Research Mentor Training: Building and Sustaining the Research Enterprise

Professional Development Workshops
asm2015 115th General Meeting
New Orleans, LA

Learn • Network • Collaborate

Icebreaker
Add 4 fun facts about yourself to your name tag.

Examples include:
- Hometown
- Unique Skill/Hobby
- Favorite Food/Music/TV show
- # of Family Members
Workshop Facilitators

David Chaplin,  
University of Alabama Birmingham

Kelly Diggs-Andrews,  
American Society for Microbiology

William Glover,  
WA State Public Health Laboratories

Michael Ibba,  
Ohio State University

Harlan Jones,  
University of North Texas

Robab Katani,  
Pennsylvania State University

Beth Lazazzera,  
University of California Los Angeles

Vanessa McRae,  
Albany State University

Chinonye Nnakwe,  
University of Chicago

Beth Potter,  
Pennsylvania State University

Latishya Steele,  
Stanford University

Anita Wood,  
University of the District of Columbia
Workshop Objectives

Morning Workshop: Mentor Training for Microbiologists
• Design, implement, and evaluate various approaches to mentoring.
• Develop skills to build respect, trust, and communication with mentees.
• Build a community of trained mentors by sharing mentoring challenges and solutions collaboratively amongst peers.

Afternoon Workshop: Facilitator Training for Research Mentors
• Develop the knowledge and skills to implement mentor training.
• Be able to describe evidence supporting the effectiveness of research mentor training.
• Be able to articulate practical plans for implementing mentor training at their home institutions.
Morning Agenda

• 8:30 – 9:30 am  Welcome
  Purpose and Benefits of Mentor Training
  Introductory Activity

• 9:30 – 10:30 am  Mentor Training Round #1

• 10:30 – 11:30 am  Mentor Training Round #2

• 11:30 – 11:45 am  Debrief and Reflections
  Question and Answer

• 11:45 – 12:00 pm  Workshop Evaluation
Defining Mentoring

Using one’s own experience to guide another person through an experience that requires personal and intellectual growth and development.

Within the realm of scientific research training and career development, the primary research mentor(s) plays a critical mentoring role.
To be successful, research mentees must...

- develop technical & disciplinary knowledge in the field
- develop the tacit skills needed to craft a career to fit their needs & wants

Know **What** Skills + Know **How** Skills = Career Development

Research Mentoring Relationships

Adapted from Angela Byars-Winston, 2014
Research Mentoring Relationships

MENTOR

MENTOR/MENTEE

MENTEE

Principal Investigators (Faculty)

Junior Faculty/Post-doctoral researchers

Graduate/Medical Students

Undergraduate Researchers
Mentoring Matters
Strong Mentorship Has Been Link to:


- **Desire to pursue a Ph.D or M.D/ Ph.D** (McGee and Keller, 2007).

- **Persistence** (Sambunjak *et al*, 2010; Alberta *et al*, 2001; Solorzano 1993).

- **Research productivity** (Steiner *et al*, 2002; Wingard *et al*, 2004).

- **Higher career satisfaction** (Schapira *et al*, 1992; Beech *et al*, 2013)

- **Enhance recruitment of URMs** into biomedical research-related career pathways (Hathaway *et al*, 2002; Nagda *et al*, 1998).
Underrepresented Minorities Less Likely to Be in Effective Mentoring Relationships

• URMss typically receive less mentoring than their non-minority peers (Thomas et al., 2001; Helm et al., 2000; Morzinski et al., 2002).

• Minority investigators indicate that inadequate mentoring posed obstacles to obtaining funding (Ginther et al., 2011).
The Ginther Report: The Challenge

**GRANT GAP**

Scientists from racial minority groups are less likely than white applicants to receive research funding from the US National Institutes of Health.

- Black
- Asian
- Hispanic
- White
- Full sample*

Award probability, 2000–06 (%)

*83,188 applications

---

Figure from Nature. 2014. 512:243
Mentor Training Curriculum

Topics:

• Maintaining Effective Communication
• Establishing Expectations
• Assessing Understanding
• Addressing Diversity
• Discussing Ethics
• Fostering Independence
• Developing a Mentoring Philosophy

Originally optimized for biologists engaged in mentoring undergraduate researchers, many of whom were graduate students and post-docs.
Key Elements of Mentor Training

