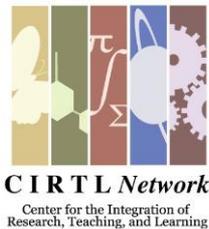


# Research Mentor Training: Supporting Evidence and Resources

Stephanie House  
University of Wisconsin-Madison



# Seminar Outline

- Describe the evidence supporting research mentor training based on the *Entering Mentoring Series*
- Give you a sense of what the training is like
- Describe currently available resources, including those through the new NIH National Research Mentoring Network (NRMN)
- Q & A

# Poll Question

What is your role in the CDA program?

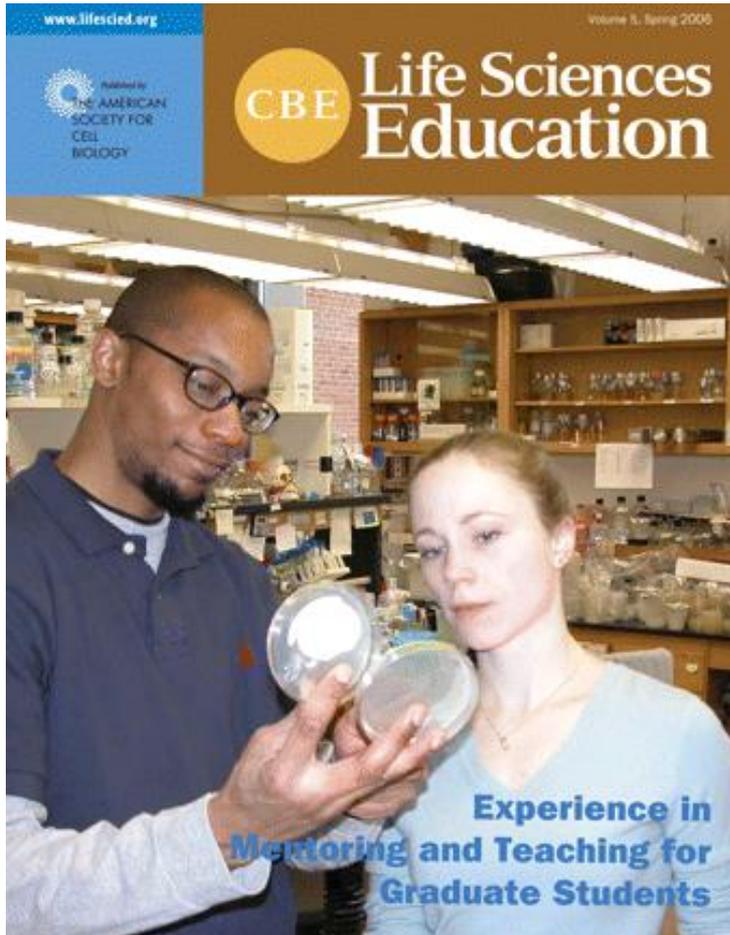
- Current or Former recipient
- Currently preparing application
- Current or Former Mentor
- Multiple Roles (CDA recipient & Mentor)
- Other

# Poll Question

Are you a:

- Mentor
- Mentee
- Both

# Research Mentoring Relationships



MENTOR



MENTOR/  
MENTEE



MENTEE

Principal  
Investigators  
(Faculty)

Junior Faculty/  
Post-doctoral  
researchers

Graduate/  
Medical  
Students

Undergraduate  
Researchers

# Defining Mentoring

A **collaborative learning relationship** that proceeds through purposeful stages over time and has the primary goal of helping mentees acquire the essential competencies needed for success in their chosen career.

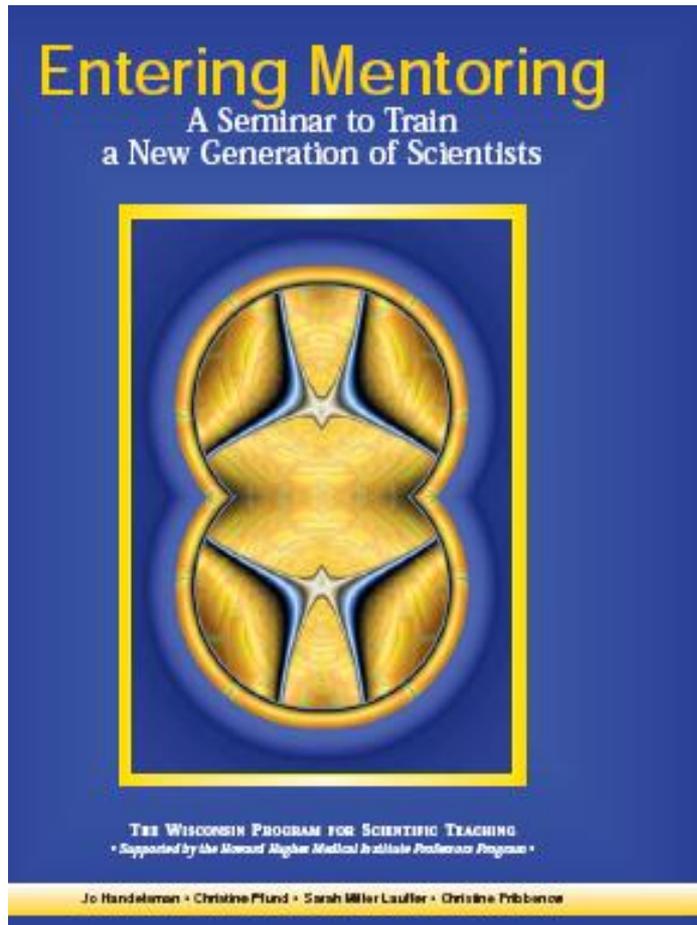
It includes using one's own experience to guide another person through an experience that requires **personal and intellectual growth and development.**



# The Importance of Good Mentoring Relationships

- Students being mentoring report fewer non-persistence decisions (Gloria & Robinson Kurpius, 2001)
- Most important factor in degree attainment was positive mentoring experience (Solorzano, 1993)
- Mentoring increases persistence in science, career satisfaction and productivity (reviewed in Sambunjak, Straus and Marusic, 2010)
- The desire to pursue a Ph.D or M.D/ Ph.D is influenced by a strong mentee-mentor relationship (McGee and Keller, 2007)
- Mentoring and research training cannot be separated from scientific research for anyone in postdoctoral or graduate student positions and should not be considered as separate objectives (NAS 2005)
- Good mentors foster independence so that mentees can go on to be successful on their own, establish themselves, and differentiate themselves from their mentors (NEJM, 1994)

# *Entering Mentoring Curriculum*



## Seminar Topics:

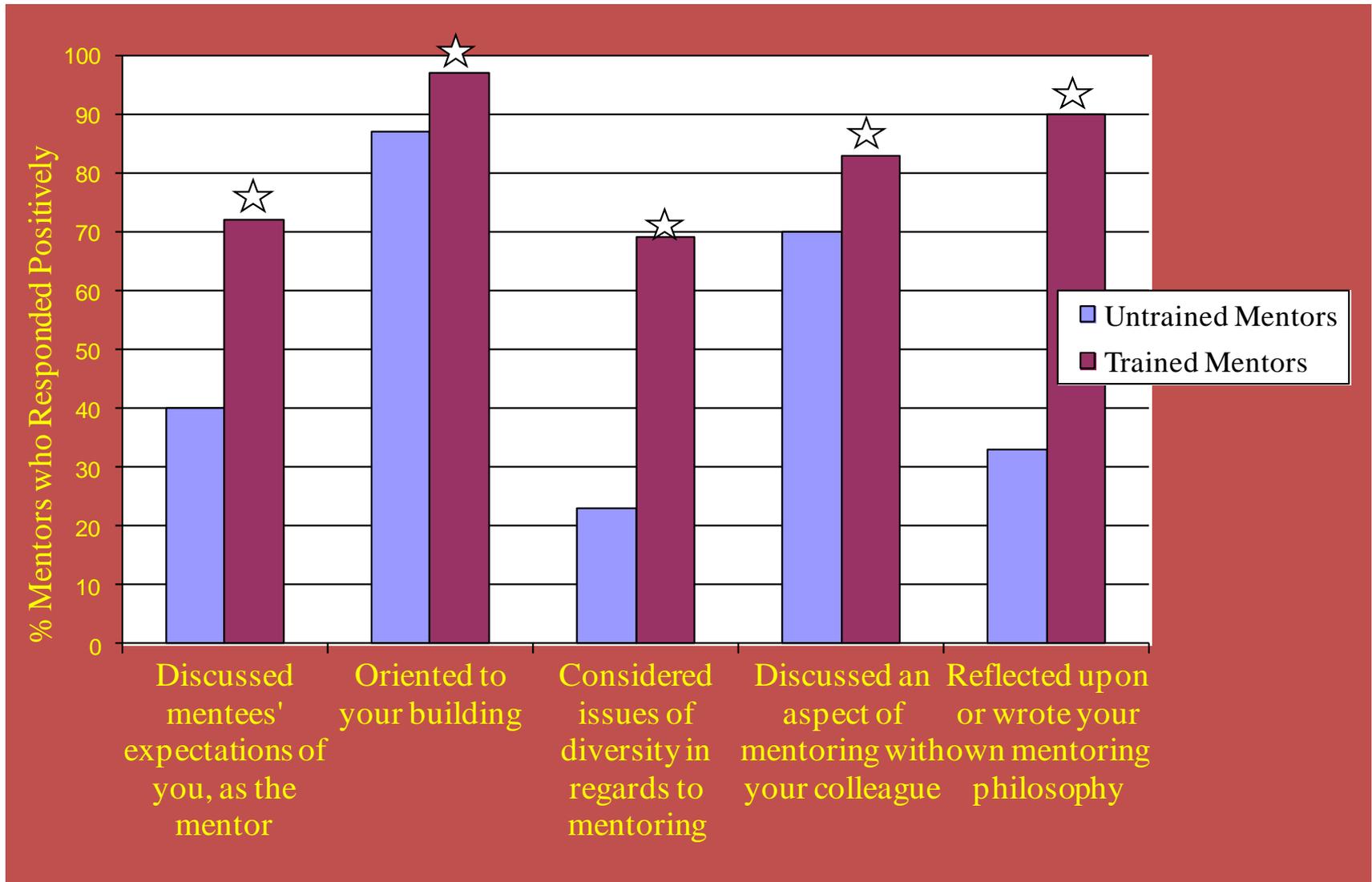
- Establishing a good relationship with your mentee
- Communication
- Expectations
- Understanding
- Diversity
- Ethics
- Independence
- Developing a Mentoring Philosophy

