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POSTDOC SURVIVAL GUIDE





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Postdoc Survival Guide
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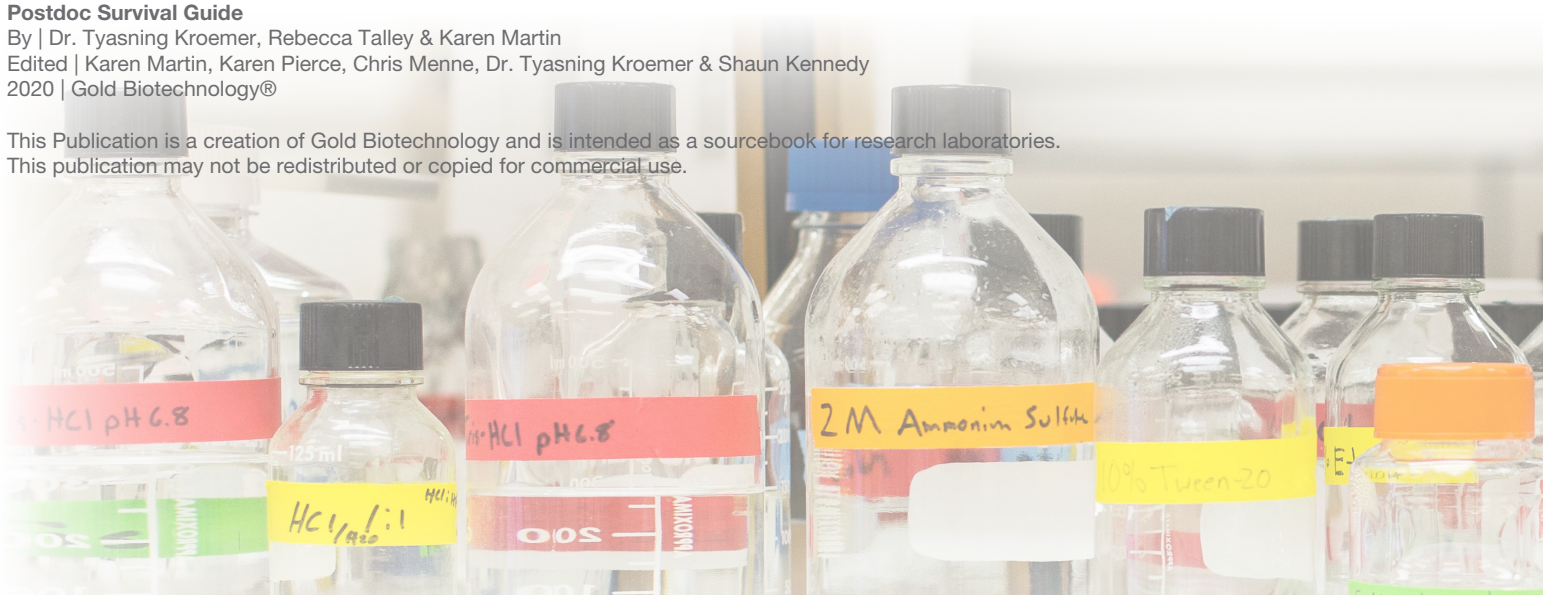

Postdoc Preparation

What is a postdoc? What does the application process really look like? What should I expect?

Find all of the answers to these questions and more with this section. Know what to expect and how to get prepared.

What Is a Postdoc?

By | Dr. Tyasning Kroemer

Some people who have been in academia for a while are familiar with this term: postdoctoral researcher (a postdoc). Likewise, many undergraduate students in the sciences have heard the term. It's a path they may one day take, but it still is a little vague. For those who are new or unfamiliar with the term, a quick guess may lead them to another question, "Is that another degree after you finish your PhD?"

For some of us, who just submitted the first draft of our dissertation and set up our defense date, it seems that a postdoc position is the default path after finishing your PhD. Particularly, when you start to worry about finding a job as soon as you graduate. But, before you apply for a postdoc position, you may want to explore more details about the types of postdoc positions and the job responsibilities of postdocs.

What Is A Postdoc?

A postdoc is a PhD research scientist working temporarily under the supervision of a mentor, commonly the principal investigator of a research project. The goal of a postdoc is to gain more training, experience and skills, before entering a more permanent science career.

What Are Some of the Job Responsibilities for a Postdoc?

A postdoc usually performs research designed by the mentor. Following their research, a postdoc will potentially publish their work in a peer-reviewed journal. In addition, a postdoc who works in academia may have to help their mentor write a grant proposal to apply for research funding and they may also help train a mentor's graduate students.

Types of Postdocs

Based on where they work, there are three common types of postdocs:

Academic postdoc: An academic postdoc is a scientist who works at a university. As an academic postdoc, you will receive training before entering a tenure-track position at the university under the supervision of a professor. You will assist the professor with his or her research projects, conduct your research experiments, and publish your research. Many professors post a postdoc position opening on the university's website, social media (such as LinkedIn), or other employment search engines. Follow their posted

instructions about how to send your cover letter and curriculum vitae to the professor.

Industry postdoc: An industry postdoc works at a company. Many scientists pursue an industry postdoc position because they can perform research, gain higher salaries, and get access more resources (equipment, facilities, and research materials). Most importantly, this position may help them get their foot in the door of a major company. Some companies have industry postdoc opportunities posted on their websites, job search engines or LinkedIn. They may ask you to send your resume to their human resources department or directly to the individual researcher who will become your future mentor.

Government postdoc: A government postdoc is a scientist who works to perform research and probably other science-related tasks (such as reviewing products, patents, and grants) in various government positions. Scientists usually publish their work in this position. Some scientists prefer a government postdoc position because it offers the satisfaction of serving the country, provides relatively good benefits, and usually provides a healthy work-life balance. In the U.S., some agencies that hire a postdoc are the NIH (National Institutes of Health), FDA (Food and Drug Administration), CDC (Centers for Disease Control and Prevention), EPA (Environmental Protection Agency), and USDA (U. S. Department of Agriculture). If interested, you may find postdoc opportunities on the government agency websites, on the USAJOBS (https://www.usajobs.gov/) website, in journals, and on the website of some professional societies.

How long is a Postdoc Appointment?

A postdoc appointment is typically 2-4 years. However, the length of your appointment as a postdoc usually depends on the funding for your research project. In academia and government, the expectation of the mentor is for you to finish and publish your research within a given timeline.

Some postdocs usually extend the length of their appointment by applying for more funding. Particularly, if they think they still need more training as a research scientist.

In industry, a postdoc appointment depends on a team's particular research goal. For example, a goal might be to introduce and establish a new technology for that team. Therefore, the length of time for the postdoc appointment in industry depends on the accomplishment of that goal.

During your interview, it's better to ask your prospective mentor about your timeline so you can start preparing your plan for a more permanent career.

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A Detailed Guide to your Postdoc Application

By | Rebecca Talley

Applying for postdoc positions is an important process along your journey to academia. While there are many similarities to applying for jobs in general, there are a few very important differences. To provide you with a detailed guide on how to go about finding the best postdoc position for you, I will discuss the application process as well as the application itself. I will then give you a variety of tips on how to maximize your success and avoid common mistakes throughout the course of the postdoc application.

The Application Process

The application process for postdoctoral positions varies based on your field, interests and type of position you desire. There are also multiple directions you can take when looking for a positions that fits your interests. One option is to follow the formal process, which involves looking for an open position and submitting an application. However, there is also the option of identifying potential PIs that you wish to work with and contacting them directly about becoming a postdoctoral fellow in his or her lab. Oftentimes, PhD students decide to take both approaches simultaneously. Having as many doors open to you as possible will increase your chances of finding a job that matches your interests and skills.

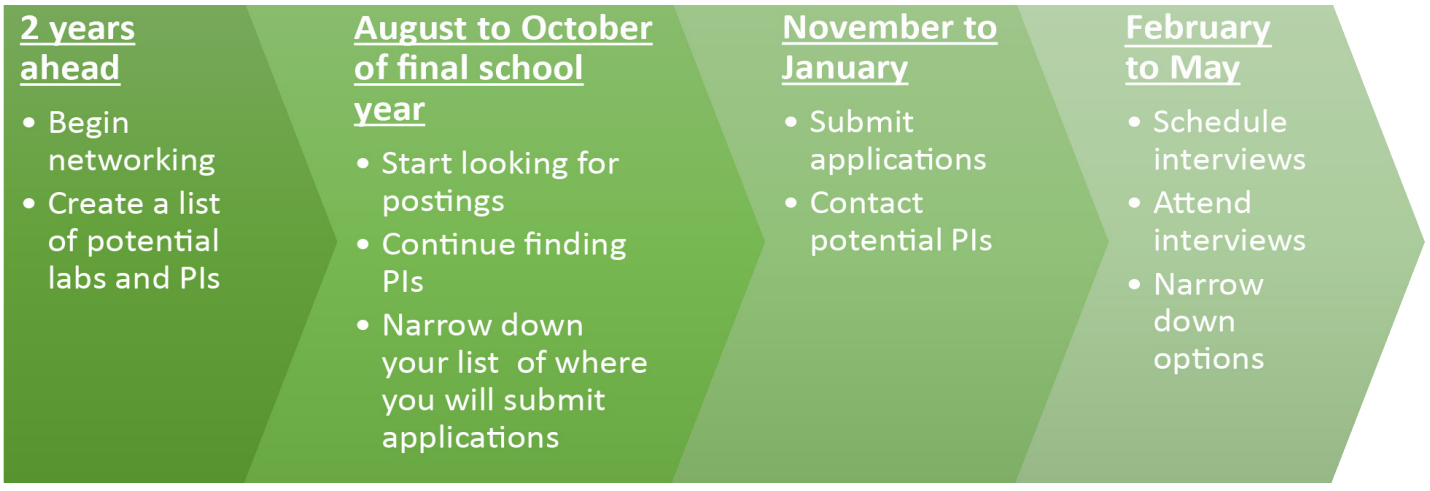
The Traditional Route

The traditional application route involves submitting a formal application for an open position. These positions can be found by searching through job postings on university websites or through job search databases. They can also be found through word-of-mouth, but this is easier accomplished by those who have done extensive networking.

The key to being successful with the traditional route is applying to positions which you are passionate about and qualified for. Applying to every position you come upon will not increase your chances of getting a job quickly, but will instead lead to less time spent on each application. Identify positions in which you would be a great addition to the PI's lab and where you think you can make a difference and be successful. A postdoc's primary job is to assist in furthering the research of the PI, so having goals that align is imperative.

The Alternative Route

The alternative route to obtaining a position as a postdoctoral fellow involves contacting PIs directly—regardless of whether they have an advertised opening or not. This method will require a lot of research.



First you will need to identify potential PIs with similar research interests as you. You can go about this in a few different ways such as networking during conferences, identifying authors of papers which align with your research, or even asking your advisor for potential leads. Once you have these contacts identified and you have read some of each PI's publications, contact them via email (read below on sending a postdoc request letter)—your email will essentially be your cover letter, but be sure to attach your CV.

A Closer Look at the Application

Applying for a postdoctoral position through the traditional route is extremely competitive.

According to Times Higher Education, as many as 200 applications are received for each postdoc position at some universities. With statistics like these, your application must give the best impression of you and your scientific experience.

In this section, I'll discuss the purpose of the application, what it tells the PI about you, and what should be included in a formal postdoc application.

Purpose

The purpose of your application is to give the reader enough information about you so that he or she can determine whether or not to invite you to interview for a postdoctoral position. This is usually the first impression the reader will get of you, unless you have previously met this person at a conference or other networking event.

Cover Letter

I like to picture the cover letter of your application as your personal abstract. It should give the reader all of the most important information in your application, and in many times, will help him or her decide whether to continue reading the rest of your submission or if you may not be the best fit for the position.

How you write your cover letter can vary, but the format below can help you keep it organized and efficient. Remember to address the PI by his or her appropriate title, likely Dr. (insert name) and to close your letter by thanking the PI for his or her consideration. It is a good idea to put your contact information with your signature at the end of the letter so it is easily accessible for the PI. Additionally, the recommended length of a cover letter is typically one page.

In this paragraph, you want to inform the PI why you are the best candidate for this particular position; this means your cover letter must not be generic, but rather tailored to each position you apply for. Include things such as past research experience and relevant skills and traits that make you a great candidate.

Curriculum Vitae (CV)

The purpose of the CV in your application is to provide details of your credentials for the position and to outline your professional experience as a scientist. To start, you should make a list of all the potential experiences and qualifications you might want to include. I personally recommend starting your CV when you start your academic career, and adding to it as you accomplish something; this minimizes the chance of leaving something important off of your CV when using it to apply for postdoctoral positions or even academic jobs later on.

Research Statement

Some positions that you apply for will request that you provide a research statement with your postdoc application. This is a summary of your research with past, present and future components. You should discuss any accomplishments you have made in your research career this far as well as what your current project is, including the methods, results and conclusions of your project. You will also need to discuss where you see your research interests going in the future. Do you have any potential projects in mind? Do you see yourself continuing in the field you are currently in or branching out to another area of interest?

According to Cornell University, this statement should also address issues such as lab equipment that you may need, funding issues and possible collaborations on projects you foresee. They also suggest that "the strongest research statements present a readable, compelling, and realistic research agenda that fits well with the needs, facilities, and goals of the department."

Letters of Recommendation

Some institutions will request that you submit letters of recommendation as part of your postdoctoral application. These letters should be from people who are comfortable writing you a strong recommendation, so ask them if they feel they can do so before choosing them to write your letters.

Letters of recommendation can be a way for your potential PI to learn about how you contributed to research in the past and how you may add value to his or her research team. So choosing someone with whom you've done research before is a great idea. Provide your letter writer with adequate information about the position you are applying for as well as an updated CV and research statement. Each letter should be tailored to the position you're applying for, if possible. It can often be time consuming for a letter writer to write a new letter for all of your applications, but at the very minimum, the writer may be able to tweak a few sentences here and there to make the letter more specialized to each position you are applying.

Application Tips

Making your application stand out is the one of the most important aspects of applying for postdoc positions. This can be very challenging, but there are a few simple steps you can take to boost your application.

General Tips and Resources

- Finding a postdoctoral fellowship to apply for can be difficult. Some ways to find positions include word-of-mouth, looking at university job postings and searching sites like PubMed for potential PIs. Remember that looking at prior publications only shows you what the researcher has worked on in the past, so you may need to reach out to find out what their current projects are.

- When you find positions to apply for, make sure you pick positions that meet all three of these categories: **safety positions, target positions** and **stretch positions**. Safety positions refer to those that you think you have a good chance of obtaining. They may not be at a big name school, but they are something you can fall back on if you don't get one of your more desired positions. Target positions are those that fit your skill level and experience. They are the ones you are likely to get an interview with and would be happy to have. Stretch positions are positions you don't

feel as confident about applying to. They may be with big name researchers or at top universities. Apply to some of each, because you never know what will happen over the next few months.

- Follow the instructions of the application. I cannot stress this enough. The PI will notice if you do not follow the instructions as they are stated on the posting, and this can be an easy way to get your application removed from the potential candidates. This is an easy step, so follow it without exception.

Networking

Networking is a great way to get your foot in the door of someone's lab. This can be done with others at your own university as well as throughout the country and beyond. Networking should begin at least two years before you graduate, but starting earlier is even better. Attending conferences and talks is a great way to get to know others in your field. Approach presenters and mingle with other students and researchers at these events. Exchange contact information and talk about projects you're involved in or hope to get started. These people may later be able to help connect you with others in the field or even be a starting place to look when searching for the postdoc position that is right for you.

PRO TIP: Have a business card made with your contact information and field of study. This can be passed out to anyone you meet and can be a way for them to remember you or contact you later on.

Postdoctoral Request Letter

The postdoctoral request letter is intended for applicants who are using the alternative route of finding a postdoc position. Since you will be looking into working with a PI who is not currently advertising an open position, you will need to send a letter requesting that a position be created for you. This type of letter is typically sent via email to a PI who you wish to work with. It is imperative not to send blind emails to a list of PIs in your field—they will not respond if it does not appear that you have a strong desire to work in their specific lab. In his editorial letter in Analytical Chemistry, Dr. Jonathan Sweedler advises students to send fewer emails in higher quality. He suggests that students should "read about a faculty member's research and tailor your letter to the group."

Ultimately, your postdoc request letter should include why you are contacting the potential PI and why you want to work in his or her lab specifically. It should then outline your research interests and plans as well as a possible funding plan. Additionally, you should include a copy of your CV and a research statement.

Google Yourself

With social media thriving in our culture, potential employers now have a way to get more information on you than your application provides. By simply typing your name into a search engine, they may be able to find pictures and social media accounts you have. Before you submit an application, do some research on yourself and figure out what kind of online presence you currently have. Ensure that what others will find is presenting you in a positive and professional manner. Perhaps, creating a LinkedIn profile will allow you to provide links to prior publications and provide more details about your work experience. The goal is for your online presence to help you get a postdoc position and not deter you.

Common Application Pitfalls

One of the great things about applying for postdoctoral positions is that so many people have done this before you—some people successfully and some not so successfully. However, you now have the opportunity to learn from their mistakes and avoid repeating them. Here are some common application pitfalls to avoid throughout the process..

Sending a Generic Application/ Cover Letter

Sending a generic application or cover letter is one of the most common mistakes applicants make. Of course, it takes less time and is easier to use a generic application, but this gives the impression that you are applying to any position that you find and are not truly interested in a particular job. Instead, put in the effort to research the institution, lab, and PI for each position you apply for. Include details that you find in the cover letter, and tailor your application and CV to match what the PI is looking for. Getting a postdoctoral fellowship is a process of finding a PI and candidate that are compatible with one another, so it is essential that both you and the PI can evaluate how you will fit in his or her lab.

Randomly Emailing PIs

Following up on the last point, applying to or emailing random PIs is not beneficial. If you won't be a great fit in the lab that you are seeking employment, you're essentially wasting your time and the PI's time. Research the type of work the PI is doing and determine if it fits within your research desires. Only seek out positions where you will be a good fit.

Only Applying to 'Big Names'

Applying only to big names is a common mistake students make. Although, you may have a strong desire to work for a top research lab in the country or elsewhere, you should also apply for more reasonable opportunities. No matter how strong your application may be, you will have a lot of competition. You don't want to end up without a job after graduation, so keep an open mind when it comes to deciding where to submit your application.

Lack of Proofing

This goes without saying—but having mistakes in your application is unprofessional and will give the PI a bad first impression. Have someone else look over your application before you submit it because it can be easy to miss small mistakes after you have spent so much time working on your application.

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Post Doctoral Application Planner

Starting Out — 2 Years Before Graduation

- ☐ Begin Networking
- ☐ Create a List of Potential Labs and PIs

Notes:

The Final School Year — Aug - Oct

- ☐ Start Looking for Postings
- ☐ Keep Finding and Listing PIs
- ☐ Narrow Down Your List of Where You Will Submit Applications

Notes:

The Final School Year — Nov - Jan

- ☐ Submit Applications
- ☐ Contact Potential PIs

Notes:

Before — Feb - May

- ☐ Schedule Interviews
- ☐ Attend Interviews
- ☐ Narrow Down Your Options

Notes:

Tips for Acing Your Postdoctoral Interviews

By | Rebecca Talley

Any type of interview can be nerve-wracking, and postdoctoral interviews are no exception. While they typically include the traditional interview where you allow the interviewer(s) to get to know you and answer the questions that they have, it may be conducted in a variety of formats. It may be a traditional one-on-one interview with the PI or it may be organized as a group interview with multiple interviews and multiple candidates being interviewed. The postdoctoral interview also generally includes a talk portion, where you have the opportunity to present your thesis to the department. Being prepared for the entirety of your interview can be a great way to stand out from the rest of the candidates. Review our tips below for steps you can take before, during, and after the interview to put your best foot forward along this part of your journey to a postdoctoral position.

Before the Interview

Apply to the Right Positions

When you are deciding where to apply for your postdoc fellowship, there are a few things you need to take into consideration. You want to apply for positions that genuinely fit your interests and that are a good fit for you as a scientist. If the researcher you are applying to work with is not doing research in your field of study, you may want to consider looking for other options. Additionally, you want to be sure to apply to positions that are looking for someone with your experience and skill level. A general rule of thumb to use is to apply to safety positions, target positions, and stretch positions. You can read more about these categories of postdoc fellowships and more tips on choosing where to submit applications and find a detailed timeline and guide to applying for postdoctoral positions in our article "A Detailed Guide to your Postdoc Application."

Do Your Research

Once you apply for positions and start scheduling interviews, you need to do your research. This entails learning as much as you can about the PI that you will be working with and what the research the lab is currently doing. You should also find information on the people who are working in the PI's lab with him or her already and the department as a whole. Having an idea of what research is currently being conducted will allow you to better discern how you are a good fit and to advocate for yourself during the interview. This will also give you some great talking points to bring up and questions to ask during the interview day, but I will discuss more on this below.

During the Interview

Dress the Part

The first impression you give to your interviewer and the department you wish to work in will make a large impact on whether or not you are offered a position in their lab as a postdoctoral fellow. While researchers do not generally dress professional when working in the lab, it is essential to wear business professional attire on your interview day. This will not only show that you are serious about the position, but will also boost your confidence throughout the interview process. However, dressing the part does not only refer to what you wear, but also refers to the demeanor you have during your talk and interview. As you know, a postdoc position is just one part of the pathway to becoming an academic scientist, and teaching will be expected of you. You want to show your interviewers and audience that you will be an effective educator, which requires you carry yourself in a way that ensures your students you are confident in the material you are teaching. You can read more about effectively delivering talks in our article Public Speaking Dos and Don'ts – A Life Scientist's How-To Guide.

Prepare to Answer Questions

There are a lot of Online resources with typical interview questions. Here is a list of sample questions and answers provided by BitesizeBio specific for students doing postdoctoral interviews.

One question that is bound to be asked during the first moments of your interview is "tell me about yourself." Having an idea of what you will say can ease your nerves about the interview and ensure it starts off on a good note. Start by giving a brief introduction about yourself, where you are from, and where you currently are in your career. After you give a brief

introduction, tell the interviewer(s) where you see your career going in the future and what goals you have for your career as a whole.

