



# Division of Biomedical Research Workforce

Develop, maintain, enhance & assess NIH policies & programs that support innovative research training, career development & diversity of the biomedical research workforce.

**Director DBRW**  
*P. Kay Lund, PhD*

Research and economic analyses related to biomedical research workforce & the associated career options & labor market.

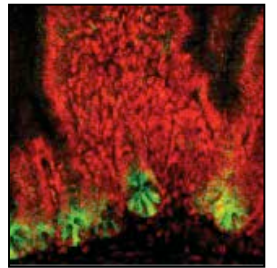
- **Training Program Policy Officer**  
*Henry Khachaturian, PhD*
- **Training Program Policy and Evaluation Officer**  
*Jennifer Sutton, MS*
- **Scientific Workforce Diversity Officer**  
*Lisa Evans, JD*
- **Labor Economist/Modeling**  
*Silda Nikaj PhD*

- **AAAS fellow**  
*Marguerite Mathews, PhD*
- **Program Specialist**  
*Kristen Kirkham*
- **Collaborators/Advisors**  
*Walter Schaffer, PhD*  
*Alison Hall, PhD*

[http://acd.od.nih.gov/Biomedical\\_research\\_wgreport.pdf](http://acd.od.nih.gov/Biomedical_research_wgreport.pdf) 'NIH should create a permanent unit in the Office of the Director that works with the extramural research community, the NSF and the NIH ICs to coordinate data collection activities and provide ongoing analysis of the workforce and evaluation of NIH policies so that they better align with the workforce needs'.

# Experience I Bring

- Extramural perspective, multiple research areas (Physiology, Gastroenterology, Intestinal Stem Cells Endocrinology, Diabetes, Molecular Biology, Cancer Biology, Neurobiology, Aging, Nutrition, Microbiome, Translational)
- Mentor/Career development across the entire spectrum from high school and undergraduate students, graduate and medical students, and basic and clinical postdoctoral scholars and faculty
- Multiple diversity programs and advocacy for women
- Editorial and study section experience (Reproducibility, rigor and research integrity issues)
- ***Concern about morale of trainees and early stage investigators***

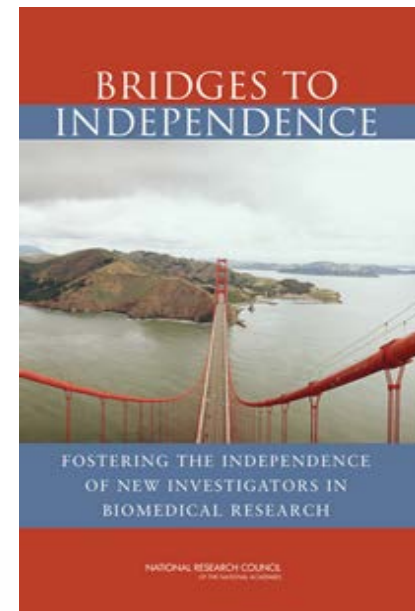


# Topics and Current Activities

- Early outcomes of the K99-R00 program
- Planned follow-up to 2011 K award evaluation
- Postdoc training, stipends & benefits
- Implementation of Physician Scientist Workforce working group recommendations--*Pilot programs to Recruit, Retain and Accelerate Independence*
- New resources and tools

# K99-R00 History and Background

- Established in 2006, in response to the “Bridges to Independence” report
- Intended to promote earlier transition to faculty positions and lower the average age of new investigators, then 42
- Non-citizens are eligible
- Two-year mentored phase (K99), followed by a three-year independent phase (R00)

