

Hite Lab Manual

v 1.0

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1 Welcome and Overview

Welcome to the lab. We are so happy to have you join the team!

Broadly, research in the lab seeks to advance our understanding of the proximate and evolutionary factors that influence variation in host immune responses and host-pathogen dynamics at the molecular, organismal, and population levels of biological organization.

To do so, we combine experimental data and functional genetics with mathematical models. This data-theory integration provides a powerful framework for identifying how key mechanisms at the molecular or individual level scale up to influence population-level outcomes.

We work on a range of host-pathogen systems with a current focus on the genetic model *Drosophila melanogaster* and two gram-negative bacterial pathogens: *Escherichia coli* and *Providencia rettgeri*. To move from the lab to the field, we also have ongoing collaborations with projects involving livestock. The overall goal is to conduct research that advances both basic and applied scientific challenges.

2 Lab Culture and Values

We value conviviality and strive to cultivate a welcoming and supportive community where lab members will thrive and conduct phenomenal research. Our lab values conviviality and we strive to create a welcoming and supportive community where folks from diverse backgrounds, interests, and experiences can have fun working together to exchange ideas, creativity, and knowledge in order to solve key ecological, evolutionary, and epidemiological puzzles. Science often requires creativity, perseverance, resilience, a sense of humor, and constantly expanding your world view; diversity and kindness are crucial to fostering these traits.

We also know that enhancing diversity in the STEAM fields is crucial to fostering the next generation of critical thinkers and informed citizens and is particularly important to developing solutions to public health, environmental, and social challenges. We are committed to expected actively pursuing programs focused on fostering diversity and inclusivity - as a teachers, mentors, and members of the broader community.

We're all responsible for making this a great place to work. Our lab culture influences what we are able to achieve - both in the lab and our broader community. We want every lab member to feel a sense of belonging and contribute at their highest potential. Therefore, we have shared expectations and accountability as students, managers, and leaders. Collegiality, professionalism, and enthusiasm for the work we do are key to creating the sort of exciting environment where all members feel energized, thrive, and do their best work!

3 Lab Dress Code

For your safety, please wear lab-appropriate attire. There are even lockers down the hall (in the restrooms) that can be reserved to keep an extra change of clothes if need be. Please wear:

- long pants or skirts
- closed-toed shoes

In case you have been watching a lot of Beyoncé lately, and are wondering,



The following are fabulous on the dance floor but would be a liability in the lab because they provide insufficient epidermal protection:

- belly shirts
- open-toed shoes
- transparent leggings
- shorts
- mini skirts
- bulky or long dangling jewelry

Working in the lab - whether as a research technician, intern, graduate student, or manager - is an important step in your *professional career*. As you embark on this professional journey, you will interact with folks from diverse backgrounds, religions, and cultures. It is important to make sure that you avoid wearing any articles of clothing that could be perceived as offensive to your colleagues.

4 Biosafety Training

All lab members must take the appropriate safety training before starting any lab work and to use appropriate PPE at all times. Lab biosafety protocols and procedures will also be provided in a binder in the lab (beside the First Aid Kit) and electronic form. In the event of emergencies involving accident or injury, call 911, and ask to be routed to the campus police.

Training required for everyone

All training modules can be found on the UW-Madison EHS website under Biosafety Required Training.

- (1) Biosafety 105: Biosafety Cabinet Use
- (2) Biosafety 106: Autoclave Use
- (3) Biosafety 107: Centrifuge Safety
- (4) Biosafety Required Training
- (5) Chemical Safety Training

Once you have successfully completed each training module, you will receive confirmation. Please collect the confirmations (with the specific date and your name). Place these in a single file labeled LastNameBioSafety. This folder will be uploaded into your the BioSafetyTraining Folder for on the Lab GitHub page.

5 Mentorship

Group meetings: We will hold weekly lab meetings as a springboard for open and critical scientific exchange. We will also discuss any lab logistics in this meeting as well.

Individual meetings: I will also schedule regular individual meetings with every member of the lab so that we can discuss research progress and whatever else that may arise. These meetings follow the 'Scrum' method - emphasizing that they are *not* 'status' meetings. Instead, they are 'collaborative planning sessions'. Our goal at these meetings is to discuss efforts toward completing the monthly goal. At the beginning of each month, we will discuss the goal for the month, and the semester. Then, at each weekly meeting, we will discuss the progress toward the monthly goal. Please come prepared to discuss the following:

1. What worked well?
2. What could be improved?
3. Actionable SMART goals for the next week (and how these relate to the monthly and semester goals)

Career development is a multi-faceted endeavor. To the best of my ability, I will identify or help create opportunities that relate to the career aspirations of individual lab members. I will work with trainees to help polish their scientific writing and communication skills. This crucial endeavor will occur through a combination of drafting manuscripts (as well as emails, slack, and protocols; all are incredibly important components to scientific/professional communication), crafting presentations, and attending relevant conferences.//

In developing research projects, it can be incredibly helpful to write up detailed methods, - including statistical, molecular, and bioinformatic analyses, - and a *hypothesized* results section, including the proposed figure layout. This exercise will help highlight/uncover any unforeseen wholes in the current experimental design, which is much much easier to remedy preemptively rather than after the investment of time and money into an experiment.

Once lab members have a firm grasp of their primary research projects, I will often encourage them to move out of their comfort zones. For many, this may mean achieving fluency in a programming language (e.g., R, Python, Mathematica) that will be essential to their research careers.// Lab members should also be encouraged to make use of the expertise of the broader lab and university community. In general, your resources should include a wide network of peers and mentors (no one mentor can possibly meet all of a mentee's needs!). Foster relationships with others in your same position and those who are willing to offer advice. It is critical in science to foster your own support network of people you trust, are inspired by, and that have expertise you don't yet have. Again, key

to fostering these relationships are maintaining a sense of professional, friendly, and appreciative communication.