Ask Questions

What many postdoctoral position candidates fail to realize is that the interview process is not only about the lab determining if you are a good fit to work with them, but it is also about you figuring out if the PI and lab is a good fit for you and your career. What this means is you should be asking questions to find out more about the lab, department, and people you will potentially be working with. Many times, questions will arise throughout the conversation and it is important that you feel comfortable asking them. Sometimes, however, you may find yourself not knowing what questions to ask and this may be partially due to your nerves. One strategy is to have an idea of questions that you can ask before you begin the interview. If you come up with other questions along the way, you don't necessarily have to use your prepared questions, but you will have them in the back of your mind if you do need them.

Here is a source you can use that provides a list of questions that may be important to you as you make your decision on where to complete your postdoctoral fellowship: This LinkedIn article provides a list of questions as well as some ideas on how to come up with questions on your own based on what you value in a position.

Give Your Best Talk

If you're going to be giving a talk during your interview, you need to be prepared. According to one Reddit user who answered my question on best ways to prepare for your talk, you should be prepared to give it in any combination of circumstances—if you're sleep-deprived, dehydrated, or anything else.

As part of your preparation, make sure your talk is well-organized. You will typically be presenting your current research project and will want to present it in a similar way as you would write a journal submission. How you organize it is up to you, but make sure that it is organized in some way and that leaves you time for your audience to ask questions as the end.

Another Reddit user suggested making sure you have time to meet with the PI and lab members before giving your talk. This can help ease your nerves and get to know more about expectations and moods before you begin presenting your research.

Get to Know the Department

While you are at your interview day, you will likely have a few opportunities to meet others who are working in the lab you are interested and in other labs in the department. Whether it is before or after your talk or during lunch, put in effort to get to know the people you may be working with in the future. While it isn't a formal part of the interview, the PI will want to know that you can get along with the rest of his team and other colleagues you may end up working with during your postdoc fellowship. He or she may even ask their opinion of you after the interview is finished. Beginning to form a relationship with them by showing interest in their work and backgrounds can give you the extra boost you need to be offered the position that you want.

Also, it doesn't hurt to make friends with others early. If you end up choosing to work at that university, you may need some advice on living in a new city and finding housing. The other team members can be a great resource.

After the Interview

Don't Forget to Follow-Up

Following up with a thank you email after your interview is important. It gives you an opportunity to thank the PI for your chance to interview as well as let him or her know how you are a great fit for the position now that you have learned more about it. If there was something you thought of after the interview that you wish you had mentioned, you can include it in the thank you letter as well. This email should be sent to the PI as well as anyone else who interviewed you within 24 hours.

Be Patient

After the interview is over and you have sent a thank you letter, be patient. The amount of time it takes for a lab to get back to you can vary depending on where they are in the interview process. If you were the first person they interviewed, it may be quite some time until you hear back, and if you were one of the last interviewees, you may hear sooner. Instead of worrying about when you will hear from the PI, focus on preparing for your next interview. Start researching the next lab and PI so that you can give each position your best impression.

If you're really hoping to get a certain position, try not to make that your very first interview because you will be more comfortable and have more practice after you have one under your belt. Good luck!

Article references in the supplemental reference section of this guide

To Postdoc or Not To Postdoc - Questions to Ask Yourself to Decide

By | Rebecca Talley

When you're nearing the end of your PhD program, it is easy to assume working as a postdoc is the next step towards your career goals, but there are other options. Here are questions to ask yourself if you're unsure if a postdoc position is right for you.

Do my goals include academia?

Depending on what your goals are for the rest of your career, a postdoc may or may not be for you. While many PhD students seek to work in academia, there are a variety of other career paths that you can take if becoming a professor is not something you desire. The postdoctoral research fellowship is meant to be a link between graduate school and working independently in academia. Therefore, it is most important to complete if you want to obtain tenure at a university in the future.

However, academia is not the only field that likes to see that you have completed a postdoc before hiring. Some government agencies and other private industrial companies request postdoc experience before applying to certain jobs.

Do I need more training or am I ready to pursue a career outside of academia?

If a career in academia is not one of your ultimate goals, then you should consider whether you have the skills to pursue another type of career. If your PhD research was done in something you no longer wish to work on, then you may consider doing a postdoc in your desired field. This will help you to gain more experience with it and make you a better candidate when it comes to applying for jobs.

However, for some industry jobs, especially if you are applying within your field, pursuing a postdoc is not necessary. To get an idea of what is required for the type of job you would like to have, start looking at open positions and review the minimum requirements and recommended requirements for applying to those positions. Since there will be a lot of variation by company and location, be sure to look at jobs that would suit you well—in a location that works for you and that meets your expectations for your career.

Am I prepared for life as a postdoc?

Postdoc life can be a lot different than graduate student life. While it probably seemed like you were spending countless hours in the lab while working towards your PhD, you will spend even more time working during your postdoc. With the pressure to produce results and publish your work, the postdoc life will be stressful. While you will be paid for your work as a postdoc, PayScale posts the average pay as a range from $36k to $63k. Long hours combined with low pay as well as being in the "make it or break it" phase of your career can make postdoc life difficult, but it is doable if you find ways of effectively managing your stress. Fortunately, for many who have a passion for research, the long hours and stress may not seem like a real obstacle.

Have I done enough networking to get a job outside of academia?

During graduate school, the majority of networking done by students is within academia. They are encouraged to get to know various faculty, peers, and researchers at their own institution and beyond, but few are encouraged to obtain contacts and network outside of the academic world. When graduation comes along and you consider obtaining a job in industry instead of continuing along the path toward academia, it is important to have made connections with people in your field at various corporations. It can be difficult to obtain an industry position quickly after graduation without having these contacts in advance. Consider what type of network you have created for yourself outside of academia before deciding against a postdoc opportunity.

Have I published enough papers to submit a competitive job application?

Whether you're looking to go into academia or another field, the number of publications you have may impact your decision to pursue a postdoctoral fellowship. To obtain an academic faculty position, most PhD graduates will be required to have a publishing record. However, when it comes to working in industry, publications are not generally required depending

on the company. Some government agencies require postdoc training. Ultimately, if your desired career relies heavily on publication record, a postdoc fellowship is an opportunity to publish more papers in journals. If your career path doesn't rely on having a certain number of publications, a postdoc may not be necessary for you.

Have I talked to people in my potential career path to get their opinions?

If you know what career path you would like to take, you can learn a lot from people who have traveled the same journey before you. Reach out to people who hold positions similar to a position you would like to have. Find out what they recommend, ask if they completed a postdoc, and if there is anything they would change about how they got to the point they're in today. Since these people have already obtained a career in the field you're interested in successfully, they will have great advice.

Have I fully reviewed my alternatives such as working as an industrial postdoc?

A common myth is that postdoc positions are only found in academics. However, there are a variety of postdoctoral positions available in industry, which will provide you with the experience necessary to obtain a job in industry if you cannot get an independent position immediately after graduation from your PhD program. Take a look at the field you are interested in and see what postdoc programs are available both in academia and industry.

Can I transition from industry to academia without having completed a postdoc?

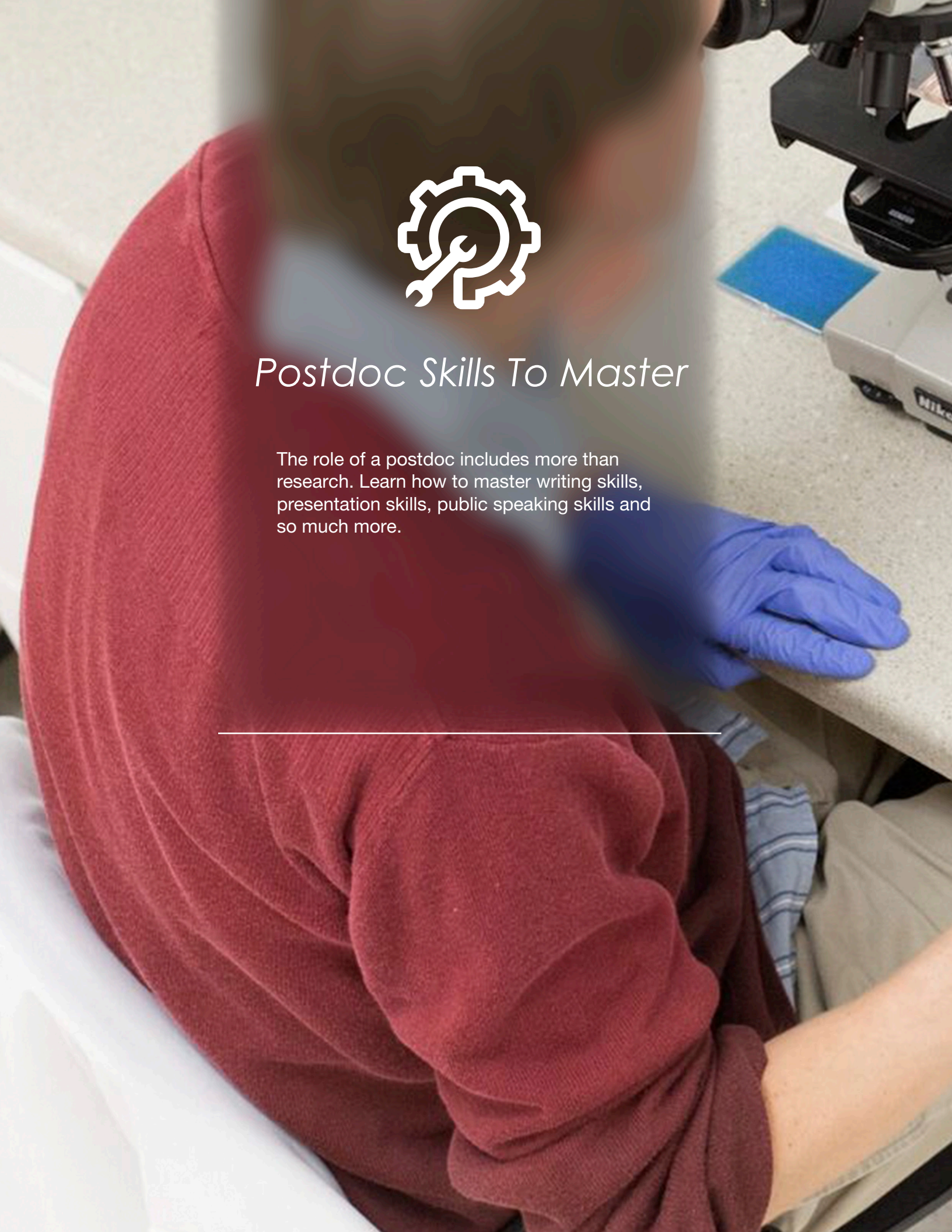
It is possible to transition from industry to academia, but it is not always easy to do. Depending on your field of research, your industrial skills may be valuable in an academic setting. In order to increase your chances of obtaining a position in academia, you should take opportunities to publish papers and mentor younger scientists during your time in industry. If your company has an internship program, getting involved in it may be a great way to gain experience working with students. Additionally, some scientists work both in industry and as a professor part-time. Explore all of your options and find out what is typical of your field when it comes to applying for an academic position after working industry for some time.

What skills can I obtain from a postdoc that I wouldn't otherwise get?

Working as a postdoc is not just about the science. It is a time for scientists to grow professionally as well. During the PhD years, most students focus on one specific area of research and gain little experience outside of this specialty area. During the postdoc, the researcher has the opportunity to gain experience in a variety of other methods and expand their knowledge of their field. Additionally, during the postdoc, the fellow has few other professional commitments and can give his research his undivided attention. This is a great time to produce a number of high quality manuscripts. If there is another research area of interest or a particular lab that he would like to work for, a PhD student should apply to postdoctoral positions in that area at that institution.

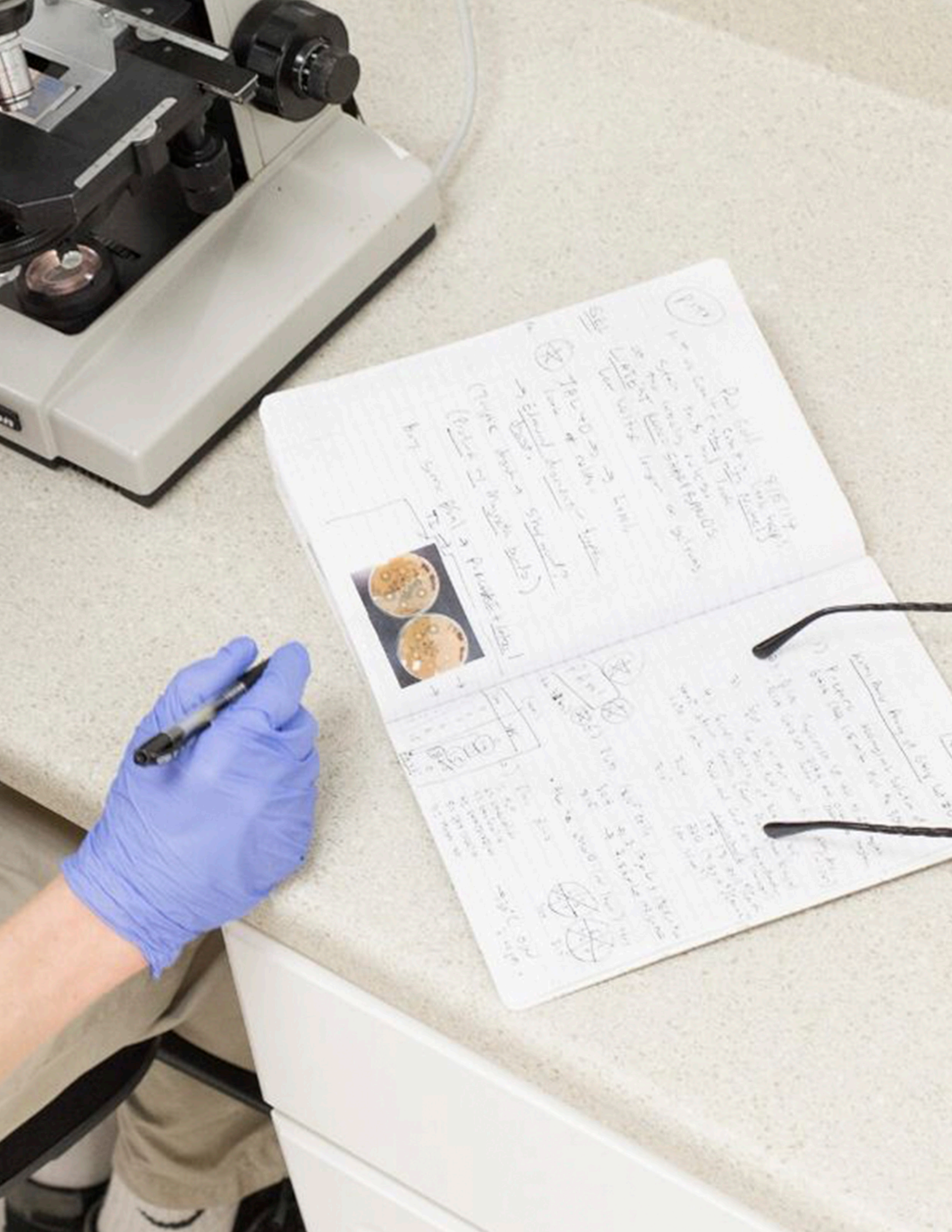
If I don't do a postdoc, what downsides might I suffer?

Ultimately, what your career goals are will determine what downsides you may suffer from not completing a postdoc. Traditionally, the way to obtain a position of tenure at a university is by first completing at least one postdoc—the typical number of postdocs to complete before becoming independent depends on your field. However, you may be able to reach academia straight from your PhD program or through industry. It is harder to move from industry to academia than academia to industry, however. Another downside you may encounter is having fewer numbers of publications when looking for a job. This may place you behind other candidates who have already completed a postdoc position—whether applying for private industry, government, or academic jobs. Lastly, completion of a postdoctoral fellowship can help to round out your areas of expertise by widening your research scope. This can be beneficial to both the job search and your advancement as a scientist.



Postdoc Skills To Master

The role of a postdoc includes more than research. Learn how to master writing skills, presentation skills, public speaking skills and so much more.



How to Bounce Back From Manuscript Rejection

By | Dr. Tyasning Kroemer

You saw a new email coming from a journal regarding the status of your manuscript submission. You have been waiting for that particular email since forever and it finally came. However, the content of that letter was not what you expected.

It was a rejection letter along with not-so-positive comments from reviewers. Your heart sank. All of a sudden, you felt that all of your hard work went down the drain with that letter. You even started to doubt yourself.

Before your self-confidence falls apart even more, you must remember that authors of research papers deal with the rejection of their research manuscripts or grant proposals regularly. At this point, the key is to not take the rejection of your manuscript personally. Instead, start planning your next steps. Of course, that's easier said than done. Therefore, in this article, we talk about how to process manuscript (or grant) rejection and to turn your rejected manuscript into a published paper.

Types of Manuscript Rejections

The first thing to do is to reread and analyze the rejection letter you received. You should read all the instructions in that letter carefully.

In some cases, you may just need to clarify and rewrite your paragraphs to address some concerns and questions from the reviewers. On the other hand, those reviewers may also want you to do extra experiments to strengthen your results and conclusions.

Below are different types of rejection letters from the journal editor (Roediger III et al., 2019, pg. 142-143):

Desk rejection

In this type of rejection, the editor rejects your manuscript without sending it out to reviewers.

Flat-out rejection

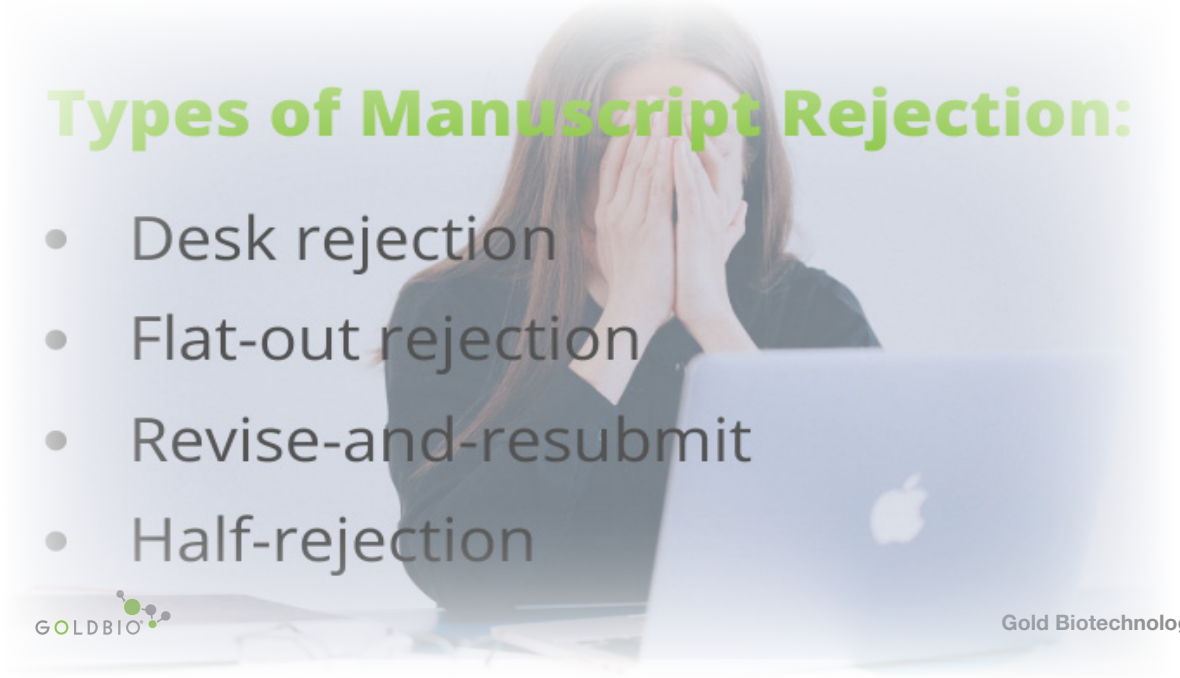
In this rejection, your manuscript receives two or more negative reviews from outside reviewers. As a result, there is no chance to resubmit your manuscript to the original journal.

Revise-and-resubmit

In this case, the editor informs you that you will be able to submit your manuscript after you make changes suggested by the reviewers. The editor will send your revised manuscript for re-review by the original reviewers.

Half-rejection

This rejection letter acts as a provisional-acceptance letter. In this letter, the editor requires you to make relatively minor changes before resubmission. Then,



the editor will check with the quality of those changes and often accept your manuscript for publication without re-review.

Although rarely discussed, most researchers need time to process this and deal with a manuscript rejection letter.

Stages to Process Your Manuscript Rejection

For early career scientists, coping with manuscript rejection is a beneficial skill to learn. The stages to processing a rejection letter are very similar to the stages of grief.

Here are some stages you might go through before resubmitting your manuscript (Roediger III et al., 2019, pg. 144-145):

Denial

In this stage, it's difficult for you to receive the reviewer's criticism, because you worked hard and felt your manuscript was excellent.

Anger

After denial, you feel extremely upset about the comments of the editors and reviewers. To recover from this; try to calm yourself, stay away from that email for few days, and talk to your colleague, your mentor, or even a professional counselor about it. However, refrain from sending a protest email to the editor and complaining about the reviewers, because you may regret your action later.

Bargaining

This is the point when you reflect on the criticism of the reviewers and think they actually make some good points.

Depression

After you decide to talk to your co-authors, you realize that you will be the one doing additional laboratory work and writing to address the reviewer's comments. Then, you start to get overwhelmed.

Acceptance

This is the last and the most important stage when finally you are willing to do the laboratory work and make the changes needed for the resubmission.

Since this experience is common among researchers, if you think you need it, give yourself some time to recover from rejection. After you are all set, you can start planning for the manuscript resubmission.

Strategies to Get Your Manuscript Published

The next step is to decide the fate of your manuscript; whether you are going to resubmit it to the same journal or to a new journal (Sullivan, 2015). After analyzing the type of rejection letter, you can get a hint on whether the original journal will be interested in your manuscript after resubmission.

If there is a good chance of acceptance, make the changes and resubmit to the same journal.

However, if you think the chance of acceptance is slim, consider resubmitting to a new journal. To submit to a new journal, read and follow the author instructions.

Resubmitting to the Same Journal

Keep in mind that the same journal can reject your manuscript again after resubmission. Therefore, if you plan to resubmit to the same journal, make sure that you can reasonably address all the reviewer's comments.

