



Jones Lab Manual

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written by
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Welcome to the Jones Lab! We're really pleased you've joined us and will do what we can to make your time in the lab amazing. We hope you will learn lots of new biology, chemistry and materials science whilst also developing new skills (presenting, data analysis, writing, latex), making new friends, and having loads of fun throughout the whole process. There are lots of fantastic opportunities for you to take advantage of in the group and also development and skills trainings hosted by the University - make the most of all of them! When you join the lab you are expected to read this manual (email Sam to confirm you've done this) and abide by its contents.

Disclaimer: This lab manual was inspired by several others (and borrows heavily from them) including Heemestra Lab Manual, Aly Lab Manual and Peelle Lab Manual.

1 Introduction

This lab manual is here to help you understand what is expected from you, in many aspects of your role, now you are a member of the Jones Lab. It should contain all the information you need however, it is also a work in progress so if you have any thoughts on things to add, or change, talk to Sam (Group PI). If there are any aspects of the manual you are not happy with, don't feel represent the group well or you don't think you can adhere to, come and speak to Sam and he will try and find a solution everyone is happy with.

2 Expectations and Responsibilities

2.1 Everyone

Science is hard. But it's also fun. In the Jones Lab, we want to make sure that everyone experiences a positive, engaging, hostility-free, challenging, and rewarding lab environment. To maintain that environment, we all have to do a few things.

- Work on what you're passionate about, work hard at it, and be proud of it.
- **Advocate for your own needs**, including personal and career goals.
- Support your fellow lab mates. Help them out if they need help (even if you aren't on the project), and let them vent when they need to. Science is collaborative, not competitive. Help others, and you can expect others to help you when you need it.
- Be independent when possible, ask for help when necessary.
- Be patient. Including with Sam. He will forget things you just talked about, and repeat some stories over and over.
- Communicate honestly, even when it's difficult. In the long run this will help you and everyone around you.
- Scientists have to be careful. Don't rush your work. Think about it. Implement it. Double and triple check it. Incorporate sanity checks. Ask others to look at your data if you need help or something looks off. It's ok to make mistakes, but mistakes shouldn't be because of carelessness or rushed work.
- If you do make a mistake, you should definitely tell your collaborators (if they have already seen the results, and especially if the paper is being written up, is already submitted, or already accepted). We admit our mistakes, and then we correct them and move on.
- We all want to get papers published and do great things. But we do this honestly. It is **never** ok to plagiarise, tamper with data, make up data, omit data, or fudge results in any way. Science is about finding out the truth, and null results and unexpected results are still important. This can't be emphasised enough: *no academic misconduct!*
- Respect your fellow lab-mates. Respect their strengths and weaknesses, respect their desire for quiet if they need it, and for support and a kind ear when they need that. Respect their culture, their religion, their beliefs, their sexual orientation.

2.2 Daily Things

- Be on time (or ideally early) for your meetings, group meetings and other commitments. If you are going to be more than 5 minutes late you should let your lab mates or Sam know. Respect that everyone has a busy schedule and that everyone's time is valuable.

- If you're sick, stay home and take care of yourself. Because you need it, and also because others don't need to get sick. If you're sick, reschedule your meetings for the day (or the next couple of days) as soon as you can. Let Sam know as soon as you can.

- You aren't expected to come into lab on weekends and holidays, and you aren't expected to stay late at night. You are expected to get your work done (whatever time of day you like to do it).

- Keep the labs tidy and follow the necessary safety rules for each lab. We are limited on the space available to us and by keeping your work area tidy you will really help us all out.

2.3 Principal Investigator

All of the above and:

- Have a vision for where the lab is going.
- Care about your happiness, and physical and emotional well-being.
- Give you feedback on a timely basis, including feedback on project ideas, conference posters, talks, manuscripts, figures, grants.
- Obtain the funding to support the science (and the people) in the lab.
- Support you in your career development, provide advise/guidance, including writing letters of recommendation, introductions to other scientists, conference travel, and promoting your work as often as possible.
- Support you in your personal growth by giving you flexibility in working hours and environment, and encouraging you to do things other than science.
- Make the time to meet with you regularly, read through your manuscripts, and talk about science.
- Listen to you, your concerns, your problems or anything else you want to discuss with me.
- Obsess over font choice, punctuation, and graphic design.

