

Welcome to the CNDP Webinar Series

Best Practices and Innovations in Neuroscience Education and Research Training

SFN Committee on Neuroscience Departments and Programs (CNDP)



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Webinar Tips

- Listen to the webinar via your computer speakers or dial in using the telephone number provided on the screen. Charges will apply for international calls.
- To resize the presentation click and drag the lower right- hand corner.
- Type your question into the question box. Questions will be addressed after the presentation.
- The recording and webinar resource materials will be available on www.sfn.org/webinararchives within 48-72 hours.

CNDP Mission

Advance Education & Research Training in Neuroscience

- Recognize Excellence

- Award for Education in Neuroscience

- 2013 – Keith Trujillo, California State University San Marcos
- <http://www.sfn.org/Awards-and-Funding/Individual-Prizes-and-Fellowships/Science-Education-and-Outreach/Award-for-Education-in-Neuroscience>

- Neuroscience Programs of the Year

- 2013 - Central Michigan University (undergraduate)
- 2013 - University of Pennsylvania (graduate)
- <http://www.sfn.org/awards-and-funding/program-of-the-year-award>



2013 SFN Meeting – Keith Trujillo receives award for Neuroscience Educator of the Year at the CNDP Reception



2013 SFN Meeting – Central Michigan University and University of Pennsylvania receive Neuroscience Programs-of-the-Year Awards at the CNDP Reception

CNDP Mission

Advance Education & Research Training in Neuroscience

- Foster Professional Development
 - Graduate School Fair
 - <http://www.sfn.org/careers-and-training/higher-education-and-training/developing-training-programs-and-faculty>
 - SfN Institutional Program Membership
 - <http://www.sfn.org/Member-Center/Join-or-Renew/Institutional-Programs>
 - Directory of Neuroscience Training Programs
 - <http://www.sfn.org/careers-and-training/higher-education-and-training/training-program-directory>
 - Educational Resources in Neuroscience (ERIN)
 - <http://erin.sfn.org/>
 - Conferences & Workshops
 - <http://www.sfn.org/careers-and-training/higher-education-and-training/annual-departments-and-programs-conference>



2013 SFN Meeting – graduate school fair brings training programs and potential graduate students together



Hermes Yeh, chair of the CNDP, thanks Joan Frye and Naomi Rosenberg for addressing an audience of 50 participants at the 2013 Spring Conference on Mentoring and Morale.

Building, Retaining, & Sustaining a Diverse Student Body

March 2014 – Inaugural CNDP Webinar

SfN Staff Acknowledgments

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Building, Retaining, & Sustaining a Diverse Student Body

Moderator and Speakers



Keith A. Trujillo, PhD

Director, Office for Training, Research & Education in the Sciences (OTRES)
Professor of Psychology
Adjunct Professor of Biology
California State University San Marcos



Lee E. Limbird, PhD

Professor of Biochemistry
Dean, Natural Sciences, Mathematics, & Business
Dean, Graduate Studies
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Andrew G. Campbell, PhD

Associate Professor of Medical Science
Molecular Microbiology & Immunology
Warren Alpert Medical School
Brown University

Moderator and Speaker



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Diversity in Neuroscience

Introduction to the Summer Program in Neuroscience, Ethics and Survival (SPINES)

