

Webinar Q&A Report

The Next-generation Scientist: What's next after graduate school?

Questions in this Q&A Report were submitted during the live webinar, [Next-Generation Scientist: What's next after graduate school?](#).

Answers have been provided by:

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1. Is it worth doing a postdoc? Should I do it after a PhD degree? How long should I expect it to take? Should I anticipate doing more than one?

M. Gumz: I think it is always worth doing a postdoc. It keeps your options open for any other type of career. Even if you don't want to continue on to academia or even industry, you can use that postdoc training time to build your network and make connections that could lead to a career in government or scientific writing. I hope the days of seven-year postdocs are behind us. How long you spend in your postdoc will depend on what your goals are for after your postdoc. If you want to be a PI of an academic research lab, four years is probably a reasonable amount of time to establish a niche area for yourself, get a few strong papers out, and obtain funding to take you to the next step. If your future goals require you to be trained in multiple areas, you might need to consider a second postdoc to obtain that additional training.

C. Northcott: Depends on what you want to do. To work within Industry there isn't a "rule" that says you have to have a postdoc, so don't think you have to have one. Especially if you have a skill that the Pharma is looking for. With that said a postdoc will allow you to broaden your horizons. Postdocs in industry are usually 2-3 years and you typically won't do more than 1 postdoc.

2. What is your advice for 1st year postdocs who have just joined a laboratory and want to maximize their productivity?

M. Gumz: My first thought is to READ. Immerse yourself in the literature and take notes as you go through it. It's often slow getting a new project up and running so you can use that time wisely and still be productive by writing a review article in your area. This will help you see the gaps in the field and ensure that what you are planning to do hasn't been done before. In terms of planning your project, it is important to be strategic. Early in your postdoc is not the best time to take on a high-risk high reward project. You want to plan studies that will be publishable, regardless of whether your hypothesis is correct. It is important to make sure your experiments are properly powered so that if even if the data are negative, it is still a publishable result. Be strategic with collaborations within and outside your lab. Is there a technique you've already mastered in your doctoral work? See if you can contribute to ongoing work in a meaningful way so that you can be a co-author on publications.

C. Northcott: Schedule and set goals for yourself and strive for those. I am a firm believer in goal setting and working towards those goals. Have achievable actionable goals, as well as a few stretch goals for yourself. Re-evaluate those throughout the year and adjust as needed. Within my job, we are required to do this. I have honestly done this throughout my career.

3. In your opinion, what is the best time to start looking for your postdoc position?

M. Gumz: This depends on what type of position you want. If it's a position in industry, Carrie's advice was to look somewhere between 1–6 months out. For an academic postdoc, once you get through your qualifying exam, I don't think it's ever too early to start looking. Many labs need time to plan for the financial support for a new postdoc. If there is a particular lab or a particular area you are interested in, networking with these groups at meetings (virtual or in person) is a great way to get the ball rolling.

C. Northcott: Throughout your tenure within Graduate school you should be networking, and reaching out to scientists, "building your brand" if you will. This will also help you shape what you want to do. As you approach your completion of your graduate work, you should start talking about next steps with appropriate people (if in industry- take a look at those deadlines for applications, make sure you hit them).

4. As a lead, how do you measure success in your group? Are there any qualitative or quantitative indicators?

M. Gumz: On a quantitative level, it comes down to grants and papers. I think it's important to count the submissions because we deal with so much rejection as part of this career. Completing a grant application or a manuscript submission is no small feat and it should be treated like a win! Qualitatively, the most important thing to me as a PI is that everyone in the lab is happy and

looks forward to coming to work. Life isn't always like that, but in promoting an inclusive and supportive lab culture, it is my goal.

C. Northcott: As a project lead, I make sure the team sets goals and works toward those goals; and as the lead I am indeed accountable for those goals. We also re-evaluate these goals and purpose throughout the year (I can tell you my team has re-invented itself numerous times and pivoted as things required). Our success is measured by meeting those goals (and hopefully exceeding them), some are quantitative (be involved in X amount of projects, publish X amount of papers) and some are qualitative in nature (share our vision within the company). My role is to assist my team in achieving those goals, leading them and bringing my own knowledge to the table, listening to all, removing obstacles, lending a hand when I can, obtaining necessary resources and funds for us to work, as well as working to keep us on track. Also, I always make sure there is a "plan B".

