

# Postdocs: the invisible university

**NASEM The Impacts of Sexual Harassment in Academia --  
Cambridge/Boston, MA October 4, 2017**

[http://sites.nationalacademies.org/PGA/cwsem/PGA\\_181402](http://sites.nationalacademies.org/PGA/cwsem/PGA_181402)

These slides: <https://zenodo.org/record/1002153>

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#SHSTEMstudy



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# The Invisible University

Postdoctoral  
Education  
in the  
United States

National Academy of Sciences

1969

# How many postdocs are there?

ACD Biomedical Workforce Working Group Data (2012)



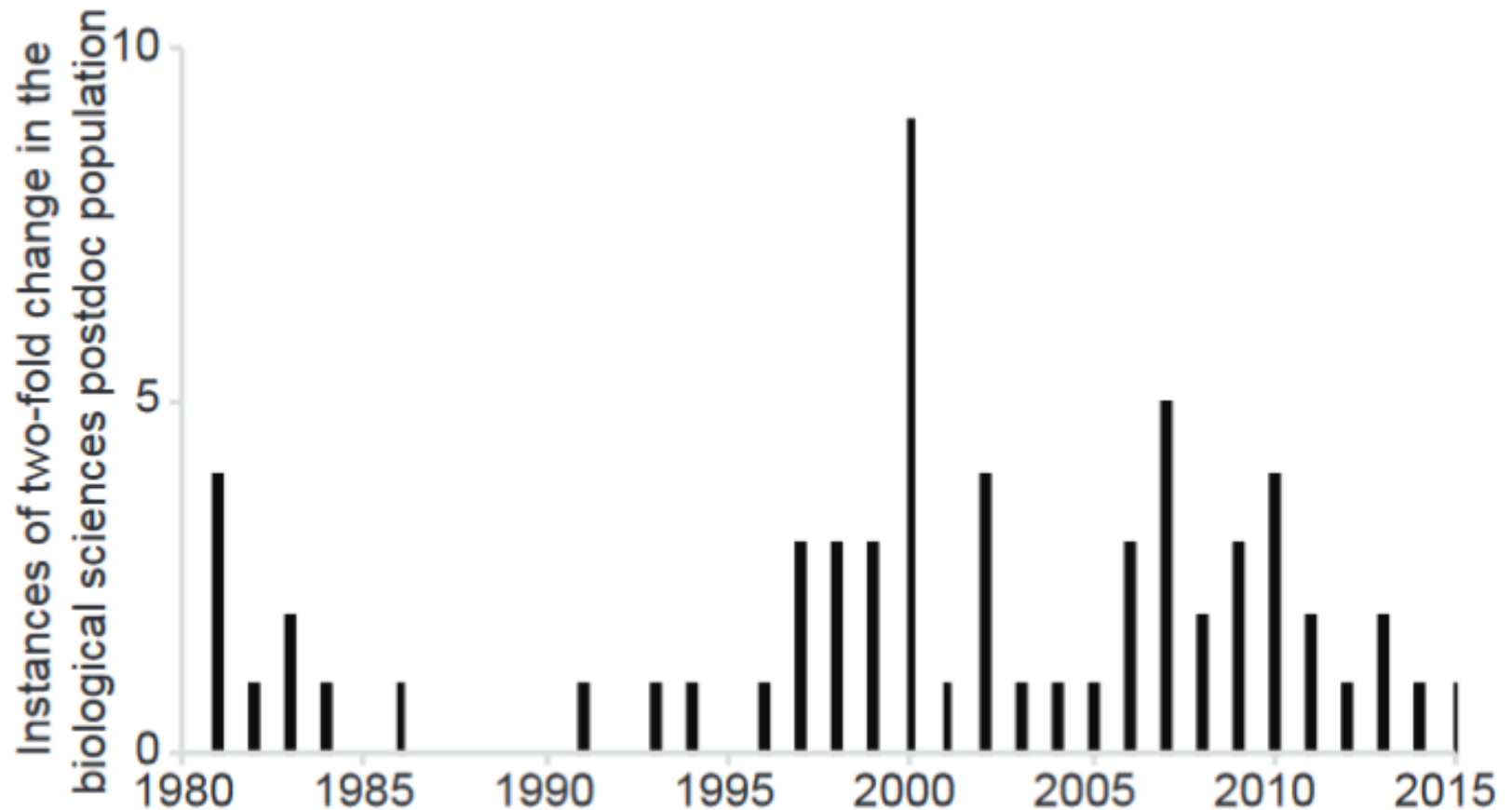
[https://report.nih.gov/investigators\\_and\\_trainees/ACD\\_BWF/index.aspx](https://report.nih.gov/investigators_and_trainees/ACD_BWF/index.aspx)

