NIH SciEd 2012

ANNUAL CONFERENCE FOR
NIH SCIENCE EDUCATION PROJECTS
WASHINGTON D.C.

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Overview

NIH SciEd 2012 was the first NIH-wide conference for science education projects funded by the National Institutes of Health. The 93 projects represented at the conference were funded by the following programs:

- Science Education Partnership Award (SEPA), Office of Research Infrastructure Programs (ORIP), Division of Program Coordination, Planning and Strategic Initiatives (DPCPSI), Office of the Director
- Science Education Drug Abuse Partnership Award (SEDAPA), National Institute on Drug Abuse (NIDA)
- NIH Blueprint for Neuroscience Research Science Education Award
- Science Education Awards, National Institute of Allergy and Infectious Diseases (NIAID)
- National Library of Medicine

The conference was held May 13-16, 2012 at the Bethesda North Marriott Hotel and Conference Center in Bethesda, MD. The 260 conference participants included project PIs, staff and evaluators, teachers who participate in projects, NIH leaders and staff, and individuals interested in science education.
The Conference theme, "Teaching and Learning with Diverse Populations" was addressed in plenary and breakout sessions. The Conference also provided opportunities for updates by NIH staff, training in developing logic models, discussions of evaluation methods and tools, regional meetings, networking, and an exchange of information among participating projects.

NIH SciEd 2012 Conference Organizing Committee

Adela de la Torre, PhD, Professor, Director of Chicano/a Studies, University of California, Davis

Greg DeFrancis, MA, Director of Education, Montshire Museum of Science

Barbara Hug, PhD, Clinical Assistant Professor, University of Illinois, Urbana-Champaign

Michael Kennedy, PhD, Research Assistant Professor, Center for Genetic Medicine, Northwestern University

Laura Martin, PhD, Senior Director of Strategic Initiatives, Arizona Science Center

Leslie Miller, PhD, Executive Director, Center for Technology in Teaching and Learning, Rice University

Virginia Shepherd, PhD, Professor and Senior Career Scientist, Department of Veterans Affairs, Vanderbilt University

Louisa Stark, PhD, Director, Genetic Science Learning Center and Research Associate Professor, University of Utah

L. Tony Beck, PhD, NIH SEPA Program Officer, ORIP, DPCPSI, OD

Cathrine Sasek, PhD, SEDAPA Program Officer, NIH NIDA

Conference Supported By

NIH OD ORIP SEPA Cooperative Agreement 8U13OD012222-05
Louisa A. Stark, PhD
Principal Investigator

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NIH SciEd 2012: Annual Conference for NIH Science Education Projects

Teaching and Learning with Diverse Populations

Bethesda North Marriott Hotel & Conference Center

May 13-16, 2012

Schedule

All sessions meet in Grand Ballroom, Salons A,B and D, main level, unless otherwise noted

Sunday, May 13

5:00 - 7:00pm **Conference check-in and Reception** - *Foyer A - C*

Monday, May 14

7:15-8:30am **Breakfast**
Poster set-up
Late conference check-in

8:30-9:00am **Welcome**

James M. Anderson, PhD, Director of Planning and Strategic Initiatives,
NIH Office of the Director

Louisa A. Stark, PhD, Chair, Conference Organizing Committee
Director, Genetic Science Learning Center, University of Utah

9:00-9:30am **Update**: Science Education Partnership Award (SEPA) Program

L. Tony Beck, PhD, NIH SEPA Program Officer
Office of Research Infrastructure Programs (ORIP), Division of Program Coordination, Planning, and Strategic Initiatives (DPCPSI), Office of the Director (OD)

9:30-10:00am **Update**: Science Education Drug Abuse Partnership Award (SEDAPA) Program

Cathrine Sasek, PhD, SEDAPA Program Officer
NIH National Institute on Drug Abuse (NIDA)

10:00-10:20am Break

10:20-11:40am **Keynote Address:** Culturally-Nuanced Science Education

Frances Contreras, PhD, Associate Professor
College of Education, University of Washington

Discussion

11:40-1:00pm **Lunch**

SEPA Mentor-Mentee groups meet over lunch

1:00-2:15pm **Breakout Sessions**

Culturally-Nuanced Science Education for **African American Populations**
- Forest Glen, Lower Level

Culturally-Nuanced Science Education for **Latino and English Language Learner (ELL) Populations**
- White Oak B, Lower Level

Culturally-Nuanced Science Education for **Rural Populations**
- White Oak A, Lower Level

Culturally-Nuanced Science Education for **Native Populations**
- Grand Ballroom, Salon C

Culturally-Nuanced Science Education for **Urban Populations**
- Glen Echo, Lower Level

Culturally-Nuanced Science Education for **Special Needs Students**
- Grand Ballroom, Salons A,B and D

2:15-2:30pm **Break**

2:30-3:30pm **Keynote Address:** Exceptional Opportunities for Science, Extraordinary Opportunities for Science Education
Francis S. Collins, MD, PhD, Director, National Institutes of Health

3:30-3:45pm **Break**
Poster Session I presenters move their posters to assigned breakout rooms

3:45-5:00pm **Poster Session I**

Session A: **Informal Science Education I**
Glen Echo, Lower Level

Session B: **Student Science Enrichment I**
Forest Glen, Lower Level

Session C: **Teacher Professional Development I**
White Oak A, Lower Level

Session D: **Curriculum Development I**
Grand Ballroom, Salon C

Session E: **Technology-Infused Educational Materials**
White Oak B, Lower Level

5:00-5:45pm **Networking reception**
- Foyer A - C

5:45-7:00pm **Networking dinner**
- Grand Ballroom, Salons A,B and D

7:00-8:45pm **Screening of the film "*Rare*"**

"This documentary follows an inspiring and extraordinary mother in a race against time as she unites a group of isolated people from around the world in a quest to cure her daughter's rare genetic disease. Together, they discover that community, laughter and hope are some of the greatest therapies."

Discussion with Donna Appell, who is featured in the film
Donna Appell, RN, President and Founder
Hermansky-Pudlak Syndrome Network, Inc.

Facilitator: Jeanne Chowning, MS, Director of Education
Northwest Association for Biomedical Research

Tuesday, May 15

7:15-8:30am **Breakfast**
Meeting for all new SEPA PIs
L. Tony Beck, PhD, NIH SEPA Program Officer, ORIP/DPCPSI/ OD

8:30-9:30am **Update:** The Federal STEM Strategic Plan
Bruce Fuchs, PhD, Director, NIH Office of Science Education

9:30-12:00pm **Professional Development:** Developing and Using Logic Models for Project Planning and Evaluation
Claudia B. Horn, MS, Performance Results Inc.

12:00-1:15pm **Lunch**

1:15-3:30pm **Logic Model Professional Development (**continued**)**

3:30-3:45pm Break
Poster Session II presenters move their posters to assigned breakout rooms

3:45-5:00pm **Poster Session II**

Session F: **Informal Science Education II**
- Glen Echo, Lower Level

Session G: **Student Science Enrichment II**
- White Oak B, Lower Level

Session H: **Teacher Professional Development II**
- White Oak A, Lower Level

Session I: **Curriculum Development II**
- Grand Ballroom, Salon C

Session J: **Research Experiences for Students and Teachers**
- Forest Glen, Lower Level

Dinner on your own.

Wednesday, May 16

7:15-8:30am

Breakfast – *Grand Ballroom, Salon D*
Regional Meetings
Breakfast will be available outside all meeting rooms

Mid-Atlantic: MARSepa – MD, NJ, NY, OH, PA, VA, WV, DC
- Glen Echo, Lower Level

Midwest – IL, IN, IA, KY, MI, MN, MO, WI
- Linden Oak, Lower Level

New England – CT, RI, ME, MA, NH, VT
- Grand Ballroom, Salon C

Northwest – AK, ID, MT, OR, WA
- Forest Glen, Lower Level

8:30-9:45am

Breakout Sessions

Working with Undocumented Youth and with Mixed Family Status Families
- Grand Ballroom, Salon D

A Tale of Two Cities: The Importance of Population-Specific Strategies for Assessing Scientific Skills in Middle School Youth
- Forest Glen, Lower Level

Evaluation Resources for Science Education Projects
- Glen Echo, Lower Level

Expanding Science Education Partnerships with Native Communities
- Grand Ballroom, Salon B

Developing Collaborative Partnerships Among Teachers, Schools, Districts and Science Education Projects
- White Oak A

Showcase of Computer-Based Educational Videogames and Web Applications: Growing the Community of Developers and Users
- Grand Ballroom, Salon C

9:45-10:00am

Break

10:00-11:15am **Breakout Sessions**

NIH DOC (Diabetes, Obesity, and Cardiovascular Disease) Working Group: Past, Present & Future
- Grand Ballroom, Salon D

Project Evaluators: Sharing Instruments and Methods
- Glen Echo, lower level

Addressing Project Challenges in Informal Science Education
- Forest Glen, Lower Level

Addressing Project Challenges in Curriculum Development
- Great Falls, Lower Level

Addressing Project Challenges in Research Experiences for Students and Teachers
- Timberlawn, Lower Level

Addressing Project Challenges in Student Science Enrichment
- Middlebrook, Lower Level

Addressing Project Challenges in Teacher Professional Development
- White Oak A, Lower Level

Addressing Project Challenges in Technology-Based Educational Materials
- Grand Ballroom, Salon C

11:20-12:30pm **Lunch**

Those going on the NIH Clinical Center and Zebrafish Core Facility tours should leave by 12:10pm if they are taking Metrorail

1:00-2:00pm **NIH Facility Tours** - optional; take Metrorail or taxi to Medical Center Metro Station; be at NIH front entrance by 12:30pm to go through security

- NIH Clinical Center
- NIH Zebrafish Core Facility

1:30-2:30pm **National Library of Medicine Tour** - optional; take Metrorail or taxi to Medical Center Metro Station; be at NIH front entrance by 1:00pm to go through security

Breakout Sessions

Monday, May 14, 1:00-2:15pm

Culturally-Nuanced Science Education for African American Populations

This session will expand on Dr. Frances Contreras' keynote address, providing an opportunity to discuss the following questions: What approaches are most successful for engaging African American populations? What approaches have not worked well? What challenges have projects encountered in working with African American populations? In what ways have projects been able to (or not able to) address these challenges?

Facilitators: Susan DeReimer, PhD, Professor, Meharry Medical College
Gussie Fuller, BA, Program Coordinator, MNPS-SEPA, Meharry Medical College
Panelists: Tonya Smith, MEd, Science Consultant, Richland School District One, Columbia, SC
Feon Smith, PhD, Assistant Professor, Marshall University
Ann Chester, PhD, Assistant Vice President for Education Partnerships, Health Sciences, West Virginia University
Room: Forest Glen, lower level

Culturally-Nuanced Science Education for Latino and English Language Learner (ELL) Populations

This session will focus on the development of ELL and culturally nuanced pedagogical strategies for science teachers. We will discuss the utility of using the 5Es model for science education workshops as well as exposure to ELL cultural issues that may impact science engagement and learning styles in the classroom and familial support of science learning in and outside of the classroom

Facilitators: Adela de la Torre, PhD, Professor, Director of Chicano/a Studies, University of California, Davis
Rosa D. Manzo, Graduate Student, University of California, Davis
Rosa Gomez-Camacho, Graduate Student, University of California, Davis
Panelists: Carole Flores, Project Manager, Arizona Science Center
Joshua Briese, MEd, Professional Educator, Excelencia Elementary School, Creighton School District, Phoenix, AZ
Room: White Oak B, Lower Level

Culturally-Nuanced Science Education for Native Populations

We all have challenges working with students and teachers from cultures other than our own. This session is an open discussion with educators working with Native American, Alaska Native, Native Hawaiian and Pacifican cultures.

Facilitator: Kelley Withy, MD, PhD, Professor and AHEC Director, John Burns Medical School, University of Hawaii, Manoa

Panelists: Kitty LaBounty, MS, Science Teacher, Mount Edgecombe High School and Assistant Professor, University of Alaska, Southeast
Sue Hills, PhD, Principal Investigator, Alaska BioPREP, University of Alaska, Fairbanks
Tony Ward, PhD, Assistant Professor, University of Montana
Marlys Witte, MD, Professor and Director, Medical Student Research Program, University of Arizona

Room: Grand Ballroom, Salon C

Culturally-Nuanced Science Education for Rural Populations

This session will expand on Dr. Frances Contreras' keynote address, providing an opportunity to discuss the following questions: What approaches are most successful for engaging rural populations? What approaches have not worked well? What challenges have projects encountered in working with rural populations? In what ways have projects been able to (or not able to) address these challenges?

Facilitator: Margaret Shain, MSEd, K-12 Programs Coordinator, The American Physiological Society

Panelists: Robert Manriquez, MEd, TAP Master Teacher, Stanley High School, DeSota Parish Schools, Shreveport, LA
Larry Johnson, PhD, Professor, Veterinary Medicine and Biomedical Sciences, Texas A&M University
Kim Obbink, EdD, Executive Director, Extended University, Montana State University

Room: White Oak A, Lower Level

Culturally-Nuanced Science Education for Special Needs Students

What approaches have projects found most successful for engaging special education students? What challenges have projects encountered in working with students in this population? Our panelists will be doing several brief hands-on activities with session participants to show a few examples of activities that they have successfully used with special education students. This will be followed by whole-group discussion with panelists and session attendees.

Facilitator: Dina Markowitz, PhD, Professor of Environmental Medicine and Director, Life Sciences Learning Center, University of Rochester

Panelists: Kathy Hoppe, MS, Instructional Specialist, Monroe-2-Orleans BOCES, Rochester, NY
David Syracuse, MSEd, Science Teacher, TST BOCES Career and Technical Center, Ithaca, NY
Donna Cassidy-Hanley, PhD, Senior Research Associate, Cornell University

Room: Grand Ballroom, Salons A,B and D

Culturally-Nuanced Science Education for Urban Populations

This session will expand on Dr. Frances Contreras' keynote address, providing an opportunity to discuss the following questions: What approaches are most successful for engaging urban populations? What approaches have not worked well? What challenges have projects encountered in working with urban populations? In what ways have projects been able to (or not able to) address these challenges?

Facilitator: Virginia Shepherd, PhD, Professor and Senior Career Scientist, Department of Veterans Affairs, Vanderbilt University

Panelists: Jennifer Lewin, MEd, Science Lead Teacher, Graeme Stewart Elementary School, Chicago Public Schools
Michael Kennedy, Research Assistant Professor, Center for Genetic Medicine, Northwestern University
Matthew Dugan, MAT, Biology Teacher, Madison Park Technical and Vocational High School, Boston, MA
Berri Jacque, PhD, Postdoctoral Associate, Curriculum Development, Tufts University
Lynn Tarant, Science Teacher, Charles J. Riley Middle School, and Health and Nutrition Sciences, Montclair State University

Room: Glen Echo, lower level

Wednesday, May 16, 7:15-8:30 am

Join colleagues from your region to network and discuss potential opportunities for collaboration. Breakfast will be available outside each meeting room.

Mid-Atlantic: MARSepa

Maryland, New Jersey, New York, Ohio, Pennsylvania, Virginia, West Virginia, Washington, DC

Facilitators: Brinley Kantorski, MEd, Independent Consultant; formerly, Director of Education, Partnership in Education, Duquesne University
Joan Schank, Principal Investigator, Pittsburgh Tissue Engineering Initiative

Room: Glen Echo, lower level

Midwest

Maryland, New Jersey, New York, Ohio, Pennsylvania, Virginia, West Virginia, Washington, DC

Facilitator: Barbara Hug, PhD, Clinical Assistant Professor, University of Illinois, Urbana-Champaign
Room: Linden Oak, lower level

New England

Connecticut, Rhode Island, Maine, Massachusetts, New Hampshire, Vermont

Facilitator: Carla Romney, DSc, MBA, Associate Professor and Chair of Science and Engineering, Boston University School of Medicine
Room: Grand Ballroom, Salon C

Northwest

Alaska, Idaho, Montana, Oregon, Washington

Facilitator: Susan Adler, BA, Executive Director, Northwest Association for Biomedical Research
Jeanne Chowning, MS, Director of Education, Northwest Association for Biomedical Research
Room: Forest Glen, lower level

Wednesday, May 16, 8:30-9:45 am

Working with Undocumented Youth and with Mixed Family Status Families

This session will focus on the issues surrounding undocumented youth and family members in the classroom setting. Discussion will focus on the intersection of how immigrant and legal status issues may affect teacher-student interaction as well as student self-esteem. Federal and state legislative initiatives such as the Dream Act and the impact of US Supreme court case law impacting these students will also be discussed in relationship to student rights and their impact on student educational aspirations.

Facilitators: Adela de la Torre, PhD, Professor, Director of Chicano/a Studies, University of California, Davis
Rosa D. Manzo, Graduate Student, University of California, Davis
Rosa Gomez-Camacho, Graduate Student, University of California, Davis
Panelists: Rebecca Fulop MS, Science Department Chair, Mission High School, San Francisco, CA
Rebecca Smith, PhD, Co-Director, Science and Health Education Partnership, University of California, San Francisco
Room: Grand Ballroom, Salon D

A Tale of Two Cities: The Importance of Population-Specific Strategies for Assessing Scientific Skills in Middle School Youth

This session will highlight the challenges inherent with developing a "universal" instrument for youth science skills assessment. Panelists from Montclair State University and Northwestern University will share their experiences with pilot testing and validating a multiple choice science literacy instrument with their respective middle school populations. Topics to be covered include analysis techniques and results. Panelists will also discuss the mode (paper vs digital), setting (formal vs informal), and format (quiz vs interview) for assessing skills among youth of diverse abilities. The session will allow ample time for questions and discussion with the audience.

Moderator: Michael Kennedy, PhD, Research Assistant Professor, Center for Genetic Medicine, Northwestern University
Panelists: Rebecca Daugherty, PhD, Postdoctoral Fellow, Center for Genetic Medicine, Northwestern University
Wendy Huebner, PhD, Epidemiologist Consultant, Montclair State University
Mark Nicolich, PhD, Statistician, Cogiment, Lambertville, NJ (consultant for Montclair State University)
Camellia Sanford, PhD, Evaluator, Rockman, et al. (consultant for Northwestern University)
Room: Forest Glen, lower level

Evaluation Resources for Science Education Projects

This session will introduce some online resources for evaluation instruments and techniques. Come join us to learn about new resources and to share some of your tried-and-true favorites!

