

# POSTDOCS IN A WIDER WORLD

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**W**hen you think of doing a postdoc, do you picture spending a couple of years at a university, working for a professor on his or her research program? Most postdoctoral positions fit this description. In fact, a 2014 report by the National Academy of Sciences (NAS) reports a “dramatic” growth in the number of academic postdoctoral positions financed by research grants that are obtained and managed by individual faculty members.<sup>1</sup> However, most postdocs will not find permanent employment in academia when their appointments end, and their future careers might bear scant resemblance to their postdoctoral projects.

Government agencies, national laboratories, nonprofit research institutions, and private industry also sponsor postdoctoral researchers, using fellowships or traineeship programs rather than a mentor’s grant. Nonacademic postdocs often enjoy a higher degree of autonomy, including the ability to choose their own research projects, and sometimes, the location where the research is performed. This setup also provides more recognition for the postdoc in his or her own right, rather than as an assistant to a principal investigator.

The NAS report states that only about 11% of postdoctoral researchers work at research-and-development centers funded by industry or the federal government.<sup>1</sup> However, these positions are worth considering because they tend to be better defined, shorter in duration, and better paying than their academic counterparts. They also have a clearer connection to career development and often pave the way to a full-time job at the end of the postdoctoral period.

## A Change of Scenery

Nonacademic postdoc positions provide an introduction to the work environments in industrial and government research, which can be very different from those in academia.

- Academic institutions reward advances in scientific knowledge as demonstrated through teaching, publications, conference presentations, and patents.
- Industries focus on developing innovative products to attract customers, solving problems, reducing costs, and complying with regulations.
- Government labs can go either way—some projects focus on applied research related to an agency’s mission, but others seek to advance basic knowledge. Postdocs at the national laboratories often assist visiting scientists from academia and industry in using the labs’ specialized instruments and facilities.

Some government and industrial laboratories use the postdoctoral period to “try out” potential future employees. This also gives the postdoc an opportunity to evaluate potential employers and gain insight into the organization’s work environment that it would hard to obtain in any other way. However, staff openings can disappear as a result of government funding cuts and industry reorganizations, so it’s essential to have a backup plan for these positions.

Some organizations prohibit hiring in-house postdocs, an important consideration to check out before signing on the bottom line. Some firms set up competitions, taking on more postdocs than they have permanent positions for and

## Postdoctoral Appointments Aren't Limited to Laboratory Research

### The National Academies

<http://sites.nationalacademies.org/PGA/Fellowships/>

**American Association for the Advancement of Science** <http://www.aaas.org/page/fellowships>

**The National Lab Postdoctoral Programs Resource Guide** [http://sites.nationalacademies.org/cs/groups/pgasite/documents/webpage/pga\\_068400.Pdf](http://sites.nationalacademies.org/cs/groups/pgasite/documents/webpage/pga_068400.Pdf)

### ACS Public Policy Fellowships

<http://www.acs.org/content/acs/en/policy/policyfellowships/programs.html>

### NASA's postdoctoral Research Participation

**Program** <https://nasa.orau.org/postdoc/description/overview.htm>

hiring only the top performers.

The benefits offered to nonacademic postdocs are often similar to those received by permanent employees; they may include paid vacation and sick-leave days, medical and disability insurance, and family leave policies. Postdocs generally deal with the same human resources office that administers benefits and handles employee matters for permanent staff. To get a better idea of the types of benefits available, look at The National Lab Postdoctoral Programs Resource Guide, published by the National Academies (please see box to the left for additional resources). It contains a wealth of information about hiring, professional development and support, work policies, and compensation practices at the National Laboratories in the United States.

Some government postdocs, especially those dealing with

national security and the military, require U.S. citizenship and a security clearance. Nevertheless, slightly more than half of all the science postdocs at federally funded research-and-development centers were in the United States on temporary visas in 2013<sup>2</sup>.

## Can You Talk About Your Work?

One major difference between academia and a government or industrial lab is your ability to discuss your research freely outside of your workplace. Publishing your research is a major factor in establishing your credentials, and talking about your research at conferences and job interviews is critical to obtaining a permanent position outside of the institution where you do your postdoc.