Keith Trujillo

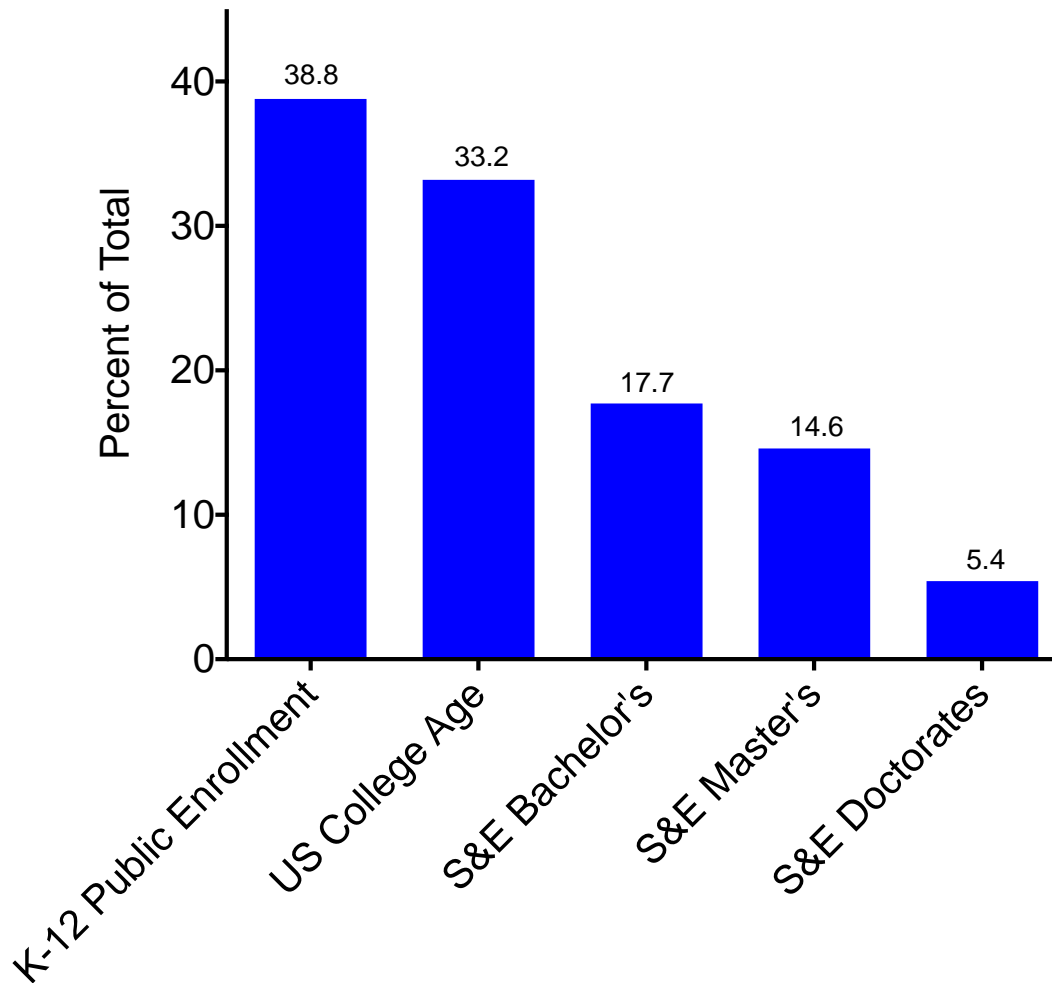
Professor, Department of Psychology

Director, Office for Training, Research and Education in the Sciences

California State University San Marcos

The Leaky Pipeline

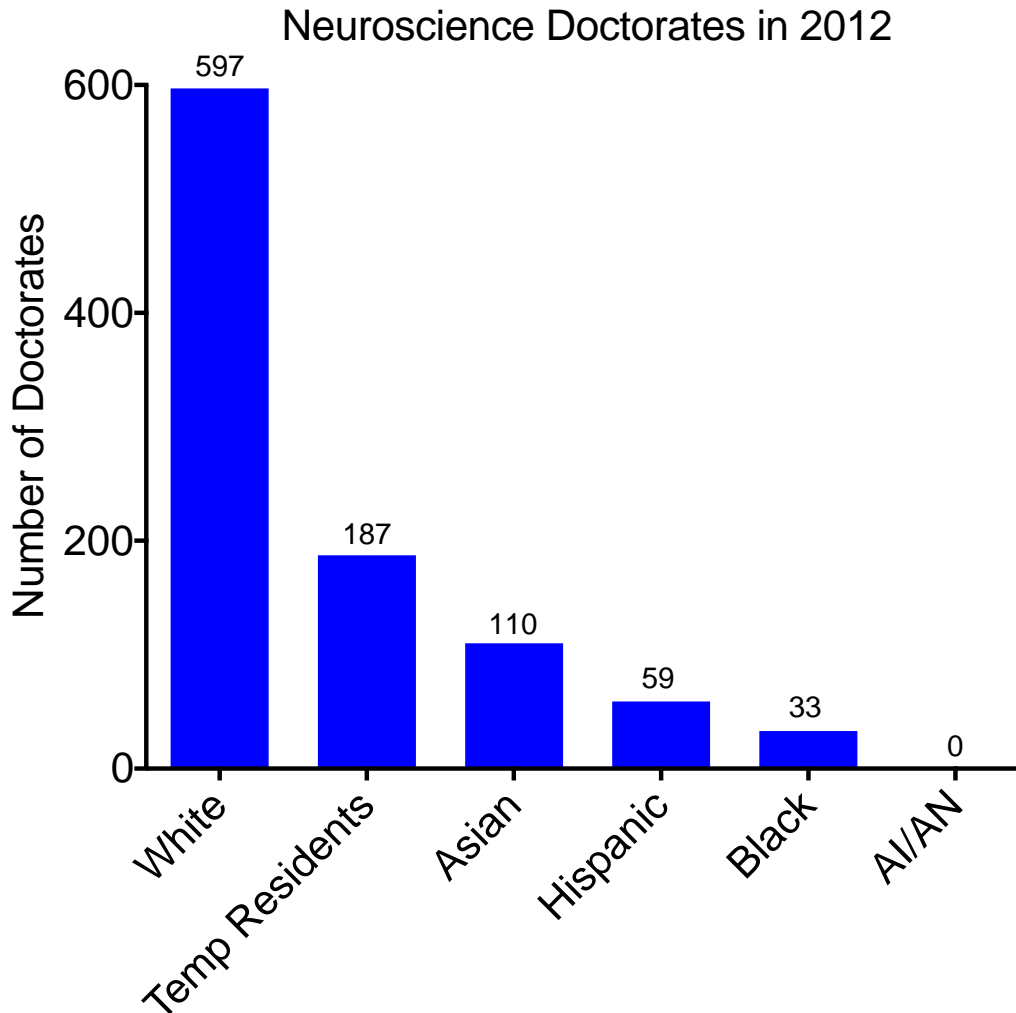
URM, Percent of Total (2007)



- Severe under-representation for URM groups in S&E
 - Increasing disparity higher up the academic ladder

Adapted From: *Expanding Underrepresented Minority Participation: America's Science and Technology Talent at the Crossroads*, National Academy of Sciences (2010)

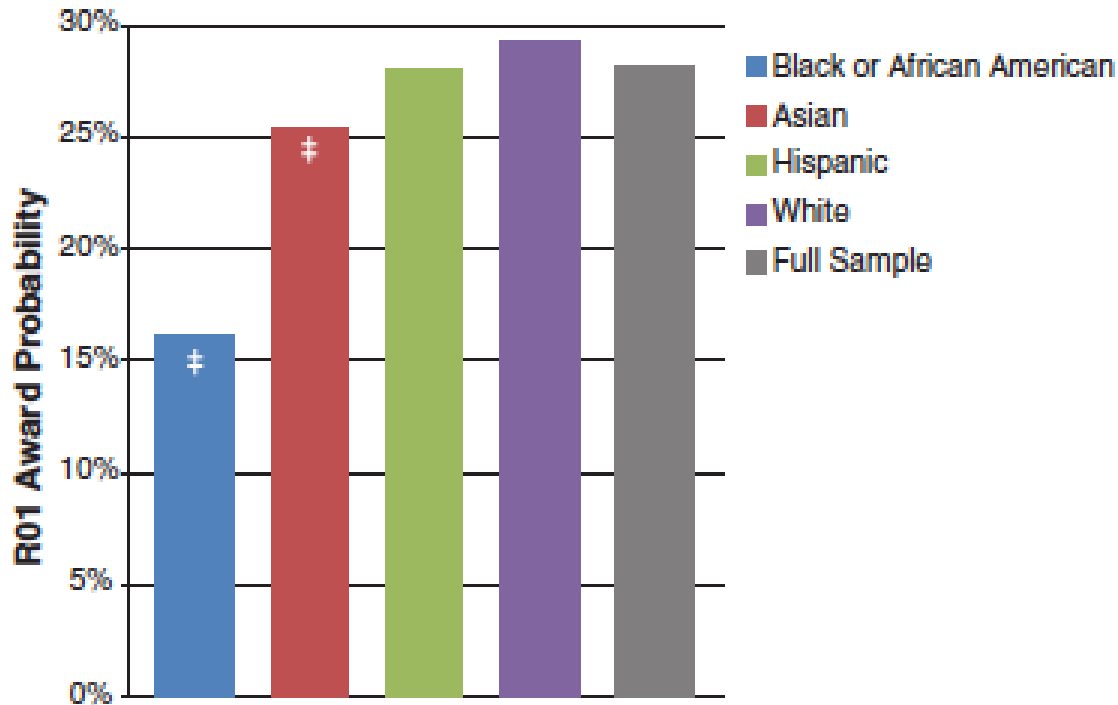
URMs in Neuroscience



- CNDP includes 125 Graduate Training Program Members
 - Average 0.74 URM doctorates/program
- Approx 4% of postdoctoral fellows in CNDP programs from URM groups

Adapted from *Doctoral Recipients from U.S. Universities, 2012*, National Science Foundation (2012)

