

# STEM postdoc researchers are highly trained, but for what?

December 9 2014, by Gary Mcdowell

---



All dressed up with nowhere to go? Credit: Joe Hall

The STEM fields of Science, Technology, Engineering and Mathematics supposedly suffer from a shortage of graduates. Conventional wisdom says there's no one for employers to hire for science and engineering jobs. This STEM shortage [myth](#) has even figured in the immigration debate in the US.

But look again. There are actually plenty of STEM graduates; the US is just training them the wrong way. It's true there are many professional [STEM vacancies](#) but there are also many STEM grads who could fill them. The problem is the current training pipeline doesn't direct

graduates to these non-academic jobs.

STEM students aren't prepped for the professional world. Instead, they are guided toward an academic workforce that has expanded through a dramatic rise in the number of graduate students and postdoctoral researchers. Graduate researchers and postdocs – that is, researchers with PhDs carrying out advanced research – are part of the academic career track originally designed to lead to tenured academic research positions. As renowned engineer [Vannevar Bush advised](#) President Truman in 1945, while advocating for the creation of a National Science Foundation:

The plan should be designed to attract into science only that proportion of the youthful talent appropriate to the needs of science in relation to the other needs of the nation's high priority.

However, the number of permanent – that is, tenured – jobs has not increased since that time, leading to [hyper-competition](#) and a [massive pool of postdocs](#). Junior researchers are shamed by a culture that perceives leaving academia as a [betrayal](#). Colloquially non-academic jobs are referred to as "alternative" careers. But when [only 10% of PhD students](#) end up in tenured positions, the term "alternative" is highly misleading.

Training relevant to other career tracks is either not forthcoming or culturally discouraged. And there's not even adequate training for the managerial responsibilities academic researchers will be saddled with – if they're lucky enough to secure an academic position. Practical science, and the accumulation and publication of data is where training is directed.

## Postdocs joining forces

A group of Boston postdocs, led by Jessica Polka and Kristin Krukenberg at Harvard Medical School, organized the [Future of Research Symposium](#) to bring graduate students and postdocs together to discuss these problems facing young academics and to come up with potential solutions. Attendees [outlined](#) the position of junior scientists in Boston and proposed a [wide range of possible solutions](#) in the categories of connectivity, transparency and investment.



Comparison of before and after concrete benefits of unionization in CA. Credit: Cain et al. How postdocs benefit from building a union, Author provided

## Connectivity

Graduate students and postdocs should talk. Being a postdoc can be a

lonely business. Most postdocs are [from abroad](#) and move out of their former networks to entirely new regions, so there are both social and academic reasons for greater connection between scientists.

These junior scientists must interact with institutions, making use of [graduate student](#) councils and postdoctoral associations, to ensure adequate training and benefits are provided. They should connect with learned societies and nominate themselves for committees that include young scientists, to make their voices heard.

Organizations including the [National Association of Graduate-Professional Students](#) and [National Postdoctoral Association](#) allow nationwide interactions. Postdocs in the University of California system have unionized, and junior scientists around the country have noted the resultant [benefits](#), which include greater connectivity throughout the community across different campuses.

## **Transparency**

Nobody knows how many postdocs there are in the US; this is unacceptable. The National Institutes of Health only recently [began tracking](#) researchers on training grants. Institutions should monitor how many junior scientists they have and their career outcomes and make this data available.

Junior scientists lack career awareness: they need to wise up to career realities. But also institutions must be transparent about career outcomes of their trainees. We must stop telling all PhD students they will become academics; most won't.

## **Investment**

We postdocs don't necessarily want more money. [Doubling of the NIH budget](#) in 2003 led to this crisis in the first place. Instead we call for more funding of graduate students and postdocs through training grants that give more power to the junior scientists to develop their own careers.

Graduate students currently need permission from their advisors to graduate; I know many who have been trapped in the lab by advisors reluctant to let go of students when they're most productive. In the UK, my PhD was funded by a training grant: my advisor had no way to delay my graduation and indeed there was a limit of four years to submission before the funding council would actually impose penalties on future grant applications. These measures ensure security for students in their training timelines.

## Continuing the conversation

This is a worldwide problem. In a report examining [the culture of scientific research](#), the Nuffield Council on Bioethics revealed that out of 100 PhD [students](#), 30 will get postdoctoral positions, and 4 will end up with permanent academic research positions in the UK, showing that the situation is even worse than in the US, with an added bottleneck at the PhD to postdoc transition. And this is not just a science problem: there are [increasing numbers of postdocs](#), and particularly [adjunct faculty](#), in the humanities.

Public money is being wasted by directing people towards nonexistent jobs. If junior scientists aren't going to be trained for non-academic careers during PhD and postdoctoral research, the number of people in the system simply must be reduced. However, if we accept that PhDs and postdocs can and should be trained for other career paths, then we can produce highly-skilled professionals with analytical and communication skills, able to influence technology, policy and business

to the benefit of society.

*This story is published courtesy of [The Conversation](#) (under Creative Commons-Attribution/No derivatives).*

Source: The Conversation

Citation: STEM postdoc researchers are highly trained, but for what? (2014, December 9)  
retrieved 20 March 2024 from <https://phys.org/news/2014-12-stem-postdoc-highly.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------