

THE POSTDOCTORAL EXPERIENCE REVISITED (2014)

Concerns about the postdoctoral training system have been gnawing at the research community for decades. While postdoctoral research positions are intended to give recent Ph.D. recipients a fixed period of mentored, advanced training to enhance their professional skills and research independence, for many postdoctoral researchers this ideal is not mirrored in reality.

The National Academies produced a report in 2000 that called for reforms to the system, and since then other agencies, organizations, and professional societies have released reports expressing concerns. Has any progress been made? In 2011 National Academies appointed another study committee to revisit the status of postdoctoral researchers.

The committee's report concludes that although some improvements have been made since the release of the previous report in 2000, postdoctoral researchers at many institutions continue to lack adequate mentoring, recognition, status, and benefits. Moreover, the practice of employing postdoctoral researchers as long-term researchers, with little mentoring and little hope of moving into a career that requires advanced research training, appears to be becoming more common.

The postdoctoral experience should be refocused to have training and mentoring at its center, the report recommends.

Salaries for postdoctoral researchers should be raised.

In addition, graduate students should avoid viewing postdoctoral positions as the default next step, because growth in the number of postdoctoral researchers far exceeds growth in the number of tenure-track jobs to which many of these researchers aspire. Instead, with the assistance of their institutions, graduate students should consider a broad range of scientific career paths.

More Ph.D.'s Pursuing Postdoctoral Positions, Staying in Positions Longer

The percentage of Ph.D.'s who pursue postdoctoral training is growing steadily and spreading from the biomedical and physical sciences to engineering and the social sciences. Between 60,000 and 100,000 postdoctoral researchers now work in the United States in a wide range of disciplines.

Although the data are not definitive, the average length of time researchers spend in postdoctoral positions seems to be increasing, the report says. Sources of funding have changed as well. The number of postdoctoral fellowships and traineeships—which provide postdoctoral researchers relative autonomy and recognition—has remained nearly constant for decades, while the number of postdoctoral researchers hired as part of research grants or supported by nonfederal sources has grown dramatically.

Tenure-Track Openings Have Not Kept Pace

While the demand for junior research workers has boomed, the number of research faculty positions into which the junior researchers could hope to move has not kept pace, especially in academia. Tenured faculty are not retiring at the rate that their aspiring replacements are being trained. The result is a system that has created expectations for academic career advancement that cannot be met.

As the result of this imbalance, many individuals are staying as postdoctoral researchers for prolonged periods and sometimes moving into a second or third postdoctoral position. Some attain research positions for which postdoctoral training was not necessary, while others are leaving their chosen research field or abandoning their research pursuits altogether.

When postdoctoral researchers do eventually pursue nonacademic or non-research jobs, they do not receive a wage premium for their additional training. On average, postdoctoral researchers start at lower salaries than what is paid to graduates who entered similar jobs immediately after earning their Ph.D. In addition, the total earnings of those with postdoctoral training trail those of their Ph.D.-only contemporaries for the rest of their careers. Employers appear to be sending a signal that the time spent in postdoctoral research is not valued in many job markets.

Recommendations

In an effort to re-center the postdoctoral experience around training and mentoring, improve the salary of postdoctoral researchers, and address the imbalance between the number of postdoctoral researchers and tenure-track research positions, the committee developed recommendations for best practices in six areas.

1) Period of service. Postdoctoral appointments for a given researcher should total no more than five years in duration, barring extraordinary circumstances (e.g. family leave, illness). This maximum term should include cumulative postdoctoral research experience.

Needed actions:

- Host institutions should maintain a record of how long a postdoctoral researcher remains in a position and provide that information to funding agencies as part of grant proposals.
- To facilitate tracking of postdoctoral researchers, funding agencies could assign each postdoctoral researcher an identifier and keep a record of the total length of time any given individual is holding such a position.

2) Title and role. In many instances, positions currently occupied by postdoctoral researchers are more appropriately filled by permanent staff scientists (e.g., technicians, research assistant professors, staff scientists, laboratory managers). **The title of “postdoctoral researcher” should be applied only to those people who are receiving advanced training in research.** When the appointment period is completed, the postdoctoral researchers should move on to a permanent position externally or be transitioned internally to a staff position with a different and appropriate designation and salary.

Needed actions:

- Funding agencies should have a consistent designation for “postdoctoral researchers” and require evidence that advanced research training is a component of the postdoctoral experience.
- Host institutions should create or identify professional positions for individuals who are conducting research but not receiving training, and they should receive appropriate remuneration, benefits, and privileges.

3) Career development. Host institutions and mentors should, beginning at the first year of graduate school, make graduate students aware of the wide variety of career paths available for Ph.D. recipients, and explain that postdoctoral positions are intended only for those seeking advanced research training. **The postdoctoral position should not be viewed by graduate students or principal investigators as the default step after the completion of doctoral training.**

Needed actions:

- Host institutions, especially those with graduate student populations, should provide multiple engagement activities to help students explore all avenues of career development. Funding agencies should help to support these efforts.
- Professional societies should gather and disseminate information about the full range of career paths within their discipline. Useful activities could include collecting statistics about job openings and salaries, identifying individuals in various sectors who can provide career advice, and organizing career fairs at professional meetings.
- Mentors, in addition to providing guidance based on their own experience, should become familiar with and disseminate information about all forms of career development opportunities available at the host institution or through their professional society.

