An ASBMB Career Symposium

September 21, 2013
8:15 AM - 5:30 PM
University of Missouri, Columbia, MO
Our Sponsors

This workshop is made possible by the American Society for Biochemistry and Molecular Biology (ASBMB) with additional support from the following academic units at the University of Missouri:

Department of Physics and Astronomy
O. M. Stewart Fund
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Chancellor’s Distinguished Visitors Program
Division of Biological Sciences
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Organizing Committee

Dr. Hannah Alexander, Division of Biological Sciences
Dr. Stephen Alexander, Division of Biological Sciences
Carina Collins, Division of Biochemistry
Melody Kroll, Division of Biological Sciences
Dr. Deanna Lankford, Office of Science Outreach
Dr. Mannie Liscum, Division of Biological Sciences and the MU Graduate School
Dr. Bruce McClure, Division of Biochemistry
Tim Pale, Division of Biological Sciences
Dr. Lily Tesfali, Division of Biological Sciences and MU Postdoctoral Association Council
Dr. John Walker, Division of Biological Sciences
Event Schedule

All events will be held in Chamber Auditorium unless otherwise indicated.

7:30  Registration and continental breakfast

8:15  Introductions and Welcome
      Dr. Hannah Alexander, University of Missouri

Session I: Communicating Science to K-College

8:30  Partnering with K-12 Science Teachers and Students
      Dr. Troy Sadler, University of Missouri

9:00  College Science Teaching to Science-bound and Non-Science Bound Students
      Dr. Bethany Stone, University of Missouri

9:30  Reach for the Stars – Bringing Graduate Research to K-12 Education
      Dr. Michelle Paulsen, Northwestern University

10:00 Bringing Education Back to the Rural Community
      Drs. Billy and Julie Hudson, Vanderbilt University

10:45 Break (Room 2206)

Session II: Effective Science Communication

11:00 The Effective Use of Rhetoric in Scientific Communication
      Dr. Keith Gibson, Allen Communication Learning Services

11:30 Bad Presentation Bingo: The Science Communication Game You DON’T Want to Win
      Monica Metzler, MA, JD, Illinois Science Council

12:00 Science in the News
      Dr. Morgan Thompson

12:30 Lunch Provided (Room 2206)
Concurrent Session A: Interactive Workshop (Room 2205)

1:15 All the World’s a Stage: How to Connect with An Audience
Dr. Suzanne Burgoyne, University of Missouri

Concurrent Session B: Outreach Programs Spotlight (Room 2206)

1:15  ASBMB’s Public Outreach Committee
Dr. Geoff Hunt, ASBMB

1:35  Saturday Morning Science
Dr. Bruce McClure, University of Missouri

1:55  Teaching STEM Graduate Students to Communicate with the Public: A New Graduate Course and Practicum
Melanie Bauer and Eric Hamilton, Washington University-St. Louis

2:15  RELATE: Researchers90 Expanding Lay-Audience Teaching and Engagement
Elyse Aurbach and Katherine Prater, University of Michigan

2:45  Break (Room 2206)

Session III: Communication and Outreach in Science Careers

3:00  The Role of Science Communication in Getting and Keeping a Faculty Position
Dr. Supriya Srinivasan, The Scripps Research Institute

3:30  The Role of Science Communication in Getting and Keeping a Position in Industry
Dr. Suzy M. Cocciolone, BASF Plant Science

4:00  Preparing Future Faculty
Dr. Mannie Liscum, University of Missouri

4:30  Keynote Lecture
Communicating Science & NSF Broader Impacts
Dr. Karen Cone, National Science Foundation

5:30  Networking Event (pizza served)
Sponsored by the MU Biochemistry Graduate Student Organization
Dr. Hannah Alexander

**Adjunct Associate Professor, University of Missouri**

Dr. Hannah Alexander was educated both in science and in science education at the Hebrew University in Jerusalem, Israel, and worked at Tufts Medical School, Boston, MA, and The Scripps Research Institute, La Jolla, CA. In 1987, she joined the faculty in the Division of Biological Sciences at MU, where she conducted research on the molecular basis of resistance to anticancer drugs. She has directed her recent efforts on science outreach and, in particular, developing programs designed to train students to communicate science to lay adult audiences.