URMs and NIH Grants

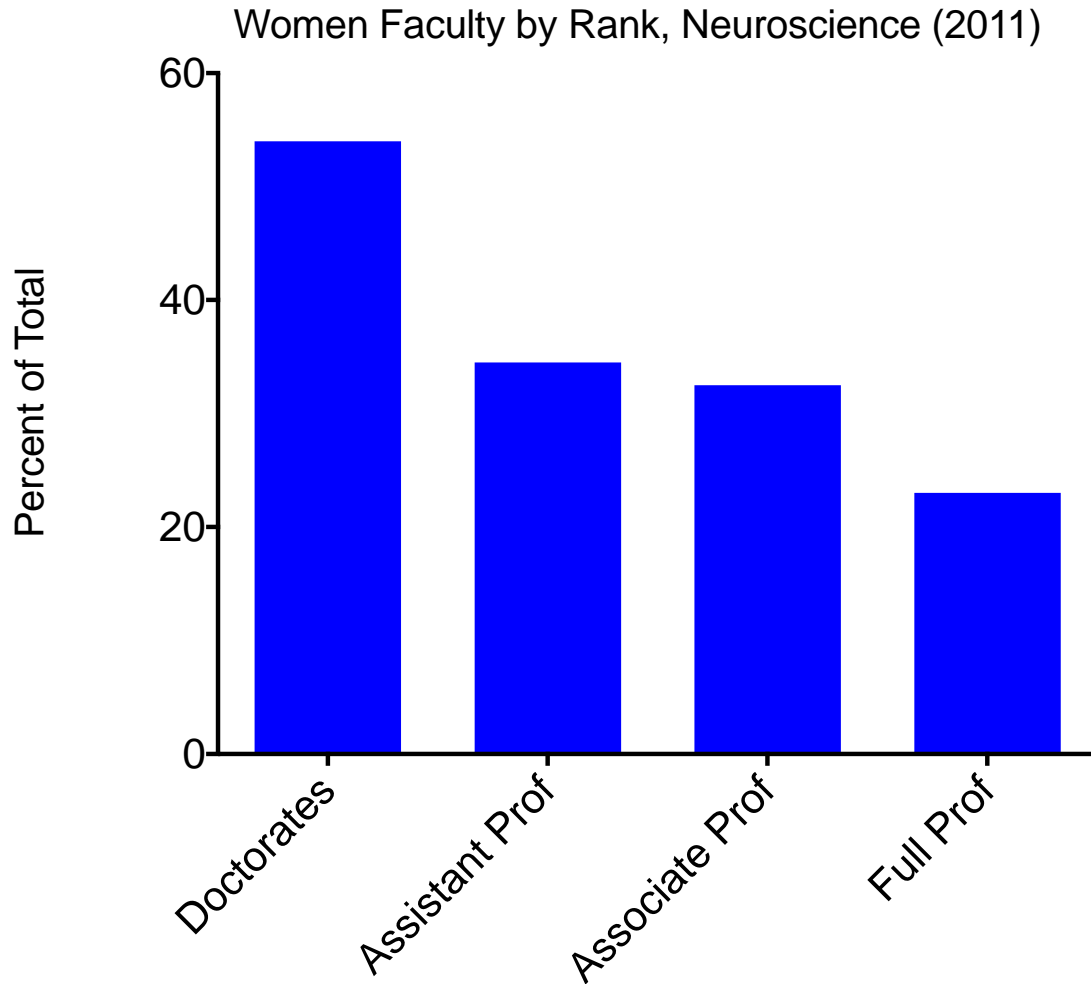


- URMs disadvantaged in R01 grants
 - After correction for many factors
 - Science, 2010
- Finding led to recent moves by NIH to address disparities

Underrepresented Groups

- Racial and Ethnic Minority
 - African American
 - Hispanic/Latino
 - American Indian/Alaska Native
 - Pacific Islander
- Women
- Disabled
- LGBT
- Individuals from low socioeconomic groups

Women in Neuroscience

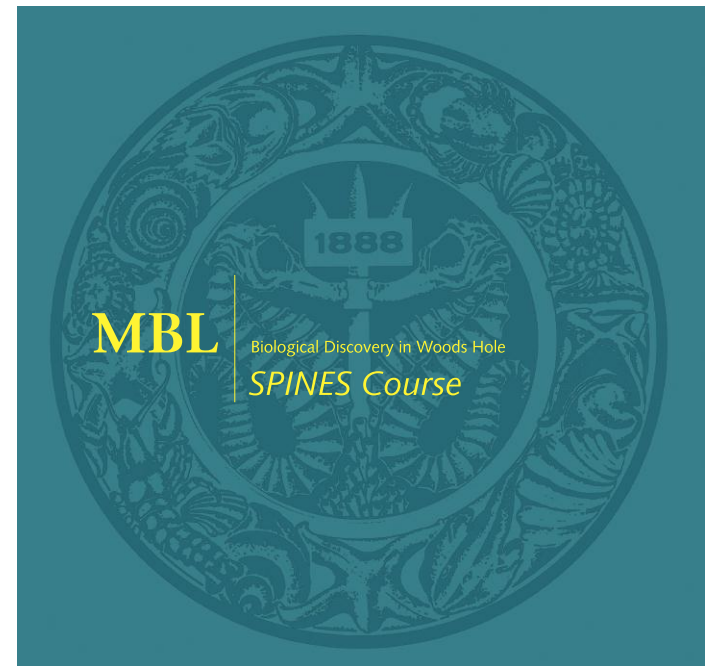


- Underrepresentation by women and URM highest at top of academic ranks

Adapted from *Report of Survey of Neuroscience Graduate, Postdoctoral, & Undergraduate Programs (Academic Year 2010-2011)*, SfN (2011)

SPINES

- Summer Program in Neuroscience, Ethics and Survival
 - National program aimed at increasing diversity in neuroscience
 - Founded by Dr. Joe Martinez and Dr. James Townsel
 - Over 20 years in existence
- Current Co-Directors
 - Dr. Jean King, UMass Medical School
 - Dr. Keith Trujillo, CSU San Marcos
- Supported by NIMH R25 Grant #055929



SPINES

- Marine Biological Laboratory, Woods Hole, MA
 - Premier research institution; large neuroscience community
 - More than 1400 visiting scientists and students
 - 55 Nobel Laureates
 - 124 HHMI Investigators
 - 214 Members of the National Academy of Sciences



Biological
Discovery
in Woods Hole



SPINES Basics

- Four weeks in residence at MBL – Mid-June to Mid-July
 - Up to 20 students each year
 - Full fellowship program: all costs, including travel, housing, and meals at the MBL are covered
 - Applications due in February
- Opportunity for additional four weeks of research with an MBL summer scientist in post-course research



