Johnson Lab Philosophy, Guidelines, and Rules

(Modified from Strassman/Queller)

Principal Investigators: Loretta Johnson, johnson@ksu.edu,
office 785-532-6921, cell 785-341-9689
For other members of the lab, see web page, http://lorettajohnsonlab.weebley
For info about the Ecological Genomics Institute, see webpage ecogen.ksu.edu

Structure of research and learning:

1. **Lab meeting** time is set each semester, depending on everyone's schedule. We alternate between lab talks and discussing articles.
2. **Meet with Loretta.** I have an open door policy and am happy to talk any time. We will set up meetings once per week.
3. **Sign out on calendar** if you are going to be out of the office one or more days. This is a permanent record of time out of the lab, which Loretta keeps.
4. **Get shared information.** This includes shared files like plot maps, experimental designs, protocols.
5. **Undergraduate Research Forum in Biology**. All undergrads in the lab are expected to take part in this activity that takes place in April every year. Undergrads are expected to present at other University-wide research fora.
6. **University Graduate Student Research Fora.** All graduate students are expected to present in the annual fall EEB Graduate Students on Parade 4 min presentation, the annual Biology Research Forum that takes place in March every year, the annual University-wide Research Symposium, Research and the State, and 3 minute thesis.
7. **Attend national meetings.** At the national level, graduate students should go to at least one appropriate national meeting each year. Undergraduates may benefit from this as well. Travel funds are available through the College of Arts and Sciences, Graduate Research Council, and Biology Grad Student Association.
8. **Seminars** attendance is required: Friday 16:00 departmental seminar, Thursday 12:00 Ecology and Evolution seminar. The schedule can be found at:
   Url www.k-state.edu/ungererlab/EEBSeminar/EEB_Seminar.html. There may be other seminars of interest in Agronomy, Plant Path, or Biochemistry. You should attend at least one journal club per semester.

Philosophy:

1. Ask and answer big questions.
2. Research and discovery are really fun.
3. Do careful science, with controls, appropriate statistics, and alternative hypotheses.
4. Analyze your results in a timely fashion to immediately spot any questionable data points in a timeframe so that the data point or sample can get re-analyzed!

5. Finish your work through to publication in a timely but thorough manner.
6. Learn the natural history of your organisms.
7. Understand the history of your question.
8. Read and re-read the literature. You will take away different things from additional readings.
9. Learn new techniques, lab, field, genomics, cell biology, evolution, statistics, modeling.
10. Writing is essential; is best learned by doing it frequently.
11. Never lose anything because it was not backed up properly, daily in the cloud.
12. Everyone should be treated with dignity and respect.
13. People work best when they have a say in what they do.
14. Collaboration is synergistic and leads to great science.
15. Ask questions often; brainstorm with others on anything new.
16. Your time in this group is one of discovery. Make the most of it!

Guidelines:

1. **Read the literature.** You need to stay up to date with what is going on. Subscribe to tables of contents. Set up alerts on Google Scholar or Twitter for topics and journals that interest you, people's names, or whatever you like. Read the abstracts as they come in and read a paper or more every day. Collect your pdfs in a "references folder" in your dropbox folder that will be easily organized for writing papers and haring with Loretta and collaborators.
2. **Design careful experiments.** Consider alternative hypotheses. Run power analyses on dummy datasets. Do all the right controls. "To call in the statistician after the experiment is done may be no more than asking him to perform a post-mortem examination: he may be able to say what the experiment died of." Ronald Fisher. Go to our statistical consulting department to get advice especially in the early stages of experimental design.
3. **Visualize your hypotheses and your results effectively.** Become a master of clear figures, appropriate to the data and show distributions.
4. **Write your papers as soon as possible.** Getting your work done and out there is essential. The best plan is to write at least once a week, ideally every day. Write an introduction and methods before you begin and modify them as you go along. You should aim to publish at **LEAST** one per year as a first author, and perhaps one as a collaboration.
5. **Write up methods and protocols as you do them and share.** This is particularly important for undergrads and people new to the group, and will help with ultimate paper writing.
6. **Accept mentoring and be a mentor and teacher.** We all have a lot to learn and can do this by helping others and learning ourselves. Mentoring a student is a responsibility. Keep careful track of your students and ask us for mentoring advice.
7. **Ask questions all the time!** Remember the Star Trek quote: "I respect an officer who is prepared to admit ignorance and ask a question, rather than one who, out of pride, will blunder blindly forward" -Capt. Jean-Luc