Developed to train the graduate student, post-doc and faculty mentors of undergraduate researchers (<http://www.researchmentortraining.org/>)

# Key Elements of Mentor Training

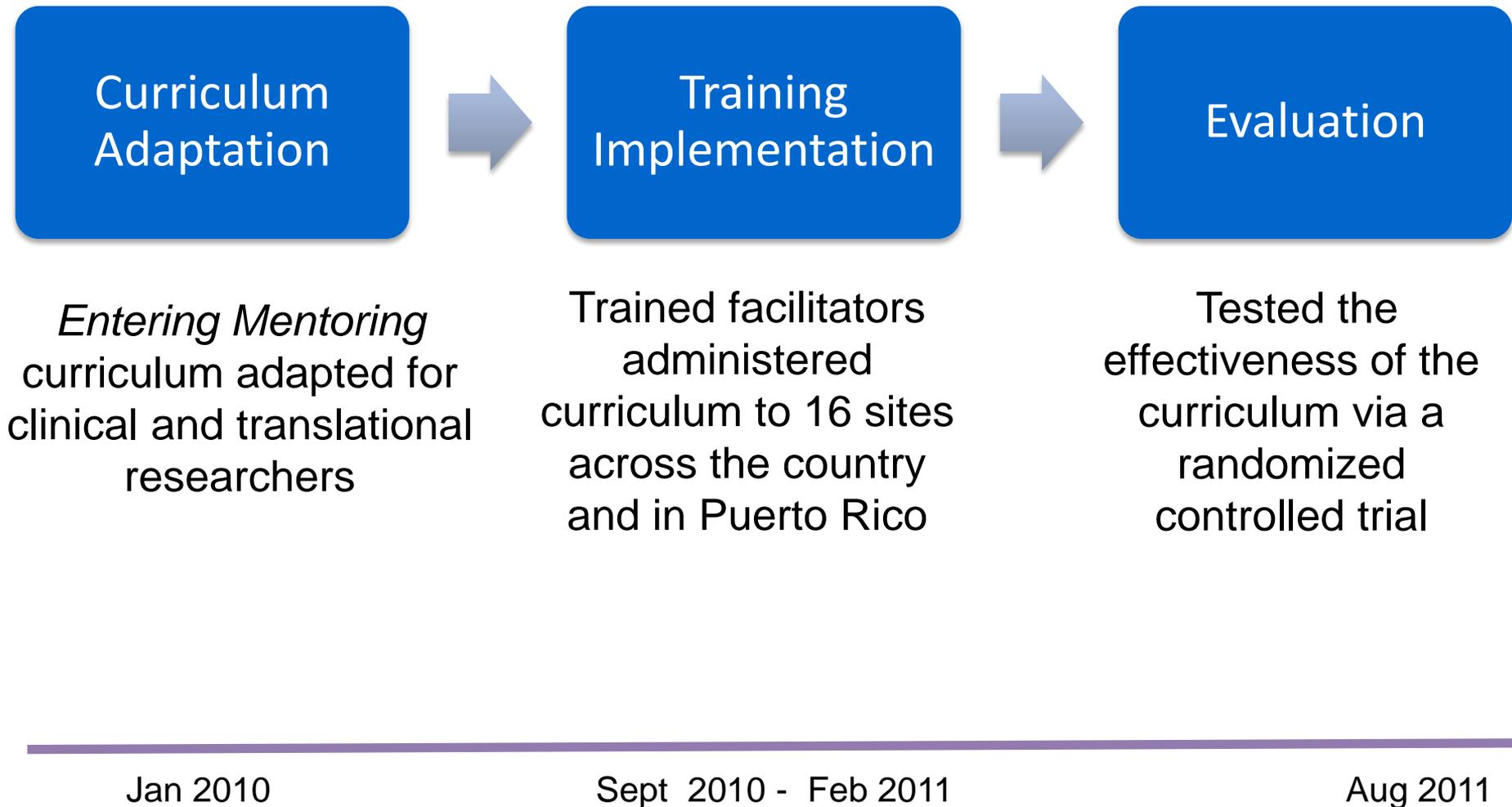
- Process-based using case studies and group problem-solving
- Aimed at awareness-raising
- Provides a forum and safe space to share the collective experience of mentors across a range of experiences
- Links to resources to improve mentoring