Facilitator: Kristin Bass, PhD, Senior Researcher, Rockman, et al
Panelist: AAAS Project 2061
Room: Glen Echo, lower level

Expanding Science Education Partnerships with Native Communities

Expanding partnerships is a major focus of many science education programs. This is especially true of those that work with Native communities. This session will focus on working with non-traditional partners such as the Society for the Advancement of Chicanos and Native Americans in Science (SACNAS) and the National Museum of the American Indian. The latter, represented by Jane Sledge, will discuss how Native knowledge and communities' long-term observation of the natural world enriches contemporary science. People tend to see a conflict between scientific method and traditional or community knowledge. Increasingly, however, scientists recognize that Native knowledge can bring complexity and insight to the scientific discussion. The National Museum of the American Indian worked with four communities to present their responses to environmental change in an educational website designed for middle school students (http://nmai.si.edu/environment). Jane will discuss this and other on-going projects.

Facilitator: Maurice Godfrey, PhD, Associate Professor, Munroe-Meyer Institute, University of Nebraska Medical Center
Panelists: Jane Sledge, Associate Director, National Museum of the American Indian, Smithsonian Institution
David Wilson, PhD, Director, Native American Initiatives, Society for the Advancement of Chicanos and Native Americans in Science (SACNAS)
Andrew Jameton, PhD, Professor, University of Nebraska Medical Center
Marlys Witte, MD, Professor and Director, Medical Student Research Program, University of Arizona
Room: Grand Ballroom, Salon B

Developing Collaborative Partnerships Among Teachers, Schools, Districts and Science Education Projects

This session will begin a discussion about how partnerships are developed and established between teachers, schools, districts and science education projects. Discussion will focus from several viewpoints on the following: factors that promote successful partnerships, factors that can hinder successful partnerships, challenges to developing successful partnerships and ways in which these challenges can be addressed. We will hear a range of perspectives from three SEPA groups as part of a panel discussion as well as from audience members.

Facilitator: Barbara Hug, PhD, Clinical Assistant Professor, University of Illinois, Urbana-Champaign

Panelists: Jennifer Love, MAEd, Assistant Principal, Northwestern High School, Prince George's County Public Schools, Hyattsville, MD
Margery Anderson, PhD, Contractor, Office of Science Education and Strategic Communication, Walter Reed Army Institute of Research
Brandon Finegold, MEd, Chemistry Teacher, Madison Park Technical and Vocational High School, Boston, MA
Karina Meiri, MSEd, K-12 Programs Coordinator, Tufts University
Brinley Kantorski, MEd, Independent Consultant; formerly, Director of Education, Duquesne University, Partnership in Education
Robert Bonneau, PhD, Professor of Microbiology and Immunology and Pediatrics, Penn State College of Medicine

Room: White Oak A, lower level

Showcase of Computer-Based Educational Videogames and Web Applications: Growing the Community of Developers and Users

This session focuses on demonstrations and discussion of technology-based educational applications/tools that have been developed through NIH science education funding and are available for testing/use within the community and beyond. These technologies include computer games and data visualization/interpretation such as:

- Meta!Blast: A Unity-based videogame for cell and metabolic biology education that is set within a virtual 3D photosynthetic cell (www.metablast.org). The database associated with Meta!Blast enables educators to extract in-game data based on student play and to tailor biological content to student needs as well as providing data for project evaluation (http://metablastapi.vrac.iastate.edu/).
- UV Zombies: An online game highlighting the connection between UV rays from natural (sun) and artificial (tanning beds) sources and skin cancer (URL available at conference).
- SeeIt: An online tool that helps visualize and compare existing and user-contributed datasets with an emphasis on distributions, correlations, sampling and probability (http://sbcesepa.org).
- Forensics: An online set of web adventures to learn forensic science and apply your knowledge. Based on the Crime-Scene Investigators (CSI) TV show (http://forensics.rice.edu).

Posters and/or brief announcements of other technology that is near completion will be shared during the session.

Facilitator: Marco Molinaro, PhD, Chief Education Officer, University of California, Davis
Eve Wurtele, PhD, Professor, Iowa State University

Additional Presenters: Leslie Miller, PhD, Executive Director, Center for Technology in Teaching and Learning, Rice University

Room: Grand Ballroom, Salon C

Wednesday, May 16, 8:30-9:45 am

NIH DOC (Diabetes, Obesity, and Cardiovascular Disease) Working Group: Past, Present & Future

The vision of the DOC is to leverage the resources of the NIH, in partnership with funded formal and informal science PIs, their institutes and partners, as well as science education stakeholders, to promote mathematics and scientific literacy for all United States citizens. The purpose of the proposed session is to provide individuals interested in DOC (Diabetes, Obesity, and Cardiovascular Disease) topics an opportunity to meet face-to-face to discuss the working group's mission, past activities, plan future initiatives and call for new leadership. DOC WG members, new and old, will be encouraged to recharge their enthusiasm for working together and make concrete action plans to continue to work together throughout the coming year.

Facilitator: Virginia Carraway-Stage, MS, RD, LDN, Associate Director, FoodMASTER, East Carolina University
Presenters: Melani W. Duffrin, PhD, RD, Professor, East Carolina University
Wendy Huebner, PhD, Epidemiologist Consultant, Montclair State University
Nancy Place, MS, Director, IMS – Academic Technology Services, University of Texas Health Science Center at San Antonio
Room: Grand Ballroom, Salon D

Project Evaluators: Sharing Instruments and Methods

This session will be a collaborative experience focused on project evaluation from the perspective of the evaluator. Participants will have time to network with other evaluators, ask questions, share evaluation experiences, issues and instruments.

Facilitator: Molly Stuhlsatz, MA, Research Associate, Biology Sciences Curriculum Study
Room: Glen Echo, Lower Level

Addressing Project Challenges

Join science education projects with similar types of programs to discuss challenges and ways to address them. Projects are encouraged to bring a challenge for which they would like input.

Addressing Project Challenges: **Informal Science Education**

Facilitator: Laura Martin, PhD, Senior Director of Strategic Initiatives, Arizona Science Center
Room: Forest Glen, lower level

Addressing Project Challenges: **Curriculum Development**

Facilitator: Greg DeFrancis, MA, Director of Education, Montshire Museum of Science
Room: Great Falls, lower level

Addressing Project Challenges: **Research Experiences for Students and Teachers**

Facilitator: Shannon Colton, PhD, Program Director, Center for BioMolecular Modeling, Milwaukee School of Engineering
Room: Timberlawn, lower level

Addressing Project Challenges: **Student Science Enrichment**

Facilitator: Judy Diamond, PhD, Professor and Curator, University of Nebraska State Museum
Room: Middlebrook, lower level

Addressing Project Challenges: **Teacher Professional Development**

Facilitator: Mary Jo Koroly, PhD, Research Associate Professor, Department of Biochemistry and Molecular Biology, College of Medicine, and Director, Center for Precollegiate Education and Training, Academic Affairs, University of Florida
Room: White Oak A, lower level

Addressing Project Challenges: **Technology-Based Educational Materials**

Facilitator: Leslie Miller, PhD, Executive Director, Center for Technology in Teaching and Learning, Rice University
Room: Grand Ballroom, Salon C

Monday, May 14, 8:30am - 9:00am

PLENARY SESSION: **James M. Anderson, PhD**

James M Anderson, Director of Planning and Strategic Initiatives, NIH Office of the Director
Reported by **Virginia Shepherd**, PhD, Vanderbilt University

Dr. Anderson stressed that it is critically important for the NIH to be involved in the science literacy of the public and in communicating science to the public to inform the next generation of scientists and allow citizens to make informed decisions in their lives.

- SEPA – in late Dec – moved to the Office of the Director – Division of Planning and Strategic Initiatives. This move has placed SEPA centrally within NIH and is critical to the mission of SEPA.
- The Office of Science Education will assist in coordinating STEM initiatives
- Importantly this reorganization will assist in coordinating STEM education throughout the NIH.

Monday, May 14, 9:00am - 9:30am
Update: **Science Education Partnership Award** (SEPA) **Program**

L. Tony Beck, PhD, NIH SEPA Program Officer
Reported by **Michael Kennedy**, PhD, Northwestern University

The 2012 NIH SciEd meeting is the first NIH trans-science education meeting – a very exciting time. Attendees were encouraged to take the opportunity to talk with others, learn from others' mistakes, and form at least one collaboration during the conference.

The Science Education Partnership Award (SEPA) program started in 1991 with a goal of creating a diverse pipeline of future scientists. Former Illinois senator John Porter was instrumental in securing funding for the SEPA program. As of FY2010 there were 48 projects in formal education settings and 11 informal science projects serving 82,000 students, 5,700 teachers, and 2,000 schools. SEPA program is actively funding projects in Institutional Development Award (IDeA) states, which currently only receive 8% of overall NIH research funding. Several SEPA awards will be made to projects in IDeA states this coming year, including the first SEPA project for New Mexico.

SEPA projects range from veterinary medicine to nanotechnology. Nearly all NIH institutes and centers have SEPA programs that directly support their subject area. SEPA PIs partner with NIH Clinical and Translational Science Award programs, and support trans-NIH activities like DNA Day, Brain Awareness Week, and the USA Science & Engineering Festival.

One such initiative is from Oregon Health Sciences University (OHSU) and West Virginia University (WVU), "Beating the Odds for Better Health." This interactive exhibit allows attendees to learn about health research and gain valuable information about the roles of diet and exercise in a healthy lifestyle. At the recent Science & Engineering festival, the exhibit was a big success, with project staff collecting ~500 lifestyle and body composition surveys. The exhibit will move to the NIH visitor's center in the coming months.

The SEPA website was recently updated with a new look, faster page loading, improved navigation, and the funding map feature has been reinstated.

In December of 2011 the SEPA program was administratively moved from the National Center for Research Resources (NCRR) to the Division of Program Coordination, Planning, and Strategic Initiatives (DPCPSI), NIH Office of the Director. This administrative move was commensurate with the dissolution of NCRR. Within DPCPSI, the SEPA program is in the Office of Research Infrastructure Programs (ORIP).

Two challenges for the upcoming year were highlighted. First, program evaluation continues to be an area of emphasis, as it was back in the 90's when SEPA started. Attendees were encouraged to balance rigor with project goals, especially for informal science education projects, where formal methods of evaluation can be challenging to implement. All PIs were encouraged to share best practices and even summative evaluation reports.

Second, stagnant or declining education budgets mean that PIs will need to find ways to "do more with less" through creative approaches and collaborations. This summer a new federal STEM education plan will be released with the goal of promoting synergy and integration among federally-funded STEM education projects.

Remembrances were offered for two SEPA PIs who passed away in the last year, George Eyambe (University of Texas–Pan American) and Claudia Pryor (Independent Filmmaker)

Monday, May 14, 9:30am - 10:00am
Update: **Science Education Drug Abuse Partnership Award** (SEDAPA) **Program**

Cathrine Sasek, PhD, NIDA SEDAPA Program Officer
Reported by **Barbara Hug,** PhD, University of Illinois Urbana-Champaign

Overview of the program requirements and about past funded grants

- Grant program for funding the development of innovative programs and materials for understanding advances in neuroscience and the neurobiological mechanisms of drug abuse and addiction in k-12 students and others
- Requires a partnership between educators and scientists
- First funded in 1992, grants 4 years in duration

Goals of the program:

- Improve science education and literacy in k-12 (in and out of schools) as well as general public.
- Understanding of importance of scientific research
- Understanding the range of scientific careers
- Teacher knowledge
- Can extend into college and medical schools if working to improve understanding about drug abuse (i.e. curriculum development for wide range of people)

Requirements for a program: impact a large segment of the target audience—more the just an individual school if possible. The program is interested in scale (i.e. an entire state or even students across the country) Programs should try to include a component for replication or distribution to a broad audience.

Key components:

- Must adhere to the NSES (or other standards, benchmarks, or the next generation science standards when they are finalized)
- Must adhere to other standards
- Must include an evaluation component

Evaluation details:

- No specific requirement for the amount of funds spent on evaluation, critical that the evaluation plan is not an afterthought
- Formative and summative evaluation
- Evaluation will vary depending on the type of project
- Applications that do not have careful evaluation will not be funded

Evaluation is key for successful applications

Interested in funding:

- Strong evaluation
- Programs that address women/girls, minorities
- Biology of the brain and substance abuse (prevention should be secondary or not at all)
- Innovative projects
- Have funded more traditional projects that take an innovative approach
- Not interested in funding the same-old-same old
- Large target population

Monday, May 14, 10:20am - 11:40am
Keynote Address: Culturally-Nuanced Science Education

Frances Contreras, PhD, Associate Professor
College of Education, University of Washington
Reported by **Adela de la Torre**, PhD, University of California, Davis

Recent book: *Achieving Equity for Latino Students: Expanding the Pathway to Higher Education Through Public Policy*

Overview of Changing Demographics and Policy Context

The U.S. Census projects that by 2020, 1 in every 4 students will be of Latino origin. Latinos are the group most affected by the "Great Recession". From 2005-2009, Latinos experienced a 66% decline in household income. As a result, Latino families had less disposable income to invest in education. Given that Latinos are the fastest growing population, it is important to alter their educational path. Contreras describes the "Brown Paradox" as the increase of the Latino population in the US and the decrease in investment coupled with targeted divestment of education for this particular group. Over the years, public policies that adversely target ethnic and racial groups, like the recent Arizona immigration law, SB 1070, create hostile community and school environments for immigrant and EL students.

Proyecto Acceso: A Case Study in Washington State
Dr. Contreras presented a mixed-methods study that incorporated focus group data from parents, students, and teachers. In addition, data was collected on student demographics, context for learning, student interaction with parents and peers, students' awareness of resources and their post high school aspirations. The parent dataset included data about student-parent interaction, parents' interaction with schools, parents' awareness of resources, and their aspirations for their children to go to college. For this study, Contreras collected teacher demographic data and surveyed teachers about their context for teaching, instruction methods used for English Learners (ELs), teachers' interaction with other colleagues, professional development; teachers' aspirations for Latino students, and interactions with parents. Results from her study suggest that these teachers do not feel prepared to meet the needs of the EL students, and use students and paraprofessionals to inappropriately translate and teach content areas. Over 70% of the teachers believed that only one quarter of of their students could attend college. On the other hand, student responses in this study revealed their awareness of negative teacher expectations and the lack of access to needed school support systems and resources for academic success. Parent responses revealed expectations of higher education opportunities for their children and expected teachers to provide information about the pathway to higher education. Most parents in this study resided in rural, farm working communities, which made it difficult for parents to participate in extracurricular activities, and most parents attained less than a high school education. In addition, many of these parents were not familiar with the US educational system.

SAT Test Takers Youth Who are Beating the Odds Study (Gándara & Contreras)

Over 60% of Latino students start at the community college, but may not successfully transfer to four-year institutions. Barriers faced by community college students include the need to support their education through multiple jobs that may adversely impact their academic performance. Data show that Latino students who enrolled in a four-year institution have better outcomes. Despite the many barriers, there are students who beat the odds and manage to navigate the educational pipeline. A key finding is that Latino student achievers are very busy in multiple activities such as band, church activities, ethnic group activities that reaffirm their identity, student government, honors programs, work part-time, and participate in internship programs. Participation in these activities positively influences achievement on SAT scores and GPA in school. By engaging in different activities, students are able to create a peer network with other high academic achievers and interact with students who may have access and resources to facilitate their college-going path. The research demonstrates that involvement in activities is key for both, Latino and African-American students beating the odds, and that academically successful Latino, African-American, Native American students navigate school differently. The challenge for teachers and schools is to incorporate opportunities for these types of activities within and after school. A final example provided from this study was the high degree of resiliency that these students have when faced with extreme adversity. An example of this resiliency was presented with the case study of the success story about the undocumented student "Antonio", an entering MD/Ph.D. student who gained admission to Stanford, and who navigated successfully his prior educational experience despite lower teacher expectation and poor guidance from his teachers in his schools.

Key Recommendations and Models of Success

Given the growing Latino population, we need to create best practices that support the success for Latino and EL students. Some of the programs that work provide comprehensive services to the Latino student and their families, for example, Puente, GEAR UP, and AVID are successful programs. In addition, quality early education programs that have measurable effects on achievement over the long-term are also important. Intervention efforts must complement school efforts and not be a substitute for the quality of educational services. The comparative cost advantage for successful interventions from pre-school through college is high and this has potential positive impacts for significant cost savings and educational outcomes. Examples of programs that raise STEM achievement and promote preparation are Quattro Alliance for Science and Language Integration, the Meyerhoff Program, Project Lead the Way, Project TEACH MATH, The Learning Brain, and the UCD-SEDAPA ARISE Program. Partnerships do have the ability to influence students and their families, but cannot operate in isolation. A P-20 approach that connects communities and their strengths, validates community and cultural assets and alters deficit model paradigms will create better support systems for academic achievement for Latino and other underrepresented students.

Question & Answer Session

Q: In different regions students do not want to speak Spanish. Is this specific to regions?

A: There are regional differences and generational differences and the system does not reinforce bilingualism. For example, in CA, Prop 227 banned bilingual education.

Q: With the growing Latino population, what is happening with elections to address the issues?

A: There is political mobilization in the Latino community, but policies need to be developed at multiple levels, i.e. local, state, federal levels. This topic is also addressed in my book.

Q: Research interest in science in schools is important. However, how does learning happen outside the classroom and with different social networks and media?

A: Informal learning can occur within churches and communities. For example, Communities Organizing Resources to Advance Learning (CORAL)—partnered up with organizations to incorporate parents and highlight students' work. These activities do influence achievement in different ways.

Q: We have a science education program, but we have difficulty recruiting Hispanic students. Students may not want to sign up for our program because some students are undocumented and we have Federal funding. The school administration is not involved in expanding opportunities to these students. Student participation is important—how do we do outreach to parents?

A: Taking the program outside of where you are. You are already doing the right thing by taking it to other places where the community is located. Providing resources at the clinic or church is an important way to reach out to these communities. Our data suggests that spiritual activities are very relevant to Latino and African American communities so working with churches can be important. If you know your community and meet them where they are you will be more successful.

Q: How are the peaks and valleys in BA attainment from 1975-2010 explained?

A: The valleys are related to public policy --reduction to grants in higher education for students (e.g. CA had a decrease in Calgrants during the Reagan administration). The more recent valleys in the data suggest that policies such as the anti affirmative action policies may have had adverse impact on funding and access to higher education.

Q: Community colleges may have smaller classes, more support and have many students who go on to become doctors and engineers. Can the community college transfer turn out to be a positive outcome?

A: Some institutions have transfer agreements and programs like these and are successful with these students, but without these programs the transfer rate is diminished. The problem is that some remedial courses do not count as transfer courses, and this can increase the time at the community college and students may become discouraged and may not transfer to 4-year colleges. There needs to be more structured programs.