If there are some comments that you won't be able to address, consult with the editor of the journal. If you skip addressing a specific comment, it would prevent future acceptance of the manuscript. If the journal editor approves your revision plan, you must then carefully make the changes required by the editor and reviewers.

For any changes you make, you should refer to the page and paragraph numbers in the revised manuscript (Wong, 2019). Start by addressing the easy changes, such as rewording, adding references, and changing technical errors (Wong, 2019). Then, work on the more difficult ones, such as performing additional experiments, fixing tables, adding figures, and rearranging paragraphs.

Resubmitting to a New Journal

To submit your manuscript to a new journal, organize your manuscript according to the correct format of the new journal. Find a new journal that matches the scope and topic of your manuscript. Make sure you rewrite and address your cover letter to the new journal. One thing to consider is the same reviewer(s) who read your manuscript from the previous journal might also be the reviewer in the new journal you've selected. Therefore, make the recommended changes before submitting.

Article references in the supplemental reference section of this guide

How to be a Better Troubleshooter in Your Laboratory

By | Dr. Tyasning Kroemer

For scientists, the ability to troubleshoot their experiments is a valuable skill to develop. This skill allows you to be an independent and responsible researcher (Roberts, 2001).

Although important, troubleshooting as a subject is commonly not included in many undergraduate molecular biology courses. Therefore, this article provides some useful steps to troubleshoot problems in the molecular biology laboratory.

Some common steps for troubleshooting problems in the lab are (Gerstein, 2004):

1. Identify the problem

2. List all possible explanations

3. Collect the data

4. Eliminate some possible explanations

5. Check with experimentation

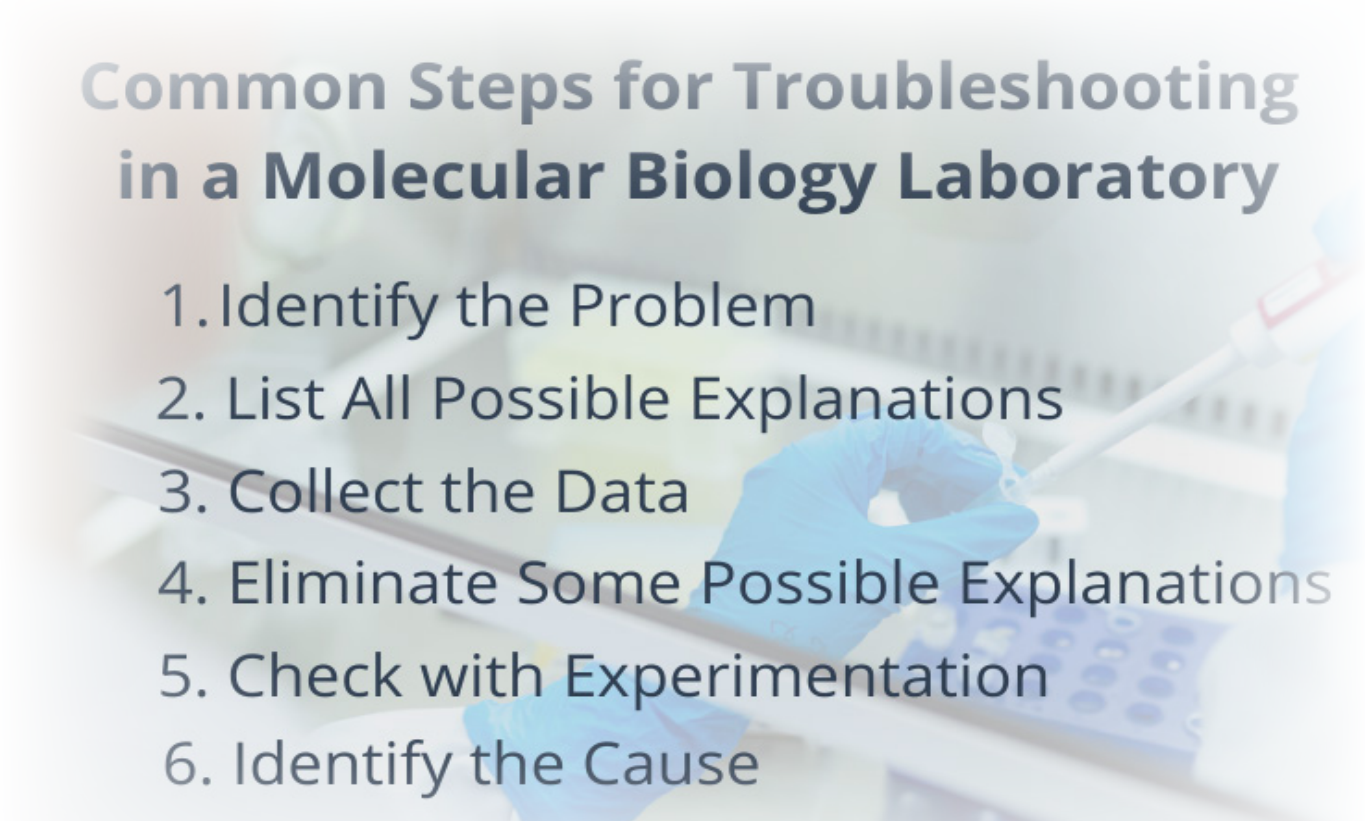
6. Identify the cause

We present two different scenarios and how this troubleshooting process could be applied. While these scenarios are very specific, this troubleshooting approach can be used broadly across other experiments in your lab.

Example 1: No PCR Product Detected

1. Identify the Problem

First, you need to identify the problem, but try not to



define the cause yet. In this example, let's say you don't see any PCR product on the agarose gel. You see the presence of your DNA ladder, so there is no problem with the gel electrophoresis system. Now, you identify that the problem is your PCR reaction. Remember, we're not looking at the cause just yet.

2. List All Possible Explanations

After you identify the problem, list all the possible causes for the issue (in this example, your PCR reaction). Start listing the obvious causes. These could be each of the ingredients in your PCR Master Mix: Taq DNA Polymerase, $MgCl_2$, Buffer, dNTPs, primers, and your DNA template. After listing the obvious causes, include the causes that might have escaped your attention, such as the equipment and the PCR procedure.

3. Collect the Data

To do this step, start collecting data for the easiest explanations. First, check if the PCR equipment works properly. You can ask other scientists in your laboratory if they have encountered similar problems. However, if there is no problem with the equipment, then go ahead and collect data for the other explanations.

Controls

If you ran your samples with all proper control reactions, find out whether your positive control (using a DNA vector as the DNA template) was present in your gel or not.

Storage and Conditions

The next step is to find out about the expiration date of the PCR kit that you used. In addition, check if your PCR kit was stored according to your vendor's instructions.

Procedure

To collect data about your procedure, check your laboratory notebook for the procedure that you used in the experiment and compare it with the manufacturer's instructions. Write down all the modifications you made during this experiment, and note any possible missed steps.

4. Eliminate Explanations

Based on the data you collected, eliminate the explanations that you have determined are not the cause. For example, if your positive controls worked, your kit had not expired and it was properly stored, you can eliminate your kit as the possible cause. If you also find out that you didn't modify the PCR procedure, eliminate it as the possible cause.

5. Check with Experimentation

Recheck your list and design an experiment to test the remaining explanations. For example, test whether your DNA templates are the possible cause. For example, run the DNA samples on a gel to see if there is any degradation. Measure the DNA concentration to see if you used enough template for your PCR reaction.

6. Identify the Cause

The last step is to eliminate most of your explanations that you've ruled out and identify the only one remaining as the cause. Using information from the experiment you just ran (in step 5), plan ways in which you'll fix the problem and redo your experiment. If this issue is something that could arise again, you might want to find ways to reduce future errors. For example, rather than making your own master mix, you could use a premade master mix.

Example 2: No Clones Growing on the Agar Plate

1. Identify the Problem

First, check all the transformation plates and see if any colonies are growing on your control plates. If there were colonies on your plates, then the problem is the transformation of your plasmid DNA.

2. List all possible explanations

After you identified that the problem is not the competent cells, the possible explanations for your failed cloning may be your plasmid, the antibiotic, or the temperature during heat shock procedure.

3. Collect the data

Controls

If you included your controls in your transformation, your positive control plate should be the cells transformed with an uncut control plasmid. This plate should contain many colonies. If there are only few colonies growing on this plate, the efficiency of the competent cells may be too low.

Procedure

To find out if your antibiotic is the cause, check if you used the correct antibiotic for selection and the concentration recommended for selection. To see if the incorrect temperature during the heat shock could be the cause, find out if the temperature water bath was at 42°C.

4. Eliminate explanations

Now you can start eliminating some of the possible explanations. For example, based on your data collection, there were many colonies growing on your positive control plate. It means that your competent cells were efficient. You also found out that you used the correct antibiotic with the recommended concentration for selection. Then, you can eliminate antibiotic as a possible cause. Moving on to the temperature during the heat shock, you found out that the temperature of the water bath was at 42˚C. Therefore, the procedure was not the problem and this should be eliminated from your list. Now the only possible cause is your plasmid DNA.

5. Check with Experimentation

In order to test if your plasmid is the problem, check if it is intact using gel electrophoresis and the plasmid concentration is not too low. In addition, check your ligation by sequencing your plasmid to make sure the insert DNA is in the plasmid. Make sure you follow the instruction from your transformation protocol regarding the concentration of plasmid you should use.

6. Identify the cause

For the last step, gather all the information you need after you ran the experiments. For example, you made sure that there was no problem with your ligation based on your sequencing data, but you saw a faint band on the gel electrophoresis and found out that the concentration of your plasmid was too low. Therefore, you identified that the cause of your failed transformation was that your plasmid DNA concentration was too low.

References

Gerstein, A. S. (2004). Molecular biology problem solver: a laboratory guide: John Wiley & Sons.

Oelker, S. (2012). LibGuides: Biological Sciences: FAQs.

Roberts, L. M. (2001). Developing experimental design and troubleshooting skills in an advanced biochemistry lab. Biochemistry and Molecular Biology Education, 29(1), 10-15.

Troubleshooting Checklist

Steps:

1. State the problem

The Problem is _____

_____

_____

_____

2. List All Possible Explanations

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

3. Collect the Data

Controls: _____
Storage:_____
Equipment: _____
Procedure: _____
Other: _____

_____

_____

4. Eliminate Explanations (Cross out in section 2)

5. Check with Experimentation (List your tests)

Exp 1: _____
Exp 2: _____
Exp 3: _____
Exp 4: _____
Exp 5: _____

6. Identify the Cause

Tips for Writing, Editing and Submitting a Successful Grant Proposal

By | Rebecca Talley

After finding potential sources of funding for your life science research, it's time to get started on writing your grant proposal. If this is your first attempt or you are a novice grant writer, follow these tips to prepare a successful application and increase your chances of getting your research project funded.

Writing grant proposals is understandably one of the most stressful, challenging and important tasks for PIs and postdocs today. With decreased funding, earning a grant has become extremely competitive. Not only is there the pressure to produce a well-written, scientifically sound proposal, you have the added anxiety of knowing that your project, and perhaps even your career, cannot go on without funding.

The best way to cope with the stress of writing your first few grant proposals is to focus it into preparing a successful grant application. Our steps will help you optimize your opportunity to receive a grant. Start with these steps after you have identified potential sources of funding.

Define the parameters of your study.

Before you begin to apply for funding, and as obvious as this sounds, you need to know what you will be studying and how you will do it. This will help you to determine what your needs are as far as money, personnel and supplies go. Once you know what you will study and how you will study it, you will be able to determine which grants you are eligible for. Each grant you apply for will take a significant amount of time to prepare so you only want to submit a proposal for grants you have a chance of getting. You want to submit proposals to all funding opportunities which you are eligible for and you want to do it early, so take this first step now.

Draft a generic proposal and budget.

Once you have defined the parameters of your study, you can begin to develop a generic proposal. A generic proposal is one that includes all the basic elements of your study, but has not yet been edited for a specific submission. You need to include the problem that you will address and what the need is for you to address this topic. Explain to the reviewers why the research you are doing is relevant and important. You will also include what your plan is to achieve your results. What materials and methods will you use? What type of analysis will you do? All of these aspects of your study design should be explained in a logical and concise manner. Finally, include what your intended results are and what implications they will have in your field of study.

Base your proposal on evidence and preliminary data.

When you ask an agency for money, they will want to know that you have done your homework and that your proposal makes sense. Not all of the reviewers will be experts in your particular field. Provide them with facts and data that support the questions you desire to answer through your proposed project. If your lab ran preliminary data to test your hypothesis or observed that your study design was sound, include that in your proposal because it will help the reviewers understand the work you are doing.

Make a calendar of deadlines.

Once you determine which grants you will be applying for based on your eligibility, make a calendar of deadlines. Complete and submit each grant proposal in the order that they are due. You want to get them submitted as early as possible because missing a deadline would be an unfortunate reason to miss out on funding you may have gotten if your application was submitted on time. It is a good idea to schedule your own deadlines prior to the deadlines set by the funding agencies—aim for these dates and you will be ahead of schedule in case another funding opportunity arises that you want to apply for.

Follow the guidelines and directions for each proposal.

With each available grant, there will be a set of guidelines provided by the agency. It is important to

follow the directions they provide. Instead of submitting the same grant application to each agency, update the formatting, length, etc. to meet the standards requested. While this may seem monotonous or unnecessary, ignoring the instructions provided is an easy way to get your proposal thrown out of the running before it is even reviewed. Optimize your chances of getting funded by taking this extra step.

Align your interests with the interests of the funding agency.

Another way you should update your generic proposal for each grant you apply for is by changing the goals and objectives of your study to align with those of the funding body. For example, if you're applying for an NIH grant, you will want to emphasize the implications your research will have clinically and in the treatment of disease. On the other hand, if you're applying for a grant from the NSF, it would be in your best interest to discuss how your project will aid to the understanding and knowledge of basic science principles. Take time to look over the mission of each of the agencies to which you are submitting a grant proposal so that you can focus on what they care about. They are more likely to fund your project if it has similar goals as their organization.

Anticipate questions the reviewers will have.

After you have finished writing your grant proposal, it's time to proofread and make edits. Make sure it is free of any errors before you submit. As you go through and read your proposal, try to predict what questions the reviewers may have. Are there places were your phrasing was confusing or nonspecific? If you anticipate the questions and incorporate the answers into your application, you will be a step ahead. You won't be there during the review to answer their questions so try to be as thorough as possible while also being concise.

Have your proposal reviewed by a colleague.

After you feel that your grant proposal is ready for submission and all edits have been made, have it read by a colleague. This should be someone who is not involved with the project and who does not know very much about it prior to reading the proposal. This will allow you to get feedback from someone who is reading the application for the first time and address any areas of confusion. If you know someone who has been a grant reviewer in the past, he or she would be a great person to ask. You aren't limited to one peer reviewer so if you have more resources, use them.

Include a cover letter.

Including a cover letter with your proposal is vital. The cover letter will give your reviewers their first impression of your project. You want to include what your project is, how much money you are asking for, and why your project aligns with the mission of the funding agency. It would also be beneficial to let the reader know what you have included in your proposal.

Follow up with funding agencies.

After receiving funding from an agency, it is important to maintain a good relationship with them. Often times, if you build a relationship with the agency, they will be more likely to thoughtfully consider further funding requests. If there are any reports or documents requested by the agency, get them filed in a timely manner. You can also keep them updated on the status of your project, what results you have obtained and how these results will be used. You can even send a copy of any publications you produce as a result of the project.

Following these tips, you can increase your chances of your grant proposal being accepted. The more quality applications you submit, the higher your chances of being funded. Don't get discouraged if you don't find funding on your first try, but take the feedback given to you into consideration and make revisions to your proposal and try again.

Public Speaking Dos and Don'ts—A Life Scientist's How-To Guide

By | Rebecca Talley

It can be difficult for even an experienced life science researcher to keep an audience focused and awake. To address this issue, we have compiled strategies to avoid losing your audience during your next talk or lecture. In this article, we have listed the Dos and Don'ts along with some extraordinary pro tips that will change the momentum of your presentation.

It probably isn't hard for you to think of a time when you were attending a talk, lecture or some other type of presentation where you were struggling to stay awake. Your eyes start to feel heavy as you fight to keep them open. You do everything to prevent becoming the person in the front row who has fallen victim to the head bobbing cycle where you're awake one minute and asleep the next. We've all been there.

Gaining the audience's attention is one of the most difficult challenges a speaker will face. After crowd-sourcing ideas from scientists all around, here is a list of the dos and don'ts all professional life scientists should follow. Consider this a best-practice in the art of keeping your audience awake and engaged.

The DOs

Do show enthusiasm and excitement about your work.

Perhaps one of the best ways to keep your audience interested in your research is to be interested in it yourself. Show your passion and excitement about your work. Radiating positive energy throughout your presentation will allow the audience to feed off of your enthusiasm. Don't forget to smile and have fun! The tone at the beginning of your talk can subconsciously set an impression on your listeners about how the rest of the talk will go.

Do relate to the audience.

From the very beginning of your talk, it is important to get the attention of the audience. One strategy is to know who your audience is and what they care about. You can then relate your topic specifically to them and tell them why they should care and how it affects them. You can also tell stories which resonate with your audience. Stories help evoke emotion and bring your listener's focus to you.

Do engage the audience.
Engaging the audience can be difficult to do but is a good way to keep your talk interesting. Methods include telling a story and relating to what the audience cares about. Another simple way is to ask the audience a provocative question, show them compelling images or state a shocking statistic. Other ways include offering a handout or encouraging dialogue among the group when time allows.

Do make sure each slide has a clear message.
Have you ever been watching a presentation that was 30 slides long and thought to yourself that the topic could have been covered in about 10 slides? Unfortunately, this happens quite frequently. After preparing your presentation, it's time to consolidate. Go through and think to yourself what the main message of each slide is. If you cannot come up with that main idea, then consider updating or deleting that slide. Padding a presentation with extra slides can make your audience feel like listening to your talk may not be the best use of their time.

Do manage your time appropriately.
A pet peeve when attending a scheduled presentation is when it runs over time. Remember that your audience has a tight schedule and possibly a short attention span. Therefore, it is important to respect your listeners by trying to properly gauge how long your talk will last and how long your audience will be willing to sit through it. Practicing your presentation is a good way to do this, but don't forget to leave some extra time open for questions.

Do define words the audience might not know.
A good strategy to ensure your audience is keeping up with the science involved in your research is to use conversational words as much as possible. It is inevitable that you will need to use larger words when speaking about scientific topics, so be sure to define any words people may not understand. It is easy to succumb to the curse of knowledge and forget that those who haven't been working on your project may not be familiar with the concepts.

The curse of knowledge is a type of cognitive bias in which one fails to realize the knowledge she has that others do not inherently possess and can confuse and distract your listeners. If there is any doubt that your audience may not understand a term, define it just to be safe.

PRO TIP: Be mindful of the gap in knowledge when it comes to an interdisciplinary audience. A developmental biologist might not have the same background in the materials and methods as a biochemist. Something as simple as RT-PCR might not be understood by everyone.

Do use animations to guide your presentation.
While animations can be distracting at times, when used appropriately, they can serve as good transitions between points. One strategy is to use animation effects so that bullet points appear one at a time as you are talking. This prevents the audience from becoming distracted by all of the bullet points being displayed at once and helps you pace yourself as you discuss each point.

Do use arrows to emphasize the important aspects of complicated figures.
When possible, it may be best to avoid complicated figures altogether. However, when their use is necessary for understanding the methods or results of your study, arrows can be used to indicate which part of the figures the audience should be focusing on. You can also use a laser pointer during your talk to emphasize certain aspects if you have one available.

Do be yourself.
One of the best things you can do that people often forget about is be yourself. If you enjoy making people laugh, include a bit of humor. If you're quirky, like many scientists are, show your quirky side. Letting the audience see different aspects of your personality will remind them that you are human and you are relatable. Just remember to maintain the degree of formality required for your situation.

The Don'ts

Don't explain every detail of your methods.
When polling, we found that the number one point in a talk where most people become disengaged is the methods section. Techniques and procedures are often very detailed and hard to understand in a short period of time. It is best to include only the details necessary for understanding the project or the details that directly support the results of your research.

Another way to look at it is to only include details that tell your research story. Omit the rest. You can always refer people to your paper if they seek a more detailed explanation of your methods.

3 Tips for a memorable methods section:
1. Explain what you did and why you did it. Tell the audience the importance of the steps you took and why they were done in such a way.

2. Explain how you did it. Show the way you interpreted the results so that the audience can interpret your results for themselves.

3. Explain what it all means. Inform your listeners of the significance and consequences of the results you obtained. Remember that to your audience, many results will seem meaningless until you explain how they support your study.

With these tips, you will be able to create a methods section that is not only interesting, but also allows the rest of your talk to come together.

Don't stare at the screen.

It is a common mistake to look at the screen too often during a talk, usually because it is less intimidating than looking out into the crowd. However, this is the opposite of engaging your audience and could give the impression that you don't know your topic enough to look away from what you have on your slides. Making eye contact with your listeners and looking around the room, and even walking around the stage is a good way to avoid staring at the screen.

On that note, it is important not to fill your slides with text and do not have everything you're going to say written out. This can be very distracting and cause your audience to focus more on your slides than on listening to you.

Don't use phrases such as "as you know…"

I am very guilty of using the phase "as you all know" while speaking. I often do it when I'm worried that I'm telling the audience something they already know and I don't want them to feel insulted. However, it is more often the case that not everyone in the audience fully grasps what's being said, and this can cause you to quickly lose them. Additionally, it might make you come off as conceited, so it's best to avoid any phrasing similar to this.

PRO TIP: Identify your crutch word(s) and obliterate it from your vocabulary! The concept of the crutch word is taught to student radio DJs who usually develop a go-to transitional word when on air. For example, you might start every other sentence with the word "literally" to emphasize a point. Or you might end every sentence, statement or point with a, "you know" or an "ok."

When it comes to academic lectures and talks, however, one of the most common crutch words is "So." Yes, it actually sounds educated to begin the answer to a question or thought with a "So," but when it becomes prevalent, your audience will pick up on it quickly, look for it and become slightly annoyed.

Don't ramble.

This strategy goes hand-in-hand with not padding your presentation with additional slides. Concision is key when it comes to keeping your audience interested, so get to the point in as few words as possible.