• Process-based using case studies and group problem-solving
• Aimed at awareness-raising
• Provides a forum to share the collective experience of mentors across a range of experiences
• Links to resources to improve mentoring
Experience Research
Mentor Training
### Session | Topic
--- | ---
1 | Introduction to Mentor Training
2 | Aligning Expectations
3 | Promoting Professional Development
4 | Maintaining Effective Communication
5 | Addressing Equity and Inclusion
6 | Assessing Understanding
7 | Fostering Independence
8 | Cultivating Ethical Behavior
9 | Articulating Your Mentoring Philosophy

*Optimized for mentors across STEM engaged in mentoring undergraduate researchers, many of whom were graduate students and post-docs*
Entering Mentoring 2nd ed.
Training Curriculum

<table>
<thead>
<tr>
<th>Session</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to Mentor Training</td>
</tr>
<tr>
<td>2</td>
<td>Aligning Expectations</td>
</tr>
<tr>
<td>3</td>
<td>Promoting Professional Development</td>
</tr>
<tr>
<td>4</td>
<td>Maintaining Effective Communication</td>
</tr>
<tr>
<td>5</td>
<td>Addressing Equity and Inclusion</td>
</tr>
<tr>
<td>6</td>
<td>Assessing Understanding</td>
</tr>
<tr>
<td>7</td>
<td>Fostering Independence</td>
</tr>
<tr>
<td>8</td>
<td>Cultivating Ethical Behavior</td>
</tr>
<tr>
<td>9</td>
<td>Articulating Your Mentoring Philosophy</td>
</tr>
</tbody>
</table>
Chapter 1: Introduction to Research Mentor Training

Introduction and Learning Objectives (page 9)

Mentors will have the knowledge and skills to:

1. Learn about other mentors in the group and begin building a learning community
2. Reflect on group dynamics and ways to make the group functional
3. Establish ground rules for participation
4. Identify qualities of good research projects for their mentees
5. Prepare to establish effective research mentoring relationships with their mentees
### Introduction to Research Mentor Training: Core Activities

<table>
<thead>
<tr>
<th>Learning Objectives</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Learn about other mentors in the group to begin building a learning community</td>
<td>Preintroductory online social networking (Activity #1)</td>
</tr>
<tr>
<td></td>
<td><strong>Introductory Activity (Activity #2)</strong></td>
</tr>
<tr>
<td>2. Reflect on group dynamics and ways to make the group functional</td>
<td>Constructive &amp; Destructive Group Behaviors (Activity #3)</td>
</tr>
<tr>
<td>3. Establish ground rules for participation</td>
<td>Give or generate group ground rules (Activity #4)</td>
</tr>
<tr>
<td>4. Identify qualities of good research projects for undergraduate mentees</td>
<td><strong>Brainstorm elements of effective research projects (Activity #5)</strong></td>
</tr>
<tr>
<td>5. Prepare to establish effective research mentoring relationships with their mentees</td>
<td>Share ideas for introductory activities in which to engage with mentees (Activity #6)</td>
</tr>
<tr>
<td></td>
<td>Write mentee project description and draft mentoring philosophy (Post-session Assignment)</td>
</tr>
</tbody>
</table>
Pair up and interview each other for 3 minutes each

- Write down facts about your partner’s work, research, and hobbies
- As part of this interview, ask each other about a significant mentor that has influenced their own practices (either positively or negatively).

Introduce your partner to the whole team (table)

**Twist** Playfully exaggerate 2 facts from your interview, except your partner’s name and mentor statements

Example: *If your partner plays basketball, then say that (s)he taught Kobe Bryant and Michael Jordan how to dunk.*
Objective 4: Identify qualities of good research projects for mentees

Who are you currently mentoring?

- Undergraduates
- PhD Students
- Medical Students
- Post-doctoral Fellows
- Junior Faculty
- Others (i.e. K-12 students, non-students, etc.)
Objective 4: Identify qualities of good research projects for mentees

What are the elements of a good research project in your discipline for a mentee?

Pick one person from your table to record conclusions from your discussion.

Image from: http://www.abrcms.org
Workshop Notes

Topic: Microbiology
Focus: Undergrads

Key elements
• Focused
• Easily Available
  – Technologically
  – Conceptually
  – Accessible resources/components
• Fits experience level
• Respects Timeframe, flexible time schedule
• Publishable
• Interesting and significant

• Covers whole project (not factory style)
• Well supported hypothesis
• Collaborative
• Requires understanding/reading literature
  – Needs published body of literature
• Provides communication opportunities (both written and oral)
• Planning (both mentor and mentee)
What did you learn about how mentors can positively and negatively influence mentees?

