

## Sweedler Group Expectations and Operation

**Executive Summary.** My goal in having you in the group is to foster your development into a scientist / engineer and make sure you have a successful follow-up career. The Sweedler group has two overarching scientific goals. The first is to create measurement approaches that characterize small-volume samples, and the second is to use these approaches to understand cell-cell signaling in complex systems, with more details on our specific research efforts included on our group web pages. The group is often comprised of individuals from Chemistry, Biochemistry, Physiology, Neuroscience, Bioengineering, and other departments and programs. Besides conducting research, my mission is to foster a group environment that allows individuals at all levels, from undergraduates to postdoctoral associates, to become outstanding scientists and prepare them for careers in industry, academia, and government. We are creating a diverse scientific workforce while addressing questions at the boundaries of the unknown. I hope that being in the Sweedler group is an exciting and fulfilling period in your scientific career.

As an analytical chemist, I like hard numbers. As of Summer 2024, 64 postdoctoral associates and 96 graduate students have joined my group, and of those that have left, ~85% of received a Ph.D. (and most of the others received M.D. or M.S. degrees). Of the former Ph.D. students, about 50% are women and 50% men. The group includes a diverse team of undergraduates, graduate students, postdoctoral associates and research professors, and together this team fosters your success, encourages positive attitudes, and welcomes inclusiveness.

An interesting / hard part of being a graduate student is that you are both a student working towards program goals (courses, exams, etc.), and on your dissertation research. As a research director and as the head of your committee, I have input into some of these areas but not all of them. For example, the graduate college has one set of requirements leading to a degree and your home department has others. The research group is primarily involved in your research and growth as a scientist. In other words, you need to meet group goals / requirements and follow your program requirements as well. I cannot waive grade-point average or teaching requirements, required courses, etc.

The Sweedler group is scientifically diverse. In Fall 2022, there are graduate students in the Chemistry Department (about 50% of the group) in the Analytical, Materials and Chemical Biology areas; recent graduates have included students in Biochemistry and Molecular and Integrated Physiology (within MCB), the campus-wide Neuroscience Program, and Bioengineering (within the College of Engineering). Each of the departments, programs and colleges have somewhat different rules for their Ph.D., allowed dissertation committees, when degree requirements must be met, and even graduate student salaries. I cannot control these rules. Because of this variety, this document does not go into specific degree requirements or timelines to complete them, and I have not created a separate manual or set of expectations for each program. Thus, one of the overarching requirements when joining my group is to track *your own* degree requirements. I try to remind you of these, but I may not keep up with the latest changes in each program. Similarly, the undergraduate researchers and postdoctoral associates in the group have training requirements and belong to a wide range of programs and departments. This scientific diversity is a strength of the group; if you do not know something, it is likely someone else in the group can answer your questions.

This document primarily focuses on the details enabling scientific research. For the graduate students in the group, the major part of your Ph.D. is your dissertation research. For postdoctoral associates, your efforts within the group are also focused on your research, whereas for undergraduates, the research is only a small part of your academic efforts. In what follows, I address the major aspects of being a member of the Sweedler group.

- (1) **Who pays for your research?** Neither I nor UIUC pays for most of the research done in the group. The funds come from a variety of sources, mostly from U.S. government agencies through a number of funded grants. This is always important to remember as it helps explain limitations on the research projects we want to explore. For example, if you are working on a project for the National Institute on Drug Abuse and they are paying for your research (and yes, I have had funding from them for 20+ years), then we cannot decide to change projects and work on a cancer-related project. We need to stay aligned in the areas that our funding supports. I share the funded proposals with students so they can follow the overarching goals and we can jointly come up with projects that fit group expertise and your interests while meeting the objectives of our funding agencies. Similarly, the graduate students and postdoctoral associates will be assigned an account number to use for purchasing chemicals, supplies, and other items for your research. You will need to justify your purchases, not in terms of what “you” need (or what “I” need) but how the purchase fits the goals of the funded project. Lastly, there are a large number of university and federal rules on purchasing and we have to follow them, and yes, they can be confusing. These federal and university rules must be followed by all of us. If you have questions, ask senior group members or me.
- (2) **Safety and compliance.** Your first responsibility is to walk out of here alive and healthy, and your second responsibility is to see to it that everyone else around you does the same! No deadlines, requirement pressures, or other responsibilities should ever be allowed to lead you to do anything of questionable safety. Our group works with chemicals, biological materials, and animals, and all of these have a host of safety and compliance rules. We have a large number of standard operating procedures (SOPs) in the group and we all have to follow a number of rules to enable us to continue our research. The group SOPs are available separately in the group’s online documents storage location, and so are not part of the lab manual. If you don’t have access to these documents, let me know. It is important to understand that I give individuals in the group a large amount of freedom to try new ideas, and at times I may suggest a new experiment. In every case, all safety rules, SOPs, and approved animal protocols must always be followed. If you are not sure of what these are, read the group SOPs and ask questions! Don’t hesitate to ask others in the group for guidance; similarly, if you (or someone else in the group) notices someone doing something that is not safe, let them know. This should not be considered being rude or interfering, but rather, how we support each other!
- (3) **Manuscripts required and group expectations to receive a Ph.D.** I always have a hard time answering the question about how many manuscripts are required to graduate. I do not have an absolute requirement on manuscripts, although to graduate, I expect people to be (co)author on at least a few papers. How many is a few? It may be one or two research papers, and perhaps an overview, protocol or review (which can make an excellent introductory chapter for your dissertation) but for most graduates, the number is larger. We are a highly collaborative group and many people work on joint projects within the group and with other groups. The issue is that it is hard to know how well these collaborative projects will proceed. At times, they become the major goal and at times, they fail. Thus, in an ideal scenario, you will have at least two related projects, one of which may be important for a funded effort with an exciting goal that may not be entirely within our control (for example, your samples are supplied by another team). The second may be in a subarea that you completely control. I encourage individuals to have this type of dual plan. My job as an advisor is to work with you to establish projects that can proceed when other parts do not go as planned.