6 Lab Citizenship

I am deeply committed to your success in research and professional growth. This relationship requires mutual respect as well as bit of give and take and will be facilitated if we all follow certain guidelines: All members of the lab are expected to:

- Take ownership of their projects.
- Lend their help and expertise to one another and understand that our laboratory is a *team* with common scientific goals.
- Display good lab citizenship and maintain a high level of professionalism (remember, we all represent the Broader Scientific Community, UW-Madison, and the Lab!). We value an open, collaborative, professional, friendly, fun, and safe scientific environment.

1. Help others - this is a team effort!
2. Carry out your SMART goals/lab tasks in a timely manner.
3. Follow rules for ordering and inventorying items.
4. Keep your items organized to assigned spaces.
5. Please ask before borrowing or moving shared lab items.
6. Clean up after yourselves (esp. lab benches and scales) and put items back in assigned locations.
7. **Cover the microscopes after use! (my favorite lab item)**
8. Be here during normal work hours so that you can maximize interactions. Working remotely 2 days a week is fine, but please do communicate these plans. Update lab calendar with vacation times (and please remind me the week before!)
9. Follow all rules when using facilities or resources outside of our lab.

10. Plan the use of fly stocks and pathogens many weeks in advance.
11. Make sure the lab is properly shut down and communicate before leaving.
12. Remember, things in science rarely go as planned - but this means that they often work out way better than planned. Maintaining a positive attitude will go a very long way in maintaining a welcoming and fun lab environment, and your broader professional career as well!

7 Lab Onboarding Checklist

- Biosafety Training (All modules)
- Room key and building card access form
- Provide photo for lab website
- Provide name and preferred pronouns for lab website etc.
- Emergency contact info. (see GitHub folder)
- Office space, bench, and pipette assignment
- Printer connection and VPN setup (contact Jason Brenner (jason.brenner@wisc.edu))
- Check with Elena or Chris on vacation time and entering leave (Postdocs and Research Assistants)
- Electronic accounts (will use UW email)
- Quartzzy
- Benchling
- Box
- Outlook HiteLab Calendar
- Outlook Planner and To Do
- Google Group (for shared sheets)
- GitHub
- Overleaf
- R (and R studio)
- Mathematica (primarily Graduate Students and Postdocs)
- Essential Reading List on GitHub
- If there are any particular accommodations that would make working in the lab easier for you, please chat with Jessica so she can make arrangements!

If you are working in the lab for course credit, make sure to fill out the volunteer form, send a copy to Jessica and upload a copy into your GitHub folder.

8 An Introduction to Flies

If you are new to working with *Drosophila* or bacteria, please go through the tutorials provided on the LabDocs section of the lab webpage. These documents are great resources to refer back to as your work in the lab progresses and you learn new techniques and try new experiments.

9 Rubbish Management

Autoclave discard bags: Remove bag, twist top, and bend over and wrap clear packing tape around the top to seal. The bags go in the MERI bins in the loading dock. Replace autoclave bag with new bag labeled HITE LAB.

Gloves: Non-contaminated gloves go in the blue glove recycling buckets. Full buckets can be emptied into box on the loading dock for recycling. We reuse the blue buckets.

Cardboard benchtop tip boxes: These boxes are designed only for pipette tip discards. When box is full, tape top closed with clear packing tape. Full tip boxes can be placed by either sink in the labs until there is room to add it to a autoclave bag. They cannot go into the MERI bin unless they are in an autoclave bag. New tip trash boxes can be found assembled on a shelf in 230 or unassembled on the bench in the loading dock.

Uncontaminated serological pipette discard boxes: There is an empty tip box in each lab room for these. When the box is full, tape closed with clear packing tape and place a green OK to trash sticker on it with name and date filled out. These can then go into large trash bin by elevator. Replace with new box.

Regular floor rubbish bins: When full, tie off top and place in large trash bin by elevator. Replace with new bag found in drawer S2 in 223 or on bench in the loading dock.

Liquid bacterial or parasite: Decontaminate with 10 percent bleach before washing down the drain.

Empty blue pipette tip boxes: Boxes are placed in autoclave tub in 230 by sink. The clear plastic in the boxes are recyclable and can go in the blue recycling container by elevator. Colored inserts are also recycled through a program with USA Scientific. Empty colored inserts go in empty pipette tip box in 235 for pick up by USA Scientific.

Glass rubbish: Glass that cannot be recycled goes in the cardboard box in

223 by fridge/freezer this includes broken glass as well. Small glass slides and capillary tubes can go in red sharps containers. Full cardboard boxes get taped up with clear packing tape and put in hall outside lab doors with OK to trash green sticker filled out on it. Replacement boxes are in 235. Full red sharps containers get capped and can go in or next to MERI bin on loading dock. New red sharps containers are found on loading dock.

Hazardous liquid waste: There are very specific containers for Halogenated and non-Halogenated hazardous waste. Please see paperwork and containers next to hood in 231. Some Hazardous waste requires a special pick up from Safety.

Dirty Glassware: Dirty glassware in 236 ('Main lab') goes in tub on cart by the sink. Dirty glassware in 231 ('Bacteria lab') goes in or next to sink. Glassware is cleaned in the dishwasher in autoclave room on program 4.

Empty cardboard boxes: Empty cardboard boxes go on top of blue mixed paper bin by the elevator.

Packing material: Some packing material can be recycled (look for recycling triangles). Some packing peanuts dissolve in water. All Styrofoam must go in blue bin in the Animal Science loading dock! Some shipping boxes with Styrofoam inserts can be returned to the company. Fill out flap on box top and place on table behind mailboxes with note for US Mail pickup.