

Biology
Research Experiences for Undergraduates

Principal Investigators Workshop

April 4 – April 6, 2019

Bio REU Leadership Committee

2019

This report was prepared by the BIO REU Leadership Committee and funded by the National Science Foundation (NSF-DBI1842610 to Ian Billick, Rocky Mountain Biological Laboratory). Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the view of the NSF or the US government.

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Executive Summary

One hundred and fifteen representatives of REU sites participated in a workshop for principal investigators of Research Experience for Undergraduates (REU) Sites funded by the Biological Sciences Directorate at the National Science Foundation. The meeting was held on April 4 - April 6, 2019 at the Holiday Inn Rosslyn in Arlington, Virginia. The Bio REU Leadership Council (LC) organized the workshop to bring principal investigators together to network, share best practices and to provide feedback concerning longitudinal tracking.

The LC developed two main recommendations/actions that emerged from the workshop. The LC developed feedback and recommendations concerning the longitudinal tracking system, but this has been removed at the request of NSF.

- 1. We will rotate some longstanding members off the LC and add some new individuals.**
- 2. The REU LC will establish an REU PI listserv to facilitate communication among site directors.**

2019 Workshop Overview

Workshop Goals

This workshop was an opportunity for site directors to discuss and share best practices around a range of topics including but not limited to Title IX requirements, working with students with disabilities, culturally responsive mentoring, and responsible conduct of research. It was also an opportunity for site directors to foster initiatives to enhance the REU experience, provide feedback to NSF and Mathematica concerning implementation of longitudinal tracking, and discuss science communications.

Workshop Activities

Networking Meals - Workshop participants met one another and shared experiences and best practices around common interests.

Poster Session - Workshop participants presented posters featuring their programs.

Plenary Talks - Speakers shared their expertise in science communications, mentoring, and longitudinal tracking.

Breakout Sessions - These were facilitated discussions on topics. Potential topics were identified through a survey of REU PI's. At registration participants indicated which sessions they planned to participate in and we used this information to set the break out session schedule.

Description of Plenary Sessions

Plenary 1: "Science Communication." Anna Rothschild, Washington Post.

Anna Rothschild described her personal path from being an REU participant to science communication professional. She discussed storytelling using examples from her current work in digital media and described how digital storytelling could be implemented in REU programs.

Plenary 2: Science Communications. Dr. Kevin Padian (UC Berkeley). "Lessons from the "Intelligent Design" trial: Explaining evolution and climate science in a "post-evidentiary world."

Kevin Padian described the lessons he learned from participating as an expert witness in the Dover "Intelligent Design" trial, in which teaching science ultimately prevailed. He

provided suggestions for public advocacy of science, including arguing less from scientific evidence and more from the consequences of what we (scientists) do and why it matters. He also suggested engaging with non-scientists to find narratives that move us from outrage to strategies that focus on common interests.

Plenary 3. Mentoring. Dr. Beronda Montgomery (Michigan State University). “From deficits to possibilities: Supporting students’ growth and success.”

Beronda Montgomery described ways of thinking about mentoring, the role of the mentoring environment, and the critical factors that influence student success. She distinguished mentoring from advising and “imprinting.” She introduced the importance of fixed versus growth mindset for both our views of mentees and our views of ourselves as mentors. She also described culturally-relevant mentoring practices, and the importance of developing mentors.

Plenary 4. Panel Discussion: Moderated Q&A of Site Directors. Ian Billick (moderator), Janet Branchaw, Alan Berkowitz, Alonso Ramirez.

Panelists provided insights about most gratifying/most challenging aspects of their REU programs, tips for establishing a new program, student selection processes, recruiting, and assessment.

Plenary 5: Mathematica tracking. Dr. Clemencia Cosentino, Senior Researcher, Mathematica Policy Research. “Pilot Testing a tracking system.”

Dr. Cosentino presented preliminary results and fielded questions, but this information is not public so is not summarized here.