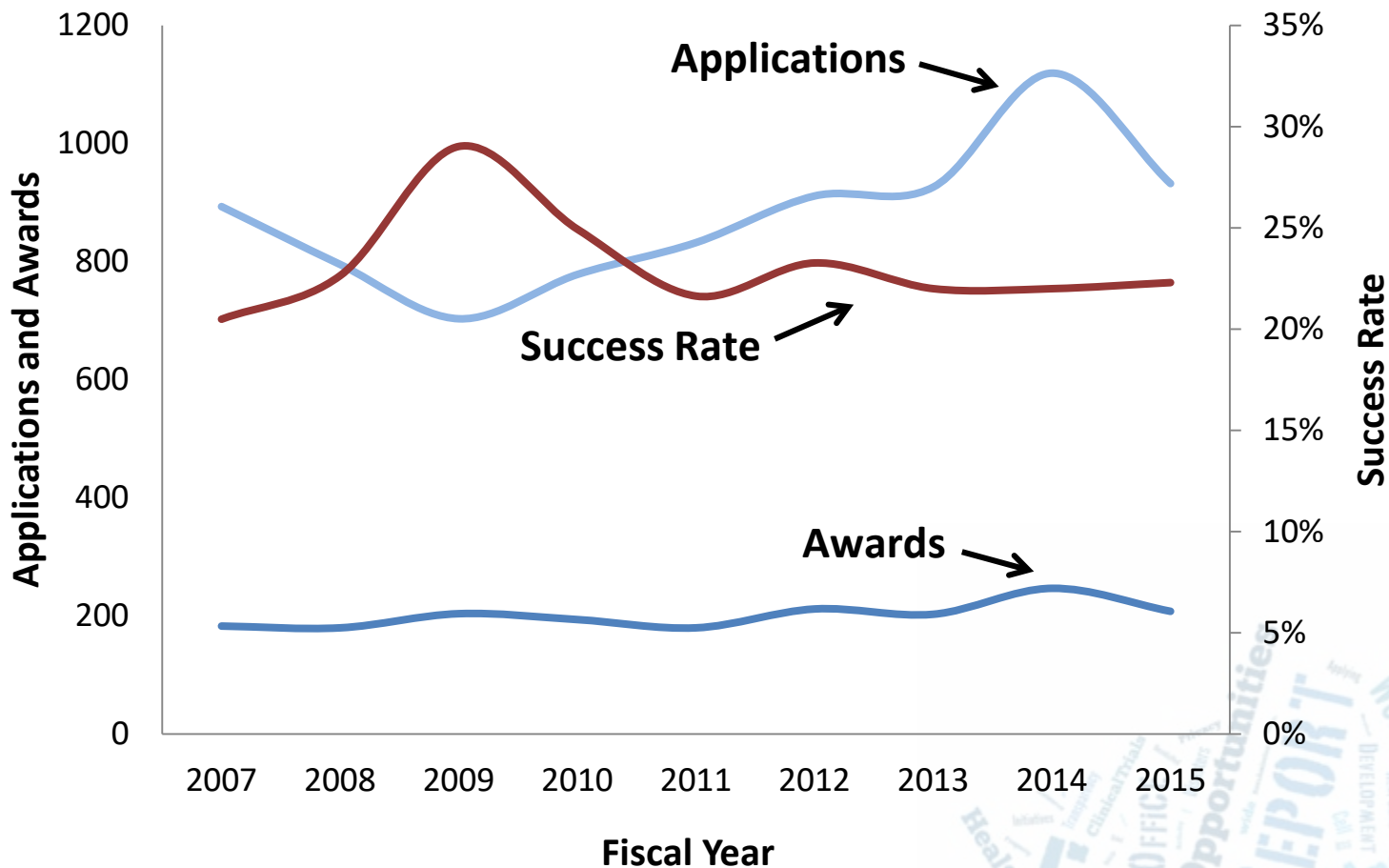




# K99-R00 Applicants and Outcomes, 2007-2015

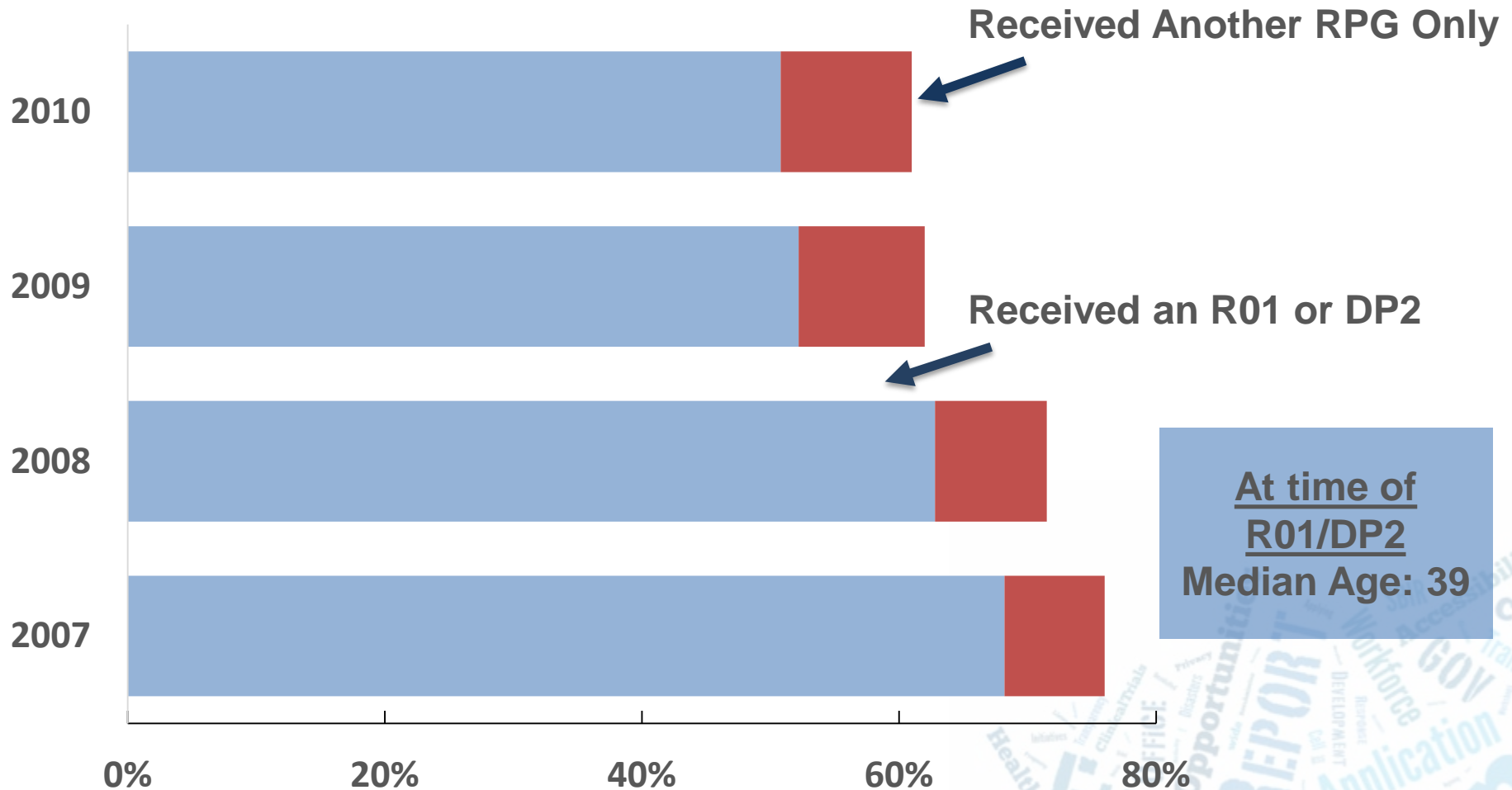
- Average age 34 at time of application; 4-5 years after doctoral degree
- Fewer women (40% applicants & awardees)
- 86-95% transition to R00
- Fewer women move to another institution
- **Many** fewer MDs and MD/PhDs than PhDs
- Eligibility of physician scientists clarified: clinical training (residency) does not count towards 4 year eligibility window ([PA-16-077](#))

# K99 Applications, Awards, and Success Rates



National Institutes of Health  
Office of Extramural Research

# All NIH K99/R00 Awardees: Subsequent Research Awards





# Areas for Further Consideration

- How to enhance participation by physician-scientists and women in the K99/R00 program
- Implications of a greater proportion of women staying at the home institution (quality of start-up package, future career trajectory)
- Status of K99 awardees who did not transition
- Formal evaluation with a comparison group
- Comparisons with other K awards
- Follow up to 2011 K award evaluation

# K-Awards Next Steps

- Follow up study to K99/R00 and 2011 K-award study
- Sufficient time to establish if those with R01 have achieved renewal or stayed in research
- Physician scientists vs Basic Scientists
- Time to independence
- (Mentor evaluation)

# Postdoctoral Training Issues

- Too many postdocs for the job market/best jobs?
- Many funded on RPG and training outcomes unknown
- Inclusion of trainees in Research Performance Progress Report (RPPR) will assist tracking
- Postdocs still well employed
- Evidence that National Research Service Award (NRSA) fellowships improve success in NIH funding
- Improve benefits and funding via NRSA?
- New training mechanisms for careers beyond academia?