8. **Be helpful.** You might know something that could be helpful to someone else that you realize before they do. Take the initiative and talk to them. Science is not a zero-sum game. Careers might be zero-sum because there are only so many positions. But even that is not a competition against your labmates. It's a competition against everyone and one of the best ways to compete is cooperative collaboration with your labmates.
9. **Learn new things.** Talk to other lab members and learn specific things all the time, whether they be techniques, approaches, or something else, planning active learning is always good. Take workshops regularly, either at the University or elsewhere associated with scientific meetings or stand-alone workshops. The college of Arts and Sciences has a generous travel grant program.
10. **Address authorship issues early.** Authorship in a collaborative lab group can be challenging. You should ideally be first author on work you lead and write. There can be ties and they should be discussed and resolved in ways fair to all. When in doubt, include someone as an author. Loretta has final say on all authorship issues.
11. **Talk to people outside our research group.** There are people outside our group who know things we do not know and they can help.
12. **Apply for funding.** There are funding opportunities available for all levels of researchers from undergrad to postdoc. Apply for funding whenever possible. Be sure to review any proposals with the group and to give them to Loretta with plenty of time for review. Grad students can apply for DDIG, GRFP and others. Postdocs can apply for USDA and NSF and others. There are also Sigma Xi grants at the chapter and national levels, as well as Kansas Academy of Science grants for grads and undergrads, Kansas wildflower society Bancroft awards and other society-level awards for grads and undergrads.
13. **Reach out to the public and grades K-**12 to excite them about science! There are plenty of opportunities for this—Science Café, Science on tap and KAWSE for middle and high school science programs, judge a science fair, among others.

Rules:

1. **Be safe at all times**. Stay up to date on safety training. Dress safely. Read equipment manuals and Safety Data Sheets. Do not eat or drink in the lab. Help others to stay safe by telling anyone immediately if they are doing something unsafe. Report any safety issue, large or small.
2. **Treat everyone with respect.** A friendly laboratory atmosphere is essential for productive, fun research. There are no stupid questions and everyone is deserving of support and help. Respect persons that a different from you and learn from their perspective!
3. **Benefit from the synergy of working when other people are in the group.** We do not want to tell you exactly what your hours should be, but they should overlap with normal business hours daily because cooperation and collaboration are facilitated in this way. If there are problems we will give you more specific instructions.

4. **Clean up after yourself and leave all areas neat and clean.** It is very important when working in shared areas that you do not leave a mess anywhere. Areas of particular concern are the balances, sink, the computer area, and other common areas. Samples and supplies should be labeled with your name and date.
5. **Do not begin a project without a careful plan approved by the PI.** This plan should be written and discussed with Loretta. The work should address an important scientific question, should show deep familiarity of the background literature, show through power analyses that the sample sizes will be appropriate, alternative hypotheses considered, and the methods are feasible. Play with the system to be sure you can do the things you want to do, but the project needs discussion and approval. This is crucial for avoiding problems in study design or inadvertent overlap among lab members. The design can take the form of part of the paper, intro and methods, for example, or a small grant proposal.
6. **Write everything in your laboratory notebook.** Your laboratory notebook should be a complete reflection of what you do in the laboratory. It should contain what you do, why you did it, and what you thought about the results. If you choose to do this using your computer, you must print out your work and put it in a loose leaf or other lab notebook at least once a month. Every page should be dated in a way. Scientific notation is day month year.
7. **Protect the integrity of your physical samples.** If you have collected plat material, isolated DNA, or have any other physical sample, make sure you have a list that includes where the samples are, -80 freezer room, -20 freezer, cold storage and location. Everything should be labeled carefully, with your name, date, and other information as specified for your material.
8. **All samples and lab notebooks remain in the laboratory.** Feel free to take a copy of sample lists, or your lab notebook, but originals remain with us. Lists of your material go to Loretta and to the lab server. When you graduate or leave the group, we should have physical samples and entries in the master database.
9. **Protect your data and writing.** You must have a clear, automatic back up system, at least daily, and off-site, including cloud back ups for data and Time Machine for computers, or equivalent.
10. **Pay attention to your email.** There are many ways of communicating. Use them to your advantage, but you must be responsible for anything sent by email. Loretta expects you to stay in daily communication by email.
11. **Do annual reports and update your cv.** Twice a year (at least), I will ask for an updated CV, a reflection on what you have done in the last 6 months and what you plan to do in the next 6 months. It is required that graduate students submit the annual report to the Division of Biology each January.
12. **Sign out for time outside the lab/office.** Let Loretta know in advance if you are not in the office on any day. Formal vacation policy for grad students is the following: You can take a **5 day** period (not including weekends) off in summer, as this is often a busy time for field and