If rambling is born out of nervousness, try treating your talk like a conversation, making it easier to stay calm and on topic.

PRO TIP: Be aware of signs that you might be rambling. Some indicators might include losing your breath from talking quickly without pauses, repeating yourself and going into detail about a topic you've been sidetracked into talking about.

There is a common theme among the dos and don'ts of giving an enticing talk—keeping your audience entertained and interested. These strategies will help you maintain the audience's attention. In the book "Made to Stick" by Chip and Dan Heath, it is suggested to "use a simple unexpected concrete credentialed emotional story" to appeal to your listeners. Check out this book here to learn even more ways to make your ideas 'stick' in the minds of your listeners.

Public Speaking Self-Evaluation Sheet

Public Speaking Dos	*Rate 1-10* *(higher rating for when you do this)*
Asks a provocative question	
Conversational tone	
Defined difficult terms	
Engaging	
Enthusiasm	
Excitement	
Explains how you did it	
Explains the meaning	
Explains what you did	
Explains why you did it	
Genuine	
Images and content fully relevant	
Images are compelling	
Mindful of knowledge gaps	
Passionate	
Presentation uses animations	
Relatable	
Slides have a clear message	
Smiling	
Time managed appropriately	
Uses arrows for emphasis	

Public Speaking Don'ts	*Rate 1-10* *(higher rating for when you don't do this)*
Fill slides with text	
Losing breath when talking	
Over-explains information	
Rambles	
Repeating yourself	
Stare at screen	
Use crutch phrases	

Steps to a More Effective Scientific Presentation

By | Rebecca Talley

If you find yourself stressed or nervous about an upcoming research presentation, you are not alone. Here I'll discuss simple ways for life scientists to improve their public speaking skills.

Define your audience.

It is important to cater your talk to your specific audience. It would be ineffective to discuss a topic to a group of people who are unfamiliar with it without giving them a decent introduction to the subject matter. At the same time, an audience who is already familiar with a topic will quickly lose interest if you spend time going over information that they already know. Taking the time to think about the background of your audience will allow you to effectively communicate with them throughout your talk.

Define the purpose of your presentation.

Mapping out your presentation can be very difficult, especially if you don't have set goals on what you want your audience to gain. Taking some time to think about what the purpose of your presentation is will make it easier to prepare an effective presentation. What works best for me is to write down all the goals of my presentation and then to summarize these goals into a statement of purpose that encompasses the big picture of the point I am trying to make.

Organize your presentation from the end to the beginning.

Our minds have been trained since we were young to do things in chronological order and normally that makes the most sense. However, when it comes to presenting research, starting with the outcomes and then working up to the problem can help keep your presentation focused. First, decide what conclusions from your research are most important to communicate to the audience. The conclusions are what you want your audience to remember from the work you have done and may include implications of the study or ideas for future work. Keep these slides brief and your audience will be more likely to remember the main points. Next, prepare the results section of your presentation. There will usually be a lot of information that you want to include with your results such as graphs and charts. Since you have already outlined your conclusions, it will be easier for you to decide what details need to be included in the results section to support the conclusions. Not every finding from your study needs to be presented, but those necessary to support your main purpose must be included. After finishing the results section, explain how you got there—the methods. Include the details necessary for an understanding of how your results were obtained. Lastly, prepare the introduction and title slides. The introduction is meant to gain your audience's attention and prepare them for the rest of your talk, so it makes sense that you should already have the rest of your presentation completed before you work on this section. Remember who your audience is when creating the introduction because some audiences will need more background information than others.

Treat your presentation like a conversation.

One of the common misconceptions about public speaking is that you should have your presentation memorized. I, too, have fallen victim to this misconception in the past, but have learned that it actually creates a lot more anxiety and stress to memorize what you are going to say.

Instead, treat your presentation like a conversation. Your audience is just a friend who you are explaining your research to. While this may sound like giving an impromptu speech, you have an outline of your slides there to guide you. This type of speaking is known as extemporaneous, and you do it every day. The hardest part of speaking extemporaneously is getting over your fear that you may not know what to say. I do this by reminding myself how much time I put into researching the topic and gaining an understanding of it. It also helps to actually have a conversation about what you are going to present with a peer. This will boost your confidence in the subject matter.

Summarize.

After listening to a lengthy presentation, it is likely that the audience has already forgotten some of what was presented at the beginning of the talk. For this reason, summarizing is an excellent tool that can be used to help the audience remember the most important parts of your talk, ensuring that your purpose is fulfilled. After you finish discussing the conclusion of your topic, summarize all of the important points from the introduction, methods, results and conclusion. This can be done in just a few sentences outlining the importance of the project, how it was done and what conclusions can be made. This will also help the audience remember any questions they may have been saving for the end of the presentation.

Preview your slides.

Slides appear different on the computer they are made versus when it's projected onto a much larger screen. To avoid this, I try to preview my slides on the screen that will be used for the presentation. This way, I can make sure everything is legible from the audience's point of view. I understand that sometimes you may not have access to the room or equipment in advance, so try to use color schemes that you know work well and a font size that will definitely be readable. Try to stick to size 24 font or larger. When it comes to colors, white or light text should be used on dark backgrounds and black or dark text should be used on light backgrounds. Avoid photographic backgrounds unless there is a clear purpose for its presence on a particular slide. Avoid red text unless it's used for emphasis and adds to the clarity of the presentation. Sticking to premade templates and basic fonts can also be a good way to make sure your slides will be legible.

Practice, practice, practice.

Practice giving your presentation to a friend or family member. Practice it in front of the mirror or practice by recording yourself on your webcam. This way you can get feedback from others or yourself and improve each time you give the presentation. Just remember that your presentation isn't going to be the same each time you give it because it is not memorized. Practicing will help ease your nerves and increase your confidence.

If you're currently preparing for your thesis defense, it is important to remember that the committee is there to support you, not to fail you.

Use body language to your advantage.

Like many times in life, body language often gives people their first impression of you during a presentation. Your body language gives the audience an impression about whether you are powerful or powerless. For this reason, it is important to have good posture and use hand gestures when appropriate, but not too often.

In this TED Talk, social psychologist Amy Cuddy discusses the effects of power posing and body language. She also discusses how putting yourself in a certain pose can influence hormone levels and how you view yourself. So when you present, if you embody a posture that shows power, you will actually begin to feel powerful and more confident as you speak. This strategy can be used for public speaking, interviews and in everyday life.

Don't be afraid of questions.

When it comes to a presentation about science, the thought of being asked questions about your research or whatever your topic may be can be very intimidating, especially if your audience happens to be your supervisors or professors. The key is to take each question one at a time and answer it honestly. If it is something you do not know the answer to, a good way to handle the question is to explain that it is an aspect you have not yet looked into but plan to in the future. If a question is asked that is too complicated to answer in the time available, it is okay to ask the person who posed the question to stay after so you can explain it in more detail without going over time.

Another strategy you can take is to let the audience know if you prefer questions during your presentation or at the end. If you are going to take questions during your presentation, it is a good idea to factor in a minute or two of time to answer these so that it does not put your presentation behind. If you are going to take questions at the end, again, factor this time into the total presentation time.

Fake it 'til you make it.

Perhaps the best advice when it comes to public speaking that I have ever received is to fake it 'til you make it. This works in many aspects of life. Faking it 'til you make it is all about pretending to be confident even if it is your first time. Acting like an expert and embodying the confidence of an expert will eventually become natural, and that's when you know you finally made it.

How to Build Your Teaching Skills

By | Dr. Tyasning Kroemer

Whether you are a graduate student or a postdoc in academia, you may be interested in a career path that includes both teaching and research—a tenure track professor. Yet, it can sometimes be hard to find an opportunity for you to sharpen your teaching skills. Even when offered, you feel hesitant to commit to teaching a class because it can really take a significant amount of your research time.

Teaching is a way to share your knowledge to help other people understand and learn more. Although overlooked, teaching is actually a hirable skill to gain before finishing graduate school and during postdoctoral training.

Teaching, as either a lab instructor or a teaching assistant, can be nerve-wracking without prior teaching experience. So, how can you prepare sufficiently ahead of time and make your lectures interesting for your students?

Preparing Your Course

The first thing you need in order to master your teaching skills is to really prepare, so your course will run smoothly. This preparation step may include writing your syllabus, planning and practicing your lectures (Kuther, 2003).

Writing Your Syllabus

You can view your syllabus as a contract between you and your students. It should include your expectations and class policies to avoid future problems.

A common syllabus should cover (Kuther, 2003):

- Your information, office hours, communication
- Course description and topics addressed by your course
- Learning goals and reading materials
- Exams and quizzes (including dates and what materials are included for each exam)
- Assignments and due dates
- Attendance policy
- Class policy (example: a cell phone policy)
- Grading policy, including points deducted for a late or missing assignment
- Make up policy
- Academic dishonesty

Be Selective about Your Lecture Materials

The most important thing to remember before planning your lecture is most of your students can only focus for about 45 minutes (Kuther, 2003) before their mind wanders away. Plan your lecture based on the materials they must know, instead of what they should know.

Practice in Moderation

First, you need to practice giving your lectures. For each hour of your lecture time, you want to spend no more than 2 hours to prepare until you feel comfortable lecturing over time (Kuther, 2003). Instead of writing and memorizing what you are going to say in details, practice it with an outline of your major points (Kuther, 2003).

How to Make a Connection During Your Lectures

Throughout the lecture, you have to get and keep the attention of your students. In order to do that, they have to feel a connection to your lecture.

Therefore, when preparing for a lecture, ask yourself these questions (Wright, 2001):

- Why should my students care about what I am going to teach them?
- What difference will this information make in their lives?

Below are some tips on how you can build this connection:

Make a Connection with Your Students

Remember your students' names (Wright, 2001). Actually, put this task as one of the priority goals that you have to accomplish during first few weeks of your class. This is one effective way to build a two–way interaction with your students, so they care more about your class. Sometimes, this type of interaction helps improve their attendance.

Incorporate Good Stories into Your Lectures

Telling a story before you start your lecture may help you break the ice (Wright, 2001). It will help you beat your nervousness and get your students to connect more with the lecture material. For example, you can tell a story from the news about a daily struggle of a little girl who has a particular rare genetic disorder before starting a lecture about 'The Chromosomal Basis of Inheritance' in your genetics class. This story will help your students to put a face on the lecture topic and connect the most up-to-date problem to your lecture.

Help Students Apply New Knowledge

One way to help your students apply new knowledge is by using a story from trending search topics in the media related to your lecture material (Wright, 2001). For example, you can use it as a group discussion topic for your students and conclude with your valuable scientific point of view about the topic. Otherwise, you can start a group discussion about the best way to defeat an ongoing disease after a lecture about viruses and end the discussion with a past successful story of virus control.

Show Your Enthusiasm

Once in a while, share with them a story about why you chose a science career or how awesome your field of study or your research is (Wright, 2001). Your excitement about science can be contagious and it may inspire your students.

Evaluating Your Teaching Experience

Remember that there is always room for improvement. To organize a better course structure or policies for your class, ask other instructors for their syllabi and compare those with what you have (Kuther, 2003). In addition, toward the end of your class, you may receive evaluations about your class from your students. Use both of these to collect ideas about how you can build a better class and improve your teaching skills.

How to Find Teaching Opportunities

Most early academic scientists, such as graduate students and postdocs, never get a formal offer from their institution to teach a class. Therefore, in order to create your way, you may have to actively search for an opportunity to teach.

Listed are some ways to find some teaching opportunities:

- Contact an office of education at your institution to search for seminars or workshops related to teaching.
- Find a visiting or adjunct professorship in a small public university or a community college.
- Apply for teaching postdoctoral fellowship programs.
- Find teacher-training programs.
- Connect with local school principals and teachers and offer to teach a 10-15 minute lesson in collaboration with the teacher. You may ask for feedback from the teacher on how to improve your teaching.

Teaching may seem intimidating at first, but you will receive your reward toward the end. Nothing compares to the satisfaction you will feel when you realize that your work nurtures and inspires the mind of future scientists.

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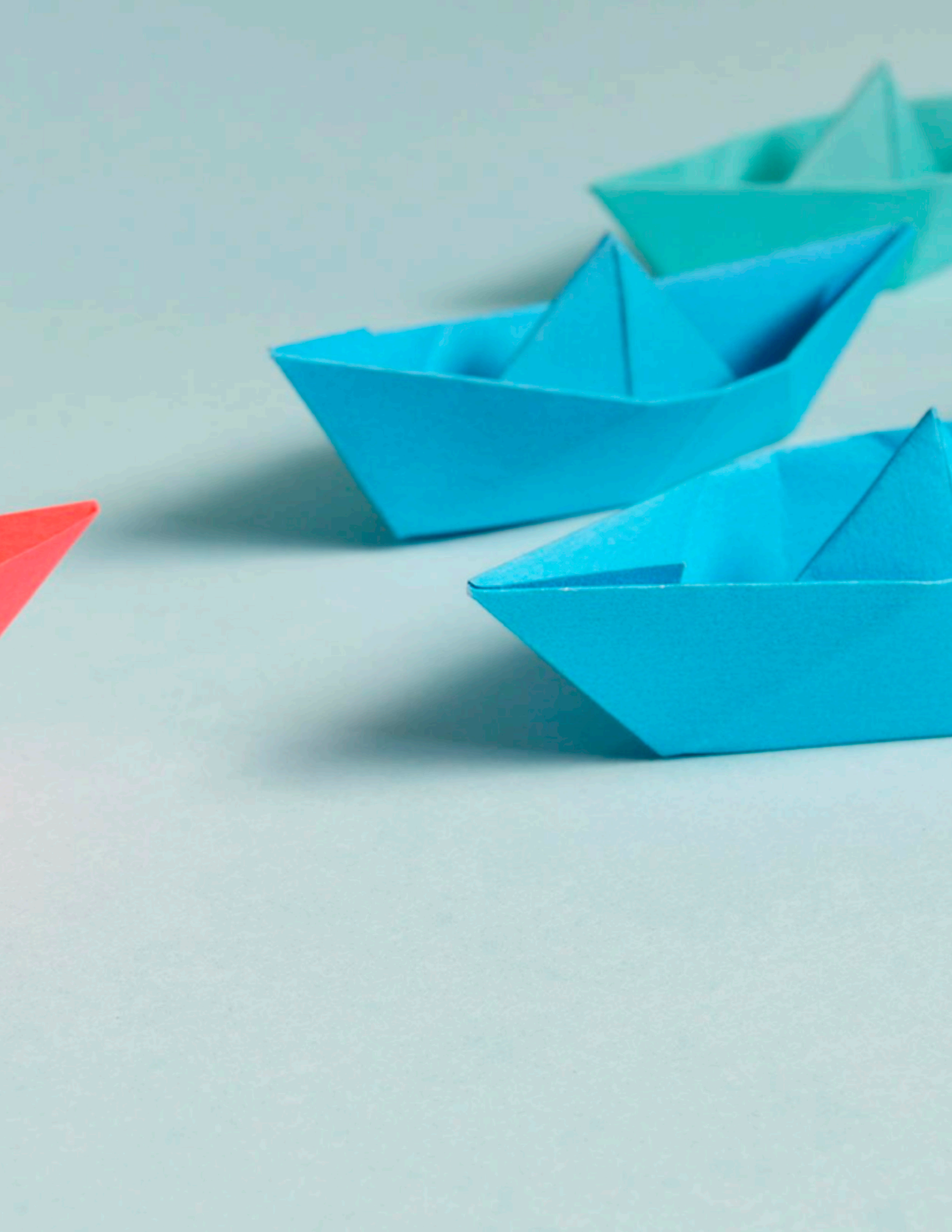
Leadership

Leadership is an important aspect of being a postdoctoral researcher. Enhancing your leadership skills opens more opportunities. It also helps create a positive work culture within your lab. In this section, we discuss why it is so important to develop leadership skills and what makes an effective leader.



Team Building and Motivational Strategies for Your Lab

By | Rebecca Talley

Life science labs come in many varieties. Some are small with just a couple people and some are very large. According to Nature, the ideal number of members in a lab is 10 to 15. While this number of people has been determined to be great for productivity, it can often be difficult for everyone to get to know each other and come together to work as a team—especially if there is significant turnover of employees. As a postdoc, it might your job to keep everyone working together and motivated, and here we will discuss the best ways for you to successfully fulfill this role.

Show Appreciation

When your team performs well and meets the goals you have set together, show them your appreciation. There are a variety of ways to do this, but you don't have to do anything elaborate. Simply acknowledging that they did a great job and saying thank you for their hard work can go a long way in encouraging them to keep performing at their best level. If something goes particularly well and you want to go above a simple thank you to show your appreciation, get creative with your gratitude. Bring in a homemade dessert one day or order lunch in for your team. Letting people know that their work is appreciated is imperative to maintaining a happy research environment.

Avoid Perfectionism

While most postdocs and lab managers know that perfectionism is impossible in the field of research, many still have that expectation. These high standards are not only held for people who are working under you, but for yourself and your performance as well. If you are constantly expecting perfect work and perfect results, you will be consistently disappointed—research is a field where there are many unknowns and unexpected outcomes. Your team will pick up on the vibes you put off and how you react when things do not go as planned.

If you show, by example, that it is okay when unanticipated events occur and experiments don't work out perfectly, your team will likely mirror your attitude. This prevents your team from becoming burnt out and losing their motivation after failed experiments, which are sometimes unavoidable.

A good rule of thumb is to hold your team to the same level of performance that you expect from yourself. In a lab, doing your best might not always correlate with results, but it is more about maximum efficiency and knowledge.

Call in Help if Needed

Many life science projects will have certain aspects that the members of your team are not fully experienced and comfortable with doing. In some cases, there may be lengthy statistics that would require a lot of research, practice and time for your team to learn. This may be a case where hiring a temporary statistician would be worth the extra money. Your team can stay focused on doing the type of work they enjoy—science—and the statistician can ensure your research is analyzed and interpreted accurately.

Regular Productive Meetings

Meetings can be incredibly productive or incredibly unproductive. According to an article produced by Inc., the average employee wastes about four hours per week in meetings that don't benefit the team. Productive meetings on the other hand, are those that only require the presence of those who really need to be there, that start on time, and that end as quickly as possible. This type of meeting allows the team to update one another on their progress and address any unresolved issues.

Be a Leader, Not a 'Boss'

Micromanaging a team is a surefire way to foster negativity in your lab. Having been in this situation before, I know it can be extremely difficult to be productive when someone is constantly looking over your shoulder to ensure no mistakes are being made. This can cause unnecessary workplace anxiety and tension. Instead, be a leader. Provide your team with concrete expectations and provide feedback as necessary, but not constantly. While you may have one way of getting a task done, one of your postdocs may have different method that works just as well. Allow your team to figure out what works best for them and give them the autonomy to do so. This will encourage motivation and positivity rather than resentment.

Foster a Positive Atmosphere

Creating a place where employees enjoy coming to work can have a great impact on your research and team productivity. Offer praise to your team members in front of their peers when something goes well, but save criticism for private meetings and keep it constructive. Don't look at mistakes as failure, but rather learning opportunities and emphasize this with your team. A lot of your lab atmosphere comes down to your attitude. If you're happy, your lab is more likely to be happy; if you're motivated, your lab is likely to be motivated.

But What If You're Not Motivated?

As a leader, it is your job to constantly motivate your team. While the above strategies are great for inspiring and leading your team to success, some of them require a fair amount of motivation on your part to work. So what do you do when you are the one who isn't motivated? Here are some steps you can take to increase your own motivation:

- Be passionate. Try to remember why you went into this field of science in the first place and what excites you about your research. Take some time to reflect on your own goals and what brought you to where you are today.
- Recognize your declining motivation early. The earlier you realize you aren't as motivated as you once were, the sooner you can make a change and prevent your team from losing motivation with you.
- The lab is not your life. You have to have hobbies and people outside of the lab that can help you relax after a long day or week at work. Having a support group of friends or family can help keep your spirits up. According to Dr. Joelle Jay, a senior manager at a leadership firm and author of "The Inner Edge: The 10 Practices of Personal Leadership," "when you're a leader, all of the people below you lean on you…you don't have anyone above you to lean on." Family and friends can be great for this, or you can find an outside mentor who is more familiar with your field.
- Remember that your feelings don't necessarily have to be reflected in your actions. Even when you aren't motivated, the bottom line is that it is still your job to keep your team motivated.

You should not feel guilty if you are in a slump. Instead, use these tips to help pull yourself and your team back up and always encourage positivity—a happy attitude can go a long way, and a negative attitude can cause a lot of unnecessary problems in the lab.

Article references in the supplemental reference section of this guidebook.

Why It's Important for Postdocs to be Leaders

By | Karen Martin

Emerging responsibilities in a lab are part of the puzzle. As a postdoc, you're on a journey to grow as a researcher. The only direction is forward, and as you move forward, you will face other demands, including leadership. So here are the major reasons to improve your leadership skills.

Preparing for Industry Work

According to Smart Science Career's article "Do Postdocs Need Leadership Skills," 90% of postdocs will eventually find positions outside academia (Hendrix, n.d.). Depending on the company and the position, that transition into industry work could require extensive leadership experience.

Running a Successful Lab

Running a lab successfully requires a lot of skills. For instance, good communication skills, good organizational skills, time management skills, conflict resolution skills, listening skills and more. As you look closely at some of these skills, they start to overlap with traits of good leadership. Refining some of these traits will ensure your lab runs smoothly.

Creating Opportunities

One of the reasons leadership is so important, according to the National Postdoctoral Association, is because it creates more opportunities for a postdoc.

Given how competitive research life can be, seeking more opportunities and obtaining more marketable skills is necessary for future success.

As you improve your leadership skills, you will grow into a good networker, mentor, project manager and team leader in the lab, which will also be valuable to future labs.

Article references in the supplemental reference section of this guidebook.