5. How did the pandemic affect your laboratory performance? What strategies did you use to stay productive?

M. Gumz: The timing worked out for us because we had three manuscripts in preparation. Having to work from home meant we had the time to finish those papers and get them submitted. The other fortuitous thing that happened was that we got back a great deal of RNA Seq data over the summer. That meant we had a lot of data analysis to do. We also completed an invited review article that had been overdue and started work on another review article that we are still working to complete. For anyone looking to stay productive in these challenging times who doesn't have those options available to them, I would suggest checking out existing databases to learn more about the pathways you are studying. I once found myself in that position due to problems with mouse breeding and I spent a good portion of an entire summer mining freely available databases like Gene Expression Omnibus.

C. Northcott: While we weren't in a lab, we had to shift to everything being virtual. We collaborated online, made sure everyone had the tools necessary to do their job, embraced web meetings (more so than we had in the past). It requires more work, because you don't just run into people in the hallway now, you have to reach out. Also we truly embrace pivoting regarding plans.

6. I will be completing my PhD in a year-year and a half. My partner is also completing her PhD but she's a year behind me. We don't necessarily want to stay at our current institution long-term. Any advice for pursuing a short-term postdoc position?

M. Gumz: The best case scenario might be to work out a short-term position with your current mentor, if the funds are available. You could continue your PhD work, perhaps generate an extra manuscript, or help finish up experiments for other works in progress. If this isn't possible, I would be upfront with potential employers that you are looking for a short term-position. With a short time frame, most employers might want you to come in and do something you are already

trained to do, rather than commit to training you to do something new since your time will be limited.

C. Northcott: Look locally for someone that may take you on for a year, it may not be the “dream postdoc” but things happen. I know my spouse and I had situations like that arise, I would teach or work as more of a lab tech in the interim, etc. while he finished something, or vice versa. That is if you are not willing to be “apart” for a bit. These are always tough questions and require discussion between you both.

7. How have you determined if you've been successful with networking on Twitter? Do number of followers, likes, and retweets matter?

M. Gumz: I think this depends on your goals for Twitter. If you want to be a science communicator and disseminating information is your goal, then likes, followers, and retweets will be an important metric for you. If networking and engagement are your goals, then I think these metrics become less important, that it's more important who you follow, who follows you, and who you interact with rather than the number of interactions.

8. How did you handle or balance having children during such pivotal training years?

M. Gumz: The flexibility of the research life was a big part of it. There were plenty of times when I wrote grants or papers at odd times because it fit the kids' schedules better. I had wonderful, supportive mentors during this time. They never doubted that I could be successful in research and have a family. They always encouraged me and never gave me a hard time if I had to leave lab or take time off. I also had a lot of support from my husband and our family, especially when I needed to go to a conference out of town. My husband works in an industry that has zero flexibility and requires shift work, so taking a day off, leaving early for a doctors' appointment, or going in late because of school drop-off were not possible.

Another thing that really helped me was having supportive lab mates. In grad school and during my postdoc, I had lab mates who would sit with my babies in their stroller while I did some quick lab work on the weekend or who would keep the kids for a couple hours on the weekend if I had to do something more significant. For better or worse, I also took the kids to lab with me pretty often.

Having all this help definitely made it easier but I was also very driven. When I was an undergrad I had a graduate student tell me I would never make it as a scientist if I wanted to have a family. Proving that person wrong was a helpful motivator when times were tough. I also had to be willing to make sacrifices. I was very focused on my family and my career and that didn't leave a lot of time for anything else. My friendships suffered for a time as a result. Luckily, my best friends were understanding and supportive. I am a big believer in working smarter and not longer. Since I had my first daughter in grad school, I almost always eat lunch at my computer so I can keep working and I rarely take social breaks during the work day.

C. Northcott: I had 1 child during my postdoc and 1 while a young faculty. It is tough. You learn your time is precious, and value and use your support network.

9. Question for Carrie: What was the main reason that you left your faculty position at Michigan State for Pfizer?

C. Northcott: I admire those within an academic environment, it is a tough job, not saying that science in industry is any easier either though. At the time, I saw that the field I was in took time and was challenging (while I truly still find it fascinating) and funding was getting tougher and tougher. I also found myself wanting to expand my research horizons and at the start of an academic career that can be difficult to do. So, I started exploring other careers; I found that within industry I could work within a specific area but continue to challenge myself in new ways.

