

# **Advisory Committee to the Director Working Group on Diversity in the Biomedical Research Workforce**

Report to the  
Advisory Committee to the Director  
June 14, 2012

Drs. Reed Tuckson, John Ruffin, and  
Lawrence Tabak, Co-Chairs

# ACD Working Group on Diversity in the Biomedical Research Workforce

- Reed Tuckson, M.D., co-chair  
UnitedHealth Group
- John Ruffin, Ph.D., co-chair  
NIH
- Lawrence Tabak, D.D.S., Ph.D., co-chair  
NIH
- Ann Bonham, Ph.D.  
AAMC
- Jordan Cohen, M.D.  
AAMC
- José Florez, M.D., Ph.D.  
Harvard Medical School
- Gary Gibbons, M.D.  
Morehouse School of Medicine
- Renee Jenkins, M.D.  
Howard University
- Tuajuanda Jordan, Ph.D.  
Lewis and Clark College
- Wayne Riley, M.D., M.P.H., M.B.A.,  
MACP  
Meharry Medical College
- Samuel Silverstein, M.D.  
Columbia University Medical Center
- Dana Yasu Takagi, Ph.D.  
University of California, Santa Cruz
- Maria Teresa Velez, Ph.D.  
University of Arizona
- M. Roy Wilson, M.D., M.S.  
NIH
- Keith Yamamoto, Ph.D.  
University of California, San Francisco
- Clyde Yancy, M.D., M.Sc., FACC,  
FAHA, MACP  
Northwestern University

# Acknowledgements

- Drs. Donna Ginther and Wally Schaffer
- Peer Review Workshop Panelists: Drs. Irwin Arias, Irene Blair, Monica Biernat, Molly Carnes, Jennifer Crocker, Rachel Croson, Donna Ginther, William Harbaugh, Vivian Lewis, Peter MacLeish, Joan Reede, Maggie Werner-Washburne, and Keith Yamamoto
- NIH Diversity Task Force and NIH Women in Biomedical Research Careers Working Group
- White House Initiative on Historically Black Colleges and Universities, White House Initiative on Educational Excellence for Hispanics, White House Initiative on Asian American and Pacific Islanders, and the White House Initiative on American Indian and Alaska Native Education
- Efforts to Broaden HBCU Participation in Biomedical Research Meeting Participants
- The many organizations and individuals that contributed feedback to the RFI and the public meeting, and through emails, letters, meetings, and phone calls.
- Our team: Justin Hentges, Rashada Alexander, Donald Bordine, Alison Davis, and Jennifer Weisman.

# Ginther Report Published August, 2011

**Science**

VOL 333 19 AUGUST 2011

## **Race, Ethnicity, and NIH Research Awards**

Donna K. Ginther,<sup>1\*</sup> Walter T. Schaffer,<sup>2</sup> Joshua Schnell,<sup>3</sup> Beth Masimore,<sup>3</sup> Faye Liu,<sup>3</sup>  
Laurel L. Haak,<sup>3</sup> Raynard Kington<sup>2†</sup>

Black or African-American applicants are 13 percentage points (~1/2) less likely to receive NIH investigator-initiated research funding compared with whites and for Asians it was 5.4

After controlling for the applicant's educational background, country of origin, training, previous research awards, publication record, and employer characteristics, we find that black applicants remain 10 percentage points (~1/3) less likely than whites to be awarded NIH research funding and for Asians, the observed difference was no longer statistically significant

Our results suggest some leverage points for policy intervention

# Charge to the Working Group

- Examine the Ginther, et al. report and other available data on the success rates of NIH extramural applicants, and well as intramural investigators
- Explore potential causes for the differential funding success rates observed between ethnic/racial groups
- Recommend immediate and long-term strategies for intramural and extramural programs that address barriers across 5 key transition points :
  - entry into graduate/professional degree programs
  - transition from graduate student to postdoctoral research
  - transition from a postdoctoral position to the first employment/identification as an independent scientist
  - award of the first independent research grant from NIH or equivalent in a non-academic setting
  - establishment of an independent research program and emergence as a nationally recognized senior investigator in a researcher's chosen field

# Process

- 13 Meetings/Conference Calls: First on August 15, 2011
- Issued a Request for Information: January 2012
- Conducted a Public Meeting: February 2012
- Held a joint meeting with Biomedical Research Workforce Working Group: March 2012
- Conducted a Workshop on Peer Review: March 2012
- Convened a Workshop in conjunction with White House Initiative on HBCUS: April 2012
- Data mining and analysis beyond the Ginther paper
- Numerous emails, letters, and conversations with stakeholders and researchers (big thanks to Dr. Ginther for ongoing work!)

