

Some General Considerations on Choosing and Maintaining Your Next (PhD) Position - A Quick Reference Guide for MoBi Students

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Dear MoBis,

in this document we aim to provide some guidance and to point out some resources which we personally found useful or wished to have received before choosing an internship, Master Thesis or PhD position. That also means that this little ‘editorial’ is by no means perfect nor comprehensive and you probably read this best with a grain of salt. Just feel free to pick what works for you.

MoBi | Alumni | PhD | Guide

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Before you apply for a PhD position

Before you get busy with applications: self-reflect and honestly ask yourself whether a PhD is the right choice for you and, if so, why exactly? There are some of us who wanted to do this since they were kids but some still opt in for a PhD because they see few other options. There are plenty! The MoBi master gives you a unique opportunity to explore some of those and it pays off later if you explore a bit in this stage. Think of each internship as a hypothesis to test what you want to do later on. Depending on what motivates you (opportunity to learn, to teach, to perform unique research, better career options later on etc.) very different kinds of PIs and lab dynamics might suit you better. Starting a PhD without having your expectations clearly set and without asking your peers and/or prior supervisors for advice can lead to a ‘PhD crisis’ later. That said, don’t just do it because everyone else is doing it or you got rejected for the two entry-level positions in industry you applied for during your master thesis. Don’t use the PhD to ‘buy some time’ to avoid making the decision what you want to do with your life. It doesn’t get easier afterwards if a PhD is not what you truly want. Still want to do it? Great! Here are some tips how to narrow down your list of potential labs.

Part I - How to pick a lab?

In the following we’ll walk along some references worth reading and sum up what we got out of it:

Barres, B. a. (2013). How to pick a graduate advisor. Neuron 80, 275–279. Ben Barres also gave an iBiology lecture on YT on the topic, which covers exactly the same content. Two distinct skill sets to look out for in your

prospective advisor: (i) scientific ability and (ii) mentoring ability.

Odom, D.T. (2013). How to evaluate a graduate studenthip, or choosing the right doctoral advisor. Genome Biol. 14, 114. Duncan Odom (now at DKFZ) has a refreshingly blunt style, sometimes with a good dose of cynicism, and provides us with survival strategies for the academic career path. In this comment he gives advice on how to evaluate your prospective graduate lab and advisor **before you sign a contract**. Although some of the advice seems to be a bit strict he is absolutely right with his metaphor: If you decide to cross the Sahara desert with a car, you would ask a mechanic to check it before you buy it. Since, the biggest single influence on your successful training as a researcher is likely going to be your advisor, you better check.

He distinguishes between established labs and junior group leaders:

1. Established labs
 - 1.1 Check the history of the lab (e.g. via a web search and by asking alumni and members of the lab):
 - 1.1.1 How many people have accepted PhD studentships in the past if they were offered one?
 - 1.1.2 Did they all publish first-author papers somewhere?
 - 1.1.3 If not, who did not publish at all, and what fraction of the initially accepted students does that represent?
 - 1.1.4 How many students left the group, successfully and otherwise?
 - 1.1.5 Where did they go?
 - 1.1.6 Why?
 - expect to more or less have the same experience when you decide to join the lab
 - brief note: check if the alumni of the lab and there current positions are listed on the webpage. If not this can be a bad sign (= the PI does not care that much about it).
 - 1.2 What and what not to look for
 - 1.2.1 Avoid certain character traits (rather obvious): conflict avoidance, being a bully, having an unstable temper, overt narcissism, passive-aggressive patterns, unprofessionalism (getting

wasted at your local beer session), crippling insecurity, excessive perfectionism, a damaging history of playing favourites. As Duncan Odom rightfully points out - do not demand perfection here, **just look for survivability**. It is a spectrum. Just be aware and make a decision based on 'data'. Snieder and Larner 2014 write about the "perfect advisor": "The professional has ample time for you, reads your manuscripts promptly, gives adequate comments, motivates you, and combines the roles of coach and evaluator in an admirable way, and is thrilled to see your ideas forge ahead of hers." This utopic combination of traits will probably never be reached in a single person but still can be useful as a framework to guide your decision.

1.2.2 In terms of "big shots": How much time does your prospective advisor spend travelling (conferences, meetings, multiple labs, collaborations, family abroad,...)? You can get a feel for that asking members of the lab. Don't expect efficient supervision during the time the advisor is travelling. We are all just humans

1.3 Lab dynamics

1.3.1 Lab size: if you depend on direct interaction with the PI, labs with more than 6-10 people become really difficult. Supervision tends to get cut.

1.3.2 Is there (i) a sufficient and constant output of papers and (ii) is it spread evenly across the lab members. Are some people favoured? Are just a fraction of the members recurring as authors? Ask yourself how high are the chances that you are going to be an author yourself in that case.

2. Freshly established labs

2.1 Since there is not much track record yet, you should ask the PIs **what kind of lab they intend to build**.

2.2 How many people do they intend to have in the lab in five years?

2.3 In what roles?

2.4 Why?

2.5 The reason to ask this is that you can spot those senior postdocs who thought these issues through - that increases your chance that this actually happens.

