress reports, lab participation, presentations and lab notebooks.
2. You should learn to apply your general lab and research skills to new problems and concepts by reading and sharing learned material from current research literature and by discussing your project with others.
3. You should learn to select, follow, and adapt basic protocols for the methods required by your research projects. You must consider appropriate controls and how to draw conclusions from your experiments.
4. My hope is that you will be exposed to the intrigue of scientific research and that you will feel a part of a research team.

VI. Areas of research and current Reese lab project assignments:

- | | |
|---------------------------------|---|
| 1. Brittany Symbol (Sr) | Genotypic analysis of a fungal cave sample |
| 2. Catherine Bradshaw (Sr) | Study of <i>Rhodo</i> capsule with our new <i>Rhodo</i> antibody |
| 3. Brittany Fikes, (Sr) | RNA interference and alpha-1,3-glucanase |
| 4. Michelle LaClair (Sr) | Levels of alpha-1,3-glucanases in <i>Crypto</i> |
| 5. Christina Morra | Expression of <i>Crypto</i> glucanase genes in <i>S. cerevisiae</i> |
| 6. Jessica Reed (So) | The wax moth as a virulence model for <i>Crypto</i> & <i>Rhodo</i> |
| 7. Shannon Costelow (So) | Phenotypic analysis of fungal cave & other samples |
| 8. Young-eun Choi | working with Catherine Bradshaw |
| 9. Kathaleene Deane | working with Michelle LaClair |
| [Beth Bachert (Jr), Kliman lab] | Genotypic analysis of crypto from pigeon samples |

VII. Attendance & participation:

1. I wish for us to begin the semester with a brief one-on-one meeting to plan for the semester.
2. I expect you to consider research as another one of your courses. Put lab work time into your schedule as you would a class. I expect 353 students spend a minimum of six hours per week

working in the lab, attending lab meetings, or reading papers in order to obtain an average grade. Lab effort is important. Project progress is even better.

3. Plan on attending lab meetings and let me know if you will need to miss them. If you have a course conflict, you may be asked to register for only 1 credit to excuse you from meetings or we may work out an alternative meeting time. I expect you to participate by questions, sharing your work, or presenting/discussing journal articles as relevant to each meeting. The meetings are to facilitate our communication since we can't all work in the lab at the same time.
4. Each semester we will have several joint lab meetings with the Walther lab. These will be opportunities for more senior lab members or those with more completed projects to present formal presentations.
5. We may also schedule individual or sub-group meetings for those working on similar projects as needed throughout the semester.

VIII. Progress reports:

1. The purpose of the bi-weekly progress reports is to help you monitor and follow your work, to establish lab accountability, and to incorporate feedback.
2. The progress report is available on the Reese lab website, from me, and in the lab manual and can be mostly completed on the computer (which could aid in later report writing) or by hand. You can also satisfy the report questions by answering the questions below.
 - a. On what experiments were you working & what did you accomplish the last 2 weeks?
 - b. What methods did you use for these experiments? Were there appropriate controls?
 - c. What were your results and what did you interpret from them?
 - d. Did you have to do any troubleshooting?
 - e. What are your plans for the next few weeks?
 - f. How did you contribute to overall Reese lab citizenry?
 - g. What were the strengths or skills gained?
 - h. How many hours did you spend in the lab this past two weeks? When?
 - i. Were there any suggestions or comment from lab meeting?

IX. Final Reports/Meeting:

1. At the end of the semester, I'd like to meet at the end of the semester to review progress, notebooks, literature reviews, and discuss your grade. There is a semester end form available from the Reese lab website, from me, and in the lab manual. I'd like you to fill it out before we meet and for you to bring your notebook and literature reviews then too.
2. If you are graduating, you must also sort through your samples, remove anything unneeded, provide a detailed list of what is saved, and give me a tour of your samples.

X. Primary literature paper reviews:

1. For each area of research in the lab, I will provide at least one paper of interest that you are to read before the assigned day and that we will discuss as a group. These or other papers could be student-led.
2. You should also be reading appropriate literature for the background and methods associated with your specific research topic. You may use the literature guides (on-line and in the Reese

research lab manual) to guide you in your reading. I expect you to read at least one paper per week and to write about it in your lab notebook or a journal notebook. You should turn these in with your notebook at the end of the semester.