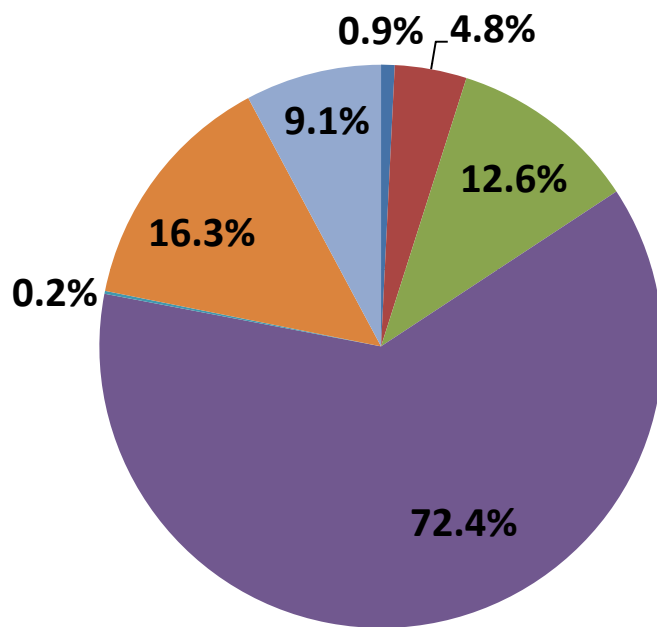
## Why Diversity Is Important

- NIH Motto: “Turning Discovery Into Health” is an active phrase underscoring that people are the lifeblood of biomedical research
- Innovation requires a range of skill sets and viewpoints borne of diverse backgrounds
- Creativity is enhanced
- The Scope of Inquiry is expanded
- Narrowing the Health Gap by more effectively addressing disparities in population health status
- Promoting and Ensuring Fairness in the use of public funds
- Consistent with NIH’s Commitment To Excellence : providing support for talented individuals to explore ideas at the highest level of inquiry

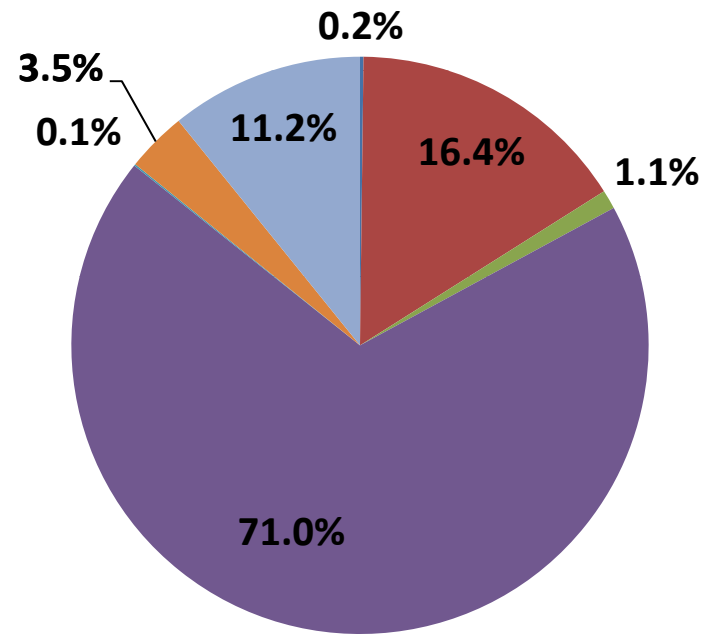
# Race and Ethnicity of the 2010 U.S. Population and the 2010 NIH Principal Investigators on RPGs

- American Indian or Alaska Native
- Asian
- Black or African American
- White

- Native Hawaiian and other Pacific Islander
- Hispanic or Latino (of any race)
- Other, unknown, not reported, and more than one race