# The Merits of Training Mentors

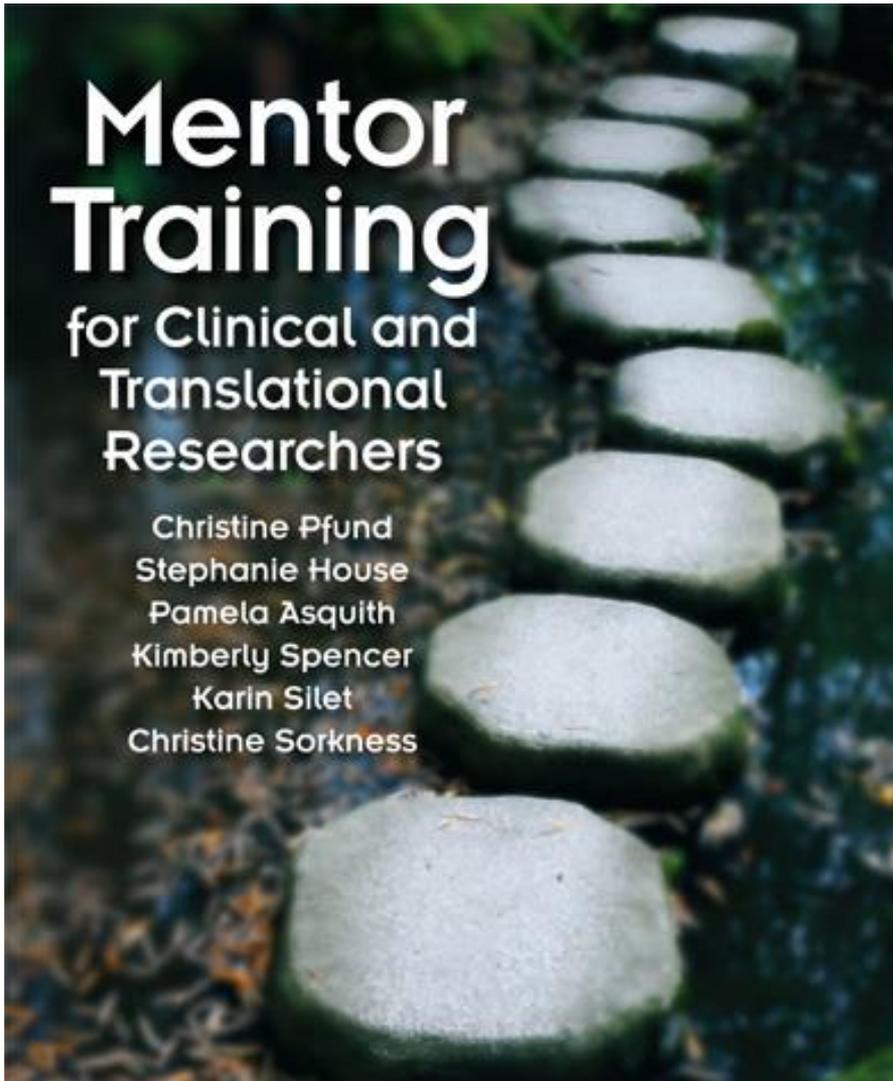


**Pfund et al. Science 311, 473 (2006)**

# Overview of Randomized Trial to Test Effectiveness of Mentor Training Curriculum

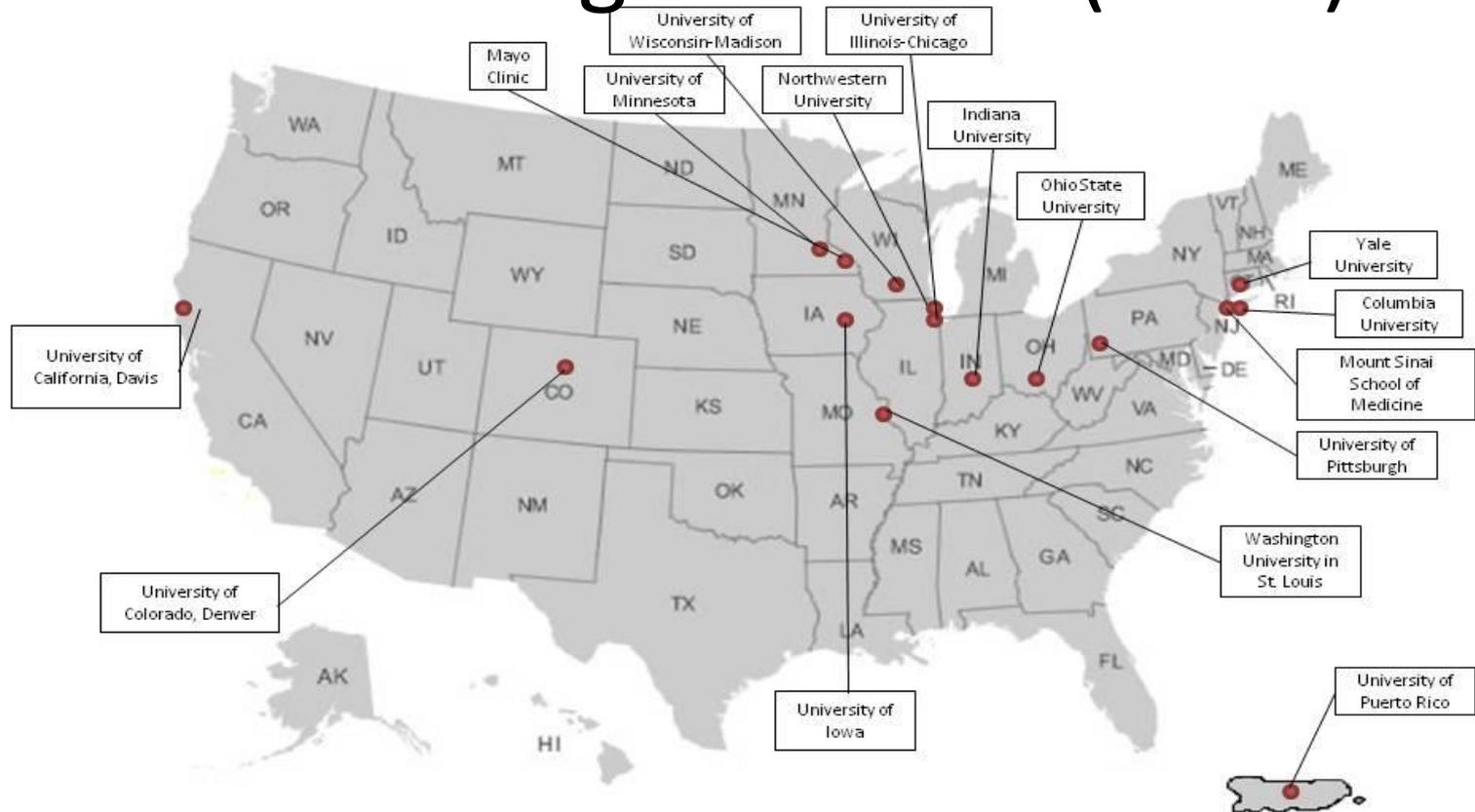


# Curriculum Adaptation: Final Published Version

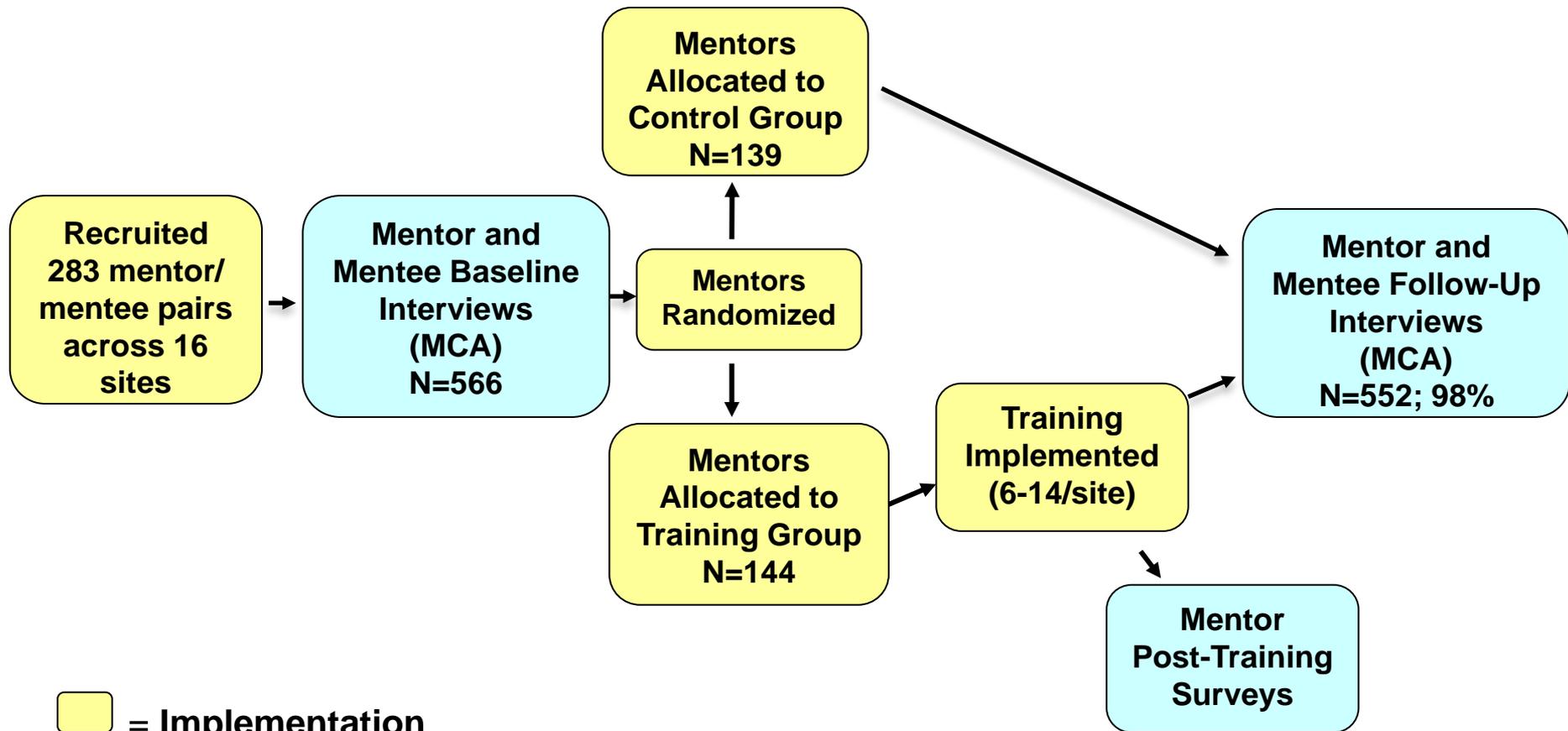


Session	Topic
<b>Session 1</b>	Introduction to Mentor Training (30 min)  Maintaining Effective Communication (90 min)
<b>Session 2</b>	Aligning Expectations (75 min)  Assessing Understanding (45 min)
<b>Session 3</b>	Addressing Equity and Inclusion (60 min)  Fostering Independence (60 min)
<b>Session 4</b>	Promoting Professional Development (90 min)  Articulating a Mentoring Philosophy and Plan (30 min)

# Training Implementation: Mentoring Trial Sites (n=16)



# Training Implementation and Evaluation: Flowchart of Research Mentor Training Trial



 = Implementation

 = Assessment

Jan 2010

Sept 2010 – Feb 2011

Aug 2011

# Study Population

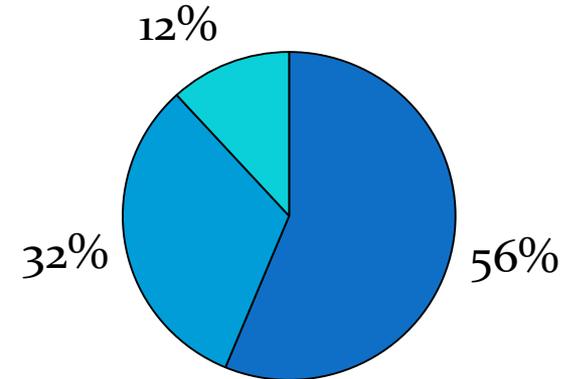
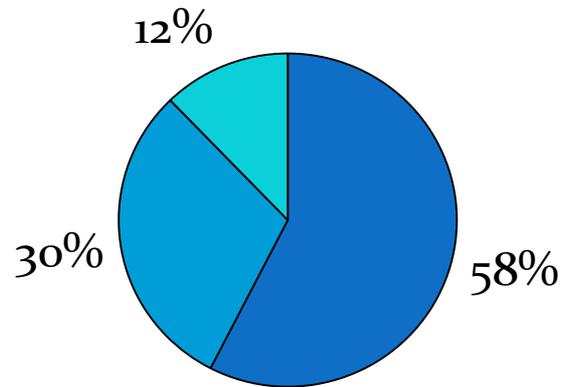
## N=283 Mentors

Control N=139

Intervention N=144

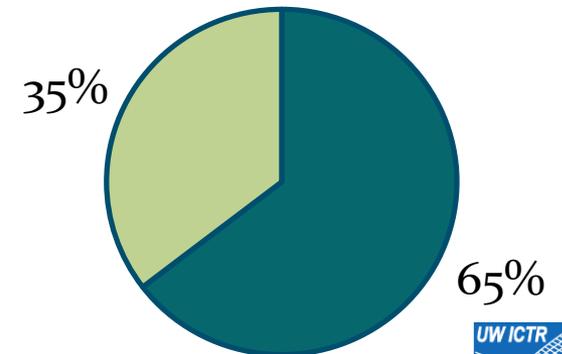
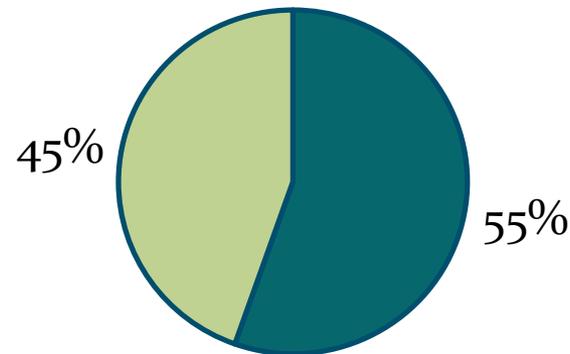
### Career Stage

- Professor
- Associate Professor
- Assistant Professor



### Gender

- Male
- Female



# Study Population

N=283\* Mentors

Race/Ethnicity	N (%)
White	257 (90.8)
Hispanic/Latino	20 (7.1)
Black/African American	6 (2.1)
Chinese	9 (3.2)
Asian Indian	7 (2.5)
Other Asian	5 (1.8)
Other	6 (2.1)

\*Respondents could choose more than one category

# Study Population

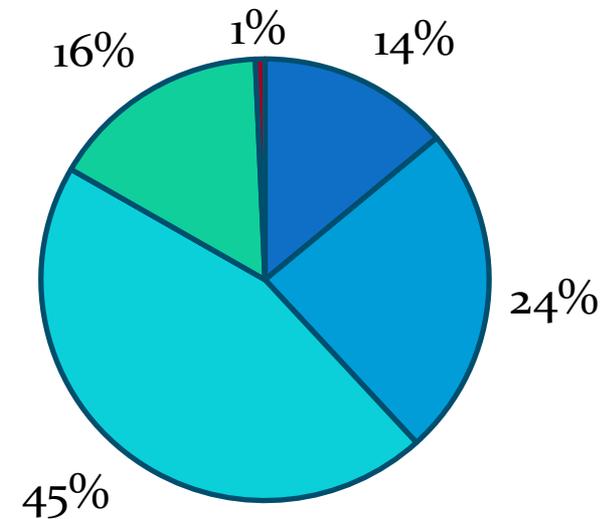
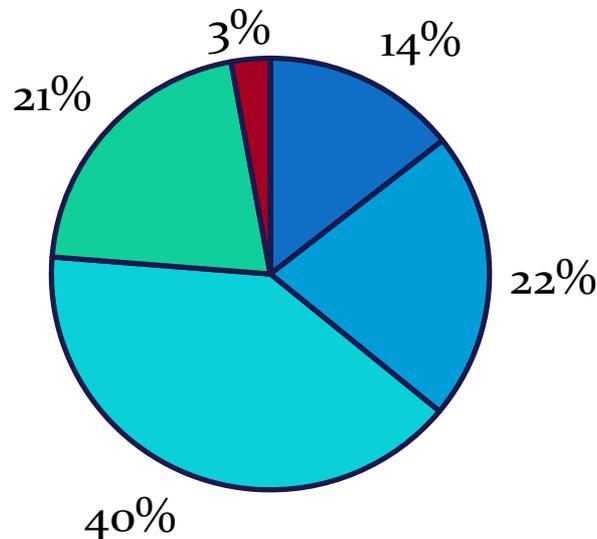
N=283 Mentors

## Control

## Intervention

### Number of Years Mentoring

- 1-5
- 6-10
- 11-20
- 21-30
- Over 30



The most common profile for a mentor is a 50 year old white male professor with 15 years of mentoring experience.