2.4 Post-docs

All of Section 2.1 & 2.2 and you will also be expected to:

- Develop your own independent line of research.
- Help train and mentor students in the lab (both undergraduate and graduate) when they need it - either because they ask, or because I ask you to.
- Present your work at departmental events, at other labs (if invited), and at conferences.
- Apply for grants. It's in your best interest to get experience writing grants - and if you get them, you'll be helping out the entire lab as well as yourself.
- Apply for jobs (academic or otherwise) when you're ready. If you think you'd like to leave academia, that's completely ok - but you should still treat your post-doc seriously, and talk to me about how to best train for a job outside academia.
- Challenge Sam when he's wrong or when your opinion is different, and treat the rest of the lab to your unique expertise.
- To have (or acquire) the technical and other skills listed for PhD students, below.

2.5 Ph.D. Students

All of Section 2.1 & 2.2 and you will also be expected to:

- Generate the data, images and results to produce a thesis (typically containing 3 experimental chapters) **within 4** years of starting your Ph.D. Remember that others in lab (especially Sam!) are there to help you when you need it
- Know the literature related to their topic like the back of their hand. You should be the expert on your research.
- Prioritise time for your thesis research. Coursework, training and lab demonstrating are important, but ultimately your research gets you your Ph.D. and prepares you for the next stage of your career.
- Seek out and apply for (after discussion with Sam) conferences, fellowships and awards (including travel awards, etc.).
- Generate data for and write papers. Remember Sam and your lab-mates can help you!
- Realise there are times for pulling all nighters, and times for leaving early to focus on you.
- Challenge Sam and others when they are wrong or when your opinion is different.
- Present your work at departmental seminars and at conferences.
- Be honest
- Be proactive
- Think about what you want for your career (academia - research or teaching, industry, science writing, something else), and talk to Sam about it to make sure you're getting the training you need for that career.

We are all going to be busy, and as a result meeting regularly can often be forgotten. Sam often has less time than he would like to spend meeting with members of the lab. However, the lab and its members are one of the most important aspects of his role to him and you can help him stay organised and involved in the things he needs to be involved in by following this manual and these general rules of thumb:

1. Be proactive - tell Sam what you need. This includes coming to knock on my door even if it seems like you are interrupting, emailing me to set up a time to meet, or catching me before or after group meeting. In all likelihood I will not check in with you as often as I'd like, so it is up to you to make sure nothing falls through the cracks.
2. Write things down and remind me what we've talked about. I would love to remember everything we decided when we met last week, but this doesn't always happen. Don't hesitate to bring me up to speed when we meet. Even if I already remember what we are talking about, a couple of introductory topic sentences will help get me in the right frame of mind. Be sure to write down everything in your lab notebook.
3. Read all of the lab documentation. You are responsible for knowing what is in each of them, following the rules and guidelines we have set up, and notifying someone if you find incorrect information (or if you have questions).

4.2 Sam's Office

Metaphorically my door is always open, but sometimes my door is, physically, closed. In these instances you should check to see if I am in a meeting. If this is the case, please either come back another time or if it is urgent message me on Slack or email me. If I am alone, feel free to knock, if I have the time I will gladly speak with you but to make the most of our meetings it is best to arrange them ahead of time. If I've got my headphones in, use the door bell to get my attention (it lights up on my desk so I know when someone is at the door - amazing!) *Note: Sam's typical working hours are based around taking and collecting his children from school/nursery and are usually 9:15-14:30 & 19:00-late, but this can vary.* There is no expectation for you to work during these (unusual) hours if they are outside your normal working hours, so feel free to ignore emails sent by Sam if you are not working but be prepared that you may receive some at odd hours.

4.3 One-to-One meetings

One-to-one meetings offer an important opportunity to go over the finer details of your research project but require you to be proactive about them. As mentioned above (Section 2.5), you are expected to self-advocate for your needs and to work independently. This includes scheduling meetings with Sam, coming prepared and following up on actions set during the meetings. On average you should expect to meet with Sam one-to-one (for 30-60 min) at least once every two weeks. Even if you don't think you have any new data make sure you keep arranging regular meetings, this is when you will need Sam's help the most.