2.6 **In general young PIs can be an excellent choice:** (i) they need papers so your interests in publishing are exactly aligned. (ii) They tend to have way more time to directly teach and mentor you as a senior PI with a 'factory' of a lab.

Further Reading

Odom, D.T. (2014). **Survival strategies for choosing the right postdoc position. *Genome Biol.* 15, 107.**

This piece is mostly aimed at postdoctoral researchers and how they can form and establish the careers they want for

themselves. Although, it is worth a read already at the PhD or Masters level to get a feel for what potentially lies ahead and to develop a clearer picture of what one wants. The author covers (i) if a postdoc is the right career choice for a person, (ii) how to personally define success, (iii) when to choose a lab for a postdoc, (iv) characteristics to look for in the host lab, (v) the lab size and (vi) the lab stage.

Alon, U. (2009). How To Choose a Good Scientific Problem. *Mol. Cell* 35, 726–728.

This is a short but very nice essay on what makes a good scientific problem/project to work on given a certain time frame and taking into account the skills and interest of the researcher (e.g. the PhD student).

Alon, U. (2010). How to Build a Motivated Research Group. *Mol. Cell* 37, 151–152.

Needless to say what is covered. Informative read, maybe pass it to your PI with a twinkling eye if needed.

Part II - What to keep in mind, once you've decided for a lab

What do you get in exchange for your time? - negotiating your pay or other benefits.

There are a some topics which not only apply to PhD fellowships **but also for internships** etc. **One of the things we rarely talk about in science is a decent salary.** The topic how the number on your paycheck actually comes into being for most professions is rarely discussed in academia. Bluntly said, we are expected to be driven by passion and curiosity and not to ask mundane questions about money. In most professions this is not the case and the salary level was heavily negotiated over time by trade unions and employer parties with the result of today's collective agreements. That said, we do not ask you to go on strike immediately, but we want to stress that this process never happened in science for historical reasons. The result is today's arguably poor or even no salary for interns (and even some PhD students, e.g. in the humanities). On the contrary, in the non-academic tracks of vocational training a fair salary is paid starting from day 1.

Why are we telling you this? Because we want to encourage you to think about your salary, or any other reasonable expectation you may have for your next position, from a different perspective: Although it is noble, exciting, fulfilling and important to have a genuine curiosity and interest in science, what does it tell you about the expected value of the produced results and evidence obtained if not even the minimum wage is paid for that work? The salary in most professions with way lower requirements is much higher. Not to say that these are is not equally important professions, but is this the reason you have invested so many years into your studies and training?

But it is how it is, **who am I to claim more and try to change that?** Well you're still kind of in a lucky environment. Most researchers are open to reasonable arguments and although they most likely cannot pay you an industry-style salary, they may have funds to put you on a HiWi contract during your internship or master thesis simply if you talk

to them (actually many people are on such a payroll - **ask your colleagues**). If you can, ask other people who have been working in that institute or group if they got paid and how much.

Of course there are other things, most importantly effective supervision and high quality training in sophisticated techniques, you may get in exchange for your time. Even if this is your main motivation and you do not expect any additional, even minimal, compensation you still should take measures to ensure that this is going to happen. Good supervision and training take time and effort and not all supervisors are willing or capable to spend it (this takes surprisingly much of your supervisor's time). Ask your PI or supervisor, what exactly you are going to do and learn during your internship/thesis. Since we are talking about science he or she most likely cannot say that with 100% certainty but from the response you can tell if your supervisor thought these issues through and if your learning outcome is 'on his/her list'. Moreover, you implicitly communicated that you are aware and that you are not just here to work for free.

If your supervisor asks you why you think you should get paid, one argument could be that you put a lot of effort and care in the proper conduct of the work you perform with them, **but mostly for them**. Although you will learn from them, **their research will benefit from the work the most** and, although this is rarely said they actually depend on the 'internship-workforce' as a whole. You could also ask how they themselves would think about the value of their work if they don't get paid for months. If that is the case, is this research project really a good idea to follow through? **Most people are good and in general on your side** so don't be demanding just friendly negotiate with care and good arguments. Also it goes without saying that this should not be the first or main topic of the job interview - but still it is fair to mention it and you have every right to negotiate.

Another argument for getting paid could be that research groups invest huge amounts of money in devices, kits, labware ect. The hardware is just one prerequisite for conducting research, personnel is another. For a sustainable high-quality research output of the lab (which is the main concern for most PIs) the personnel also needs to be maintained to work properly - **in the form of guidance, training, and yes also salary**. Moreover, you could say that without this basic support you would need to take up a part time job to cover your costs of living. Since you are a human being with a limited budget of resources and energy: Do they really want to suffer your work in the lab because you have to wash the dishes at night and on the weekends?

These arguments do not only apply for internship positions, you could also use them to negotiate your PhD salary. Most of those are fixed but some schools leave some leverage. For instance, we are aware of a case at the Max Planck Munich in which the student also had offers from EMBL in Heidelberg and another renowned university. In that case the PI negotiated with Max Planck to increase the salary in order not to lose the good student to the other institutions. This brings us to the last point of this topic: if you can it is always

a good idea to have more offers than you need to have some leverage and if you happen to have acquired a skill which is high in demand you could also use this to negotiate.

