

**Our mission as a scientific research and training group**

Our mission is to advance understanding of how life works at a molecular level using the scientific method to design, conduct, interpret, and communicate experiments that provide the greatest achievable insight, with enthusiasm, rigor, and adherence to the highest ethical principles. Key parts of our mission include:

(i) using our resources wisely to gain basic knowledge about fundamental biomolecular mechanisms and to apply the knowledge to achieve scientific advances that help address current human problems like microbial disease and the need for renewable energy;

(ii) communicating what we discover clearly in written publications and oral presentations to our colleagues to promote scientific progress and to the public to promote appreciation of the wonders and value of science; and

(iii) helping each other learn to practice science properly and successfully.

**Our group's collective expectations of each other**

- *Treat your lab colleagues with respect, decency, and kindness regardless of position.*

To achieve our mission, all members of lab from undergraduate helpers to senior scientists must treat each other as equals deserving of mutual respect as individuals and for the value of their ideas and their intellectual and other contributions. Our group is diverse and our diversity in thought, in identity, and in perspectives makes us stronger and better able to solve scientific problems. Respect, promote, and celebrate that diversity to help us succeed.

- *Take actions to create and maintain camaraderie, as well as promote a healthy active science environment in the lab.*

Participate in collective lab activities like periodic social outings and lab retreats.

- *Actively participate in group meetings but also encourage others to participate.*

If you're someone who always contributes, consider stepping back and making space for others to speak. If you're someone who tends to stay silent, make a concerted effort to speak up.

- *Make reasonable efforts to support colleagues when they are presenting their work (practice talks, posters, seminars, etc).*

It is helpful to have a large group of friendly faces in the audience and to get constructive feedback, even if you have heard the talk many times.

- *Maintain and contribute to protocols on the wiki and publicize those protocols when they are uploaded or updated via an announcement on Slack to help future members with their bench work.*

- *Clap for speakers after lab meeting presentations.*

- *Maintain a respectful tone when asking questions in lab meeting and in every conversation with a colleague.*

Talk about the science, not the person. Avoid interrupting and remember that feedback should be balanced (both constructive and notes on what went well!)

- *Help deal with packages when they arrive.*

This is everyone's responsibility. If you're uncertain what should happen with them, ask around. When you receive packages for the lab, put contents away in the proper location and be certain to notify the person who ordered the item where it's stored and update the lab supply ordering spreadsheet.

- *Regularly perform your lab tasks so that we can all maintain a working and active lab.*

Be respectful in reminding a colleague to perform their lab task.

- *If you use the last of a community stock, make more of that stock or notify the person whose job it is to maintain that stock. When we need something ordered, take the necessary steps to report it on the lab supply ordering spreadsheet before we run out.*

- *If you see someone doing things in lab that are inappropriate (eg, doing a method incorrectly or interacting with someone in a way that is inappropriate), first try to speak with the person privately and suggest a corrective action. If this approach isn't working, then talk next to Bob or Rachel about how best to deal with the situation.*

- *We all bring much more to the lab than just our ability to pipette/do experiments.*

There are times in research where we may feel low due to our projects. We may bring in stresses to lab unrelated to research. During these times, it may be particularly difficult to maintain a patient/optimistic attitude in lab, especially towards others. When you encounter these obstacles, use these times to practice more patience with yourself!

- During these moments, you might consider sharing your concerns with Bob/Rachel/more senior students to seek advice. Many of the lulls we feel in research have been encountered by older students.
- More senior students should practice empathy and be receptive to offering advice in these moments.

- *Uphold your values both in and out of the lab.*

Science is a human endeavor and neither we as individuals nor science as a discipline can achieve their true potential if pursued without regard to the world around us. In this way, science is political. As a group, we will try to be the change we want to see happen. Each of us can contribute. Be an advocate for the changes you want to see in government and research relations. Use your platform as a scientist to speak out. If eligible, vote in local and national elections. In whatever way you best can, contribute to the fight for social justice. As a group, we actively recruit and support people from all backgrounds, and reject racism and xenophobia in all forms. We will not be silent in the face of injustice. Supporting each other through world, national, and local crises creates a safe and supportive lab culture, and contributes to a safer world for everyone.