2010 U.S. Census

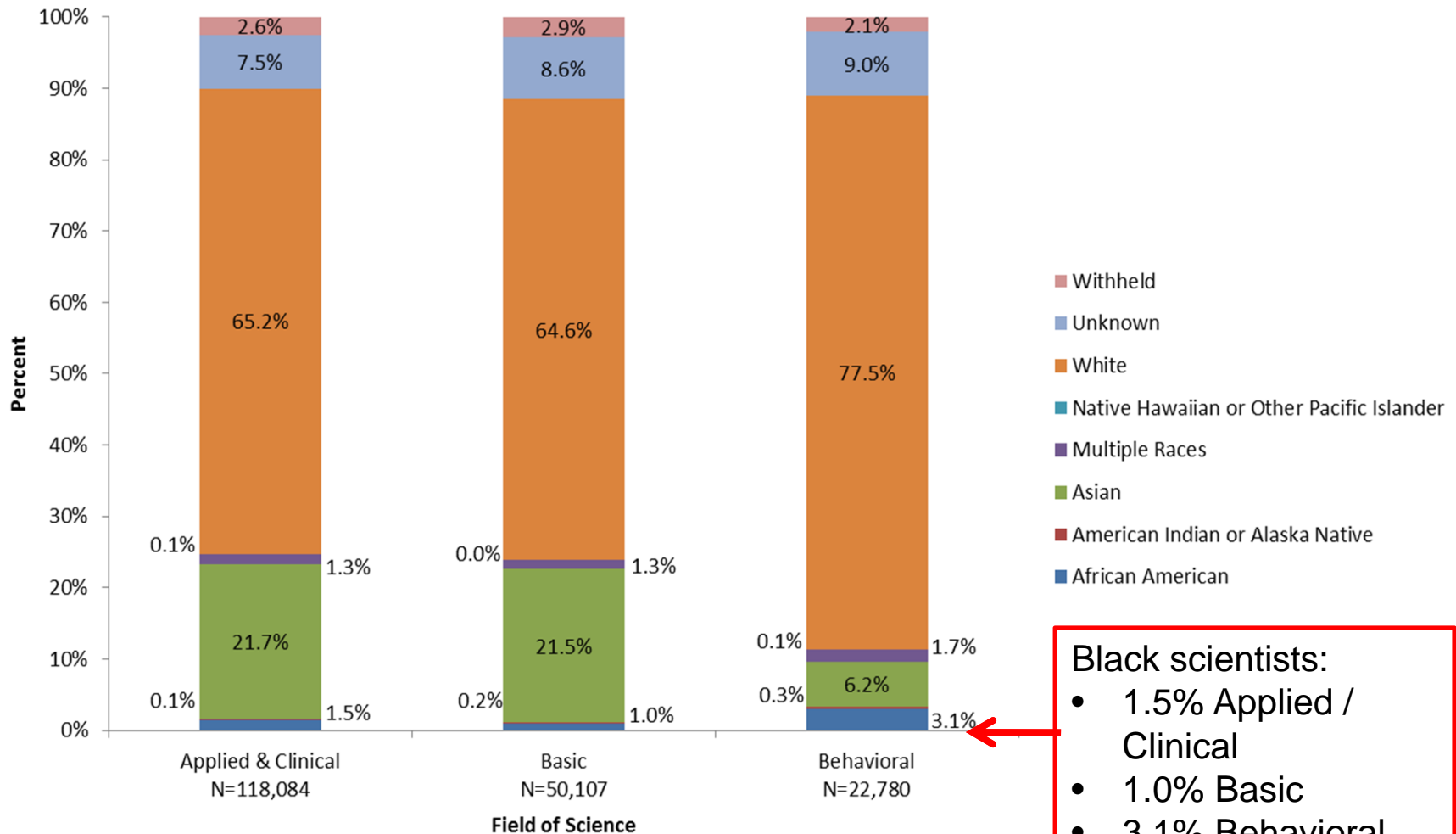


2010 NIH Principal Investigators on RPGs



# Very Few Black Scientists Apply For RPG's

**Distribution of Type 1 CSR Reviewed RPG Applications by Field of Science and Race of PI  
Fiscal Years 2000-2010**



**Black scientists:**

- 1.5% Applied / Clinical
- 1.0% Basic
- 3.1% Behavioral

# The Bio-Medical Workforce Continuum

K-12



Undergraduate



Graduate School



NIH RPG  
Award

NIH Review Process



# Fulfilling Our Charge: Data And Analytic Challenges

- Analyzed numerous other data sets, in addition to the original paper, to better understand the problem
- Noted significant data gaps:
  - Number of Native Americans and Alaska Natives, and Native Hawaiian's and other Pacific Islanders have insufficient numbers of applicants for statistically significant analysis
  - Hispanic Issues: the NIH census data does not provide the granularity to know whether the person is from an under-resourced background or one who comes from privilege: (who is a true URM Hispanic and who is not?)
  - Lack of comprehensive tracking data for NIH Trainees, including race/ethnicity-specific data
    - Unknown long term outcomes of pre/ postdoctoral trainees supported by NRSA, T32, F31, and F32
    - RPGs such as RO1s are a special challenge: not tracked at all<sub>10</sub>

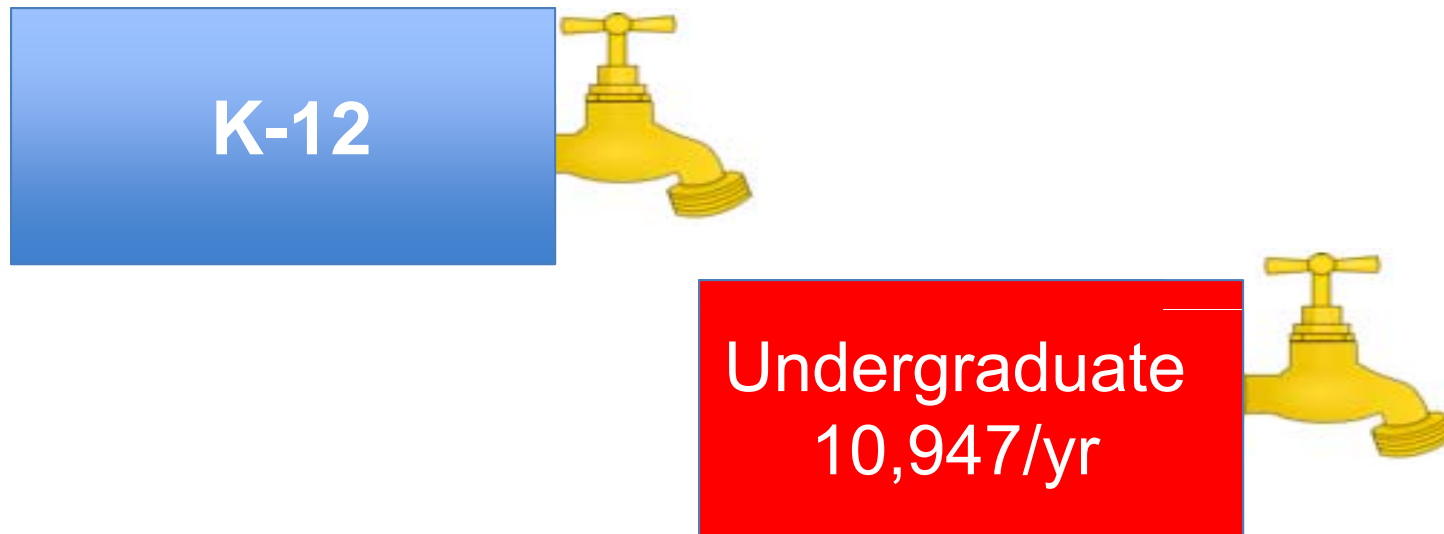
## Recommendation 1: Enhanced Data Collection & Evaluation Of Training Program Outcomes