Dr. Edward Castaneda meets with two SPINES students, 2013

SPINES Features

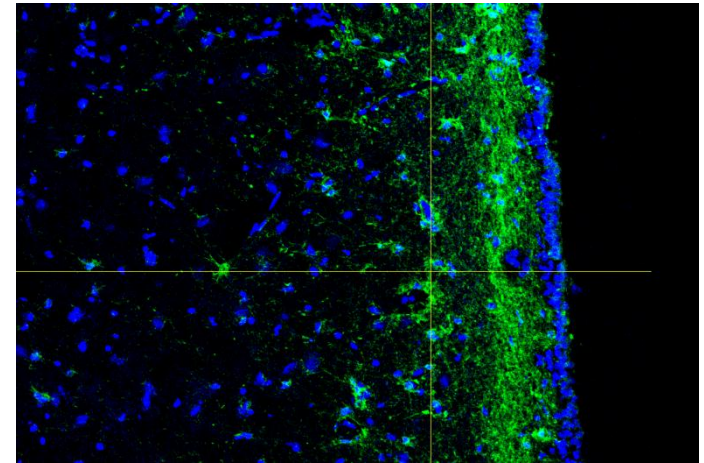
- Exceptional role models and mentors
 - Majority of core faculty successful scientists from URM groups
 - Non-URM faculty have strong record in mentoring URM students
- Mentoring
 - Students become lifelong members of the SPINES ‘family’
 - Supplements and extends home institution mentoring
 - Formal extended mentoring program
- Networking
 - Unrivaled opportunities at MBL during summer
 - Nobel Laureates, HHMI investigators, National Academy Members

SPINES Features

- Professional Development (Survival)
 - Navigating a career in neuroscience
 - Networking skills
 - Effective mentoring
 - Selecting a postdoc position; Selecting a faculty position
 - Scientific writing; Critical reading of scientific papers
 - Scientific presentations
 - Grants and fellowships
 - Health disparities
 - Diversity in science
 - Succeeding as a URM scientist

SPINES Features

- Exposure to Leading Edge Neuroscience
 - SPINES scientific seminars and discussions
 - MBL seminars and Endowed Lectures
- Lab work
 - Human Neuroanatomy
 - Zebrafish as a Model in Psychiatric Discovery
 - MatLab as a Tool in Neuroscience Research



GFAP and DAPI staining of human subventricular zone by SPINES students 2013 under supervision of Dr. Alfredo Quinones-Hinojosa

SPINES Features

- Responsible Conduct of Research and Research Ethics
 - Discussion topics in responsible conduct and ethics
 - Data acquisition and interpretation
 - Responsible conduct in authorship
 - Neuroethics: Implications of neuroscience research
- SPINES Symposium
 - Student presentations to the MBL community



SPINES students and faculty following the SPINES Symposium, 2013

SPINES Success

- Over 300 graduate students, postdoctoral fellows and early career faculty supported
- Very positive student evaluations
 - Median rating of 'Excellent' for components of course
 - Individual elements rated above 4 on a 5 point scale
- Alumni
 - Publish in highly ranked journals
 - Successful at competing for fellowships and grants
 - Successful at obtaining positions in academia and industry

SPINES Success

“This was truly a unique experience that I would not have missed for anything. The lecture roster read like a who's who of neuroscience and nowhere else can a student have such a privileged experience.”

“This experience is life changing. I feel empowered.”

“SPINES is not just a summer program but a guiding force that inspires people to be the best that they can be no matter what obstacles lie ahead of them.”

Speaker



Lee E. Limbird, PhD

Professor of Biochemistry

Dean, Natural Sciences, Mathematics, &
Business

Dean, Graduate Studies

Fisk University

Lessons Learned from the Fisk-Vanderbilt Master's to PhD Bridge Program

And how they might influence the success of your Minority Focused Training Aspirations

Lee E Limbird, PhD
Professor and Dean
Fisk University

Fisk-Vanderbilt Master's to PhD Bridge Leadership:

Kevian Stassun, PhD, Founder and Co-Director

kevia.stassun@vanderbilt.edu

Arnold Burger, PhD, Fisk Co-Director, aburger@fisk.edu

Dina Myers Stroud, PhD, Executive Director: dstroud@fisk.edu

What is the BRIDGE Program ?

- Started in 2004 - informed by NRC data that . 65% of Minority PhDs first received a Master's enroute to the PhD
- MA at Fisk in Biology, Chemistry or Physics leads to seamless transition to PhD
 - Students take courses at Fisk AND at Vanderbilt
 - Get to know faculty as young scientists
 - [Fisk and Vanderbilt are only 2 miles apart]
- Students then apply to “bridge” to Vanderbilt or another PhD granting institution



Fisk-Vanderbilt Master's to PhD Program Outcomes

- 100% of students (n=44) that have applied for PhD programs have been accepted
- 80% retention rate to the PhD degree (compare to 50% national average)



What the Fisk-VU Bridge Does differently

- Recruiting
 - Identify jewels in the rough
- Interviewing
 - Looking for “grit”
- Mentoring
 - Multifaceted
- Monitoring
 - Expectations clear; monitoring frequent

Recruiting

- National Meetings for Minority Undergraduates
 - MARC
 - ABRCMS
 - SACNAS
 - SfN
- as well as National Meetings in Focus Areas of Interest
 - Faculty visiting student posters
 - Students, *not just staff !!*, at program tables
- Recruiting Materials FEATURE the students

