

PhD expectations

A PhD is a personal endeavour, for a personal degree. However a PhD within our lab is also about joining a community and working under the guidance of a supervisor. As your supervisor, I have some core expectations that apply to everyone in the laboratory: honesty, kindness, responsibility, leadership and teamwork. These are the key values:

	Successful scientists...	My expectations...
Honesty	A scientists' reputation is their career. A reputation for honesty and integrity is essential. Your reputation also reflects on all of those around you.	Honesty. Scientific fraud is a pathway that begins in small steps. Fudging the truth about an experiment that you didn't run or messed up. Being afraid to fess up to a mistake. Shifting over a control from one experiment to another where that control didn't work, but you think it would be the same. These small steps escalate to the point where only full fraud escapes discovery, until it doesn't. The only way to avoid is to be scrupulously honest from day one. Never fudge data. Never hide experiments. Never plagiarise text. Never manipulate graphs.
Kindness	Unfortunately, too many scientists forget that being critical and kind are not mutually exclusive. A reputation for kindness and generosity does make you someone that others will want to work with.	We have a special environment where trust and teamwork thrive. We can only keep that by always valuing kindness. The lab needs to be a safe space for people to make mistakes and learn. Try to be kind when being critical, apologise when you offend, forgive when you are offended.
Responsibility	Takes ownership over their mistakes	Mistakes are a part of everyday science. It happens, but it can be hard to get used to. There are always internal and external causes for mistakes. The former you have control over, the latter you rarely do. When you make a mistake, own it. Share it – the only mistakes that will come back to bite you are the ones you try to hide. And learn from it – how will you make that particular mistake less likely next time?
Leadership	A lead scientist is in charge of their own project. A good scientist may not have all the skills or knowledge required, but they are in charge of their project and are on the lookout for collaborations to fill the gaps in their knowledge	Show initiative. If you've read a pivotal paper, come and talk to me about how it will affect your research. If you need help, look around for the best person and ask them for help. If you see someone else struggling, give them your suggestions
Teamwork	A good lab colleague is willing to help others out. An extra pair of hands in the morning can make the difference between finishing at 6pm and finishing at midnight!	Be the type of team member that you want to have around you. If you know someone has a big experiment coming up – offer to help them!

Beyond these core values, the expectations for a PhD will vary. A PhD is an exceptionally versatile degree, you can specialise in any field and develop professional skills across an incredible range enabling you to enter a host of different downstream careers. The key expectations for your PhD therefore need to come from yourself. What are your expectations from yourself? What career direction do you want to go towards? Your PhD is your PhD.

I see my role as being a sounding board for your ambitions and an honest source of feedback. Initially, you might not have a career goal – indeed, I would recommend that every PhD student start with a range of potential goals and only narrow them over time (see: Liston and Makaroff, Immunology and Cell Biology 2023, “Strategic career building during your PhD”). I am not here to pick your career goal or set expectations, I am here to help you find your career pathway and to feedback on whether you are progressing towards your goal.

Initially I therefore start with generic expectations about your time in the lab. These are expectations that keep options open, including for a career in academia. However once you set your own path, some of these expectations can drop away and be replaced by your own goals, tailored to your chosen pathway. Below I have outlined with some of these common denominators for success in academia:

	Most successful scientists...	Goals to set yourself...
Become a Specialist	Advancing a field means understanding it. Most successful scientists know the major papers and techniques in their field, and have a fair good idea of where other leaders are taking it	Sign up to eTOCs for the major journals in your field. Follow key topics on BlueSky. Find a method for literature tracking that works for you. Keep a look out for relevant papers and read them! You need to read and synthesize the literature for yourself. No point in reading that ground-breaking paper after all the research is finished! If you keep your notes from the initial literature search you essentially have a draft of your thesis introduction.
Stay a Generalist	The most successful of scientists are also enough of a generalist that they can see the cross-disciplinary potential. Maybe that technique you just saw in a virology seminar is exactly what has been the limiting factor in immunology	Actively participate in lab meeting, journal clubs, regularly attend seminars outside of your comfort zone. Remember, the point of attending is to learn – not to just be present
Work hard	Academia is a lifestyle choice as much as it is a career. Most successful scientists (especially at the PhD/post-doc stages) worked <i>occasional</i> evenings and weekends. You can have a successful PhD in normal working hours, but it requires incredible efficiency	Work around the experiments. Sometimes you have heavy periods, where all the work is coming together or reviews for a paper are back and you just need to push through to get that paper. Other times are less intense – take these chances to recharge your batteries!
Play hard	On the one hand, successful scientists work hard. On the other, they don't sit in a dusty cubicle wearing a suit – your colleagues are fun and informal, and lifelong friendships are made. Remember that creativity is an integral part of science, so you need	Stay sane. The psychological component of a PhD is one of the hardest. It can be difficult to work on a project that will take four years to finish – find an outlet When you take time off, try to really take it off. Don't get into the habit of working