4.4 Group Meetings

Being able to present your research is an essential skill and one that we practice regularly. Each week (Monday 10am) one lab member will present at group meetings. Group members are on a rota and should expect to present around once every 2 months. Group meetings are an opportunity for you to practice your presentation skills and should be prepared to a high quality. **They should take around 40 min and will be followed by questions.** Those watching the presentation should be ready to ask questions at the end as this is also an essential skill we all need to develop. We use a feedback form (found on the shared drive - one completed by each group member) to offer guidance and feedback on your presentation. You should use this feedback to improve your presentation for the next group meeting. As we are preparing you to give talks at international conferences each presentation should be prepared as follows;

1. There is a template to use on the JonesShare and previous examples from all group members to help you to prepare your presentation.
2. Your presentation should include a comprehensive introduction to your research area/topic/field including appropriate references.
3. Then an overview of your own personal research goals that is followed by a detailed overview of your past and recent findings, including relevant data and images.
4. Finish by concluding your findings and giving information on future experiments that you will conduct, to address what you have found to date.

5.1 Well-being

We are all here to grow as scientists, leaders, and people by pursuing ambitious research goals. However, that should never come at the cost of your well-being. Your mental and physical health are by far the most important consideration in all that you do while in our lab. Moreover, success should not come at the cost of maintaining your interests/hobbies or healthy relationships in your life. In fact, you are more likely to be successful if you take care of yourself and give time to the things outside of work that matter to you. Below are some general guidelines on well-being, but every situation is unique, and Sam is always open to discussion on this topic, so don't hesitate to ask.

5.1.1 Mental and physical health concerns.

If you are not feeling well, either physically or mentally, take the time off that you need to seek out help and take care of yourself. If you are struggling with depression or anxiety and wondering: Is it okay to go see a counsellor instead of setting up that reaction?? the answer is: Absolutely! Get the help that you need. If you have an acute situation that requires help, take the day (or a few days) off with no questions asked. If you are going to be out for more than a day or miss a group meeting, just give Sam a heads up so that he knows you are okay - no need to give details if you don't want to, it is sufficient to email and say that you have a 'personal health emergency'. If you need to take more substantial amounts of time off, you can work with Sam to facilitate this. Being an undergraduate/masters, Ph.D. student, or postdoc is stressful. We all care about you and are here to support you - just let us know how we can help.

5.1.2 Personal emergencies.

If you are a member of our group for multiple years, the chances that a life situation (or multiple life situations) will arise are fairly high. In these situations, the top priority is taking care of yourself and dealing with the situation. This can also happen to Sam so please try to be understanding. If possible, communicate with Sam to let him know that you are dealing with something and approximately how much time you will need off. You can share as much or as little detail as you feel comfortable with. These situations are inherently stressful, so also make sure you are taking care of yourself and getting help if needed.

5.1.3 Work-life balance

Being ambitious and working hard are part of our lab culture, but it should come from a perspective of driving yourself out of the fun of pushing your limits and exploring what you are capable of. The key is to know your limits. Similar to playing sports, you advance by pushing out of your comfort zone, but if you push too hard you end up injured and stuck on the sidelines. Managing your motivation and work habits while integrating interests and commitments outside of work is a key self-leadership skill that will serve you well throughout your career, and now is a great time to build that skill. You can get useful tips and advice on this from Sam, your labmates, and other resources (books, podcasts, etc).

*This section was adapted from Heemestra Lab Manual.

6 Communicating outside the Lab

6.1 Manuscripts

Rightly or wrongly the number (and quality) of manuscripts that you produce during your time in the Jones Lab will often be used to compare you to others. This becomes especially important when you start looking for your next role. As a (very!) rough guide, most groups you apply to would expect an average of one paper per year - **This is highly dependant on your project**, so don't feel pressured if you do not achieve this. It is important that the manuscripts we produce during your time in the group are of the highest quality and to ensure this, here are some general guidelines for preparing a manuscript.

6.1.1 General

In the Jones Lab we use latex to draft, prepare and submit manuscripts. This helps with version edits, formatting and will allow for simple inclusion in a thesis template (if needed) at the end of your time with us. There is a learning curve to Latex, start practising early and ask Sam and other lab mates with troubleshooting questions. We have a slack channel for asking Latex questions - use it! It is always faster to ask than try and figure it out yourself or by googling it.

Every manuscript (or revision) should be shown to all authors before submitting it, giving them ample opportunity to comment. Galley proofs (including references) must be carefully checked by at least 2 people (usually 1st and 2nd authors) and the corresponding author (usually Sam). There are always mistakes so ensure that they are found and changed. The corresponding author will have final say on submission of manuscripts.