lab work. You can take a **seven day** period off over Christmas and New Years break (not including weekends).

13. **Make sure that anyone you are mentoring is practicing good science and following all the rules and guidelines.**
14. **Its everyone's responsibility to observe ethical conduct rules in scientific research**. It is your responsibility to report unethical conduct.
15. **Name any file you send to Loretta beginning with your last name.**
16. **All abstracts, papers, posters, grant applications etc MUST be reviewed by Loretta before submission as you are representing the lab as a whole, not just you.** Allow AT LEAST one week for Loretta to review any text, longer if it is long document such as a paper or grant proposal. Please count on at least an additional week to provide time for co-authors to review. If the document is longer than an abstract, you will need to allow longer. You need to allow AT LEAST a week for a letter of reference.
17. **If you are attending a meeting or conference, plan on going for the ENTIRE time of the meeting.** It's a pity to not benefit from all of it!
18. **If there is a problem of any kind, or something you do not know or understand, let me know.** I am committed to making our laboratory an excellent place for learning and discovery.

Additional rules for undergrads:

1. **Minimum number of hours is 12 per week during academic year. Hours counted as paid must be on research.** You may not do homework, read material unrelated to the lab, etc or any such things while being paid by us. **Always be really sure you understand your project.** Research is most fun if you understand it, what the big question is, the specific question, and how the actual research will address it. Keep learning and research gets more and more fun.
2. **Take graduate courses if you can.**
3. **Participate in the Undergraduate Research Symposium in the spring, and plan to present an 8 minute talk on your research each semester.**
4. **Be on time.** If you have an emergency, let your mentor know as soon as possible, certainly before you are late.
5. **Tell us if you break or something goes wrong with your protocols and experiments.** It is a normal part of learning to break things and inadvertently something goes wrong. Try not to, but if you do, tell us immediately.

Additional rules for grad students:

1. **It is your responsibility to keep abreast of the requirements of your program.** This includes teaching assignments, required courses, timely committee meetings (at least 2 per yr), timely prelim exam scheduling, attending seminars and generally being a good grad student citizen.

2. **Work hour expectation. You are being paid through university or government funds.** Thus, it is the expectation that you should be on the premises **9am-5pm (at least!),** either teaching, in your office or lab doing research, or taking classes. Weekends should be used for keeping up on your research/classes, and also to have some fun and keep a balanced life! No outside jobs of any kind allowed. See vacation policy above.
3. **Learn how to mentor undergrads well.** They should have a big question, should learn a set of techniques and then be given increasing levels of autonomy. They should not watch you do stuff except for first time learning. Get advice from more senior people in the group. A second or third year undergrad should be working on a project they can do largely on their own. Do not take on a new summer undergrad if you are going to be too busy or gone to meetings.
4. **Figure out how to publish two papers a year, at least after the first 2 years of graduate school.** This is going to be challenging, but one can be something you take the lead on and the other can be something you help with. This is to your benefit. Always be alert to new discoveries or ideas that can lead to a paper. The more you write, read, and run statistics, the more quickly your research results can be transformed into a compelling publication.

Approval:

I have read this document and will ask questions if there are things I do not understand. I am up to date on all safety issues. I will treat everyone with respect.

Printed Name: _____ Date:_____

Signature: ____