

## Welcome to the Waterman Group

The purpose of joining a research group is to learn experimental techniques and research methods to train you to be a better scientist. My goal is to teach you a set of skills and help you become an independent researcher.

My PhD advisor used to say that experimental science is taught—not discovered. Some techniques have potential safety hazards associated with them, and most experiments when executed incorrectly will not give reproducible or correct results.

Ask questions. Talk to me and your colleagues about what you're doing.

No one can learn and accomplish research alone. Talk to me, your labmates, and your colleagues in the department about your science and theirs. Read the literature, and read literature outside of your project. Inspiration can come from anywhere.

This group is supportive. Everyone and their ideas are welcome.

### Safety

Take every appropriate and reasonable precaution in lab to protect you and your labmates.

- Wear your safety glasses at all times.
- All other safety equipment (heavy gloves, lab coats, face shields, etc.) are always available and stop your experiment until you have the safety equipment you need.
- Know where the exits, eye wash, safety shower, fire blanket, fire extinguishers are.
- Keep the lab neat.
- Plan experiments carefully and anticipate potential problems.
- Mentally prepare for experiments. For example, anticipate that when you are using a pyrophoric reagent that the worst-case scenario would be fire and know what to do.
- Label your compounds properly (name or structure and notebook page at minimum).
- Label waste properly and do not let it accumulate.
- Large scale reactions can be particularly dangerous.
- The possibility of condensing oxygen with liquid nitrogen is the biggest hazard in lab.
- Synthetic laboratories can be particularly dangerous (alkali metals, flammables).
- Use and maintain the inventory.
- Avoid working alone.
- Emergencies: 911 is campus security and rescue; 9911 is Burlington police and fire; ESF is 65400, <http://www.uvm.edu/~esf/>.
- Please complete the on line safety training through ESF (<http://esf.uvm.edu/courses/>) Log on there and please complete the four sections under "Training for Workers in Laboratories that use Chemicals."

You must complete the online safety training through the ESF Web page to conduct chemistry.

## Starting

Research is the key to any degree in chemistry—get a good start on yours.

- Familiarize yourself with the lab and instrumentation.
- Start running reactions as soon as possible.
- Ask questions!
- Get your set up checked on new procedures.
- Learn how to operate a piece of equipment (start up, operation, shut down) before using.
- Familiarize yourself with the library.

## Attitude

The reason you are in the group is that I think you can succeed—prove me right!

- Running experiments is how you learn new things (and how you get your degree).
- Think! Think about what you're doing, why you're doing it, and what question it can answer.
- Try new reactions.
- Get inspiration from your peers, the literature, me.
- You can learn from failed reactions.
- Failed experiments or syntheses are not a measure of personal worth.
- If everything worked as planned, research would be dull.

## Lab etiquette

Group members spend a great deal of time together in lab. Being respectful of your labmates will make your time and work go smoothly.

- Be a team player.
- Be ready to share your expertise with other group members.
- Promptly clean and return glassware.
- Don't let group supplies (pipettes, vials, etc) run out.
- Be sensitive toward other group members—everyone is welcome.
- Handle group solvents rigorously.
- Keep a proper notebook (see handout).

## Expectations

Remember all that other stuff about being a graduate student (classes, TAing, etc) is not going into your thesis—only your research.

- High level of commitment and hard work. This is not a Monday–Friday, 9–5 job!
- Multitasking is a key to success.
- Talk to me about research/results.
- Talk science with other people. It will make you a better scientist.
- Keep up with the literature. I recommend using journal TOC alerts or RSS feeds.
- Vacations: 3-4 weeks/year, please provide me with advance notice
- Attendance at departmental seminars is required.

You are making a big investment in your research—use me for advice!