Elyse Aurbach and Katherine Prater

**Graduate Students, University of Michigan**

Elyse Aurbach and Katherine Prater are graduate students studying anxiety and depression in the Neuroscience Graduate Program at the University of Michigan. Through their previous experiences in outreach and education, they have realized a passion for promoting lay-audience communication—especially for the biological sciences. Their project RELATE: Researchers Expanding Lay Audience Teaching and Engagement was selected as the “Community Choice” Winner in the NSF’s Graduate Education Challenge competition. RELATE combines lay-audience engagement training with community service to target adults underserved by outreach efforts.

Suzanne Burgoyne, Ph.D.

**Curators’ Teaching Professor of Theatre, University of Missouri**

A past Fulbright Scholar, Kellogg National Fellow, and Carnegie Scholar, Dr. Burgoyne continues to pursue her interest in applying techniques from theatre to education in other disciplines. In 2011, she attended Stony Brook University’s Center for Communicating Science Summer Institute where, under the leadership of noted actor Alan Alda, improvisation is a key training method.
Suzy Cocciolone, Ph.D.

Research Manager, BASF Plant Science

Dr. Suzy Cocciolone is a Research Manager in the plant biotechnology division of BASF, a major global chemical company. She has 13 years of experience in the biotechnology industry, starting out as a bench scientist and climbing the corporate ladder to project management. She is an alumnus of University of Missouri, with a Ph.D. in biology.

Karen Cone, Ph.D.

Program Director, National Science Foundation

Dr. Karen Cone is a Program Director and Leader of the Genetic Mechanisms Cluster in the Division of Molecular and Cellular Biosciences at the National Science Foundation. She joined NSF in 2009 after 20+ years as an NSF-funded principal investigator. Cone is a strong proponent of NSF’s use of “Broader Impacts” as one of the criteria for reviewing proposals and projects.

Keith Gibson, Ph.D.

Senior Design Consultant, Allen Communication Learning Svcs

At Allen Communication Learning Services, Dr. Gibson designs education programs for corporate and academic clients. He holds a PhD in rhetoric from Penn State University, and he has previously served as a faculty member at Auburn University and Utah State University. He has published several articles on scientific and technical communication in Technical Communication Quarterly, Programmatic Perspectives, and The Writing Instructor.

Eric Hamilton and Melanie Bauer

Graduate Students, Washington University in St. Louis

Eric Hamilton and Melanie Bauer are both graduate students at Wash U with experience in science outreach. Their project Communicating Science to the Public: A New Graduate Course and Practicum received Third Place in the NSF’s Graduate Education Challenge competition. Their project proposes a course that would teach students to practice their science communication skills with local, regional, and national audiences.
Billy Hudson, Ph.D., and Julie Hudson, Ph.D.

**Aspirnaut Initiative and Vanderbilt University**

Dr. Billy Hudson is the Elliott V. Newman Professor of Medicine, Biochemistry, and Pathology and Director of the Vanderbilt Center for Matrix Biology at Vanderbilt University Medical Center. Dr. Julie Hudson is Assistant Vice Chancellor for Health Affairs for Medical Center Relations at Vanderbilt University Medical Center. The Hudson family launched and directs the Aspirnaut Initiative, a project designed to elevate math and science achievement of rural students by transforming idle time on long school bus rides into productive learning time.

Geoff Hunt, Ph.D.

**Public Outreach Coordinator, American Society for Biochemistry and Molecular Biology (ASBMB)**

Dr. Geoff Hunt is the staff liaison for the Public Outreach Committee. He has a background in science, having received his PhD from Princeton University in 2009 for work on the effects of extracellular matrix proteins on embryonic stem cell behavior. Dr. Hunt began work at ASBMB in 2010 as the society’s Science Policy Fellow, working in the Office of Public Affairs, before transitioning to his current position at the beginning of 2012. His role with the Public Outreach Committee is to translate the ideas and enthusiasm of the committee members into action. In addition to (or as part of) his day job, Dr. Hunt has been known to perform the occasional science rap.

Mannie Liscum, Ph.D.

**Professor and Associate Dean of Graduate Studies, University of Missouri**

Dr. Mannie Liscum helps organize MU Graduate School’s Preparing Future Faculty Program (PFF), which helps doctoral students and postdoctoral fellows learn about faculty roles and job expectations and helps ensure that future faculty are prepared to meet the challenges of the 21st century.
Bruce McClure, Ph.D.