# Study Population

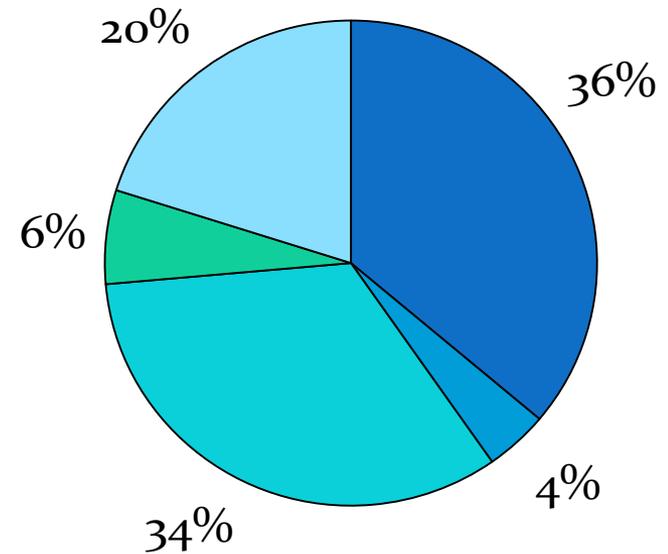
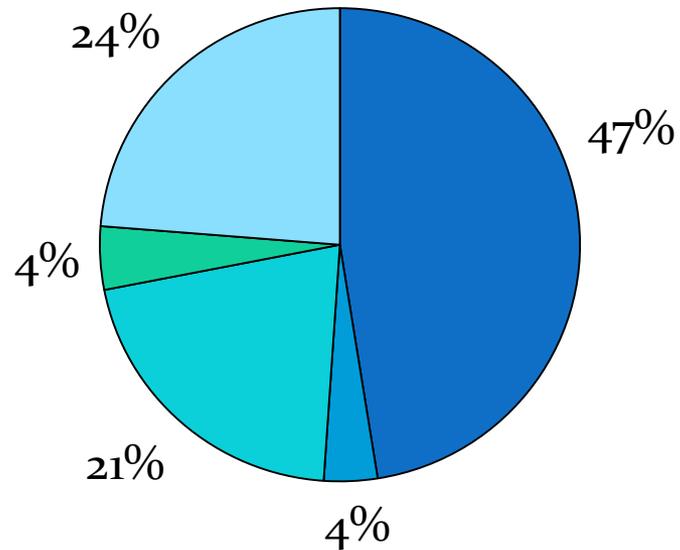
N=283 Mentees

Control N=139

Intervention N=144

## Career Stage

- Assistant Professor
- Associate Professor
- Postdocs/Fellows
- Scientist
- Other Trainee



# Study Population

N=283 Mentees

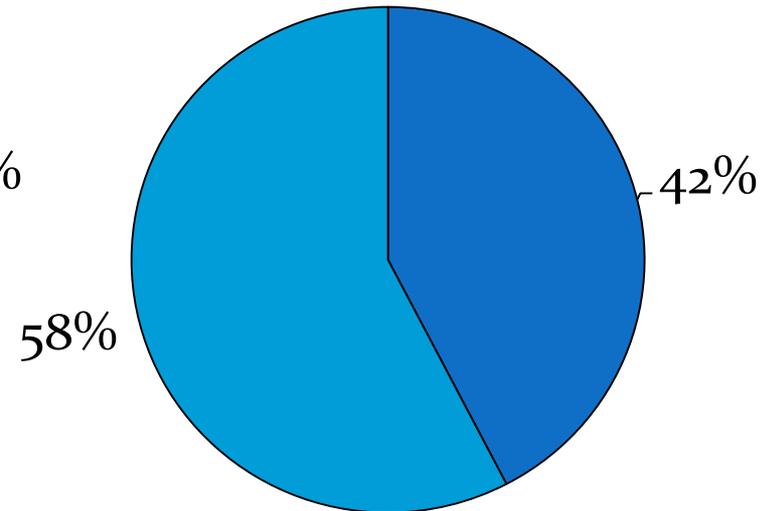
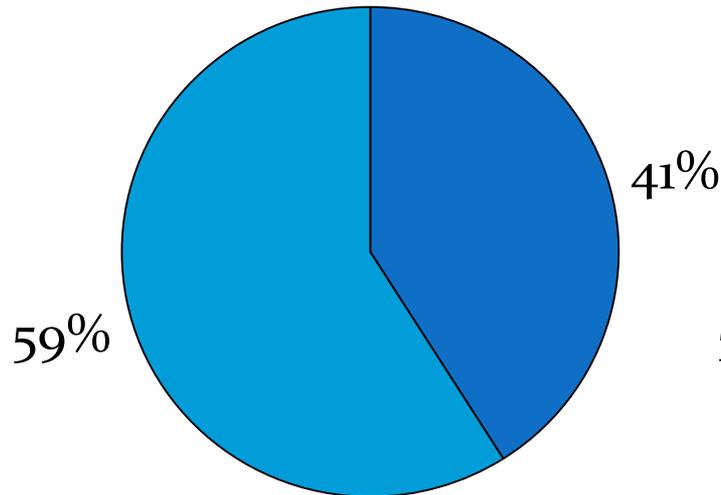
Control N=139

Intervention N=144

## Gender

■ Male

■ Female



# Study Population

N=283\* Mentees

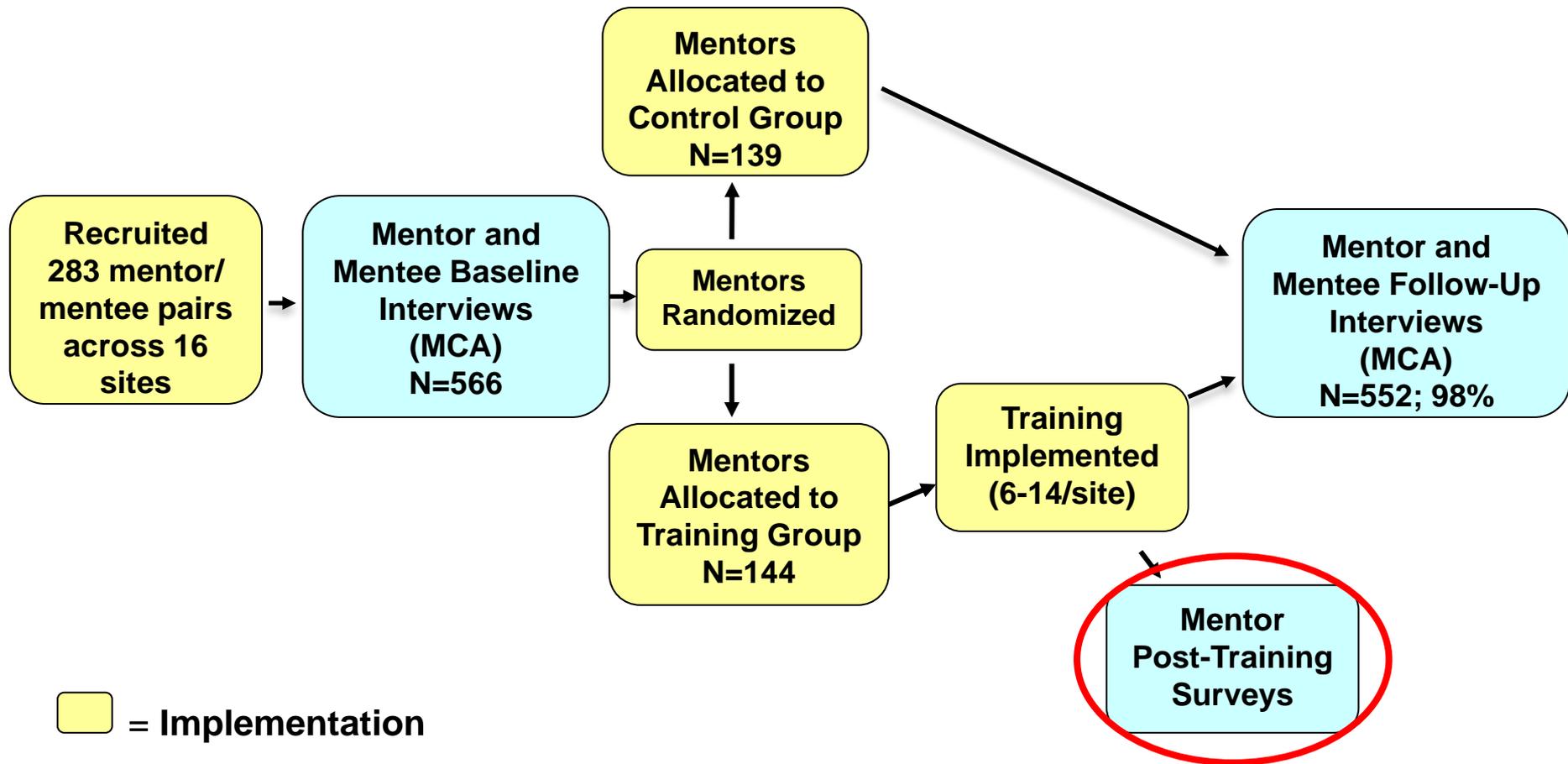
Race/Ethnicity	N (%)
White	208 (74.0)
Hispanic/Latino	32 (11.4)
Black/African American	19 (6.8)
Chinese	14 (5.0)
Asian Indian	20 (7.1)
Other Asian	16 (5.7)
Other	21 (7.5)

\*Respondents could choose more than one category

The most common profile for a mentee is a 36 year old white female who is an assistant professor.