# More postdocs than (academic) jobs and concerns about pay

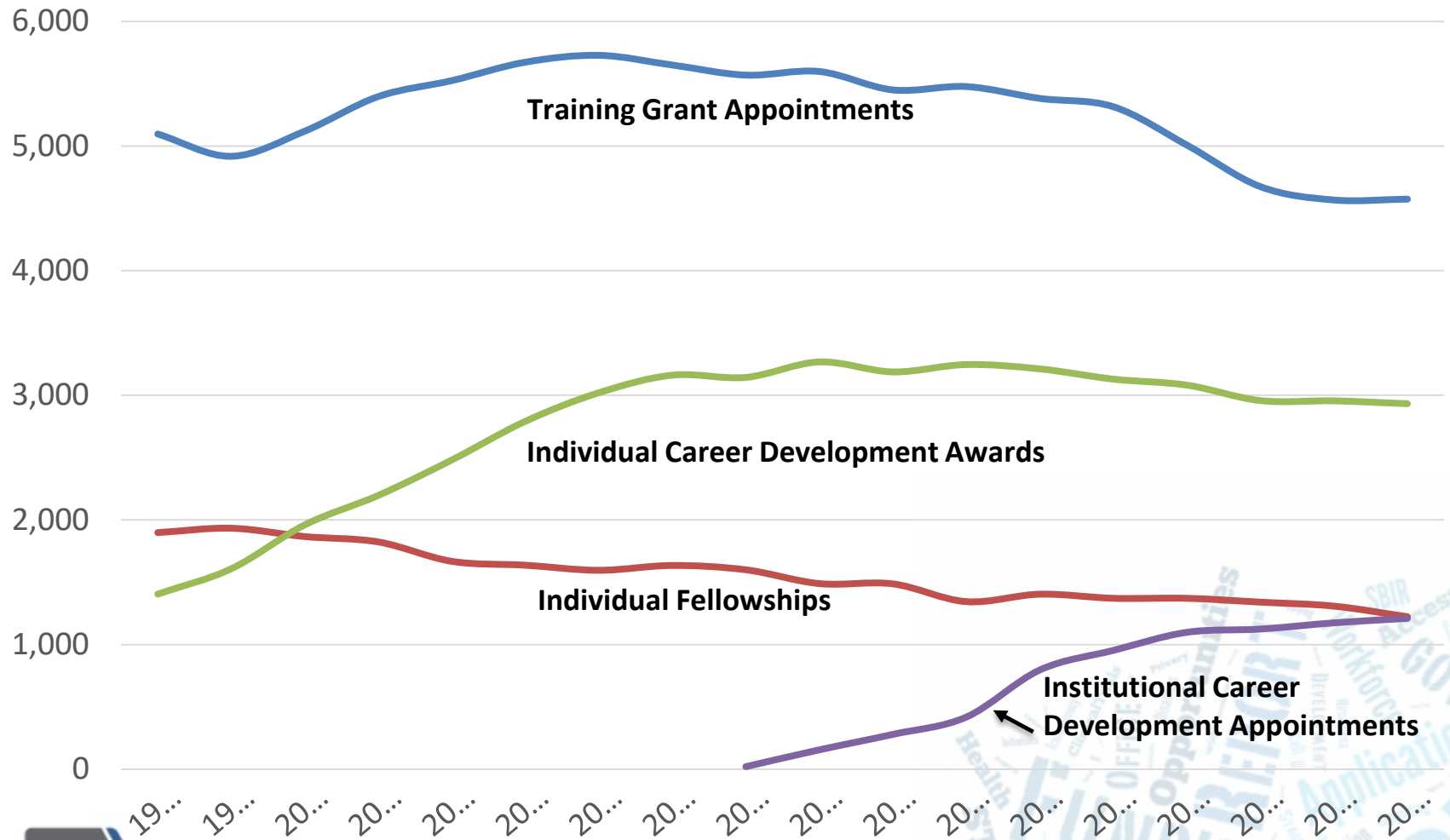
- National Science Foundation data on careers of >10,000 PhDs between 1980 and 2010
- Typical biomedical research postdoc lasts 4.5 years
- Annual postdoc salary approximately \$45,000, compared \$75,000 median starting salary to PhDs in industry).
- Estimated significant pay gap for biomedical postdocs (versus PhDs who did not do a postdoc) who later enter the nonacademic workforce
- Evidence that a postdoc may have limited/less value outside of academia

The impact of postdoctoral training on early careers in biomedicine

**Shulamit Kahn & Donna K Ginther**

*Nature Biotechnology* **35**, 90–94 (2017)

# Trends in Training and Career Development Support for Postdoctorates and Early Faculty



National Institutes of Health  
Office of Extramural Research

# NRSA-F32 Study: Preliminary Results

- NRSA/F32 evaluation (under completion)
- Regression discontinuity – compares those with similar percentile scores near to the cut-off
- >16,000 F32 applicants (1996-2008)
- Increased numbers of RPG applications & RPG awards
- Decreased probability of no RPG application

Implications for reduced numbers of fellowships  
More analyses in progress



# Evaluation of NRSA postdoctoral benefits

- Survey 2015, working group 2016
- NRSA benefits lower than for postdocs as employees on RPG
- Few postdocs receive retirement benefits
- About 1/3 of early postdocs and 2/3 of advanced postdocs have children
- NRSA offers 8 weeks of paid parental leave – but can depend on institutional policy
- Multiple instances of NRSA postdocs being denied paid parental leave

## Current postdoc Stipend & Benefits Under Different Support Options

	NIH NRSA Fellows (IA)	NIH NRSA Trainees (TRE)	NSF Postdoc Biology Fellowships	Postdocs on NIH Research Grants
Stipend Or Salary	\$43,692 - \$57,504	\$43,692 - \$57,504	\$54,000	Base Salary - Average \$47,349
Total Benefits	\$8,850 (15% to 19%)	\$8,850 (15% to 19%)	\$15,000 (22%)	Fringe Benefit - Average \$12,780 (27%)

# Recommendations

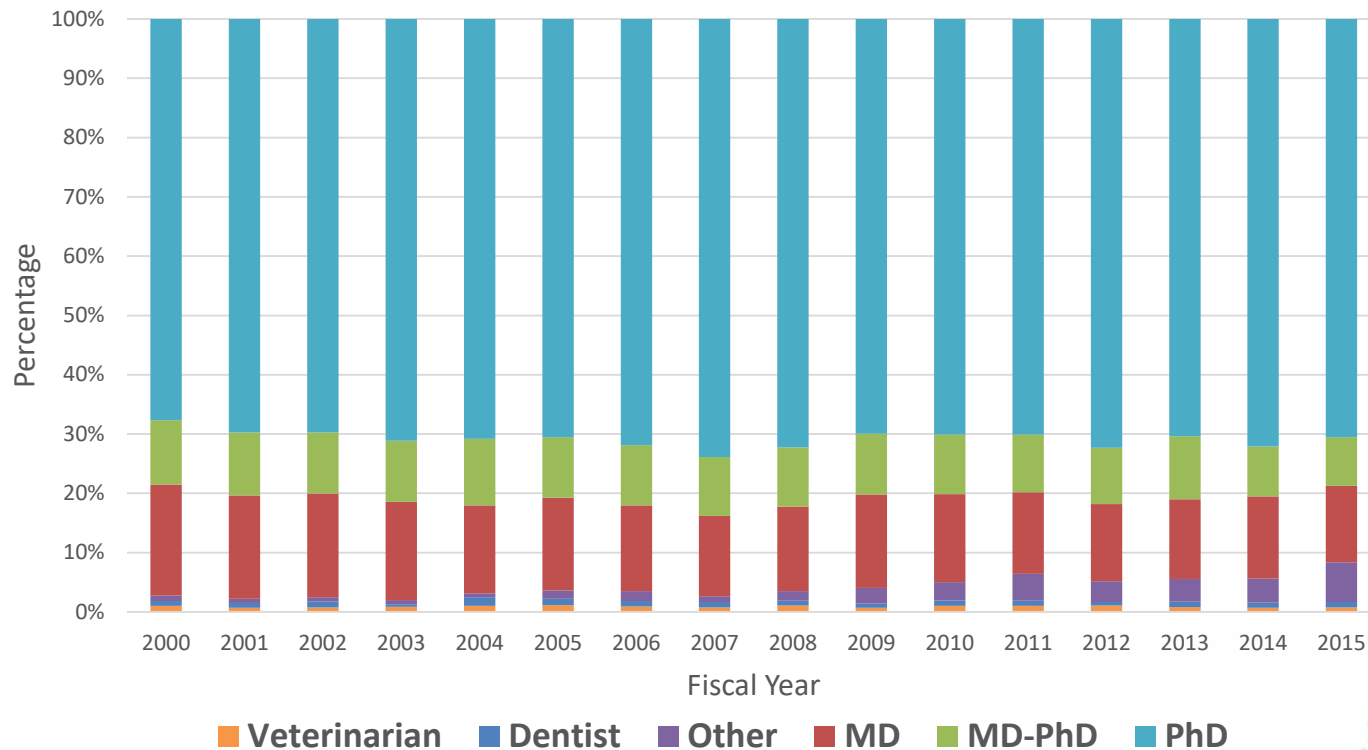
- Separate category for subsistence and dependent expenses in training related expenses (TRE) and Institutional Allowance (IA)
- Gradually increase NRSA benefits to levels comparable with RPG
- NRSA paid parental leave policy no longer requires that others at the institution have access to the same level of paid parental leave (NOT-OD-16-105)
- Still instances of postdocs being denied paid parental leave – if denied funds must be returned
- Support for ‘paid extension’ of NRSA for fellows or trainees whose progress slowed/interrupted due to childbirth/adoption is under consideration