# Many institutions report >2-fold changes in # of postdocs from year to year

**The GSS is an unreliable indicator of biological sciences postdoc population trends**

Christopher Pickett, Adriana Bankston, Gary S. McDowell  
doi:

<https://doi.org/10.1101/171314>



# Why can't institutions count?

“There are very little reliable data on the number of postdoctoral researchers in the US and the length of their training ... This is due to a dearth of information about the numbers of foreign-trained postdoctoral researchers, as well as changes in the titles of postdoctoral researchers as they proceed through their postdoctoral positions”

[https://acd.od.nih.gov/documents/reports/Biomedical\\_research\\_wgreport.pdf](https://acd.od.nih.gov/documents/reports/Biomedical_research_wgreport.pdf)

By Gary McDowell

<http://www.asbmb.org/asbmbtoday/201604/Education/Postdoc/>

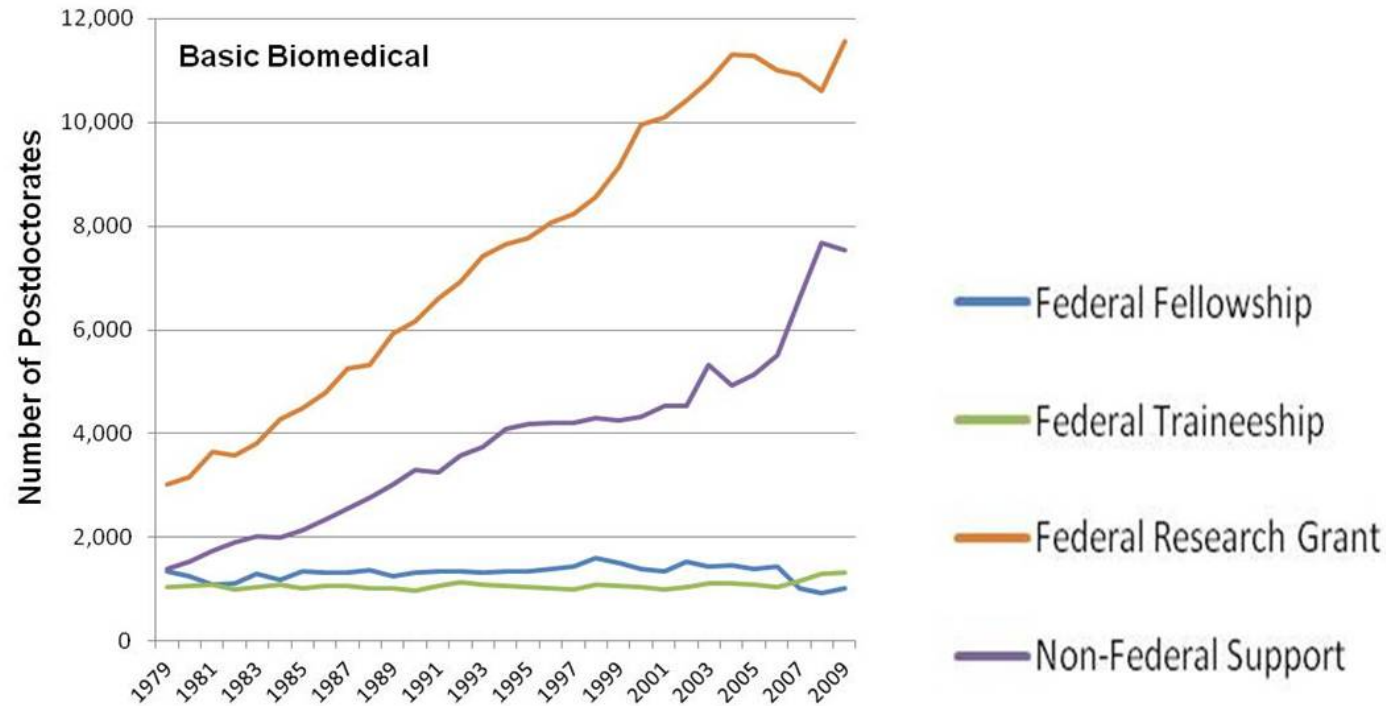


# No one is watching

- If postdocs can't be counted by institutions, how well can they be supported?
- Postdocs do not have classmates, a thesis committee, external advisors, etc
- Postdocs are interviewed and selected by an individual faculty member, upon whom their research & career depends
- This creates **isolation** and **power asymmetry**