Professor of Biochemistry, University of Missouri

Dr. Bruce McClure has helped organize Saturday Morning Science since 2004. This series of science lectures for the general public attracts 100-150 people each week. How can such a series succeed in a world of tweets, blogs, and YouTube courses?

Monica Metzler, MA, JD

President, Illinois Science Council

Monica Metzler, MA, JD, has professional experience in law, government, politics, marketing and the nonprofit sector, but her passion is science outreach. She is the founding president of the Illinois Science Council, a nonprofit organization in Chicago that creates engaging public programs for adults to increase awareness and appreciation of science and technology. She has produced scores of outreach programs and attended hundreds of science and technology talks for both scientific and lay audiences. Metzler uses her experience to demonstrate in an engaging way the differences between good, bad, and must be avoided science presentations.

Michelle Paulsen, ME

Director of Science Communication Programs and Adjunct Professor of Education, Northwestern University

With degrees in chemistry, engineering, and school leadership as well as teaching and school leadership experience that runs from preschool to graduate school, Paulsen brings a unique background and experience to Northwestern University. This rich diversity has enabled her to guide Northwestern’s Graduate Students in K-12 Education Program (GK12), Reach for the Stars, to be one that is highlighted by the NSF. Most recently, Paulsen has founded Ready, Set, Go, a STEM Communication fellowship program and she teaches an undergraduate education course for math and science majors interested in participating in Teach for America.
Troy Sadler, Ph.D.

Professor of Science Education and Director of MU’s Science Education Center, University of Missouri

Dr. Sadler conducts research related to how students learn science and engage in scientific practices. Recent work includes an NSF funded project using computer-based games to teach high school students and teachers biotechnology, and facilitating programs for high school students to engage in scientific research. His presentation will explore several dimensions of K-12 partnerships with the goal of improving the effectiveness of science outreach.

Bethany Stone, Ph.D.

Associate Teaching Professor of Biological Sciences, University of Missouri

Dr. Stone has been teaching biology since 2002 at the University of Missouri. She primarily enjoys teaching non-science majors because of the diversity of backgrounds and perspectives they bring to the classroom. However, some non-majors are intimidated by, or resistant to, learning science concepts. This provides a challenge, and Bethany has developed several teaching practices to help overcome this challenge. In addition to her professional responsibilities, Bethany volunteers as a 4-H Clover Kid leader and as a visiting scientist in local schools.

Supriya Srinivasan, Ph.D.

Assistant Professor of Chemical Physiology, The Scripps Research Institute

Dr. Supriya Srinivasan uses the nematode C. elegans to study how energy balance and metabolic set points arise in complex multicellular animals. Over the course of her doctoral and post-doctoral training and now in her own lab, she has been engaged in outreach activities in the form of training and mentoring students ranging from high schoolers to postdoctoral scholars.
Morgan Thompson, Ph.D.

Dr. Morgan Thompson is a geneticist who investigates the basic biology underlying inherited human metabolic and neurodegenerative diseases and has a passion for informal science education. Her goal is to connect scientists, particularly early career researchers, to opportunities for training in science communication through direct engagement in their broader communities. She is actively involved in a number of science outreach programs and organizations, including the Science and Social Justice Project, Science in the News, Sense About Science, the Coalition on the Public Understanding of Science, the Emerson College Science Communication Collaborative, the Huntington’s Disease Outreach Project for Education at Stanford, Voice of Young Science USA, and Ask for Evidence USA.
Poster 1

Lessons from Princeton GMOP: Keep It Simple!

Kelly M. LaRue¹, Brian J. Ell¹

¹Department of Molecular Biology, Princeton University, Princeton, NJ

The Princeton University Graduate Molecular Biology Outreach Program (GMOP) is a Molecular Biology Ph.D. graduate student run science outreach organization. With financial support from our home department, we have been able to dramatically expand our reach during the 2012-2013 academic year. Our 50+ volunteers have presented demonstrations at several science expos in the region, sponsored independent high school student research with the intention of publication, performed science lessons at a local after school program for middle school students and judged science fairs. We have found that when interacting with children, the simpler the scientific message, the better. Simplicity in demonstration promotes a better understanding within our audience. Additionally, students are more willing to ask questions, encouraging a discussion rather than lecture-like format that allows us to tailor our instruction to the appropriate level. Our most successful demos include a “Model Organism Zoo” and performing brain dissections. Not only are these exhibits accessible to children, but accompanying adults frequently ask insightful questions. In addition to our traditional events, in the future we hope to participate in more sophisticated outreach, including science café nights, public research talks and science lessons in local high school classrooms. Through these efforts, we not only work to promote widespread science literacy, but aid the professional development of our graduate students who wish to pursue science education as a career.
The Amazing Brain Carnival: Graduate Students Communicate Neuroscience Research to Visitors at a Local Science Center