# Concerns about too few Physician Scientists

- NIH should support pilot grant programs to rigorously test existing and novel approaches to improve and/or shorten research training for physician-scientists.
- Programs should include mechanisms to shorten medical and/or laboratory training, and explore timing and spacing of the research and clinical components of post-graduate training.
- Those programs exhibiting the most promising results should receive expanded support.

[https://acd.od.nih.gov/reports/psw\\_report\\_acd\\_06042014.pdf](https://acd.od.nih.gov/reports/psw_report_acd_06042014.pdf)

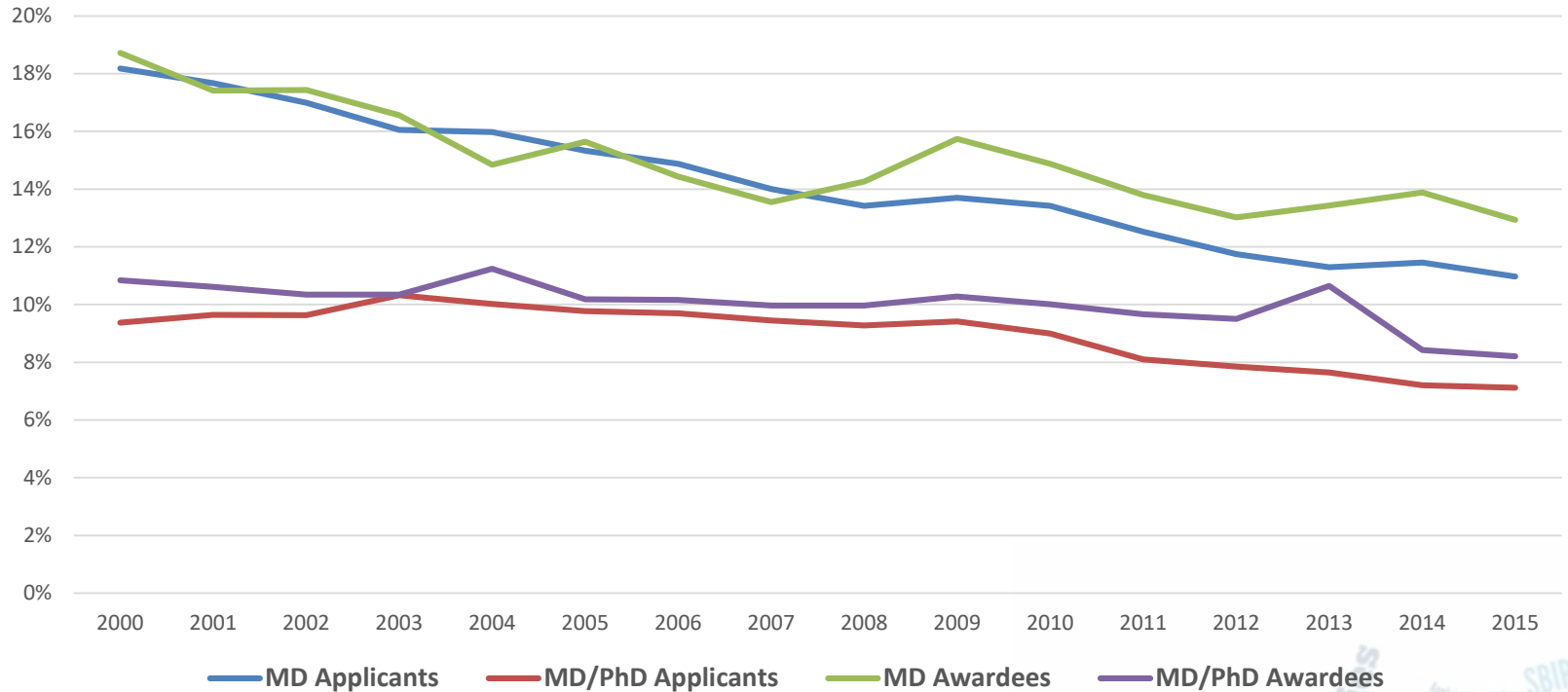
# Percentage of New Investigator RPG Awardees with the Indicated Degrees, Fiscal Years 2000 to 2015



New Investigators: PhD increased by 60%,  
MD/PhD by 17%; MD by 7%



## MD and MD/PhD New Investigator Applicants and Awardees as a Percentage of All RPG New Investigator Applicants and Awardees in each Fiscal Year from 2000 to 2015



# Too Few Physician Scientists/Clinician Investigators

February, 2016 PSW Pilots Workshop Recommendations:

Research in Residency

More Research On-Ramps (PhD, Masters after MD)

Partnerships for Faculty Networking Career Development-

Pilot for under-represented groups



- Pool of MDs is large (~18,000 per year; ~600 MD-PhD)
- Small increase in numbers would assist pipeline
- Residency is key career stage and ‘research gap’
- July 2016 – Board Certification and Research Pathway leaders
- December 2016 – NIH directors and small external group – strong support!