- Allocate appropriate resources for the systematic tracking, reporting, and evaluation of the immediate and long-term outcomes of all trainees (ranging from college students engaged in summer research activities through recipients of career development awards), regardless of NIH funding mechanism.
  - Assign a unique identifier to every NIH-supported trainee, fellow, and career development recipient, including those supported on research project grants.
  - Given the lack of data regarding sub-populations of Hispanic researchers, the lack of data regarding people with disabilities, and the suspected substantial differences between socially and educationally advantaged groups and those who are disadvantaged and marginalized, enhance NIH's data collection capabilities for these populations.
  - Require that all programs undergo systematic review and evaluation every 5 years. Those found to be particularly effective in increasing URM participation in the biomedical sciences should be used as models for other programs that are not as effective, and should be considered for expansion.

## Recommendation 2: Provide Leadership Support For K-12 Science Education

- NIH should take a leadership role in developing interest and curiosity of greater numbers of K-12 and undergraduate minority students in biomedical and behavioral sciences through:
  - the design and dissemination of NIH-specific activities
  - providing an increased number of research experiences for HS Students and their teachers
  - advocating for and promoting cooperative efforts across Federal agencies and with private and philanthropic organizations

# Fulfilling Our Charge: Examining The Data Regarding Pre-Doctoral Pathway (Biology, Chemistry, Physics Graduates )

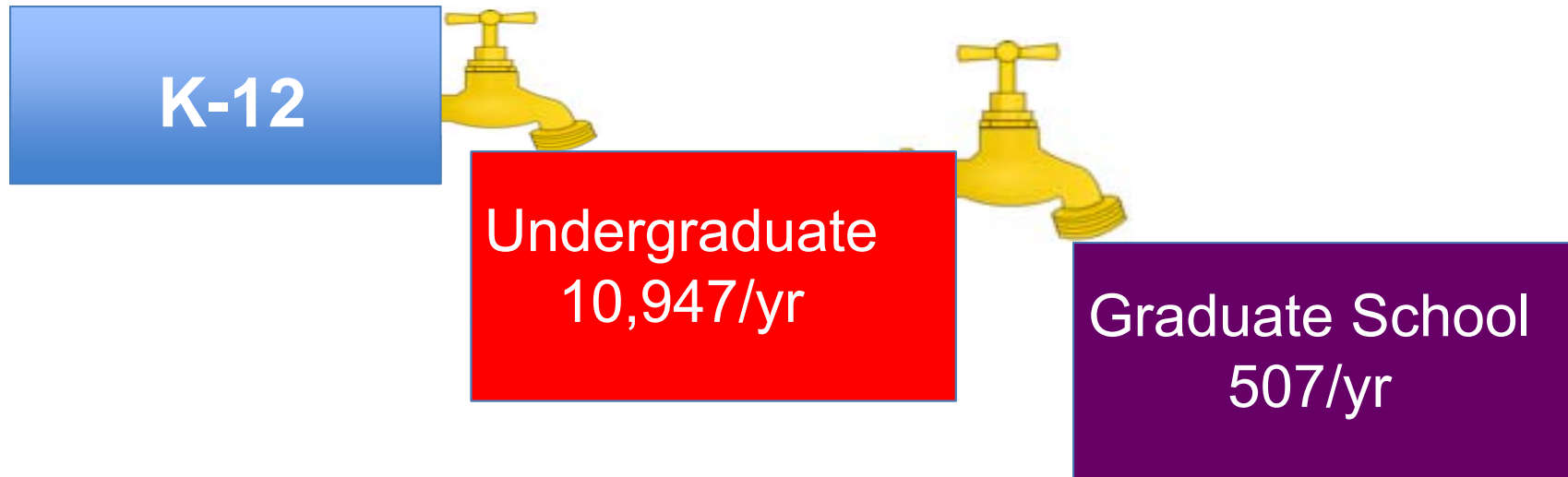


- For a cohort of 1995 -1998 pre-docs: URM's accounted for only 10% of the total program participants in NIH sponsored NRSA training programs
  - This is important because: the 5% of the AA participants received an RPG by 2010 (vs 12% whites.)