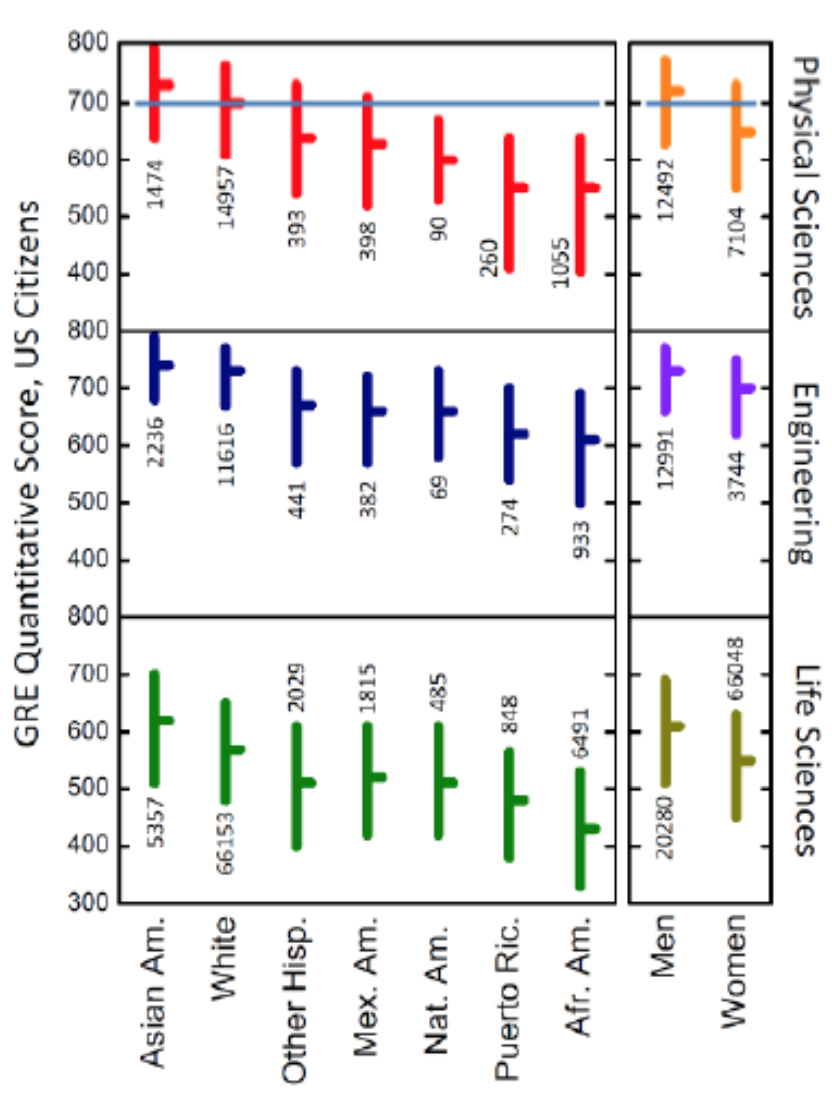
<http://www.vanderbilt.edu/gradschool/bridge>

you can
Reach for the Ph.D.
tú puedes

FIK
UNIVERSITY

V
VANDERBILT
UNIVERSITY

Reliance on the GRE Disproportionately Suppresses Minority Grad School Entrance



Use of GRE cut-off scores in grad school admission significantly impacts diversity.

Miller and Stassun, Nature 2014, in press

Unrealized Potential Revealed in Structured Phone Interviews

- Focus on “Grit”
- Ability to overcome obstacles
- Facing and responding to failure
- Commitment to the PhD

The Program Builds Intentional Community

- **BOOT CAMP**
 - Crash courses (e.g. intro to bioinformatics)
 - Skills assessment to inform individualized course selection
 - Social activities to build community
- **Shared Professional Development Course**
 - Fall, first semester
- **Monthly Evening Seminar Series**
 - Inspiring Role Models
 - Science to Social Science



Wrap-around Mentoring

- “It is virtually impossible for me to express the depth of my gratitude for the Bridge Program. The **multi-faceted mentoring** and encouragement I received there were invaluable to my development and are still informing the next steps I'm taking in my career. Having 'bridged' from Fisk to Yale and now beyond, I still feel very much a part of the family - and the legacy - of all that this program has to offer.”



***Jedidah Isler, Fisk, Physics M.A.
2007, Yale Ph.D. 2013.***

Tiered Mentoring

- **Peer Mentoring and Near-Peer Mentoring**
 - Bridge Buddies
 - Evening Fellowship/Seminar Series
- **Bridge Post-docs**
 - Office Hours
- **Executive Director – scientist and administrator**
 - Tracking and one-on-one meetings at least once a semester
- **Directors of Graduate Studies at Fisk**
 - Link students to VU Course directors/potential mentors

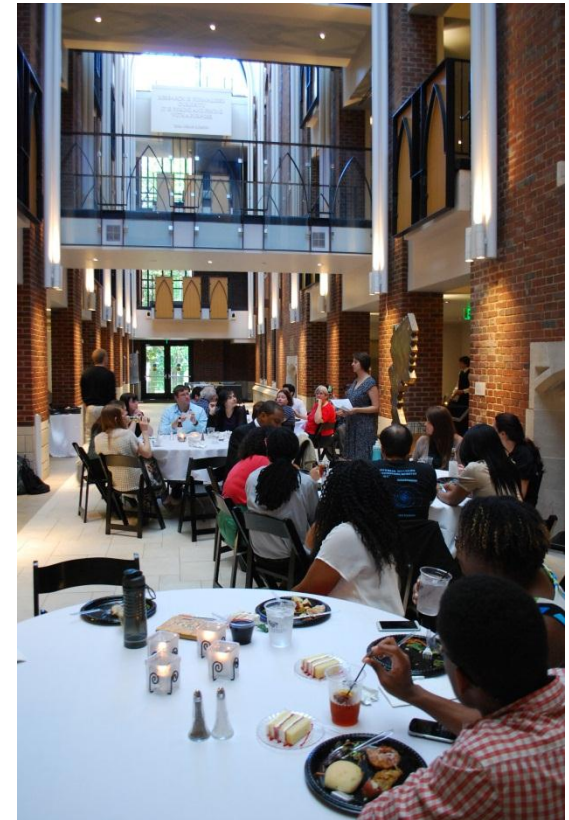
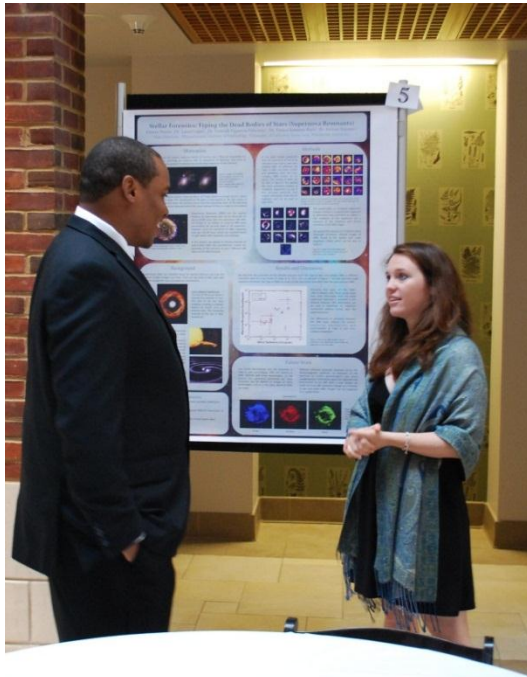
**... Everyone mentors,
all (faculty included) are mentored!**

HIGH FIDELITY COMMUNICATION and PERSISTENT TRACKING

- **COMMUNICATION:**
 - Share with students:
 - *Rubrics* for what is expected in a Research Rotation
 - *Rubrics* for what is expected during research phase
- **TRACKING :**
 - **Monthly** steering meetings of Program Leaders
Green- Yellow- Red Dashboarding with strategic follow-up

Research Celebration Day

- Student Driven
- Affirm that the trainee *is* a scientist!
- Institutional Leadership affirms the trainees *and* their mentors



What are the 'Take Home' Messages?