Q: How do we avoid making extra curricular activities "school-like"? Students are being successful in these activities, but we need to avoid that students' negative perceptions about school are transferred to these community activities.

A: Schools need more resources/funds, and the schools need to reinforce these programs and activities despite the resource shortage. We want to inspire the middle and low achievers with these activities so we can begin to engage them.

Q: Is sports part of the activities that make a difference for academic success? Is there any research that supports this hypothesis?

A: Sports do matter specifically for boys as it provides, for example, discipline skills. Part of the benefit of being involved in these group activities is that it exposes students to a college going path. The students who engage in multiple activities have the potential to develop multiple identities, to navigate multiple worlds, and to reduce the stereotype threat.

Q: There was a lack of incorporation of technology in your talk—is this influencing achievement?

A: Yes, currently I am working on Project Comunical, which works with teachers and parents. Parents receive text messages in Spanish. We are also focused on maximizing the types of media students are already utilizing to connect them with appropriate messages.

Monday, May 14, 1:00pm - 2:15pm

Culturally-Nuanced Science Education for **African-American Populations**

Facilitators: **Susan DeReimer,** PhD and **Gussie Fuller,** BA – Meharry Medical College
Panelists: **Feon M. Smith**, PhD, Marshall University
Tonya F. Smith, MEd, Richland School District One
Ann Chester, PhD, West Virginia University
Reported by **Jill Peeples**, MAE, Meharry Medical College

Session Discussion Prompts:

1) Build Trust
   Mechanisms
   Partnering choices
2) Importance of Crew
3) Building and raising "the bar"
   Visibility
   Loudly
   Clearly
4) Importance of Sharing Personal Stories
5) It's Cool to be Smart
6) Multiple Cultures within One Person
7) Having the "rare conversation"

Session Facilitator and Panelist Profiles:

Feon M. Smith, PhD
Assistant Professor
Adult & Technical Education
Department of Leadership Studies
Graduate School of Education and Professional Development
Marshall University

I am an African-American Assistant Professor in Adult and Technical Education at Marshall University which is located in Huntington, WV. I earned the Ph.D. Degree in Education with an area of specialization in Leadership for Higher Education, School of Education at Capella University, which was conferred on April 30, 2012. I have actively been a part of the Cabell and Lincoln Counties Health Sciences and Technology Academy (HSTA) Local Governing Board since it began in our region of the state in 2000-2001, and have served as chair of the Cabell-Lincoln HSTA Local Governing Board consecutively for the past five years. I raised two daughters, ages 25 and 21 as a single parent, and never thought I would earn a college degree. My oldest daughter was born when I was just 18 years of age. I always dreamed of going to college, but did not think I was smart enough or motivated enough. I would consider myself as being an "underrepresented" student back when I was in K-12 school, because my mother only had a high school diploma, our family's income status, and there were no academic programs in our schools to help underrepresented minority students to excel. My main focus when my daughters were born was to find gainful employment to support them. With the minimal office/clerical experience I had, I took classes at our local junior college and community college from time to time. However, when I became employed at Marshall University as a secretary in 1997, I began to meet people and network with people, and many of them became mentors and motivated me to pursue my education. It was in 1997 at the age of 33 when I began to work on my bachelor's degree. I wanted to make my daughters proud of me and show them that if you set goals and work hard, no matter the situation, you can achieve your dreams. I instilled in them that Education is very important.

I began my career at Marshall University in January of 1997 and held administrative staff positions (Administrative Secretary; Administrative Assistant, and Program Specialist) to the Vice President for Multicultural Affairs until December 2007 when I applied for and was selected as the Marshall University Carter G. Woodson Faculty Initiative Fellow (CGWFI). The CGWFI program, established by the office of Multicultural Affairs, is designed to increase the number of minority faculty on campus by providing the resources for selected individuals to enroll in doctoral programs to earn a doctoral degree, and become full-time, tenure-track faculty at Marshall University. Prior to joining Marshall University I worked as a Legal Secretary for the Law Office of Henderson, Henderson & Staples in Huntington, WV from October 1988 until December 1996. I joined the Marshall University faculty in January 2007 as Instructor of Adult and Technical Education while completing my doctoral studies at Capella University, Minneapolis, MN through the CGWFI program. In the spring of 2009 I was appointed as Assistant Professor, Adult and Technical Education. I teach graduate courses in Adult and Technical Education.

Tonya F. Smith, **IMA**, **MEd**
Secondary Science Consultant
Richland School District One
Waverley Administration Center

I'm the teacher in the bunch! I am an African-American science consultant in an urban school district in Columbia, SC. We serve over 23,000 students, a majority of which are non-Caucasian. I have 25+ years teaching experience in middle and high schools and have always taught science at schools with high minority populations and low socioeconomic status. Teaching has always been my passion. I come from a family of teachers. My parents met when they started their careers and many of their friends were teachers also. The children of their friends became my classmates. While in the classroom, I always looked forward to the new challenges the next day would bring. I understood, before I knew anything about learning styles that my students needed to experience science. I also understood the importance of making science relevant to their lives and addressing misconceptions. Buy in from my students was/is very important. They needed to know that I would be there for them, that I would listen, that I would push them to no end that I believed in them, even when they didn't believe in themselves.

Ann Chester, **PhD**
Assistant Vice President for Education Partnerships, Health Sciences
West Virginia University

I'm a white middle-class woman with a Ph.D. in plant ecology because plants don't bite or talk back. I have a love for helping underserved kids reach far to realize their potential. I had college going expectations from birth but was dropped into a non-college going track in the 7th grade by mistake. Inside of 6 weeks, my efforts and my behavior modeled a problem child – nothing but trouble. My mom rescued me and put me back in high expectation classes. It took me years to recover from 6 weeks of low expectations. From then on, I had a profound understanding of what is seen through the eyes of the under-served and why behavior and success often reflect expectations. I've started and nurtured from ground up, a pipeline program for underserved 9th-12 graders in WV with tremendous success through community engagement. The Health Sciences & Technology Academy is 18 years old and is a national model for STEM enrichment and college recruitment for underserved students. NIH has funded HSTA for 16 of the past 18 years. Approximately 800 kids and 80 teachers participate in HSTA annually. The students are 30% African American, 56% financially disadvantaged, 65% first to go to college and 69% female. The college going rate is 96%, the college retention rate is above 95%, and the STEM retention rate is over 50%. We've graduated over 1600 kids as of this spring. They get tuition and fee waivers to any WV state college or university through med school, and many other terminal degrees.

Susan A. DeRiemer, **PhD**
Professor, Department of Professional & Medical Education
Meharry Medical College

I am a white Professor at a historically black medical school with two African-American children. I have a Ph.D. in Neuropharmacology, but one of the areas I teach the medical students is cultural competence. The key points I try to make with them include: 1) Culture is embedded in every aspect of medicine, 2) They have internalized cultural norms that affect their perceptions and their behaviors---often subconsciously, as have their patients, 3) When these cultural assumptions don't align or when they conflict, there are barriers to becoming an effective doctor-patient team, and they can lead to systemic failures and health disparities, 4) They have to be self-aware, respectful of their patients' values, creative in dealing with the conflicts, humble enough to seek out help, and motivated to make a difference.

Our SEPA project (finishing year 2) is a partnership between Meharry and the Metropolitan Nashville Public Schools that focuses on their high school Health Career Academies. We are working with two schools, one that is predominantly African American, and another that is the most ethnically diverse school in the district. We are taking a multi-pronged approach that provides student activities of different intensities from 9th grade to post-graduation, combined with teacher professional development and a community outreach component. We explicitly built in Meharry's unique position as the leading producer of African American Ph.D.'s in the biomedical sciences as well as its long history of training minority professionals.

23 **Gussie Fuller**, **BA**
Meharry-SEPA Coordinator
Meharry Medical College

I am an African-American female With a B.A. degree in English and a minor in African Studies from an HBCU. I am currently working towards obtaining a Masters in Public Health from a different HBCU, while currently working as the Program Coordinator of the Meharry-MNPS SEPA. My background is in career education, corporate relations, and fundraising. My two brothers and I are products of parents who understood the value of a good education and were insistent their children understood as well. We were first generation college graduates that did not have the benefit of parents that were able to provide us the road map into college nor the pathways to follow to ensure success. All three of their children work in the field of education at some level or another where we are committed to helping minority students achieve personal and academic goals. We were socialized with educators, their children, and other progression al role models from early childhood through high school. When you raise the expectations of both the parents and the children, there will be improved outcomes with lasting impact.

Contact Information:
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Susan DeRiemer: 615-327-6050 or sderiemer@mmc.edu Meharry SEPA PI

Culturally-Nuanced Science Education for African-Americans

This session was led by four professionals, each from various backgrounds. Each professional led a table discussion focusing on the following areas: defining African American culture, building trust with students, and raising the bar for the students.

i. (Educators/partners) Need to have conversations about race with the students
    a. Unclear on how to deal with those conversations
    b. Children connect well with teachers, etc. that show vulnerability
    c. Establish a commonality which they relate to
    d. Take out those heroes (Shaq) and show them as examples
        i. What's the message and how can we translate that to the students…
ii. Different people are in different culture settings
    a. Get to know that person, their culture in order to get to know them
iii. Build trust (students-program/student-teacher/admin-students)
    a. If there's no trust, the program will not be successful
    b. Trust can't occur when racism is present
    c. Must have a mentor that can relate and tie together experiences
    d. Use a questionnaire: 5 things that challenge you, what do you want me to know about you
iv. Increase participation- spark interest in community
    a. You need to go to your target population- Don't wait for them to come!
    b. Role Models- recruit and educate
    c. Ask people to join with the extra-curriculum activities that don't normally join
v. Find partners that come from the target population
vi. Go in as equals as well as educate- be teacher and student at same time
vii. Mix interracial groups- break down barriers to solve a problem
viii. Grants can't stop as relationships are built
    a. Keep the grant going
ix. Families come first in African American culture
x. Recognize that families need to make money in order to survive
    a. Student perspective: Don't want to go to college, I want to make money.
    b. Money hasn't been present in school, it's enticing after graduation
    c. Cause/Effect: Students are working; therefore, academics suffer
xi. It's not always obvious, parents really do wish for success for their students
    a. Raising parent awareness and ability
    b. Get parents involved: Show parents the long-term goals, will help in the future
    c. Kids raising kids
xii. Importance of relationships in the process of delivering information
    a. Relationships are achieved through the process of sharing your story
        i. Children connect well with teachers, etc. that show vulnerability
        ii. Establish a commonality which they relate to
    b. Students make the connection with you when you're volunteer
xiii. Students need to invest in their own future
    a. Give young people access to that information
    b. Allow them to tweak it to their needs
xiv. Provide relevance to the curriculum
    a. Lessons need relate to their lives
    b. Keep it real!
        i. Educators need passion, emotion and real about what you're talking about
    c. Be creative in curriculum
        i. Have imagination
        ii. Increase field trips
xv. Incentive-based learning
    a. Example: earning gummy bears for understanding the lesson

xvi. Get the community involved
    a. Parents are having problems with their teens as well
    b. Create a fun and safe environment
xvii. Culturally nuanced programs for science
    a. Art throughout/engage health care
    b. Ownership and relevance
    c. Informal programs hands on. Vital. So many ways to access the process

Participants

Sandra Amass, Purdue University
Dawn Banks, LSU Health Sciences Center at Shreveport
Christina Boelter, University of Kentucky
Chiquita Briley, Mississippi State University
Alison Bruzek, The History Makers
Shaw-Ree Chen, University of Rochester Medical Center
Ann Chester, West Virginia University
Rebecca Daugherty, Northwestern University
Val Davillier, Great Lakes Science Center
Melani Duffrin, East Carolina University
Tiffany Ellis Farmer, Vanderbilt University
Carl Franzblau, Boston Univ School of Medicine
Brittany Garvin, EdVenture Children's Museum
Nancy Geving, University of Minnesota
Barbara Hug, Univ of Illinois, Urbana-Champaign
Sue Kirk, Virginia Commonwealth University
Naomi Luban, Children's Research Institute
Rabiah Mayas, Museum of Science and Industry, Chicago
Karina Meiri, Tufts University
Bradie Metheny, Office of Science Education, NIH
Marco Molinaro, University of California, Davis
Megan Moore, LSU Health Sciences Center at Shreveport
Catherine Morton-McSwain, West Virginia University
Kimberly Mulligan, Vanderbilt University
Karen Nelson, J. Craig Venter Institute
Jill Peeples, Meharry Medical College
Daniel Petering, University of Wisconsin, Milwaukee
Stephanie Rangel, Northwestern University
Joan Schanck, Pittsburgh Tissue Engineering Initiative
Feon Smith, Marshall University
Diedre Suber, San Francisco State University
Barbara Tharp, Baylor College of Medicine
Michael Toombs, Kansas Medical Center
Michelle Ward, Texas A&M University
Suzanne Wilkison, North Carolina Association for Biomedical Research
Chuck Wood, Wheeling Jesuit University
Eve Wurtele, Iowa State University
Mike Wyss, University of Alabama at Birmingham
Debra Yourick, Walter Reed Army Institute of Research

Monday, May 14, 1:00pm - 2:15pm
Culturally Nuanced Science Education for **Latino and EL Learners**

Facilitators: **Adela de la Torre**, PhD, Professor, Director of Chicano/a Studies, University of California, Davis
Rosa D. Manzo, Graduate Student, University of California, Davis
Rosa Gomez-Camacho, Graduate Student, University of California, Davis
Panelists: **Carole Flores**, Project Manager, Arizona Science Center
Joshua Briese, MEd, Professional Educator, Excelencia Elementary School, Creighton School District, Phoenix, AZ
Reported by **Adela de la Torre**, PhD, Professor, Director of Chicano/a Studies, University of California, Davis

"Students aren't flawed. It's a flawed system."

The growth of the Latino population in the last decade provides evidence of the need for relevant teaching pedagogies to address the growing achievement gap in science for EL Learners, who are disproportionately Latino students. It was observed by several participants in this session that many EL Learners are concentrated in underfunded schools, with under-resourced science programs, and face discouraging experiences in their classrooms, which creates a perfect climate for failure in science. As described by Rosa Manzo, a UC Davis, doctoral student who grew up as an EL student in California's Central Valley, EL students in rural areas navigate high school without clear advice on how to prepare for college, are offered few AP classes, and often experience discriminatory treatment and lower expectations from their teachers because of their gender and ethnic status. She provided a personal account of her high school cohort experience in terms of their final academic pathway. Of the 100 students in her peer group, only 64 managed to graduate high school, 12 successfully enrolled to a four-year college, and only one student went to graduate school. Sadly, this pipeline mirrors national data trends for many of these students. Participants also shared their frustration of the lack of teacher preparation and inadequate tools to teach science to EL students.

As shared by Carole Flores and Joshua Briese, from the Arizona Science Center, an innovative strategy for EL student engagement is an inquiry based approach to teach and create network communities to support science learning within the EL student classroom. Their project, "Busy bones", an interactive space that allows young students to engage in science activities through a hands-on lab experience, which provides middle school students animal bones to explore science, visibly creates a positive learning outcome in young EL students. Joshua is a 4th grade teacher whose classroom is comprised of 93% Latino students. His students engaged in this program and became proactively engaged through active exploration in this student lab experience. As a result of this experience his student became more proficient in the use of science vocabulary and increased their interest in science learning. The lab experience showcased the efficiency of using creative teaching strategies, particularly the 5E model in engaging EL students in science learning.

Dr. Adela de la Torre from UC Davis presented key elements of the NIH SEDAPA funded ARISE program. This is a teacher professional development program for middle to high school science teachers of EL students from the Central Valley of California. The project uses a neuroscience and addiction science content approach as a focus area, which is then intersected with the 5Es teaching methods in order to improve EL science outcomes in the classroom. The 5Es pedagogical approach (engagement, exploration, exploration, elaboration) is also combined with the content areas that explore the use of culturally nuanced information and strategies to help teachers understand the context that influences EL learners in the classroom. The ARISE teachers are paired with a science mentors and are provided support from a science coordinator trained in 5E methods to develop and present research projects with their EL students at a UC Davis sponsored research symposium later in the year.

 Teachers in the ARISE program are encouraged to move from traditional to transformational teaching methodologies and to advance from a teacher centered to a teaching modeling strategy. They are also trained in cultural nuanced learning approaches through curriculum developed by psychologists with expertise in psychological impacts of immigrant experiences and are exposed to psychometric learning style measures such as a "face" measure and leaning style field dependency measures.

Participants during the breakout session discussed their background working with EL students in informal and formal educational settings as well as shared with the group important issues they faced with these students and strategies that may be helpful when teaching EL science students. These included the following:

Issues:

- There is a lack of resources to support these students and several risk factors that impact the performance of these students in the science classroom.
- There are limited educational strategies available and disseminated to assist science teachers to effectively instruct these students in science.
- There are insufficient role models/ science teachers from these ethnic groups to help motivate and minimize the social distance and maximize cultural understanding between EL students and their teachers.
- Unconscious racism and internal biases exist that adversely impact EL students within the teaching profession, thus there is a need to support programs to allow teachers to self evaluate and develop more empathetic and culturally sensitive teacher skills.
- The majority of science teachers across the country that teach EL students are largely white- non-Latino and there is a need for professional training to enhance their understanding of language and cultural needs of EL learners.

Classroom Strategies:

- Increase the diversity of the teacher pipeline and staff to mirror the demographic composition of EL students.
- Engage and connect students using successful teaching models such as the 5Es model.
- Provide sophisticated mentorship and role models to engage students such as academic researchers or near peer mentors and recognize the power of encouragement.
- Use an asset not deficit approach when working with bilingual and bi-cultural students. For example, an asset approach in the classroom could capitalize on these skills so that students can develop projects within their local communities using their language and cultural skills
- Develop culturally relevant materials or adapt existing material to capitalize on unique cultural practices or traditional foods of EL communities. For example, the "lazybones" project could include a discussion of the Mexican tradition of "Dia de los Muertos" in the bone discussion, and traditional foods such as salsa could be used in understanding bacteria analysis.
- Understand and support the students' need to find place and identity in their schools.
- Allow students to do their work in their native language and to process learning in their own language.
- Do not just translate language, create translation in both languages.
- Recognize that access to quality science education is an issue of social justice and children should be engaged in science before they enter middle school.
- Aim to engage students as a way to convey science information to their families.

Out of the Classroom Strategies:

- Know regional demographic needs.
- Work with the community and bring content to people.
- Create sustainable strategies.
- Use different media approaches for example, include church publications and local community visits.
- Be authentic and develop community trust over the long term.
- Create positive out of the classroom experiences.