### **My expectations: contribute to the group's mission and your success at UW & beyond**

By joining our research group, you agree to work toward our mission and to always place it at the top of your priorities. To ensure a common understanding of what this agreement means, I have developed the following set of expectations. Read them carefully and understand their meaning because both I and others in the group will hold you to them.

- *Take ownership of your research and your educational experience.*

- *Learn how to plan, design, and conduct high-quality scientific research.*
- *Learn how to document and present your scientific findings.*
- *Be honest, ethical, and enthusiastic.*
- *Share credit for our achievements with everyone who contributes.*
- *Be supportive and respectful of your lab colleagues.*
- *Be a team player—help make the group and your lab colleagues successful.*
- *Work hard—never give up!*
- *Learn to engage in the scientific method with enthusiasm.*

Doing science right is not easy and not for everyone. We undertake it because we derive great internal satisfaction from using the scientific method to gain new knowledge. Rejoice in your opportunity to practice science. Accept that it's supposed to be hard and that you will often fail. If it wasn't hard, anyone could do it—the hard is what makes it great. To practice science, you always must be open to thinking about and evaluating new ideas and must always be skeptical of results. We never prove or believe anything unconditionally; we just give greatest weight to the ideas not contradicted by experimental results. When you meet with me, you can expect me to always be trying to think of new approaches and ways we could test an idea. This approach of constantly questioning is the heart of the scientific method. To find the right experiments, we must try to think of as many approaches as possible, and then sort out which ones will give the most information with the least cost in time and resources. Do not shy away from thinking about what we could do just because it sounds like a lot of work. Without thinking through options, you will not excel as a scientist. When you pursue an experiment, work hard, be brave, and be undaunted. When experiments fail, do not be discouraged and look away—always think hard about what the result is trying to tell you before you repeat it.

- *Maintain a written lab notebook documenting your work that will remain with the group.*

Lab notebooks are an essential component of scientific research. The need for them and their value has been established by literally hundreds of years of experience. We have a supply of hardbound notebooks for graduate students, postdocs, and scientists, and softbound notebooks for undergrads and rotation students. A loose-leaf notebook is acceptable if you strongly prefer it and it's properly maintained, but be aware that most scientists frown on them and that it will not be legally admissible if you are involved in patentable research. An electronic notebook is acceptable if you use the methods described on the wiki to maintain an e-notebook. You can tape printouts into your notebook. Your electronic records should be carefully catalogued by experiment, stored on the server in a well-organized fashion, and cross-referenced in your notebook.

- *Take responsibility for publication and communication of your work.*

Our scientific advances mean nothing unless they are communicated to others promptly and accurately. You are responsible for making sure your work is conducted in a way that publication is achieved, for writing manuscript and preparing figures, for preparing abstracts and talks, and for the processes of submission, response to reviewers, proof-reading, and finalizing publications. A proven method for effective manuscript outlining while work is ongoing is provided to you on the lab wiki. Use it as described! A graduate student should publish two-first authored papers to earn a PhD. A highly successful graduate student will publish even more and will also write a review that may serve as the heart of the introduction to their thesis. A good plan for a graduate student is to publish one first-authored paper in their third year and a second one

in their fourth or fifth year. These publications will be primary determinants of your future success, for instance in obtaining post-doctoral fellowships. A successful postdoc should publish on average one first-authored paper per year. I recognize that there can be variation in these goals; however, when papers contain variable amounts of material, sometimes one large paper might be equivalent to two or more smaller papers.

Increasingly, publications require two additional components that have not been components of publications historically: (i) deposition of all data associated with a paper and (ii) publicizing a paper, for example through press releases, social media, and other auxiliary descriptions. You are responsible for these additional components also. Be sure to keep all data well organized on a file server so that deposition is easy. Enthusiastically promote your work by engaging in auxiliary activities.

Step up to present your work at campus forums and at scientific meetings when asked. These are important opportunities to increase your communication skills. Conferences are also an opportunity to further your research and education, not to take a vacation. If you register for conference, I expect you will attend the scientific sessions and participate in conference activities during the time you are there. Few things are more important in science than meeting your colleagues at conferences and engaging in scientific dialog. Pursue these chances with enthusiasm, vigor, and the same respect of those you meet that you afford your lab colleagues.