# Research in Residency Pilot (Draft)

## Two-phase support

Institutional Program

Program Director, Research Mentors

6 months-two years research in residency

Up to two years research in fellowship if milestones met (transferable)

Some pilots already ongoing at specific NIH IC

Draft FOA in progress for review



## Structure(s) may include more than one specialty and differ across specialties

Internal Medicine and Pediatrics

Surgery may differ due to long residency and typical 2 years research



# NIH Research Training Website

<https://researchtraining.nih.gov>

Division of Biomedical Research Workforce

**NIH** National Institutes of Health  
Research Training and Career Development

SEARCH  

Intramural |  Contact Us

About DBRW Career Path Programs Institute/Program Matrix Resources

**NIH programs help to prepare the skilled, creative and diverse biomedical research workforce of tomorrow**



Undergraduate and Postbaccalaureate Education    Predoctoral Training/Clinical Doctorate    Postdoctoral Training/Clinical Residency    Early Research Career Development    Investigator Development and Mentoring

Launched in 2015, one stop for funding opportunities

Useful resource for trainees and early stage faculty

Modifications and integration with new DBRW website in progress



National Institutes of Health  
Office of Extramural Research



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Undergraduate and Postbaccalaureate Education

Predoctoral Training/  
Clinical Doctorate

Postdoctoral Training/  
Clinical Residency

Early Research Career  
Development

Investigator  
Development and  
Mentoring

## Recent Announcements

Jointly Sponsored Ruth L. Kirschstein National Research Service Award for Institutional Predoctoral Training Program in the Neuroscience (R25) [\[NEW\]](#)

## Career Pathways

NIMH Research Education Programs for Psychiatry Residents (R25) [\[NEW\]](#)

Dec 13, 2010

NIMH Research Education Programs for Psychiatry Residents (R25) [\[NEW\]](#)

## NIH Research Training and Career Development Programs

NIH programs help prepare individuals for careers in biomedical, behavioral, social, and clinical research.

- Learn more about how NIH Institutes and Centers may vary in research and training
- Contact NIH training staff to discuss how specific programs fit your training and career goals.
- Explore this website for resources for training program leaders and individuals seeking research support at various career stages.

## Research Career Pathways

Interactive guides describe NIH programs and links to support training and career development of biomedical scientists:

- Physician-Scientist Infographic
- Veterinarian-Scientist Infographic
- Dentist-Scientist Infographic
- Research-Scientist Infographic

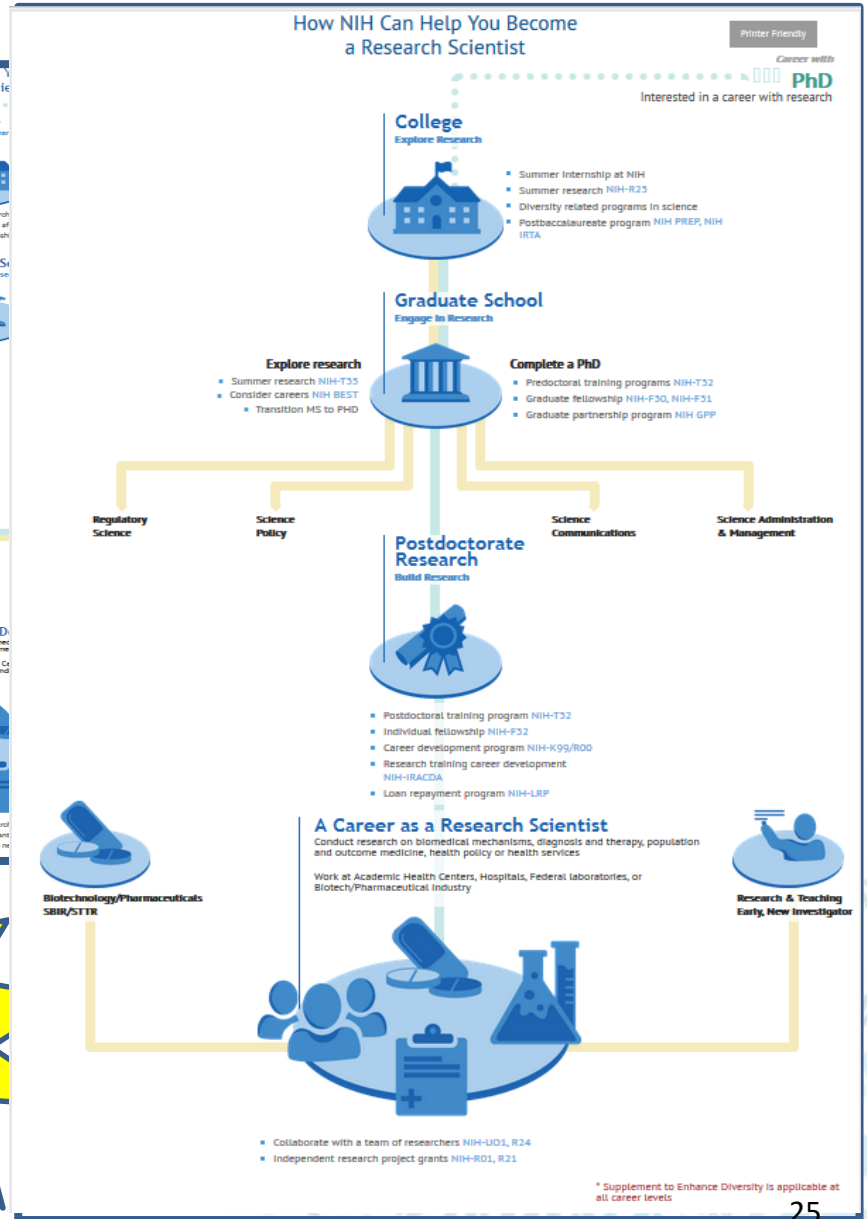
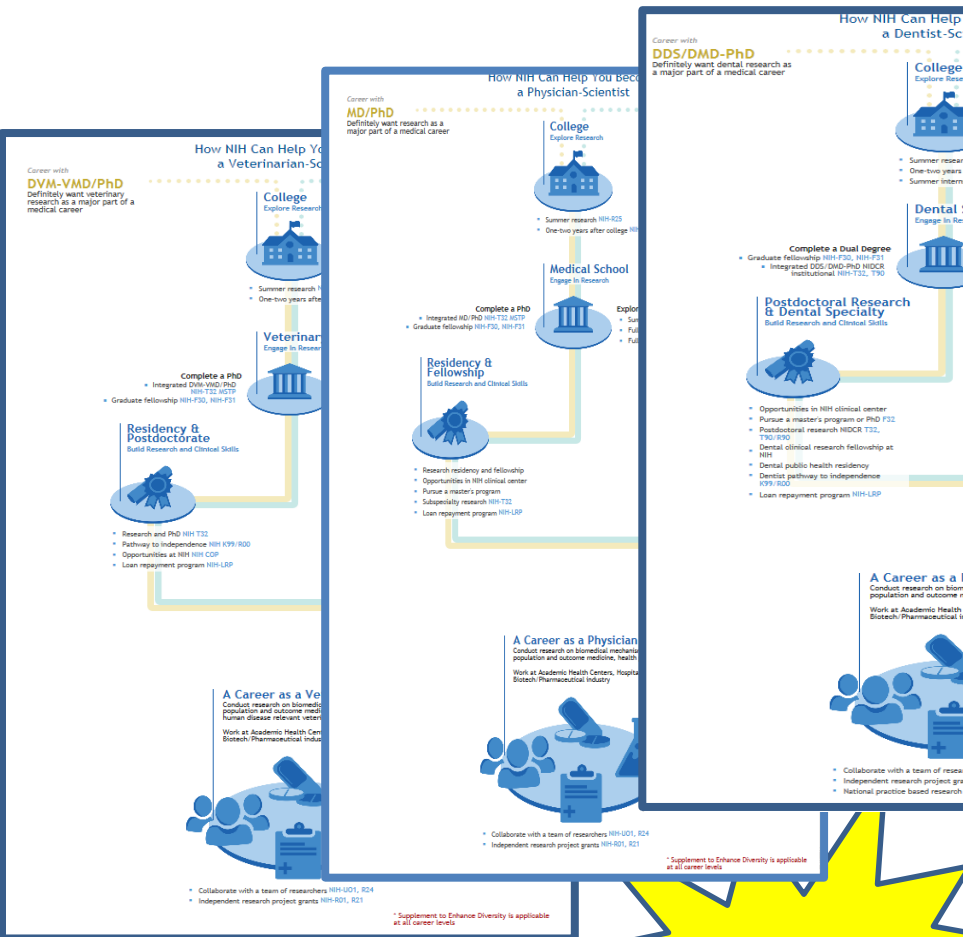
CAREER DEVELOPMENT  
KIOSK