Participants

Margery Anderson, US Walter Reed Army Institute of Research
JoAnna Baldwin, Twin Cities Public TV
Cheryl Bodner, Pittsburgh Tissue Engineering Initiative
Joshua Briese, Creighton School District, Excelencia School
Judy Brown, Miami Science Museum
Chris Chipps, University of Texas, Health Science Center at San Antonio
Virginia Coats, Oregon Museum of Science and Industry
Frances Contreras, University of Washington
Janet Dubinsky, University of Minnesota
Deanna Flora, Virginia Commonwealth University
Carol Flores, Arizona Science Center
Nicole Garneau, Denver Museum of Nature & Science
Lisa Gough, National Institutes of Health (NIH)-OD
Luis Haro, Duarte Unified School District
Chandana Jasti, University of Illinois, Urbana-Champaign
Kelli Johnson, Texas A&M University
Susan Kane, City of Hope
Nicole Kawrach, Museum of Science and Industry, Chicago
Kristin Kush, Resource Development Institute, Kansas City
David Lally, Virginia Polytechnic Institute and State University
Jennifer Love, Prince George's County Public Schools-Northwestern High
Katie Malanson, Tufts University
Leticia Marquez-Magana, San Francisco State University
Laura Martin, Arizona Science Center
Julia McQuillen, University of Nebraska, Lincoln
Maureen Munn, University of Washington, Department of Genome Sciences
Darrell Porcello, Lawrence Hall of Science, Univ. of California, Berkeley
Rosemary Riggs, University of Texas, Health Science Center at San Antonio
Bob Russell, Space Science Institute
Patrice Saab, University of Miami
Rebecca Smith, University of California, San Francisco
Kristi Straus, University of Washington
Michelle Ventura, Georgia State University
Rebekah Ward, Northwestern University
Marilyn Winkleby, Stanford University
Steve Yalowitz, Oregon Museum of Sciences and Industry

Monday, May 14, 1:00pm - 2:15pm
Culturally-Nuanced Science Education for **Rural Populations**

Panelists: **Margaret Shain**, MS, The American Physiological Society
Robert Manriquez, MEd, Stanley High School
Kim Obbink, EdD, Montana State University
Larry Johnson, PhD, Texas A&M University
Reported by **Lisa Marriott**, PhD, Oregon Health & Science University

Introduction to panelists:

- Margaret Shain: grew up in Virginia and then moved to rural middle America. Used to be a teacher, now working with SEPA program through American Physiological Society. Looking at online vs in person training – using a rubric to determine if differences exist
- Robert Manriquez: teacher at Stanley High School in Louisiana; used to teaching multiple classes. Inquiry-based learning
- Kim Obbink: director of extended university at Montana State (Bozeman). One congressman from the state. 2nd largest number of rural districts. Largest number of very small schools. They have a research 1 institution. Native American is 7%; lots of different tribes. 8% is home-schooled. Poor math skills in their district. Only 20% of 4H members come from rural families
- Larry Johnson: Texas A&M University. Higher percent of minority in rural schools. Many teachers start in rural schools before moving to larger school. Teachers are also older after they've changed careers. Their SEPA program works with vets and Future Farmers of America (FFA). Too many requests, so they put things online. Presentations from faculty. Virtual scientist presentations and interviews, e.g. career day.

Topics Discussed (Bold indicates most in-depth conversations)

- Rural Groups to consider
  - Home-schooling population – important population to consider; especially in rural areas. Parents and/or an external teacher are the learning coach (Georgia Cyber Academy program plus other for-profit programs that provide support and use different coaching models).
  - Small schools
  - Teacher Networks across Schools -- how does one develop networks. Landmines to stay away/things to do.
    - Walt (Maine) – every kid has a computer, so try to introduce technology. Teacher networks only happen when you bring people together. Bring them from all over the state, then they become their own group to tell their local constituents. Getting teachers together first is key. Amount of time may play an important role
      - How do you use technology to keep them together – because they're friends, they email, etc.
      - How do you measure? Is anyone measuring a long-term collaboration between program. One group is measuring it informally. In 3rd year of program – one is a one day program (tend not to have longitudinal interactions) vs 2 week program (where they actually still communicate with each other). Measuring the teacher networks seems like an untapped opportunity.
    - Other considerations: keep it simple for teachers, make it align with standards, no extra paperwork for teachers
    - Other resources and programs on this topic:
      - NASAtalk – tells about best practices
      - HubZERO (Purdue) – if you participate in any of the STEM education through purdue, you can get all of the other resources as well.
      - eMission – online teacher training then live program. Virtual lab to take around the state (West Virginia) and now also in 18 countries. For profit program.
      - Science Teacher Meetings are a great resource. - districts pay for them to go to that meeting, then you can meet with them there.

- **Internet considerations** – Sometimes bandwidth in rural locations is too slow or sometimes families don't have internet. But by and large, schools often have good internet capabilities though it's hard to get all teachers access to them.
  - L. Johnson's program puts things online, such as presentations from faculty, virtual scientist presentations and interviews, e.g. career day. Also animals: neutering. Can't talk about reproduction to middle school students, but you can talk about neutering a puppy.
  - Broadcasting is a great opportunity: Too hard to get scientists to rural locatons, so instead they use website as a resource.
  - **Online Courses** – how does one develop, evaluate, etc. Margaret Shain says this is being developed (e.g. 8th grade algebra). Positive formative feedback from rural teacher: "I know have a resource of teachers I can call on" (especially beneficial for rural schools who may be the only class there). Methods: Use online blackboards and skype. GoTo Meeting allows more than three people. American University – Center for Learning and technology Resources (CLTR) – they may have resources.
    - Stanford/Berkeley/Princeton, etc CourSERA Experiment – one class free online. Over 10K enrolled in one class. Army of TA's who grade the material. Paid for by university to pay for program
    - Harvard/MIT – MOOCS – Massive Online Open Courses. E.g. how to build a search engine. Not for credit, but it has a Stanford logo, etc. 20-30% actually finished the course. Great for places like Mumbai.
  - Can rural schools actually handle this technology? What's another step that don't have the resource. Larry: They can record video from internet, then play later. Telecommunication abilities to talk online. Not every state has this.
    - Internet in a box – everything mobile, then use internet

- Questions and other considerations
  - Where do youth get their career counseling in rural areas.
  - What qualifies as rural? (some are considered too rural; others not rural enough)
  - Economy concerns are prevalent
  - Important to do more than just a one-shot deal of bringing students to campus. MSU connected with 4H program to increase repeat.
  - Rural mentality –
    - Using a Navigator to make up for school cuts – Louisiana source said their community voted if their state has to have budget cuts, first things to go are education and healthcare. Tough climate. Hired a navigator to help with this (for the BioStart program). Creates a one-on-one personalized counseling. Navigator makes them take the ACT again and again. Teaching them how to get into college and do the other pieces besides calculus, teenage pregnancy, etc.
    - Sometimes communities don't want their kids to leave – unless there are jobs for them to come back. Important step to move forward is to create the jobs.
    - Can't just pop a new idea on a community. Need to be mindful of social norms. (e.g. in Texas, didn't like that a woman was carpooling with a man who wasn't her husband)
    - Need to connect with something in the community that's helpful/meaningful to them. Montana has kids present their work at a county fair to create buy-in. In Louisiana, students are the representatives for the program – gives them more buy in to the internship. Like inviting scientist to come to a church. One needs to be invited into a rural church.

Other Resources:

- "Why Rural Matters" – great resource for grants/publications that provide statistics for every state. Looks at mobility rates as a stress indicator, e.g. If students moved more than once in past year

Participants

Lola Adedokun, Purdue University
Walter Allan, Foundation for Blood Research
Anisa Angeletti, University of Nebraska, Lincoln
Barbara Baumstark, Georgia State University
Virginia Carraway-Stage, East Carolina University
Ginger Cross, Mississippi State University
Greg DeFrancis, Montshire Museum of Science
Paige Gingrich, University of Alaska, Fairbanks
Jason Heinz, UNC Morehead Planetarium and Science Center
Georgia Hodges, University of Georgia
Adam Hott, Hudson Alpha Institute for Biotechnology
Amanda Jones, Seattle Children's Research Institute
Loretta Kelley, San Francisco State University
Heather Kleiner-Hancock, Louisiana State University Health Science Center, Shreveport
Mary Jo Koroly, University of Florida
Michael Lichtenstein, University of Texas Health Science Center, San Antonio
Donna Loden, Mississippi State University
Lisa Marriott, Oregon Health & Science University
Ron McNeel, Baylor College of Medicine
Amanda Meyer, University of Alaska Fairbanks
Leonard Munstermann, Yale Peabody Museum of Natural History
Caren Oberg, EdVenture Children's Museum
Jeff Shaver, University of Washington
Jackie Shia, Wheeling Jesuit University
Patricia Slattum, Virginia Commonwealth University
Amy Spiegel, University of Nebraska, Lincoln
Denise Young, UNC Morehead Planetarium and Science Center

Monday, May 14, 1:00pm - 2:15pm
Culturally-Nuanced Science Education for **Native Populations**

Facilitator: **Kelley Withy**, MD, PhD, University of Hawaii, Manoa
Panelists: **Kitty LaBounty**, MS, Mount Edgecombe High School and University of Alaska, Southeast
Sue Hills, PhD, University of Alaska, Fairbanks
Tony Ward, PhD, University of Montana
Marlys Witte, MD, University of Arizona
Reported by: **Paul Cotter**, DA, Evaluator, Alaska BioPREP

The session began with an informal discussion about time perception. Broad comparisons were made between native Hawaiians/Pacific Islanders, Native Americans and Alaska Natives. Focus shifted to identifying challenges of working within Native communities. Several were identified, including:

- High teacher turnover in native communities
- Differing perceptions of school and schools in Native communities
- Large geographic areas and travel distances
- Cultural differences between community served and formal educator
- Identifying the right community contact or cultural liaison
- Community skepticism due to past involvement with outside groups/educators/researchers
- Differences in parental involvement
- Under-achievement on standardized tests
- Interpreting spoken and unspoken communications
- Developing mutual trusting relationships within grant time frames

Dr. Withy directed the discussion toward identifying successful strategies to engage Native students. Dr. Tony Ward, who works with Native communities in the Dakotas, Intermountain West, and Alaska on indoor air quality and respiratory health, detailed several strategies he has used to engage students:

- Provide equipment for community members to use in their homes and public buildings to study indoor air quality issues.
- Bring gifts (items with University logo are popular).
- Discuss geographical origins of visiting education teams. He has found that community members are often interested to know where visitors originate.

The discussion expanded to entire group. Several other strategies were added. Including:

- Offering college credit for participation in education programs.
- Including all members of education team on site visits. This tends to create a buzz of enthusiasm associated with the visit and may indicate a greater level of commitment by the funded entity to work with the community.
- Offering a two-tiered approach to educational efforts. A structured environment for school kids might be effective, whereas informal community nights allow for closer interaction with community members.
- Talking less, listening more.
- Using "raggedy beginning" and "linger longer" strategies instead of strict call-to-order and end times for meetings may help in rapport development with some communities.

A point regarding differing perceptions of mobility and advancement between some Native and non-Native cultures lead to a general discussion of this topic. In some communities, advancement is not tied to quantifiable metrics, but to service to family and community. Despite poverty and under achievement on standardized tests, many in Native communities view themselves as "advantaged" because of close connection to family and community and their commitment to community values. This can be difficult for non-Natives to understand, but respecting this notion is necessary for those working in these communities.

Participants

Diane Adger-Johnson, National Institute of Allergy and Infectious Diseases
Tony Beck, NIH SEPA, ORIP, DPCPSI, OD
Trez Buckland, University of Washington
Sheila Caldwell, National Institute of General Medicine Sciences
Paul Cotter, University of Alaska, Southeast
Maurice Godfrey, University of Nebraska Medical Center
Sue Hills, University of Alaska
Andrew Jameton, University of Nebraska College of Public Health
Daniel Kalman, Emory University School of Medicine
Michael Kavanaugh, University of Montana
Kitty LaBounty, University of Alaska, Southeast
Ann Lambros, Wake Forest School of Medicine
Leslie Miller, Rice University
Gillian Roehrig, University of Minnesota
Marti Ruffo, Seattle Children's Research Institute, Science Adventure Lab
Catherine Sasek, National Institute on Drug Abuse
Tom Scarlett, University of Hawaii
Veronica Smith, Northwest Association of Biomedical Research
Kim Soper, University of Nebraska Medical Center
Molly Stuhlsatz, University of Nebraska Medical Center
Kimberly Tanner, San Francisco State University
Tony Ward, University of Montana
Martin Weiss, New York Hall of Science, Corona
Kelley Withy, University of Hawaii
Marlys Witte, University of Arizona Health Sciences Center

Monday, May 14, 1:00pm - 2:15pm
Culturally-Nuanced Science Education for **Urban Populations**

Facilitator: **Virginia Shepherd**, PhD, Vanderbilt University
Panelists: SEPA Scientist/Teacher Teams from Chicago, Boston and Paterson, New Jersey
Michael Kennedy, PhD, Northwestern University
Jennifer Lewin, MEd, Chicago Public Schools
Berri Jacques, PhD, Tufts University
Matthew Dugan, MAT, Boston Public Schools
Wendy Huebner, PhD, Montclair State University
Lynn Tarant, MSET, Paterson Public Schools
Reported by **Susan Kuner**, President, Topaz Canyon Group, LLC

"When something is confusing, you unconfuse it." Quote reported from a student in an urban SEPA project
"Before students will be interested in careers, STEM education must be cool." SEPA project scientist

Each team was asked to spend five minutes describing their SEPA program and list their major challenges. A list of specific challenges for science educators working in urban settings was then developed and discussed by the group.

Challenges reported from the Chicago teacher included issues of safety and poverty. The school is in a neighborhood with gangs and violence. Issues from students' lives enter the learning environment for example, a student who did not eat that day so a teacher must also be a mother and a nurse. The biggest challenges for the university were recruiting enough mentors from underrepresented populations, how to train the mentors to be culturally sensitive, and making sure that the mentors come every week. Graduate students were better mentors as undergraduates had more of a "flake out" factor.

Challenges reported from New Jersey schools included finding enough time to hold the Epi club either during the school day or after school. Challenges for the university were the difficulties of conducting valid research in authentic educational settings and finding comparison groups requiring consent from parents whose children are not in the program. A second challenge was finding teachers who would commit to a time-consuming three year program.

The Boston team reported challenges of how to make STEM curriculum relevant for the students finding that students' initial responses were that science is not cool and robots are not cool. Another challenge was having a program at schools with different student populations. For example, a Socratic discussion worked well at a top school but failed with students at a low performing school. For teachers the main challenges were learning content knowledge and the lack of time.

The group discussed other urban challenges and shared advice about:

- Sustainability – how to survive turnover, how to keep costs reasonable, how to empower teachers to "own" the program, wish for support from SEPA for examples of sustained programs and sustainability transition grants
- Forming lasting partnerships – putting in the time
- Keeping students safe and dealing with life issues
- Transportation – bus passes, collaborate with other agencies though hard to do
- Strategies and tools to work successfully with underrepresented populations; designing tools for urban settings; technology availability and level of skill
- PI resistance to graduate student participation – show benefits for grad students
- Parent involvement
- More support for valid educational research

Participants

Susan Bonk, EdVenture Children's Museum
Rob Bonneau, Penn State College of Medicine
Kristi Bowling, Rice University
Liam Casey, University of Rochester
Shannon Colton, Milwaukee School of Engineering
Leda Cummings, Walter Reed Army Institute of Research
Susanna Cunningham, University of Washington
Nell Curran, Stanford University
Don DeRosa, Boston University
Laura Fawcett, Yale Peabody Museum of Natural History
Brandon Finegold, Madison Park Technical and Vocational High School
Laurie Fink, Science Museum of Montana
Gail Fletcher, University of Southern Maine
Christine Frank, George Washington University
Becky Fulop, Mission High School
Beth Hahn, Northwestern University
Susan Hershberger, Miami University
Renee Hesselbach, University of Wisconsin-Milwaukee
Tania Jarosewich, University of Illinois, Urbana-Champaign
Sabine Jeske, University of California, San Francisco
Mark Kaelin, Montclair State University, New Jersey
Susan Kuner, Topaz Canyon Group, LLC
Lisa McDonald, Oregon Museum of Sciences and Industry
Tammy McKeown, Virginia Commonwealth University
Tracey Meilander, Great Lakes Science Center
Nancy Moreno, Baylor College of Medicine
Audrey Parangan-Smith, San Francisco State University
Loran Parker, Purdue University
Debra Piecka, Wheeling Jesuit University
Nancy Place, University of Texas Health Science Center, San Antonio
Marcia Pomeroy, University of Kansas Medical Center
Linda Pruski, University of Texas Health Science Center, San Antonio
Jeff Radsick, Duarte High School
Monique Scott, American Museum of Natural History
Meena Selvakumar, Pacific Science Center
Erika Shugart, Marian Koshland Science Museum of the National Academy of Sciences
Donna Spruijt-Metz, University of Southern California
Patricia Ward, Museum of Science and Industry, Chicago

Monday, May 14, 1:00pm - 2:15pm
Culturally-Nuanced Science Education for **Special Needs Students**

Facilitator: **Dina Markowitz**, PhD, University of Rochester
Panelists: **Kathy Hoppe**, Monroe 2-Orleans BOCES, NY
Donna Cassidy-Hanley, PhD, Cornell University Ithaca
David Syracuse, TST BOCES Career & Technical Center
Reported by **Rebecca Martin**, BA, Northwestern University

This session focused on innovative practices to better engage special needs students with scientific material and topics. There is a broad diversity of special needs students including students with emotional, behavioral, and cognitive issues. Students can become bored with traditional programs and so more interactive methods of learning are often useful in teaching scientific concepts and ideas in special needs education.

Kathy Hoppe from Boards of Cooperative Educational Services (BOCES) in New York first presented examples of case based learning techniques to teach 7th grade, 8th grade, and high school special needs students. Case based learning (or problem based learning (pbl)) is a student centered, interactive approach to teaching that involves real-world concepts of high interest. Each teaching unit is designed to present a scientific topic in an engaging yet still informative manner through several activities. These fun and engaging activities often result in better management of behavioral problems. Some example of topics covered in specific case-based learning units:

- Genetic testing
- Pollution Problems
- Water Intoxication
- Plankton studies

An example unit, "Who's the Daddy" was presented and discussed. "Who's the Daddy" is a genetics unit modifiable for different students. For example, an adapted unit, "Who Let the Dogs Out," is available for lower level (middle school) students with changes made to informational text and context but with many of the same hands-on activities. Instructional Booklets provided contain directions to complete different interactive activities including:

- Literacy activity: A bioethics vocab survey.
- Hand's on lab activity: Gel electrophoresis of DNA
- Interactive modeling activity: Nucleotide building activity with PVC pipes & connectors representing sugars, phosphates, nitrogenous bases & hydrogen bond.