# Most postdocs paid by funds awarded to their PI

## Postdoctorates by Type of Support



Federal fellowships  
(except K99) not  
open to foreign  
postdocs

Source: NSF Graduate Student and Postdoctorate Survey

Table 40. Postdoctoral appointees in science, engineering, and health in all institutions, by detailed field and primary mechanism of support: 2015

Field	Total	Fellowships	Research grants	Traineeships	Other types of support
All surveyed fields	63,861	6,286	39,811	3,884	13,880
Science and engineering	45,295	4,079	30,742	1,873	8,601
Science	37,639	3,555	24,996	1,762	7,326

Current data:

[https://ncesdata.nsf.gov/datatables/gradpostdoc/2015/html/GSS2015\\_DST\\_40.html](https://ncesdata.nsf.gov/datatables/gradpostdoc/2015/html/GSS2015_DST_40.html)



# 55% of Science, Engineering, & Health postdocs are on temporary visas

NSF GSS 2015

**Table 38. Postdoctoral appointees in science, engineering, and health in all institutions, by detailed field, sex, and citizenship: 2015**

Field	Total	Sex		Citizenship	
		Male	Female	U.S. citizens and permanent residents	Temporary visa holders
All surveyed fields	63,861	38,566	25,295	28,726	35,135
Science and engineering	45,295	28,970	16,325	19,593	25,702
Science	37,639	23,011	14,628	17,072	20,567

[https://ncesdata.nsf.gov/datatables/gradpostdoc/2015/html/GSS2015\\_DST\\_38.html](https://ncesdata.nsf.gov/datatables/gradpostdoc/2015/html/GSS2015_DST_38.html)



# J-1 VISA

## EXCHANGE VISITOR PROGRAM

### Termination

Participants are subject to the Department of State's Exchange Visitor Program regulations, and to the rules specified by their sponsors. Participants found to be in violation of program regulations and/or sponsors' rules may be terminated from the program. Other grounds for termination include, but are not limited to:

1. Failure to pursue the exchange activities for which the participant was admitted to the United States;
2. Inability to continue the program;
3. Willful failure to maintain insurance coverage as required under 22 CFR 62.14; and
4. Unauthorized employment. [22 CFR 62.40]

Participants who are terminated from their exchange programs are expected to leave the United States immediately.

37,465 in the  
"Professor and  
Research  
Scholar"  
category  
<https://j1visa.state.gov/basics/facts-and-figures/>