10. One thing I feel less delighted with in academia is the pressure and stress in gaining funding for lab. How do you see it in industry? Are industry researchers also worried about funding or can they enjoy doing their research without any concern about funding?

C. Northcott: I will be honest, I don't worry as much about "funding" in industry, like what I did when in academia. I "worry" that the company may change directions, or that the target may change, but as for funding, I have found if it is a worthy project, I can find the money in my current environment. It does require flexibility, patience and persuasive skills; similar to those used in grant writing.

11. What are your thoughts on doing an industry postdoc vs. an academic postdoc?

C. Northcott: They are both postdocs. In both you will be working on specified projects, publishing, working with world class scientists, etc. Having done an academic postdoc and now being in industry, the foundation is similar. The difference with industry is that now you are part of a "larger" picture, you will learn more about the company and have different resources available. If industry is something you are interested in, then look into an industry postdoc, it will give you more of a hands-on look at the day to day.

12. What are some important differences between academia vs. industry postdocs?

C. Northcott: In many ways they are similar, scientific studies are performed based on hypotheses and those findings are published. Within industry postdocs you will also have the opportunity to participate and be involved in the drug development process to a certain degree as well, observing the various resources that working within pharma can provide. With that said most projects for postdocs in industry are done in collaboration with the mentor and are designed as such that they can be shared publicly (published). An industry postdoc does provide

you with some “industry experience” and can be helpful to more fully understand the industry if that is the direction you are looking to pursue.

13. How is an industry postdoc different than a standard entry level position?

C. Northcott: Industry postdocs have a specified timeline attached and defined projects that aren't necessarily “asset” based. Often pharma also has policies about not “hiring” their postdocs as well. But I know having the postdoc in industry provides much desired experience requested for other positions at other companies. You have a better understanding following a postdoc of what is required within the industry setting.

14. Would you recommend including grants for which you applied but were not awarded on a CV when applying for postdocs?

M. Gumz: I wouldn't put this on your CV, but I would definitely keep track of it and be ready to discuss your submissions with a prospective employer. This is something I do for my faculty activity report every year. I make a table of all the grants I applied for, whether they were resubmissions, and what the outcome was. Tenacity and persistence are critical in this line of work, so it's important to demonstrate that you can keep going despite challenges like unfunded grants.

15. Is there a 'best' time to enter industry (e.g. before/after postdoc)?

C. Northcott: No, it depends on what you are wanting to do and what level you want to enter.

16. Thanks for a great webinar! I have always wanted to explore potential options in industry, but I do not have traditional bench experience. Would this be an issue if I decided to pursue a career in industry?

C. Northcott: There are a lot of roles in industry. I haven't done bench research since starting within industry.

17. I'm interested in pursuing a career in industry but would love to maintain some academic activities (teaching). Is it impossible or not reasonable to pursue both?

C. Northcott: It is possible. I have had colleagues opt to teach “on the side”. There are also various opportunities for outreach.

18. Will PhD's face competition from MD-PhD's in translational research and faculty/Industry recruitment? Or are skills, publication and experience more important than the degree?

C. Northcott: I think unless the position specifically requires an MD (or DO), it will boil down to what the role requires for the position. I have seen a full range of degrees in various roles.

19. What are the challenges a graduate student should expect during the job search while trying to shift in their field, and how can you overcome them?

C. Northcott: It isn't "easy" per se to change areas. I will say it takes patience, a well written cover letter, and highlight that your learnings are transferable. Once you are within industry, it is a little easier, there are opportunities for job shadowing, short-term job sharing, trainings etc. It is something I like about industry.

20. In your experience, what are the main differences between an academic and industry researcher?

C. Northcott: Well this is a tough question to answer, because there are number of "types" of researchers on both sides if you will. Some of the things I see, in academia you are answering to your grant, and your research answers to prescribed questions/hypotheses that you set out in your grant application. Within industry often the work is prescribed by the targets and the goals of the scientific portfolio you are working in, so similar, but not the same. I think something that is different though, is that there are shifting needs within industry, so I may find my research area shifting, not necessarily because I wish it to, but because of the changing goals of the company.