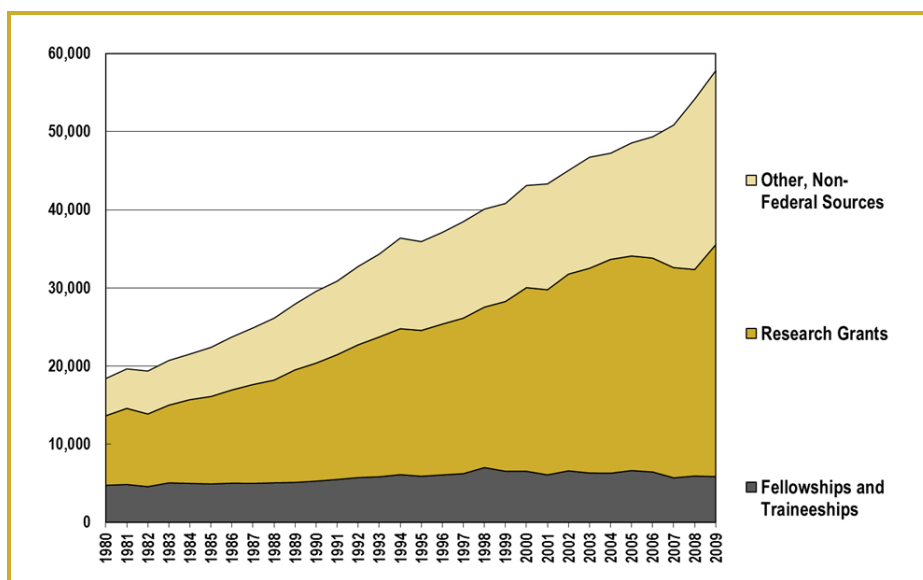


FIGURE 2-1 Variations in types of postdoctoral researchers working at academic institutions with graduate programs by mechanism of support.

NOTE: Includes science, engineering, and health postdoctoral researchers.

SOURCE: Data compiled from the NSF and NIH Graduate Students and Postdoctorates in Science and Engineering Survey (GSS) via WebCaspar.

- Postdoctoral researchers and graduate students have a responsibility to participate in the career development opportunities provided by their institutions, to explore other sources of information such as professional societies, and to use available career-development tools.

4) Compensation and benefits of employment.

Postdoctoral salaries are currently low. The study committee considered five different approaches for determining an appropriate salary, and all of them suggest an amount of \$50,000 or more. In addition, data reveal that the starting salary for NIH's National Research Service Award (NRSA) postdoctoral award—currently set at \$42,000 for 2014—has become the de facto standard for many disciplines and on many campuses. **The NIH should raise the NRSA postdoctoral starting salary to \$50,000 (2014 dollars) and adjust it annually for inflation.**

Postdoctoral salaries should be appropriately higher where regional cost of living, disciplinary norms, and institutional or sector salary scales dictate higher salaries. In addition, host institutions should provide benefits to postdoctoral researchers that are appropriate to their level of experience and commensurate with benefits given to equivalent full-time employees.

Needed actions:

- Federal agencies should require host institutions to provide documentation of the salary a postdoctoral researcher will receive with all grant proposals.

- Professional societies should collect data on salaries for all positions and make these publicly available.

5) Mentoring. Mentoring is an essential component of the postdoctoral experience and entails more than simply supervision. Mentoring should not be solely a responsibility of the principal investigator, although he or she should be actively engaged in mentoring. **Host institutions should create provisions that encourage postdoctoral researchers to seek advice, either formally or informally, from multiple advisors, in addition to their immediate supervisor. Host institutions and funding agencies should take responsibility for ensuring the quality of mentoring through evaluation of, and training programs for, the mentors.**

Needed actions:

- In addition to providing mentorship training and guidance to the immediate supervisors of the postdoctoral researchers, host institutions should establish mechanisms that make it easy for postdoctoral researchers to seek guidance from additional faculty or senior professionals who can enrich the postdoctoral training experience.
- Funding agencies should identify better ways of evaluating or rewarding mentoring as an essential component of research.
- Professional societies are in an ideal position to provide additional mentors to supplement those at host institutions.

- Postdoctoral researchers need to recognize that a great research investigator is not necessarily equivalent to a great mentor and that many if not most principal investigators or senior research faculty have not received any formal training in mentoring. Therefore, postdoctoral researchers should seek guidance from a variety of people, and should be encouraged to do so.

6) Data collection. Current data on the postdoctoral population, in terms of demographics, career aspirations, and career outcomes are neither adequate nor timely. Every institution that employs postdoctoral researchers should collect data on the number of currently employed postdoctoral researchers and where they go after completing their research training, and make this information publicly available. **The National Science Foundation should serve as the primary curator for establishing and updating a database system that tracks**

postdoctoral researchers, including non-academic and foreign-trained postdoctoral researchers. Host institutions and federal agencies should cooperate with NSF on the data collection and maintenance process.

Because this recommendation on data collection has been made many times before with little effect, research institutions and professional societies should explore what they can do to enrich what is known about postdoctoral researchers and that all institutions make better use of new technologies and social and professional networks to collect relevant and timely data.

All of the reforms recommended should be coordinated through a strong and separate or stand-alone postdoctoral office (PDO) at each host institution.

COMMITTEE TO REVIEW THE STATE OF POSTDOCTORAL EXPERIENCE IN SCIENTISTS AND ENGINEERS

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