- There is **NO ONE MAGIC BULLET**
 - Multiple complementary strategies
 - Multiple modalities for mentoring
 - Focus must be **INDIVIDUAL**
 - Tracking with strategic and *individualized* intervention plans
 - Long-term institutional commitment is essential

Speaker



Andrew G. Campbell, PhD

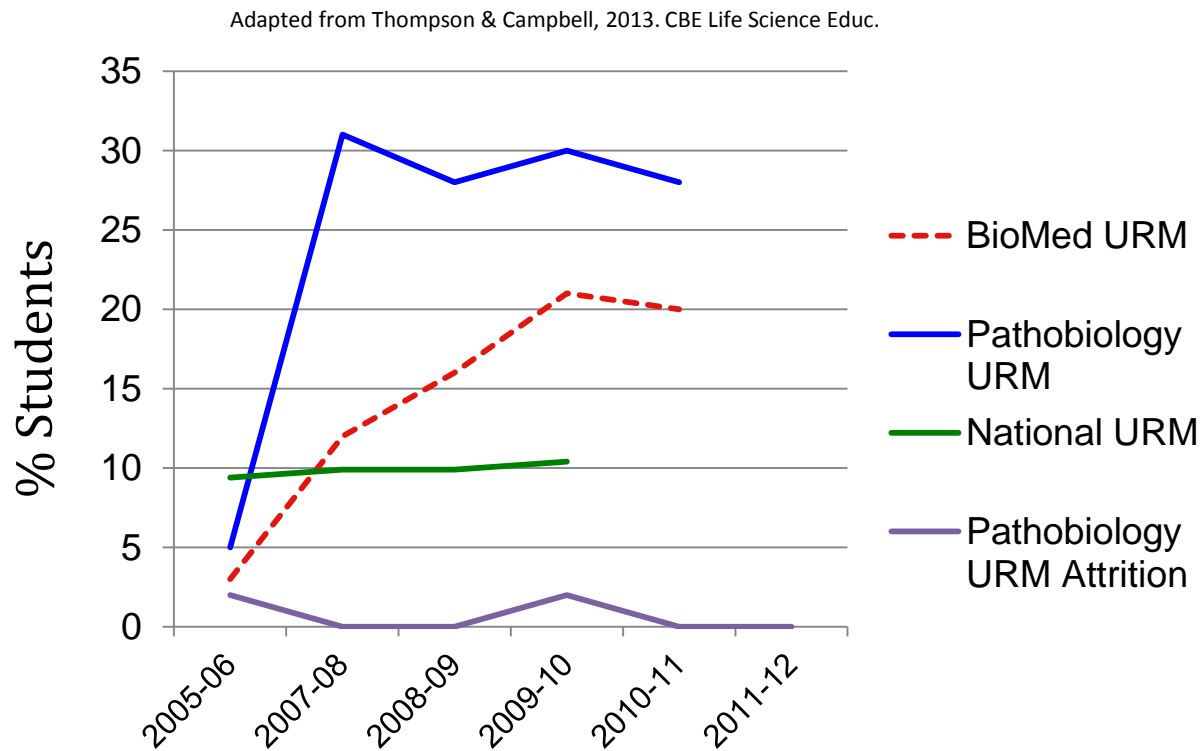
Associate Professor of Medical Science
Molecular Microbiology & Immunology
Warren Alpert Medical School
Brown University

Diversity

Brown University's IMSD Program: Best Practices & Challenges

Andrew G. Campbell, PhD
Associate Professor of Medical Science
Brown University

Enrolled URM Graduate Student Populations: Pathobiology Graduate Program and BioMed vs. National Average



2005-11 Pathobiology student population : 50 -55 PhD students

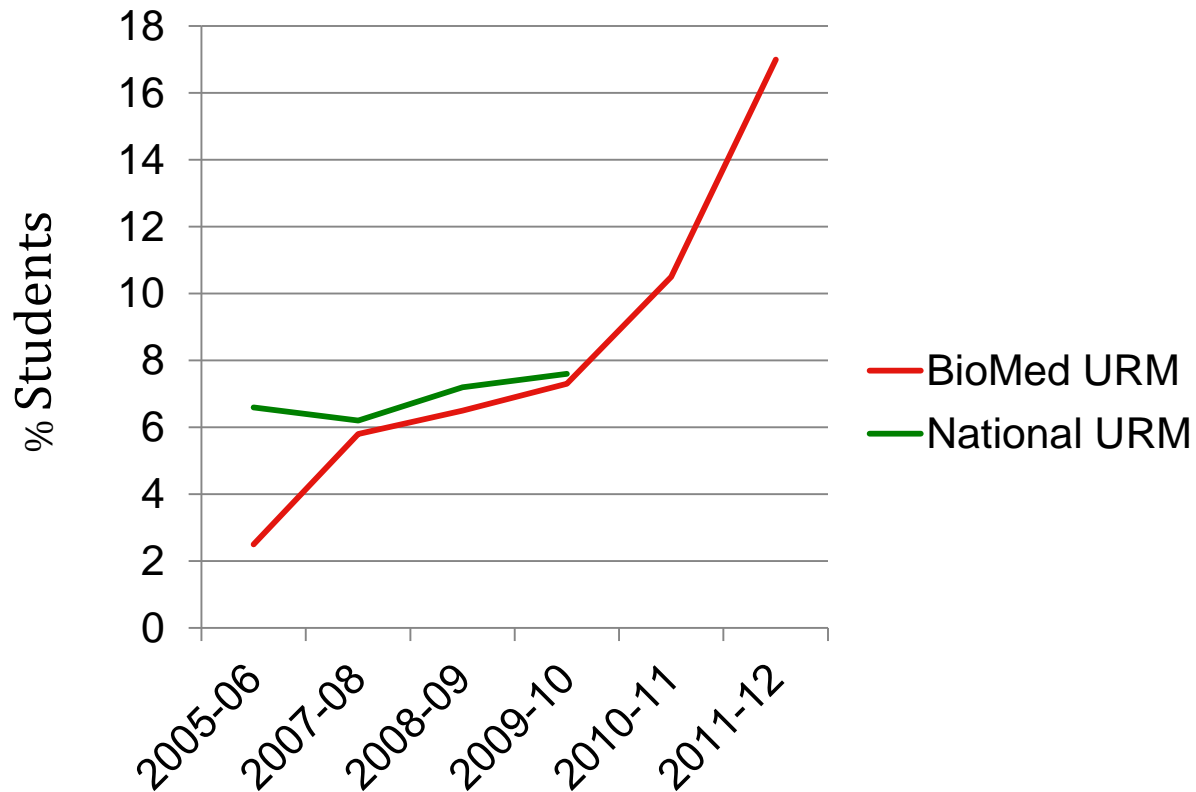
URM: U.S. Under-represented racial& ethnic trainees (African-American, Hispanic or Latino/a, Native American, Native Hawaiians or Other Pacific Islanders

National URM source: [nsf.gov/statistics/nsf12300/content.cfn?pub_id=4118&is=2](http://www.nsf.gov/statistics/nsf12300/content.cfn?pub_id=4118&is=2).