# Training Implementation and Evaluation: Flowchart of Research Mentor Training Trial



 = Implementation

 = Assessment

Jan 2010

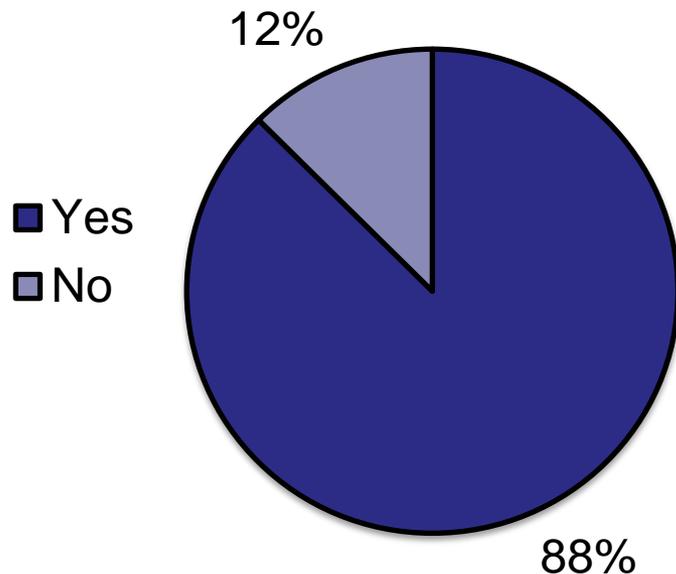
Sept 2010 – Feb 2011

Aug 2011

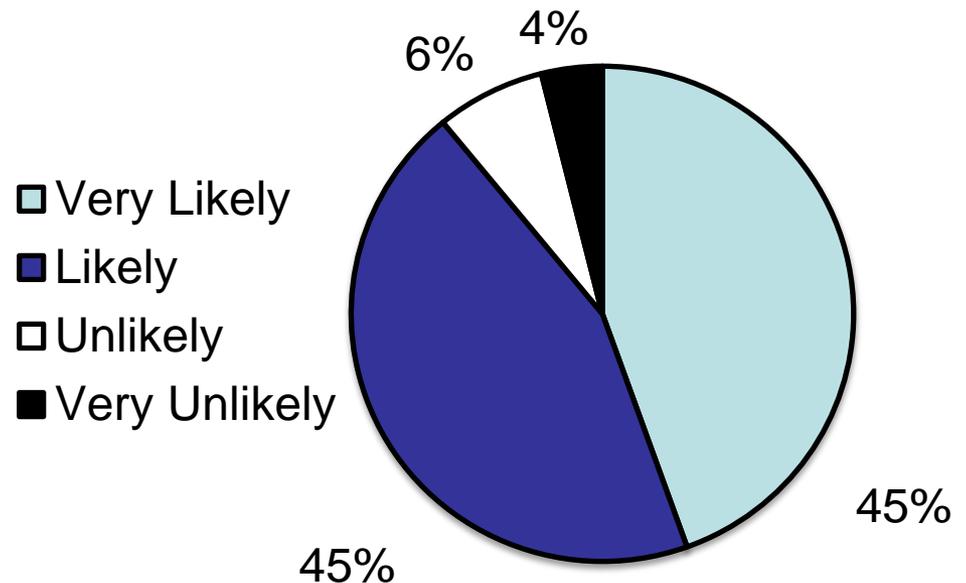
# Mentor Satisfaction with Training

N=128

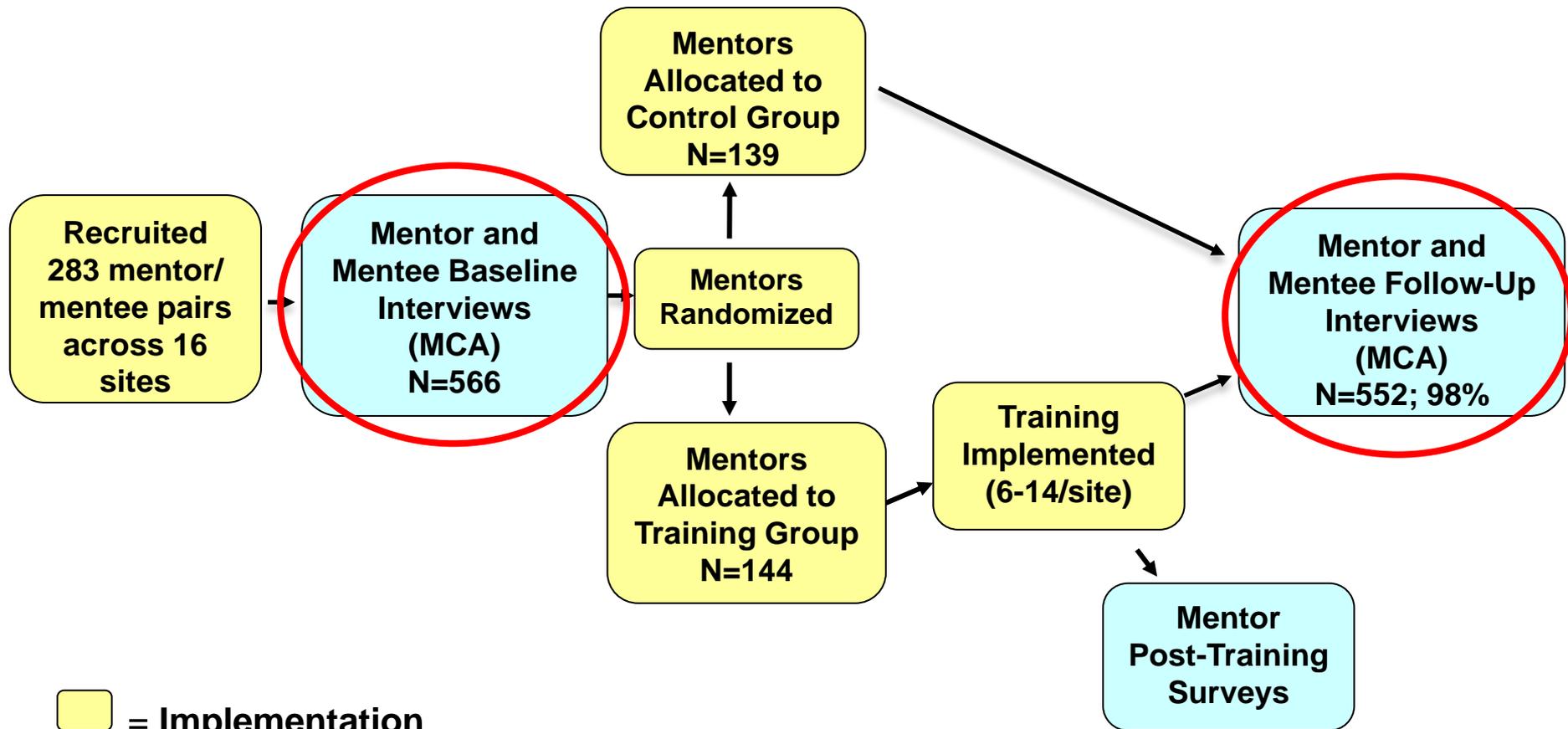
**Was the 8-hour training a valuable use of your time?**



**Would you recommend the sessions to a colleague?**



# Training Implementation and Evaluation: Flowchart of Research Mentor Training Trial



Jan 2010

Sept 2010 – Feb 2011

Aug 2011

# Training Evaluation:

## Baseline Interview Schedule

- Conducted with mentors and mentees (n=566, 283 pairs) in person by trained research assistants at each site
  - Close-ended survey
  - MCA (Mentoring Competency Assessment)

# Mentoring Competency Assessment (MCA) 26 items

	1 Not at all Skilled	2	3	4 Moderately Skilled	5	6	7 Extremely Skilled
Effective Communication (6 items)							
Aligning Expectations (5 items)							
Assessing Understanding (3 items)							
Addressing Equity & Inclusion (2 items)							
Fostering Independence (5 items)							
Promoting Professional Development (5 items)							

# Training Evaluation: Post Interview Schedule

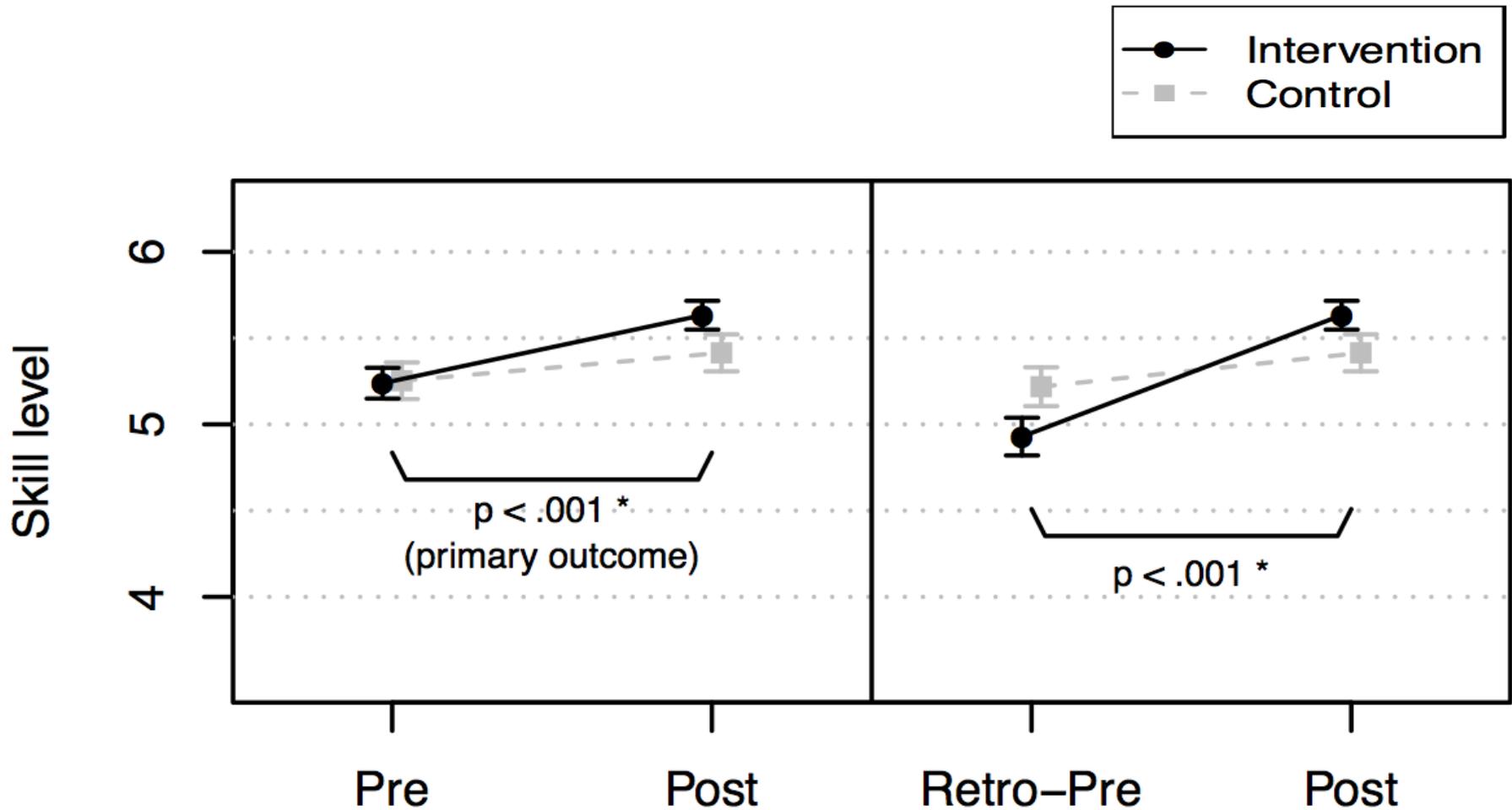
- Conducted with mentors and mentees (n=552, 98% retention rate) via phone by staff at UW Madison
  - Mirrors baseline but also includes:
    - Retrospective assessment of skills
    - Qualitative section
      - Mentors asked if they changed their behavior in each of the six competencies since baseline
      - Mentees asked if noted changes in their mentors' behavior in each competency since baseline