Melanie Bauer¹, Erik Herzog¹

¹Washington University in St. Louis

“The Amazing Brain Carnival” is a fun-filled science outreach event at a local science center that focuses on communicating neuroscience research to the general public. It is an all-day event that occurs twice a year, contacting thousands of visitors, through a collaboration between Washington University in St. Louis and the Saint Louis Science Center. The goal of the event is two-fold: to present scientific research that is accessible, interesting, and relevant to a public audience, as well as to train graduate students with informal communication skills so they feel empowered to communicate about science throughout their research careers. We are in our 6th year of conducting these events at the Science Center and find ways to improve every year. To put on this event, we recruit a group of graduate students from the departments of Neuroscience, Psychology, and Biomedical Engineering to design demonstrations based on their own research. One example of such a demonstration involves showing visitors how we can learn about the neural systems of humans by studying model organisms such as electric fish. Another demonstration tests visitors’ attention by having them perform the classic Stroop task of inhibitory control. Prior to the event, we train our student presenters on how to communicate to a non-expert audience as well as use the expertise of the informal educators at the Science Center to get feedback on the demonstrations. In addition to communicating about cool topics in neuroscience, we also seek to portray the diversity of individuals that seek careers in the sciences by providing brief biographies of our graduate student presenters. Overall, the event is fun and engaging for all participants, graduate students and public attendees, and has become a mainstay in our community.
Poster 3
Materials Outreach for Rural Education (MORE) from the Vanderbilt/Fisk Chapter of the Materials Research Society

Gabriel LeBlanc¹, Toshia Wrenn¹
¹Vanderbilt University

The vision of the Materials Research Society (MRS) is to provide a “framework in which the materials discipline can convene, collaborate, integrate, and advocate.” This proposal aims to utilize an interdisciplinary group of scientists to bring hands-on science lessons to rural middle schools in the state of Tennessee and help integrate these students and teachers into the growing field of materials science. These schools are rarely, if ever, exposed to hands-on science lessons, much less the field of materials science. By using MRS graduate student volunteers, we will be able to reach the most needing rural counties in middle Tennessee with lessons adhering to the standards within the state. By using MRS graduate student volunteers, we will be able to reach schools with high academic and financial need. The volunteers will both teach the middle school students directly and provide instruction to middle school science teachers on new hands-on lessons. To achieve our goal of bringing these lessons to isolated and currently inaccessible schools, we plan to collaborate with other organizations at Vanderbilt with experience bringing hands-on science to the schools around Vanderbilt.
An urgent focus for many science education initiatives is directed at understanding the reasons of the underrepresentation of women in STEM fields and strengthening the STEM pipeline for women at all levels of their education. Research points to the middle school years as a particularly vulnerable time for girls and STEM due to the internalization of negative stereotypes about gender and science, negative attitudes and opinions toward science classes, and a drop in their self-confidence in STEM subjects. The Catalysts for Change science outreach program was designed to target girls at this age group with the goal of cultivating a strong STEM identity through science enrichment activities and exposure to women scientists as role models. Catalysts for Change invites St. Louis-area ninth grade female students to Washington University’s campus for a series of day-long workshops. This program aims to expose female 9th-grade students to the different STEM fields and career paths, to educate the high-school students on “stereotype threat,” and to encourage them to take courses in physics, chemistry, biology, and mathematics. Some of the major barriers that women trying to enter these fields confront are low confidence in their own abilities and a lack of female STEM role models. This project addresses these issues through a three-tiered mentoring program between graduate, undergraduate and high-school female students. High-school girls receive the opportunity to learn from successful women in STEM fields as well as gain knowledge about how to succeed. Female undergraduate and graduate students gain self-confidence and leadership skills by working together to plan two consecutive Saturday workshops focusing on biology and biotechnology, physical sciences, and engineering for the ninth graders, and teaching these activities to the ninth-grade girls. This poster will highlight the various aspects of the program and feedback from the attendees.
Poster 5

