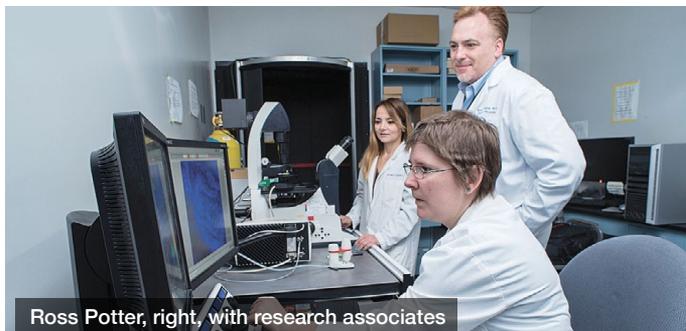




A career in big data is one of many alternative careers for postdocs



Ross Potter, right, with research associates

Alternatives to professorships in academia

If you're a Ph.D. scientist who loves academia but doesn't want to become a professor, don't fret—there are plenty of diverse and challenging career paths to be pursued in institutions of higher learning that don't require a faculty appointment. **By Alaina G. Levine**

Like many Ph.D. scientists, **Latanya Scott** had made it her personal mission to help people through research. She envisioned a career as a faculty member to achieve this objective.

Scott pivoted slightly, thinking that working in Big Pharma might be more in tune with her nature. She pursued a postdoc at the Moffitt Cancer Center in Tampa, Florida, in cancer drug discovery. Yet, "I felt I wasn't realizing my purpose," she says. "Bench science can be very rewarding when you have a breakthrough, but a lot of times, experiments fail. It made me question whether I was making enough of an impact toward our mission to prevent and cure cancer. I wanted to find a way to help as many [therapeutic] strategies and technologies as possible get to the patients." Ultimately, she recognized that being a professor might not give her the opportunity to be as influential as she desired, so she started looking for other career avenues.

One of Scott's requirements for a new vocation was that she still had to be involved in the research enterprise in some manner. Bolstered by her principal investigator, she started exploring the profession of technology transfer. Informational interviews with staff in this field led to an internship in Moffitt's Office of Innovation and Industry Alliances, and ultimately a job offer as a licensing associate. Today, Scott continues to work toward her goal of advancing human health as the senior industry alliance development manager for the sprawling cancer research hospital. In the last 24 months, she has assisted in securing more than \$35 million in research funding for Moffitt scientists by helping forge basic



Latanya Scott

and translational research collaborations between clinicians, scientists, and industry. "I see the extraordinary value these preclinical projects and resulting technologies offer now and in the future," she says. "So I feel like I am helping make strides to finding cures someday. I'm playing a role in moving the science forward to benefit cancer patients everywhere."

Those with doctorates naturally first look to the professoriate as their career choice. After all, they've seemingly spent eons in academia, have gotten to know—and in many cases love—the culture, and have been mentored their entire career by faculty. But what many Ph.D.s may not realize is that becoming a professor is simply one of the paths available in the academy. Indeed, universities and similar research institutions provide a fertile foundation for crafting multiple career paths, and offer diverse opportunities.

Catalyzing a new career

So what are the different career paths a Ph.D. scientist can pursue in academia? An obvious first choice is to serve as a scientist or technical professional in university departments. These positions can be based in disciplinary departments, such as physics. Alternatively, as is the case in some large research universities, they can be based in their own divisions, where Ph.D.s can serve as in-house consultants who help to solve scientific and technical problems for researchers.

As the use of big data becomes increasingly effective and popular, more universities are forming groups and subgroups that focus on big data problem solving, which in turn is spurring the creation of new employment opportunities for scientists with expertise in this arena. For example, **Nick Cross**, a staff scientist for the University of Edinburgh's Institute for Astronomy in the United Kingdom, develops software to process and archive imaging and other data from large astronomical surveys.

Big data jobs are often uncovered accidentally through networking, as **Jean Davidson** discovered. With a doctorate in molecular and cell biology, she originally came to Stanford University to pursue a postdoc. When her appointment came to a close, a colleague rolled his chair over to her one day and suggested her for a data scientist job with the Stanford-based Data Coordination Center of the ENCODE (Encyclopedia of DNA Elements) Consortium, an international collaboration of research groups funded by the **cont.>**

Upcoming Features

Faculty Careers—September 16 ■ Faculty Careers—October 7 ■ Focus on Wales—October 14

PHOTOS: (CLOCKWISE FROM TOP) © NICOLINO/SHUTTERSTOCK.COM; MIDWESTERN UNIVERSITY; PURE EMOTIONS PHOTOGRAPHY

“I love seeing all kinds of science and not just what I saw at the bench. I get a broader overview and perspective in a lot of different fields now.”