# Most postdocs are in it for an academic job

## Why pursue the postdoc path?

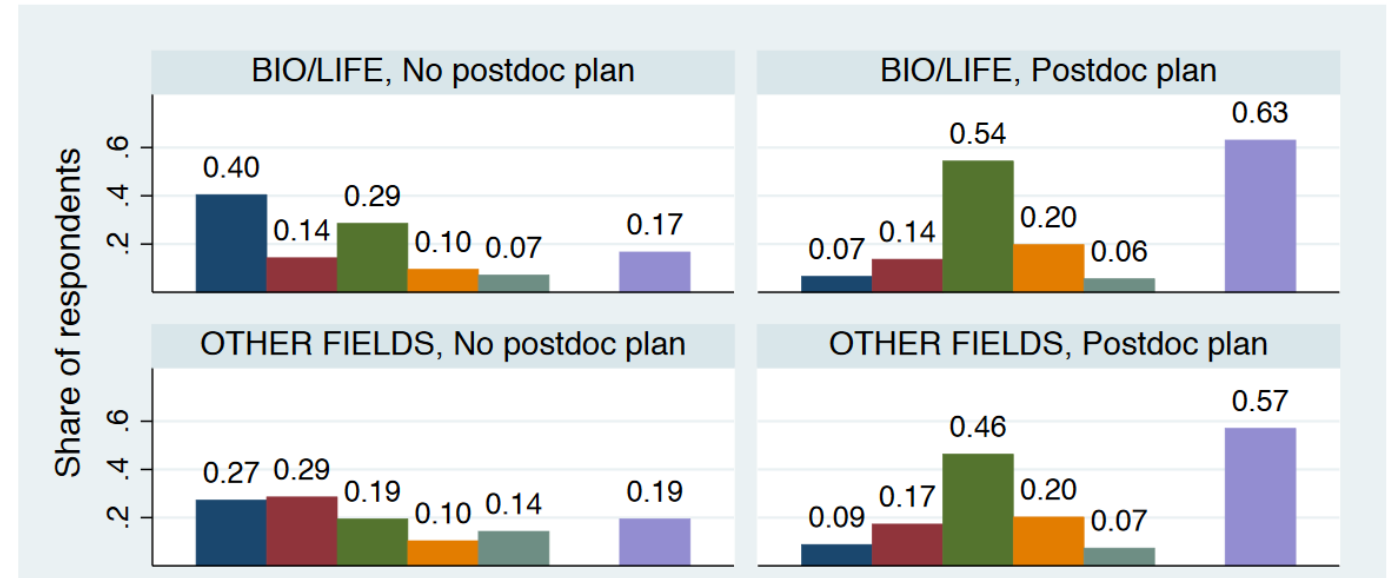
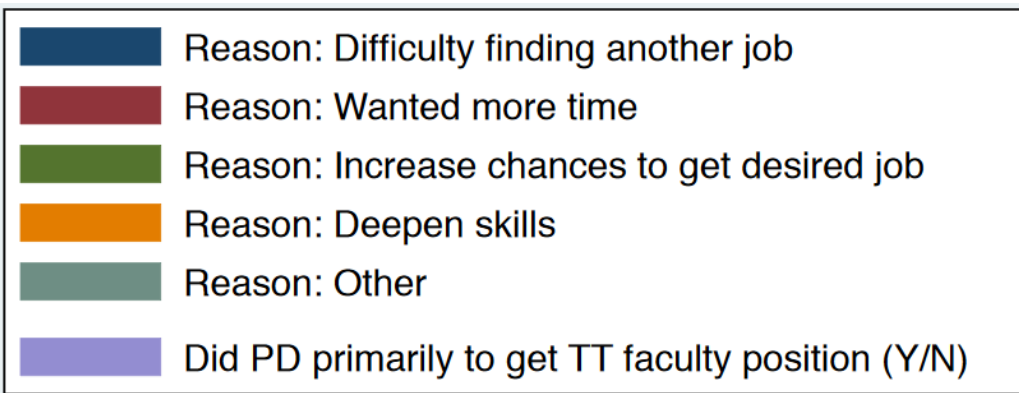
Henry Sauermann & Michael Roach

*Science* 06 May 2016:

Vol. 352, Issue 6286, pp. 663-664

DOI: 10.1126/science.aaf2061

**Fig. S3.** Reasons for doing a postdoc, by field and postdoc plan. Postdoc respondents to the SEPPS 2013 who were PhDs in 2010. N=843.



# The academic job market is tight

**14.75%**

Respondents' estimate of  
the share of biological or  
life science Ph.D. graduates  
holding a tenure-track position  
5 years after graduation

**14.30%**

Actual share reported  
by NSF 2012

**10.60%**

Actual share reported  
by NSF 2016

# PI power over the faculty job search



“

Letters of recommendation have a huge influence ”

<https://elifesciences.org/articles/32016>

# Influence doesn't stop there

NATURE | COMMENT



## Stop blocking postdocs' paths to success

Ben A. Barres

30 August 2017

Lab heads should let junior researchers take their projects with them when they start their own labs — it drives innovation and discovery, argues Ben A. Barres.



PDF



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Subject terms: [Research management](#) • [Neuroscience](#) • [Lab life](#) • [Ethics](#)



Illustration by David Parkins

“A postdoc is formally free to work on any project in his or her own lab. But those that snurn their advisers' wishes risk losing their support — something that is usually crucial for winning junior investigator awards and other types of funding, or when trying to obtain a promotion, say from assistant to associate professor.”