Your papers should be free of spelling and grammatical errors. There is no shame in asking for help with this; your fellow lab mates are available to help and it is good practice for everyone to analyse and critic each others work. The best proofreaders will explain to you why things need to be changed so that you learn how to be a better writer, rather than simply correcting your writing. By taking time to clarify your writing early on, you will become a better writer, and also free Sam up to help you focus on the scientific content. If you send Sam a paper with grammatical errors or sloppy writing he will return it to you, which is annoying for both of you.

Manuscript Folder Organisation: In order to make editing and tracking modifications easy please use the following folder organisation system when preparing a manuscript. An appropriately named parent folder should be created on the JonesShare server (or Overleaf), within this folder you should have two folders; 1) Manuscript and 2) ESI. Within each of these is where you should have you latex file, folder of images, bibliography files and any other files needed for the file to tex. When we come to publish, the parent folder will also hold the cover letter and other supporting documents for submission.

6.2 Talks

We have a Jones Lab slide template that should be used for all group meetings and public presentations. It is important that this template is used for all public/conference talks as it allows work from the Jones Lab to be easily identified. Anyone giving a talk is required to give a practice talk to the lab at *least* one week before the real talk. If this is your first public talk on a lab project, plan on at least two practice talks (starting at least 2 weeks before the real talk). Practice talks should be mostly finished (final slides, practiced, and the right length) so that our comments will be as helpful as possible. Schedule one or more meetings with Sam ahead of time to plan or go over your slides, especially if you haven't given many talks before.

6.3 Posters

Anyone presenting a poster should circulate an initial version to all authors at least one week before the printing deadline. Use the lab Adobe Illustrator/Power point template (found on the JonesShare) so that our posters have a consistent look to them. If this is your first time using Illustrator, make sure to leave plenty of extra time so you can learn how to use the software. Make sure to double check the poster size and orientation for the conference, and the size of the paper or canvas it will be printed on.

7 Scientific Conduct

7.1 Data Protection

There are specific University guidelines that cover all manner of data protections. Protecting your data and ensuring it is not shared inappropriately is important. If your work generates data that can be used towards a patent application then it must not be shared outside of the group. There may be some instances where this is appropriate but each case should be discussed with Sam in detail before any information or data is shared.

7.2 Data Management

Managing your data is an important part of undertaking your research. We are responsible for storing data collected and making this data available to everyone (in most cases) when publishing. This means that you must have good data management in place from the moment you start collecting data. Hard drives (on personal computers and those connected to instruments) break all the time and this can cause a significant loss of data. Always ensure that you have appropriate data management in place to ensure there are back-ups of our work and never just leave them on the instrument machine. It is good practice to start organising your data into folders and ensuring those folders could be viewed by someone else and they still make sense. Using the original file name is not always appropriate in this case *i.e.* original NMR file names are not helpful. You can store data on the JonesShare if this is appropriate and the University system stores your personal desktop in "the cloud" so it can be accessed from other machines using your log-in details. Ensure that you are complying with data protection when storing your data.

7.3 Scientific Integrity

You have a responsibility to Sam, the institutions that support our work, and the broader scientific community to uphold the highest standards of scientific accuracy and integrity. By being in the lab you agree to adhere to professional ethical standards. There is never an excuse for fabricating or misrepresenting data. If you have any questions, or in the unlikely event that you have concerns about a research practice you have seen in the lab, please talk to Sam immediately.

It is also important that you prioritise the accuracy of your work while in the lab. Unintentional errors due to inattentiveness or rushing can be extremely damaging and produce results that turn out to be incorrect. Although there is always a pressure for a high quantity of research, it is critical that everything we do is of the highest quality. Please double-check your work frequently. In many cases multiple people will double-check a data set to ensure no mistakes have crept in along the way.

Anyone conducting an independent research project should have a lab notebook for keeping track of discussions, experiments, and taking notes. Keeping a well-organised lab notebook with clear images and writing will help when preparing manuscripts or if others need to follow a procedure you have developed. English should be used at all times when writing in your lab books to ensure everyone can read them. Lab books are provided by Sam or are available from the stores. Ensure that you date each page to track when each experiment was started, running and completed. It is also advantageous if your work may be patented to have each page signed by you and countersigned by a colleague. The important thing is that you are keeping notes, and they are in one place.

8 Safety

The Department offers safety training for all new members who will conduct work in both chemical and biological labs. This will cover the basics of safe working including appropriate PPE, information of risk assessments and COSSH forms (which need to be completed for every experiment and added to the JonesShare folder - see below) and safe working in the department. Every member of the Jones Lab must attend these safety training sessions **before** starting any lab work.