## Recommendation 3: Increase Support For Undergraduate Science Training

- NIH should increase the number of scholarships for undergraduates
  - Building on the NIH intramural Undergraduate Scholarship Program that include 'payback' through participating in meaningful research experiences
  - Provide additional fellowships for the anticipated increased numbers of URM graduate students.

# Fulfilling Our Charge: Examining The Data Regarding Post-Graduate Pathway (Biology, Chemistry, Physics Graduates)



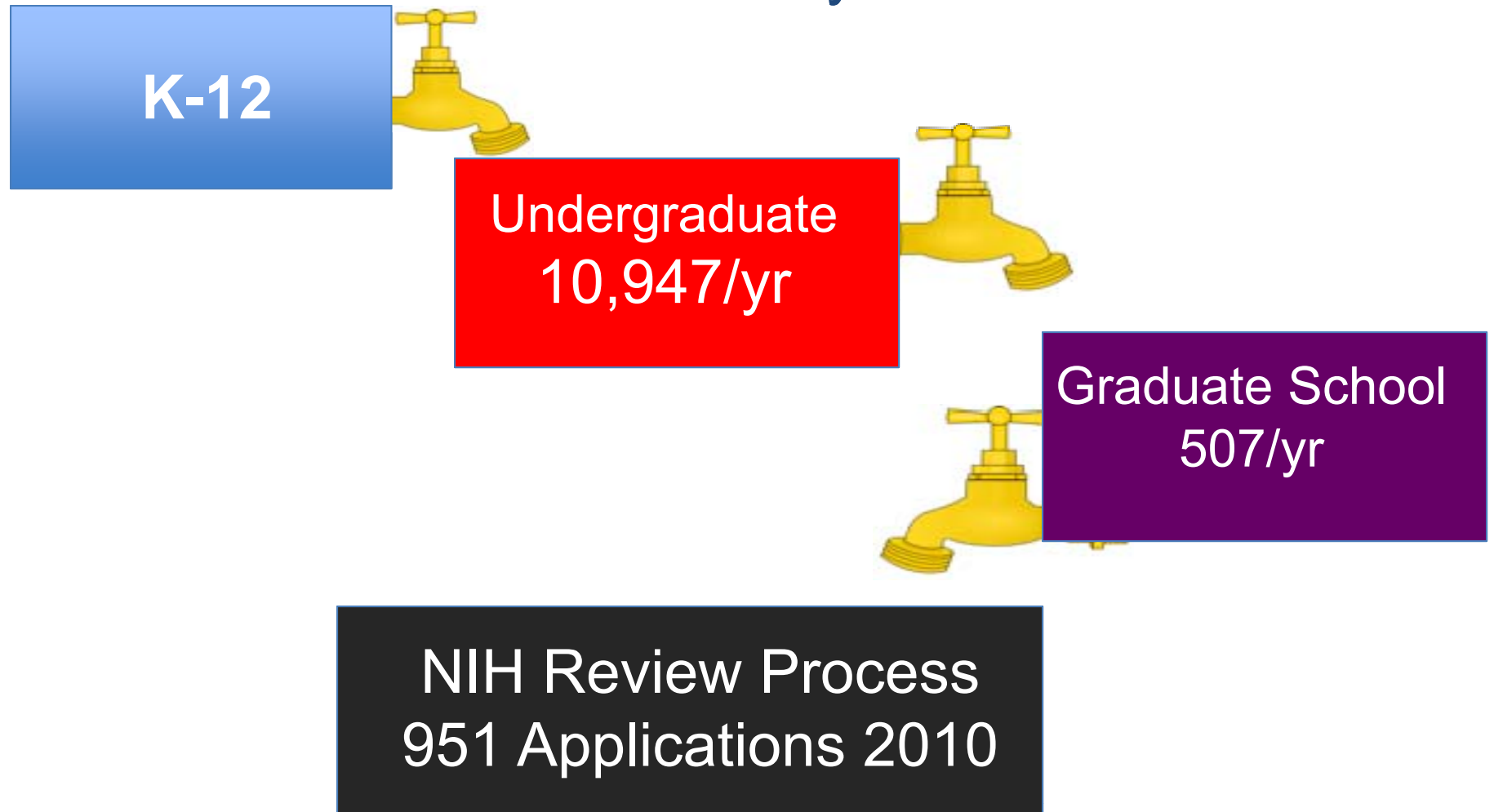
- For all groups, recipients of NIH supported post-doctoral fellowships fare better in ultimately being awarded an NIH RPG compared to those with only pre-doctoral support
  - In a 1998-2,000 cohort: URMs comprised only 8.1% of all NRSA-sponsored post-doctoral fellows
  - This is important because: 11% of the AA participants received an RPG by 2010 (vs 23% whites.)