- *Contribute your fair share to maintaining the lab in a fully functional state.*

Keeping a lab functional takes a tremendous amount of work and attention to many details. Everyone must contribute. You will be assigned a set of responsibilities. Execute them diligently and remind others if they let things slip. Maintaining equipment requires regular attention, so take proactive care of equipment assigned to you. Notify the person responsible for ordering when supplies run low. Do your part to make the lab work for everyone.

- *Treat the lab, equipment, supplies, and resources with care and respect for others.*

Use laboratory resources carefully, frugally, and with respect for others. Lab resources include the plasmids and strains you make and the oligos and DNAs you order. They must be properly stocked in the lab banks and recorded appropriately in the databases. You are responsible for these steps for all the plasmids and strains you make and oligos and DNAs you order, which must be complete when you leave the lab to leave in good standing.

- *Take primary responsibility for the successful completion of your degree (grad students).*

This includes commitment to your work in classrooms and the laboratory. Maintain a high level of professionalism, self-motivation, engagement, scientific curiosity, and ethical standards.

- *Complete your degree while a full-time, resident member of the group (grad students).*

To finish your degree in good standing, you must remain physically present and working full-time in the lab until your degree is complete and your papers are submitted and preferably accepted for publication. Your stipend is predicated on your full-time presence. In taking responsibility for your work, you are responsible for ensuring it is published. Not infrequently, one or more experiments needed for a paper may not be apparent until the manuscript is fully written and submitted. Sometimes reviewers will ask for additional experiments. You are responsible for completing this work to ensure publication of your findings, which means you must remain working full-time in the group. If concerns arise, discuss them with me.

- *Show up on time for your Friday meetings.*

Show up for your meetings prepared to show your results (bring your notebook) and to discuss progress and obstacles. If you can't make a meeting, it is your responsibility to tell me (not my assistant or someone else in lab) so it can be rescheduled. Make sure that you also use this time to communicate new ideas that you have about your work and challenges that you are facing. I can't address or advise about issues that you do not bring to my attention.

- *Be aware of and meet institutional and grad. program requirements.*

It is your responsibility to know the policies, deadlines, and requirements of the graduate program, the graduate school, and the university. Comply with all institutional policies, including academic program milestones, laboratory practices, and rules related to chemical safety, biosafety, and radiation safety.

- *Attend and participate actively in lab meetings.*

Attend in person unless out of town or ill and actively participate in all group meetings and journal club. Participation in group meetings does not mean only presenting your own work, but also providing support to others in the lab through shared insight. Do not use your computer or phone during research meetings. If you need a device to look up something to augment the discussion, then do so expeditiously and without attention to anything else. It's OK to take notes on a computer as long as you are actively paying attention to the speaker and not doing anything else. It is disrespectful to a presenter and to the group to divert your attention to an electronic device. Pay attention to the meeting and help create a climate of engagement and mutual respect.

- *Be a good collaborator.*

Engage in collaborations within and beyond our lab group. Keep me informed about all collaborations and any issues you perceive. Do not establish collaborations without discussing with me and getting my agreement. Collaborations use lab resources and can sometimes lead to issues you may not foresee. Collaborations are more than just publishing papers together. They demand effective and frequent communication, mutual respect, trust, and shared goals. Effective collaboration is an extremely important part of success in science.

- *Keep up with the scientific literature.*

To think effectively about science and your research, you must read the scientific literature avidly. Block off at least 1 hour per week to peruse current tables of contents for journals or do literature searches. Reserve another 2 hours to read papers.

- *Help QC the scientific literature.*

From time to time, especially as you progress in lab, I may ask you to help review or even take a lead role in reviewing scientific manuscripts submitted for publication at journals that send them to me. Recognize that this is part of your professional responsibility as a scientist and also an important part of your training and do not hesitate to agree unless you have a really good reason to think you can't complete the assignment in a timely manner. (Typically, I'm aware of these constraints and won't impose on you when I know it's a problem.) There are guidelines for manuscript review on the wiki. Use them. Collaborate with others in lab to improve the quality of reviews. Take seriously your responsibilities both to make sure published research is solid and

important and to help authors improve their manuscripts (remember, someone else will be doing this for you).