Leadership Self-Evaluation

Trait	Rate 1-10
Accountability	
Action	
Active listening	
Assertive	
Authenticity	
Being a role model	
Belief in others	
Belief in self	
Collaborative	
Committed	
Communication	
Compassion	
Confident	
Consistent	
Conviction	
Creative	
Creativity	
Curious	
Decisive	
Decisiveness	
Dependability	
Discipline	
Driven	
Effective feedback	
Emotional Intelligence	
Empathy	
Empowerment	
Energetic	
Fair	
Flexibility	
Flexible	
Focused	
Goal definition	
Gratefulness	
Helps Others	
Honesty	
Humility	
Identify Strengths	
Independent	
Inspiring	

Trait	Rate 1-10
Integrity	
Intentional	
Intuitive	
Lead by example	
Looks for Experiences	
Loyalty	
Mentoring	
Motivation	
Motivator	
Negotiation	
No Fear of Failure	
Open Minded	
Organized	
Passion	
Patience	
Persistent	
Positivity	
Presence	
Proactive	
Problem-solving	
Professionalism	
Project management	
Public speaking	
Reliability	
Resourceful	
Respectful	
Risk management	
Risk-taking	
Seeks Advice	
Self-motivated	
Servant	
Shares success	
Strategic	
Team building	
Time management	
Training	
Transparency	
Trusting others	
Vision	

How Postdocs Can Improve Their Leadership Skills

By | Karen Martin

We're laying out some steps postdocs can take to help improve leadership. Most of these steps can be carried out simultaneously. And it's important to keep in mind that developing yourself as a leader takes time. You'll make mistakes. You'll get it wrong. And that's ok. We're not perfect.

Mindset:

The first step in improving your leadership skills is simply recognizing that you want to improve. Furthermore, it's time to establish a more impactful *why*. Right now, the self-serving reason for improving your leadership skills would be to help your career. That is definitely a good and motivating reason, and it will help you become a good leader.

But if you're wanting to become a great leader, the why has to be more meaningful. Lean on your core values for this. Are you already a compassionate person? Do you already care about your lab mates? Perhaps you have seen a bad lab culture and want to advocate for your peers. Those reasons are going to help you act more consistently and with more integrity as you become a great leader.

Remember, also, that personal leadership development takes discipline and introspection. This is also part of the mindset idea.

Therefore, to get yourself in the best mindset for leadership, determine why you want to be a *good* leader, why you want to be a *great* leader, what your core values are and commit to this journey.

Evolve:

Postdocs wanting to develop or improve their leadership skills must recognize that this takes time. As years go on and you are more practiced, some parts of you will not be the same – they'll be sharper, more refined, better.

You're going to make mistakes as you go along, but if your goal is to become a good leader, especially for the sake of your peers, be patient with yourself.

Continue to evaluate yourself for your strengths and weaknesses.

Look at what works, what makes people happy, what upsets people, what is important in times of crisis, etc.

Ask for feedback. Though it might be hard to hear sometimes, asking for feedback gives you the opportunity to find out where you need to improve. Remember not to just ask for what you're doing wrong, but also ask about what you're doing right. Good feedback should also include ways your peers think you could improve, not just what to improve.

Determine Your Leadership Style:

Motivational speaker Tony Robbins has the different leadership styles broken down on his website. What you'll find is that you might demonstrate examples of each of these styles, but there are one or two that really resonates with you (Robbins Research International, n.d.)

Democratic Leadership:

The democratic leadership style values the thoughts and expertise of the team. Just as you would think with democracy, this leadership style likes to find a consensus among peers. Democratic leaders often ask for opinions and feedback.

There is a downside to subscribing solely to this leadership style. When faced with a time-sensitive obstacle, the democratic style takes too long, and a consensus might not bring about the best choice. In these times, a leader must be flexible, and venture out of their natural style.

Visionary Leadership:

A visionary leader is a big-picture thinker who can look at something and see many more possibilities within. Not only are they good at spotting potential, they are great at communicating this and inspiring innovation.

Coaching Leadership:

A leader who has a coaching style is going to position themselves as more of a guide, bringing out the best in

everyone. These leaders are connective and instructive. One of the pitfalls of this leadership style is the risk of micromanaging a group. This is not necessarily a bad thing if the people within your team like more direct guidance, but it can exhaust your own energy as you spend time developing each individual.

Affiliative Leadership:

This leadership style puts the team first, and connects themselves with each member. According to Tony Robbins's website, this is a great leadership style when trust has been broken in an organization because this leadership style focuses on building trust and developing emotional bonds with the team. Affiliative leaders are good at communicating with the group and being available as a peer to their teammates.

One of the downsides to this leadership style is feedback can often be absent. People within a team need both positive and negative feedback to understand how to improve and grow into their own potential.

Pacesetting Leadership:

Pacesetting is an actionable leadership style. These leaders have higher standards for themselves which often inspires the rest. If your team is composed of self-starters, this is an excellent leadership style because it prompts actions, and trusts in the expertise of the team.

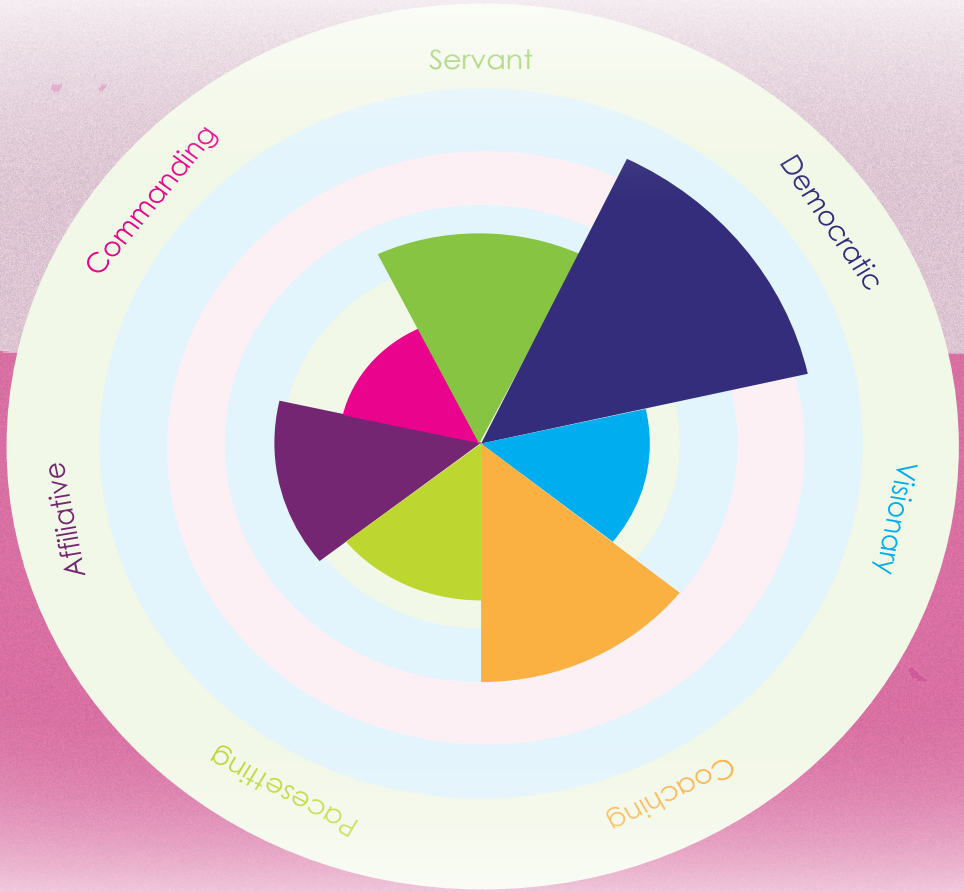
This type of leadership is cooperative, where a pacesetting leader is willing and able to do the same task they might delegate to someone else.

The risk with this leadership style is that it relies on the independence of the group. If you have a team that needs more direct guidance, this is not going to be the best style.

Commanding Leadership:

This is a tricky kind of leadership style, and is not ideal in many group types. However, it can be ideal in certain situations that demand immediate action. The commanding leadership style basically relies on the authority of the position. In this case, people do as they are told because they are told to do so by someone in charge.

In times of crisis where a decision must be made and an action must be taken, this is ideal. However in long-term settings it can decrease group morale.



Servant Leadership:

This is one of the most ideal and universal styles of leadership. Here, a servant leader puts emphasis on the greater good – usually the good of the group. It's the kind of leadership you see in movies with sacrifice and tough calls. Servant leaders understand their purpose and values and use that to guide them in bettering their peers, their organization or their communities.

While motivational speaker Simon Sinek doesn't outright say this in his talk "Why Good Leaders Make You Feel Safe," he leans toward this idea. He emphasizes how great leaders build trust within their organization, make people feel safe and will sacrifice to ensure the best for their peers. Sinek equates it to good parenting. Like parents, good leaders want the best for their people, for them to grow, and for them to be better than they are.

When determining your leadership style, there are a few things to consider: what works best with your personality, what kind of obstacles you face, and the composition of the group. Remember, each of these styles are not suited for every situation. While you might have a leadership style that works best for you, there will be times when you need to lean into another style.

Explore leadership resources:

There are many websites, podcasts, books and YouTube videos about leadership. Start by finding some go-to resources and bookmarking them. If you prefer to watch or listen, build a YouTube playlist or find a reliable podcast.

One important thing to remember is to put what you learn into action. Sometimes that's hard to do. So one bit of advice is to find a theme in something you're reading or listening to, and focus for a week or two on that theme, being more self-aware of when you have demonstrated that quality or when you missed an opportunity to do so.

For example, if you were reading about empathetic leadership, make it a goal to cultivate that empathy within yourself, to be more aware of people's situations and put yourself in their shoes.

Attend courses and workshops:

Universities are starting to become aware of the need for leadership training for postdocs. However, that need is still largely unmet. Thankfully, while there might not be something directly available in your department, universities as a whole often have resources. Some universities have leadership centers where you can learn about upcoming workshops. Some of the different departments might have a function that you can sit in on.

Outside of your university, browse the internet for any upcoming courses, whether online, local or something you might have to travel to. You can also use apps like Meetup to find leadership events in your area.

Demonstrate good leadership:

Great leaders lead by example rather than by instruction. For example one piece of advice to a first year teacher goes something like this "Don't set any rules for your classroom that you won't follow yourself." For instance, if students are not allowed to have drinks in the classroom, then the teacher should not be seen with a water bottle on his or her desk.

To demonstrate good leadership, understand your own values and make that foundational in everything you do. Good demonstration must also be consistent – be a person of your word.

Opportunities outside of the workplace:

Depending on your lab, you as a postdoc might find yourself in a situation where you're not able to lead as much as you'd like to. Maybe it's a smaller lab, or maybe the culture isn't quite built for this. That presents a challenge when you are trying to develop your skills and put things into practice.

When faced with this situation, it's time to look for opportunities outside of work. This could be in the form of a volunteer job, or perhaps using your expertise to assist a PI in a collaboration project or even something unrelated to research (website building, social media). In these situations, you show yourself as a servant leader by helping, and you can demonstrate qualities of leadership like delegation, listening, project management, communication, etc.

We are aware that the available time for a postdoc is limited. Therefore when an opportunity arises, if you can't fully help, try to at least apply yourself in some way, even if it's as small as providing a little advice. Down the road, when you do have more time, this approach will have fostered a connection that could lead to more opportunities in the future.

Mentors and examples around you:

It's likely you have seen at least one great leader in your life. Maybe this was a teacher, maybe it was a bus driver. But there was something about this person that made everyone feel good and could get things done with just a smile. That special something they had was maybe contagious, and you found yourself learning something just by subconsciously observing them.

This happens all the time, where good people come in and out of our lives, and they leave us with so much more. Now that you want to develop your leadership skills, you're going to have to seek these people. Pay special attention to those around you, even if they're distantly connected to you. For instance, if you're in a large lab where you only see the same four people each day except at the lab meetings where everyone is the lab. And in the lab meeting there is just this one person who is a natural leader, don't be afraid to approach them.

Connect with model leaders or even look for a leadership mentor. Your mentor does not have to be in the same field as you. A leader is a leader no matter what.

Embrace failure:

As a scientist, you are very familiar with failure in the lab. But this also occurs in leadership. It's rare when failure is so detrimental that nothing can be recovered. In most cases, it's a mess-up, maybe a costly one, but then you go back and try again.

The same goes with leadership. It could be that you had a bad day and snapped at someone. It's going to happen. Don't let this discourage you. Instead, apologize, admit what you did was wrong, listen to their feelings and move forward.

As a leader, if you are going to embrace failure in yourself, then you must also embrace it in others. Your team will make mistakes, huge ones, and as a great

leader, your role is to be there, support them and in tough times let them depend on you. That's not to say a little tough-love is out of the question. People need feedback. But they also need assurance.

Encourage others:

Leadership is not about your authority or personal accomplishment. It's about the greater good, and the vision at hand. Good leaders make their peers feel safe and recognized. Part of doing that is being encouraging.

As a leader, you don't want to break anyone's spirit or tear them down, nor do you want to foster a culture that embraces something like that. Instead, your goal is to push for the best in everyone. It takes a lot of emotional control sometimes, but championing your peers helps them be confident in themselves and drives better results.

Collaborate:

When it comes to being collaborative, we're not just talking about the scientific side of things. Collaboration in leadership means acknowledging you are not a one-person-show. To do things well, you can't do it all yourself. Of course, considering that you do things very well in general, it can be hard to delegate some of the work to others. You want the vision to remain intact and for the finished product to be as good as envisioned or better. Occasionally, you're going to have a situation where there is too much on your plate and you have overestimated your abilities. This is especially going to be the case as you move up and take on more responsibilities.

Thankfully, there are people among you who are also proficient in different things, and they can help you out. Be willing to give up some of that control and trust in your peers. It will take a lot of those leadership qualities to assure the job gets done right, like clear communication and active listening. You might not get what you expected back; however, with a good collaborative relationship, you can rework so that both sides are happy.

Furthermore, collaboration also means making yourself approachable for your team when they also are faced with a situation where there's too much going on.

In the end, collaboration means supporting each other and using your resources and knowledge to do so.

Never forget your purpose:

Always remember why you're doing what you're doing. Research life is hard, and leadership in research life

is harder. Keeping your vision and purpose always in front of you will help you during the toughest of times.

Often, we go through periods of disillusionment, or derailment. It's remembering your purpose and keeping your eye on the prize that will keep you motivated and help you stay true to yourself.

Be a good follower:

You may have heard this saying before, "being a good leader means being a good follower." It's a common saying because it has a lot of truth to it.

When you think of following in order to become a good leader, there are a few directions to go:

- **Following model leaders:** There are going to be people around you who are model leaders. Following traits you respect can help you develop your own leadership.
- **Following superiors:** Even as you climb the leadership ladder, you will most likely still have some kind of authority over you. Demonstrating your respect for that authority to your peers sets a good example. Sometimes you don't always like the task delegated, or it doesn't make sense, but acting with integrity can make you an impactful leader. (This advice is not speaking to situations of oppression. That's a different situation).
- **Following your peers:** Each member of your team will have his or her own unique strengths, skills and expertise. As a developing leader, you can bring out their expertise by allowing them to lead when their experience calls for it. This is especially important in collaborative situations.

Learn to communicate better:

Communication skills aren't just vital to leadership, they're vital for healthy relationships. When it does come to leadership, clear communication is key. If something bothers you, the last thing you want to do is react emotionally. Instead, clearly communicate why something bothered you or did not meet expectations.

It's also not good to sugar-coat or be passive aggressive or try to stifle a confrontation. The goal is simply clear direction on what went wrong and how to fix it.

For example, let's say you asked an undergraduate in your lab to build a log of all the lab's instruments for calibration tracking. And what you got back was not at all what you expected. Perhaps they sent you a Word document listing the instruments out when you really wanted an Excel spreadsheet listing the instrument name, vendor type, last calibration date, next calibration date and a space to sign off. It would be unwise to let your frustration control how you communicate with this undergraduate student. Instead, good communication means sitting down with the student, explaining the project and expectations more clearly and asking questions to determine whether they understand.

Stay positive:

Our emotions and energy, especially as a leader, can be contagious. If your goal as a great leader is to foster a collaborative, productive and healthy environment for your lab, then it's important to demonstrate positivity.

That's not to say you won't have your bad days, weeks or even months, but in general, try to look for silver linings, smile at your peers, be inviting and approachable.

Leadership Improvement Resources

Making the Right Moves: A Practical Guide to Scientific Management for Postdocs and New Faculty
Free HHMI book download

The National Postdoctoral Association Core Competencies Reading List

At the Helm: Leading Your Laboratory, Second Edition

Harvard Business Review

Leadership and Management Skills Course for Postdocs

Postdoc Leadership Program (Cornell)

Postdoc Leadership Workshop: Leadership and Management

Article references in the supplemental reference section of this guidebook.

Work-Life Balance

Postdocs find time management and work-life balance to be a huge struggle. How do you cope with the demands of research and the demands of your family, friends and self-care? What if you're sick? We address these challenges in this section.

Overcoming Academic Stressors: Rejection, Impostor Syndrome & Burnout

By | Dr. Tyasning Kroemer

Early career scientists in academia, such as graduate students and postdocs, often have to deal with the pressures of work from their short-term appointment, lack of job opportunities, and requirement for publication (publish or perish). As the time goes by, you often find it difficult to juggle long hours at work and manage your work-life balance.

Unsurprisingly, many early academic scientists view their work and life as extremely stressful, accompanied with feelings of anxiety, and depression (Gloria & Steinhart, 2013). All of these emotions may negatively affect your health, job satisfaction, productivity, and engagement with your research and workplace.

Among a variety of stressful challenges at the workplace, early career scientists may experience repeated rejections, impostor syndrome, and burnout. Therefore, in this article, we show you how to identify these challenges and come up with solutions to overcome them.

Repeated Rejections

Even though the first rejection is probably the toughest of all rejections, any rejection following it may still be equally painful. Unfortunately, most academics have to deal with repeated rejections (Jaremka *et al.*, 2020)

As you encounter more rejections, you may find it easier to process. On the other hand, repeated rejections may also become a hurdle. In addition, it can affect the way you think about your self-worth.

Identifying Disillusionment from Repeated Rejections (Jaremka *et al.*, 2020):

- Losing your confidence.
- Taking these rejections as a long list of personal failures.
- Stressed and overwhelmed.
- Becoming cynical and forming negative thoughts.
- Feeling depressed and unmotivated

Tips to Overcome Repeated Rejections (Jaremka *et al.*, 2020):

- Give yourself enough time to process each rejection.
- Accept the rejection as an opportunity to improve your research, manuscript or grant.
- Plan the next step only when you are ready.
- Be persistent.
- Seek help from a colleague, mentor, or professional, if this challenge makes you depressed.

Impostor Syndrome

Have you ever felt your achievements or skills are not good enough to be in science? When this happens all the time, your self-doubt may snowball into a big hurdle and cause you to feel stressed. It may prevent you from being productive and lead you to believe you don't belong in your field of study.

Impostor syndrome is a tendency to question your accomplishments and believe you are not as competent as others think you are (Jaremka *et al.*, 2020). Surprisingly, this is common in academic scientists, despite a lot of evidence of their knowledge, skills and accomplishments.

It doesn't help when academic culture continuously demands high quality results, such as getting a greater grant, producing many high-profile publications, and scoring glowing teaching evaluations.

Identifying Impostor Syndrome (Jaremka *et al.*, 2020):

- Feeling insecure and that you don't belong in higher education.
- Afraid that people see you as a fraud.
- Undervaluing your skills or accomplishment.
- Stressed and overwhelmed.

Tips to Overcome Impostor Syndrome (Jaremka *et al.*, 2020; Levine, 2020):

- Realize that you are not the only one in academia experiencing this challenge.
- Push back your negative feelings: It is not real, nor based on facts. Try not to let it dictate your future.
- Be kind to yourself.
- Recognize your unique ideas, skills, achievements, positive values, and professional record.
- Surround yourself with supportive friends, colleagues and mentors.
- Talk to a professional counselor, particularly if what you feel causes significant issues in your work and life.

Burnout

When you experience burnout, you start questioning the value of your hard work. Burnout is a state of persistent stress generating physical and emotional tiredness, and eventually lack of interest (Jaremka *et al.*, 2020). This condition is both serious and incapacitating. Burnout may arise from being overworked. More often, it comes from feeling too overwhelmed.

Identifying Burnout (Jaremka *et al.*, 2020):

- Feeling helpless, unappreciated, and exhausted.
- Unmotivated and losing interest on completing your tasks.
- Feeling that you've reached your upper limit.
- Overwhelmed and close to quitting.
- Not caring about your job.

Tips to Overcome Burnout (Jaremka *et al.*, 2020):

- Remember that burnout is a common problem in academic science.
- Remind yourself why you pursue this academic career.
- Set realistic expectations so you don't get overwhelmed with your list of things to do.
- Even though it's hard, try to improve your work-life balance.
- Talk to a supportive colleague or mentor who can motivate you and find a good solution together.

Repeated rejections, impostor syndrome, and burnout are regular stressful experiences in academic life. Despite being common, many academic scientists find it hard to admit they experience these challenges due to high expectations of the academic culture.

However, when you experience these challenges, be kind to yourself and be persistent. Keep in mind you are not alone in these challenges. Talk to your mentor or colleague. Also, consider seeking professional help, particularly when these challenges become too overwhelming and your thoughts turn into self-harm.

Article references in the supplemental reference section of this guidebook.

Maintaining Work-Life Balance in Academic Life

By | Dr. Tyasning Kroemer

Many graduate students and postdocs associate longer hours at work with productivity. Oftentimes, the number of publications and grants become a way to measure success in academia. In hopes of standing out from their peers, many scientists dedicate their efforts and time mostly on research, grants, and publications. It's no surprise scientists struggle to find a work-life balance.

This is probably your ordinary Saturday routine as an early scientist: you run to the laboratory to split cells, take care of your animals for your experiments, and check your samples from your experiments. The more you work, the more experiments you get to finish. Your personal time will have to wait.

Obviously, longer hours at work contributes to research productivity, but scientists who work more hours are more likely to report stress and dissatisfaction with their workload (Jacobs and Winslow, 2004). Therefore, even if your priority is to achieve success in academic life, it is still necessary to care for your personal life.

How to Find Your Work-Life Balance

Maintaining the right balance between time for work and personal life is always a challenge. The solution for this problem is to create a set of realistic expectations at your workplace that matches your need for personal time. Below are some ways to help you find that balance:

Prioritize Your Tasks

Arrange tasks on your list based on their deadline. Put the tasks you need to finish immediately at the top. This list will give you an idea about your daily workload and your spare time for your personal life.

It's possible your priorities might have to suddenly change. This would mean a strictly ordered list won't be flexible enough for these changes.

Another list approach is to write a task down, and to the left, set a priority level between 1-3 (1 being the highest priority).