—Christina Papke



National Human Genome Research Institute at the U.S. National Institutes of Health (NIH) in Bethesda, Maryland.

“I wasn’t sure I was qualified, coming from a purely experimental biology background,” says Davidson, “but luckily this team was looking for a more science-focused person to join the team to inform the data questions.” Today, as a “data wrangler” (her official title), she collaborates with different labs around the country to “best capture and model the metadata of experiments, think about how the scientific community should access the data, and work to spread the utility and application of ENCODE.” Knowledge gathering of this type involves developing databases, so she leverages skills in programming and knowledge of cloud-based computing, most of which she gained on the job. “This position is a great opportunity to stay in academic science, but in a different, nontenure track,” she says.

Staying involved in research

Scientists who aspire to fuel the research engine find that pursuing a job managing core facilities (essentially the lab equipment and instrumentation) of a university is a smooth ride. Core facilities can be university-wide, or can be housed in a specific department. While at first glance these positions may seem to be focused only on operations, they still satisfy the drive many core facility managers have to be involved in research.

Ross Potter, laboratory manager in the department of physiology at Midwestern University in Glendale, Arizona, got his job because “they were interested in getting someone with an M.S. or a Ph.D. to build and expand the research program,” he notes. But once they got wind of his expertise—he had done postdocs in immunology and receptor signaling at Vanderbilt University and at the Mayo Clinic in Scottsdale, Arizona, respectively—“they changed the job description a bit and made the offer to me to expand the position to manage the research building.” Since his hiring in 2012, this dedicated health science university has increased its lab space and now has two research buildings, which Potter oversees. He manages all of the shared equipment, from confocal microscopes to freezers, and is responsible for maintaining and developing policies for using the facilities. He also serves as a liaison between the research staff and faculty/administration.

But like many core facility directors, Potter also has the chance to use the equipment to conduct research, a privilege also enjoyed by **Ralph J. Garippa**, director of the RNAi Core Facility at Memorial Sloan Kettering Cancer Center (MSKCC) in New York City. Garippa worked for over two decades in industry and was recruited by MSKCC to launch the core because of

his expertise in high-throughput biological research techniques. He arrived in 2012 and now oversees a team of eight scientists (including two Ph.D.s and one M.D.) who support researchers with resources and tools related to RNA interference (RNAi) and CRISPR gene-editing technologies. Investigators engage his core facility with a research project in mind and a need to use equipment that is under his supervision, but “most of the time they want to compose the research with us and then have us do it, because we are experts in the assay development and automation-assisted techniques,” notes Garippa. “We are also experts in troubleshooting and fine-tuning this specialized research.” In some instances, he also has the chance to present at conferences about not only the techniques utilized but the research itself. Additionally, “our core chooses to spend a minimum of 20 percent of our time working on new technologies,” he adds, which allows him to tap into his innate curiosity even more.

Grant management and writing and research development are other avenues that draw directly on doctorates and allow scientists to stay connected to the research enterprise. **Christina Papke**, Ph.D., a research development officer in the Research Development Services department at Texas A&M University (TAMU), revels in the fact that her job blends science with communications and strategic planning. She is able to dabble in the tasks she enjoys most, such as critiquing and editing NIH grant proposals, and providing training and related services on grant writing for TAMU investigators. Papke also facilitates the establishment of multidisciplinary research groups across the university, which contributes to TAMU’s strategic plan to advance its grant portfolio. “Our goal is to promote a high level of collaboration across disciplines and increase competitiveness for larger, [more] complex interdisciplinary grant opportunities,” she says. “I love seeing all kinds of science and not just what I saw at the bench. I get a broader overview and perspective in a lot of different fields now, and I really enjoy [the fact] that I still get to be involved with the research.”

Keeping a toe in the professorial pool

For scientists who consider it a necessity to remain associated with the professoriate, there are several job paths that can be pursued in academia. You might not think a deanship is possible without a faculty appointment, but **Lisa M. Kozlowski** would argue otherwise.

She’s the associate dean for student and postdoctoral affairs at Thomas Jefferson University in Philadelphia, Pennsylvania. Although she now has a joint appointment as a faculty member, she did not come into her deanship that way. Rather, she was hired for her knowledge of career development for early career scientists, which she honed as a leader in the postdoctoral association at her postdoc institution. It was only later that she renegotiated for a faculty post, something she advises others to do, preferably during the initial negotiations, for both the credence and benefits such as tenure.

