

Expectations for undergraduate students in the Lutz lab:

It is important to me that each of my students plan and conduct meaningful experiments, analyze results carefully, present their findings to the group on a regular basis, and read and discuss papers in the scientific literature. You will work hard in my lab but you will also learn a tremendous amount, and be well situated for success in your continued education plans. There is a direct relationship between how much effort you put in, and how much you will achieve. In general, the main criteria for working in the lab are to conduct good science and be a good team player. The following specific expectations apply:

- 1) Time commitment and professional conduct
 - a. Undergrads are expected to commit to being in the lab 2 years. Exceptions can be made. For optimum success, plan to spend 15 hours/week in the lab. Summers are a great time to work extra hours.
 - b. Show up at your scheduled times, ready to work. If an emergency situation is causing you to be late, inform your colleagues ASAP.
 - c. Students who exhibit a repeated pattern of not finishing experiments/analysis will not be invited to continue working in the lab.
- 2) Communication (written/oral) and evaluation
 - a. In addition to very frequent informal interactions with me, each student will have a formal, formative assessment mid-semester and at the end of each semester. This is an opportunity to discuss your progress, goals, contributions to the lab environment, and troubleshoot as needed.
 - b. At the end of every semester, each student will prepare a written and an oral presentation summarizing what you did, why you did it, what you learned, and what you plan to do next. Detailed instructions are included in the following pages.
 - c. Lab notebooks should contain all the relevant information about what you do in the lab, so that I can understand all the steps of your protocol and exactly what you did by reading your notebook. Do your calculations in your notebook, not on scratch paper. Keep your notebook in the lab always; don't take it home. Your laboratory notebook belongs to the laboratory and serves as our permanent record of what you did.
 - d. You will also receive regular, short writing assignments regarding exciting scientific publications. The purpose of the writing assignments is so that you can learn neuroimmunology, promote scientific discourse with your peers in the laboratory, and promote your critical thinking abilities. Minimum of one write-up per month.
- 3) Safety and lab environment
 - a. You may not work alone in the lab unless I have given you direct permission to do so.
 - b. Complete the required safety training and use safe techniques always. If something doesn't make sense, ask.
 - c. Contribute to a respectful, supportive environment where everyone feels valued.
 - d. I'm here to help. Talk to me if you have problems.
 - e. Work hard and have fun! This is the best job ever!

Oral Research Presentation

The purpose of presenting a research talk is to familiarize you with how scientists typically communicate their findings to their peers. You will use PowerPoint to develop a clear and informative presentation of the work that you have done in the laboratory during this quarter. You should give a concise and accurate presentation, stressing the main points of your research.

Format - 20 minutes: A 20-minute research talk with 5 minutes at the end for questions (the talk will be timed and you will be warned when 18 minutes have passed). The talk should be well rehearsed and should flow smoothly. A useful rule of thumb for all scientific talks is 1 minute per slide, so be sure to have NO MORE THAN 19 slides in addition to the title. **25 points.**

Title: The talk should use the title of your research project for the first slide.

Background: The first part of the talk will be about **4 minutes** of background. Why is your research interesting? What kind of research preceded this study? Explain the system that you are using and how it addresses major questions in the field.

Materials and Methods: The materials and methods that you have used during your research this quarter will be introduced briefly (**4 minutes**). What are the experimental techniques that you have used? Give a brief explanation of the techniques.

Results: This section will cover the primary results of your work this quarter and should be about **6 minutes** in length. What did the experiments show? What are the relevant data? Be sure to stress the MOST interesting findings due to the limited time.

Future directions: This section should be about **6 minutes**. Here you present the outstanding questions that still remain unanswered for your project and the experiments that you plan to perform in the following quarter. Please discuss in detail how do you plan to analyze the data and what statistical methods will you use to analyze your experiments.

Grading: The grading will be based on how well you understand the scientific material and convey your research to the other members of the lab. The grade (**25 points**) will be based on:

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| 1: Content | 15 points |
| 2: Organization/ Clarity of presentation | 5 points |
| 3: Ability to answer questions | 5 points |

Written Research Report

The purpose of preparing a written report of your research is to formally document your methods, results, and conclusions. This activity also will familiarize you with how scientists write their findings for scientific journals. You will use prepare a two-page written report of the work that you have done in the laboratory during this quarter. You should give a concise and accurate report, stressing the main points of your research. The written report should follow the following guidelines:

Format: a) Length: a two page-long report (one additional page can be used for references); b) Font: Times New Roman 12; c) Margins: 0.75 inches in all sides; d) Figures should be embedded in the text; e) format for your references using the Nature Cell Biology formatting rules.

Title: The title of your talk and written report should be the same.

Background: The first section of the written report will be a short background (1/3 page). Why is your research interesting? What kind of research preceded this study? Explain the system that you are using and how it addresses major questions in the field.

Materials and Methods: The second section of your written report will be about the materials and methods that you have used during your research this quarter (1/3 page). What are the experimental techniques that you have used? Give a brief explanation of the techniques.

Results: The third section will cover the primary results of your work this quarter and should be about ¾ to 1 page in length including figures and figure legends. What did the experiments show? What are the relevant data? Be sure to stress the most interesting findings due to the limited space.

Future directions: This section should be the last section of your report (1/3 page). Here you present the outstanding questions that still remain unanswered for your project and the experiments that you plan to perform in the following quarter. Please discuss in detail how do you plan to analyze the data and what statistical methods will you use to analyze your experiments.