Industrial research is often classified as proprietary, especially as the work gets closer to commercialization. Because a company's intellectual property represents a significant portion of its value, outside publications and presentations must be vetted and approved well in advance by the company's legal or public relations department.

Government labs have similar prepublication approval requirements and may impose restrictions on travel expenditures, even for research that is not considered sensitive or classified. For classified research, government agencies sponsor conferences and publications open only to those with the proper clearances—such research may even be restricted to a “need to know” basis—but discussing any level of classified research with a wider audience is out of the question.

Some companies and government agencies help their postdocs get around this problem by assigning them to research projects that are still in the early exploratory stages. Because this research has not yet “gone behind the curtain,” the postdoc can publish or present the results after obtaining the necessary approvals.

## Competitors and Collaborators

Patricia Simpson, director of academic advising and career counseling and placement at the University of Illinois at

## Number of Postdocs Working at FFRDCs

Who Administers the FFRDCCs	Universities and Colleges	Industrial Firms	Nonprofit Organizations
2013 Postdocs (all fields)	1,204	756	653
Decline from 2012	3.5%	12.5%	4.1%
U.S. Citizens and Permanent Residents	432	464	254
Temporary Visa Holders	772	292	399
Chemistry Postdocs	180	127	121
Chemical Engineering Postdocs	34	24	27

**Source:** Kelly H. Kang, “Employment of Postdoctoral Researchers at Federally Funded R&D Centers Declined in 2013” National Center for Science and Engineering Statistics InfoBrief, December 2014. NSF 15-310.

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Urbana–Champaign, noted in a 2012 interview for Chemical and Engineering News<sup>3</sup> that only a few companies had recently recruited postdocs from the university’s School of Chemical Sciences’ ranks of graduates. However, she added that some companies, notably in the pharmaceutical industry, had begun to expand their postdoc programs.

Simpson also noted that, in the wake of the Great Recession’s layoffs and cost-cutting campaigns, these companies rely on postdocs to help maintain the momentum of innovation and regard the group as a source of future employees. Even postdocs who do not remain with a particular company are seen as potential collaborators in their future roles as academics, vendors and suppliers, and fellow members of industrial consortia.

Competition for these scarce industrial postdoc positions can be fierce, and work hours can be long and demanding. Candidates must possess skills beyond technical proficiency. Companies are looking for researchers who are passionate and dedicated. They must have the curiosity and inventiveness to look outside of their own areas of specialization to solve problems with innovative solutions that have practical applications. Landing one of these positions requires much more than answering ads and doing online searches. Graduate students who have devoted time and effort to making themselves known to prominent researchers in their areas of interest have a definite head start.

### A Strategic Investment

A postdoc can be an opportunity to build experience and increase your professional network, or it can be a long slog after graduation with no clear payoff at the end. Academic institutions sponsor a significant majority of postdoctoral positions, even though most permanent positions for Ph.D. chemists lie outside of academia. Some fields, notably biomedicine and biotechnology, require postdoctoral experience as a condition of entry. Some corporations and national laboratories use postdoctoral appointments as a way of vetting candidates for permanent staff positions. Other employers place very little value on postdoctoral experience.<sup>1</sup> It’s essential to find

out how employers in your area of interest view postdoctoral experience before you make this major investment.

A well-planned nonacademic postdoc, focused on your area of interest, can give you close-up, in-depth knowledge of working environments outside the university. It can fill in and solidify skill sets such as lab management, customer and user support, independent research, and lab instrument experience. The people you meet and communicate with can become trusted colleagues and collaborators, and they can help you connect with potential employers.

Doing a postdoc isn’t the only way forward for new Ph.D.s. However, if you have plotted out your career objectives and a postdoc fits into the plan, it can be a strategic investment that gives you a competitive edge in the field of your choice. Even if you’re taking a postdoctoral appointment as a means of riding out a tough job market, bearing these factors in mind can make the difference between running in place and moving ahead. ■

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