## Recommendation 4: Better Understand The Disparity In Post-Doctoral Training Grants

- NIH should assess the reason (s) for the disparity in the frequency of awards to AA applicants for post-doctoral positions on T32 training grants and F32 fellowships
- Take appropriate remedial actions once the reasons for the observed disparities have been determined

# Fulfilling Our Charge: Examining The Data Regarding Doctoral Training To Application Pathway



# The Importance Of Mentoring

- Essential for all developing scientists and especially important for URM's
  - Career guidance; emotional encouragement; performance feedback; sources of information and opportunities
  - Special cultural needs
- We note that some institutions are creating training in culturally appropriate sponsorship/ mentorship for faculty and new model mentorship programs
  - E.g. UCSF's "Feed Forward Grant-Mentoring Program"
- There is little objective evidence that suggests one mentoring approach is preferable or more successful than another
  - We are aware that NIH has contracted to study this issue

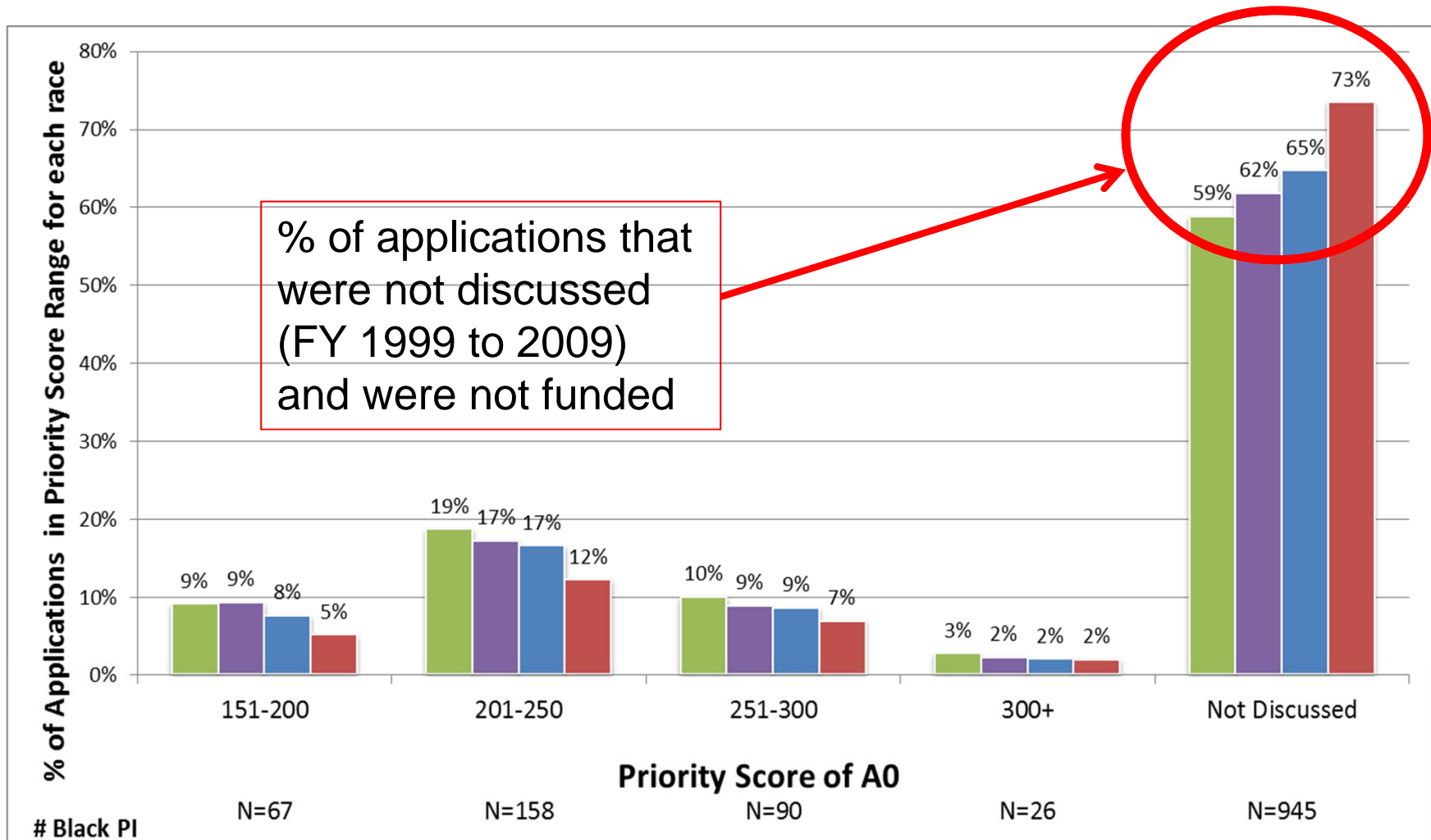
## Recommendation 5: Strengthen Mentoring/Career Preparation and Retention

- Through NIMHD, partner with established minority scientific and professional groups, other trusted organizations to implement a system of mentorship “networks” for URM students that will provide career guidance throughout their career development
  - Make available a cadre of investigators who would, among other mentoring activities, provide workshops in grant writing, grant presentations and optimal participation in editorial and NIH review processes