RESEARCH TRAINING  
KIOSK

FELLOWSHIP  
KIOSK

OTHER TRAINING-RELATED  
KIOSK

EXTRAMURAL DIVERSITY



Career Pathways



# Biomedical Workforce Data Dashboard

- Recommendation from the Working Group on the Physician Scientist Workforce
- Intended to provide data to internal and external users on various types of investigators (PhDs, MDs, MD/PhDs) in the research workforce
  - NIH funding rate
  - Demographic data such as sex, age cohort, race/ethnicity
  - Trends in training and career development
  - AAMC data





# Biomedical Research Workforce Dashboard



OER/OEP/DBRW; Version 1.0, includes AAMC data  
Public launch planned for early 2017  
Useful data for extramural community

# Biomedical Workforce Data Dashboard



## National Research Workforce: Association of American Medical Colleges All



National  
Research  
Workforce



NIH-Funded  
Research  
Workforce



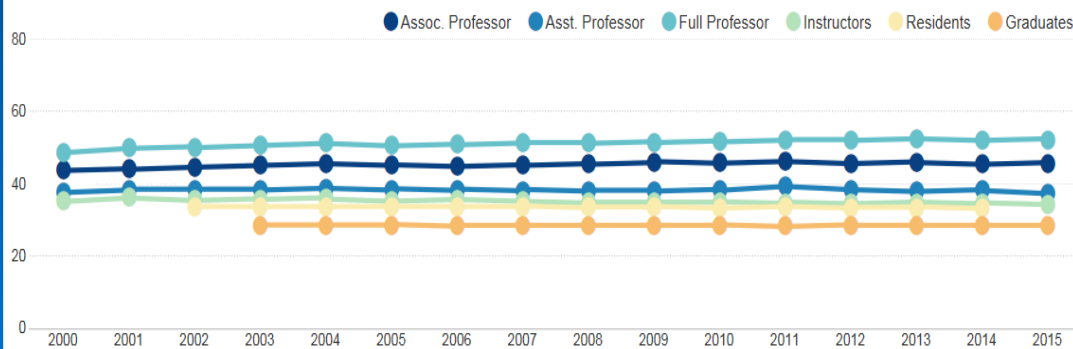
About



RePORT



### Trends in Average Age for Career Paths



## National Biomedical Research Workforce Dashboard

Office of Extramural Research

Select Data Set

FY Range: 2000 2015



### Trends in Average Age for Career Paths

Fiscal Year	Applicant	Assoc. Professor	Asst. Professor	Full Professor
2015		45.4	37.1	51.9
2014		45.2	38	51.8
2013		45.7	37.7	52
2012		45.4	38.2	51.8
2011		46	39.1	51.8
2010		45.5	38	51.4
2009		45.6	37.8	51.2



National Institutes of Health  
Office of Extramural Research

# NIH Extramural Diversity Website

<https://extramural-diversity.nih.gov/>



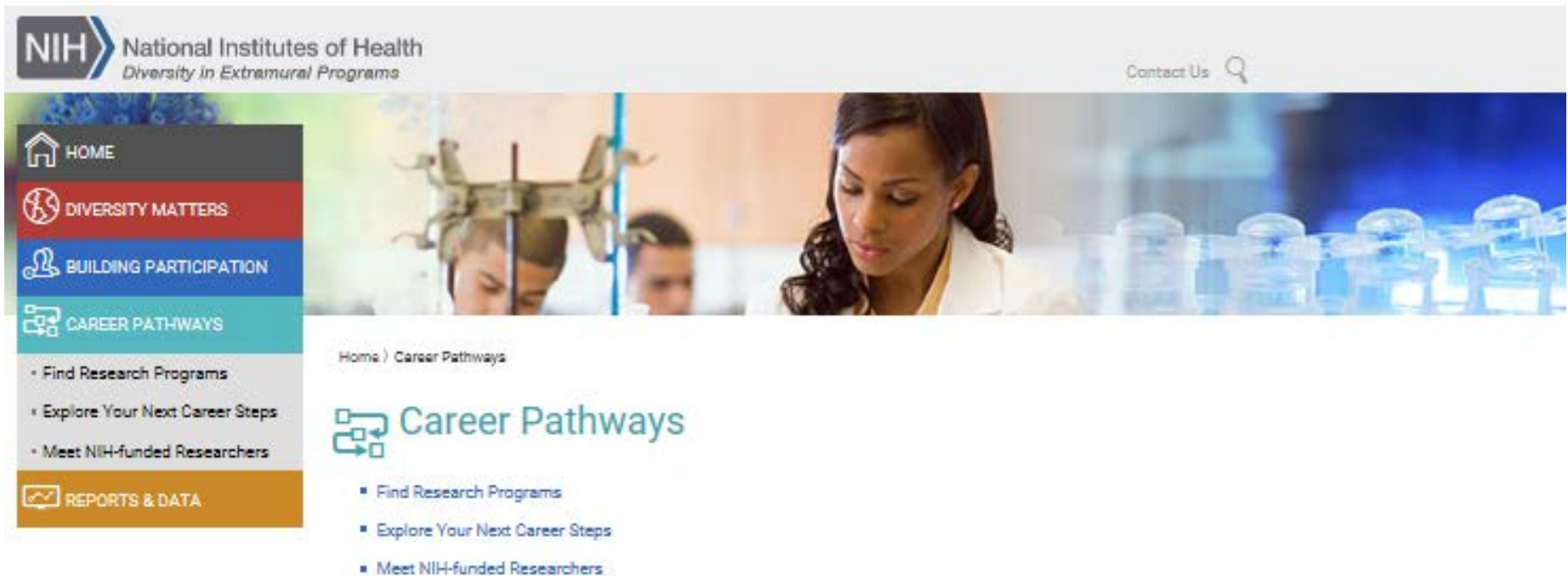
New!