Breakout session attendees were then asked to participate in the DNA modeling activity to get a sense of the level of interaction and activity involved.

Donna Cassidy-Hanley from Cornell University and David Syracuse from the NY BOCES Career and Tech program then presented on the Advancing Secondary Science Education thru Tetrahymena (ASSET) program at Cornell.

ASSET uses living cells (non-pathogenic Tetrahymena thermophila) as lab models to address biological concepts through hands-on, highly interactive lab activities. This has proven to be very adaptable for special needs students. All necessary reagents, equipments and protocols are available to teachers including teaching modules covering fundamental scientific concepts in biology. Materials (including microscopes and digital cameras) are loaned for 2 weeks intervals and sign up is available on the ASSET website.

Many key characteristics of the program were presented in terms of issues and challenges unique to special needs science education:

- Relatability/Relevancy: The tetrahymena can be collected from lakes by students and is a good way to demonstrate to kids that these protozoa exist in nature.
- Adaptability: Each module can be adapted to an individual student, the student can be involved in less challenging (organism collection) or more challenging (data analysis) activities.
- Accessibility: Many special needs students have difficulty using microscopes so digital cameras connected to the scopes are used instead. Images can then be viewed on a connected computer screen. This allows manipulation of data as movies and time lapse images. These data can then be recalled for later data analysis and allow the student to work at their own pace.
- Interaction: Students can publish & compare images and results on teacher pages in an online database allowing more extensive interaction. They also have the opportunity to participate in a Virtual Science Fair.
- Interest: Many experiments and modules are designed to be real-world relevant. For example, modules studying the effect of cigarette smoke extract and beer on cell behavior and motility.
- Collaboration: This can occur on a multi-grade level; older, and/or more able students can work with and help younger, and/or less able students.
- Cross-curricular opportunities: Images of tetrohymena can be used for art projects. Science writing activities can augment Social Studies & English lessons. The students have also been involved in drawing characters for a Cornell tetrahymena videogame.

During the discussion it was noted that all of the modules and teaching units designed for special needs students could be used just as well in mainstream classrooms.
Different forms of technology can also be very useful in science education for special needs students. Smart boards, probe tech, and iPads can be highly engaging and have all worked well for facilitating special needs learning. Technology can also be particularly useful for low-functioning but high ability students. Moreover, it can act as a unifying element, making a special needs student "cool".

Participants

Sherry Blanco, University of Texas, Health Science Center at San Antonio
Donna Cassidy-Hanley, Cornell University
Eric Chudler, University of Washington
Amy Falk Smith, University of California, Davis
Yvonne Klisch, Rice University
Rebecca Martin, Northwestern University
Patricia Newman, Office of Research Infrastructure, Division of Planning Coordination and Strategic Initiatives, NIH
James Planey, University of Illinois, Urbana-Champaign
David Syracuse, TST BOCES Career and Technical Center
Kathie Williams, EdVenture Children's Museum
Jenny Williamson, University of Washington

Monday, May 14, 2:30pm - 3:30pm
Keynote Address: **Exceptional Opportunities for Science, Extraordinary Opportunities for Science Education**

Francis S. Collins, MD, PhD, Director, National Institutes of Health
Reported by **Dina Drits-Esser**, PhD, University of Utah

Focus of talk: Highlight areas of scientific advancement to make a compelling case for why young talent may want to come join the scientific enterprise. No time more exciting than right now.
Currently have new, advanced tools to understand how life works at detailed molecular level and to better understand disease.
His own background: he was inspired by high-school chemistry teacher to become scientist.
NIH very invested in science education (NIH has to do it a bit on the sly, unlike the NSF).

Science at the NIH

NIH Investments in Innovation: **Technology, Translation, Talent, and Taxpayer Return on Investment**

Technology: Driving our ability to understand how life works. For example, the cost of human genome sequencing has dramatically decreased because of advances in technology. Such technology has made it possible to understand the molecular causes of many more diseases than before such technology. Up to 4600 disorders where we know the precise molecular cause. Ability to do sequencing has led to some dramatic results in treatment. Gave example of the Beery twins with neurological disorder. Their genomes were done and pharmacological therapy was given. Results were dramatic in improvement.
NIH has the Undiagnosed Diseases Program. 30 experts try to diagnose through numerous means, including DNA sequencing. About 20% of time, they come up with diagnosis. Over a dozen new diseases discovered by this process.

Translation: Taking basic science discoveries from NIH laboratories and turning them into interventions: prevention, diagnostics, or therapeutics. Of the 4600 disorders where precise molecular cause is known, only 250 have precise treatments. Huge gap between what we know and what we can do about it. Would like to accelerate process between knowledge and treatment.
Example of disease where much progress has been made is cystic fibrosis (most common fatal genetic disorder of people of northern European descent). The gene was finally mapped in 1989 after years of work. Gene therapy never got to point of being efficient. In last couple of years, a compound was identified that treated certain forms of cystic fibrosis. FDA approved compound. More work is being done to treat patients with other forms of cystic fibrosis and to treat younger patients.
It took a long time (1989 to 2012) for drug to be available. We would like to speed up the process. Collins describes what drugs comprised of, what makes drugs effective, and drug trial processes and costs.
Describes goals of the new National Center for Translational Science. Working on manipulating human cells to develop organs for drug testing. Describes partnerships NIH has with other organizations for work in toxicology.
Could old drugs be used to perform new, different tasks (tasks with different purposes)? Could NIH be a matchmaker between drug companies with drugs that have passed Phase I and II trials and scientists, in order to repurpose these drugs?

Talent: NIH has variety of ways they invest in talent from K-12 (SEPA Program and NIH Office of Science Education) to faculty. Spark for science must be ignited in K-12. Need for talent remains great. Cites reports of 8th grade science achievement scores):

> **Bad news:** Boys still outperform girls, Private schools still outperform public, Hispanics and Blacks still lag far behind Whites
> **Good news:** Hispanics and Blacks made slightly more progress than Whites in past decade
> **More good news:** U.S. Education Dept.'s effort to boost number of science teachers by 100,000 over next decade through incentives

More good news: Next Generation Science Standards, draft released May 11. Goal is to create voluntary, national science curriculum

Long way to go to attract promising talent to science fields. Desperate need for more diversity in science and medicine in the U.S.: African Americans, Hispanics, and Native Americans represent 31% of U.S. college age population, but only account for 14% of undergraduates in life sciences. They account for even fewer in later stages.
Collins showed pie chart of NIH investigators who are of color (very few Black or Hispanic).

Taxpayer Return on Investment:

Investment in science and technology is an essential part of U.S. economy.
Talked about deleterious effects of inflationary growth on purchasing power. Need to think about ways to be more efficient.
To encourage this at NIH: grants for research at U.S. academic institutions. NIH is a driving force in U.S. economy. Impact of NIH-supported research on U.S. economy:

In 2010, NIH research supported 488,000 jobs at 3000 institutions and small businesses nationwide
In 2010, NIH funding generated $68 billion in new economic activity—double taxpayers' investment
NIH serves as foundation for entire U.S. medical innovation sector that: employs 1 million U.S. citizens, generates $84 billion in wages and salaries, exports $90 billion in goods and services

President Obama understands what NIH is doing and understands connections between innovation and science education.

Questions from Audience:

Question: How do you address some politicians' lack of understanding of NIH story and need for science education?

Answer: Taking every opportunity to explain and discuss the story. Through conversations and through documentation of successes.

Question: *Regarding NIH initiatives to find new uses for old drugs, is there anything for utilization of drugs that are polymers, are common, are already in use in medical fields but current pharmaceutical companies not using to repurpose?*

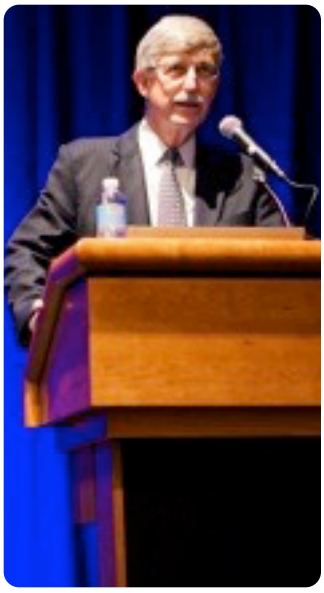
Answer: Problem is who will cover the cost. NIH will cover to Phase II, then company covers Phase III. If compound off-patent (generic) or never had patent, harder to cover the costs. How create incentive? Maybe through "use patent" ("use" is a new idea for the drug).

Question: What is connection between CTSAs and science education?

Answer: *Some CTSAs have partnership with SEPA grants. CTSAs have variety of areas they're asked to pursue and some of these are making community connections. Some CTSAs have these connections. This will need to be a greater part of the CTSAs.*

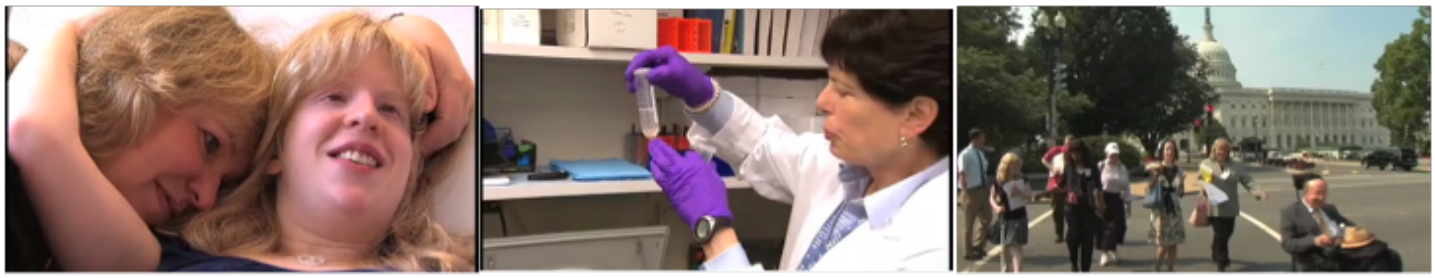
Question: What ways are you trying to integrate bioinformatics and consistent standards for data (for data to be available for others, etc.)?:

Answer: *We have good models for data sets, especially in genomics. With other kinds of data, people get more anxious about privacy issues. This is an area of very high intensity at NIH.*



Monday, May 14, 7:00pm - 8:45pm
Film Screening of ***"RARE"***

Reported by **Jeanne Ting Chowning**, MS, Northwest Association for Biomedical Research



Screenshots from "RARE"

RARE, a new documentary by award-winning filmmakers Maren Grainger-Monsen, M.D., and Nicole Newnham, takes viewers into the world of those living with a rare genetic disease and participating in a clinical trial. The film follows Donna Appell, whose daughter Ashley was diagnosed as a toddler with Hermansky Pudlak Syndrome (HPS), a rare syndrome causing albinism, blindness, a bleeding disorder and often a fatal pulmonary fibrosis. When Donna learned that her baby daughter Ashley suffered from a rare genetic disorder that would kill her in thirty years, she was told there were less than thirty people in the US who were known to have it and no one knew where they were located. Realizing that no one was going to help cure "just one child," Donna set about forming an advocacy group and harnessing the Internet to gather as many patients as possible who suffered from HPS. By the time Ashley turns twenty, Donna, under insurmountable odds, has achieved something incredible: the advocacy group she started is now in the hundreds and the NIH has agreed to start a clinical trial.

Filmed with intimate access over three years, as the clock ticks and the stakes get higher, RARE follows Donna and her advocacy group as they travel to Puerto Rico and throughout the US in a race to fill a drug trial they hope could prolong her daughter's life. Along the way we become part of a sweet love story when Donna's daughter Ashley falls for an earnest young man who has the same fatal disease.

RARE takes viewers into the world of what it is like to live with a rare genetic disease. In the film ,we visit Donna's annual conference, which unites HPS patients and their families with the doctors studying their disease, and opens an intimate window into the world of clinical trials. We also see how patient advocates are joining together to increase their influence – following Donna's group as they lobby congress on Capitol Hill along with members of other rare disease groups.

We learn that while the diseases may be rare, there are over 30 million people in the United States that have some sort of rare disease and more than 250 million people in the world suffer from one. As Donna finds out that Ashley herself must be excluded from the trial, RARE puts into relief the importance of hope, love and perseverance in the face of staggering odds.

The film is designed to provoke debate and discussion of some of the major ethical and social issues inherent in genetic testing and research: How do advocacy leaders like Donna Appell balance the sometimes dueling roles of parent and scientist? What conflicts are raised for researchers who develop an emotional relationship with their subjects? How is research study design impacted by input from patients? What is the patient's/family's experience of being diagnosed and living with a rare genetic disorder, living through genetic testing, or being involved in a clinical trial?

41 The Northwest Association for Biomedical Research (NWABR), with supplemental funding to their SEPA grant "Collaborations to Understand Research and Ethics" (CURE), partnered with the filmmakers to develop a DVD version for the high school classroom. The high school version also pairs with lessons developed specifically by CURE for a unit on "The Science and Ethics of Humans in Research" that focuses on clinical research processes and issues and that will be available at www.nwabr.org in Fall 2012. The high school version of RARE is available to SEPA educators from the filmmakers at http://medethicsfilms.stanford.edu/films/rare.html.

Donna Appell attended the SEPA screening and engaged in an active question and answer session following the viewing. Jeanne Chowning, CURE PI and Director of Education for NWABR, facilitated the discussion. Ms. Appell, who is also a member of the NIH Council of Public Representatives (COPR), shared her personal insights both into the process of making the film as well as her experiences as a mother, nurse, and disease research advocacy group founder. The SEPA audience was visibly moved by Ms. Appell's courage, honesty, and integrity, and many conference participants stayed on after the discussion to speak to Mrs. Appell personally.

Tuesday, May 15, 8:30am - 9:00am
Update: **The Federal STEM Strategic Plan**

Bruce Fuchs, PhD, Director, NIH Office of Science Education
Reported by **Leslie Miller**, PhD, Rice University

Dr. Fuchs highlighted several key elements relevant to those who labor in the field of STEM education. Beginning with a brief mention of prior reports such as the September **2010 PCAST Report** and the **NSTC Report to the President**, he went on to present the recent results of the **2011 Inventory of Federal STEM Education Portfolio**, covering Pre K-20. From this report, available online (http://1.usa.gov/uYCfAa) the data indicate that there were 252 investments at a cost of $3.4 billion, with modest overlap among investments, and no duplications.
This survey of will be updated yearly.

In contrast, the total education spending in the US is $1.1 trillion, with the federal share comprising only 5.9%. Seventeen percent (17%) of this outlay is from the National Institutes of Health, with larger proportions coming from the National Science Foundation and the Department of Education. A majority of the NIH Education funding is related to the mission of producing a sufficient and competent workforce. More detailed slides in the presentation detailed the percentage of program as defined by their "primary mission." The percentage of programs whose mission is to target underrepresented groups comprises approximately 33% of the programmatic efforts.

Currently underway, with a planned release date of July 2012 is a new **Strategic Plan** that will guide investments in STEM Education for the next five years. This plan will focus on:

- Learning and Engagement
- Pre-service Education & Leader Performance
- Postsecondary STEM education
- Institutional Capacity
- Education Research and Development
- Underrepresented Groups

One anticipated outcome from this Strategic Plan is that agencies that fund STEM education will re-focus their missions.

Dr. Fuchs urged the audience members to examine the recently released **Program Design Principles** (something akin to best practices) that are on the web until June 15 for public comment. See http://1.usa.gov/JTuedU. These guidelines will be the new standards on which STEM projects will be graded.

Another key report that should be available early Summer 2012 deals with the **Future Biomedical Workforce**. Prior arguments have been made that the US is creating an oversupply of scientists. It will be interesting to see if this report echoes those concerns or presents a different scenario of workforce education efforts.

Another intriguing part of Dr. Fuch's presentation revolved around the notion of predicting the future in STEM education. He cited the quote by Alan Kay, a founding research scientist at Xerox PARC, "The best way to predict the future is to INVENT it." The report by Goldman-Sachs in 2003 forecasting the economic future, titled "Dreaming with BRICS" predicted the rise of Brazil, Russia, India and China, but this rise occurred even faster than was predicted. A central question is how will the US respond so that our citizens will continue to enjoy a high standard of living. Given that we have witnessed the movement of research and development to other countries, will this departure make the US into a post-R&D nation when R&D has been our strong suit for so long? In ways that parallel the transformation of the US to a post-agrarian society, are we also undergoing a similar transformative pivot now?

The book, **American Road** by Pete Davies, was highlighted as illustrative of how national innovation is fostered by those persons who see a unmet need and then employ government efforts to focus education and innovation on solving specific problems. The lessons learned from the 1919 truck convoy attempting to make a transcontinental trip ultimately resulted in our national highway system. Similarly, a vision of unmanned cars seemed far-fetched, yet Google cars are traveling California highways in the early stages of this innovation.

With this as a context, Dr. Fuchs then presented several data charts that reinforced the notion that the US does not appear to be well positioned to meet the world-wide demand for rapid innovation as we have in the past. These data points relate to:

- America's continued low performance in science and math as compared to other countries (reports such as PISA)
- Economists' work indicating that test scores are correlated with a countries GDP
- Family median income and male median income in the US have remained fairly flat despite large increases in US GDP.
- The divergence of the workforce from one that produces "goods" to one that is based on "services."

Two books present very different viewpoints about the rate and nature of innovation. **Great Stagnation** by Tyler Cowan suggests that innovation has slowed considerably, while **Race Against The Machine: How the Digital Revolution is Accelerating Innovation**, **Driving Productivity**, **and Irreversibly Transforming Employment and the Economy** argues that innovation is moving faster than we have been able to adapt to it.

Dr. Fuchs concluded his presentation with a quote from Franklin D. Roosevelt.
"No country, however rich, can afford the waste of its human resources." Due to time constraints, questions from the audience were not possible. In summary, his overview of STEM education, set within the national and international context, was excellent in stimulating conversations about the larger reasons for continuing to labor in this arena and for providing the audience with concrete ways in which to make our voices heard with regard to upcoming guidelines.

Tuesday, May 15, 9:30am - 12:00pm and 1:15pm - 3:30pm Professional Development: **Developing and Using Logic Models for Project Planning and Evaluation**

Reported by **Laura Martin**, PhD, Arizona Science Center

Claudia Horn from Performance Results, Inc. conducted the session. Dolores Vaughn assisted.