## Recommendation 6: Strengthen Direct and Regular Input To The Director

- Establish a working group of the ACD, of racially and ethnically diverse scientists, to:
  - Provide regular input to the Director of NIH regarding the state-of-the-art in effective programs that overcome or reduce disparities in research awards
  - Develop guidelines for colleges and universities that receive NIH grants
    - E.G. all applications for training, fellowship, and research grants that support graduate students and post-doctoral fellows should include a section certifying that the mentor has been through the necessary culturally appropriate training

# The Importance Of “Not Discussed” Applications



URM applicants are less likely to resubmit, especially if their application is not discussed, and for Blacks, those who did, had to do so many times more than whites to eventually achieve funding

## Recommendation 7: Strengthen Feedback To Unsuccessful Applicants

- Investigators whose applications are unscored should be provided with a more detailed explanation of the factors that led to this determination
  - Enabling the applicant to better understand the areas of concern leading to the decision
  - Ideally, these comments from peer reviewers should assist the applicant to decide whether he or she should 'resubmit or rethink' an unscored application

# Special Attention To Institutions Devoted To Training URM Scientists

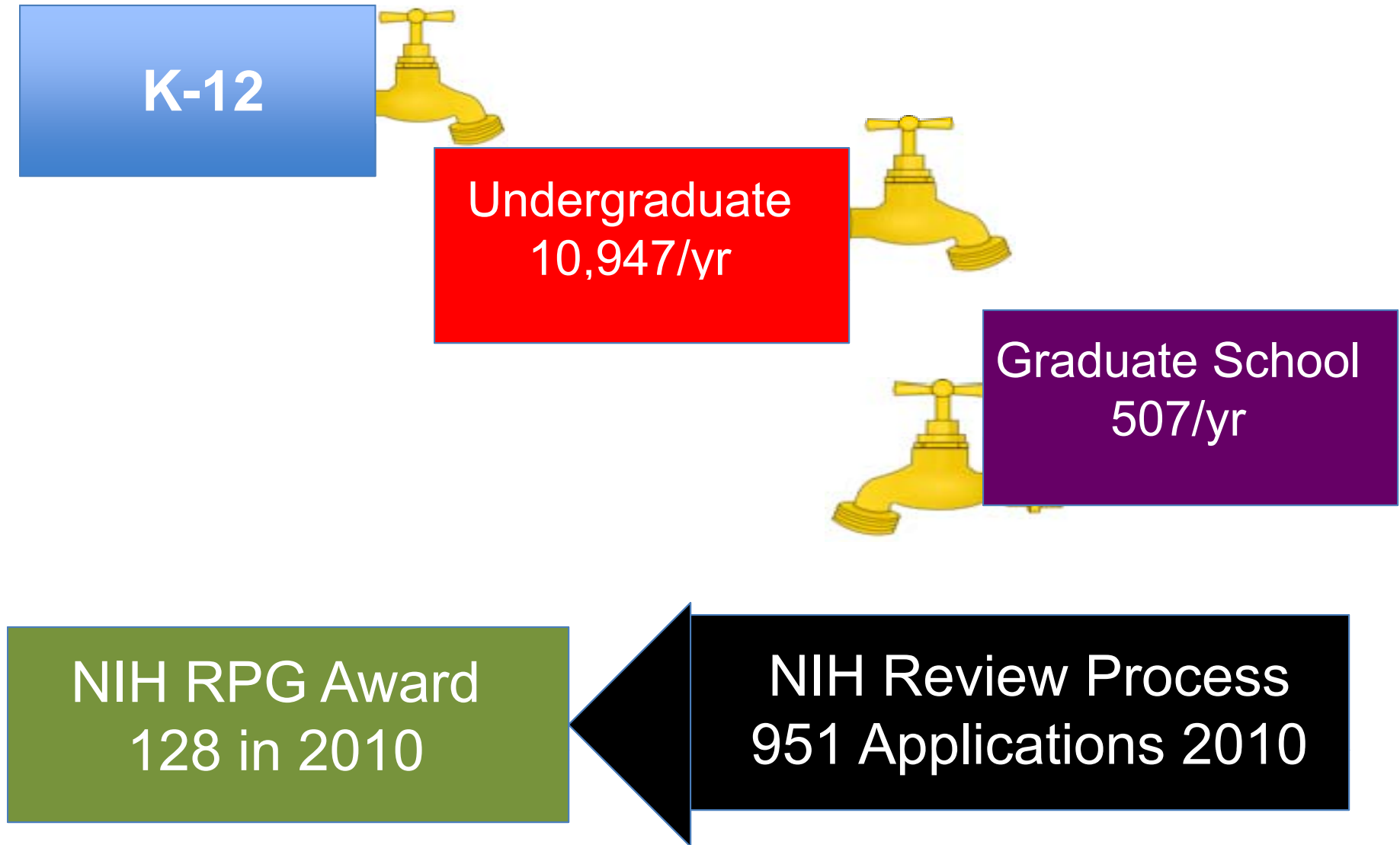
- The WGDBRW was impressed by the track record, and the challenges faced, by many institutions that have devoted themselves to the training or support of URM scientists
- Significant resource and infrastructure constraints often limit their ability to expand their efforts to address the disparities in the workforce concern
- We appreciated the compelling testimony we received on this issue that highlighted the need for:
  - Scholarship support
  - Reduced teaching loads
  - Grants management
  - Technical writing advisors
  - Upgrades in instrumentation, equipment and facilities