<http://www.nsf.gov/statistics/wmpd/tables.cfm>

Non-Agricultural biological science disciplines. Last accessed 6-1-12

URM PhD Recipients



URM: U.S. Under-represented racial& ethnic trainees (African-American, Hispanic or Latino/a, Native American, Native Hawaiians or Other Pacific Islanders)

National URM source: [http:// nsf.gov/statistics/nsf12300/content.cfm?pub_id=4118&is=2](http://nsf.gov/statistics/nsf12300/content.cfm?pub_id=4118&is=2)

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Non-Agricultural biological science disciplines. Last accessed 6-1-12

Maximizing Success & Productivity Through Diversity

BEST PRACTICES

I. Transforming Institutional Culture & Climate

II. Build Inter-Institutional Partnering

III. Curricular Mapping

IV. Academic Development / training Scaffolds

Maximizing Success & Productivity Through Diversity

PRACTICE I

Transforming Institutional Culture & Climate

Engaging students, faculty & administrators as beneficiaries of training investments in diversity

Institutional Culture:

- The shared values, beliefs and intentions that define an organization
- Guides, and can change, institutional climate
- It should, but may not always, align with institutional climate

Institutional Climate:

- Prevailing attitudes, practiced behavior & expectations that exists in an organization
- Does not always, but should, reflect the culture of the organization.

Maximizing Success & Productivity Through Diversity

PRACTICE I

Addressing the Misalignment of Institutional CLIMATE AND CULTURE

Good practice:

- Use assessment surveys to monitor institutional climate and its relationship to culture
- Survey current & past graduate students
- Survey faculty
- Share results with the upper administration /point out disconnects between culture & climate

Use survey responses to identify, dispel and erase misconceptions about all graduate students being 'A' students and emphasize the RANGE

Maximizing Success & Productivity Through Diversity

PRACTICE II

Build Inter-Institutional Partnerships

- Personalizes any recruitment / placement process
- Get to know institutions, their students and faculty
- Helps in making make informed choices re: the right place, right person, right program
- Unmasks and helps address cultural differences that affect choices
- Failure provides useful data to refine future approaches
- Build a legacy mindset among students who see their peers go off to graduate school

Maximizing Success & Productivity Through Diversity

CHALLENGES TO PARTNERSHIPS

Scaling	'That model won't work here' – create a model that works
Ownership	Who owns what and why Who is empowered / not empowered
Life cycle	How long to commit Don't want to get into something you can't get out of
Confidence	New things, people and culture challenge confidence
Expectations	Different expectations, misunderstanding Shared vision or not Trust or not Communication
Resources	What particular resource should be valued above all else

Maximizing Success & Productivity Through Diversity

PRACTICE III

Curricular Mapping

Alignment of undergraduate curricular content with content of graduate program

- Aids in developing appropriate academic plan for each student
- Establishes better training reference points
- Identifies knowledge gaps early
- Informs pedagogy at MSIs and smaller institutions lacking PhD-level programs

Maximizing Success & Productivity Through Diversity

PRACTICE IV

Build Training Scaffolds

- Brown University Skill-based training modules (<http://biomed.brown.edu/imsd/>)
- Community / Critical mass building

Maximizing Success & Productivity Through Diversity

PRACTICE IV

Training Scaffolds

Create appropriate learning and support structures for students

- A. Skill-based Training Modules (<http://biomed.brown.edu/imsd/>)
- Demystify the PhD training experience & expectations
 - Strengthen early graduate student development
 - Prepare trainees for careers and career choices in the world beyond graduate school
 - Not stigmatizing
 - Taught by faculty and advanced graduate students (IMSD Scholars)
 - Complement regular academic coursework
 - 10-12 instructional contact hours per module
 - A menu of 11 modules are offered throughout the calendar year
 - Non credit-earning. Certificate awarded upon completion of each module taken
 - Selection from menu made during advisories. Combination taken tailored to students needs.
 - Subject to immediate participant evaluation - Module revision driven by evaluation

Maximizing Success & Productivity Through Diversity

PRACTICE IV

Training Scaffolds

Create appropriate learning and support structures for students

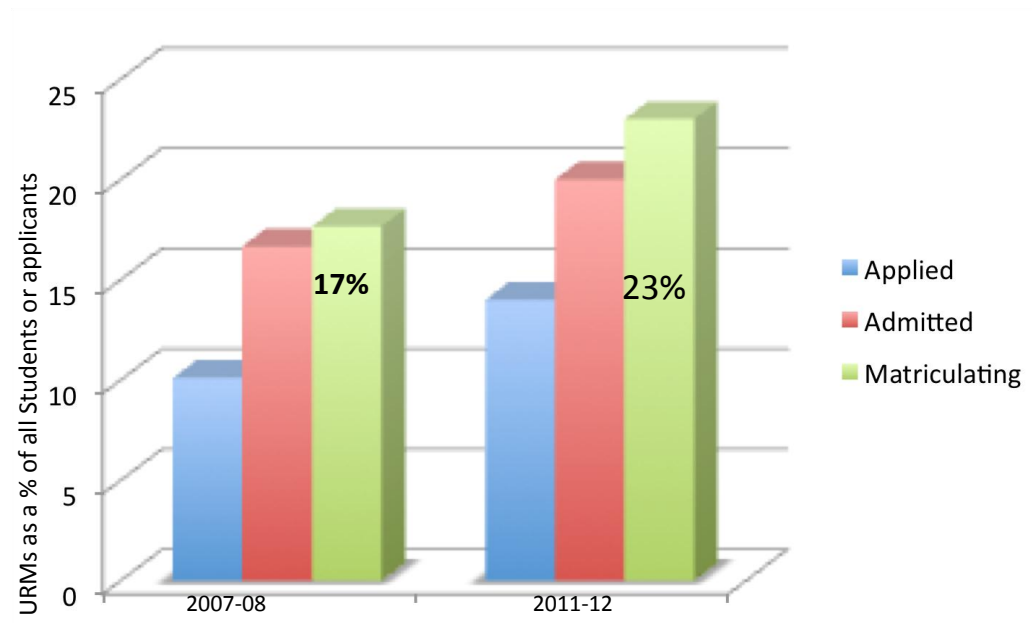
- B. Building and preserve a critical mass of students/affirm scientific identities & capacity.
Build/strengthen student communities around:
- Recruitment
 - Seminar series
 - Peer Mentoring networks & peer driven programs (SACNAS chapter)
 - Support presentation of research works at local, regional & national venues

Achievements of 17 URM graduate students vs. 17 Non-URM graduate students

MEASURES OF STUDENT ACHIEVEMENT					
Training Period	Trainee Cohort Status	Trainee Cohort Publications	Trainee Cohort Awarded Fellowships	Trainee Cohort Scientific Presentations	Trainee Cohort Travel Award
2005-2007	URM	0	3	1	1
	Non-URM	4	1	11	0
2008-2011	URM	15	6	20	4
	Non-URM	18	9	25	4

Adapted from Thompson & Campbell, 2013. CBE Life Science Educ.