A handout with the Power Point overheads and Logic Model worksheets was distributed.

- This is a "so what?" workshop to help you find out what happened in your project. Funders are now asking for this kind of information. The Logic Model is the "basement" for building your "house."
- We need to demonstrate results in an organized system and so we have to capture what the organizations know they are doing. Define things like "increase awareness" or "increase knowledge of cardiovascular disease."
- The goal is get a functional model, a realistic way to think about your project; significant, realistic, meaningful outcomes.

Program Purpose Statements

Horn asked why the Philanthropy Roundtable describes successful and unsuccessful failure. Each should lead you to understanding that can be shared with others of what is meant by such project goals as increased skills, attitudes, behaviors, status, life condition.

Think through: what is intentional, what do you intend to do?

A distinction was made between Programs and Services (e.g., a food bank) where no change is expected, and outcomes are usually measured by counts. Programs have deeper interactions with clients and expect change. There is a need for a Purpose statement: We do what for whom for what outcome or benefit?

[We then worked at Program Purpose statements till 10:45]

Examples of statements from the group were reviewed.

- Positively Aging: We teach professional development (summer training, intensive workshops, support) and conduct educational research to produce a more effective teacher, student attitude, student knowledge, disseminate a validated curriculum, publish.
- ASSET: Producing, testing, and evaluating teacher curriculum modules, disseminating the modules, creating a lending library of equipment for MS and HS teachers and students. The goal is the acquisition of science content knowledge by students; enjoyment, encouraging the development of critical thinking skills, address the common core standards, introduce students to labs, and a social studies strand of discussing science in society.
- Outcomes can be processes (as in, "to provide…")
- The question was raised about the end point being a product not a change in people. Horn suggested one could measure the characteristics of the product.

We continued through the Power Point. Horn suggested not starting with Inputs on the Logic Model because that tends to restrict the thinking. Two other examples of practical starting points were given.

 Q: what do you do when it is impossible to measure baseline responses? **A:** you can offer some proxy measures.

We then discussed **Outcomes with Target Audiences**, trying to identify what is outcome is for each: attitude, knowledge, skills, behaviors, etc.

- Outcomes always have a target audience so use of the product or perception of the value of a product is relevant
- The focus isn't about you, it's about the effect of what you do on people, restricted to the target audience being measured.
- Keep outcomes singular not compound; they should be measured separately

We then discussed **Indicators**. You need to know uniformly when it happens so that people recognize what's going on. Wording of an indicator like "improve diet" would become "adopts an appropriate diet."

We continued to work on Indicators.

- Good examples of indicators are concrete, measurable, and observable.
- These are good for planning and analyzing
- **Q:** How do you judge the # and % of a target – will be discussed later
- Use this exercise to propose next grant
- **Q:** How do we measure sustainability after the grant?

Retrospective Evaluation: allows you to do a pre-post on something like confidence level. Horn showed an example of a U-shaped curve where confidence scores decrease: as people become aware of what they don't know, their confidence is shaken.

We discussed where data comes from, kinds of data, who gets measured. Data intervals and when to measure. Performance Targets (# and %) – where does the number come from?

- Sometimes we promise levels of performance
- Sometimes we promise to do better than similar projects
- What would you be happy with? Piloting would be good; we try not to guess. 80% (a "B" grade) is often chosen. Put in an explanation of the level chosen.
- A resource: What Works Clearinghouse has effect size charts.
- **Q:** with learning games they use 40% learning from lectures as a baseline comparison.

Inputs: they're like what is represented in the budget.

- For services, you can estimate the value of the program, cost per person served. You can figure the cost per outcome and fundraise with it, how much it costs to achieve outcomes.

Services: activities that affect outcomes (processes)

Outputs: often confused with Outcomes, which are personal. These are things not people. Counts and amounts of products and things the grant is producing. This talks about volume.

- Use the form Framing the Evaluation for planning your next grant.
- **Q:** on the Activities, how detailed do you go? **A:** articulate it enough so that it makes sense in case you leave the project.

Activities: management-related tasks and work behind the scenes; payroll, recruiting (they have an indirect effect on Outcomes)

Services: direct, with people, effect on Outcomes

In sum: What did we want to do? We did what? So what?
Tony Beck then asked everyone to submit their Program Purpose statements for adding to the SEPA website.

Regional Meetings

Wednesday, May 16, 7:15am - 8:30am

Mid-Atlantic: MARSepa – **MD, NJ, NY, OH, PA, VA, WV, DC**

Facilitators and Reporters: **Brinley Kantorski**, MEd, Duquesne University
Joan Schanck, MPA, Pittsburgh Tissue Engineering Initiative

Agenda in brief:

- strengths and weaknesses of past meetings
- how to improve
- partnering with CTSAs
- welcoming new members
- potential locations for fall meeting
- plans to start a resource list

Mid Atlantic Regional Breakout included participants form 13 SEPAs! En total, 30 people in attendance. Meeting provided opportunity to welcome new members and reacquaint regarding activities. M. Chorney provided overview of past activities and championed ongoing path forward and enhanced collaborations.

B. Kantorski disseminating a survey focused on determining strength/clarity of MARSEPA mission, past actions, strengths, weakness and accomplishments, resultant SEPA collaborations, interactions with CTSAs, partnerships with minority-based organizations, etc. Will continue to survey these areas and share with MARSEPA colleagues.

In all, noted strong ongoing interest after a slight hiatus. Discussions focused enabling legitimate/tangible collaborations above and beyond simple sharing of resources. One area of focus is to forge a concrete relationship between the midatlantic SEPAs. Goal to form a real working relationship across and within the MWSEPA-CTSAs. Group will work to enable next MARSEPA meeting to be conducted in tandem with CTSAs. We could work with the CTSAs to represent/direct the community outreach arm and invigorate the community-based participatory research/clinical trials education. Case in point, WVU, GW, PSU, UPitt, Cornell, Rockefeller and others have CTSAs. Such a partnership could provide meaningful and nonredundant management. A top-down directive from NIH to bridge this link would be like manna from heaven.

Notes that many SEPAs are already collaborating effectively with CTSAs. Effective approach to engage CTSA PIs/Investigators as CO-PIs to SEPA grants. Provided some success stories and limitations, which frequently relate to funding.

We will continue to follow-up and B. Kantorski will reach out to MSSEPA folks to determine breadth and specifics of current work with CTSAs

One noted weakness of the MWSEPA alliance is a lack of ongoing "homework". We get charged up at meetings. Conference fever! Goal to develop tangible deliverables and timelines.

What to accomplish/consider next: Laundry list below

- increased marketing and promotion efforts
- bulletin board for teachers
- increased sharing of resources
- we need to think on a grander scale – CENTER
- Goal to establish a database of everyone's resources. Reminded all to use the MARSEPA website, http://marsepa.org/ for updates, resources, etc.
- Capitalize on the strength of this collaboration – we can generate a tone of data. We have not tapped into this!!!! Bill ourselves as a resource data CTSA/MWSEPA???
- MARSEPA Scholar program
- Formal partnerships with HBCUs and other minority serving organizations

Wrapped up with need to determine next meeting location, agenda, etc. Will work to coordinate with CTSAs. Brinley to continue follow-up with survey summary, requests for resources, meeting logistics, etc.

Participants

Lisa Abrams, Virginia Commonwealth University
Margery Anderson, Walter Reed Army Institute of Research
Dabney Baum, George Washington University
Cheryl Bodnar, Pittsburgh Tissue Engineering Initiative
Rob Bonneau, Penn State University College of Medicine
Donna Cassidy-Henley, Cornell University
Ann Chester, West Virginia University
Michael Chorney, Penn State Hershey Medical Center
Houda Darwiche, University of Florida
Val Davillier, Great Lakes Science Center
Sara Hanks, West Virginia University
Mary Kay Hickey, Cornell University
Wendy Huebner, Montclair State University
Mary Jo, University of Florida
Mark Kaelin Montclair State University
David Lally Virginia Polytechnic Institute and State University
Naomi Luban Children's Research Institute
Tracey Meilander Great Lakes Science Center
Cathy Morton-McSwain West Virginia University
John Pollock Duquesne University
Bernadette Rhodes Steelton-Highspire School District
Diana Ritter Cornell University
Joan Schanck Pittsburgh Tissue Engineering Initiative
Monique Scott American Museum of Natural History
Patricia Slattum Virginia Commonwealth University
Michael Sudya Cornell University
David Syracuse TST BOCES Career and Technical Center
Martin Weiss New York Hall of Science
Tony Wolfe Steelton-Highspire High School

Wednesday, May 16, 7:15am - 8:30am
Midwest – **IL, IN, IA, KY, MI, MN, MO, WI**

Facilitator: **Barbara Hug**, PhD, University of Illinois, Urbana-Champaign
Reported by **Tania Jarosewich**, PhD, Censeo Group

Introduction: The members of the group introduced themselves and briefly described their project.

The group agreed that they would like to convene regularly using virtual collaboration software or systems to:

- Share with each other information about their project successes, challenges, barriers, dissemination methods, and lessons learned so that the group has a better awareness and understanding of the projects in the Midwest region.
- Discuss development hurdles, build on past experience, and discuss classroom enactments.
- Develop connections among projects. (By the end of the session, several of the PIs had already identified connections and potential for sharing between projects.).
- Disseminate the created work, possibly at museum venues and to teachers who are already working with other projects. The group was curious about how museum projects disseminate their online components into schools.
- Create a way for students to collaborate (e.g., virtual conferences or groups).
- Get feedback on materials that are in development.

Major themes of interest

- Project overviews
- Synergy between projects
- Building on each other's resources
- Lessons learned
- Technology in the classroom
- Web applications
- Teacher professional development
- Supporting teacher implementation (e.g., use of animals)
- School buy-in
- School differences

Process

- Virtual collaboration – GoToMeeting, Skype, Face Time
- Web-based meeting series, possibly convening monthly?
- Two groups would present about their project at each virtual meeting
- Barbara Hug will send out an email with potential dates/times to schedule the first meeting

Participants

Trisha Camp, Delran School District, NJ
Jan Dubinsky, University of Minnesota
Maurice Godfrey, University of Nebraska Medical Center
Susan Hershberger, Miami University
Barbara Hug, University of Illinois, Urbana-Champaign
Tania Jarosewich, University of Illinois, Urbana-Champaign
Chandana Jasti, University of Illinois, Urbana-Champaign
Nicole Kowrach, Museum of Science and Industry
David Petering, University of Wisconsin--Milwaukee
James Planey, University of Illinois, Urbana-Champaign
Patty Ward, Museum of Science and Industry, Chicago
Rebekah Ward, Northwestern University
Eve Wurtele, Iowa State University

Wednesday, May 16, 7:15am - 8:30am
New England – **CT, RI, ME, MA, NH, VT**

Facilitator & Reporter: **Carla Romney**, DSc, MBA, Boston University School of Medicine

Discussion

Bradie: NE regional NIH rep requests input regarding access to schools.

Tony: Questions about immersing teachers into labs and how effective this may be.
Suggestion to study the effectiveness of immersive laboratory experiences for teachers.
Translation into the classroom is questioned.

Don: SummerLab immerses teachers in the lab experience and provides an opportunity to teach students.
This may be a useful way to study immersion experiences for teachers

Tony: NIH may announce supplements of ~$150K per year / 3 years for regional collaboration.
Pacific NW regional members contributed $300 per year
for a booth at NSTA. Exhibit booths are great opportunities to market programs and may be more
effective than a workshop

Bradie: Suggests activities that will attract teachers regionally. Offers to coordinate the NE SEPA projects
at a regional meeting

Bradie: Has attended 3 regional meetings (local) within STEM regions and they seem more effective.
These are state determined local regions. STEM pipeline initiative is an example. Maine has one too.

Greg: Opportunities for regional collaboration are to meet and share practices and/or extend projects where
they make sense. i.e., provide teachers with whom we work access to opportunities that regional SEPA's provide.
Funding may allow teachers to exchange regions. On a larger scale, maybe create a larger region- wide project.

Carla/Greg: MobileLab could be used among regional programs.

Berri: NC project – this year SummerLab will be launched in NC. A new model is to build beyond our own walls

Greg: What synergy can we create? Regional booth idea suggested again

Bradie: Regional meetings can be attended at low or no cost. Offers that his role is
supportive in that he can help us coordinate collaborations among the regional SEPA projects.

Bradie: Will help to promote our programs.

Berri: Suggests regional web page

Carla: Put together a common calendar on the web page.

Greg: If SEPA releases a regional RFA, do we want to submit?

Berri: Depends if there is a goal. i.e., could we run a science event among us?

Bradie: NIH is looking at how we can disseminate.

Carla: BU has the infrastructure to administratively house a supplement. The proposal cannot just come from BU- it must be genuinely collaborative. Need PIs from other programs to serve

Bradie: Amgen may be looking to support regional foundations. Bradie can help getting the program going.

Greg: Use Google docs for brainstorming possible collaborations

Carla: Think about meeting over the summer, especially if an NIH RFA for regional collaborations is released Carla will send out a doodle to get a sense of availability for either a face-to face meeting (perhaps in Maine) or a web-based meeting

Bradie: Hosted the presidential award winner in ME.

Teachers in the group said they would like to do some professional development
Adjourned with the following suggestions:

- Continue the discussion
- Possibly begin with a small project such as a web page to advertise or a common calendar.
- Create a NE SEPA presence at regional science education conferences
- See where the collaboration goes organically

Participants

Walter Allan, Foundation for Blood Research
Greg DeFrancis, Montshire Museum of Science
Don DeRosa, Boston University Medical Campus
Monroe Duboise, University of Southern Maine
Gail Fletcher, University of Southern Maine
Berri Jacque, Tufts University
Daniel Kalman, Emory University
Brady Metheny, National Institutes of Health, Office of Science Education
Karen Moulton, University of Southern Maine
Leonard Munstermann, Yale University

Wednesday, May 16, 7:15am - 8:30am
NORTHWEST – **AK, ID, MT, OR, WA**

Facilitators: **Susan Adler**, BA and **Jeanne Chowning**, MS, Northwest Association for Biomedical Research

Reported by **Susanna Cunningham**, PhD, University of Washington

1. Introductions
Each attendee introduced themselves and described their project. There were 22 attendees from Alaska, Washington, Oregon, Nebraska, and Montana.

2. Collaboration opportunities and SEPA/SEDAPA awareness.
Last year group had a booth at the Science Teachers convention in Seattle. Which then led to a discussion of opportunities for future collaboration. There is a meeting in Seattle June 25-27 to which attendees were invited by Seattle Children's Research Institute. Group also discussed having a booth at the regional Science teachers conference in Portland in October, 2013.

Also it was suggested that there be a poster that could be sent to local and state teachers meetings. Key point was the importance of making teachers aware of SEPA and SEDAPA programs. A brochure advertising projects was also suggested.

Discussed need to have email lists, and ways to connect. Facebook pages were suggested. Also discussed how to retain contact with people and program products who are no longer funded - institutional memory. This could be a resource that could support the regional group. Edmodo was also suggested as a way to keep connected. Explore videoconferencing given the geographic spread of this region. Webinars also are a possibility. Could plan several webinars focusing on projects.

Even teachers who have participated in a SEPA /SEDAPA activity do not necessarily understand the scope of the program. Also need ideas for opportunities for students, especially summer programs, lab experiences, particularly in areas that do not have large biomedical programs locally.

We also need to explore resources that are locally available to support teachers.

Participants
Susan Adler, Northwest Association for Biomedical Research
Trez Buckland, University of Washington
Jeanne Chowning, Northwest Association for Biomedical Research
Vicki Coats, Oregon Museum of Science and Industry
Paul Cotter, University of Alaska, Fairbanks
Susanna Cunningham, University of Washington
Paige Gingrich, University of Alaska Fairbanks
Wendy Hansen, Pacific Science Center
Sue Hills, University of Alaska, Fairbanks
Andrij Holian, University of Montana
Andrew Jameton, University of Nebraska Medical Center
Amanda Jones, Seattle Children's Research Institute
Kitty LaBounty, University of Alaska, Southeast
Lisa Marriott, Oregon Health & Science University
Amanda Meyer, University of Alaska Fairbanks
Maureen Munn, University of Washington
Mark Ruffo, Seattle Children's Research Institute
Meena Selvakumar, Pacific Science Center
Jeff Shaver, University of Washington
Veronica Smith, Northwest Association for Biomedical Research
risti Straus, University of Washington
Tony Ward, University of Montana
Jenny Williamson, University of Washington

Breakout Sessions

Wednesday, May 16, 8:30am - 9:45am

Working with Undocumented Youth and with Mixed Family Status Families

Facilitators: **Adela de la Torre,** PhD, University of California, Davis
Panelists: **Rosa Manzo**, University of California, Davis
Rebecca Fulop, MS, Mission High School San Francisco, CA
Rebecca Smith, PhD, University of California San Francisco
David Syracuse, TST BOCES Career & Technical Center
Reported by **Rebecca Martin**, BA, Northwestern University

One in ten children in the US live in Mixed Family Status (MFS) families, which are families that include at least one undocumented family member. Undocumented students and students in MFS families face particular challenges along their lives as they are less likely to participate in programs that require engagement with formal institutions due to their undocumented status. This affects their likelihood to participate in early childhood programs like Head Start. During their academic career through K-16, this undocumented status creates significant barriers to their full participation in extracurricular programs, internships or programs where the threat of discovery of their or a family member's legal status can adversely impact family cohesion due to the threat of family member removal through deportation proceedings. In addition, many of these students who may aspire to enter higher education have limited economic options as they lack access to federal sources of funding for subsidized financial aid and federal educational grants available to most low income documented students. Based on both the legal risk factors and psychological stress faced by these undocumented students it is critical that teachers become aware and sensitive to their unique needs and receive training about how to effectively approach and retain these students and families within their programs so that relationships of mutual trust and respect can ensure successful outcomes for educational interventions within the growing immigrant communities.

A video presented by Rosa Manzo on the issues surrounding UC Davis undocumented students provided the emotional context of issues that may surface when addressing undocumented student needs in a college setting. An outline of key terms, policies and issues was then presented that are helpful for teachers and administrators to fully understand when working with this population. For example,
by definition, an undocumented student is a student who entered the U.S. without inspection or with fraudulent documents or that entered legally as a nonimmigrant and remained in the US without authorization. Nevertheless, most undocumented students in the United States migrated during their childhood, attended American schools, speak English and consider themselves American as they share American values. They also have aspirations for higher education, but they are denied opportunities to apply for many federally supported financial aid programs. A final discussion included a brief description of the Development, Relief, and Education for Alien Minors (DREAM) Act, a proposed Federal program to increase higher education opportunities for undocumented students. Discussion of two state DREAM Act programs implemented in California and Illinois highlighted how undocumented students can participate in state funding mechanisms for support and are provided other benefits to support them in their higher education careers.