Manage Your Schedule Wisely

Try not to put too many activities in your agenda. It's important that you set a time boundary for yourself. For example, you plan to be out of the lab by 5:30 pm. Now you have to be realistic about your approaches. Given the available time you have, how much do you really think you can accomplish? Keep in mind, it's very easy to overestimate how much you can do, and forget all the interruptions and situations that come up during the day. So stay conservative about this. Things

to remember are to prioritize lunch and post lab clean-up so that you can be out at the time you set.

Be More Selective

One thing to remember is that any time you agree to do something for other people, you are more likely to sacrifice your personal time to do it. This might happen a lot to you, particularly when you have too many projects with tight deadlines.

To be more selective during this busy time, you need to learn how to say "no." For example, when someone asks your help, think about how this request can get you closer to your goal, like learning a new skill. If this request causes a significant delay for you to finish your projects, then politely say "no." When there is less amount of work on your schedule, use your free time at work to help others.

Identify What You Need

Self-care is essential for your physical and mental health. It includes getting enough rest, sleep or exercise, and eating healthy food when you need to eat. So, try to schedule your research experiments around your sleep time, lunch break, or exercise schedule. When you need to take a short vacation, check your institution's policies for paid and unpaid leave. If you feel too stressed and overwhelmed, allocate time to talk to your mentor or seek a professional counselor.

Identify What You Enjoy

Sometimes when you get too busy, you have no spare time to do fun activities. Even so, it is very important to find time for an activity that helps you complete yourself.

To do this, try to remember an activity you enjoy doing the most when you were younger. For example, some people choose to do some sports (such as swimming, basketball, or yoga) to keep their mind off their laboratory and refresh themselves.

If the lab has really overwhelmed you, it's best to find simple activities that delight. For instance, a gentle hike.

Find Your Support System

When you put in long hours, you tend to miss family events or lose contact with your family members or friends. Furthermore, you might be "taking work home" mentally, which can make it harder to focus on meaningful conversation with family and friends. This can make you feel isolated and lonely without immediately realizing it. If possible, find time to reconnect with your family members or friends you haven't contacted for a while.

Turn Off Work Mode

When you enter your personal time at home, try your best to not to think about your work anymore. This is probably easier to say than done. However, if you really have to use your personal time to do some work, set up in advance how long it should take and try not to go over this allocated time.

Juggling Family Life and Career

Parenthood is a special kind of challenge for scientists. The ability to take some time off for parents to care for sick kids or even after the birth of a baby depends on the institution, the funding agency, and the mentor—usually it is limited or none.

For example, nearly 44% of 66 institutions (polled by National Postdoctoral Association) in the U.S. provide no paid time off for externally funded postdoc mothers after giving birth (Ledford, 2017). For those with paid time off, the maternity leave often is too short, so some new mothers have no time to recover and bond with their newborn.

Below are some ideas to maintain work-life balance for early scientists with a baby or little children:

- Find out about the policy for a maternal/paternal leave and any personal leave to care for your sick child in your institution. Also, check if there are any limitations and any rooms for negotiation.
- Consult with your mentor to find a solution together about balancing research expectations with your family life.
- Prioritize your tasks, try to finish tasks as soon as you can, and politely say 'no' to tasks that you can't do.
- Let your mentor or lab manager know when you have to pick up your baby or little child from the daycare due to illness.
- Manage your experiments efficiently, so you don't have to sacrifice your family time.

Article references in the supplemental reference section of this guidebook.

How to Manage Sick Days as a Researcher

By | Karen Martin

It's 6 a.m. and you had a rough night of coughing, a runny nose and a massive headache. Despite the eight hours of sleep you attempted, your body feels more unrested than when you first went to bed the night before. Your body is telling you to stay home and rest. You consider it for a moment, but when you recall your lab to-do list, you say to yourself, "suck it up," as your feet plop down on the cold floor.

When flu, colds and other illnesses strike, you're called to decide between your health or your experiment. Too often, the experiment is the winner. Except, your experiment, your lab and your colleagues might not actually be winning. In this article, we highlight the risks caused by being sick in the laboratory along with ways to feel a little less stressed about taking a sick day or two.

Why it's important for researchers to take sick days

You might feel selfish or guilty about taking a sick day while others work hard in the lab. The ideas of selflessness, endurance and toughing it out is not isolated to the laboratory. It's widespread in many workplaces, but there are several consequences, especially within research.

Your colleagues:

Communicable illnesses spread quickly in closed, shared spaces. Immediate examples of extreme situations include the number of school closures reported in 2018 and 2019 due to the rate of flu related illnesses, and gastrointestinal outbreaks reported on U.S. Navy Ships and cruise ships.

Likewise, a laboratory setting is the perfect place for contagious illnesses to spread. Even if you bounce right back after a cold or flu, your colleagues might not. Nor will they be happy to take the flu home with them to family and friends.

Your experiments:

If the reason you're thinking about going into the lab while sick is because of the endless tasks your experiment can't wait on, think again. When you're sick at work, you quickly realize how much your mind is not operating at 100%. Trying to carry out experiments with clouded judgment might actually come with great costs. Imagine setting up a massive PCR experiment, only to realize after running it that you forgot to include

Taq. Now, you've got to rerun the whole thing again. What's worse, you don't feel good.

Foggy brain aside, there is another possible consequence to your experiment (or even your colleagues' experiments): contamination.

Let's look at *Mycoplasma* contamination since it is a great pain to cell culture. This tiny bacterium is hard to detect, they impact cell growth and can render research invalid. When it comes to *Mycoplasma,* contamination in cell culture, a major source of contamination is from laboratory staff. A 1976 study showed 80.6% of lab technicians sampled were carriers of *Mycoplasma (M.salivarium).* One of the methods of transmission is sneezing. While flu and colds are viral illnesses not caused by *Mycoplasma*, you might heighten your risk of causing *Mycoplasma* contamination or any other detrimental contamination due to the fact that you're now sneezing and coughing in higher frequencies.

But I don't feel sick. I don't even have a fever:

While on the topic of *Mycoplasma* and contamination, there are situations where you have all the symptoms of being sick, but you still feel pretty good. You're not fatigued. Your head feels good. You don't have a fever. You're just coughing a lot, and you sound hoarse.

Walking pneumonia, caused by *M. pneumonia*, can cause you to be somewhat symptomatic of a cold but feeling well enough to work. However, keep in mind, you're still coughing, sneezing at a higher frequency, and therefore potentially contaminating your experiment.

How to manage a sick day as a researcher

When you've got time constraints and a long experimental pipeline, even imagining a sick day can raise stress levels. So what do you do when you have cells to keep alive and crucial experiments planned?

1. Breathe, and understand that science is meant to be slow and careful.

To properly figure out how to manage a sick day when it comes up, the first thing that needs to happen is to relax for just a moment. Understand that the pure process of science is methodical and long-term. You might be in a hurry, but the reality is that many things can wait a day or two or few in order to mend.

2. Ignore what others might think:

A devoted work ethic is admirable and important to the productivity of science. What isn't admirable is when the culture of the lab places that devotion above overall health. There is a pride that comes with sticking it out, but there is also a cost, especially in a research lab. Remember, contamination from sickness and spreading infection to others is a greater consequence than missing a day in the lab.

3. Decide on what is truly urgent:

Once you're a little more relaxed, it's time to review your to-do list for the day or week. From that list, determine what is actually urgent. What will die if you're not there? For example, running the gels you planned to run can be put off. Ensuring your cells are pulled from an incubator when they need to be, can't really wait.

Go through each task, and use the following questions to decide what can be put off, and what absolutely cannot wait (write up your own set of questions that might be more unique to your situation if necessary):

- Will putting this task off cause me to lose a significant amount of time?
- Will putting this task off mess up the results of my overall experiment?
- Will putting this task off cause a significant loss of supply/money?
- Will putting this task off completely derail or kill my experiment?
- Can this aspect of my experiment be redone if need be?
- How detrimental would it be to have to redo my experiment?

Sort your task list between urgent and not urgent based on these questions. This lets you clearly see what you need to prioritize and what you can put off.

4. Delegate!

For those things on your list that absolutely cannot wait and are hopefully easy to execute, ask a colleague, and be willing to return the favor if and when that day comes. Your lab manager can also be an excellent resource in this situation. Call with your list and ask if they can delegate out the must-do tasks.

5. If you must, get in and get out!

In a situation where you can't delegate, go in and get the stuff done on your list that absolutely cannot wait. Plan to stay no more than one or two hours, and do not push yourself to go further. Once you have finished your urgent to-do list, leave the lab.

Special cases

The advice in this article is not going to offer a one size fits all solution. Instead, these are general, practical tips. Your experiments, lab culture, schedule and unique situations are going to impact how you manage sick days. And in some cases, your situation might be more specialized or challenging to work around. In this section, we'll highlight certain special-case scenarios, and how to best navigate them.

Meetings and presentations

One of the huge dilemmas with being sick is that there is just never a good time. Occasionally, it can happen to coincide with a scheduled presentation or important lab meeting that can't be rescheduled.

How you approach this will depend on a few considerations. Two primary things to think about are:

- **How does your lab handle this?** Some labs are on strict schedules. Missing a meeting means missing a significant window. Or, it might put things off schedule for your PI. In this case, there's not a lot you can do except to go ahead with your presentation and do the best you can. But the key is to do your presentation or attend the meeting, and then immediately go home after to rest.

- **How sick are you?** It's really, really hard to reschedule important meetings, or presentations when you're expected to speak. The decision to cancel or reschedule will have to depend on how sick you are. Obviously if you're in the hospital, there's no way around it. But what if it's just a stomach bug or cough? Only you can decide what is best for you. Consider yourself, consider others and consider the constraints. One key thing is to think very realistically about the situation. For example, if you cannot hold your stomach, giving a presentation is going to be extremely difficult to manage. It's better not to push yourself in a situation like that.

Managing the expectations of professors and PIs

You might find it difficult to take that sick day if your professor or PI is not as flexible. Or perhaps they are flexible, but it feels a little scary to ask. This is never an easy situation to face. Not only do you feel dreadful, you feel guilty or ashamed for even thinking about asking. Here are some approaches to help you decide what to do.

- **Consult your institution's sick policy:** Most universities and research institutions have outlined policies for illness. This is the base requirement for what to do and how to proceed. However, too often those same policies might require you to make arrangements with your PI or professor.

- **Check with your professor before you get sick:** When you're sick, you immediately feel pressure about what to do. But that pressure is lessened if you have this mapped out ahead of time. Before you ever get sick, find out from your professor or PI what their expectations are when a member is sick. Perhaps they require a doctor's note after so many days of absence. Maybe they have a policy already drafted. Maybe it depends on what experiments you're running or the day's schedule (as in there might be very mandatory things that shouldn't be missed except in emergencies).

- **Ask your lab manager to advocate for you:** If you're in a lab with very high expectations or strict policies, you might want to approach your lab manager first. If your lab manager has a long-standing relationship with the lab's PI, they might be a great ally for you.

- **Ask Anyway:** If you're feeling pretty terrible, it's best to just ask anyway. If you know there are things that are urgent, explain that you can come in to take care of those items on the list and then you intend to go home to rest.

When your child is sick

When your child is sick, the entire story changes. You want to drop everything because your little one is depending on your care.

Some labs are going to be extremely supportive, but others might have stricter deadlines and timelines. For the latter, this is a difficult situation and can cause a larger barrier for those wanting to advance their career in research. Unfortunately, there is not a single solution to address these challenges.

Instead, consider the options above (Managing the expectations of professors and PIs section)

- Consult your institution's policies – many of them have policies regarding the illness of immediate family members.
- Talk to your professor or PI before the situation arises.
- Seek the assistance of your lab manager

Additional tips for these situations include:

- Identify people you can rely on for assistance, collaboration and help. They can be your go-to when emergencies arise.
- Sync experimental schedules with other labmates

in anticipation.
- Communicate a strategy ahead of time with the other researchers in your lab so you can support each other in the future.

Your situation might call for other considerations. Knowing yourself, how bad you feel, and what the expectations are will help you determine your best course of action.

Proactive approaches

Getting sick is a reality of life. Instead of figuring out what to do once you are sick, it's better to plan ahead and be prepared. Here are some strategies to be a little more proactive in the lab for the next cold and flu season.

Have a rule about sickness already in place

It's better to be ready. Have it written in a handbook or have a seasonal email go out to everyone in the lab reminding them why it's important and that it is required to stay home (or out of the lab) when sick. Even remind the lab about flu shots, and preventative measures to keep the lab safe overall.

Get the lab manager involved

If you're serious about being prepared for the next wave of illnesses, get with your lab manager to help prepare. Ask them to volunteer as a resource or a coordinator for when someone is sick. The lab manager can be a great point of contact when delegation is required.

Encourage sick days in your lab

This is really one of the most important things. Being a lab that encourages and supports sick days can help motivate a person to use it when they really need to. Have that become part of your lab's culture so that when someone calls undecided about whether or not to come in, the default answer will be to stay home, feel better and only come back when they're well enough.

Remind your labmates that you will support them when they're sick

At the first sign of someone being sick in the lab, remind labmates that you're available to help if they can't make it in. As the day progresses and their condition worsens, get ahead of the game by asking what their plans for the next few days are and how you can help.

Remember, taking a day or two off from the lab during sickness doesn't just help you get better, it helps your colleagues and reduces the risk of your experiments.

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Time Management Hack: Work Efficiently, Not Longer

By | Dr. Tyasning Kroemer

Without realizing it, time is up. The day is over. Unfortunately, that means you ran out of time to cross out the last few bullets on your list of things to do. You become stressed and overwhelmed, because the deadlines for some of your tasks are approaching fast.

There are never enough hours to finish each task on your list. It's also hard to decide which tasks to prioritize within your limited time. Often, you end up putting extra hours in finishing research projects with strict deadlines. The problem with longer hours is your efficiency decreases. When you are tired and stressed, you tend to make more errors (Woolston, 2017).

One easy way to manage your time better is by using the urgent-important matrix, also known as the Eisenhower Principle. As Dwight D. Eisenhower (former U.S. President) once said, "What is important is seldom urgent and what is urgent is seldom important." (Bielczyk *et al.*, 2020).

The urgent-important matrix helps you to prioritize your tasks based on the level of urgency and importance. Therefore, define what's urgent and what's important. Urgent tasks are activities that demand our immediate attention, whereas important tasks bring us closer to our goals.

The Urgent-Important Matrix

To manage your time effectively, categorize activities and organize them from high to low priority. The order for this list is: ***important and urgent; important, but not urgent; not important, but urgent;*** and ***not important, not urgent.*** After that, you can proceed to focus on tackling those tasks in the high priority list.

Important and Urgent

The tasks in this category are crises. If not attended to as soon as possible, they can impede your goals. Therefore, do these tasks at first. Examples of 'important and urgent' tasks include preparing your presentation for tomorrow and arranging a repair for a broken PCR machine in your laboratory, so you can do your experiment.

Important, But Not Urgent

These tasks are associated with important things that you need to do without time constraint, for example performing your research experiments, and conducting literature reviews for your study. You can certainly wait to do these tasks, but you must schedule and do them to achieve your goals.

Not Important, But Urgent

These tasks in the 'not important, but urgent' category require your immediate attention, but they cannot help

you get closer to your goals; for example, answering certain emails, invitations to join side research projects, and a request from a graduate student to help her or him troubleshoot her or his experiments. Most of these tasks can become interruptions, particularly when you have too many tasks with tight deadlines in your schedule. Therefore, delegate these tasks or do them later.

Not Important and Not Urgent

This type of activity distracts you from finishing your goals; for example, checking your phone and sorting through junk e-mails. Don't do these activities when you have too much on your list.

	URGENT (Do these first)	NOT URGENT (Schedule and do next)
IMPORTANT	1 2 3 4 5 6 7	1 2 3 4 5 6 7
NOT IMPORTANT	(Do later) 1 2 3 4 5 6 7	(Try to delegate) 1 2 3 4 5 6 7

Some Useful Tips for Effective Time-Management

Plan Your Long-Term Goals

Planning small steps towards your ultimate goals is important to navigate your career (Bielczyk *et al.*, 2020). It should include planning tasks for short-term goals and a clear timeline leading to your long-term goals. Later on, this plan will guide you on choosing your urgent and important tasks. By doing so, you will also avoid procrastinating, being too overwhelmed, and stressed out.

Identify Your Most Productive Time

Identify the time of day when you have the most energy to finish your important and urgent tasks and the time of day with the lowest energy to do more maintenance work, such as splitting cells and cleaning up your lab bench.

Take Care of Yourself

Don't forget to allocate time for self-care activities, such as exercising and eating. These activities belong in the 'important, but not urgent' category. The goals of these activities are to keep you healthy and stress free. Both illness and stress can affect your ability to get you closer to your long-term goals.

Learn to Say 'No'

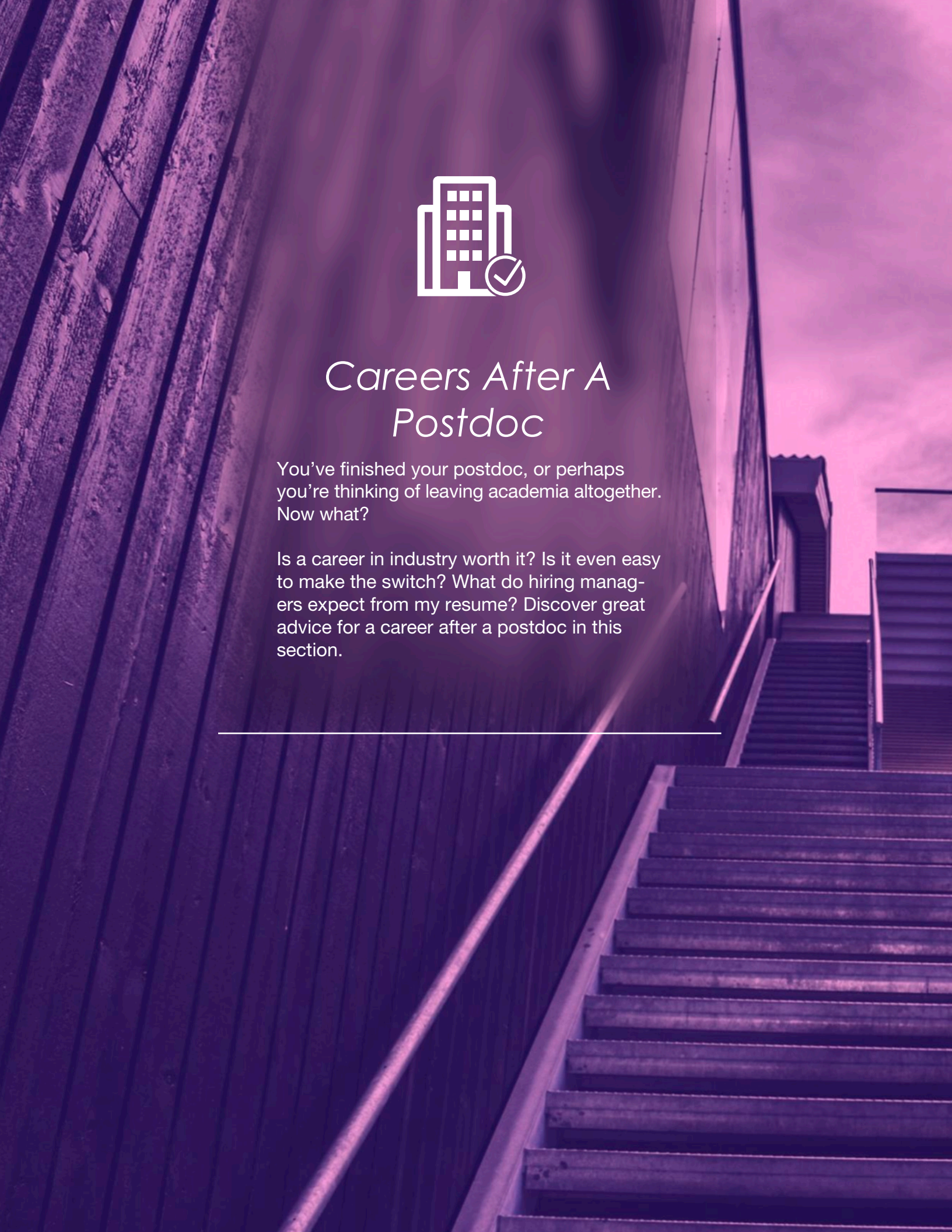
After planning the timeline for your goals, choose tasks based on the urgent-important matrix. Saying 'no' to activities in the 'not important, but urgent' category is difficult. However, it is necessary when you have too much on the other higher priority lists (Bielczyk *et al.*, 2020). To make it easier, you can imagine if the deadline for your tasks is approaching soon, would you still say 'yes' to these activities? When you finally find spare time, you can definitely go back to these activities.

Avoid Distractions

Eliminate any distractions that will delay you from finishing your 'important and urgent' tasks. You can use this method to avoid distractions: make them inaccessible for you. For example, you can silence and put away your cell phone when you are in the middle of finishing important and urgent tasks. At your workplace, you can close your office door when you are busy (Boss & Eckert, 2004). This closed door sends a message to your colleagues to "not to come in," so they will find another time to chat with you unless there is an urgent situation.

Learning how to prioritize your daily activities can help you manage your time effectively and steer your career in the right direction. One way to do it is by categorizing short-term tasks based on the importance and urgency leading to the fulfilment to your long-term goals. By doing so, you avoid unnecessary stress when the deadlines for these tasks are getting closer.

Article references in the supplemental reference section of this guidebook.



Careers After A Postdoc

You've finished your postdoc, or perhaps you're thinking of leaving academia altogether. Now what?

Is a career in industry worth it? Is it even easy to make the switch? What do hiring managers expect from my resume? Discover great advice for a career after a postdoc in this section.

How to Move Forward and Leave a Postdoc Position

By | Dr. Tyasning Kroemer

The majority of graduate students have entered into higher education and postdoctoral training to land careers in academia. Unfortunately, times have changed and postdoctoral training is not a fast guarantee for an academic career.

At this time, there are limited number of available faculty positions for many postdocs and PhD holders searching for a job. This situation then generates a problem: many postdocs are trapped in the same waiting list, causing them to stay perpetually in their position and compete with each other for the same job.