“Right now PIs wishing to take advantage of their postdocs can act with impunity.”  
[re research direction]

<https://www.nature.com/news/stop-blocking-postdocs-paths-to-success-1.22515>



# Advice from *Science*

“As long as your adviser does not move on to other advances, I suggest you put up with it, with good humor if you can. Just make sure that he is listening to you and your ideas, taking in the results you are presenting, and taking your science seriously. His attention on your chest may be unwelcome, but you need his attention on your science and his best advice.”



Credit: G. Grullón/Science

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## Help! My adviser won't stop looking down my shirt!

By Alice Huang  
June 01, 2015

Alice and her friends answer questions that you don't want to ask your preceptor, peer, or colleagues regarding your career in science. Send your questions to Alice's attention via [SciCareerEditor@aaas.org](mailto:SciCareerEditor@aaas.org).

*The U.S. Equal Employment Opportunity Commission defines unlawful sexual harassment as “unwelcome sexual advances, requests for sexual favors, and other verbal or physical harassment of a sexual nature.”*

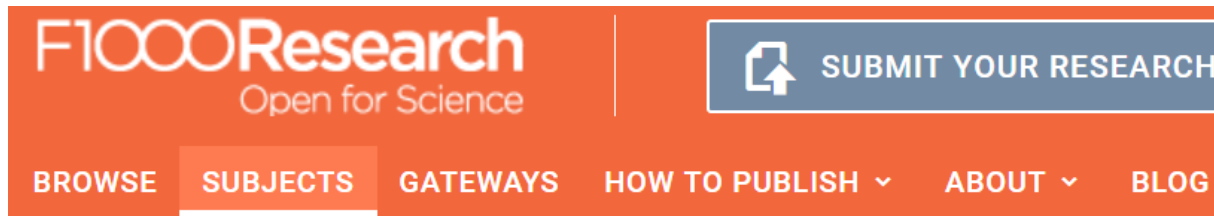
Dear Alice,

**Q:** I've just joined a new lab for my second postdoc. It's a good lab. I'm happy with my project. I think it could really lead to some good results. My adviser is a good scientist, and he seems like a nice guy. Here's the problem: Whenever we meet in his office, I catch him trying to look down my shirt. Not that this matters, but he's married.

What should I do?


—Bothered

# Perspectives from the Future of Research Symposium (Boston 2014)



OPINION ARTICLE

## **REVISED** Shaping the Future of Research: a perspective from junior scientists [version 2; referees: 2 approved]

Gary S. McDowell<sup>1\*</sup>, Kearney T. W. Gunsalus<sup>2\*</sup>, Drew C. MacKellar<sup>3</sup>, Sarah A. Mazzilli<sup>4</sup>, Vaibhav P. Pai<sup>1</sup>, Patricia R. Goodwin<sup>5</sup>, Erica M. Walsh<sup>6</sup>, Avi Robinson-Mosher<sup>7</sup>, Thomas A. Bowman<sup>8</sup>, James Kraemer<sup>9</sup>, Marcella L. Erb<sup>10</sup>, Eldi Schoenfeld<sup>11</sup>, Leila Shokri<sup>12</sup>, Jonathan D. Jackson<sup>13</sup>, Ayesha Islam<sup>14</sup>, Matthew D. Mattozzi<sup>7</sup>, ✉ Kristin A. Krukenberg<sup>3</sup>, ✉ Jessica K. Polka <sup>3</sup>

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[Photo by Lipofsky.com](#)



“From the many ideas presented in the workshops and continued discussions among the organizers, we have distilled the following three principles to guide future activities towards scientific reform:

1. We recommend increased **connectivity** among junior scientists and other stakeholders to promote discussions on reforming the structure of the scientific enterprise.
2. We advocate for increased **transparency**. This includes the number and career outcomes of trainees, as well as the expectations of the balance between employment and training in individual postdoctoral appointments.
3. We call for an increased **investment** in junior scientists. with increased numbers of grants that provide financial independence from Principal Investigator (PI) research grants, and increased accountability for the quality of training as a requirement of funding approval.”

# Possible actions

- Empower postdocs (including foreign postdocs) with individual fellowships to reduce power asymmetry
- Provide postdocs with mentors who are not their PI

# Thank you

- Gary McDowell, Executive Director, Future of Research
- Board of Directors, Future of Research

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futureofresearch.org