

Lab Manual

This lab manual lays out general expectations and a code of conduct for the members of the Scholz Lab. It is an evolving document: Please talk to me if anything is unclear or you feel it should be changed. However, as a member of the lab I expect you to abide by the expectations and guidelines laid out in this document, unless explicitly discussed with me.

Onboarding

Trainings

- Lab Safety training
- Laser safety training
- SAP training

Get these things

- A computer
- Lab notebook [Click here to set it up](#)
- Access to office and lab space

Sign up for

- Access to lab server(s)
- Put info on [lab contact list](#)
- lab mailing list (try sending email to mail2nif@caesar.de and see if you get it.)
- Lab calendar (add your birthday so we can celebrate! Monika will add you)
- lab [Github](#)
- [Zotero account](#) (reference manager) and get added to journal club library

Read

- The Lab manual

Research

Finding a project

Finding and developing a project is an ongoing task and projects evolve very fast. Depending on our initial discussions, you might start out with a very narrowly defined project that is essential to the lab. As you become more familiar with the lab and an expert on your domain, you will start to develop creative ideas. I will always be happy to discuss your thoughts in our individual meetings.

If we move forward with an experiment, project or collaboration depends on a few things: Is the project in the triad of science: original, important and interesting? Does the project fit into our scientific mission or is it a distraction? Do we have funding for this project and if no, can we acquire some? Will this project benefit more than one member of the lab? What is the expected timeline and does it fit with your career timeline?

Postdocs will develop a project idea with me, and I will guide you to find a project that meets these goals. For graduate students, your project will typically start with a project developed by me, but you will be able to make your own creative contributions as you become more independent. Lab technicians, staff and undergraduates will generally be working on projects led by graduate students or postdocs, but I will ensure that you will have an appropriate amount of ownership and independence within these bounds and as requested by you.

Publications

Publications are the bread and butter of our profession: A paper represents the thorough summary of many years of work, and should add to the existing literature. I find it helpful to write the outline of a potential paper as soon as a project has some actual data and about 1 figure. At this point, writing the outline helps to identify gaps in the argument and missing experiments.

Generally, the process of a manuscript will look like this:

1. * Rough outline in bullet points
2. * Early draft with rough figures and citations
3. * Edited draft (expect ca. 5 rounds)
4. * Edited draft with polished figures and citations
5. * Final draft after co-author comments
6. * Preprint
7. * 1st Submission
8. * Revision/Resubmission (repeat as needed)
9. * Proofs
10. * Publication

Writing

Once we are ready to write, we will create a designated shared folder where all pertinent info should reside. If we write in latex, we will use [overleaf](#) as a shared latex editor. I expect the project leader (first author) to write the first draft. Typically, there will be multiple rounds of back-and-forth edits. Once we have a final draft, we will send it to the lab members and any external co-authors for critical reading. You and I will incorporate the comments. Always use track changes or labelled versions (overleaf) when editing. Expect figures to be changed frequently as the text evolves. Please make sure that your workflow allows flexible remaking of figures (i.e. do **not** manually create the figure. Manual steps should be limited to very minor changes that are hard to write in code. This will also help with revisions.)

Starting to write a paper is a daunting task. I am aware, and still want you to give it a shot. In the beginning, most of your draft will be edited. I will ask you to sit with me as I edit to explain my editing choices to you. Learning to write is a core part of your training and you can only learn it by writing.

Submission

We will identify reviewers to suggest. Generally, as corresponding author I will write the cover letter, submit the manuscript and keep you informed of reviews. When reviews come in, we will discuss revisions and make a plan for textual and experimental revisions. As a postdoc, I want you to be involved in this process and might ask you to write a draft cover letter and/or submit with me.

Conferences

We will aim for attendance at both local and international conferences. Generally, I will prioritize meetings I know the quality of and that are a good fit for our labs profile. If you find a conference and want to go, we can decide together based on your current research and the required funds. All students and researchers are encouraged to apply for travel funds if you are eligible.

Open Science and Data management

I am committed to sharing reagents, code and other insights from our lab with other researchers. As a standard for submission, we will prepare a folder with all the data underlying the paper and ideally also the code used to generate the figures and submit it to an online repository such as OSF. If this is infeasible due to the size of the data, we will seek out storage options within Max-Planck.