After researching for a faculty position, you might start to worry about your future. Your research revealed how other accomplished postdocs have struggled to land an academic job, and now you wonder whether someday you will leave this position.

Although necessary, many postdocs are probably unfamiliar with the process of developing their career (Sinche, 2016, pg. 3). Therefore, this article is geared to help postdocs start their career development and build their skills to move into the next career phase.

Moving Forward to Find More Career Options

Career development is a way to improve, keeping yourself more competitive for the job market. In this process, you will link your interests to career fields and improve your skills (Sinche, 2016, pg. 11).

Below are the stages of career development:

Self-Assessment

To go through the four stages of career development, you start by self-assessment (Sinche, 2016, pg. 11). Ask yourself some helpful questions during this process, such as:

- What is your education background?
- What are your interests?
- What are your skills?
- Why did you choose a career in science?
- Do you want to stay strictly science, or use your expertise in other ways?
- Do you enjoy working in a group or alone?
- Are you interested in working at a company, a university, or a government agency?
- What is your priority among your values (such as a high salary, a flexible schedule, a work from home job, or a frequent travel)?
- Where do you want to live?
- What type of activities do you like the most and what inspired you as an undergraduate student, a graduate student, and a postdoc?
- What are my strengths and weaknesses in my current position?
- What areas do I need to improve?
- What do I like about my current position, and what do I dislike?

You can also ask for more inputs from your friends, family, colleagues, or mentor to learn more about yourself. Another way is by finding a career counsel-

or in your institution to help you performing self-assessment.

Career Exploration
After you reflect and learn more about yourself, you are ready to explore different types of careers and the necessary skills required for your careers of interest (Sinche, 2016, pg. 11). In this process, write down information about the required skills with the skills that you already have.

Goal Setting
For the next process, write down a list of required skills that you still need to build (Sinche, 2016, pg. 11). Make a plan and put it in your priority list to develop those skills to be competitive for pursuing your career of interest. It is also useful to research what others have gone through and done to fit the skills required for a particular job.

Job Search
In this process, you start your job search and prepare your application. In addition to job search websites (such as LinkedIn) and recruiters, network your way into your career of interest.

Alternatively, look deep into your volunteering activities (Sinche, 2016, pg. 11). For example, if you like being in a committee on student affairs and recruiting a guest speaker for a symposium, these clues may lead you to a path involving managing scientific collaborations. Another example is if you enjoy volunteering to teach kids about science at local schools, consider transitioning into teaching.

However, what if, after going through this process, the answer is for you to stay in academia. What should you do to leave a postdoc position to land a job in academia?

Moving Forward to Find a Faculty Position
For some postdocs who love to be in the academia, but they don't want to be a professor, there are some alternative careers. These positions includes a licensing associate, a science core facility technician, a research investigator, a laboratory manager, a research development officer (to manage grants), or a biosafety coordinator (Levine, 2016).

However, if you still want to pursue an academic professor, find a college or university that is a good fit for you. In order to do that, you may want to explore these questions for your self-assessment:

- Which one do you like better: a position with a heavier teaching load or one with a heavier research load?
- Would you prefer to teach undergraduate students or graduate students?
- Where do you prefer to be located: A city or a rural area?
- Would you be willing to move from your current area to another location?
- Is the value of the college or university similar to your value?
- What is the policy of the college for promotion, tenure, family life, and work-life balance?
- How do other colleagues support new professor in pursuing tenure?
- The next steps will be similar to the last three steps of career development: career exploration, goal setting, and job search. By doing so, you may need to build more game-changing skills required to be competitive for an academic position.

For example, to land an academic position with more research requirements, add valuable skills, such as writing your own grant and publishing in journals with high impact factors. On the other hand, to land a position with more teaching loads, add valuable experiences, such as teaching more variety of classes for both undergraduate and graduate students.

Keep in mind that there are satisfying career options for you, when you are ready to move on from your postdoc position. It is less likely that an academic job will just land smoothly on your lap, particularly after you stay too long as a postdoc in your university. Therefore, in order to move forward, you must take an initiative to develop strategies to pursue your next job.

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Tips to Move on from an Academic Postdoc to an Industry Job

By | Dr. Tyasning Kroemer

Finally! You finished collecting and analyzing data from your experiments. It means you will soon be busy writing your manuscript. Deep down inside, you feel satisfied that you will have at least one publication in the pipeline.

In your mind, you are ready to take the next step and apply for your dream job. But, you still have a huge question mark about whether your publication, skills and background as an academic postdoc are enough to beat your competition for industry work.

Below are some useful tips to help you enter an industry job from academia:

Be Honest with Your Supervisor

Ask your supervisor or mentor how he or she can help you obtain your dream job (Jensen, 2016). Put it on your agenda, so you remember to discuss it with your supervisor.

Be More Selective

If possible, choose research projects that bring you closer to get a job in industry (Jensen, 2016). For example, you might want to consider the types of projects that produce a product that will need marketed and patented. Your involvement with a patented product will definitely look good on your resume, particularly if you are interested in joining an industry R&D team as a research scientist. It will also be useful for you to learn the newest research techniques that are of interest to industry scientists.

Otherwise, you may choose collaborative research projects between your mentor and scientists from industry. This collaboration could help develop important soft skills in the areas of communication, project management, leadership and teamwork. It may also help you to network and get your name on their radar.

Networking to Open Your Path

Never underestimate the power of networking (Jensen, 2016). During a professional meeting—even if you'd rather sit quietly with your laptop—you should introduce yourself to a company representative, show what you know about the company, ask some questions (such as its products, working culture, employment, and history), and listen carefully to show your interest.

Networking is also useful when there is a new job opening at a company. When a current employee of a company thinks you will be a good fit for a new

job opening, he or she may inform you about it. This employee may give you more details and direction about the requirements of the position and the hiring manager.

In addition to professional meetings, LinkedIn is also a good way to make connections with employees from industry. LinkedIn also lets you easily search and apply for industry jobs.

Start Searching for a Job before Your Funding Runs Dry

Even if you think your professor has a lot of time before he pulls you into his office to have the "end of your funding" talk, it's never too early to search for a job (Jensen, 2016). It usually takes a while for a company to review applications and candidates, finish interviewing candidates, make decisions, perform a background check, and inform you about the decision.

Explore a potential job for PhD level scientists by searching a job from websites, such as HigherEd, Indeed, Glassdoor, and LinkedIn, and job recruiters.

Below are some examples of potential careers in industry you may want to check out:

Research Scientist

General responsibilities: designing, developing, and executing research experiments.

General preferred skills: technical skills and knowledge in biology, biochemistry, or related field of study; multitasking; teamwork; meeting deadlines; research experience; research writing experience; research publication experience; and good verbal, written and interpersonal communication skills.

Laboratory Manager/Team Lead

General responsibilities: performing laboratory duties as assigned, managing a laboratory team and checking inventory. They also often perform research and train new employees.

Common preferred skills: technical skills and knowledge in biology or biochemistry, good communication skills, multitasking, good laboratory practices and regulatory compliance.

Regulatory Affairs Specialist

General responsibilities: providing regulatory guidance, creating and compiling regulatory documents for submissions, maintenance, and relevant regulatory filings.

Common preferred skills: experience and background in a scientific field of study; good negotiation skills; good verbal, written, and interpersonal communication skills.

Medical Writer

General responsibilities: preparing, editing, and finalizing brochures, synopses, regulatory documents, and clinical documents.

Common preferred skills: medical or life science background, good regulatory document writing and review skills, and interpersonal skills.

Science Writer

General responsibilities: planning, writing, editing, and submitting proposals, progress reports, scientific manuscripts and other forms of scientific communications.

Common preferred skills: life science background, experience in writing research publications, critical thinking, literary research, proofreading, and editing.

Start Updating and Evaluating Your Resume

After doing thorough research on a particular industry career you are interested in, quickly update your resume. Evaluate your resume to check if you can learn new techniques, obtain appropriate licenses/certificates, or add specific skills and knowledge—anything useful to improve your chance of getting the industry job.

Keep in mind every job posting is different. Each posting will have different needs and different skill requirements, even if the job title is the same. Therefore, it's important to tailor your resume for each job you're applying for. Furthermore, consider the skills and elements of the job description as keywords. Use those keywords in your resume to help hiring managers and HR representatives move you forward.

Getting your foot into industry isn't hard. It just takes a little bit of preparation, creativity and patience.

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Alternatives to Completing a Postdoctoral Fellowship

By | Rebecca Talley

If you find yourself asking the question, "is a postdoc really my only option after receiving my PhD," this article is for you. Here are great alternative career paths to consider when a postdoc isn't your ideal route.

Research and Development

One of the most common alternatives to working in academia is working industry. While there are many different types of industry jobs available, working in research and development is one of the most popular. R&D jobs include those related to discovery of new drugs and other preclinical research. PhDs are typically the scientists that test new medical therapies before the drug moves into clinical trials on humans. There are also positions for PhDs that focus on development of processes and optimization of production of new technologies—whether that be a new drug or some type of instrumentation necessary for another scientific application.

While there is an option to complete a postdoctoral fellowship in industry, most companies do not require you to have completed a postdoc. If you want to increase your chances of getting a position in industry upon completion of your PhD, look into getting an internship in industry while you are still in school. This will give you experience working in the field without the completion of a more lengthy postdoc.

Pharmaceuticals

Another popular type of industry job is working for a pharmaceutical company, particularly as a pharmaceutical scientist focusing on drug discovery. There are many different jobs which fall under the pharmaceutical scientist category which include but are not limited to analysis of drugs and metabolism of drugs.

A scientist can also work as a pharmaceutical sales rep whose job it is to sell products. PhDs have the ability to understand the way drugs work and affect the body, which makes them appealing as pharmaceutical reps who will be educating physicians on the company's products. With bonuses for making sales goals, scientists have the potential to start out making more money as a pharmaceutical rep than as a postdoc, and PhDs also have the ability to move up to management positions within pharmaceutical companies.

Scientific Entrepreneurship

If you are a someone who is spewing creativity, scientific entrepreneurship may be a great choice for you. First, you have to have an idea. Next, you have to get people interested in your idea. This step has become much easier with social media and crowdfunding sites such as Kickstarter. Starting a business isn't easy, but with the right group of people assisting you, you can be very successful. Many scientists have started companies by joining forces with colleagues who specialize in business.

Patent Law

Many intellectual property law firms will hire PhDs to work as advisors. This is a great opportunity for those who are interested in dealing with the newest scientific discoveries on a daily basis, but you have to be willing to explore a variety of fields. As a scientific advisor, a PhD may be responsible for drafting and securing patents.

Another option for PhDs interested in patent law is going back to school to become a patent lawyer. This can be done on your own or with the support of a law firm who may help finance your education.

Scientific Writing

One alternative to pursuing a career in academia is to become a scientific writer. If you have strong writing skills and don't mind swapping out your lab bench for a desk, this may be an option for you. You can work for journals, magazines, pharmaceutical companies, etc. Many PhDs with writing skills also obtain jobs for marketing departments or editing scientific articles.

One way to get started is to look for internships in science journalism. This will get your foot in the door as a writer and help you to gain experience necessary for a career as a scientific writer despite having spent a majority of the last few years in the lab.

Finance

Another area that scientists can find jobs in is finance. According to Science magazine, scientists often make great financial analysts not only due to their extensive training in mathematics and quantitative analysis but also because they have the ability to understand the science behind new technologies. These skills allow them to determine the best investment decisions for their company.

Industries that employ scientists for financial analyst positions include pharmaceutical and biotech companies. Investment companies and large financial corporations also hire scientists to head their healthcare and life science sectors. It is to their advantage to hire someone who understands the processes involved and science behind new designs.

Of course, moving into finance from science is not a simple change. While your science degree has provided you with the reasoning and mathematical skills that you will need, you will also need to increase your financial literacy through reading and enrolling in finance courses at university or online.

Military

The military offers alternative careers for scientists as well. Military scientists study infectious agents such as bacteria and viruses and study disease, drugs and chemicals. They also work to keep all military personnel free of contagious disease and are involved in studying the effects of different exposures and activities. Doing research for the military can be a very rewarding career for a PhD who is not ready to leave the lab bench but is not set on a career in academia.

There is also the option of completing a postdoc in a military research program like the United States Army Research Laboratory. This is an alternative career path to entering academia that can increase your chances of working as an independent military researcher in the future.

If you decide to go into the military before receiving your doctorate, you may be able to use the post-9/11 GI bill to pay for part of your education when you decide to go to graduate school. Talk to a recruiter before enlisting to get more details on the stipulations of the GI bill.

Secondary Education

You're probably thinking that this article was about alternatives to academia and you're right. However, teaching at the secondary level is a lot different than pursuing a career as a college professor. It takes less time to reach the goal because there are no required postdocs and there will be fewer people applying who are as educated and qualified as you are with a PhD. While you can always go back to school to get a teaching certificate, whether one is necessary will depend on the state requirements and whether you're looking into teaching at a private or public school. If there is a requirement for a teaching certification, look into state-approved alternate routes to get certified. Teaching science at the high school level can be really fun if you enjoy working with teens.

Nonprofit Organization

Working for a nonprofit organization, you can do almost anything with your science degree. From getting involved in policy to doing biomedical research of interest to the organization, there are numerous possibilities. While there are many positives to working for a nonprofit such as independence and flexibility, there are also a few disadvantages to consider. Most nonprofits cannot afford to pay scientists as much as they would make in other industries. Additionally, there will be a lot of time spent raising money and applying for grants in comparison to working for a larger corporation. Take all of these factors into consideration when deciding on the next step in your journey.

The Postdoc's Guide to Networking

By | Rebecca Talley

If you've ever heard the phrase "it's all about who you know," you are probably familiar with how important networking is. Careers in academia and life science are no exception. Networking has been reported as the single most important factor to obtaining a job after your postdoctoral fellowship. While many postdocs have already begun networking during graduate school or before, there are many who are still not comfortable doing so. Networking can be very challenging for some people and a breeze for others. In this article, I will discuss the *who, what, when, where, why,* and *how* of networking to help increase your confidence as you continue your journey to a professional career in the life science field.

The Whys of Networking

Why should I network?

Before we get started talking about the ins-and-outs, and dos and don'ts of networking, you may be wondering what the point of it actually is. Talking to strangers and meeting them may not seem very beneficial to you at this time, but the benefits will become apparent as you move forward in your career.

Networking is a great way to get your foot in the door for job opportunities. If you're familiar with the idea of six degrees of separation, then you know that it is a theory where everyone is only six people away from any other person through "friend of a friend" connections. If there is someone you want to meet, you can probably find a way to meet them through your networking connections.

Additionally, networking can be a good way to meet people socially and academically. Perhaps you want someone to travel with to a certain conference out of town or even need someone with experience to run ideas with. These connections have limitless benefits to your professional and personal development.

And don't forget, networking isn't one-sided. You can also assist someone else, find a collaborator, or eventually develop a support network for a future startup.

The Hows of Networking

How do I prepare?

Before you attend a networking event, you want to be sure you are well-prepared. Have a plan and know what strengths and skills you have to offer. Create a brief outline of what you plan to talk about. Develop a mental introduction that includes information about yourself, your current status, your current position, your goals and your talents.

Make sure your plan includes questions for others. We can't emphasize enough that networking is meant to be connective – two-sided. Therefore it's important to ask people you meet about their passions, interests and research.

How do I approach people I don't know?

Approaching people you don't know can be intimidating, even for those who consider themselves to be social. To overcome this, many dating gurus suggest using the three second rule, which can also be applied to networking.

The three second rule says that you should give yourself three seconds from the time you think about approaching someone to actually go up and talk to them, eliminating much of the overthinking that would occur if you gave yourself time to ponder.

Using this rule, scope out someone you want to talk to during a networking event, and go start a conversation with them. Introduce yourself and if you don't know much about the person quite yet, you can use the event you are at as a conversation topic. Did you like one of the talks that occurred earlier in the day? Is there an interesting portion of the conference coming up? Is there something about this person's research that is intriguing to you? What you talk about matters a lot less than actually making the connection. Be friendly and polite, show genuine interest in the person you are talking with, and assess their body language as the conversation moves forward.

How do I network?

The hardest part of networking is approaching someone you don't know, and there is another great strategy you can use to get remembered.

Business cards have become more outdated with recent advances in technology and social media, but they can be great tools to have when networking with larger groups of people. Have business cards printed before the event. Make sure your cards include your name, field, current position, and contact information including your LinkedIn profile link.

When you are finished connecting with someone, give them a card and ask for theirs so you can remain in contact later on.

How do I get people to like me and build a relationship?

While there are no secret ways to make people like you, being polite and friendly is the first step to building a connection with someone. You can also show interest in someone by asking questions about current research and future goals. During your conversation, use their name and show empathy by understanding their perspective. Making people feel like you've known them forever, even if you have just met, is a great way to make a positive connection with someone.

Following up with the people you meet helps you continue building new relationships. This can be easily done if you have exchanged business cards, but if someone doesn't have a card, try to jot down as much of their information as you can remember. You can shoot them an email or LinkedIn message letting them know you enjoyed meeting them.

The Whos of Networking

Who should I network with?

Knowing who to network with can be tough because it is hard to know which connections may lead to opportunities down the road. For this reason, networking with a wide variety of people at different universities, institutions, businesses and organizations is most beneficial.

Some people may think networking with older, more experienced scientists in higher positions is the best method; however, Belinda Lee Huang, PhD, the executive director of the National Postdoctoral Association, notes that postdocs should also network with each other. Getting your name out there early enough and finding out what other people in your industry are involved in can help you to know who to reach out to down the road when you are looking for new career opportunities and ways to advance. It is also important to remember that the PI is often not the only person in a lab who has influence on who gets hired. If another postdoc has gotten to know you at a previous conference or even if you worked together during your undergraduate career, it is likely that the PI will trust his colleague's opinion of you.

You may also come across opportunities to network with nonscientists who work in the science industry. This may include people who are launching startups, people who are involved in marketing for a company, or a variety of other disciplines related to the sciences. It is important to make connections with these individuals as well because they might have ways into new opportunities or show you a path that you have not yet considered. Networking with these individuals is not much different from networking with a scientist. The major difference is that you will want to tailor your conversation style and vocabulary to language that they are familiar with, since they may not have experience with the technical aspects of your research.

The Whats of Networking

What are my objectives?

The point of networking is to make a lasting connection with someone, and leave an impression that they will remember. Since you want to have this person as a future resource, it makes sense that you want them to be able to remember who you are, what it is that you do, and how you are an asset to the industry. Keep in mind that your reasons for networking are going to vary and these will determine your ultimate goals. Some reasons people network are discussed below:

- To find out about different career paths within a specific life science field: In this case, you may be wanting to know how different people got to the place in their career that they are in now. Did they go straight to an academic position after completing a postdoc fellowship or did they work in industry at some point? Maybe the route they have taken was atypical and they can give you some ideas on how you want your own journey to play out.

- To actively seek an employment opportunity: Many people network in hopes of finding job connections. This is a great way to find out who is hiring and get your name out there before submitting an application. Meeting face to face is a great way to learn about ways to enhance your CV or even find out what different PIs are looking for in a job candidate.

- To seek a mentor outside of your own institution: In the science field, many people work with mentors along their way to seeking an academic position. Usually these mentors are from your school and are in a field similar to what you plan to work in. Sometimes, however, it can be beneficial to get a mentor from and outside institution since they will have a completely different perspective to share with you as you pursue your goals.

- To make connections for later project collaborations: Depending on what stage of your career you are in, you may have ideas for projects that would benefit from multi-institution collaborations. This is not uncommon because resources will vary from school to school and people will have different levels of experience in certain techniques. Forming connections with people who you may be able to work with later on is great if you have a larger research project in mind in which you could benefit from this collaboration.

What questions should I ask?

Questions to ask when networking will depend on the setting; however, you never want to come on too strong. Your first goal is to learn about the people you are talking to. If you are meeting someone who just gave a talk at a conference, then you may have a follow-up question regarding some of the details that he spoke about. If you're meeting a peer who works as a postdoc at another university, you may want to ask about her background and goals in the future as well as what she is currently working on. There are no set series of questions that you are required to ask, but you want to show interest in the person and their work. You can also use the objectives you have laid out to develop questions that you should ask.

If you are currently in a position where you are looking

people who are involved in marketing for a company, or a variety of other disciplines related to the sciences. It is important to make connections with these individuals as well because they might have ways into new opportunities or show you a path that you have not yet considered. Networking with these individuals is not much different from networking with a scientist. The major difference is that you will want to tailor your conversation style and vocabulary to language that they are familiar with, since they may not have experience with the technical aspects of your research.

What if I'm an introvert?

Networking can be particularly intimidating to those who consider themselves to be introverts or less comfortable in social settings. If this applies to you, the addition of social media as a networking tool is invaluable to you. You don't have to meet face to face to make a great connection.

With a variety of platforms available for you to use to network, it is beneficial to know how to optimize your use of each. Here are some common platforms and tips for using them:

- Facebook: Facebook is a great way to connect with those you meet networking in person that you want to stay in contact with later on. By adding someone as a friend, you have the ability to make more of a personal connection with them and have the ability to message them at any point in time.
- Twitter: Twitter is a great marketing tool that many scientists use to keep their followers updated on their recent projects. While it isn't as helpful for making long-lasting personal connections, it can be a way for you to connect with other people in your field and keeping up-to-date with each other's progress.
- LinkedIn: As far as professional networking sites go, LinkedIn has been the go-to platform for the past few years. Here, you can connect with individuals and share your CV all in one place. This is a great way to find connections for employment or to seek out individuals who need a job if you are hiring. However, some features on LinkedIn require you upgrade to a paid account.
- YouTube: Many companies and universities have YouTube channels where they post videos about different projects they are working on. While these can help you learn about various institutions, the comments section can actually be a way to network by discussing the video and giving feedback.
- Reddit: Reddit is a great way to exchange ideas with fellow scientists, there is even a special page for this exchange called LabRats. Here, you can post questions, ideas, or even job interests, and get feedback from people all over the world.
- ResearchGate: According to ResearchGate, it is a site where researchers connect to "read and discuss publications, create exposure for your work, get stats on your research, and connect with your colleagues." You can even connect your profile to your Facebook or LinkedIn account.

for leads on jobs or a career path, some of the things you will want to ask include:

- What can I do right now to make myself marketable?
- How have you been searching for work (now or in the past)?
- What can I do to ensure I land a position at an ideal place?
- What qualities or benefits should I look for in a company or university that make in an ideal place to work?
- What have you heard other PIs say they tend to look for in a candidate?

