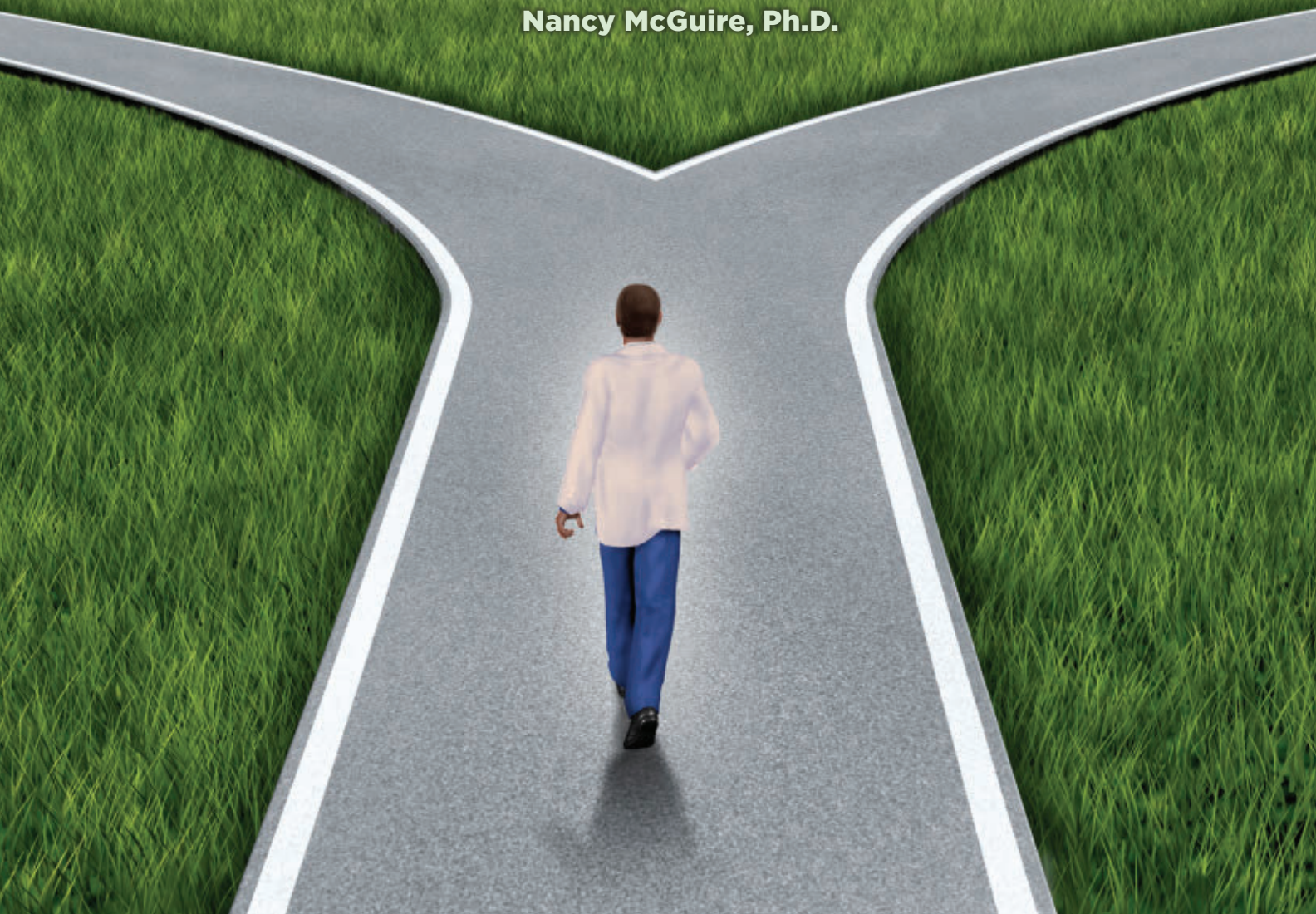


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# To Postdoc or Not To Postdoc

Nancy McGuire, Ph.D.



**I**n today's job market, is doing a postdoc really worth the effort? Depending on who you ask, it's a requirement for entry into a research career, an optional choice to strengthen your credentials, or an expensive waste of time. Postdoctoral programs range from well-organized career development opportunities to glorified internships.