What are the elements of a good research project for mentees?
Elements of a good research project

• Shared goals between mentor and mentee that includes input form the mentee.
• Mentor and mentee should have an understanding of what each others ultimate outcomes are for the research project, eg. letter for medical school.
• Projects need to be significant and engaging to mentees. Mentors need to help mentees see the broader impacts of a project.
• Projects should stimulate a mentees creativity. To this end, the pros and cons of new research projects vs a follow-up of another’s research project should be considered.
• Mentees should have a passion for a project and be able to develop ownership of it.
• The timeframe and comfort level with the technical skills needs to be considered.
• Research projects should point out connections to mentees lives (classes).
## Mentor Training Discussion Groups

<table>
<thead>
<tr>
<th>Topics</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Group 4</th>
<th>Group 5</th>
<th>Group 6*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintaining Effective Communication</td>
<td>Fostering Independence</td>
<td>Addressing Equity and Inclusion</td>
<td>Aligning Expectations</td>
<td>Promoting Professional Development</td>
<td>Assessing Understanding Cultivating RER</td>
<td></td>
</tr>
</tbody>
</table>

### Discussion Leaders

#### Round 1
- **William Glover**
- **Beth Potter**
- **Robab Katani**
- **Anita Wood**
- **David Chaplin**
- **Kelly Andrews**

#### Round 2
- **Vanessa McRae**
- **Beth Lazazzera**
- **Mike Ibba**
- **Harlan Jones**
- **Anita Wood**
- **Kelly Andrews**
REFLECTIONS and DEBRIEF

Share your thoughts on:

- Highlights from small table discussions;
- Process-based approach to mentor training;
- Plans to implement lessons learned;
- Discussion points not covered.
Summaries: Maintaining Effective Communication

Key Barriers

• Language
• Intimidation
• Time availability
• Distance
• Priorities

• Mentee responsibilities
• Sensitive issues
• Age differences
• Personality
Summaries:

Aligning Expectations

Key Themes:
1. Grad school vs. med school
2. How much time should you devote to student based on student’s career choice
3. Training to be “like mentor” because alternate career paths are not worth time
4. Developmental advice to student mentorship

How to improve?
• Mentor needs to provide appropriate mentorship to student’s career paths (direct students to other career dev resources)
• Recognize that mentors cannot be all things to all students but need to know how to point students to right resources
• Value judgments; can mentor what you “know”
• Students “think” they know what they want; therefore mentors should query why students chosen a specific career path to help define and decide the true path
• Mentors should help students prepare for next career/training choice, i.e. GRE, MCAT
• Pros/cons of choice: Puts student in “driver's seat”

AMERICAN SOCIETY FOR MICROBIOLOGY
ANY QUESTIONS?
Acknowledgments

Many partners at UW-Madison and nationally

UW-Madison (past and present)

Pamela Asquith, Nick Balster, Robert Beattie, Chris Brace, Janet Branchaw, Kevin Buhr, Angela Byars-Winston, Gail Coover, Marc Drezner, Michael Fleming, Kimberly D’Anna, Amy Fruchtmann, Andrew Greenberg, David Griffeath, Jo Handelsman, Stephanie House, Eric Hooper, Erin Jonaitis, Paatrice Leverett, Kristyn Masters, Robert Mathieu, David McCullough, Trina McMahon, Sarah Miller, Rae Rediske, Karin Silet, Christine Pfund, Christine Sorkness, Kimberly Spencer, David Wassarman, Ashley Shade, Tehshik Yoon, Larissa Zakletskaia
Funding Acknowledgments

- NSF/ASM Leaders Inspiring Networks and Knowledge (LINK) program co-sponsored by the ASM Education Board and NSF Directorate for Biological Sciences (grant #1241970, Co-PIs: Amy Chang and Beronda Montgomery).

- 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: Dresner)

- Workshops and curricula have been developed for faculty mentors (NSF #0717731, PI: Pfund) including training workshops for T32 and R25 trainer. CIRTL and APS partnered to adapt the curriculum for physic mentors.

- 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)

- 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 as funded the National Research Mentoring Network (NRMN) (U54 MD0009479-01; PIs Burgess, Ofili, Okeyemi, Pfund, and Vishwanatha)
Workshop Evaluation

Please complete the workshop evaluation and leave on the table before you leave.

Thank you!