## Information about NIH initiatives that promote scientific workforce diversity

Learn how diversity supports our mission, find opportunities to participate in diversity programs, meet researchers, and more. Whether you are a science student, trainee, faculty member, or someone who is interested in diversity programs, you should find what you are looking for *here*.



# Career Pathways



NIH National Institutes of Health  
Diversity in Extramural Programs

Contact Us

HOME

DIVERSITY MATTERS

BUILDING PARTICIPATION

CAREER PATHWAYS

- Find Research Programs
- Explore Your Next Career Steps
- Meet NIH-funded Researchers

REPORTS & DATA

Home > Career Pathways

## Career Pathways

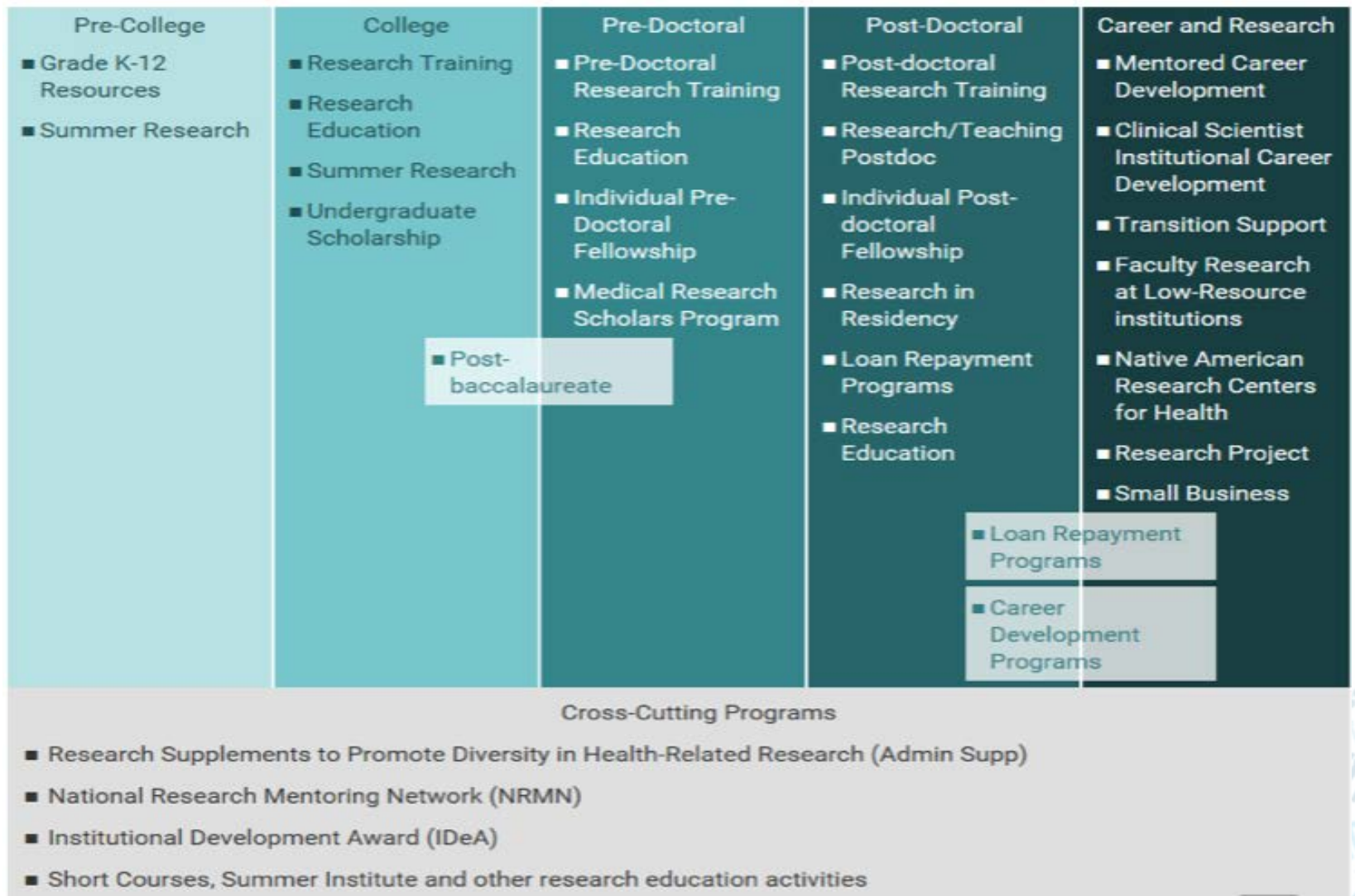
- Find Research Programs
- Explore Your Next Career Steps
- Meet NIH-funded Researchers

For Training  
Applicants



# Career Pathways: Searchable

## NIH Programs Build Research and Science Careers



# Other Issues and Questions

- How to promote strategic planning **before** a PhD or postdoc?
- How to best align pre- and postdoctoral training with needed and essential jobs/career paths (e.g. integration with business, policy, communication-modified IRACDA)?
- New strategies to promote earlier independence?
- Optimal approach to training in rigorous experimental design tailored to specific career stages
- How to choose or train effective mentors and how to evaluate them?
- How to maintain morale of our very talented pool of trainees and early stage scientists?





# Mentoring – Issues and Questions

- Mentors don't (*shouldn't*) always say what the mentee wants to hear
- Mentors, coaches & sponsors – potential differences in access across men, women, under-represented groups?
- Long-term co-authorship & potential impact on transition to independence?
- How to encourage mentors to value commitment of time to career development experiences (outside research)?
- NAS workshop on effective mentoring February 2017
- How to reward effective mentoring?

*Tell me and I forget, teach me and I may remember, involve me and I learn – Benjamin Franklin*

*If you get a good result do everything to prove it wrong and you may be on to something – David Sanders*

# Remember and Emphasize Biomedical Research Career Positives



Science

Long-term, constant exciting discoveries (own and the field)



Academics

Flexible and rewarding positions in academics and other research careers



Mentees

A family of former trainees, mentees across the USA and beyond



Yes!

