

Breaking Out of the Academic Pipeline

For many graduate students, the academic path may not be the best fit, and with limited faculty positions available, many students are now looking to other career possibilities. University programs are helping students to explore and pursue alternative careers.

About halfway through her PhD program at Johns Hopkins University, Diedre Ribbens started thinking that running a lab might not be what she envisioned for her future. Was this just the typical third-year-of-grad-school experience of feeling trapped in an endless tunnel? Or was it a signal that a non-academic path might be a better fit for her?

Fortunately, Ribbens had the opportunity to attend a number of career panels at Hopkins, where she was able to explore other options. At one of these, a speaker introduced her to the idea of science writing, and she became intrigued. Her research advisor, Peter Espenshade, made it a point to conduct an annual review with his trainees to discuss their accomplishments, research trajectory, and future goals, so Ribbens used this time to open a discussion about her interest in science writing. With his approval, she started looking for opportunities to write press releases, newsletters, and blog posts during her final years in graduate school, including for the American Society for Biochemistry and Molecular Biology (ASBMB), and successfully launched a career in science writing when she graduated in 2013.

"I think I was one of the first students who graduated from Peter's lab and didn't go on to a postdoc," Ribbens reflects. "It was uncharted territory for him and me, so we were learning together."

For his part, Espenshade says, Ribbens was the first trainee he'd met who had that passion for a non-academic career. "I became a better listener and started thinking that those are just the people saying something—what about people who aren't saying anything at all?" he says. "I took a real interest and wanted to do something about it."

At the same time, both nationally and at Hopkins, the conversation was bubbling around preparing students in the life sciences for careers outside of the academic pipeline, given the limited number of faculty positions relative to the number of students. With funding from the Provost's Office at Hopkins, Espenshade helped develop and launch a program called the Biomedical Careers Initiative (BCI) on the campus in 2014. Under the university's Professional Development and Career Office, BCI now helps to expose trainees to other professional career paths and skills training. The program holds networking events and facilitates internships with partner companies or societies in a variety of fields, including administration, policy, consulting, and science writing.

"Some people still think it's a distraction, but as faculty we've all had students who would benefit from something like this. When faculty are faced with a student sitting across the table from them who will benefit from these programs, they realize this is a good opportunity," says Espenshade.

Hopkins is far from the only institution to kick-start hands-on career exploration programs like this. The conversation around training science students and postdocs for a wider range of careers is growing, whether their interests lie in education, equity research, policy, industry, tech transfer, or any number of other options.

Many of these training or exploration programs start at the grassroots level with students who form clubs or cohorts around a common career interest. At the University of Texas (UT) Southwestern, a student-run committee called Quest for Careers (QFC) brings in speakers once a month to represent different career paths

for PhD scientists. Svetlana Pitts, the current president of QFC and a PhD candidate in neuroscience, oversees the seminars, many of which are presented by members of the alumni network. Generally, each member of QFC's committee gets a chance to suggest and host a speaker.

"I think this is the easiest way to explore your career options," says Pitts. "You don't have to make contact with people yourself, which can be very scary in the beginning. You go to a talk, get to hear about the career, and if you want to know more you can approach the speaker or email us to ask for more contact information. It's providing people a chance to learn."

Similar programs at other institutions have been running for more than a decade. The Training Initiatives in Biomedical and Biological Sciences (TIBBS) program at the University of North Carolina, for instance, began in 2006 as a career development program for the life sciences students.

In its early days, the TIBBS office organized career panels and workshops with scientists working in different fields. "They were basically trying to respond to the needs of the trainees at the time," says Patrick Brandt, the university's director of career development and training. With steady budget increases each year, TIBBS was able to increase its offerings in 2008, when Brandt joined the office as a postdoc. The team started a "career blitz," an afternoon in which two dozen scientists who took different career paths meet with students for informational interviews, as well as a bootcamp to help students consider how a postdoctoral fellowship might advance their career goals. As TIBBS developed, more trainees volunteered their time to help organize and coordinate the program.

"I think it was hugely ahead of the game," says Pat Phelps, the first director of TIBBS and now director of the Professional Development and Career Office at Hopkins, where she works in tandem with Espenshade to create career programming.

A major impetus for other institutions to develop career exploration programs has been the NIH Broadening Experience in Scientific Training (BEST) grants, which awarded 5 years of funding to 17

universities between 2013 and 2014 to help prepare trainees for careers outside of conventional academic research. The BEST grant program, funded out of the NIH Common Fund, is one of the most visible organized efforts to inform PhD scientists about varied career options. “The NIH is stating that these career paths are important to the nation, to the biomedical research community,” says Trish Labosky, program leader in the NIH’s Office of Strategic Communication. “It gives the programs a certain level of gravitas.”

The BEST programs are themselves research oriented and are carrying out experiments with quantifiable results, with the aim of identifying what approaches are most effective for broadening career development. Grantee institutions survey students to measure their awareness of different careers and their perceived agency to approach a career path or decision, as well as the time it takes graduates to reach desired career outcomes. Program administrators also engage faculty to assess their needs and participation. “The goal is culture change amongst the trainees, faculty, and administration, such that the activities the grantees develop will be measured and the ones that work will be maintained and be valuable,” says Labosky.