To this end, and to make our science reproducible, it is very important to manage your data. Data should be stored with clear labeling, ideally redundantly, such that understanding the exact conditions of a recording or experiment can be done by someone who is not you.

Authorship

Authorship on a manuscript is both an honor and a responsibility. All authors stand with their name for the content of the manuscript. As such, you should carefully read it and ensure that it is both scientifically correct and no mistakes are made. To avoid conflicts, we will discuss authorship early and often throughout the development of a project. If you have concerns about your or another persons authorship, please bring them to me early. I will lay out the general rules about authorship below:

No role in the lab, no matter how short or long or what your job title is precludes you from authorship. If you are an undergraduate that adds a vital measurement for a paper, you will be an author.

To avoid conflicts about first authorship, all projects will have a designated project leader, typically a graduate student or postdoc. They will be the first author of any resulting publications from this project. The first author is expected to assemble all the data and write at least the first draft of the publication. The first author is also expected to lead the revision efforts, should they be required.

I will be the last and corresponding author, unless we decide on a specific exception.

Leaving the lab

With increasingly long times between first submission and paper acceptance, I do not believe it is fair to require you to stay in the lab until a paper is published. However, I strongly prefer to have a preprint of your paper submitted or ready to submit before you move on. During journal submission, I will ask you to participate in necessary revisions as possible from your new position. If another lab member is contributing substantially in the revisions, they will be co-first author.

Communication

Mentorship

My goal as your mentor is to ensure that you get the necessary training for your career goals while being a productive member of the lab. Please share your ambitions and goals with me, so that I can help you get the training that you need for your career steps. While you are a lab member, my goals are to

- train you to be a solid experimental or computational scientist
- provide you with guidance, opportunities and recommendations letters to further your career
- give you credit for your work and promote you in my talks
- encourage and help you to publish your work
- create a lab environment where you are welcome and can work productively

In the lab

Your discoveries, setup improvements, and reagents should be shared freely among lab members.

With collaborators

We will share reagents and information related to the collaborative projects with our collaborators. If you are unsure, please ask me before providing sensitive information or reagents to our collaborators.

With outsiders

We are happy to share our advances with the world, but there are two considerations before sharing reagents and results with the outside world: We need to ensure that any information, data or reagent is verified and we are sure that it works. Otherwise we might get a reputation for sloppy work! We also want to finish projects that are in the works and have some protected time before allowing others to build on our advances. For this reason, if you are unsure if information is sensitive, please ask me before sharing it with other scientists.

Using social media

Twitter

Community

Science is a community of people and part of your training is to appreciate and recognize other people's work, engage with them and be exposed to other approaches, reasoning. In summary: I want you to develop a 'taste' in science. These days, there is a vibrant community of scientists on twitter. I encourage you to seek it out. It can also be very helpful to get a quick sense of the direction a field is heading. Take care though to separate the `loudest` voices from actual true paradigm shifts.

Promotion

Given the amount of papers published each day, it is near impossible to keep up. One way we publicize our research is via twitter. We will promote our preprints on twitter using paper threads (essentially a lay-mans few tweets version of a paper with a few striking figures/panels). You can be as involved as you wish in creating these threads for your papers.

Slack

There are slack communities for each career stage. While they are usually dominated by scientists from the US, some advice and information can also be relevant to you. For example, Monika got a lot of information about job applications on `future_pi_slack`.

Engagement

Outreach and public engagement are part of our mission as scientists. I encourage you to find venues to talk about your science to the public, and practice these kinds of talks in front of the group. I only ask that your time spend on engagement is in line with the goals of the lab and your career goals as discussed with me.

Caesar has a school lab, which we will participate in. Please add other possible science outreach opportunities in our area as you find them.

Logistics

Roles in the lab

Generally, labs have people in different stages of their training. It is important that everyone is allowed to thrive in the lab environment and all lab members are appreciated for their contributions. In very broad strokes, most labs have these roles (in rough order of their typical length of stay):

Technical assistants/lab managers TAs and lab managers are the people who know how stuff works. With their long-term outlook, they tend to be specialists both scientifically, technically and and

in dealing with the administration. Their roles often include record keeping in the labs (chemical, strain and plasmid databases) and general ordering of lab consumables.