As far as writing your first manuscript, you will work with all of those involved with the research; oftentimes, details of the study are discussed at a subgroup meeting and the initial draft of the figures optimized. Once this is done and we all agree that the data supports a publication, outlining and writing starts. For individuals who have not written a scientific paper before, it can be surprising to learn how many drafts and how much effort it takes to create the final product; you can rely on both your coauthors and my expertise to help accomplish this. Just as most research is a team effort, creating the manuscript is also. If you have a writing block that prevents you from making progress, let me know. There are resources available to help. Most find the second manuscript is much easier to write.

Trust me here: my goal is your success and to make sure as many of your projects succeed and result in as many strong publications as is feasible. I want you to succeed in your career goals. If your career goal involves an academic position or work at a government laboratory, then just getting the minimum research accomplished (and the fewest number of manuscript coauthored) to receive a Ph.D. may not be enough for you to get the job you want.

- (4) **Working hours.** I have never tracked the working hours of individuals in the group and I have no plan to start. For graduate students, the hours expected will evolve during your tenure within the group. When you are working on courses, you need to follow the course requirements and you will have less time for research. The same applies for periods when you are working on preparing your preliminary exam, etc. For someone who has signed up for 12 hours of dissertation units with me and is supported on an RA, I find it helps to think about this as two separate positions. The RA is 20 hours per week and may involve some duties not directly related to your dissertation, such as helping write reports to the funding agency. In some ways, this is the more clearly defined part of the graduate degree as the 20 hours is being paid for by the funding agency. You need to put the 20 hours each week into the project for the RA, even when working on courses or other requirements – this is your job. The dissertation units comprise the second ‘position’; just as with any other course, the hours you devote are individual and vary. In any case, a sustained 50ish hour effort per week is a good expectation for the combination of dissertation units and RA (obviously, if taking courses, etc., the dissertation units are reduced and substituted for the course or exam preparation times). I use the word ‘sustained’ as there will be weeks when you are running samples on an instrument that may exceed this effort and other times that are less.

Similar expectations apply for postdoctoral associates, who are required to work 40 hours per week. Undergraduates agree to work a set number of hours for research units and again, must meet this time commitment.

- (5) **Time off.** Everyone needs time off. Though I follow the Chemistry PTO policy, I do not track time off. For those on TA or taking courses, you need to arrange your time off while taking into account your jobs / duties. Within the group, a good rule of thumb is an average of two days per month of vacation, plus sick leave and university holidays. However, if you are not a Chemistry graduate student, please follow your own department / program rules. Keep in mind that the Chemistry PTO policy is not the same as the MCB or NSP policies. The group does have one hard rule: if you will not be reachable / in the lab for two or more days, please send me an email with details (when you will be gone, and if possible, an emergency contact). We have had issues in the past where we needed to contact someone on vacation because of important paperwork, safety or other issues and being able to contact you is vital. In terms of leaving for

health issues, doctor's appointments, or taking off early because of a visitor, I do not track these events nor do I need to know such details. Again, if you are going to be out longer than two days, let me know in writing via email.