Feedback on 2019 Meeting and Recommendations for Future Meetings

We sent out a survey to meeting participants as well as collected and discussed anecdotal reports as the Leadership Council. We received lots of positive feedback about the meetings. People particularly seemed to enjoy the plenary sessions. There were numerous comments about the hotel (e.g., the audio system was poor and despite responsive AV staff we were unable to get it to work and the elevators were slow). However, the hotel is being torn down and we will not be returning, so we will not dwell on that feedback. Based upon the feedback we have the following suggestions for future meetings.

1. ***Continue recruiting strong plenary speakers.*** We should continue to dedicate resources, including potentially an honorarium in addition to travel funds, to maintain the quality of the plenary speakers.
2. ***Have an REU alumni give a plenary talk.*** People enjoyed Anna Rothschild's talk on science communication and how she was able to link it to her REU experience. We should continue with this tradition.
2. ***Ask plenary speakers to moderate break-out sessions.*** Kevin Padian's break-out session was very popular and it would have been nice to have similar break-out sessions for the other plenary speakers.
3. ***Continue providing an opportunity for last-minute break-out sessions.*** At the last minute we added a session on working with incarcerated students. When scheduling break-out topics we should leave space for at least two last minute additions.
4. ***Better manage expectations for break-out sessions.*** People enjoyed the looser nature of the break-out sessions, but there were at least a few individuals who were disconcerted by not knowing what to expect. We can provide more information ahead of the meeting about what to expect during the sessions, as well as make it clear that they are welcome to organize sessions.
5. ***Post and advertise the list of participants and contact email on the conference website.*** People requested that information and we were able to provide it on the website quickly. However, the posted information did not include contact information, nor was it made widely known that the information was available.

6. ***Have orientation tables towards the end of registration and during the mixer.***

People enjoyed the break-out session for the new PI's, as well as the panel discussion. However, the LC thinks that having designated tables, perhaps sorted by topic, during registration/mixer/poster session would help orient new PI's as well as facilitate the exchange of information.

7. ***Keep the opportunities for informal networking.*** There is a sense that the opportunities for people to talk during the unscheduled times, including the dinner the first night, are important and should be retained.

The Leadership Committee

The Bio REU Leadership Committee (LC) was established following the 2007 Bio REU PI workshop. Its mission is to promote an active and diverse undergraduate Biology research program. The LC plans and hosts the Bio REU PI workshops, develops and maintains a website for REU Site directors (www.Bioreu.org), and provides feedback to NSF concerning the program.

Leadership Committee members for the 2019 meeting:

John Barthell	University of Central Oklahoma
Ian Billick (Chair)	Rocky Mountain Biological Laboratory
Janet Branchaw	University of Wisconsin - Madison
Susan Carson	North Carolina State University
John Matsui	University of California – Berkeley
Camellia Okpodu	Xavier University
Mark Siddall	American Museum of Natural History
Julio Soto	San Jose State University
Michelle Evans White	University of Arkansas
Alan Wilson	Auburn University

Bio REU PI Workshop History

The 2019 workshop was the seventh workshop held for Bio REU PIs. Below we summarize previous workshops and the focus/outcomes/notes of those meetings.

YEAR	FOCUS/OUTCOMES/NOTES
2003	Included UMEB PI's
2007	Established Leadership Council
2010	America COMPETES
2012	Assessment, RCR, sustaining programs
2014	Evidence-based practices
2017	Common assessment
2019	Science communications, longitudinal tracking

Appendix 1: Workshop Agenda

NSF BIO REU PI Workshop, April 4-6, 2019

Holiday Inn Rosslyn, Arlington, VA

Thursday, April 4 (at Hotel)

1:00 – 5:00 PM	Registration and Name Badge Pickup
4:30 – 5:00 PM	Poster Session Set up
5:00 – 6:15 PM	Poster Session
6:15 – 6:30 PM	Welcome Ian Billick, LC Chairperson
7:00 – 8:45 PM	Networking Dinner

