Welcome to the Kreeger Lab!

Rev. 09/30/2021

Mission Statement

The Kreeger lab strives to do the best quality science possible, support each lab member as they work towards their educational and career goals, and maintain a collegial and intellectually-stimulating environment. We are committed to fostering an environment of inclusive excellence and advocating for marginalized voices.

What I expect from you

You will take ownership of your educational experience

- You will need to **determine the requirements for your individual graduate program and are responsible for insuring that you are in compliance**. As you progress, I will work with you to select courses, qualifying exams, and committee members.
- You will **keep me updated on your research progress and challenges.**
- To earn your degree **you must transition towards independence**. We will work together to track this process, but ultimately when you earn a degree will be up to the work you produce, not simply the time you put in.
- **Seek out professional development opportunities** – being a successful scientist involves more than being good at the bench. You must communicate well (presentations, papers, grants), develop personal skills (lab management, mentoring), maintain high ethical standards, and for a faculty career, teach. However, these opportunities must be balanced with the most important element of your career development – research progress towards your thesis. Therefore, you must check with me before committing to any major programs (*e.g.,* those requiring more than 4 hours/month).

You will develop your personal research skills

- Begin **reading the scientific literature** - read the papers I suggest, run a literature search and read papers suggested by this search. Literature searches can be done in PubMed (best for looking for a specific author/combination of keywords), Google Scholar (best for looking for the 'top' papers on a topic), or Google (really useful for finding specific factoids). Spend some time each week updating your literature and just browsing. Subscribe to relevant eTOCs.
- Learn how to **plan your experiments** so that they help you progress on the overall goal of your project. Make sure your experiments address the question of interest correctly – this includes learning how to do the appropriate controls, techniques, etc. You will be required to take the iBiology courses. In addition, you can reference 'At the Bench' Chapters 1-6 provide general advice on how to set up your lab space/desk space, keeping a notebook and planning experiments, while Chapters 7-10 provide useful technical background for many of our lab's main assays. Additionally, Wikipedia or company websites are often great sources of information on how an assay works. You will also need to learn how to effectively plan and multi-task to prevent down times. Develop plans with short/medium/long-term goals.
- Keep **detailed lab notebooks** – these are essential to turn your hard work into a finished paper. Your notes should allow your work to be reproduced (meaning they must be understandable by people other than yourself) and will help to assign credit for authorship. They are required by funding agencies and for any potential patents. Each experiment should clearly identify the date, the purpose, what you did (including anything that didn't go well), the results, and your conclusions. Your bound notebook should establish links to electronic files (such as images,

flow cytometry files, etc). You are required to leave the originals behind when you leave the lab for others to build upon your work. More details can be found in posted guidelines.

- Develop your **writing and presentation skills**. As you start to make progress, begin outlining a paper's figures and drafting the text. Be prepared to go through rounds of revisions before submitting an abstract or paper. Although the availability of travel funds will vary, I encourage you to submit your work for presentation at one conference per year – note that you must get permission from me prior to submitting an abstract. **Attend relevant seminars** – I suggest 1-2/month to learn both science and how to give a good talk.
    - For talks, please use the lab slide template – this makes it easier for me to incorporate into my talks when I present on your work.
- Consider **applying for fellowships, traineeships, and travel grants**. Not only will an award help your career and the overall lab funding situation, the experience of writing the proposal will help you think about what you are doing more deeply.
- Learn how to **accept and utilize constructive criticism**. The feedback from me, colleagues, committee members, and course instructors is intended to improve your work.