Interdisciplinary Outreach: Teaching Families How They Benefit from Interdisciplinary Research

Robin G. Walker¹

¹University of Missouri, Columbia, Missouri, 65211

Background: Mizzou Adventures in Education is a free public outreach event for families with children in grades K-6. The annual event, sponsored by the Graduate School, features interactive educational booths representing graduate research degree programs across campus. More than 140 graduate students work on 25+ disciplinary teams to plan and implement hands-on learning activities for children. Now in its seventh year, Mizzou Adventures in Education attendance is estimated at 600-700 children plus their family members.

Needs Statement: In the past, the graduate student teams have worked independently, offering activities specific to individual disciplines. To propel the event to the “next level” we need to also teach the public about the societal benefits of interdisciplinary research. The addition of interdisciplinary outreach booths will have a transformative effect on graduate students’ thinking as well as on our event.

Specific Aim: By incorporating interdisciplinary learning activities into this event, we will be able to provide a unique outreach experience for K-6 children and their families.

Outreach Activities: In 2014, Mizzou Adventures in Education will feature four interactive, durable displays that showcase interdisciplinary research at Mizzou. Each display will be conceived and created by an interdisciplinary team of graduate students under the direction of a faculty mentor with an established interdisciplinary project. After the event, the displays will be deployed in numerous venues: schools, local mall, county and state fairs, downtown festivals, select athletic events and K-6 outreach events on campus.

Outcomes: 1. Establish a new interdisciplinary model for K-6 outreach. 2. The ongoing engagement with campus interdisciplinary networks will shape graduate students’ thinking about interdisciplinary research and outreach. 3. Motivate families with young children to sustain learning across multiple disciplines. 4. Educate the public on how interdisciplinary research solves real-world problems and benefits society. 5. Extend publicity on the broader impacts of interdisciplinary research at Mizzou, particularly with stakeholders like the National Science Foundation.
MU-NSTA Student Chapter: Preparing Science Educators for the Challenges of the Twenty-First Century

Matthew Martin¹, Boyle Meghan¹, Smith Christine¹, Victoria Keuth¹

¹University of Missouri, Columbia, Missouri 6211

The MU-NSTA Student Chapter offers MU undergraduates outstanding opportunities for professional development, real-world experiences with science education, and informal STEM education venues. MU-NSTA undergraduate members have multiple learning opportunities. First, chapter meetings are actually pre-service teacher professional development workshops. During each meeting consists of a program focused on a different aspect of K-12 education. In-service elementary and secondary teacher panel discussions focus on important aspects of K-12 education. Research scientists are invited to conduct programs focused on the nature of science and key aspects of scientific research. Second, the MU-NSTA student chapter also engages in multiple science outreach programs. The chapter partners with the Office of Science Outreach and the Science Coordinator for Columbia Public Schools (CPS) to offer Columbia residents opportunities to explore science topics during the Science Sleuth program in the early fall. The chapter develops and implements a STEM Extravaganza evening program for two CPS elementary schools. Chapter members volunteer their time to support the Benton Science Club. All chapter members have electronic access to all four NSAT journals which are an outstanding resource for preparing tomorrows teachers.
Benton Elementary Science Club: Informal Science Learning with a Focus on the Processes and Practices of Science