Becky Fulop, a science teacher at Mission High School in San Francisco Unified School District shared her experience working with two undocumented students . She discussed their struggles with paying for college, accessing resources, and finishing college. Becky shared the story of Claudia, who immigrated form Honduras when she was in 8th grade, her mother was living in the US. She came through Texas and eventually settled with her aunt who was documented and her mother in San Francisco. Based on abuse in the family she was forced to move to a group home, but nevertheless still dreamed of going to college even though she realized that federal financial aid would not be available to her because of her legal status. She spent her senior year applying for scholarships, which adversely affected her grades. Despite these problems and with the support of her teacher she successfully entered a local college and is an excellent example of the persistence of many of these students to obtain their educational dreams.

Discussion:

Q: What happens with the children of parents who are deported?

Many parents are forced to make the difficult choice of leaving their children with a documented family member or return with their citizen children to Mexico. These difficult choices create severe psychological and financial hardship for many of these families since most of the families work and provide a better lifestyle for their children in the US and the prospects in Mexico for these families can be quite dim.

There are some researchers in Mexico that have focused on returning families and children and indicate that depression is a widespread problem and many of the US born children, although raised to speak Spanish, cannot write or read the language since there primary language of instruction is English.

Q: What is a viable path for citizenship?

US immigration law prioritizes family reunification first. However, if an individual has entered the country without legal status the likelihood of them pursuing legal status without returning to Mexico is extremely hard. It can take several years and cost thousands of dollars to successfully re- enter the US and become a legal resident. This is why many MFS and undocumented students do not pursue this route. The immigration system is broken and almost all Latino families have someone or know someone trapped in this system.

Q: Which strategies can we use to help these students in the classroom and engage them in the Sciences?

It is important to that our students trust their teachers and that the curriculum is relevant to their lives. For example, in San Francisco there are issues of mold and asthma and if we can bring the lived experiences into science we can engage these students more readily. The curriculum must be relevant to the communities. Also, the 5 Es model for EL students is also an effective method for language understanding, but we need to complement this with also greater awareness by teachers about their own biases. This later issue will take time as oftentimes it is difficult to address unconscious bias issues in the classroom. Since the majority of science teachers are not reflective in terms of ethnicity/race of the students in the classroom, many are unable or unwilling to address the issues of unconscious racism. We need to develop appropriate programs to help teachers recognize and change these perceptions.

Q:How do we approach issues of diversity in the classroom when students seem sensitive to the issue?

Oftentimes we need to be careful how we raise issues in the classroom to avoid using stereotypes as this can be equally damaging for these students.

We need to understand the historical perspective and context in which these students live their realities today.

Participants

Barbara Baumstark, Georgia State University
Christina Boelter, University of Kentucky
Chiquita Briley, Mississippi State University
Leda Cummings, Walter Reed Army Institute of Research
Melani Duffrin, East Carolina University
Linda Pruski, University of Texas Health Science Center, San Antonio
Bob Russell, Great Lakes Science Center
Michelle Ventura, Georgia State University

Wednesday, May 16, 8:30am - 9:45am
A Tale of Two Cities: **The Importance of Population-Specific Strategies for Assessing Scientific Skills in Middle School Youth**

Facilitators: **Michael Kennedy**, PhD, Northwestern University
Panelists: **Rebecca Daughtery**, PhD, Northwestern University
Wendy Huebner, PhD, Montclair State University
Mark Nicolich, PhD, Cogiment (Lambertville, NJ)
Camelia Sanford, PhD, Rockman et al (San Francisco)
Reported by **Rebecca Martin**, BA, Northwestern University

The objective of this session was to describe and discuss how best to develop, test and validate instruments to effectively measure scientific literacy and basic science skills in middle school youth. Wendy Huebner, from Montclair University first presented initial findings from their SEPA supplement project. The goal of their project is to develop and test a "discipline-free" multiple-choice instrument to assess general science literacy in middle school students. Assessment of general scientific literacy is important because it's related to, and informs, curriculum development and public policy and therefore valid measurements are required. A definition of scientific literacy given was "the ability to understand the scientific process and engage meaningfully with scientific information available in daily life."

The first step in developing their testing instrument was to identify constructs important to assess scientific literacy in middle school students. Extensive review of literature on science literacy testing constructs revealed an emphasis on evaluation of older students and content specificity. It is important to consider that some constructs are not easily tested, some constructs middle school students are not expected to know, and some constructs are too big to measure.

Seven high level constructs were identified from supporting literature that were deemed important to assessing scientific literacy in middle school youth.

1. Identifying questions that can be answered through scientific investigation
2. Doing science
3. Thinking scientifically/ Applying science
4. Questioning scientific findings and conclusions described in the popular media
5. Science and Society
6. Mathematics in science
7. Science Motivation and Beliefs

In the next step of developing their instrument, appropriate multiple choice items were created to represent each of the seven constructs and an initial review was performed. An iterative process was used to adopt, adapt and create the items used in the final instrument. Several informal reviews were undertaken and input on items was received from SEPA conference attendees during a 2011 breakout session.

Once 57 items were generated, initial pilot testing (a "mushy test) of 123 7th and 8th graders was conducted. The average number of correct responses was 32 (56%). Scores ranged from 14-51. The response frequency was examined closely for unusual patterns, i.e. if students were disproportionally choosing one incorrect choice over others.

After this pilot testing, several items were removed. Students themselves were useful in identifying questions that were not "good". Intuition was used rather than rigorous protocol to optimize and adapt some items. In the second pilot testing (a "firm" test) 53 items were presented to 220 7th and 8th grade students. The average number of correct response was 26.6 (50%). Scores ranged from 4-52.

An online version of 41 items was then given to undergraduate students to test the premise that more knowledgeable persons should respond with better accuracy. Responses that took between 20-40 min were kept.

A final validity test of 26 construct items + 25 attitude items is currently underway. It has been given to 1000 7th and 8th grade students from 3 schools. It is pencil and paper and is expected to take approximately 40 minutes.
Mark Nicolich of Cogiment presented some of the initial analysis and results of the pilot testings. Each item was evaluated for uniform distribution of answers to 4 choices and distribution of performance. It was noted that the frequency of number correct was uniform across questions. It was also noted that, in 2 out of 3 schools the range of correct answers were very similar. In the 3rd school the performance was much poorer.

In the second half of the session, Rebecca Daugherty from Northwestern University presented evaluation models used to assess students participating in Science Club, an afterschool informal science education program offered at a Chicago Boys & Girls club. This program is based on a "mentorship model". One afternoon a week, middle school students (5th – 8th grade) participate in hands-on inquiry based projects in small groups led by 1 or 2 graduate student mentors.

The evaluations used to assess the science skills of science club students have been modeled after the Montclair assessments and seek to test understanding of scientific methods, and other key scientific concepts such as controls, variables, data graphing etc.

In an initial evaluation, a subset of 10 questions from the Montclair assessment instrument were used to assess six science club members and four non-science club middle school students. On average, the science club students gave correct answers 36% of the time whereas the non-SC kids answered correctly 28% of the time. Cognitive interviews were given at the same time that students were given the multiple choice assessment and it was discovered that many of the students could understood the content but were deterred from answering correctly by several issues:

- Poor test taking skills: They often didn't read through all options, or brought in outside information to affect their answer.
- Language barriers: Some words were not well understood.
- Cognitive load: Kids were 'switching gears' with each scenario presented in a different question.

Camelia Sanford from Rockman et al, then presented how to address the above challenges when designing an evaluative tool unique to an informal science program such as Science Club.

The recommendations were:

- Move to an interview format rather than multiple choice to glean more information from cognitive interviews.
- Limit assessment items to one scenario rather than multiple topics.
- Create a science literacy experimental scenario where items presented can increase in complexity.

The final evaluation instrument used centered around coffee grounds and plant growth wherein a student, Sonia, spills coffee grounds onto some plants and wonders how that will affect growth.

The scenario details are as follows:

- 15-20 minutes in length
- Focuses on good experimental design, multiple variables, and data tables.
- Interview format, audio recorded
- Questions increase in complexity.

This evaluation tool was piloted with 8 science club kids and qualitative findings found that students could easily demonstrate such science skills as identifying the presence or absence of a control condition.
However there are tradeoffs to using an interview format:

Benefits

- Provides an in-depth window to student thinking.
- Removes "noise", i.e. confusion over terminology.
- Focuses on skills of interest.

Drawbacks

- Generates a large amount of qualitative data to collect, process and analyze.
- Answers can be ambiguous and difficult to score.
- Requires more staff time and resources.

During the discussion it was pointed out that several factors may affect assessment and should be considered when developing an assessment instrument. Some factors included:

- Time of year. In another project's assessment of middle school students' attitudes toward science they've found that time of year affects attitude.
- PIs should ensure that items could be answered well by scientists.
- Other projects found that they were actually assessing the students attitude at the moment rather than their attitude overall.
- It is important to ensure that questions cannot be interpreted as inflammatory or threatening.
- How a student feels that their test will be evaluated may affect how they respond.

Participants

Lisa Abrams, Virginia Commonwealth University
Sherry Blanco, University of Texas Health Science Center, San Antonio
Trish Camp, Delran School District, NJ
Shaw-Ree Chen, University of Rochester
Brittany Garvin, Edventure Children's Museum
Beth Hahn, Northwestern University
Susan Hershberger, Miami University
Mark Kaelin, Montclair State University
Lisa Marriott, Oregon Health and Science University
Beki Martin, Northwestern University
Julia McQuillan, University of Nebraska
Tracey Meilander, Great Lakes Science Center
Debra Piecka, Wheeling Jesuit University
Stephanie Rangel, Northwestern University
Joan Schanck, Pittsburgh Tissue Engineering Initiative
Amy Spiegel, University of Nebraska
Lynn Tarant, Montclair State University
Kathie Williams, EdVenture Children's Museum

Wednesday, May 16, 8:30am - 9:45am

Evaluation Resources for Science Education Projects

Facilitator: **Kristin Bass**, PhD, Rockman et al
Panelist: **George DeBoer**, PhD, AAAS Project 2001
Reported by **Neil E. Lamb**, PhD, HudsonAlpha Institute for Biotechnology

The session began by soliciting feedback from the participants about specific topics they would like to have discussed as time permits. This list included:

- Specific instruments for evaluation
- The process for determining reliability and validity of an instrument
- Are there any long-term assessments looking at the correlation between attitudes regarding students views on science and long-term predictors of success in scientific fields?
- How do we sustain funding for projects to continue the evaluation long-term so we can report successes that come about after a 3-5 year window?
- How are other groups measuring dissemination?

George DeBoer from the AAAS spoke on "Designing Assessment Items for Middle and High School". He focused on the over 700 middle school science assessment items available online as part of project 2061. The concept maps of the content areas can be found at www.project2061.org/publications. Question development was a two-year process, tightly linked to key learning goals. They were pilot tested on 1,000 middle school students and 1,000 high school students. The individual questions are available at http://assessment.aaas.org and specific questions can be selected and incorporated into tests that students can be given (and then scored upon). The questions can be freely used (with proper acknowledgement). Specific examples in life science were discussed in depth, showcasing the information that is available based on the pilot student data regarding student performance by age, gender, ethnicity etc.
A conversation then took place between Kristin Bass and the session participants, based on the list of topics initially developed. Due to time constraints, only a few of the topics were explored in depth.

1. Specific instruments for evaluation - a list of websites with science instruments was compiled, including:
   - Assessment tools in informal science - www.pearweb.org/atis/
   - Online evaluation resource library – www.oerl.sri.com
   - American Evaluation Association – www.eval.org

2. Long term assessments for correlating student attitudes with long term science involvement
Maltese, AV and Tai, RH. Pipeline persistence: Examining the association of educational experiences with earned degrees in STEM among U.S. students. Science Education, 95:877-907.

Participants

Lola Adedokun, Purdue University
Virginia Carraway-Stage, East Carolina University
Liam Casey, University of Rochester
Camilla Colvin, Children's National Medical Center
Paul Cotter, University of Alaska
Ginger Cross, Mississippi State University
Susanna Cunningham, University of Washington
Wendy Hansen, Pacific Science Center
Tania Jarosewich, University of Illinois, Urbana-Champaign
Larry Johnson, Texas A&M University
Loretta Kelly, San Francisco State University
Susan Kuner, Topaz Canyon Group, LLC
Kristin Kush, Resource Development Institute
Neil Lamb, Hudson Alpha Institute for Biotechnology
Laura Martin, Arizona Science Center
Tammy McKeown, Virginia Commonwealth University
Caren Oberg, Oberg Research
Loran Parker, Purdue University
Debra Piecka, Wheeling Jesuit University
Joh Pollock, Duquesne University
Patrice Saab, University of Miami
Margaret Shain, American Physiological Society
Erika Shugart, Marian Koshland Science Museum at the National Academy of Sciences
Veronica Smith, Northwest Association of Biomedical Research
Molly Stuhlsatz, University of Nebraska Medical Center
Barbara Tharp, Baylor College of Medicine
Michele Ward, Texas A&M University
Mike Wyss, University of Alabama at Birmingham
Steven Yalowitz, Oregon Museum of Sciences and Industry

Wednesday, May 16, 8:30am - 9:45am

Expanding Science Education Partnerships with Native Communities

Facilitator: **Maurice Godfrey**, PhD, University of Nebraska Medical Center
Panelists: **David Wilson**, PhD, Society for the Advancement of Chicanos, Hispanics & Native Americans in Science (SACNAS)
Jane Sledge, National Museum of the American Indian
Marlyss Witte, MD, University of Arizona
Andrew Jameton, PhD, University of Nebraska Medical Center
Reported by **Kim Soper**, University of Nebraska Medical Center

David Wilson gave a short PowerPoint presentation about SACNAS and what it has to offer Native American undergraduate and graduate students. They provide research opportunities in cohorts, "Science Scholars Native American Path (SSNAP)," by placing students in NIH facilities. They have approximately 30,000 students, 12,000 professionals, and 70 local SACNAS chapters across the country. SACNAS has been partnering with AISES (American Indian Science and Engineering Society) to reach K-12 students.

Question: Use of social media to foster support of Native American students.
Native American students aren't always using social media and student retention requires personal contact. The importance of reaching students through local endeavors, such as using community gardens, was also seen as a valuable first step.

Jane Sledge from the National Nuseum of the American Indian (NMAI) gave a brief presentation about the museum and some of their goals to reach out and bring people into the museum to help teach the ideas of preservation of culture. They use their website and the museum to publish Native American accomplishments. She felt that there was a crucial need to show students that there are science opportunities in the local community as well as a broader picture across the country.

Dr. Witte, explained about the Virtual Grid template that is housed at the University of Arizona. It is possible that it could be used for other people's information as well. They also have a large student mentoring community to help Native American students.

Dr. Jameton, discussed that movement (dancing, walking, working) together fosters relationships. Also, using heirloom plants, traditional gardening methods and looking at plants that can withstand climate change are vital for NA communities.

Discussion then moved to ways that there might be to create a K-graduate school transition program. It was also mentioned that the National Academy of Sciences has a transition program for students. Is it possible for there to be a trans-agency meeting on informal science to see if we can coordinate better in the future?

Discussion continued about the possibilities of identifying curriculum for, by, and about Native Americans and whether there is a way to collate such and make it available to a broad audience.

Participants

Tony Beck, Office of Research Infrastructure Programs (ORIP), DPCPSI - Division of Program Coordination, Planning, and Strategic Initiatives
Jeanne Chowning, Northwest Association for Biomedical Research
Vicki Coats, Oregon Museum of Science and Industry
Sue Hills, University of Alaska, Fairbanks
Nathan Meier, Trivium Consulting
Leslie Miller, Rice University
Maureen Munn, University of Washington
Kim Obbink, Montana State University
Kim Soper, University of Nebraska Medical Center
Anna Suarez, Trivium Consulting
Tony Ward, University of Montana

Wednesday, May 16, 8:30am - 9:45am

Developing Collaborative Partnerships Among Teachers, Schools, Districts, and Education Projects

Facilitator: **Barbara Hug**, PhD, University of Illinois, Urbana-Champaign
Panelists: **Jennifer Love**, MAEd, Northwestern High School,
Margery Anderson, PhD, Walter Reed Army Institute of Research
Brandon Finegold, MEd, Madison Park Technical and Vocational High School
Karina Meiri, MSEd, Tufts University
Brinley Kantorski, MEd, Independent Consultant
Robert Bonneau, PhD, Penn State College of Medicine
Reported by **Sonsoles de Lacalle**, MD, PhD, Charles R. Drew University

Introduction of panelists: highlighted their respective experience on the session topic and their SEPA program, including how they made the connections with partners; issues of trust between partners, mutual respect, comfort level among partners; interests in outreach (from the university point of view); changes in program content that follow a better understanding of the specific circumstances of the partners (and their special strengths that may be different from the initial program expectation); curricular modifications needed to reach out to partners that may be not sufficiently prepared academically (meeting the needs of special populations); receiving feedback from the K12 teachers on programs issues; building confidence level of the teachers that bring the SEPA curriculum to the schools (and teach it); providing graduate level courses to teachers instead of professional development courses, to enhance the value of the courses. Challenges of finding the time to meet, specially K12 teachers from different schools on different schedules.

- time is a huge issue in building partnerships, because those collaborations do not happen on the fly, it needs time and interaction, working together.
- challenges recruiting participants: usually not an issue if teachers are very involved with their classrooms, as it helps also drive student participation (and parental support). Recruiting schools that have low turn over rate in their teachers.
- what is the best way to initiate the contacts? Start with teachers or with administration? Answer: maybe both. It helps having own kids in the school! Sounds like the key issue is personal relationships. For others, doing events (science fairs) for the school district that allows to meet the teachers. Some school districts will not allow you to address teachers first, others start working with teachers and only after the partnership is created does it move on to administration. Others need to initiate at all three layers simultaneously. Most reported that working with administration of the schools was a nightmare and initiated work with teachers first. Others found that without administration support, the teachers will not be able to collaborate.

- Going to a school saying "this is what I am going to do to you" will sent the wrong message and block collaborations.
- how can we get the university to support this work better? Big issue is how to get one's time compensated from the university when outreach is not valued. It works to consider the SEPA project as another research project (getting publications). Even if the university does not respect the outreach work you do, they need you if you are involved with the community, so use that leverage. In some cases, using the program to accommodate the service learning component of university curricula, or present it as STEM pipeline programs (make the university admissions committee aware!).
- postdoc mentioned how outreach "saved" her career, helped her to stay in science when everything was "going wrong" in the lab.... She received positive feedback from the outreach/teaching part. Another postdoc talks about participating in SEPA as part of her professional development.

