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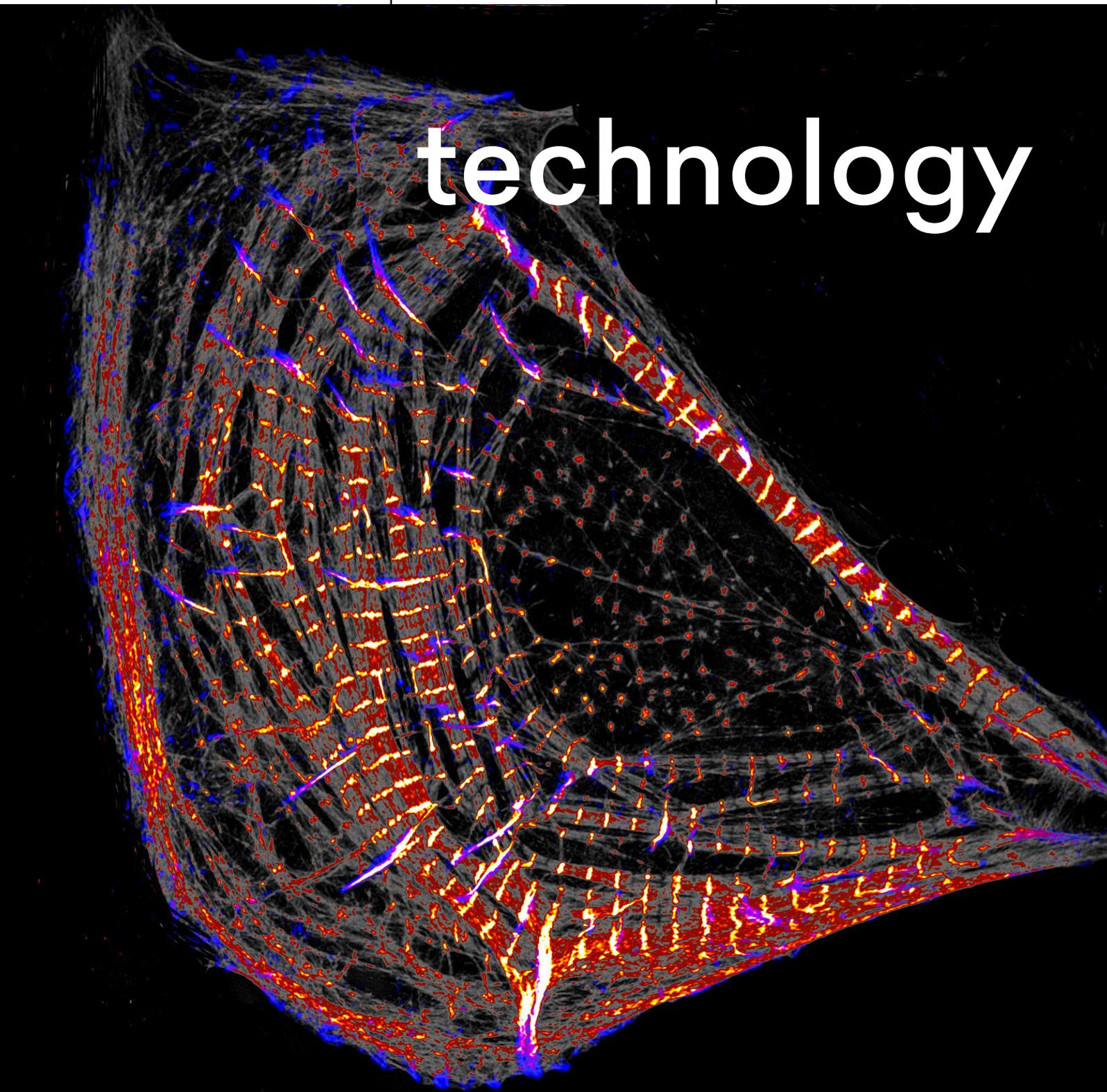
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## Emerging Voices