Remember that they key to networking is giving a good first impression that you can follow-up later on so be professional in all questions that you choose to ask.

What do I wear?

What you wear will depend entirely on the setting. Generally, if you are meeting in person, you will be at a conference or another formally organized event. In this case, according to fashion expert, Joyann King of The Ladders, it is proper for men and women to wear business casual to business professional attire. It is important to steer clear of any clothing that can give an unprofessional appearance such as low-cut shirts or short skirts for women or skipping a tie for men.

The Whens of Networking

When should I start networking?

Getting started early has many benefits. First of all, you can become more comfortable with speaking to people that you don't know and figuring out what works best for you. Perhaps you aren't too excited about approaching a stranger for the first time, which is a normal feeling to have, but once you get started, it will become easier.

Networking early also allows you to build a bigger network. The earlier you start, the more people you will meet and make connections with. You will also have more time to get to know the people you are meeting before inquiring about jobs or other opportunities or asking for any type of recommendation.

The Wheres of Networking

Where should I network?

Networking can be done virtually anywhere. It used to be done through formal, organized events where a group of people from similar fields came together such as at conferences, interviews, and different professional groups. While these places are still very important networking locations, within the past decade, online networking has become increasingly popular. Through social media, people from all over the world can become connected with one another. Perhaps the most well-known place for professional networking is LinkedIn; however, according to Science, less professional sites like Facebook and Twitter have also fostered many professional relationships between scientists. Additionally, you can join email lists to help you stay in the loop. One example is Life Science Network, which was founded in 2010 and is a place for life science professionals of varying backgrounds to stay connected.

Networking Cheat Sheet

1. Seek to establish meaningful, two-way connections and conversations.
2. Plan ahead with talking points and ice-breakers.
3. Use your surroundings as ice-breakers. IE: *the talk's topic, future research possibilities from the study, the overall event.*
4. Use the 3-Second Rule to approach new people
5. Have business cards ready.
6. Include notes when entering new contacts into your cell phone.
7. Network with everyone, not just people in your field, or people who will only benefit you. Network with people in other fields or people you might be able to assist.
8. Know your objectives before the networking event.
9. Network digitally using LinkedIn, Facebook, Twitter and Research Gate.
10. Start networking as soon as possible.

Networking Checklist

Item	✓
Clear networking objectives	
Updated LinkedIn profile	
Business cards available	
Pen & small notepad	
Know how to easily enter contacts with detailed notes into my phone	
Professional/appropriate outfit	
Planned Ice-breaker questions	
Had meaningful conversations	
Sent follow up message	
Continued, relevant engagement via LinkedIn or social media	

The Postdoc's Guide to Tenure-Track Positions

By | Rebecca Talley

With tenure track positions being few and far between, getting a permanent position requires more than just becoming the best scientist you can. This guide—combined with some good luck—will help you maximize your chances of getting a tenure track position at the completion of your postdoc.

Network, Network, Network

While this is true for any field, networking is extremely important when it comes to advancing your academic career in the life sciences. With few tenure-track positions available, having contacts in your field and at institutions you're interested in can make a huge difference when you are trying to get your foot in the door. As a postdoc or nontenured faculty, reach out to those who have tenure positions at not only your university, but others in your area as well. Attend conferences and network with people there. Get their contact information and be sure to write down any details you remember about their position and research. Another way to network is to reach out to people who have published papers that strike your interest and ask them about their work. Simply getting your name out there before it's time to apply for a tenure-track position can help your application stand out.

Avoid the Perpetual Postdoc

I'm sure you've heard it before—timing is everything. You don't want to apply for tenure-track positions before you're qualified and armed with a competitive application, but it would worse to wait too long to apply. With postdoctoral fellowships lasting longer and longer, many life scientists are getting caught in the trap of never leaving their postdoc position once complete and starting another postdoc cycle.

So when is the best time to apply? First of all, you should be nearing completion of at least one postdoc before you start applying for tenure-track positions. It is not uncommon to have completed two postdoc positions before receiving a position, however, according to Science, completing more than two may actually hurt your chances of getting a professorship. Avoid becoming the perpetual postdoc by preparing early: publish as much as you can in high-quality journals, broaden your area of expertise and showcase your skills on your application.

PRO TIP: If you become first-author of important research in your field that is published in an impressive journal, do not delay applying for tenure-track positions. Having recently published, relevant work can be a great way to get your application noticed and get an interview.

Gold Biotechnology®

Ace the Application

Often times, the application is not only the first impression the hiring department will get of you, but it can also be the only impression if it does not impress enough to receive an interview. Because the application is so important, you have to ace it. Let's talk about how.

Cover letter:

The cover letter will determine how much time the reviewer or committee spends looking at your application, if any time at all. You should have a fresh cover letter for every single job you are applying for. Using a generic letter will not convey the reasons you are a great fit for that particular position and institution. So take the time to cater your letter specifically to the job you are applying for. Tell the reader why you want the position for which you are applying and why you are a great fit. Also include information on where you did your training and describe your most interesting current research projects. It is also great to include what your future research plans are and how you will accomplish them in this position. Convey excitement and passion for your field and the position throughout the letter.

Application:

Follow any and all instructions provided to you by the institution. Be sure that all of your answers to application questions are catered to the specific position you are applying for and even to the school you are apply to work for. Include an updated copy of your CV, which highlights the specific experiences you have that pertain to the job you seek.

Mailing the application:

If there is an online application, use it to apply and attach your CV. If there is only a paper application, you can scan and email it, send it via FedEx or another mailing service, or simply send it via standard USPS. Pay attention to any deadlines you may be approaching and take any necessary steps to make sure the application arrives on time.

Be Flexible

There are only so many universities in each state and even fewer in a single city. If you are not tied down to a specific location for family or other reasons, applying for positions all over the country can greatly increase your odds of getting a position. Universities will usually pay for your travel expenses for interviews so it is an advantage to seek out these opportunities if you would be willing to make the move for a tenure-track position.

Make a Plan B

Whether you're going to use your plan B or not, it's always nice to have one in case plan A doesn't work out. There are many postdocs who continue to apply for tenure-track positions and don't succeed. It can be easy to stay in the postdoc world and hope that next time you apply things will be different, but you should also consider careers outside of academia. After crowdsourcing information from a variety of sources, I have found that most life scientists agree that after completing two postdocs and applying for tenure-track positions during and after them, a back-up plan should be considered.

Of course, I'm not saying you should give up on academia if it is your dream, but you should be aware of the other paths and options that exist because they can be very rewarding, too.

Adjunct or Tenure: The Journey of a Life Science Professor

By | Dr. Tyasning Kroemer

The path to becoming a college professor is long and arduous. To begin, it takes a huge commitment to finish a doctoral degree followed by a postdoc appointment. In recent years, the degree and some postdoc experiences are often insufficient for obtaining a professor position. It's a highly competitive job with many qualified graduate students and postdocs applying for the same position.

However if you are reading this, then you are probably certain teaching is your calling. You enjoyed teaching an introductory biology class filled with curious undergraduate students, mentoring, and interacting with them during graduate school. You also find yourself needing to solve problems by conducting research and inspiring the next generation. Therefore, you can see yourself working in academia with the goal of becoming a professor.

As you browse for a professorship, you will probably encounter different titles for this profession, such as adjunct faculty, assistant professor, and associate professor. And you're not always sure what each title actually means. Therefore, this article provides a quick introduction about some common professorial titles and ranks to guide you in your academic journey.

Currently, there are two teaching paths in academia: a tenure track and a non-tenure track. What separates these two paths is the job security of the position.

Tenure Track

A tenure is a contract for a permanent faculty position at an academic institution, unless extraordinary situations occur (such as financial problems in the university or misconduct by the tenured faculty member). With tenure, the university gives academic freedom to a tenured faculty member, allowing him or her to pursue any research or teach any courses related to his or her field of study.

The evaluation for a tenure track position is based on how well the faculty member performs in teaching, research, and service. Different institutions may have different requirements for becoming tenured, depending on service, achievements, and merit. However, to obtain tenure, you must receive one or two excellent evaluations in those three areas and adequacy in the remaining area(s).

Advantages of Tenure:
- Possibility to land permanent employment.
- Better pay and benefits.
- Academic freedom.

Disadvantages of Tenure:
- More pressure to publish research and find grants ("publish or perish").
- Promotion depends on tenure committee.
- Harder to maintain work-life balance.

Tenure Track Faculty

Some common academic ranks in the tenure track are assistant professor, associate professor, full professor, and endowed professor.

Assistant Professor

Assistant professor is typically the entry-level position to begin the tenure track journey, but it can also be a position in the non-tenure track. For the tenure track path, the tenure review can occur on the sixth year after starting as an assistant professor, although it can also start earlier depending on the individual institution (Beasley *et al.*, 2006).

The tenure file contains your CV, teaching records and evaluations, all publication records, grants or awards, external review letters evaluating your achievements in the field, and a record of your service to your university. After receiving your file,

the tenure committee evaluates it and the members of the committee can recommend you for a promotion to be an associate professor.

This committee typically consists of several tenured professors and the head of your department. Then, the president, provost, or chancellor of the university makes the final decision. If unsuccessful, you have another year to try to get the promotion or start over at another institution.

Associate Professor
An associate professor is the middle rank of a tenured professorship, although some universities have used this title for the non-tenure track career. After several years, an associate professor can ask for a review to become a full professor. To gain this promotion, the associate professor has to meet all the requirements of the institution (typically outstanding evaluations on acquiring funding through grants to perform their research, proving the quality of their research, teaching courses, and demonstrating service to the institution) (Mabrouk, 2007). If unsuccessful, the associate professor can try again within a limited time.

Full Professor
A full professor must take a leadership role in research, teaching, and service in his or her institution, because this is the highest rank of a tenure-track professorship. Faculty at this rank have tenure, more academic freedom, and a higher salary. In addition, a full professor can freely choose to teach higher-level undergraduate courses or graduate courses.

Endowed Professor
An endowed professor receives funding from a donor to carry out research for the university. The research that the endowed professor performs should fit the donor's vision and philosophy.

In recent years, U.S. colleges and universities have increased the hiring of more non-tenure track faculty (Crick *et al.*,2019). The non-tenure track faculty refer to university educators signing temporary contracts, and they are not tenure-eligible due to this short-term appointment. However, their role becomes more significant in higher education, helping ease much of the teaching load within academic institutions.

Non-Tenure Track

As a non-tenure track faculty member, you have to demonstrate excellent performance in teaching. The non-tenure track position includes adjunct faculty, graduate teaching assistants, and visiting professors.

Advantages of Non-Tenure:
- Less pressure to publish research and find grants.
- Better work-life balance.
- Ability to spend more time teaching a class.

Disadvantages of Non-Tenure:
- Lower pay and benefits.
- Temporary employment.
- Less time for research.

Non-Tenure Track Faculty

Adjunct Faculty
An adjunct faculty member teaches one or more courses at a college or university, but their position is not full-time. In addition, these instructors do not have a full-time salary or benefits (such as health insurance or retirement funds).

Graduate Teaching Assistant
In the graduate program, a graduate student can become an instructor for one or more undergraduate courses. The responsibility of a graduate teaching assistant commonly includes assisting a faculty member to teach a class or a laboratory. Many graduate programs offer a small salary and stipends for the tuition to the graduate teaching assistant.

Visiting Professor
A visiting professor is a professor who teaches at a college or university other than his or her own. The role may only involve teaching, or teaching combined with other duties in the contract. This appointment is short-term, ranging from one semester to three years.

It takes hard work and time to become a professor. However, all of these efforts are worthwhile for those who love sharing their knowledge and inspiring the next generation of scientists. If this career is a fit for you, it will be very rewarding.

Article references in the supplemental reference section of this guidebook.

Postdoc's Guide to Mastering Your CV, Resume and Cover Letter

By | Dr. Tyasning Kroemer

When you search for a job, whether it is a position in academia or industry, it's important to carefully prepare your application package containing a cover letter and CV or a resume for each job posting. The highlighted information in your documents will become important factors in the decision to include you in the running for the position. Otherwise, your application documents may end up in the "not considered" pile.

Among all your work experiences, skills and accomplishments, select which ones to include, and what not to include in some of these documents to draw the attention of the hiring manager or committee.

In order to highlight your strengths and fit your qualifications with the requirements of the position in your documents, ask yourself these questions:

1. Who will be reading and accessing my documents? Is it a human resources representative of a company, a recruiter, or a manager? Does the hiring committee include the head of a department and some professors?

2. How will they access my documents? Is it by filtering keywords via a job search website?

3. What type of candidates are they looking for? Is it a scientist with experience managing research projects? Is it a scientist with writing experience?

4. What will they look for from the applicants? Is it a particular technical skill to perform experiments? Is it somebody with a unique expertise to fill a gap in the team?

After you find your answers to these questions, tailor your documents to match the requirements of the job posting. To start, this article provides a quick overview about the three types of job application documents you may need to prepare: a CV, a resume, and a cover letter.

Curriculum Vitae (CV)

A curriculum vitae (CV) is a document containing a formal record of your professional and academic history. This document must present all of your accomplishments, education, and work history. Its purpose is to display your academic history, so the length of a CV is variable. However, it is usually longer than a resume. The common use of a CV is for applying for faculty positions, research grants, and some research positions.

What to Include in a CV

- Personal information: name, address, phone, email.
- Education background: degree and areas of expertise.
- Work history
- Teaching experience

- Research experience
- Publications
- Presentations
- Research grants
- Awards
- Professional affiliations
- Professional service (for example: your experience as an editor or reviewer for a scientific journal).
- References

How to Write a CV

1. Start with a list of your work history. Include your position, the company information and dates when you were in that role.
2. Use bold and all caps for headings. However, use only bold and avoid all caps for subheadings.
3. Organize your experiences based on the requirements for the position. For example, start with your teaching experience when applying for a position with more of a teaching load.
4. Separate contents of different subheadings with white space.
5. List additional sections, such as volunteer experience.
6. Finish with a list of references.
7. Put your name and page numbers in the footer of every page.

Tips

- Use past tense to describe your roles and present tense for your current position.
- Avoid the first person, such as "I" and "my".
- Arrange your accomplishments and skills within categories.
- Organize the sections based on the job posting.
- Include relevant leadership experience, volunteer experience, certifications, training, and experiences as a reviewer on additional sections.
- Make sure the content of your CV is clear, concise, complete, consistent, and current.
- Ask another person or your mentor to read your CV and give you some feedback.

Resume

A resume contains a summary of your professional experience or work history tailored to a specific job posting. The length is usually 1-2 pages. Employers of many industry positions ask applicants to send their resume instead of CV.

What to Include in Your Resume

- Personal information: name, phone, email (it is advised to leave your address off, unless you are within a 15-mile radius of the job's location).
- Work history
- Relevant experience, skills, publications, and accomplishments.
- Education background: degree, areas of expertise.

How to Write a Resume

1. List your work history with information about your position, the company and date range of your position.
2. Use bold and all caps for headings, but only bold for subheadings. You can also use Microsoft Word's built-in paragraph formatting under the Home tab.
3. Only list work experiences and accomplishments relevant to the position.
4. State briefly your technical and soft skills important for this position.
5. List your skills with bullet points.
6. Include additional sections, such as awards, volunteer experience, and certifications.
7. List your education, certifications, awards and volunteer experience at the end of your resume.

Tips

- Limit to 2 pages, and make it brief by using numbers and bullet points with strong verbs.
- Use action verbs.
- Use past tense to describe your past roles, and present tense for your current position.
- Only pick skills relevant to the position of interest.
- Use specific keywords related to the job posting.

- Highlight your work experience and skills to match the required skills for the position.
- List only relevant publications.
- Minimize using the word "I".
- Ask someone to proofread your resume.
- Quantify your accomplishments with profits, percentages, numbers, rankings, or ratings.

For example, instead of "responsible for publishing research, writing protocols, and designing and conducting research experiments", state "**Wrote 10 research publications. Developed 10 research protocols within a six-month period. Designed and conducted 16 chemical assays critical for the organization's QC process.**"

Another example, instead of "responsible for conducting weekly QC analyses of various reagents, reported results to my direct manager. Performed daily weigh-outs of product. Inspected reagents for any quality issues", write "**Developed 15 new assays for the QC department within a 3 month period, conducted QC analyses on an average of 70 different chemicals per week. Managed reagent inspections for all 1500 chemicals.**"

Cover Letter

A cover letter is a letter to introduce yourself, show your interest in the job posting, and highlight your qualifications for the position. Think of it as a personal commercial – your pitch about what you bring to the table and why someone should hire you. Writing a cover letter can be more difficult than preparing a CV or a resume due to its narrative nature. This letter is your first chance to convince the hiring manager or committee to hire you. Therefore, make sure your letter is well written and convincing.

What to Include in a Cover Letter

- The title of the position.
- Where you found the job posting.
- Why you are interested in the position.
- What makes you an excellent candidate?
- A call to action for the interview.

How to Write a Cover Letter

1. Opening paragraph: stating the position and your interest.
2. Middle paragraph(s): summarizing what you offer and how your experiences contribute to the role.
3. Closing paragraph: mentioning your availability for further questions or an interview and thanking the readers for their attention.

Tips

- Be specific about the position you are applying and show your enthusiasm for the position.
- Highlight why you are fit for the position (not just why you want the job).
- Avoid copying and pasting your qualifications from your resume.
- Limit to less than one page.
- Ask someone to read your cover letter before you send your application.

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Annotated Cover Letter Example

Introduction:

Show your interest in the position

Dear Hiring Manager,

I am writing in response to the job opening as a Research Scientist-Molecular Biologist at ABC Bio (Job ID: 007). I am extremely interested in the transition from a academic position to a career at a biotech startup such as yours. I am available to start as soon as possible.

Middle paragraph:

Highlight your skills and qualifications for the position and match those with the requirements of the job posting. Use action verbs and quantify your accomplishments to form a strong cover letter.

As a skilled molecular biologist with ten years of experience in a laboratory setting, I performed top quality and accurate experiments. I am confident this experience will bring a lot of value to your company by building and maintaining customer trust. Since ABC Bio is known for protein research, my advanced skills in conducting protein expression, nucleic acid extraction and Western Blots would ensure your organization's reputation for the long-term. During my postdoctoral appointment, I led a collaborative team of six scientists from various fields of research through five critical projects. I also developed three assays to test the functionality of the receptor, and our research was the first study to identify a G-protein-couple receptor in a zebrafish. These projects I ran enabled me to publish eight research publications which later helped our lab acquire three important grants.

Note:

- ***Highlighted in yellow: examples of action verbs.***
- ***Highlighted in blue: quantifiable accomplishments***

Closing paragraph:

Mention when you will be available.

I am convinced that I would be a productive member of your company, and would love the opportunity to meet with you. My availability is the third week of August.

State a call to action for an interview:

Thank you for your time, and I am looking forward to hearing from you soon.

Sincerely,

Name

Email

Phone

CV Template

Name

Phone

Email

EDUCATION AND TRAINING

Postdoctoral Research (year range)

PhD (year range)

M.Sc (year range)

B.S. (year range)

PUBLICATIONS

Research Papers

Publication 1

Publication 2

Publication 3

Book Chapters

Book Chapter 1

Book Chapter 2

Book Chapter 3

RESEARCH GRANTS

Research Grant 1

Research Grant 2

Research Grant 3

RESEARCH EXPERIENCE

Research Experience 1

Research Experience 2

Research Experience 3

TEACHING EXPERIENCE

Teaching Experience 1

Teaching Experience 2

Teaching Experience 3

AWARDS

Award 1

Award 2

PROFESSIONAL SERVICE

Service 1

Service 2

REVIEWER FOR

Journal 1

PRESENTATIONS

Poster Presentations

Poster Presentation 1

Poster Presentation 2

Poster Presentation 3

Conference Presentations

Conference Presentation 1

Conference Presentation 2

Resume Template

First and Last Name, Title/Degree
emailaddress@email.com | (555) 555-5555 | LinkedIn Link | Website URL

PROFESSIONAL SUMMARY

Accomplished [profession] with over [number] years of experience performing [function, function …, and function]. Proficient in [skill/role 1…. And skill/role #]
Note: This is your elevator pitch. What do you bring to the table that makes someone want to hire you?

SKILLS

Technical Skills

- Molecular Biology
- Cell Biology
- Cloning
- Protein Purification
- Tissue Culture
- Gel Electrophoresis

Leadership and Communication Skills

- High motivation
- Problem solving
- Time management
- Integrity
- Asks Questions
- Active listening

PROFESSIONAL EXPERIENCE

[Title/Role/Position], City, State (website – optional) **Year - Year**
[Quick background to give context to the positions you had. Was this a research position? Was it at a major institution? Use this section to quantify any of your experiences that are relevant to the role you are applying for.]

Research Project *Project Date*
[List out different research relevant research projects, giving a brief scope of the project, outcomes and why that information matters – Simplify this information and use bullets when necessary]

Research Project *Project Date*
[Project Name]: Led a team of [number] through the development of [product] in the course of a [period of time]. This project led to [major outcomes], which [why it mattered to your former organization]

[Title/Role/Position], City, State (website – optional) **Year - Year**
[Brief background about the role]

Research Project *Project Date*
[Project Name]: Led a team of [number] through the development of [product] in the course of a [period of time]. This project led to [major outcomes], which [why it mattered to your former organization]

Last Name, First Name

First and Last Name, Title/Degree

emailaddress@email.com | (555) 555-5555 | LinkedIn Link | Website URL

EDUCATION AND TRAINING

Postdoctoral Research — **month, year – month, year**
[Institution], [Department], [Location]

Ph.D. [Field and Discipline] — **month, year – month, year**
[Institution], [Department], [Location]

M.S. [Field and Discipline] — **month, year – month, year**
[Institution], [Department], [Location]

M.S. [Field and Discipline] — **month, year – month, year**
[Institution], [Department], [Location]

AWARDS & PROFESSIONAL ASSOCIATIONS

[Professional Association Name]

[Award Name]
[Quick Summary]

CERTIFICATIONS

[Certification Name]
[Quick Summary]

PUBLICATIONS & PRESENTATIONS

[Publication Name]

[Publication Name]

[Presentation Name]

[Presentation Name]

Last Name, First Name

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