# Post Interview

## Mentor MCA Example Questions

	1 Not at all Skilled	2	3	4 Moderately Skilled	5	6	7 Extremely Skilled
Working with mentees to set clear expectations of the mentoring relationship-BEFORE							
Working with mentees to set clear expectations of the mentoring relationship-NOW							
Accurately estimating your mentees' level of scientific knowledge-BEFORE							
Accurately estimating your mentees' level of scientific knowledge-NOW							

# Primary Outcome: Significant Change in Mentor Self-Reported Effectiveness



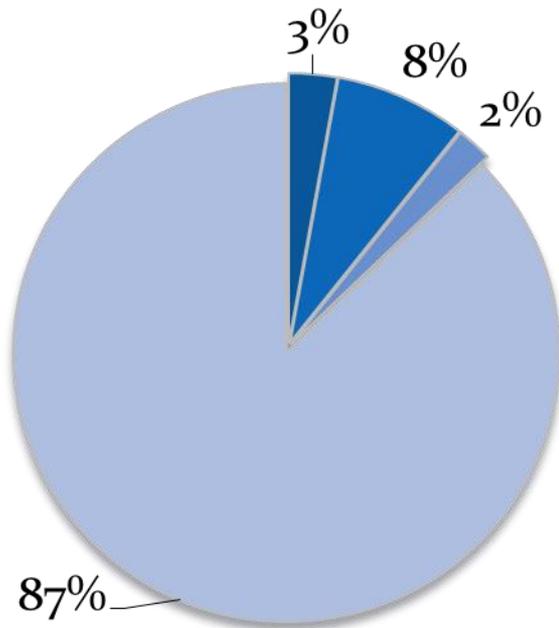
# Primary Outcome: Mentor Composite Scores

- Pre to Post improvements persist across:
  - Site
  - Gender
  - Academic title (Prof, Assoc. Prof, Asst. Prof)

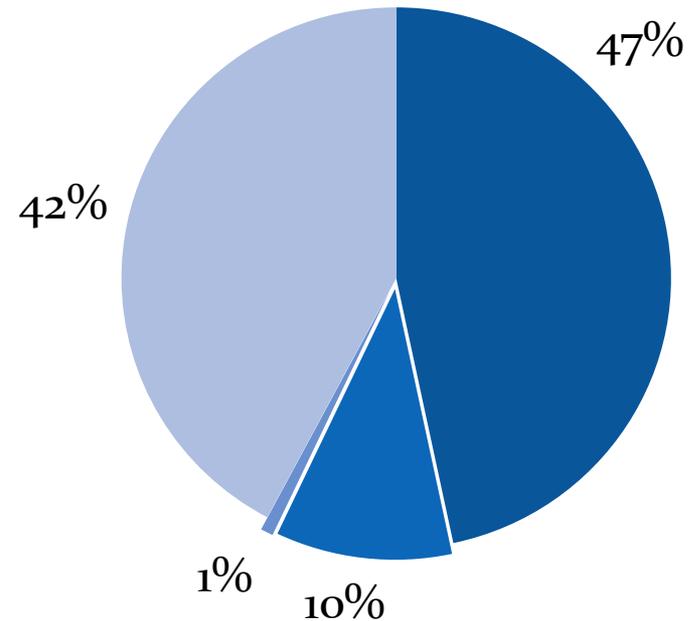
# Mentor Behavioral Change

N=141; 3 months post training

## Intervention



## Control



- No change
- Awareness
- Intent
- Implemented

# Examples of Stages of Change

## Awareness

“I *thought about* how I might adapt my mentoring based on cultural differences among mentees. I also *thought about* whether I was giving my mentees sufficient time or whether I had sufficient time to be a mentor to so many mentees.”

# Examples of Stages of Change

## Intent to Change

“In the future, I *will try* to make it my policy to meet with mentees away from my office, so as to minimize distractions and foster active listening. Also, it might be a good idea to interact with mentees more away from the office.”

# Examples of Stages of Change

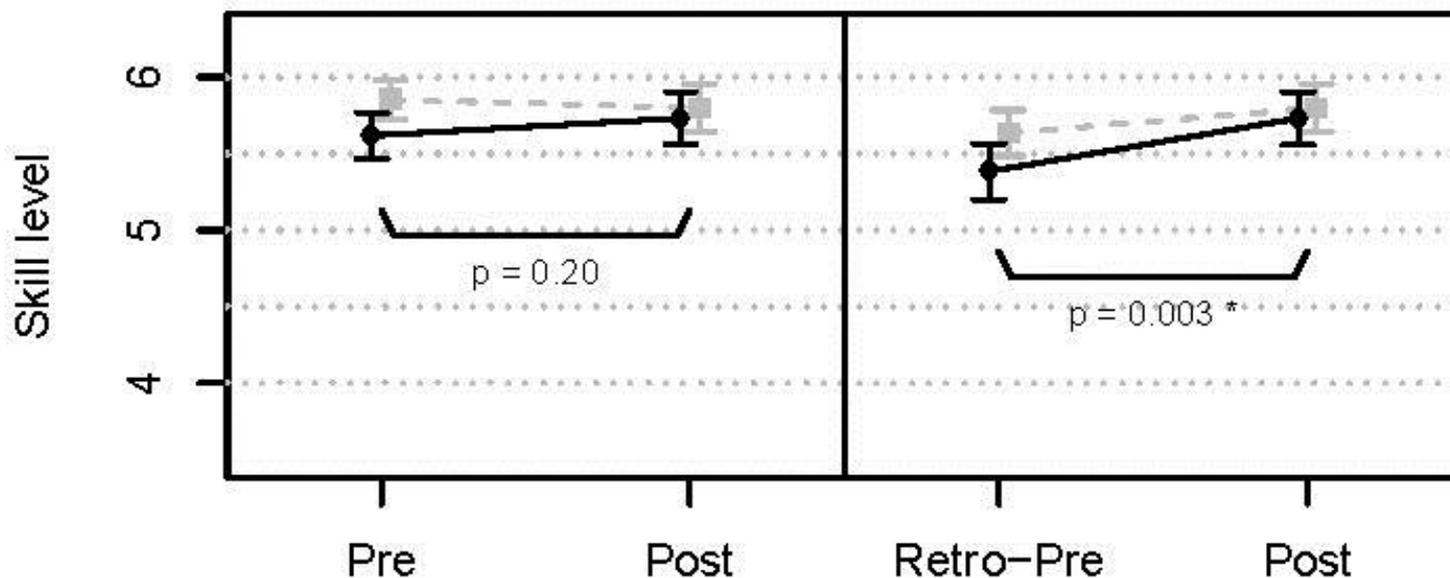
## Implemented Change

“I **have altered** my style of guiding a PhD student to stay on schedule with her research. In my latest meetings, **I approached** the discussion from the standpoint of 'how can I help' rather than 'why didn't you keep to the plan?' The PhD and I worked out a better approach to stay on schedule.”

# Significant Change in Mentee Assessment of Mentor Effectiveness



(B) Mentee-Assessed Composite Score



# Mentee Assessment of Mentor Behavioral Change

N= 140; 3 months post training

- 68% of mentees whose mentors were in the intervention group reported that they noted at least one positive change in their mentors' behavior as compared with 57% in the control ( $P = 0.053$ ).
- 44% noted two or more positive changes as compared with 24% in the control ( $P = .002$ ).

# Sample Quotes from Mentees of Trained Mentors

“There was a 100% change in communication and trust, those were two things that were lacking 6 months ago and they have greatly improved to make the relationship work”

# Sample Quotes from Mentees of Trained Mentors

“Yes, she communicates with me more and she seems to just be more helpful in general, more engaged. ...now she summarizes at the end of our meetings what’s expected of me and what’s my next step.”

# Sample Quotes from Mentees of Trained Mentors

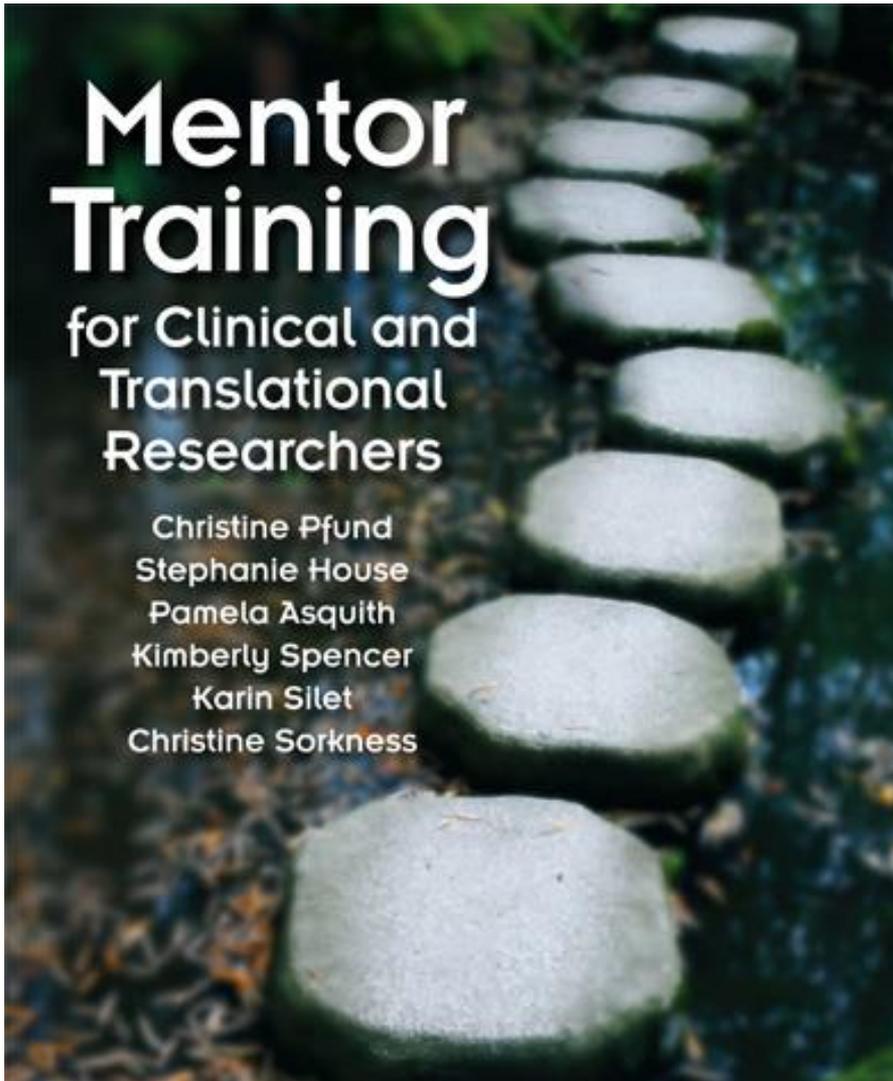
“I’ve seen a shift from general mentoring advice to specific mentoring advice about where I’m at and what I need to do in the next five years...I didn’t know those discussions could be so helpful. In terms of the people I mentor, it will definitely help there too.”