Deanna M. Lankford

1University of Missouri, Office of Science Outreach

The Benton Science Club meets each Wednesday at Benton Elementary School in Columbia, Missouri. Benton Elementary is a STEM school and has a strong academic focus on Science, Technology, Engineering, and Mathematics as well as a highly diverse student body. The Science Club meets weekly on Wednesdays from 3:45-5:00 pm; we engage all grades in the club with grades K-2 and 3-5 meeting on alternate Wednesdays. All lessons are written in the 5-E lesson format (Engage, Explore, Explain, Extrapolate, and Evaluate) to enhance active engagement of all students as science investigators. As a former high school science teacher and project coordinator for the Office of Science Outreach, I develop the lessons in collaboration with the STEM coordinator at Benton Elementary to select lesson topics which support student learning and focus students on science content, skills, and practices to enhance understanding of science as a discipline and also support students’ academic success at Benton. Because learning takes place in an informal venue, we focus on engaging elementary students as science investigators and collaborators to enhance understanding of the processes and practices of science rather than focusing on science content alone. It is important to note that this venture is a considerable task and cannot be accomplished by a single individual; therefore, I invite MU undergraduate students to work with me at Benton. Undergraduate Service Learning students, the MU-NSTA Student Chapter, and also undergraduates involved in Project Science are invited to be part of the Benton Science Club. The MU undergraduates assist in the implementation of the lesson and work with small groups (3-5) students to conduct the lesson, maintain focus, and answer student questions while I conduct the lesson. Another application for the Benton Science Club is to provide an additional venue for undergraduate science education majors to develop and implement lessons within an informal learning environment. I collaborate with science education students and College of Education professors to assist MU undergraduates with 5-E lesson development, gather necessary materials, and provide support while the undergraduate teaches the lesson.
Poster 8

Science and Me: An Interactive Program Between Science Students and Adult Communities

Hannah Alexander

University of Missouri

We present a course called “Science Outreach: Public Understanding of Science,” which trains students to communicate science in lay language. Students from a wide range of disciplines generate a series of presentations – the “Science and Me” series – in which each student prepares a 40-minute, lay-language presentation about an everyday topic, depicting the role that basic scientific research plays in that issue. Students refine their talks by presenting them to their classmates and receiving extensive in-class critiques. They then take their presentations to adult audiences in the community, in independent living facilities, the public library, or the Alumni Center. Colorful tri-fold brochures, depicting the main points of the talks, are given to the audience at the end of each talk, and have proven to be a very popular aspect of the program. We have adapted this course for graduate students, for upper level undergraduates, or high school students. Our experience shows that there is an adult audience that appreciates the interaction with “young scientists,” learning about science in lay-language, and being provoked to think about how much basic science has affected their lives. For the students, this has been a unique opportunity to learn to communicate science in simple language, to gauge first hand the public's perception of science, and to make a direct, positive impact on the lives of adult residents in our community.
Saturday Morning Science (SMS) is a free public lecture series held every Saturday at the University Of Missouri throughout the fall and winter semesters. Talks are geared toward the general public and include discussions of basic scientific concepts, demonstrations, and a question-and-answer session. Since 2003, we have presented over 220 talks with a total attendance of about 29,000. Weekly attendance averages ~150, with between 75% and 95% of the audience coming from the community. Most attendees are adults, but the audience includes K-12 students and teachers, children, retirees, and others. About 30% have attended more than ten SMS presentations. The speakers, informal atmosphere, and volunteer support are keys to the success of SMS. We choose excellent speakers who can present science in a lively and engaging manner and convey science in a way that is entertaining and accessible. Topics vary widely: physics, computer vision, plant immunity, epidemiology, linguistics, planet formation, fuel cells, traditional medicine in Africa, and more. We seek to present exciting science to the public as well as foster a culture where engagement between scientists and the public is the norm. Support for SMS comes from the MU Office of Research, Monsanto, the Christopher S. Bond Life Sciences Center, the MU Bookstore, and volunteers.
High school students are not often exposed to the field of biomaterials. We have developed and implemented several interactive activities for high school students designed to introduce them to biomaterials concepts. Examples of activities performed during three programs (School for Science and Math at Vanderbilt [SSMV], Vanderbilt Summer Academy [VSA], and Biomaterials Day) will be described. Rising 12th grade students at SSMV performed research projects investigating topics such as characterization of resorption of polyurethane scaffolds in vitro and delivery of plasmid DNA or small molecule drugs from polyurethane scaffolds. Students worked on the research projects 40 hrs/wk for 7 weeks during the summer. 11th and 12th grade students at VSA completed a biomaterials design project requiring them to create polyurethane scaffolds that could be used to deliver a drug and provide mechanical support for a given tissue. Students participated in hands-on activities that involved making polyurethane scaffolds, measuring release kinetics and determining release mechanism of dye from various scaffolds, and performing tensile tests to create stress-strain curves and determine mechanical properties of the scaffolds. Students worked on the design project for a total of ~20 h over the course of three days. High school students attending Biomaterials Day participated in a networking lunch, poster session, and hands-on activities. The activities lasted half an hour each and included extracting your own DNA, measuring the strength and Young’s modulus of several biomaterials, and making your own lab-on-a-chip.
The Center for Science Outreach (CSO), established in 2000, has developed and implemented a number of educational programs to enhance literacy in science, technology, engineering, and mathematics (STEM). The mission of the CSO is to create unique partnerships between University scientists, K-12 educators and students, and the local and global science community. These efforts, funded through a variety of state and national public and private agencies for over 15 years, have reached thousands of children and hundreds of teachers. The principal programs have included teacher professional development workshops; student-centered programs both on-campus and in schools; and unique scientist-teacher classroom partnerships.
Poster 12