In the course of the last 15 years, the number of postdoctoral researchers has grown significantly faster than

the number of permanent research positions, especially in academia, according to a 2014 National Academy of Science (NAS) report.<sup>1</sup> "New graduates are competing with a lot of postdocs" for permanent jobs, said Joel Shulman, a former industrial researcher who is now an adjunct chemistry professor at the University of Cincinnati and an active advocate within the ACS for graduate and postdoc programs. He added that the number of chemists currently doing postdocs is roughly

## By the Numbers

**150%** Increase in the number of postdocs in science, engineering, and health between 2000 and 2012

**54%** of 2013 chemistry Ph.D.s who have definite post-graduation plans

### Where they plan to go:

**59%**—Postdoctoral positions      **9%**—Work abroad

**7%**—Academic employment      **3%**—“Other”

**22%**—Industrial employment

**Sources:** National Academy of Sciences,<sup>1</sup> National Science Foundation.<sup>2</sup>

in the United States often do postdocs to strengthen their credentials, making it easier to apply for U.S. jobs as “aliens of exceptional ability.” About 60% of foreign nationals with chemistry Ph.D.s have definite commitments after graduation, according to a 2013 National Science Foundation study.<sup>2</sup> Of this group, 56% planned to take postdoctoral positions.

“Toward the end of your Ph.D., you get more confident. A postdoc solidifies this,” Zanni said, referring to building skills as an independent researcher. Most of the students he has encountered have some sense of career direction by the time they receive their graduate degrees, and doing a postdoc can build momentum in that direction.

In some cases, this momentum can carry your ideas all the way to the marketplace. In 2012, according to *The New York Times*,<sup>3</sup> the National Business Incubation Association reported that universities host about one-third of the 1,250 business incubators in the United States, compared with one-fifth in 2006. Often, when a faculty member decides to market a promising innovation, postdocs (or former postdocs) are part of the business plan.

double the number of chemistry Ph.D.s granted in any given year, and this ratio has stayed fairly constant for many years.

## Reasons for Doing (or Not Doing) a Postdoc

Shulman said that graduate students sign up for postdoctoral positions after graduation for a variety of reasons. The ones he encounters most commonly are, “because it’s required” and “because I don’t have a job lined up.”

If you’re doing a postdoc to boost your future income, you’re likely to be disappointed, according to the NAS study. However, you won’t even be considered for tenure-track positions at four-year colleges and universities or for research jobs at some research institutions and biomedical science labs without postdoctoral experience.

For many years, doing a postdoc has been seen as a way to ride out a tough job market, but it might also make sense even if you have a job offer lined up. “What’s your end goal?” asked Martin Zanni, a chemistry professor at the University of Wisconsin. He went on to say that if the permanent job will take you too far off your chosen career track and a postdoc offers specific career experience and connections, it might be better to choose the postdoc position.

Shulman recommended that unless in individual’s field requires a postdoc, graduate students ought to devote most of their efforts to finding a permanent position and look for a postdoc position as a fall-back alternative. Temp agency jobs offer another option, and some temp jobs can evolve into permanent positions. Doing two to three years as a postdoc can enhance your resume, but

Shulman says much more than that can have a negative effect. He recommended no more than three years as a chemistry postdoc and no more than five years in biomedicine: “In biology, doing two postdocs is almost expected.”

Geography is also a factor. Married graduates sometimes do postdoctoral work in a town where a spouse has landed a career position. Not all companies pay relocation expenses, and some companies only look locally to fill open positions. Doing a postdoc near the place where you want to work can put you on a stronger footing for future openings.

Foreign nationals wishing to stay

## Postdoc Parameters

In their 2014 report, *The Postdoctoral Experience Revisited*,<sup>1</sup> the National Academy of Sciences spelled out their recommendations for successful postdoctoral programs:

A postdoc should be “an individual who has received a doctoral degree (or equivalent) and is engaged in a temporary and defined period of mentored advanced training to enhance the professional skills and research independence needed to pursue his or her chosen career path.”

Barring extraordinary circumstances, an individual should spend no more than five years as a postdoc, including multiple postdoctoral appointments. A 2006 survey of doctoral recipients found that a single postdoctoral appointment usually lasts approximately two years, but the median total time an individual spends as postdoctoral researcher is between three and four years.

Postdoc positions should not substitute for permanent staff scientist positions. The postdoc should be preparing for the next stage of his or her career, not serving as a source of cheap labor for the primary investigator. To address this issue, several of the major funding agencies now require that postdoc mentoring and career development plans be included in grant applications.