The BEST grants have allowed some universities to go beyond career seminars and networking events. At the University of North Carolina, the TIBBS program expanded with a BEST grant in 2014, and the most significant changes that took place as a result of receiving the award were hiring additional staff and partnering with local companies to create internship programs and short-term job shadow opportunities. The augmented program, called the Immersion Program to Advance Career Training (ImPACT), also helps students develop individual training plans, allows staff and trainees to attend six- to eight-session skills workshops, and supports student-run “career cohorts,” which provide career-specific support in a peer-to-peer format, invite speakers to campus to talk about career



options in their chosen area, and participate in opportunities to enhance their career-related skill sets.

With the explosion of career exploration programs spurred by the BEST grants, many universities do face the challenge of gaining support among faculty for new initiatives—especially when those programs might take students or postdocs out of the lab for months at a time on internships. In departmental meetings, some nascent initiatives have raised support by presenting survey data from alumni and current trainees that illustrate the reality of their wide career interests. “Say you’re at a university where only 10 percent of your PhD students go onto faculty positions—you can’t only be training students for that,” Espenshade emphasizes. “In academia, people are most easily convinced by data.”

Similarly, other program directors have found that students return from internships with more focus and enthusiasm for their research, and sharing those stories with hesitant faculty can be quite persuasive. Paperwork requiring an advisor’s signature at multiple stages often helps keep the principal investigators involved in the discussion all along and encourages trainees to start these conversations early.

Another challenge that many career exploration programs face is getting students through their doors in the first place. At Hopkins, the Professional Development and Career Office offers multiple in-depth programs—among them, a short-term externship with investment firms T. Rowe Price and Stifel to expose

trainees to equity research and a newly launched program with AstraZeneca’s R&D branch MedImmune that allows graduate students to conduct thesis research in biopharma—in addition to the opportunities already offered through the BCI program.

However, Phelps laments the occasional low event attendance rates among Hopkins trainees. “One of the hardest things we face in offices like my own is getting the word out to students. We have all of these amazing programs that they can take

advantage of, but we might only get 5 percent of the population to attend,” Phelps says. “There’s so much going on at any institution, and unless it’s required, they might not hear about it, or they might not be comfortable leaving the lab to attend.”

Cynthia Fuhrmann, director of the BEST-funded Center for Biomedical Career Development at the University of Massachusetts Medical School, came at this problem with her team by focusing the bulk of their efforts on a required career development curriculum tailored for graduate students and postdocs as part of a broader culture change. “We were thinking about what we could launch that would be sustainable and make a real difference for all students, not just those likely to take their own action,” says Fuhrmann. “There seemed to be a strong recurring theme: trainees wished they’d begun thinking about their careers earlier.”

Fuhrmann echoes Phelps’s comment about student participation and points out that students are busy—there are dozens of reasons why trainees who could benefit still might not come to a voluntary workshop or seminar, which are also offered to supplement the UMass program. So all students in the Graduate School of Biomedical Sciences at the UMass Medical School now create an individual development plan, starting in their third year, which requires them to think about where they want to head long-term and how to use their time and training to advance toward those goals.

“We wanted to develop a culture on our campus of talking openly about career interests and taking career-oriented steps early in training,” says Fuhrmann. “We boiled it down to a required curriculum, built into our graduate training program, to support the professional development of all students—whether they want to pursue careers in academia or in any other sector.”

Once trainees start thinking seriously about what career they may want to pursue, getting them into positions where they can learn and hone new skills is a resource-intensive process, as many universities developing internship programs can testify. At the University of Chicago’s BEST-funded initiative myCHOICE (Chicago Options in Career Empowerment), the program team has created on-campus internships to cut down on the price tag.

These internal internships, in areas including clinical trial coordination, communications, grants development, and marketing, can be done part-time and are close to the lab to avoid removing students or postdocs from their research. The trainees are also encouraged to take an internship near the end of their time at the university, when the bulk of their research is completed. “The gratitude that we’ve gotten from students and post-

docs has made it all worth it,” says Erin Adams, one of the principal investigators for the myCHOICE program. “We’ve had people stop us on the quad and say, ‘Thank you so much for developing this program. It’s really opened our eyes, and we feel like we’re being valued by the university and that people care about what we do.’ I didn’t expect to get that feedback.”

For the University of Chicago and other institutions with BEST funding, all face the question of what happens after the NIH funding period concludes. This hurdle comes in multiple forms depending on how the institution has used the grant money—for some, the main challenge is securing internal support to keep staff directors on board. Others are working out financial partnerships with companies or societies that have hosted interns, and still more are reaching out to their alumni and donors to gather continued support philanthropically. Some program elements may simply be cut if they prove unsustainable in the end.

These and myriad other institutions are finding new ways to train graduate students and postdocs for the full range of careers in the life sciences. Many programs start by raising career awareness, asking trainees to think seriously about

what they want to do after completing their education, and then move to networking through panels, seminars, and workshops with professionals in those fields. Hands-on experience may come in the form of a 3-month internship with a company or society halfway across the country, a short-term job shadowing day, or a part-time program writing press releases for the campus communications office. However, the common thread is a desire to help trainees arrive in a career path that allows them to use their experience in a fulfilling manner.

A few years ago, Ribbens returned to Hopkins for a thesis seminar and spoke with a woman who’d been interested in science writing and was a year behind her in school—right in time to reap the benefits of the newly launched BCI program. “She was telling me all about the internship she had at ASBMB, working for my editor,” Ribbens remembers. As a graduate who fought to forge her own career path and struggled with feelings of isolation, Ribbens says, “I thought, ‘That is so cool, that they have the resources to make that opportunity available.’ I would have loved to have something like that. It really allows you to go a lot further a lot faster in a non-academic setting.”

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