Integrating Direct Exploration into Elementary School Education

Jeffrey M. Dale¹, Whitney Adams², Lea Selby²

¹University of Missouri; ²Lee Expressive Arts Elementary

Increased emphasis is placed on student driven learning by the new elementary school standards. The creation of programs such as 2BGreen assist in the transition to a more student driven learning experience. Within the 2BGreen program, environmental issues are encountered through direct exploration rather than by lecture. Direct exploration skills facilitate learning across all levels of the elementary curriculum. For example, students will have increased success in understanding the place or purpose of events within a historical setting and researching information for non-fiction presentations as a result of engaging in direct explorations. The 2BGreen program presents an ideal scenario where measurable results can be recorded within the science curriculum to gauge the success of the program. Success in the science curriculum brings with it an implied success in areas of the curriculum that will be benefited from increased exploration skills. From the success of the 2BGreen program, avenues are opened for implementation of similar programs in other areas of the elementary school curriculum. Within the history curriculum, direct exploration would require comprehensive historical databases. The success of the 2BGreen program would provide justification for the costs associated with and the need for such databases. Evidence of the success of direct exploration will be critical to a seamless transition from old grade level standards to the new standards being established. Smaller programs such as 2BGreen are essential for providing this evidence and paving the way for a smooth transition into the new standards that will require a larger investment into direct exploration.
Discovering Renewable Energy at Camp: Outreach from the Photosynthetic Antenna Research Center

Erica Wunderlich Majumder¹, Gregory Orf¹, Jeremy King¹, W. Kent Kovac², David Kramer² and Robert Blankenship¹

¹Washington University in St. Louis; ²Michigan State University

As part of the outreach program from the Photosynthetic Antenna Research Center (PARC) at Washington University in St. Louis, a team of graduate students work with summer campers facilitating hands-on renewable energy activities. In general, the purpose of our project is to engage campers in the science of renewable energy and sustainability while they are surrounded by the elements that provide it. We aim to put science in a fun context that creates a laid-back but informative learning experience outside of the classroom. The direct application of renewable energy technology is more evident to the camper when they are already experiencing it. It is also important to understand the science behind the decisions we make to use sustainable methods in our lives. This will foster campers who understand the reason why they are doing a sustainable action and can apply the same ideas and scientific concepts when they make decisions as adults or community leaders. After two successful summers, over 150 campers have explored topics like solar energy capture, biodegradation, water splitting, wind turbine design and more. Our project has increased positive feelings about science in male and female campers and has helped install sustainable practices at camp and at home.
Evaluation Form

This conference was a unique experiment that altered the format of a typical career symposium, centering instead around a specific skill. Your feedback will greatly inform our planning of future events.

1. How did you hear about the career symposium?  
   Check all that apply
   - Department/University Announcement
   - ASBMB Announcement
   - Social Media
   - Word of Mouth
   - Other (please indicate): ________________________________

2. Why did you sign up for this career symposium?

3. Did this career symposium meet your expectations? Why or why not?

4. Which aspect of the career symposium was most informative for you?

5. What aspects of the career symposium could be improved upon?
6. Do you have any recommendations for topics you’d like covered in future career symposia?

7. Would you be interested in a follow-up workshop that focused on in-depth training for the topics and careers covered in the career symposium?  

8. Would you recommend this career symposium to a friend?  

9. Have you previously participated in or organized any outreach activities (defined as “any activity in which scientists translate their research or broader scientific concepts to those outside of the academy”)?

Please describe your experience(s):

10. Would you be interested in participating in a trial run of an ASBMB-sponsored online science communication course next winter?  

11. Are you currently a member of ASBMB?  

Contact Information (OPTIONAL):

Name: ________________________________________________________________________________

Email address: _______________________________________________________________________

Institution: _________________________________________________________________________