## A Wider World

Postdocs can pick up experience related to their fields and build new skills that will serve them well later on. The additional experience can be helpful for making a shift in specializations such as, for example, mastering a new instrument, learning to manage a laboratory, or mentoring students. However, a postdoc is not recommended if you're going into a completely new field that will require a significant amount of coursework.

Shulman noted that, because recent graduates are likely to have spent the last several years in one academic environment, doing a nonacademic postdoc can bring them up to speed in another employment sector, such as industry or a national lab. He pointed out that big companies hire fewer Ph.D.s now, and they want their new hires to hit the ground running. Small companies, an increasingly important source of jobs for Ph.D.s, have fewer resources to devote to professional development, and they rely on new hires to have the knowledge they need.

Check out the terms of your individual postdoc agreement, however. Some companies prohibit hiring in-house postdocs, and publishing opportunities may be limited. Research that involves proprietary or classified information may restrict your ability to talk about your research, which can hinder your search for a permanent position elsewhere.

One of the most valuable aspects of doing a postdoc is the ability to build your professional network through interacting with colleagues, attending conferences and professional events, and publishing your research. An engaged, well-connected mentor can provide valuable connections and recommendations to help you land a permanent position.

Many universities sponsor postdoc organizations or informal groups, but there are several good online groups as well. AAAS Science Careers, Naturejobs.com, Nature Network, Ph.D.s.org, and MinorityPostdoc.org all offer online forums, as well as job postings and articles for postdocs. Active local ACS sections provide opportunities to mingle with lo-

cal chemists, serve on committees, and attend conferences and career development events.

## What Should You Look for in a Mentor?

Your mentor matters more than your institution if you're positioning yourself strategically, according to Zanni. One strategy is to look for hot topics in your field of research and find a mentor who is a key player in one of those areas.

A well-known or highly accomplished research investigator may or may not be a great mentor. You might be just another face in the crowd if this person has a very large research group. Having a "big name" on your resume carries a great deal of weight with well-established employers, said Zanni, but it is not as much of a consideration for smaller companies and startup businesses.

Zanni recommends working for a well-established scientist in graduate school and doing a postdoc with a rising star. Shulman agreed, saying that a new professor may treat you more as a peer and be more invested in your success. On the other hand, the pressure to perform may be more intense, as your mentor competes for funding and builds a list of publications in an effort to receive tenure.

## Doing Your Part

Progressive institutions train postdoctoral mentors and evaluate their ability to help their proteges move ahead. However, many programs leave it largely up to the individual postdoc to set a direction and make sure that things are progressing as planned. Often, mentors have no formal training in helping postdocs develop their careers, and they assume that providing them with research experience is sufficient.

An Individual Development Plan, or IDP, is an important tool for guiding a path to a career, where you set up and track milestones in your program to make sure that your research makes steady progress and stays on track. The ACS has developed a new interactive tool called ChemIDP, specifically designed for chemical scientists. Please see the accompanying editorial in this issue for updates about this new career

planning tool. The AAAS also offers an IDP tool, as well as other pertinent information, through its Science Careers web site. The NIH has set a requirement for grantees to report on the use of IDPs, and consequently some universities are beginning to include IDP planning in their graduate programs.

All in all, a postdoctoral position is an investment in your career. It can broaden and strengthen your experience, build your professional network, and establish your credentials as a researcher. How well your investment pays off depends largely on your career goals and how you put this investment to use. ■

## Notes

1. Committee to Review the State of Postdoctoral Experience in Scientists and Engineers (author); Engineering, and Public Policy Committee on Science (author); Policy and Global Affairs (author); National Academy of Sciences (author); National Academy of Engineering (author); Institute of Medicine (author). *The Postdoctoral Experience Revisited*; The National Academies Press: Washington, DC, 2014. ISBN 978-0-309-31446-6
2. National Science Foundation. *Science and Engineering Doctorates*. [Online] 2013. <http://www.nsf.gov/statistics/sed/2013/data-tables.cfm> (accessed Sept 29, 2015).
3. Pappano, L. Got the Next Great Idea? *New York Times* [Online] 2012, July 19. [http://www.nytimes.com/2012/07/20/education/edlife/campus-incubators-are-on-the-rise-as-colleges-encourage-student-startups.html?\\_r=0](http://www.nytimes.com/2012/07/20/education/edlife/campus-incubators-are-on-the-rise-as-colleges-encourage-student-startups.html?_r=0) (accessed Sept 29, 2015)

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