You will contribute to the lab and be a good lab citizen

- Senior graduate students are responsible for helping to train new graduate students in the ways of the world (*i.e.* lab procedures, how individual/group meetings work, literature searching, etc.). **Science is a community** - many people will help you along the way and you should return the favor. Share your insider knowledge of techniques with others.
- **Data belongs to the lab, not to any one individual** – as a result, you will be expected to leave your original notebooks and files when you leave the lab. In addition, there will be times when you will be asked to assist me in submitting grant applications to NIH/NSF/etc. This activity is essential to provide continuing support for the lab.
- You will have **designated lab jobs** such as ordering, general maintenance, taking care of one of the instruments, etc. Failure to do your lab jobs not only affects you, it can impede the entire lab and will not be tolerated. Everyone is expected to help with dishes, making sure that supplies do not run out, reporting problems with equipment to the person in charge, aliquotting, and general lab cleanliness.
- **You will work safely in the lab**. Before beginning in the lab you must complete safety training.
- You will **keep lab protocols up-to-date** on the Google drive.
- When working in the labs of other investigators, be polite, neat, and gracious. Always follow their rules. If something breaks during your use, report it immediately to the appropriate person.
- **Be respectful, tolerant of, and work collegially with laboratory colleagues: respect individual differences in values, personalities, and work styles.**

What is Required for a M.S. Degree

My definition for when the M.S. degree is complete represents a combination of *scientific productivity* and *intellectual development*. *Scientific productivity* reflects the publishing of papers and presentation at meetings. *Intellectual development* derives from your ability to function as a researcher and to organize scientific data and assemble a story. For a master's student, I would expect one to two published papers to be submitted before or at graduation. Generally, a M.S. can be completed in two years.

1st year – Goal: Become familiar with the laboratory and the techniques used. You should be able to perform the techniques and understand why each component is done in the way in which it is performed. During this time, you will learn a great deal from the senior people within the

lab. Be courteous - make an appointment with them, and do as much background reading as possible to be able to have a discussion. During this year, you need to develop the skills to multi-task, as classes should not take up all of your time.

2nd year – Goal: Collecting focused data that will allow you to submit papers for publication. During this year, you will finish your required courses, but experiments will be your most important responsibility, as you begin to acquire greater depth in the field through analysis of data, conversations with other in the lab, as well as reading the literature. As you leave, you will insure your project can be continued by a future student through careful documentation and/or providing hands-on training. Details can be found in the lab exit protocol on the Google drive. We will also begin working on strategies to transition to your next career stage.

What is Required for a Ph.D. Degree

My definition for when the PhD is complete represents a combination of *scientific productivity* and *intellectual development* (much like for M.S. degree, but these are much more in depth for a doctoral candidate). *Scientific productivity* reflects the publishing of papers and presentation at meetings. *Intellectual development* derives from your ability to function as an independent researcher, to organize complex ideas and assemble a multi-part story. For a PhD student, I would expect two to four published papers to be submitted before or at graduation. The amount of time this takes can vary, but outlined below is a general pattern.

1st year – Goal: Become familiar with the laboratory and the techniques used. You should be able to perform the techniques and understand why each component is done in the way in which it is performed. During this time, you will learn a great deal from the senior people within the lab. Be courteous - make an appointment with them, and do as much background reading as possible to be able to have a discussion. In terms of the project, I generally provide a starting point, and it is up to the graduate student to identify which direction you would like your project to go, within reason (I help to identify what is reasonable). During first two years, you need to develop the skills to multi-task, as classes should not take up all of your time.

2nd year – Goal: Preparing for qualifying exams and research preliminary. Experiments continue as you finish classes, however you begin to acquire greater depth in the field through conversations with other in the lab, as well as reading the literature. You are able to design your own experiments, and are able to integrate the necessary techniques available in the lab to your project. You should be able to critically evaluate the techniques and their potential/limitations. Group meetings and individual meetings are opportunities to present and discuss ideas, gain feedback from others, and to work through the details so that the best experiments are performed as you refine your project.

3rd year – Goal: Complete research preliminary. You are the major driver of your project and you now have the time to focus on the research. You should be completely comfortable performing your research (designing experiments) and know all of the necessary background. Because of your understanding of the lab, you should be able to go beyond the techniques available in the lab and incorporate new skills into your research. In regards to your project, I expect that you become more of an expert about your project than I am. You are done with classes and should really pick up the pace of your research. You should be preparing to assume a leadership position in the lab and help the less experienced people joining the lab. This year is often very challenging as you navigate these transitions.