- *Be mindful of the constraints on my time.*

When we set a deadline, I will block off time to read and respond to your work. If I do not receive your materials, I will move your project to the end of my queue. Allow a minimum of one week prior to submission deadlines for me to read and respond to short materials, such as conference abstracts, and three weeks for me to work on manuscripts or grant proposals. Do not assume I can read materials within a day or two, especially when I may be traveling or you know there are other demands on my time. Never bring written materials to a meeting and expect that I will give feedback without having seen them before.

- *Keep reasonable work hours, sick leave, and vacation; discuss any concerns with me directly.*

One of the great benefits of being a scientist is having control over your time. On average, you will work harder and longer hours than people in other professions and fields. But you also will decide when to work and when to take time off for creative thinking, adventures, and relaxation rather than working a standard 40-hour week without break (and you will enjoy your work, which isn't true for many people). Accept that there will necessarily be times — especially early in your training — when more effort will need to be devoted to work in order to get experiments done and that it may not be ideal to schedule time away. Graduate students can expect to work an average of 50 hours per week in the lab and successful scientists in general work much longer hours than a standard 9-5 job. Offsetting that apparent downside, however, we have flexibility to control our schedule and when we are working we are doing something interesting and immensely rewarding. Although you are free to work early in the morning or late at night if it suits you, I expect you to be in lab for at least half of any given 9-5 weekday so you can interact with me and others, and to be present for all meetings. Spring break and Holiday breaks are for undergraduates, not graduate students and postdocs. Most researchers take advantage of university holidays to get something done without distractions. Consult with me and notify fellow lab members in advance of any planned absences. Vacations are important times to relax and recharge. I do not track how much time students and postdocs take off for vacation, but instead focus on whether they are getting their work done in a timely manner. That said, you should recognize that science is competitive and you will not succeed if you do not work hard.

- *Help other students with their projects and help mentor/train other students.*

This is a valuable experience! Undergraduates working in the lab should be encouraged to contribute to the writing of manuscripts. If you are mentoring an undergraduate, recognize that they have a project independent of yours (i.e., they are not "your undergrads" but your junior colleagues who you are mentoring). Note that my policy is to assign as undergraduate mentors only students who have completed their prelims or postdocs, and that I always assign students a specific project not simply to help with yours.

**What you can expect from me**

- *I will be your advocate and write strong letters of recommendation for you.*

The only condition is that you meet expectations and remain a lab member in good standing.

- *I will give you honest and confidential advice.*

If you have problems and need someone to talk to, I will be available and will maintain confidentiality of anything you want kept confidential. To the best of my ability, I will give you advice that I think is in your best interest irrespective of my interests.

- *I will maintain funding for the lab's research.*

Our work is primarily funded by large grants from the NIH and the DOE. I may ask you to help apply for smaller grants or to apply for individual fellowships. Recognize that these are outstanding opportunities for your professional development.

- *I will ensure the lab stays functional and in compliance with University, State, and Federal policies and regulations.*

There are many regulations and policies that govern research. I will let you know if they impact your work. Please adhere to policies when I let you know about them so that the lab as a whole remains in good standing.

- *I will encourage you to attend scientific meetings and will help fund your participation.*

I may not be able to cover all requests, but you can generally expect to attend at least one major conference per year when you have results to present. Travel fellowships are available through Biochemistry, some graduate programs, and the university to supplement grant funds or when such funds aren't available. I will help you identify and apply for these opportunities.

- *I will be supportive of your professional goals and try to help you achieve them.*

I will try my best to understand your situation and goals, and mentor you accordingly. I understand that everyone comes from a different background and has different professional goals. Not everyone seeks to be an academic faculty or even a researcher long-term. Learning to practice science successfully is incredibly useful preparation for a wide variety of career directions because it teaches you to think critically using the scientific method. To achieve this goal while a member of the group, you will need to meet the expectations described here but you may also need other preparation if you seek a non-research career. Discuss these goals with me. My role as a mentor is to foster your professional confidence and to encourage your critical thinking, skepticism, and creativity.