# What Are Post-Baccalaureate Programs?

By Alex Maya-Romero

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Are you considering a post-baccalaureate program? Good. In their simplest form, post-baccalaureate programs (commonly referred to as post-bacs) provide enrichment opportunities for recent college graduates interested in pursuing a PhD. These opportunities often help boost graduate school applicants from slightly competitive to highly competitive candidates. Post-bac programs come in several forms, but one of the most common is the National Institutes of Health-funded Post-Baccalaureate Research Education Program, or PREP. These non-degree programs provide students with a rigorous and fully immersive one- to two-year experience at research institutions all over the country. Post-bac programs allow scholars to cultivate skills essential for graduate school while also receiving a stipend, attending seminars (for both scientific and professional development), and receiving access to standardized exam prep.

### Post-Bac Program Success by the Numbers

As scientists, we recognize the value of data. Let's take a look at the success of some post-bac programs. The Doctoral Diversity Program (DDP) at the Johns Hopkins School of Medicine has accepted 30 scholars since 2015 (eight of whom are current scholars). Of the 22 alumni, 82% (18/22) have been accepted into either PhD, MD/PhD, MD, or MD/MBA programs. The others have gone into master's programs, biotech, or education.

The PREP program at Johns Hopkins has had

97% (28/29) of alumni go on to enroll in either PhD or MD/PhD programs. The two Johns Hopkins programs differ in that DDP focuses on increasing socioeconomic diversity in both medical and graduate schools, whereas PREP programs are more tailored toward increasing graduate school diversity. Students from both programs have gone on to pursue degrees at schools all around the country, including Emory; Stanford; the University of California, Berkeley; Harvard; Vanderbilt; and Johns Hopkins.

Similar success can be seen at other institutions as well. In the University of North Carolina at Chapel Hill PREP, 40% (18/45) of scholars had previously been denied acceptance into graduate school. After the program, 94% (17/18) of scholars went straight into competitive PhD programs.<sup>1</sup>

### Post-Bacs: A Time for Technical Development

Post-bac scholars engage in independent research, which prepares them to properly ask scientific questions and independently drive a project forward. This crucial skill is underdeveloped in some undergraduate students who go straight into graduate school. During my internship at Johns Hopkins, Alexander Platero, a PhD candidate in the Biochemistry, Cellular and Molecular Biology program, said: "I wish I would have done a post-bac, it would have made the transition to graduate school much smoother." Alexander would go on to talk about the learning curve he faced when first joining his thesis lab. As did others.

## A Greater Learning Curve for Students from Smaller Undergraduate Institutions

“I had to read a crazy amount of literature or do things three or four times to even get a sense of the techniques, and still messed up some experiments because I did not have the skillset right away,” says Joseph Cirilo, a third-year graduate student in the Biomedical Sciences program at the Pennsylvania State University College of Medicine. Joseph graduated from a small liberal arts school where research experiences are often limited. “A lot of what I had to learn quickly in graduate school included things like efficiently reading papers, planning lab schedules, and thinking about big picture sorts of questions. If I had experience from a post-bac, I may have been more prepared to do these things when I started graduate school.” Joseph and Alexander are not alone; this is a common sentiment among graduate students who entered programs right after college.

## Lessons Learned between Post-Bac and Graduate School

“I wouldn’t give up my gap years for anything!” says Michelle Chan-Cortes, a neuroscience PhD candidate at the Johns Hopkins School of Medicine. During her gap years, Michelle did a post-bac at Columbia University and worked in a lab for several years after.

“While I might have taken an extreme number (eight) of gap years, I felt that I was able to start graduate school more focused and sure about what I wanted to study. In those years, I not only gained valuable technique and data analysis experience at another university, but also was able to explore other fields that were very different from my previous experiences.”

“Thanks to my post-bac experience, my expectations of the first year of graduate school were quite accurate,” says Diego Ramos Ortiz, a second-year biophysics student at the University of California, Berkeley.