Amazing rewards of their achievements



Funding

Emphasize to trainees that writing a grant is itself a reward (& fun)

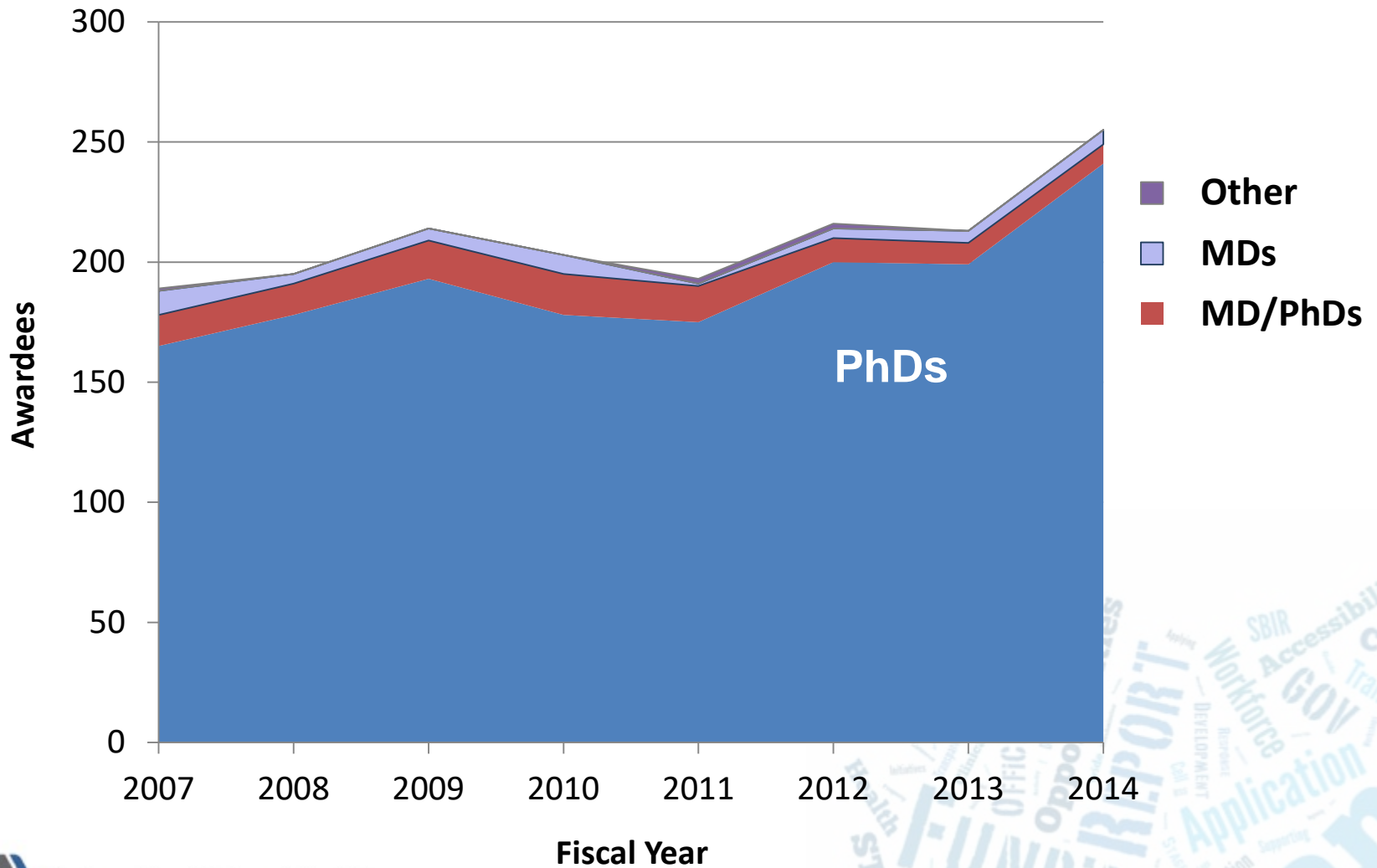
- Immersion and expertise in the topic
- Focus on more than the \$\$



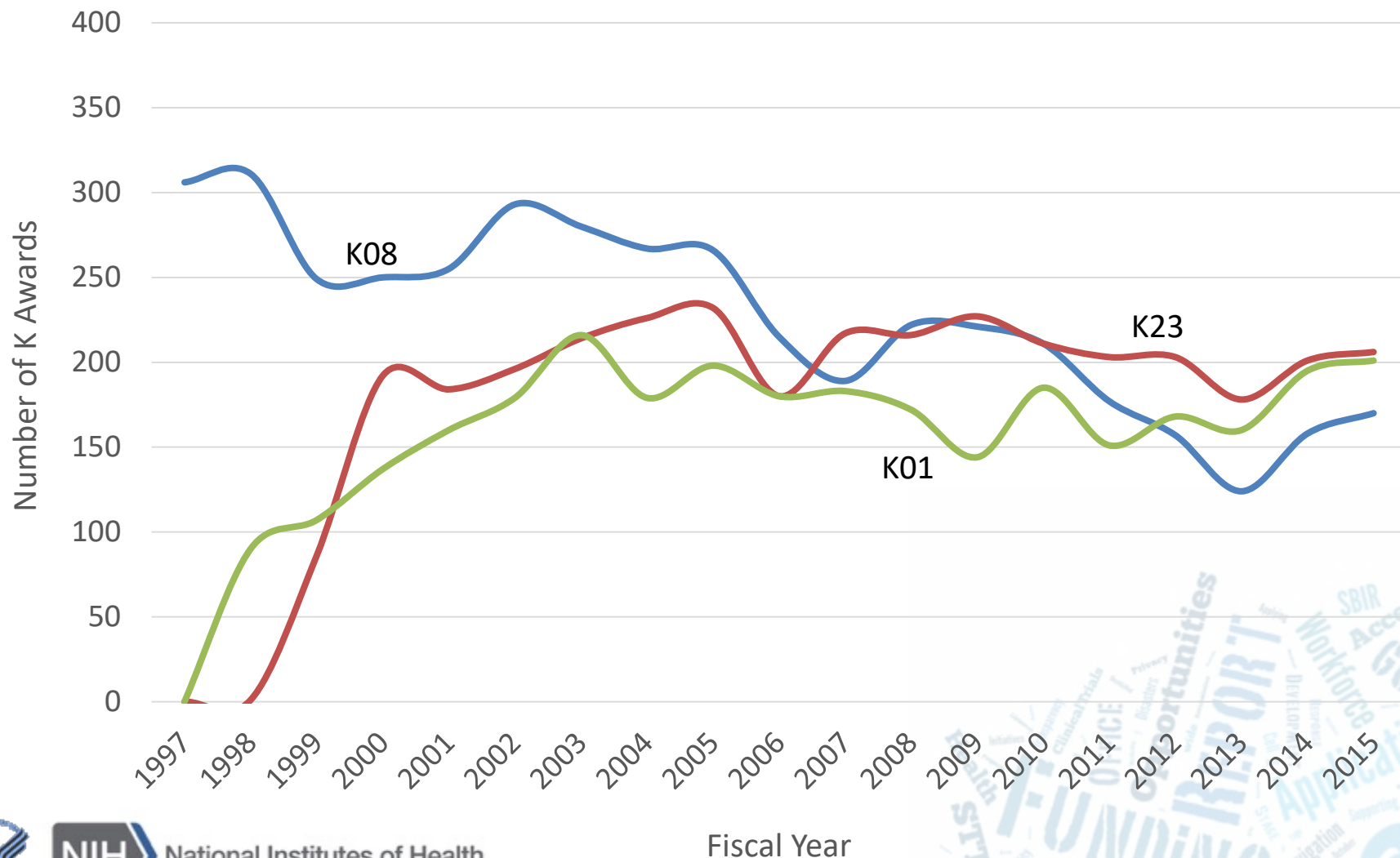




# Characteristics K99/R00: Degrees



# Trends in New K Awards: K01, K08, K23



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# Trends in Total K Awards: K01, K08, K23