Finally, if your prospective PI/employer is not open to your concerns, no matter if they are a higher salary, the allowance to attend conferences or courses, etc., take your time and carefully think through **if this is the person you want to be dependent on for the next years** and in this crucial stage of your career.

In case of conflicts.

- (i) be humble and reflect. Are you stressed, is your supervisor stressed and is this the main cause of the conflict? What are the underlying and justified causes of the conflict?
- (ii) directly talk to the people involved and try to resolve the issue. Also keep in mind that most people are good and that most conflicts arise due to a lack of communication and differing expectations - identify them. .
- (iii) if that does not work go on to the next level in the hierarchy: ask your PI for a heart-to-heart chat to resolve the issue.
- (iv) only if that does not work: every larger institute has an ombudsperson. They are there for a reason - contact them. If you don't do anything about the situation you effectively accept it as it is. It is your career and **you will be held accountable for it in the end**. Importantly and as already mentioned above, your bosses are also just humans so also use your common sense if a situation is normal and you should just take it with a smile or if it really is an issue.
- (v) Lastly, if nothing seems quite right in your current position **you can always change that by switching projects, groups or even jobs**. This is something which should not be done lightheartedly but absolutely no one is to blame for quitting a position. Don't suffer in a job you hate going to every morning for years. If this decision is well reasoned such a move is actually brave and for many people turned out one of their best decisions they made.

A note on work-life balance.

no job in the world should be bad for your health - don't burn out. It is very noble and worthwhile to do your share but, like it or not, some things are just beyond our control. If you break yourself while trying to change the unchangeable in the end no one is going to benefit from that. The least yourself and the people you care about the most (see Further reading on the topic below). *unnecessary to mention that we are human beings with human needs - go out, exercise, make and meet friends, engage in something you truly value, sleep enough, meditate...you know all that stuff the self-help books are preaching from the book shelves...

Further Reading

Evans, T.M., Bira, L., Gastelum, J.B., Weiss, L.T., and Vanderford, N.L. (2018). Evidence for a mental health crisis in graduate education. Nat. Biotechnol. 36, 282–284. (2019). Being a PhD student shouldn't be bad for your health. Nature 569, 307–307.

Antes, A.L., and DuBois, J.M. (2018). Cultivating the Human Dimension in Research. Mol. Cell 72, 207–210. Should we steer clear of the winner-takes-all approach?, Nature 554, 367-368, 2018

Being stuck.

if you feel stuck at any point you can always consider your local career service. These people's job is exactly to guide people like us along our paths through the high-competitive academic environment. Heidelberg university has such an office as well as the DKFZ, of which the latter has an excellent reputation in counseling young professionals. Furthermore, talking to mentors or simply to other students may help you a lot - don't suffer alone. This is the stage where it pays off the most if you have taken care of your network.

All is not lost.

Lastly, don't get frustrated or over perfectionist in searching for the perfect PhD position ("Have no fear of perfection - you'll never reach it." Salvador Dali). Although academia is far from a fair environment (as of 2020, it is also about all of you to make gradual change about that if you believe that is necessary!), for your own sanity still try to see the unique opportunity to do curiosity driven research and enjoy the academic freedom you have during that time. Science is an amazing thing.

The author has a strong tendency towards cynicism but still it is very much worth the time thinking his arguments through to get a glimpse of if you still can and want to manage the research environment during years of "rainy days" without falling into depression.

Meckenstock, R. (2018). Wie macht man Karriere in der Wissenschaft (Springer Spektrum).
 Similar to the above but in German and quite recent.

Further Reading

Some more references we did not go into detail here but which may be relevant for some of you. The books should be accessible online or via the university library:

Snieder, R., and Larner, K. (2014). The Art of Being a Scientist.

Nice guidebook on what the scientific career is, how to define 'success' and how to be successful as a scientist. Covers quite a lot of topics and teaches the tools of the trade for independently formulating research questions and turning them into projects. Also covers topics like publishing papers, writing grants and time management.

Bennett, D.J., and Jennings, R.C. Successful careers beyond the lab.

Beside that it should have been awarded for the absolute worst cover ever designed, the content is actually quite nice. Lots of comments of people who left academia after their PhD (tailored to the UK). This is an interesting read for those of you who are not quite sure if they want to pursue an academic career and who want to get a more specific idea what that potentially could mean (as "industry" is often used as a synonym for "everything else besides university").

Feibelman, P.J. (2011). A PhD is not enough! : a guide to survival in science (Basic Books).

Already a classic. One of the first accounts for the necessary soft skills and pragmatism to survive academia.

Mülhardt, C. (2013). Der Experimentator Molekularbiologie Genomics (Springer Spektrum).

Part of a German hand book series on how to think about and conduct experiments. Generally recommended but in this context the last chapter (p. 269 ff.) is worth reading.