## Recommendation 8: Strengthen Institutions Devoted To Training URM Scientists

- Under the leadership of NIMHD, and in coordination with other STEM initiatives across federal government agencies, the NIH should:
  - Undertake a bold, well-funded, multi-year, incentive-based, competitive grant process to support infrastructure development in those comparatively under-resourced institutions with a documented track record of producing and supporting URM scientists
    - Stimulate creative partnerships among these institutions and, where appropriate, including more resource-rich institutions
- The WGDBRW considers this action to be a bold, yet necessary initiative that reflects the urgency of the testimony presented during its deliberations. The group recommends that the NIH, along with other Federal partners, target substantial resources over 5 years to implement this recommendation at 5 or more training sites.

# The Grants Award Process: The Concern For The Potential Of Conscious Or Unconscious Bias



## Looking Into the Data Regarding RPG Awarding

- Two significant changes to the NIH peer review system in 2009
  - Specificity of criterion: approach, significance, investigator, innovation, and environment
  - Overall Impact Score: The “gestalt” of how the review panel assess the application
- African American or Black applicants received overall impact scores 1.2 points higher (worse) than Whites, on a 10 to 90 scale, all else (i.e. criterion scores) being equal
  - Having a worse score, even one of 1.2, can be determinant in whether the application gets considered for funding
  - The question that needs further study is why, after controlling for the criterion scores, we still see a small but significant difference in Impact Scores
- Importantly, no difference in funding rates based on race if you get to the fundable range

## Findings From March 28, 2012 Workshop On Bias

- The exploration and determination of bias is complex, subtle and nuanced
- Given the data available to us: it is not possible to reach definitive conclusions regarding either the presence or absence of specific bias solely based on race or ethnicity in the review process
  - E.G. separating out 'pedigree' bias; MD vs PhD individual and institution bias; field of study bias (basic vs clinical vs behavioral)
- Many factors enter into group-driven evaluation processes that extend beyond the intellectual merit of an idea and encompass judgments that may include:
  - Race/ ethnicity; mentor advisor characteristics; previous NIH review panel service among others

## Findings From March 28, 2012 Workshop On Bias contd.

- Many factors enter into group-driven evaluation processes that extend beyond the intellectual merit of an idea and encompass judgments that may include:
  - Race; mentor advisor characteristics; previous NIH review panel service among others
- The talented and principled men and women who devote themselves to the review process deserve support in their work and the protection from even the appearance of bias in their work
- The literature regarding interventions designed to protect against bias is complex and challenging
  - Based upon the unanimous consultation with our experts: we are left to conclude that there are no definitive interventions that can be uniformly administered as “best practices”
  - Great care must be exercised to ‘do no harm’!

## Recommendation 9: Bias Related Research and Intervention Testing

- The NIH should establish a new Working Group of the ACD comprised of experts in behavioral and social sciences and studies of diversity with a special focus on determining and combating real or perceived biases in the NIH peer review system.
  - Oversee the collection and analyses of quantitative and qualitative data relevant to the research project grant review and grant-making decision process.
  - Oversee the analysis of the discourse content from peer review sessions to contribute to the understanding of potential bias.
  - Oversee the analysis of text-based commentary from individual grant reviews, including R01s and a subset of applications for those awards (career awards, fellowships, smaller research project grants, and others) most likely to precede an investigator submitting a R01 application.

## Recommendation 10: Conduct Pilot Interventions With Outcomes Monitoring

- The NIH should pilot different forms of validated implicit bias/diversity awareness training for NIH scientific review officers and program officers to determine the most efficacious approaches.
  - Once the best training approaches are identified, pilot these with members of study sections to ascertain if their value is sustained. If they are, provide to all study section members.
- Design experiments to determine the effects of anonymizing applications with respect to applicant identity and that of the applicant's institution.

## Recommendation 11: Conduct An Anonymizing Experiment

- The NIH should design experiments to determine the effects of anonymizing applications with respect to applicant identity and that of the applicant's institution.



# Recommendation 12 and 13: Enhancing The NIH Intramural Research Diversity Program

- The NIH should:
  - Appoint a scientist as Chief Diversity Officer (CDO) and establish an NIH Office of Diversity resourced with a suitable budget.
  - Using the trans-NIH Earl Stadtman Investigator search process as a model, and learning from the program's experience, the NIH should institute a more comprehensive search process for tenure-track investigators to ensure that a sufficiently diverse pool of candidates is identified.

# Key Finding Regarding URM's Serving On Review Panels

- Ginther noted that for Black applicants: only NIH review experience and publication citation record correlated significantly with receiving a priority evaluation score
  - For all other groups, characteristics such as: an applicant's type of research organization, NIH funding rank, NIH Review experience, citation record affected the probability that the application received a priority score
- June 2011 initiated a new Early Career Reviewer program to engage more URM's in the process
  - As of today: 200 reviewers of whom 20% are URM's

# Summary: A Comprehensive Strategy