21. What were the main struggles you encountered during your postdoctoral life? How did you deal with it?

C. Northcott: Ownership of a project and juggling the various work and life responsibilities. Do clearly spell out "ownership" of the project aspect with your boss upfront; what is theirs and what is yours to take with you when you start your own lab. WRITE IT DOWN and both agree to it. This will help draw those lines. Also remember to have a life/hobbies and don't burn yourself out.

22. How would you go about finding out what's in the pipeline for a particular pharma company?

C. Northcott: I would check their websites, usually pharma puts it right out front what areas of research they are working on, follow the company on LinkedIn, etc. Also networking and asking questions with those that work there are valuable.

23. I am currently a graduate student. Any suggestions on how to find an "industry mentor?"

C. Northcott: APS has a "Physiologist in Industry" group, that is a great place to start. I have been part of this group for awhile and there are mixers and various opportunities for you to meet others in industry. I have had numerous students reach out with questions, talk with me, etc. Many within the group are willing to talk with students. If you are targeting a specific company or role, networking on LinkedIn is a good place to start as well. Reach out via the messenger. Also realize though we have "day jobs" as well, so we may not be as quick to respond sometimes.

24. In industry, how do you navigate scenarios where you are asked to do things you may not believe in (e.g. you are being asked to pursue and advocate for a drug that is known to cause severe side effects?)

C. Northcott: I usually would ask you some clarifying questions to understand your question more fully, BUT there is always scientific discussion and people can present alternative hypotheses. There is usually a lot of discussion if there are contrasting thoughts with various subject matter experts; sometimes multiple experiments may occur due to the contrasting viewpoints. If it is a disagreement on something serious, i.e. harm may come from it, there are always avenues you can proceed and these are encouraged. Regarding "serious side effects" there are very well-written guidelines that are followed (I can quote from many of them still today), safety margins, testing requirements, etc. and are clearly spelled out by regulatory agencies as well as company guidelines. Again, there are avenues to discuss issues of concern. I have disagreed with people in the past (and will continue to do so, I am sure), but usually we test and talk it out and figure out the best path forward.

25. Carrie, can you talk more about your experience with writing numerous articles that I read in your bio? Do you also publish in articles while working in industry?

C. Northcott: I do publish within Industry (multiple accepted this year in fact). It is very much encouraged, but not necessarily required. With that said, there is a process to publish, we have various "sign offs" and checklists we do and QC (for all aspects, including statistics) that has to occur for every paper and be documented. Timing and strategy also play a role in publishing as well. Also you always have to keep in mind the proprietary nature of some things. But yes publishing is encouraged.

26. What is the work culture at Pfizer?

C. Northcott: Each company has a "culture" I have found (or so I have been told). At Pfizer, we have a saying that I feel we all stand behind, "patients first". This isn't just a "cute saying", in that we have many opportunities to learn directly from patients, what they want, how we can help, etc. That provides a lot of meaning to my work, in my opinion. It is also a very team-based

culture, working together to solve challenging problems. It is a place that I can say at the end of the day, I really do like going to and interacting. I consider many of the people I work with as personal friends as well as co-workers. When you interview for a role, ask about it, see how people interact, do they look like they are enjoying themselves, ask about the “tough days” and the “good days”. You will learn a lot.

27. Is the industry always about teamwork? What about being able to work independently?

C. Northcott: Well there is a lot of collaboration in large pharma. With that said you can also work independently, maybe you are a subject matter expert on a specific technique or signaling pathway, etc. But there is usually a big picture and it takes a large team of individuals to ever get a drug to market. I look at it as a bunch of individual cogs that are needed to work together to make the big machine work.

28. Can you tell us what a Medical Science Liaison does?

C. Northcott: They are part of the Medical Affairs group. The role is outward facing, providing specific (usual with a specific specialty) knowledge to healthcare providers and other external stakeholders. They also assist in translating those needs back to the organization.

An interesting article on this:

[Training Needs for Medical Science Liaisons \(MSLs\) in Evolving Pharmaceutical and MedTech Industries](#)

Contact Information

If you have additional questions for Michelle Gumz or Carrie Northcott regarding content from this webinar or if you would like to learn more about the APS, you can contact them at:

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