# Poll Question

Have you ever participated in mentor training?

- Yes, one based on EM
- Yes, a different one
- No

# Curriculum Adaptation: Final Published Version



Session	Topic
<b>Session 1</b>	Introduction to Mentor Training (30 min)  Maintaining Effective Communication (90 min)
<b>Session 2</b>	Aligning Expectations (75 min)  Assessing Understanding (45 min)
<b>Session 3</b>	Addressing Equity and Inclusion (60 min)  Fostering Independence (60 min)
<b>Session 4</b>	Promoting Professional Development (90 min)  Articulating a Mentoring Philosophy and Plan (30 min)

# Maintaining Effective Communication

## *Learning Objectives for Communication*

Mentors will have the knowledge and skills to:

- Provide constructive feedback
- Communicate effectively across diverse dimensions including various backgrounds, disciplines, generations, ethnicities, positions of power, etc.
- Identify different communication styles
- Engage in active listening
- Use multiple strategies for improving communication (in person, at a distance, across multiple mentees, and within proper personal boundaries)

# Facilitators Guide (Communication)

## **Maintaining Effective Communication** (Corresponds to Objective on Communicating Effectively across diverse dimensions.)

CASE STUDY (20 min): Case #3 Third Party Mediator

(2 min) Distribute case and let participants read the case individually for two to three minutes or ask someone to read it aloud.

(8 min) Small group discussion in pairs

(10 min) Large group discussion

## **Maintaining Effective Communication**

ACTIVITY: Active Listening

(3 min ) Explain how role playing will be handled

- One mentor shares a current challenge they are facing in their mentoring relationship(s).
- The second person practices active listening skills and tries to come to a clear understanding of the situation.
- The third person acts as observer and notes tone, body language, facial expressions, etc.
- Participants rotate roles and discuss what they learned as time allows.

(10 min) Participants form groups of three and practice two 5 minute rounds.

(7 min ) Large group debrief

# Communication Case

## *Third Party Mediator*

Dr. Cook is mentoring a K scholar who is researching an intervention to decrease tobacco use and exposure to second hand smoke. The intervention includes targeted education for smoking parents delivered in local clinics that serve a primarily poor minority population. Based on their adherence to the protocol and her overall reception, the scholar feels she has good relationships with the first three clinics, but can't seem to make much progress with a fourth, despite what seemed to be strong initial interest. She has tried to set up a meeting with her primary liaison at the clinic to discuss potential concerns, but the meeting keeps getting rescheduled. She has tried to reach the contact's supervisor directly, but her emails and phone calls have not been returned. She is confused and wonders if she should just give up and move on. She comes to Dr. Cook seeking his advice on what to do next.

### Guiding Questions for Discussion:

- What are the main themes raised in this case study?
- What should the mentor advise?
- How do you mediate communication between mentees and a third party?
- How might this scenario change if the mentor and/or mentee are from an 'in group,' i.e., the same ethnic or racial group as the clients or staff of the challenging clinic?

*From Mentor Training for Community Engaged Researchers*

# Poll Question

What should the mentor do first?

- Ask mentee more about what strategies she has used
- Contact the problem clinic directly
- Help mentee draft of an email to the liaison and ask to be cc'd
- Tell mentee to visit the clinic to discuss in person
- Tell the mentee to give up and move on

\*You may share additional ideas at the end if desired.

# VA Advanced Fellowship in Women's Health

## Mentor Enters Women's Health

- Adapted and facilitated by Anne Stahr, MS from Madison VA (anne.stahr@va.gov)
- Based on *Mentor Training for Clinical and Behavioral Researchers*
- 3 sessions/90 minutes each = 4.5 hrs vs 8 hrs
- Tweaked case studies and activities
- Concurrent combination of synchronous delivery:
  - online in virtual Blackboard Collaborate room and
  - on VANTS phone line with pdf of slides
- Participants: MD or PhD Women's Health clinicians, researchers and educators at varying stages

# VA Advanced Fellowship in Women's Health

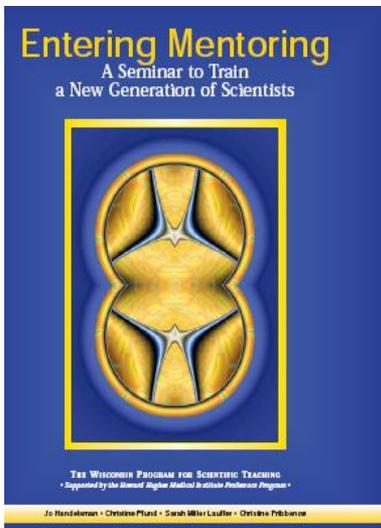
## Mentor Enters Women's Health

- Conducted a pilot of modified course
- Evaluation included:
  - Pretest/post test MCA
  - Focus group with survey
- Participant survey comment:

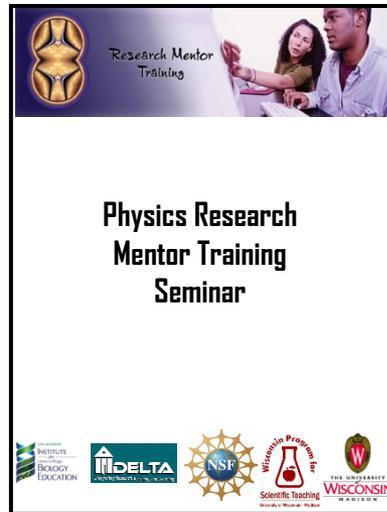
“. . .provided a great overview of topics. . .to cover with mentees. It helped me think like a mentor. . .and provided real life examples/cases. I think anyone (novice or expert mentor) could gain insight and learning from this course.”

# Available Training Curricula

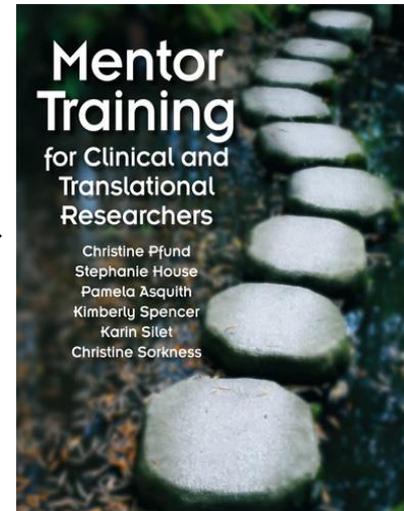
**HHMI**  
undergraduate



**NSF**  
undergraduate/ grad



**NIH**  
postdoc & jr faculty



**NIH**  
Grad/postdoc  
& jr faculty

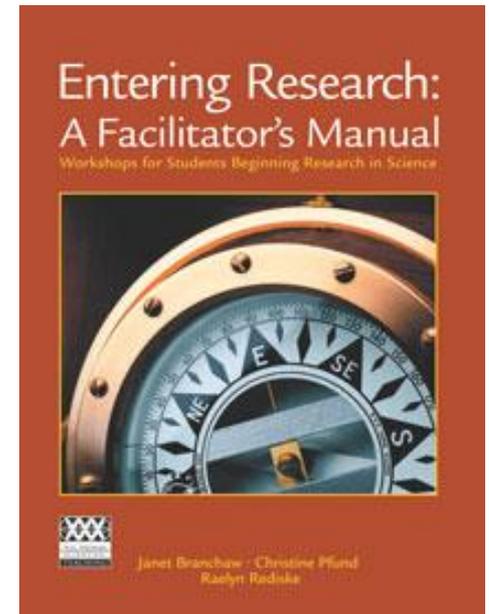


# *Mentee Intervention: Entering Research*

## Learning Goals for Undergraduates

Part 1: Students will find a research mentor, write a research project proposal, and begin research.

Part 2: Students will make significant progress on their research project, present their findings in a public venue, and write a mini-grant proposing the next phase of their research.



# Research Mentoring Website

<https://mentoringresources.ictr.wisc.edu>

UNIVERSITY OF WISCONSIN-MADISON

## Research Mentoring

*Cultivating effective relationships*



UW Institute for Clinical and Translational Research

UW ICTR

Home Resources ▾ Training ▾ About Us ▾

Register Login

Effective mentoring is a key component to the advancement of the scientific research enterprise. This website is designed to provide resources to improve research mentoring relationships. It provides curricula, assessment tools and resources relevant for mentors and mentees, as well as those who would like to implement mentor training.

### Mentor & Mentee Resources



Find resources to improve mentoring across each phase of the relationship.

### Training Curricula



Learn about effective approaches to training mentors and how to use our freely available training materials.

### Impact of Training



View feedback from participants in our research mentor training program.



Our UW-Madison team is leading the Mentor Training Core of the National Research Mentoring Network (NRMN). NRMN is part of a broader NIH consortium serving mentors and mentees that will strive to enhance diversity in the biomedical research



workforce.