4th year and on – Goal: Write manuscripts and thesis. While the exact timing of when manuscripts are written will vary, you will hopefully have one to two projects nearing publication stage. We will then discuss what you should focus your remaining time on to complete your thesis. At this time, you will take a greater responsibility in developing future

projects, while at the same time mentoring newer students. Mentoring newer students is expected of you, though you can require that they make appointments with you. We will also begin working on strategies to transition to your next career stage.

Graduation – as the timing of completing a PhD is highly variable it is essential that you discuss your proposed timeline with me early and often. **It is not appropriate to begin seeking your next position until we are confident of your defense timeline**. Of course, you will not want to wait until after your defense to start looking – the amount of time it takes to find a position will vary with your career goals, so we will discuss the timing to start looking as we become more confident of your timeline. In general, a defense should be scheduled 2-3 months in advance.

What you can expect from me

- **I will set the scientific direction for the lab and provide the means to pursue those directions**. This will include helping you to find a research topic, writing grants to fund the research, and maintaining the necessary university protocols for us to utilize the laboratory. Additionally, I will seek out collaborators for our work to further your opportunities.
- **I am committed to mentoring you now and in the future.** I am committed to your education and training while in my lab, and to advising and guiding your career development. I will work to promote you and your work.
- **I will encourage you to attend scientific meetings and make an effort to fund these activities.** These meetings are important to showcase your work and for the networking opportunities as you pursue positions after your time in my lab ends.
- **I will be available for regular meetings and will provide timely review of research.** In addition, I will do my best to provide an open door policy and respond quickly to e-mails. Please be aware that there will be times when I will be unavailable due to other obligations – in particular my teaching is on the engineering campus. For abstracts and small data questions, I will generally be able to review in 1-2 days, for papers and thesis, I will need 1-2 weeks.
- **I will provide a work environment that is intellectually stimulating, supportive, safe, and free from harassment.** I take seriously any difficulties you experience in relationship to this statement – if there are conflicts with another lab member, please inform me and I will work with you and the other lab member to find a resolution. I will strive to understand your unique situation and am open to your suggestions on how to improve your experience in the lab.

Nuts and Bolts

Hours and Vacation

I do not believe in tracking hours – instead, I am interested to see that you are productive. However, if I sense that this is being taken advantage of, the situation will be addressed. You will quickly recognize that biology is not a 9-5 proposition - night and weekend hours come with the territory. RA appointments have sick and vacation leave described here:

https://hr.wisc.edu/policies/gapp/#leave-benefits

I ask that you discuss with me at least 4 weeks before a planned absence of more than one day - this way we can determine if it is an appropriate time for a vacation and if there are grant or other deadlines during that period we have ample time to prepare. I expect you to satisfactorily complete all assigned research duties prior to your planned departure.

Meetings

Come prepared to discuss/present your recent research and next steps. A written agenda including what you have done and what you propose to do in the next week must be e-mailed to me by 3 pm the day before the meeting. You must bring your lab notebook to each meeting. Group meetings will rotate between a variety of formats: research updates, research presentations, and journal clubs. Attendance is mandatory – active participation is essential!

Annual Evaluations

Each year we will have an evaluation – this will help us to determine things that are going well or are areas for improvement. I will tell you if I am satisfied with your progress and help identify steps you can take to fix any concerns. As part of this process I will review your notebook, as a quality notebook is essential for future publications. This is also an opportunity for you to communicate to me what I can do to help you succeed. Tell me if you feel that you need more guidance, more independence, to meet more often, etc.

Authorship

One of the most important tasks in science is disseminating your research through publications and presentations; therefore, authorship on these items is an important indicator to the outside world of your role. Authorship implies a significant contribution to a paper such as intellectual ideas that change the research or experimental contributions (just following instructions and not actively participating in the experimental design/interpretation will be acknowledged, but likely would not result in an authorship). While the order of authors varies by specific field, in general for bioengineering the first author is the student/post-doc who took the lead and wrote the paper, the last author is the PI, and the authors in between are in order of decreasing contribution. Failure to complete papers before leaving the lab may result in a junior member doing so as the 1st author in your place.