XI. Lab research presentations:

1. Throughout the semester, you will be asked to present various types of updates of your research project. These may include more formal or “semi-formal” 15-30 minute powerpoint presentations, 5 minute “chalk-talk” presentations, or weekly updates.
2. If you formally present your research to both the Reese and Walther labs, these presentations should be fifteen to twenty minutes in length and include 1) background information of the project, 2) details of experiments performed to date, 3) results for experiments completed, and 4) future directions of the project.
3. After presentations, presenters should expect questions from the other lab students and me. This is practice for other departmental or conference presentations and will play a role in your satisfactory semester progress grade component.

XII. Laboratory resources:

1. In addition to the links off of my website, there are a number of resources in the filing cabinet by our research area, particularly in the top drawer.
2. I will be finalizing the Reese research and protocols manuals this semester that Jess began last semester. You may have some of the pieces already but should establish your own resource manual with the new parts. We will continue to update it over time. I will also be
3. The computer and equipment in the lab has been organized and labeled. Please check out where things are and help us maintain and improve our system.
4. Journals are now also being maintained in the lab in the filing cabinet. There is a new electronic tracking system (Zotero) that we are getting up and running.

XIII. Laboratory notebooks:

1. You are required to keep a lab notebook, with separate entries for each day of lab work. As is research tradition, this is property of the lab. At any point during the semester, I might need to check notebooks for what students are doing and how. Points will be deducted if I need to check your notebook and cannot find, or follow it.
2. As the notebook is lab property, the lab will provide the bound volumes for you to use. They are in the notebook drawer. You should also keep a separate set of your own lab manual notes & guides. If you want notes to take with you when you graduate, you may copy your notebooks.
3. See the lab manual (or your equivalent notes) on details for keeping a notebook.

XIV. Lab citizenship and protocols:

1. Part of being in a lab group is working with the rest of the group, learning from other students, helping teach other students, keeping the lab safe, and keeping the lab running efficiently. Contributions can be recorded in the lab progress reports.

2. In addition to doing your own dishes whenever possible, you may be asked contribute tasks toward general lab maintenance. These tasks might include any of the following:
 - a. monitoring general lab aliquots and replenishing as needed
 - b. monitoring sterile cabinet supplies
 - c. stocking DNA gel buffer and monitoring the DNA electrophoresis station
 - d. monitoring the protein electrophoresis materials
 - e. dealing with issues of tip boxes
 - f. disposal of waste materials
 - g. making of media for the lab
 - h. lab housekeeping duties, general dishwashing & cabinet stocking
 - i. lab protocols
3. Jess Reed will be working for the lab this semester and will likely do several of the tasks, but if they are specific to your area of research, it may be particularly important for you to do the work.

XV. Satisfactory semester progress & grading policies

1. In addition to weekly group meetings, we can meet individually or in sub-groups.
2. Research grading will take into consideration the following: lab attendance, participation and citizenship, progress reports, literature discussions, weekly literature reviews, presentations, semester progress & sample/notebook keeping.

XVI. Reese lab Schedule:

Date	Agenda focus –
Friday, Jan 22 OBC lounge 1:15-2:30	- Introductions, lab tour of resources, plan beginning semester meetings w/ Dr. Reese as needed, discuss presentation schedule, schedule semester-beginning party at Dr. Reese’s house
Friday, Jan 29 OBC lounge 1:15-2:30	- Each student will present a ~5 minute informal chalk-talk of her project goals & methods for the rest of the lab
Friday, Feb 5 OBC lounge 1:15-2:30	- Progress report 1 due -
Friday, Feb 12 OBC1 1:15-2:30	- Journal club day 1
Friday, Feb 19 OBC1 1:15-2:30	- Progress report 2 due -
Friday, Feb 26 OBC1 1:15-2:30	- Journal club day 2
Friday, Mar 5 OBC1 1:15-2:30	- Progress report 3 due -
Friday, Mar 12	SPRING BREAK – no lab meeting

Friday, Mar 19 OBC1 1:15-2:30	- Joint meeting with Walther lab - Rough outlines of PAS posters due
Friday, Mar 26 OBC1 1:15-2:30	- Joint meeting with Walther lab - Progress report 4 due - Poster drafts due of for PAS
Friday, Apr 2 OBC1 1:15-2:30	- Joint meeting with Walther lab - Prep for PAS as necessary
Friday, Apr 9	Pennsylvania Academy of Sciences meeting – no lab meeting
Friday, Apr 16 OBC1 1:15-2:30	- Progress report 5 due - Journal club day 3
Friday, Apr 23	-
Friday, Apr 30	
Week of May 4	Individual end of semester meetings w/ Dr. Reese
TBD	End of the semester ice cream event Senior presentations