# **NRMN**

**Mentoring to Diversify the  
Biomedical Workforce**

NRMNet.net  
[NRMN.info@bc.edu](mailto:NRMN.info@bc.edu)  
617-552-3901

Supported by the NIH  
U54 MD0009479-01  
9/2014 – 6/2019

# Hypothesis

*A comprehensive mentoring initiative can effect change by:*

- continuous training of the mentor and mentee through workshops, online resources and video training
- the facilitation of long-term, culturally responsive interactions
- an effective algorithm to match mentor and mentee across career stages and a framework for their relationship
- partnership with diverse stakeholders from our vast NRMN consortium.

# Goal

The overarching goal of the National Research Mentoring Network is to increase the diversity within the biomedical workforce by addressing the benefits and challenges of diversity, inclusivity and culture within mentoring relationships and more broadly the research workforce.



# Structure & Objectives

NRMN implemented the following four core structure:

## 1. *Administrative*

Oversees the growth and sustainability of The National Research Mentoring Network, ensures proper data collection and evaluation and coordinates with the NIH Coordination and Evaluation Center (CEC).

## 2. *Mentorship and Networking*

Develops the portal to support productive mentoring relationships by offering online resources and an algorithm to match mentors and Mentees. Recruitment of mentors and mentees to the NRMNet , provide face to face mentoring and networking through social media.

## 3. *Mentor Training*

Attracts mentors and mentees from a variety of biomedical research disciplines and establishes continuous training of best practices.

## 4. *Professional Development*

Identifies mentees from the undergraduate to early career faculty levels across the country and provides effective professional development for mentees along the career continuum.



# MENTOR TRAINING CORE

Christine Pfund, PI and Director, University of Wisconsin-Madison

Stephen Thomas, Associate Director, University of Maryland, College Park

Janet Branchaw, Associate Director, University of Wisconsin-Madison

# Aims & Expected Outcomes

- **Aim 1:** Serve as a national training hub.
  - **Expected Outcome:** Increased number of mentors and diverse mentees at various career stages engaged in accessible, evidence-based training, including existing and to-be-developed offerings in-person and online



**Research Mentor Training**

- Introduction to Mentor Training
- Getting Started
  - Pre-Made Curriculum & Workshops
  - Build Your Own Curriculum & Workshops
  - Solve Your Mentor Challenge
  - Virtual Community (coming soon)
- About this Project
- Contribute to the Site!

**Welcome to Mentor Training**

Your ability to mentor well can have huge impact on the overall experience and the productivity of both you and your mentee. While many efforts have focused on helping prospective and new faculty learn skills in grant writing, lab management, and classroom teaching, mentoring has been conspicuously absent. To address this need, we have developed this website which can help you to become a more effective mentor, and more importantly, can help you develop a seminar or workshop to train other research mentors.

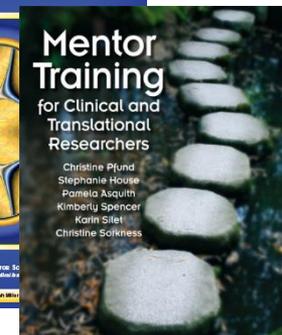
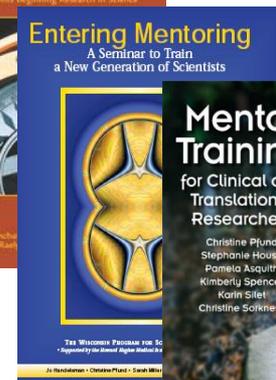
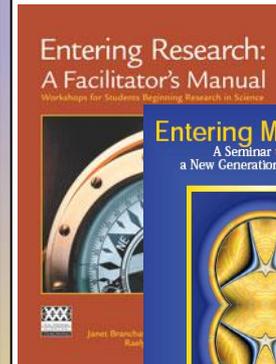
We hope you find the materials on this website useful and easily adaptable as you and your colleagues work to become more efficient and effective mentors!

**Case Study: Independence**

An experienced undergraduate researcher was constantly seeking input from the mentor on minor details regarding his project. Though he had regular meetings scheduled with the mentor, he would bombard her with several emails a day... see more

**Quotes:**

"Mentor training is a wonderful opportunity to formally learn and reflect on mentoring. The mentors in my group will no doubt mentor many other students in their careers. I believe this seminar will help them to do so more effectively."

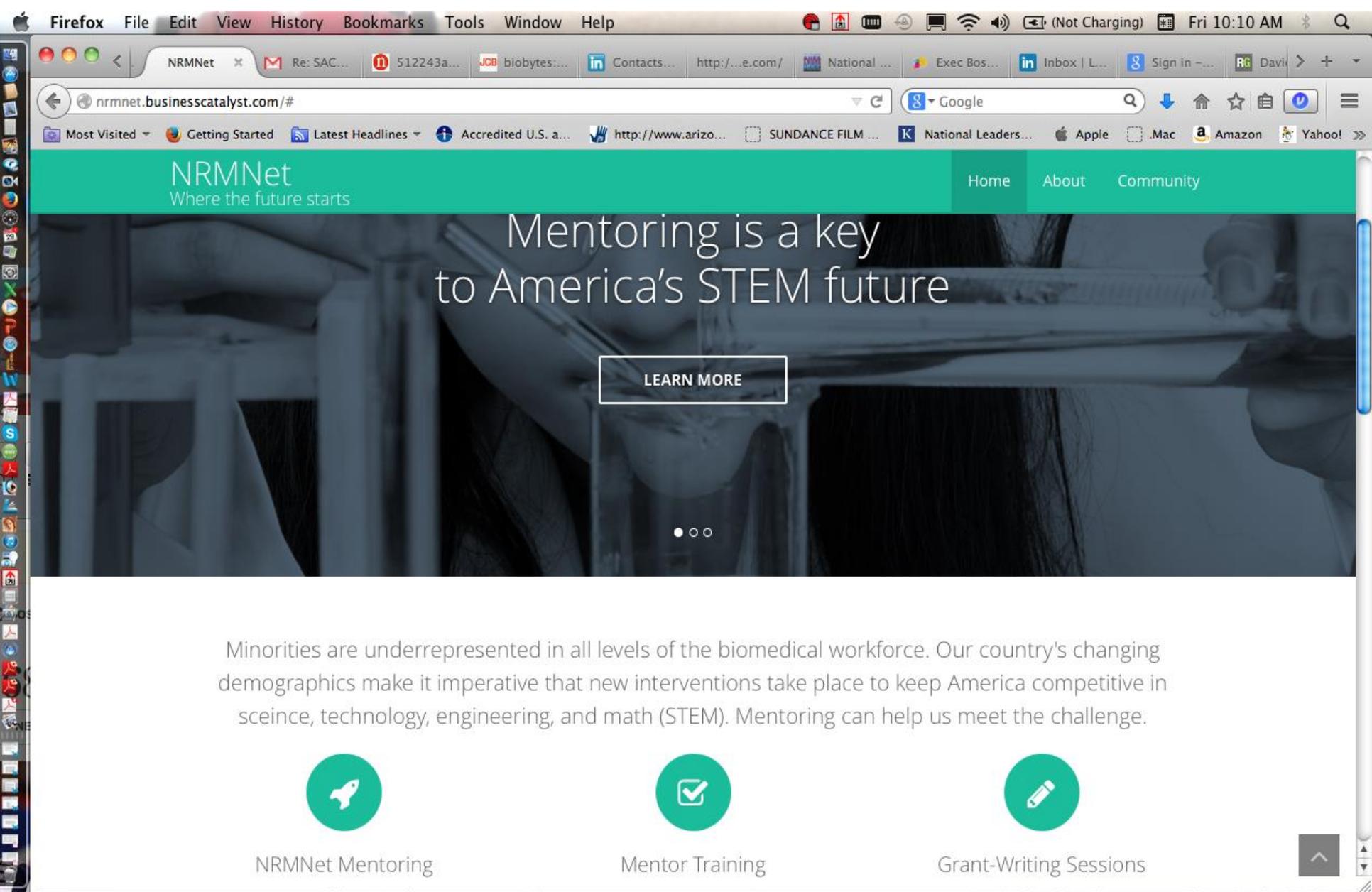


- **Aim 2:** Refine aligned mentor and mentee standards, and their accompanying metrics, for effective mentoring relationships.

– ***Expected Outcome:*** *A set of clear standards and tested metrics predicted to increase the number of diverse mentees who enter, persist in, and launch successful biomedical careers.*

### Proposed Standards for Effective Mentoring Relationships

- Teach Disciplinary Research Skills
- Maintain Effective Communication
- Align Mentor: Mentee Expectations
- Foster Independence
- Promote Professional Development
- Be Culturally Responsive
- Promote Mentee Research Self-Efficacy
- Foster Work-Life Integration
- Support Science Identity Development
- Reduce Bias and Mentee Stereotype Threat
- Enhancing Mentee Sense of Belonging



# Mentoring is a key to America's STEM future

LEARN MORE

Minorities are underrepresented in all levels of the biomedical workforce. Our country's changing demographics make it imperative that new interventions take place to keep America competitive in science, technology, engineering, and math (STEM). Mentoring can help us meet the challenge.



NRMNet Mentoring



Mentor Training



Grant-Writing Sessions

# Research Mentor Training Funding

- Original *Entering Mentoring* curriculum (HHMI Professors Program, PI: Handelsman)
- Adapted for use across science, technology, engineering, math, and social sciences (NSF #0717731, PI: Pfund) and clinical and translational science (CTSA) award mentors (NIH/NCRR ARRA UL1RR025011, PI: Drezner)
- Workshops and curricula have been developed for faculty mentors (NSF #0717731, PI: Pfund) including training workshops for T32 and R25 trainers
- NIH has funded a study to develop better understanding of specific factors in mentoring relationships that account for positive student outcomes (NIH #1R01GM094573-0 PI: Byars-Winston, co-I: Pfund) and renewal to focus on cultural aspects of mentoring relationships (PIs: Byars-Winston and Pfund)
- The curriculum has been adapted for use in a synchronous, online venue through the NSF-funded Center for the Integration of Research, Teaching and Learning (CIRTL) Network (NSF DUE-0717768, PI: Mathieu)
- CIRTL and APS partnered to adapt the curriculum for physic mentors.
- NIH has funded legacy website (3UL1RR025011-05S1, PI: Drezner), randomized controlled trial (3UL1RR025011-03S1, PI: Drezner) and train-the-trainer workshops (R13GM106445, Co-PIs: Pfund and Sorkness)
- NIH has funded the National Research Mentoring Network (NRMN) (U54 MD0009479-01; PIs Burgess, Ofili, Okeyemi, Pfund, and Vishwanatha)

# Thank you!

## Questions?

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