Friday, April 5

5:30-8:00 AM (optional)	Meet in lobby for walk along Potomac Heritage Trail with Alan Berkowitz
7:30 – 8:30 AM	Continental Breakfast & Informal Poster Session
8:30 – 8:45 AM	Meeting Goals Ian Billick, LC Chairperson
8:45 – 9:00 AM	NSF Remarks
9:00 – 9:45 AM	Plenary 1: Science Communication—Anna Rothschild
9:45-10:00 AM	AM Break
10:00– 10:45 PM	Plenary 2: Science Communication- Kevin Padian, Lessons from the “Intelligent Design” trial: Explaining evolution and climate science in a “post-evidentiary world”
11:00 – 12:00 PM	Breakout Session of Choice #1
12:00 – 1:15 PM	Networking Lunch and Informal Poster Session
1:15 – 1:30 PM	Descriptive Statistics of BIO REU Sites <i>Dr. Sally O’Connor, Program Director at National Science Foundation</i> <i>Starlette M. Sharp</i>
1:30 –2:30 PM	Plenary 3: Mentoring--Beronda Montgomery “From Deficits to Possibilities: Supporting Students’ Growth <i>and</i> Success”
2:30-3:45 PM	Breakout Session of Choice #2
3:45 – 4:00 PM	PM Break- Light Snacks, Beverages, and Networking
4:00 – 5:00PM	Plenary 4: Panel Discussion (Moderated Q&A of Site Directors), Ian Billick (moderator), Janet Branchaw, Alan Berkowitz, Alonso Ramirez
5:00 PM	Adjourn for the Day

Saturday, April 6th

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7:30 – 8:30 AM	Continental Breakfast and Poster Take Down
8:30 – 9:30 AM	Breakout Session of Choice #3
9:30 – 10:00 AM	Plenary 5: Mathematica
10:00 – 10:15 AM	AM BREAK – Beverages and Light Snack
10:15 – 11:30 AM	Breakout Session of Choice #4
11:45 – 12:00 PM	Final Comments: Ian Billick

Appendix 2: Break-Out Topics

There were up to four sessions of each break-out topic, depending upon the level of interest.

1. Developing students self-identity as scientists
2. Assessment of REU Student Learning
3. Culturally responsive mentoring
4. Navigating/managing mentor relationships as a site director
5. Science Communications
6. Pre and Post REU Program enrichment
7. Discussion of REU Tracking Tool
8. Best and Cost-Effective Practices in REU program administration
9. Developing self-efficacy
10. Best practices in Implementing Ethics Training
11. Building cohorts
12. New PI Session
13. Serving students with disabilities
14. Sexual Harassment and Title IX
15. Recruiting a diverse range of student participants
16. Serving incarcerated and formerly incarcerated students

Appendix 3: Workshop Attendees

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Appendix 4: Workshop Survey Results

1. We received 42 responses to a survey we distributed the last morning of the workshop.
2. Twenty-three of respondents indicated they had previously attended an REU workshop and 19 indicated it was their first experience.
3. On a scale of 1-5, with 1 being poor and 5 being excellent, Beronda Montgomery's talk rated the highest, with an average rating of 4.8, followed by Anna Rothschild's at 4.5, and Kevin Padian's at 4.2.
4. Suggestions that people had for break-out topics included: evidence-based learning, working with more than 1 institution, working with community colleges, advice on renewal proposals (3), common assessment, IRB's, budgeting, recruitment, supplements, transitioning students back to their home institutions, professional development, cohort conflicts, safety, housing, and behavioral problems.
5. Everybody felt they had enough free time.
6. There was general support for keeping the meetings in early April, though there were a few calls to move the meetings to the fall or February/March.
7. Suggestions/feedback included:
 - a. Binning people by issues or types of programs to facilitate discussion
 - b. Appreciation for a lack of slides in breakout sessions
 - c. More structure to break-out groups (3) and/or short descriptions of break-out groups
 - d. Development of a listserv for REU PI's to facilitate communication
 - e. Talks by deputy or division directors from NSF
 - f. Providing contact info for participants
 - g. Having the meetings in the middle of the country to reduce travel time for people from the west coast.