We take safety in the Jones Lab incredibly seriously. It is important that every lab member approaches safety with the same attitude. Everyone has the right to work in a safe environment and it is everyone's responsibility to ensure we are safe as a lab. Unsafe behaviour will not be tolerated and repeat offenders will face severe repercussions.

Risk assessments and COSSH forms need to be completed for **every** experiment you conduct and should be updated regularly. These documents are to be sent to the Royce safety officers (██████████) for approval before any chemicals can be ordered and the experiment can commence. This process is important but does slow down the time it takes to conduct some experiments. Ensure you are keeping on top of your Risk assessments and COSSH forms and get them submitted as soon as possible for approval. Examples and current documents can be found on the JonesShare.

Safe work in the labs starts with good communication and planning. We are a growing lab with limited space so it is essential that you work safely. Tidy up your workspace once you are finished and ensure that others can work in close proximity without being at risk.

The labs are always full of people each with different backgrounds and experience of working in such environments. If you see anyone working in an unsafe manner you have the right to stop them immediately. Do this in a nice way to begin with and clearly show them how they are working in an unsafe manner and then offer them help (if appropriate) to make it safe. This may be as simple as giving someone a pair of safety glasses, if they are not wearing any. If they do not stop the unsafe work or won't wear appropriate PPE, immediately inform the laboratory technicians **and** Sam. If you have any safety concerns talk to Sam as soon as possible.

Further information can be found in the Departments Health and Safety Policy here:

9 Deadlines

Being organised is essential when working in academia. This is essential because disorganisation doesn't just hurt you, it hurts your collaborators and people whose help you need. When it comes to deadlines, tell your collaborators as soon as you know when a deadline is, and make sure they are aware of it the closer it gets. Don't be afraid to bug them about it (yes, bug Sam as well).

- Give Sam at least one week's notice to do something with a hard deadline that doesn't require a lot of time (e.g., reading/commenting on conference abstracts, filling out paperwork, etc).
- Give Sam at least two weeks notice (preferably more) to do something with a hard deadline that requires a moderate amount of time (e.g. checking posters, a letter of recommendation).
- If you want feedback on research and dissertations, or other work that requires multiple back-and-forth interactions between you and Sam before a hard deadline, give him as much time as you can; at the very least four weeks.
- For manuscript submissions and revisions (i.e., which either have no deadline at all or only a weak deadline), send drafts to Sam as soon as you have them, and bug him to give you feedback if he hasn't responded in two weeks - papers are important!

10 After the Lab

When it comes time for you to leave the lab we will be sad to see you go but you will always be a Jones Lab alumni and we can and will support you in your future endeavours. There are a few things that you will need to do when you leave to ensure that knowledge is retained and data does not get lost;

10.1 Leaving Responsibly

- When you leave you will need to clean up your lab space, throw away any unnecessary or no longer useful samples and collect together all samples that are useful.
- Place useful samples in an appropriate container (ensuring each is labelled clearly!) and store in an appropriate location, which you should let Sam know about.
- Collate all your useful data into one place (memory stick, hard drive, JonesShare *etc.*) and have a very clear file naming system that Sam or other group members can navigate through easily.
- All your lab books must remain at the University and should be collected and given to Sam. You are welcome to take scans or pictures of your lab books but the physical book has to stay here.

10.2 Recommendation Letters

It is part of Sam's job to write letters of recommendation for people in the lab. Please give him as much notice as possible, and make sure he knows the deadline, format (electronic? printed?), official name of the organisation, what you are applying for, and so on. Please also send along a current CV. If you are an undergraduate, I will write your letters on my own. For more senior lab members, I will also write your letters on my own, but please send me a draft of the letter (which I will extensively modify). The first few times you do this it will probably feel awkward. However, keep in mind that your goal is to make it as easy as possible for a letter writer (in this case, Sam) to complete the task by the deadline and without error. Even though Sam will re-word a lot of the letter, it will still have the name of what you are applying for and details regarding how long he has known you, the projects you have worked on, and so on. This is extremely helpful in jogging Sam's memory and will give him more time to focus on saying good things about you. Don't worry about being too 'braggy'; Sam has no problem toning things down if need be. Like everything else, communication is key, and when in doubt, ask!

N.B. Group Song = 'Try Everything' by Shakira