For **Amy Replogle**, science core facility technician at the University of Puget Sound in Tacoma, Washington, keeping her toe in the professorial pool takes the form of teaching lab classes occasionally. Similarly, **Benjamin Porter’s** staff title is Academic Program Officer II, but he unofficially serves as the assistant head of the Department of Bioengineering at the University of Texas at Dallas. “I’m not faculty, but I help run the department,” he says. His portfolio of **cont.>**

FEATURED PARTICIPANTS

Division of Research, Texas A&M University
vpr.tamu.edu/researchdevelopment

Institute for Astronomy, The University of Edinburgh
www.roe.ac.uk/ifa

Midwestern University
www.midwestern.edu

Moffitt Cancer Center
www.moffitt.org

North Carolina Institute for Climate Studies, North Carolina State University
www.ncics.org

RNAi Core Facility, Memorial Sloan Kettering Cancer Center
www.mskcc.org/research-advantage/core-facilities/rnai-core

Stanford University
www.stanford.edu

Thomas Jefferson University
www.jefferson.edu/university

The University of Texas at Dallas
www.utdallas.edu

University of Puget Sound
www.pugetsound.edu

The University of Vermont
www.uvm.edu

“The recognition I get now is from the people I work with, that they like to work here, and that’s recognition enough. You have to look for a different kind of reward.”

—Benjamin Porter



responsibilities ranges from hiring and supervising staff and helping the department with accreditation, to event management, outreach, and even some media relations.

Leaning on research experience

Even though they do not serve as professors, researchers who pursue other academic paths note that their intensive training—in grad school, postdoc appointments, and other experiences—prepares them uniquely for the challenges of their new positions. “I lean a lot on my previous experience as a cancer researcher to review research protocols, conduct risk assessments, and add my ‘oops, been there, done that!’ to the trainings,” says **Sonia Godoy-Tundidor**, assistant biosafety coordinator at the University of Vermont in Burlington. “I always bring out real-life examples of things I or someone else did wrong from the biosafety point of view when I worked at the bench. This usually impacts people and gets the message across.”

Furthermore, the fact that these researchers received a Ph.D. gives them a certain level of currency in the academic marketplace. “My Ph.D. gives me confidence in speaking with faculty,” says Papke. “[They know] I’ve done research, I’ve applied for grants. It does lend some credibility, especially since I was entering this [undertaking] without experience in this field.”

However, a barrier still exists between faculty and nonfaculty at universities, as **Paula Hennon**, program manager for the North Carolina Institute for Climate Studies at North Carolina State University in Asheville, attests. As a Ph.D. atmospheric scientist (and an M.B.A.), “I’ve always had challenges being viewed as legitimate because I had a nonacademic plan,” she shares. “As the deputy director of the technical support unit for the National Climate Assessment, I finally stopped questioning ‘my worth’ and second-guessing my path. Scientists need an advocate, a guide through the administrative quagmire, and a voice. They should prepare to hold on for the

ride, as they will be the most misunderstood but potentially most valuable contributors to their scientific community or workplace.”

Preparing for employment opportunities

One especially important feature of these nonfaculty jobs is their reliance on a diversity of skills, from management and communications to budgeting and planning. Yes, professors need to know how to write too, but unlike faculty, hiring decisions for nonfaculty academic posts are driven by the candidates’ business and technical abilities.

So Kozlowski suggests that candidates should “get involved in things outside the lab, such as your institution’s grad student or postdoc associations, where you can gain leadership and organizational skills.” Porter helped launch the Washington, DC chapter of the Society for Neuroscience, which gave him excellent preparation for his current job.

Kozlowski also advises to do what you can to intimately learn the culture of academia—don’t just rely on your experience in a lab in grad school. “As a member of the postdoctoral association at Johns Hopkins, one of the benefits I got was the ability to sit in on faculty senate meetings and hear about strategic plans for the coming years,” she says. In doing so, she “got a feeling for how universities work.”

Passing on the Nobel Prize

Ph.D. scientists in nonprofessorial positions are essential cogs in ensuring that universities remain successful and competitive. But that doesn’t mean some who choose these professions don’t mourn certain aspects that are tied to being a professor. “When you move out of research, you have to let go of the prestige of writing papers or getting the Nobel Prize, and that takes some getting used to,” says Porter. “The recognition I get now is from the people I work with, that they like to work here, and that’s recognition enough. You have to look for a different kind of reward.”

Echoes Davidson: “You may feel you are giving up if you deviate from the [professorial] track, but there are still great careers out there [in academia] where you can be a scientist.... Although I miss being at the bench, I don’t work many weekends and I have a better work–life balance. I didn’t think I’d find a position like this that provided such balance and allowed me to contribute to science.”

Alaina G. Levine is a freelance science writer based in Tucson, Arizona.

DOI: 10.1126/science.opms.r1600166