During his gap year, Diego spent a year in the Johns Hopkins PREP program.

“During my first year, I was clear about my research

interests and felt sure about my choices for rotation labs and courses. I would say the main advantage of my time as a post-bac student was my increased comfort level in research settings. As a result, I took full advantage of my rotations by maximizing opportunities to learn while keeping in mind how I would fit into each lab environment. These circumstances made me feel very confident when I chose my thesis lab.”

As a result of the self-discovery they did as post-bacs, students like Michelle and Diego felt greater confidence in their graduate school decision. Don’t just take their word for it. Hall *et al.* showed that PREP scholars at the University of North Carolina at Chapel Hill reported increased confidence in areas like driving an independent project or getting into their choice of graduate programs.<sup>1</sup>

## Post-Bacs: A Time for Personal Development

A common misconception is that these programs *only* boost your research CV. While many undergraduates have sufficient lab experience to go straight through to graduate school, many are unaware that a good graduate school experience is more than just the science. Many undergraduates (including myself) overlook the importance of “fit” or lack a complete understanding of the concept. Fit is more than just your chemistry with a handful of students; it’s how you feel about the location, quality of life, and even the climate at the institution. These things have become evident to me during my post-bac and will factor into my graduate school decision. A post-bac can serve as a “test drive” to allow students to get a feel for what they want.

The DDP at the Johns Hopkins School of Medicine has been instrumental in helping me identify my needs. Initially, I applied to post-bacs to improve my technical deficits but quickly learned that I would gain much more. For me, this included learning about whether I wanted to attend school in a city where I could live alone or needed roommates. Additionally, it has become clear to me that I want to attend school in a location

where my hobbies are accessible because such positive outlets are crucial for a sustainable career as an investigator. Using your time as a post-bac to identify these individual needs will help ensure that you choose a graduate program that is the right fit.

### Life as a Post-Bac

I currently work in Steven Claypool’s lab at the Johns Hopkins School of Medicine. The lab studies mitochondrial lipid metabolism. My work involves further understanding an endoplasmic reticulum–associated pathway for mitochondrial protein import termed ER-SURF. In addition to my bench work, some other things I do are:

- **Audit graduate-level courses.** Attending classes is an opportunity to work on developing proper study skills for graduate school.
- **Attend virtual seminars in or outside my institution.** This exposes me to many areas of research while further developing my understanding of science communication.
- **Participate in student organizations.** Organizations are a great way to devote time to important causes beyond your research while building your network.
- **Receive assistance for conference expenses.** Conferences are great for sharing your work with others in your field. Some conferences also offer post-bac students opportunities to learn more about graduate programs while interacting with their representatives at exhibitions.

These opportunities are readily available to post-bacs at many institutions and help them test drive the graduate school experience. Seeking such opportunities allows scholars to take in great amounts of knowledge in their one to two years as a post-bac student.

### A Recipe for Success

Like many things, when it comes to post-bac programs you get out what you put in. The single best thing to keep in mind for a successful post-bac experience is to pursue mentorship beyond your lab. Are you interested in someone’s work or their journey? Reach out to them. Are you interested in a certain line of work? Speak up and communicate those interests to your mentors. Many times these practices have allowed me not only to learn, but also to develop networking opportunities. Twitter is another good place for interacting with the scientific community in a less formal way. Not being afraid to ask questions and seeking mentorship will help ensure that you not only develop in the lab, but personally as well.

### If I Could Go Back, Would I Do It Again?

Absolutely. Anyone considering graduate school should consider a post-bac. A post-bac will provide a greater sense of confidence when applying to graduate school and help ensure that you have made the most well-informed decision possible. Choosing a graduate program is a very important decision. Why not do everything possible to help you make the best choice?

### Reference

<sup>1</sup>Hall JD, et al. (2016). Preparing postbaccalaureates for entry and success in biomedical PhD programs. *CBE Life Sci Educ* 15, ar27.



#### About the Author

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