- *I will do my best to show up on time for lab meeting and your Friday meetings or let you know when that won't be possible.*

Be aware that I often find myself scheduled for meetings in different buildings that end at the same time your meeting with me might begin. Lacking access to teleportation, this sometimes causes me to be late.

- *I will read through and provide comments on your manuscripts in a timely fashion to exceed no more than two weeks barring time constraints such as travel or grant deadlines.*

Please help me achieve this goal by making sure that manuscripts are as complete as possible when you give them to me.

### **Yearly evaluation**

Each year, we will sit down to discuss formally your professional plan, your progress in science in the lab, and your goals for the year ahead and for the next decade. At that time, you should be sure to tell me if you are unhappy with any aspect of your experience in the group or at UW. Remember that I am your advocate, as well as your adviser. I may be able to help you with any problems you might have with other students, professors, or staff. Similarly, we should discuss any concerns that you have about my role as your adviser. Tell me, if you feel that you need more guidance; if you feel that I am interfering too much with your work; or if you would like to meet with me more often. If my efforts to mentor you are not working for you, let me know. I am open to talking with you about other ways to achieve goals. At the meeting, I will give you an honest and frank assessment of your progress and whether you are on track to meet your goals. I will explain to you any deficiencies, so that you can take steps to fix them. The annual planning meeting is a key time to take care of any issues before they become major problems.

### **Specific expectations for training completion and leaving the lab**

- *Graduate students should publish at least two first-author papers to complete a successful PhD. Postdocs should aim to achieve at least one major first-authored publication or an average of one/year if they are shorter publications.*

This goal sets you up for future success and ensures your work in the lab is shared with the public who is paying to support it. It is your responsibility to make sure anything needed for revision of manuscripts is supplied. Postdocs should be aware that UW-Madison limits time in a postdoc to three years with an option for two one-year extensions that must be justified by continued training needs. It is not possible to get an extension past five years.

- *Graduate students must meet with their thesis committee at least once per year.*

Scheduling is your responsibility. Do not let them lapse if you plan to graduate in timely manner. Discuss with your committee plans for publications and graduation.

- *Graduate students must complete all work for their thesis and defend while remaining in residence in Madison.*

I consider it my responsibility to make sure you complete your degree once you pass your prelim (a responsibility shared with you). If you don't remain in Madison until you defend your thesis, you release me from this responsibility.

- *Keep me abreast of your plans for next steps in your career.*

In addition to annual professional planning meetings, I am always available to discuss professional planning, to give advice of when and how to seek postdoc positions or jobs, and to discuss any concerns you have about completing your time in the group. If you feel a need to discuss career planning for whatever reason, just let me know a couple days before a Friday meeting and we can plan a discussion. Surprises rarely work out in everyone's best interest.



- *Before you leave the lab, all materials must be properly stored and recorded, notebooks copied (originals must stay in the lab), and protocols put on the lab wiki.*

Documentation of research materials is a legal requirement of participating in federally sponsored research and also is your obligation to your fellow lab members and to those who will come after you. In extreme cases, I've had to refuse to sign a thesis warrant until materials (e.g., plasmids) are properly stored and recorded in databases. Do yourself a favor and stay on top of this process throughout your time in the lab rather than leaving it to the end when it will be much harder. These are commitments you owe not just to the lab but to the research community more broadly that is supplying materials you use and to the general public who are paying for your training and research.

### **Lab Outreach**

As noted in the lab mission statement, communicating our research to the general public is part of our mission. As such, we should all take available opportunities to explain our research to the public in accessible forms. A crucial aspect of outreach is promoting publications through press releases, interviews, and, for those so engaged, via social media. Developing a more organized outreach activity, demonstration, or tool to explain our research to non-scientists would be welcome. A Lab Outreach page is available on the lab wiki to organize activities. Those interested in creating content and plans are encouraged to discuss ideas with me and to use the wiki to generate useful content, organize activities, and keep track of outreach efforts.