	periods where you are fresh and relaxed and your mind is open to wander	evenings and weekends – it should be exceptions not the norm
Be critical	Successful scientists always keep a critical eye on their data – during both collection and analysis. Experiments are always designed so that a conclusion can be logically reached – an experiment without all the correct controls is simply a waste of time and funding. Successfully scientists are good at both generating and listening to critiques at seminars, lab meetings, etc	Develop the critical thinking functions – nothing should be done on autopilot. If something stands out as being different, make sure it is biologically reasonable. Learn to check your positive and negative controls before jumping to conclusions. Take into account both statistical and biological significance. Present your data with the experimental details, raw data and analysed data at lab meetings so that others can helpfully critique
Write	Writing is the major form of scientific achievement, whether it is papers (see below) or grants. Writing simply takes practice – learn the forms and then write, write, write. A successful scientist did not rely on their PI to write everything for them – they wrote first, second and third drafts of all of their papers from the very beginning. The trick is to just write – even a shockingly bad draft is a scaffold to work upon, while procrastination leads nowhere. The first draft of a thesis takes about 4 weeks to write. Many people find writing difficult to maintain for this long, so break it up into pieces. A few days every six months writing up your results so far make writing a results chapter simple, and a literature review done in the first year takes only a few days to update at the end	Start to draft your own papers and thesis. You will get extensive feedback at every step of the way, from idea generation, to structure to fine proof-reading – but it starts with you actually writing first. If you require me to proof-read something, it needs to be on my desk at least two weeks before you need feedback. Remember that major pieces of work require multiple rounds of revision – it might take you two weeks to prepare a second draft for me to read, so don't leave things to the last minute! I always use track-change so that you can read my changes and learn how to write better yourself. Don't just "accept all" – think about how I changed your writing, and next time try to implement that change yourself. Also remember that at certain times I will have many different grants, papers and theses to read, so feedback will be slower.
Publish	Most successful scientist published one or two first-author papers in their PhD, plus a few middle-authors for helping others out and a review	Each time you finish an experimental series, put it together into a publication quality figure, together with figure legend and methods description. It does not take too much time as you go, and it makes putting articles together much less intimidating
Present	Presentations at lab meetings, seminars are conferences are golden opportunities for feedback. A successful scientist prepares in advance and listens to feedback	Put effort into preparing all of your presentations. Your audience is giving you the gift of their time – respect that by using the time wisely. Start on time and present professionally. When there is feedback, write it down, so you don't forget later or ask another lab member to be your scribe
Be Efficient	Time-management is to key to being successful. Scientists who browse the internet during incubations get no reading/writing done. Setting up that long experiment at 1pm is a good recipe for finishing at midnight	Come up with a system for time-management that works for you. Don't check your email until that first experiment has started – it'll wait until an incubation. Start the longest experiments first. Have a pile of papers on hand to read, and if the one on top of the pile

		is too intimidating shuffle it down rather than put off reading completely. Write up results while the data is fresh
Manage deadlines	Being a scientist is a professional position, which means deadlines mean something. A grant or fellowship submitted a day late is simply not eligible. Missing deadlines that we negotiated together is a good way to mess up our relationship	Put deadlines in your diary, and set reminder emails for these deadlines. If you know that you are not going to meet a deadline, then come and discuss that deadline with me in advance, rather than waiting until the day or just pretending the deadline never existed
Follow the rules	Every scientist has to know and follow the rules of the institute – safety, ethics, etc	Read and follow institutional policies, the lab guide and user guidelines