Postdocs Postdocs are often aiming to become a PI themselves. Their goal is to establish themselves as leaders in their field. They will focus on publishing fast and frequently, ideally with a project that is appreciated in their field. Visibility is important, so they might attend more conferences and give talks in many different universities. Postdocs are expected to be mentors and role models to younger lab members.

PhD students PhD students spend a long time in the lab. At the end of their PhD, they are expected to be experts in their subfield. They have less pressure to publish than a postdoc aiming for an academic career path. The first year is often spent reading and learning. Their longer residence times can make them the knowledge reservoirs in labs without lab managers or permanent positions.

Masters students Masters student who write their thesis tend to have between 6-12 months to spend in the lab. Their focus is to finish a thesis. The projects tend to be a bit narrower and often more technical than a typical PhD or Postdoc project.

Undergraduate/postbac researchers The goals of undergraduate researchers and the duration of their stay can be very diverse. Often they to gain research experience before embarking on a PhD or an alternative research career. Depending on their goals, projects can be either independent or in close collaboration with a senior lab member.

Day-to-day

Behavior

The lab is a shared space, and as such I ask you to be mindful of your lab members. Please do not play music unless agreed upon by all lab members. Talking is encouraged, but if you are planning a lengthy conversation when others are working, please book a meeting room or find a spot in the building.

Rules of courtesy also apply for reagents and resources: Please do not remove tools or reagents from a bench without permission, and return them when you are done. Rules for behavior in the lab are also spelled out in the book 'At the bench' by Kathie Baker which you can borrow from me.

One of the perks of academia is a flexible schedule. However in the spirit of collaboration, I ask you to be present in the lab in the core hours of 10 am-2 pm if possible so that all lab member can interact. Please discuss exceptions with me.

The lab is an international environment, and as such our working language is English. As we have lab members from different cultural background, please be respectful and inclusive.

Mistakes

Mistakes happen. It is however important how we handle them. If you do make a mistake that alters a result, please let me know immediately, Do not try to hide a mistake! We will discuss how to fix it together. If it is something that happened due to structural or organizational issues in the lab, please mention that to me so that I can alter such issues. I'd always rather have you come to me early than

having to retract a paper or result we have publicized.

Weekly

Meetings with Monika

Depending on seniority, we will adjust the frequency of our individual meetings. The goal of our one-on-one meetings is for me to help you with your projects, remove any administrative or logistic roadblocks and to regularly discuss your career progression. This is your protected time with me. I ask that you bring your lab notebook or digital notes and that you take good notes during our meeting.

group meetings

We will have weekly group meetings, for now capped at 45 min. These are intended to briefly discuss lab issues, and typically to discuss one persons project in depth.

journal club

We have a weekly journal club. The reading should be new papers or preprints in our field. Its goal is to get everyone up to speed on the nomenclature and current literature. We will have speed-clubs where everyone will present the gist of a paper in 10 minutes, and traditional journal clubs where 1 person presents and we discuss the paper in depth. The schedule is on the lab calendar.

Code

Please regularly commit your code to the lab git (atomic commits). At the end of the week, clean up your current stash and commit any remaining code. Spend some time going through your weeks work and comment it. Regularly push your work to the [lab github](#). Resources for learning git can be found in the [Reading List](#).

Lab notebook

Your lab notebook is your place of documentation. It should be clear and thorough and allow me and other lab members to understand what you have been doing. On Fridays, make sure all your notes are finalized. Print or add digital copies of plots and pictures, update protocols you have improved.

Backups

At the end of the week, I want you to ensure your data and code are backed up. If you are unsure how, ask me.

Google Friday

Based on [Richard Hamming's talk](#) on research productivity, we will have 'google fridays'. He says:

“ I favor heavily what I did. Friday afternoons for years - great thoughts only - means that I committed 10% of my time trying to understand the bigger problems in the field, i.e. what was and what was not important. I found in the early days I had believed `this' and yet had spent all week marching in `that' direction. It was kind of foolish. If I really believe the action is over there, why do I march in this direction? I either had to change my goal or change what I did. So I changed something I did and I marched in the direction I thought was important. It's that easy.”

I want you to take that time to be creative: Read outside our narrow focus, try a crazy experiment, prototype something. My only request is that you present it in our occasional 'Google Friday' group meetings. This would also be the time to learn something new, or - as Hamming did- think.

Ethics and Safety

We will discuss ethical conduct and safety at our onboarding meetings and at our lab retreat.

Offboarding

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