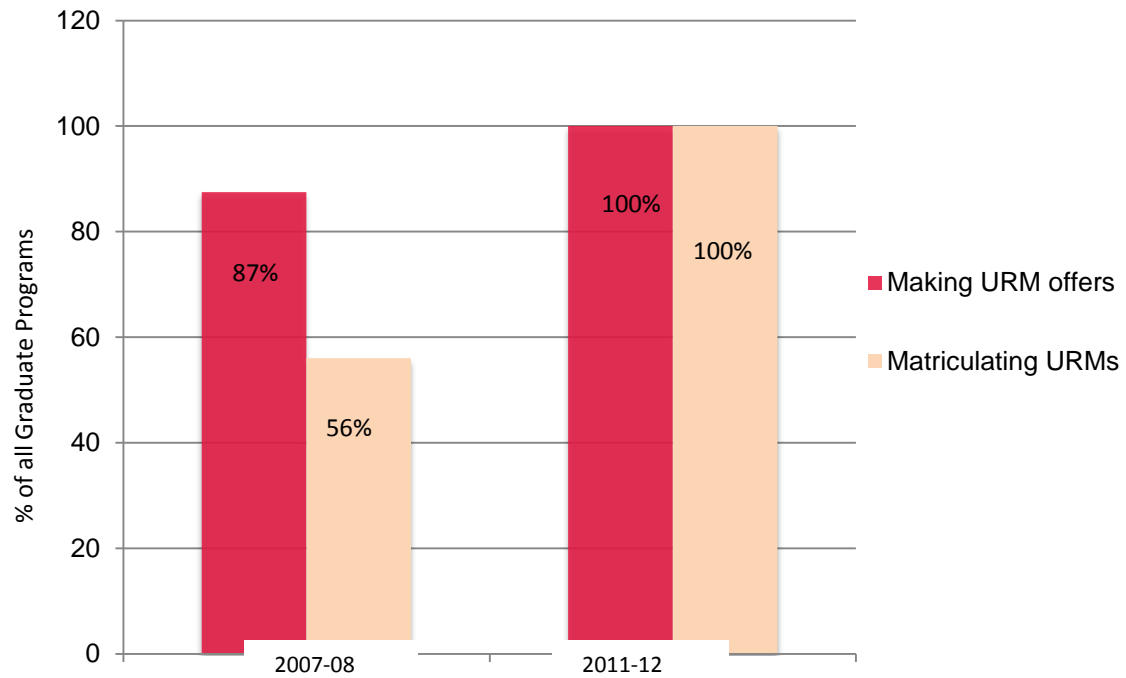
PhD Programs enrollment data URM applicants, admits & matriculants



Adapted from Thompson & Campbell, 2013. CBE Life Science Educ.

PhD Programs Enrollment Statistics

% of Programs making offers & admitting URMs



Adapted from Thompson & Campbell, 2013. CBE Life Science Educ.

Summary

- **De-emphasize the GREs as predictors of the likelihood of future student success**
 - [If used at all, use as diagnostic tools to identify training gaps]
- **Establish inter-institutional partnerships**
- **Utilize Curricular Mapping**
- **Build faculty buy-in**
- **Empower diversity programs to ensure lasting benefits**
- **Avoid activities that might be perceived as stigmatizing (to students)**

Moderator and Speaker



Keith A. Trujillo, PhD

Director, Office for Training, Research &
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Professor of Psychology
Adjunct Professor of Biology
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Neuroscience Scholars Program

Keith Trujillo

Professor, Department of Psychology

Director, Office for Training, Research and Education in the Sciences

California State University San Marcos

Neuroscience Scholars Program

- Fellowship for neuroscience trainees from underrepresented groups
 - to enhance career development and networking opportunities.
- Graduate students and postdoctoral fellows who meet one or more of the following:
 - underrepresented racial/ethnic group
 - Individuals with disabilities
 - from disadvantaged background
- Sponsored by Society for Neuroscience
- Supported by NINDS R25 Grant #025952
- Over 600 scholars to date



NSP Fellows attend the Diversity Reception at the SfN annual meeting

Neuroscience Scholars Program

- Benefits

- SfN membership
- Subscription to *The Journal of Neuroscience* online
- Stipend for career enrichment activities, networking, and professional development
- Support to attend SfN annual meeting
- Opportunity to present at the Diversity Poster Session at SfN annual meeting



NSP Fellows presenting their research at the Diversity Poster Session at the SfN annual meeting

Neuroscience Scholars Program

- Career development
 - **Mentoring:** from neuroscience experts and peers
 - **Networking:** greater connectedness at the annual meeting and year-round
 - **Career Advancement:** enhanced career knowledge and skills
 - **Lifetime engagement** with the NSP alumni community



2013-2014 NSP Fellows at the SfN annual meeting, pictured with Congressman Fattah of Pennsylvania and SfN volunteer leadership

Visit www.sfn.org/nsp for more information.

Please email nsp@sfn.org if you have any questions.

Lessons Learned and Best Practices

Recruitment and Selection

- Active ***outreach*** and ***recruitment***
- ***Eliminate GRE scores*** as selection criterion
 - URM students disadvantaged
 - Poor indicator of success
- ***Holistic selection criteria***
 - attention to overcoming obstacles in career path
- Attention to ***minority-serving institutions***
 - Many have strong training programs supported by NIH and NSF
 - Strong pool of potential URM grad students

Support and Retention

- **Active** and **engaged** mentors with **cultural sensitivity**
- To avoid feelings of isolation
 - Aim for **critical mass** of diverse students
 - Help students connect with **mentors outside the home institution**
 - Build **institutional partnerships**
 - Increase **diversity in seminar series**
- **Welcoming environment** – attention to culture and climate
 - Individuals from URM groups often feel like “a guest in someone else’s house” (and sometimes like an unwelcome guest)
 - Build **community**
 - Foster **sense of belonging**

Questions?



Keith A. Trujillo, PhD
*California State University San
Marcos*



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Brown University



Hermes H. Yeh, PhD
Chair, CNDP
Geisel School of Medicine at Dartmouth



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