- (6) **Group Meetings.** My group is fairly large, I have a number of other duties, and like many faculty, I travel too much. Of course, a surprising amount of travel is to funding agencies to maintain support for your research. Thus, I do not meet with individuals using preset regular meetings. Instead, I have a weekly group meeting on Friday at 2 pm (usually last 90 minutes or so) to include a single research presentation by a group member, and a short 15-minute talk from another group member. Occasionally, meetings are devoted to job interviews, oral prelim or final exam practices, poster and talk medleys before major conferences, or even group visitors. You are expected to attend the group meetings when you are in town and available. Yes, at times, someone has a course at the same time; this is fine for a semester. In addition, to the weekly group meeting, there are a number of monthly subgroup meetings. Subgroup meetings are smaller and allow a chance for individual feedback; everyone will be expected to attend one or more of these, depending on their research. I also aim to meet one-on-one each semester and at that time, I ask for a short written summary of recent research progress and your goals and expectations for the coming months. Lastly, each degree program has other requirements in terms of their students (diagnostic meetings, annual checkups, meetings with your committee, etc.).

If you need to reach me, I respond to emails faster than other media, and am always available to answer questions and set up individual meetings. However, it is important to realize that your greatest support comes from the other group members; for many questions, the group has more experience and information than I have and so do not hesitate to ask them. In addition, we have two research professors associated with the group (Stas Rubakhin and Elena Romanova) and their skills, expertise and experience are fantastic resources for you.

- (7) **Attending scientific meetings.** I want you to attend appropriate scientific meetings to learn from others, present your work, etc. In fact, I use a large part of flexible group funds to allow graduate students to present their research at meetings that fit the goals of our funding sources. I will support attendance at one meeting per year and this should be your expectation. For some, attending a second annual meeting is possible before graduation as this can help with job searches, etc. (as funding allows). The second meeting may be one arranged by a funding agency, or one that has some other special tie to the group. To help defray travel expenses, I ask you to take advantage of ways to reduce costs, such as sharing a room when appropriate, and I encourage you to look for other financial support. I always appreciate it when a group member tells me about a travel award (or another award) they discovered. In some cases, the group can have only one travel award nominee (per program), and so you may have to wait a semester or two for your turn. Getting reimbursed for group-related travel requires following UIUC travel rules, which I do not control.
- (8) **Group Tasks.** Keeping the group functioning smoothly requires work not directly related to anyone's specific project. The group meeting task list is available on the group website and is updated once per year. Members are expected to spend time on their assigned tasks, but understand that some tasks belong to "everyone." Everyone has to help keep the lab clean and the instruments maintained.

Remember that all group space is shared. Keep the space clean for others, label all your materials so others can figure out what they are, and be considerate to others. Please do your share.

- (9) **Notebooks and data.** “Good Laboratory Practices”, and I, require notebooks to be used. For data, be certain to provide cross references to the actual file locations. The notebooks must stay in the group (this is a requirement for most of our federal funding). Your data cannot live on the instrument it was collected on and so needs to be backed up to at least two locations. We have a current SOP covering these details.
- (10) **Interpersonal relationships and ethics.** All group members are expected to follow the policies of the University of Illinois regarding the appropriate conduct of research and scholarship, as well as addressing misconduct, such as fabrication of scientific results. All group members are expected to maintain an environment free from harassment and discrimination for all, regardless of race, gender, sexual orientation, disability, physical appearance, religion, and other identifiers, in accordance with the policies set out by the University of Illinois. Behaviors such as unwelcome sexual attention, inappropriate touching, intimidation, or any other behaviors that contribute to a hostile workplace environment are unacceptable. If you witness, or are the target of, harassment or discrimination, please consider reporting it to me or to the Assistant Director of Graduate Diversity & Program Climate immediately, or both. While it is always nice if your colleagues are also your friends, what is critical is keeping your interactions within the group professional!
- (11) **Conflict resolution.** Interpersonal conflicts between group members are best brought to my attention by all parties involved by asking for a meeting via email (for the record) so that I can mediate. Such conflicts can take many guises, ranging from authorship, to scheduling lab time or instruments, to problems among group members collaborating on a project or on a mentoring relationship. In most cases, it is appropriate for the parties involved to have a conversation first before escalating to the PI or department. If the conflict is with me (as PI), the School’s Graduate Diversity & Program Climate Director and / or Department Head should be consulted, or the student affairs dean at the Graduate College if the group member prefers a more at-arms-length confidant. One area of concern that surfaces with some regularity involves authorship order on manuscripts. I am always happy to discuss this with you. As the editor of an ACS journal that has received tens of thousands of submissions, I have been involved in a large number of such issues and am happy to work with all group members towards an authorship solution.
- (12) **Mental health.** Graduate school is a stressful period. I am always available for students to discuss mental health issues and encourage such inquiries. I understand that students may wish to consult with mental health professionals instead, or first, and the Chemistry Department website provides a detailed list of available options. All such discussions will be kept in utmost confidentiality. I am confident that we can work out a plan for you to succeed.

My goal is to keep this document short, and it is already too long. For more details, ask!