Participants

Margery Anderson, Walter Reed Army Institute of Research
Dawn Banks, Louisiana State University Health Science Center, Shreveport
Kate Berry, Children's Research Institute
Susan Bonk, EdVenture Children's Museum
Rob Bonneau, Penn State, Hershey
Nell Curran, Stanford University
Sonsoles de Lacalle, Charles R. Drew University
Greg DeFrancis, Montshire Museum of Science
Susan DeRiemer, Meharry Medical College
Monroe Duboise, University of Southern Maine
Matt Dugan, Madison Park High School/ Tufts
Catherine Ennis, University of North Carolina, Greensboro
Brandon Finegold, Penn State, Harrisburg (consultant)
Gail Fletcher, University of Southern Maine
Deanna Flora, Virginia Commonwealth University
Nancy Geving, University of Minnesota
Renee Hesselbach, University of Wisconsin, Milwaukee
Mary Kay Hickey, Cornell University
Adam Hott, Hudson Alpha Institute for Biotechnology
Sabine Jeske, University of California, San Francisco
Kelli Johnson, Texas A&M University
Sue Kirk, Virginia Commonwealth University
Nicole Kowrach, Museum of Science and Industry, Chicago
David Lally, Virginia Polytechnic Institute and State University
Donna Loden, Mississippi State University
Jennifer Love, Prince George's County Public Schools - Northwestern High
Katie Malanson, Tufts University School of Medicine
Karina Meiri, Tufts University School of Medicine
Amanda Meyer, University of Alaska, Fairbanks
Leonard Munstermann, Yale University
Jill Peeples, Meharry Medical College
Rosemary Riggs, University of Texas Health Science Center at San Antonio
Gillian Roehrig, University of Minnesota
Mark Ruffo, Children's Research Institute
Virginia Shepherd, Vanderbilt University
Patricia Slattum, Virginia Commonwealth University
Rebekah Ward, Northwestern University
Suzanne Wilkison, North Caroline Association for Biomedical Research
Jenny Williamson, University of Washington
Marilyn Winkleby, Stanford University
Denise Young, University of North Carolina Morehead Planetarium and Science Center

Wednesday, May 16, 8:30am - 9:45am
Showcase of Computer-Based Educational Videogames and Web Applications: **Growing the Community of Developers and Users**

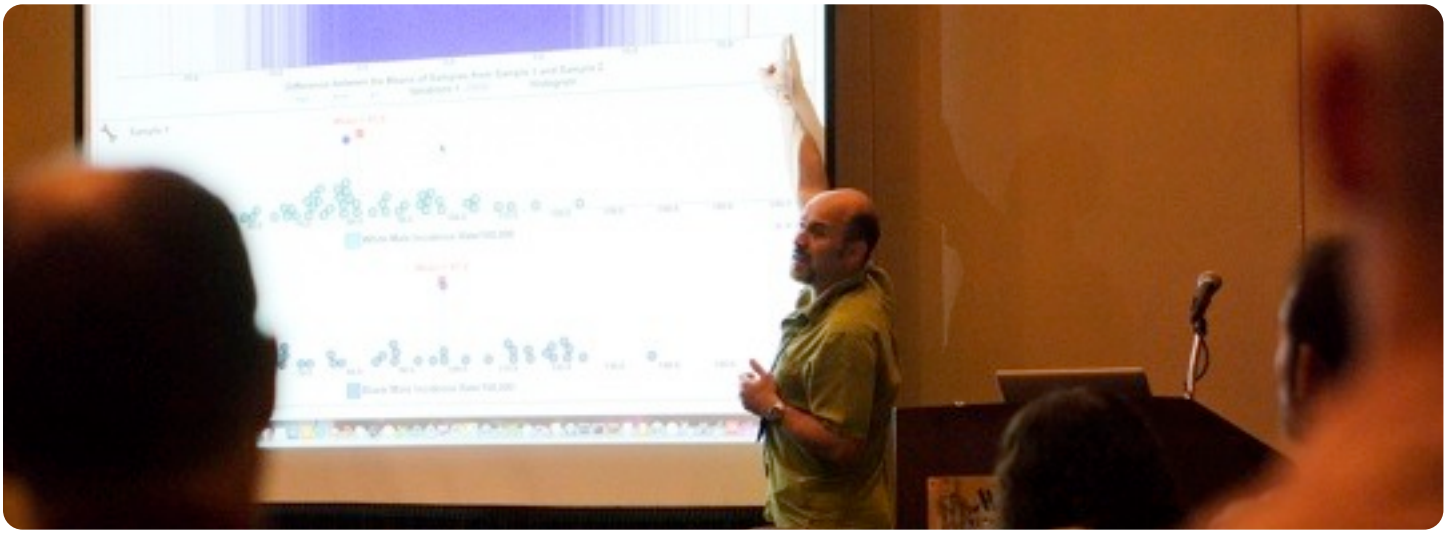
Reported by **H. Trez Buckland**, PhD, University of Washington

Six applications were shared at this session. A brief description for each application is included along with the link, when available, for connecting with it along with questions/comments. Key points: 1. All games best used with recent Firefox, Google Chrome, or the latest Explorer browsers (some run independently on Mac/PC and tablets), 2. For those who do not have computers for all students, teacher can demo or you can seek outside funding sources, 3. Teachers are more likely to use programs if assessment is done for them on line.

Meta!Blast: This videogame for cell and metabolic biology education, takes place within a virtual 3D photosynthetic cell (www.metablast.org). (SciVis 2011 winner) Students are challenged to solve a mystery involving injection of humans into a transporter which has been injected into a plant. Teachers can adjust the content to fit student needs. The Biolog of the game contains all definitions along with excellent visuals. Questions about evaluation came up. There are four types: 1. Teacher feedback on class use, 2. Pre and post tests on student performance, 3. External evaluator, less formal, at science fairs, science clubs, 4. An on-line data base records students by code number; able to analyze their responses by number of questions answered, number correct, whether they improve (http://metablastapi.vrac.iastate.edu/) – Contact – Eve Wurtele, Iowa State (mash@iastate.edu)

UV Zombies: This game highlights the connection between UV rays from natural (sun) and artificial (tanning beds) sources and skin cancer. The game provides an environment in which students, while battling the "evil" rays, and acquiring fruits, vegetables, sunscreen, in both indoor and outdoor locations, can think about the importance of risk and protective factors in relationship to skin cancer. Pre and post tests used 2 weeks prior and two weeks post game were used for evaluation. Questions: 1. Avatars: students may not want to identify as male or female, and they may want a male avatar if female and vice versa. This will be considered in the future. Also asked was whether or not you had to have a joy stick; key board controls can be used. Contact – Marco Molinaro – UC Davis (mmolinaro@ucdavis.edu)

SeeIt: Online tool that helps visualize and compare existing and user-contributed datasets with an emphasis on distributions, correlations, sampling and probability (http://sbcesepa.org) This is on the web – works best in a browser, html 5 based. Schools can have issues with new versions. Goal: make it easier to use/visualize data. Program is happy to work with you on your needs. Contact-Marco Molinaro – UC Davis (mmolinaro@ucdavis.edu)



Forensics: An online set of web adventures to learn forensic science and apply knowledge. This is based on the TV series Crime Scene Investigators (CSI) (http://forensics.rice.edu) There are three current cases, two more in development (prescription drug abuse). Included are: an educator guide, family and on-line activities and links. Question: Audio programming? Yes, with sound effects. Contact-Leslie Miller – Rice University (lmm@rice.edu)

CyberSurgeons: Become physicians on an Amazon Medi Ship. Students review patient symptoms, use simulation to use diagnostic tools, make diagnosis, clinical intervention, in this problem based module of one and one half hour. All materials are on-line for free; paid for programming available to interface live with their center. Contact-Jackie Shia - Challenger Learning Center (jshia@cet.edu)

Golden Hour: Through Project Neuron, this Flash based web game uses the super medical students to assess, and treat, using simulation, a traumatic brain injury. This game is in development. Contact – Barbara Hug (bhug@illinois.edu

Participants

Walter Allan, Foundation for Blood Research
Anisa Angeletti, University of Nebraska, Lincoln
Cheryl Bodnar, Pittsburgh Tissue Engineering Initiative
Kristi Bowling, Rice University, Houston
Joshua Briese, Creighton School District, Excelencia School
Judy Brown, Miami Museum of Science
Trez Buckland, University of Washington
Donna Cassidy-Hanley, Cornell University
Shannon Colton, Milwaukee School of Engineering
Val Davillier, Great Lakes Science Center
Don DeRosa, Boston University
Jan Dubinsky, University of Minnesota
Carole Flores, Arizona Science Center
Nicole Garneau, Denver Museum of Nature & Science
Paige Gingrich, University of Alaska, Fairbanks
Jason Heinz, University of North Carolina Morehead Planetarium and Science Center
Andrij Holian, University of Montana
Kathy Hoppe, Monroe-2-Orleans BOCES
Adam Hott, Hudson Alpha Institute for Biotechnology
Chandana Jasti, University of Illinois, Urbana-Chairman
Daniel Kalman, Emory University
Yvonne Klisch, Rice university, Huston
Kitty LaBounty, University of Alaska, Southeast
Jennifer Lewin, Chicago Public Schools
Michael Lichtenstein, University of Texas Health Science Center, San Antonio
Ron McNeel, Baylor College of Medicine
Leslie Miller, Rice University
Carl Montgomery, University of Utah
Nancy Moreno, Baylor College of Medicine
Nancy Place, University of Texas Health Science Center, San Antonio
Diana Ritter, Cornell University
Carla Romney, Boston University
Meena Selvakumar, Pacific Science Center
Jackie Shia, Wheeling Jesuit University
Amy Smith, University of California, Davis
Donna Spruijt-Metz, University of Southern California
Patty Ward, Museum of Science and Industry, Chicago
Martin Weiss, New York Hall of Science
Charles Wood, Wheeling Jesuit University
Eve Wurtele, Iowa State University

Wednesday, May 16, 10:00am - 11:15am
NIH Diabetes, Obesity, Cardiovascular (DOC) Working Group:
Past, Present, Future

Reported by **Virginia Carraway-Stage**, MS, FoodMASTER, East Carolina University

The vision of the Diabetes, Obesity, and Cardiovascular Disease Working Group (DOC) is to leverage the resources of SEPA projects to not only to promote mathematics and scientific literacy for all United States citizens but also to improve health-related behaviors – specifically eating and physical activity – that will promote energy balance and decrease risk of chronic diseases. The purpose of the proposed session is to provide DOC SEPAs an opportunity to meet face-to-face to discuss the working group's mission and develop of a strategic plan for future initiatives. DOC WG members, new and old, will be encouraged to recharge their enthusiasm for working together and make concrete action plans to continue to work together throughout the coming year.

Opening: The session began with a review of the DOC WG mission and introductions.
Past Projects & Outcomes: DOC's previous primary project has been to work on a SEPA-wide information survey. The survey is now complete and Virginia Carraway-Stage is working with Nancy Place to incorporate it into the new SEPA website. The survey will allow SEPA grantees to communicate detailed and up to date information about their project on an annual basis in an easily accessible format.

Discussion of New DOC Projects: DOC's mission guides our action plans to enhance the education capacity of the SEPA DOCs individually and collectively. A primary goal of the WG is to promote synergies within the WG's PI's and their staffs to address mission goals, and to encourage/strengthen a culture of information sharing, cooperation and collaboration. In alignment with this goal, DOC's new project will focus on a way to look at DOC-related variables across projects. This included discussion of a large database for cross analysis of common variables between programs to provide strong evidence for positive educational and health outcomes. Over the next year, DOC members will work together to determine what common variables are being assessed across projects. The long-term goal will be to submit a supplemental grant for the creation and analysis of a large database.

Call for New Leadership: The session ended with a call for new leadership. The current DOC leadership has undergone changes due to ending grant projects. Virginia Carraway and Melani Duffrin will stay on board to help ensure a smooth transition.
New DOC Leadership: Patrice Saab, Catherine Ennis, Lisa Marriott, Sara Hanks
Past DOC Leadership: Pam Koch, Virginia Carraway-Stage, Wendy Huebner, Melani Duffrin

DOC STRATEGIC PLAN

Background

The DOC WG is a collaboration of SEPA projects that focus on the study and prevention of diabetes, obesity, and cardiovascular disease through the development of science education materials that are about the energy balance equation and making healthful food and activity choices on an individual and societal level.

The WG was formed in order to capitalize on our common goals and understandings, to promote communication and sharing of information, generation of new ideas and initiatives, and collaborations as appropriate. The group began working together at the 2008 SEPA annual meeting. SEPA projects that are welcome to participate in the WG include: (1) SEPA programs specifically related to the DOC topic, (2) unrelated projects, but with project leads who are interested in applying for a new grant with a DOC topic, or (3) unrelated projects, but with project leads who are interested in the DOC topic for incorporation into their current or future projects.

Mission

The mission of the NIH SEPA DOC WG (Diabetes, Obesity, and Cardiovascular Disease Working Group) is to strengthen the SEPA DOC education enterprise by:

1. Improving the quality and quantity of K-12 teachers teaching science in the context of understanding the nature of living systems and promotion of healthy living;
2. Providing strong experiences in health and medical science to all K-16 students while increasing the number of graduates pursuing careers in health sciences, medicine, and related STEM fields;
3. Creating a supportive environment for collaborative research, evaluation, and assessment;
4. Increasing the dissemination capacity of SEPA DOC programs to target audiences and stakeholders.
5. Promoting synergies within the WG's PI's and their staffs to address mission goals, and to encourage/strengthen a culture of information sharing, cooperation and collaboration.

Vision

The vision of the DOC WG (Diabetes, Obesity, and Cardiovascular Disease Working Group) is to leverage the resources of the NIH SEPA, in partnership with funded formal and informal science PIs, their institutes and partners, as well as science education stakeholders, to promote mathematics and scientific literacy for all United States citizens. Through collaborations with university departments, business and industry, not-for-profit organizations, stakeholders, and schools, DOC translates the findings of educational research into best practices that benefit the DOC education enterprise.

Participants

Kate Berry, Children's Research Institute George Washington University
Chiquita Briley, Mississippi State University
Virginia Carraway-Stage, East Carolina University
Ginger Cross, Mississippi State University
Judy Diamond, University of Nebraska State Museum
Melani Duffrin, East Carolina University
Catherine Ennis, University of North Carolina at Greensboro
Sara Hanks, West Virginia University
Wendy Huebner, Montclair University
Lisa Marriott, Oregon Health & Science University
Maureen Munn, University of Washington
David Petering, University of Wisconsin Milwaukee
Patrice Saab, University of Miami

Wednesday, May 16, 10:00am - 11:15am
Project Evaluators: **Sharing Evaluation Instruments and Methods**

Facilitator: **Molly Stuhlsatz**, MA, Biological Sciences Curriculum Study
Reported by **Kristin Bass**, PhD, Rockman et al

This session was an opportunity to discuss some of the challenges of SEPA evaluation and hopefully learn about new resources. Participants were either external evaluators or project staffers who work with evaluators. Issues discussed included:

- Advice for transitioning to a new evaluator. Consensus? Honest, direct communication of roles, scope of work, and budget.
- The need to communicate and learn from the limitations of evaluations. This is often easier said than done.
- Ideas for getting buy-in on the evaluation from participating schools. Attrition can be very detrimental to statistical power of a study; fewer schools makes it harder to find significant effects. The group recommended keeping the lines of communication open between school districts, university project staff and external evaluators.
- The role of university learning and evaluation centers in SEPA evaluations. NSF is putting the kibosh on this (for instance, on IGERT grants). Will NIH follow?
- Rigor: What kinds of study designs are reasonable for the budgets and populations of SEPA projects? To what end do we want rigor in our evaluations – is it to draw some generalizations across projects, or to communicate the value of our work to Congress?
- How will our evaluations be used to make funding and program decisions, anyway? Many in the group felt that external evaluations were of tremendous value to individual projects, but questioned whether or how their work might influence policies within the SEPA program as a whole.
- What's the status of the SRI SEPA evaluation discussed in Seattle last year?
- Is anyone developing assessments of knowledge/awareness of clinical trials?
- Strategies for sharing evaluation instruments and leveraging evaluation instruments. The group expressed interest in making evaluation reports and instruments public on the SEPA website. Would it be possible to receive supplemental SEPA funds to further refine and validate promising measures?
- What can SEPA evaluations contribute to the larger evaluation community? There is a site for STEM evaluators on ResearchGate.net; breakout session participants were encouraged to join.
- Finally, the group expressed interest in preparing a collective response to the STEM Education Design Principles referenced in Bruce Fuchs' talk. This led to the creation of a group within ResearchGate to respond to the request.

Participants

Lola Adedokun, Purdue University
Kristin Bass, Rockman et al
Camilla Colvin, Children's National Medical Center
Paul Cotter, University of Alaska
Berri Jacque, Tufts University
Tania Jarosewich, University of Illinois
Susan Kuner, Topaz Canyon Group, LLC
Kristin Kush, Resource Development Institute
Tammy McKeown, Virginia Commonwealth University
Caren Oberg, EdVenture Children's Museum
Loran Parker, Purdue University
Debbie Piecka, Wheeling Jesuit University
Linda Pruski, University of Texas Health Science Center, San Antonio
Camellia Sanford, Rockman et al
Veronica Smith, Northwest Association of Biomedical Research
Steve Yalowitz, Institute for Learning Innovation

Wednesday, May 16, 10:00am - 11:15am
Addressing Project Challenges in **Informal Science Education**

Facilitator: **Laura Martin**, PhD, Arizona Science Center
Report by **Denise Young**, EdD, University of North Carolina, Morehead Planetarium and Science Center

Laura Martin opened the session and asked everyone to introduce themselves.

Issues for discussion:
Getting visitors (upper elementary and their parents) to understand complex science – to make it engaging enough to get people hooked to want to learn the complex science. Health seems to be an enormous hook. But people don't understand evolution. How far down can you drill before losing them?

- ASK kids what they are curious about. Those are the hooks.
- Look at what the underlying concept of the complex science is. (Vygotsky) Ex. Don't start will cell biology. Start with the fundamental idea: busy cells – cells are doing a lot of different things all the time, every day. Make the concept age appropriate. Kids got interested in how do bones heal and how do cuts heal. The idea of "The Busy Body" emerged.
- Also, break down misconceptions – skeletons are more than the white bones that hold you up. Through exploration of cow bones, learn there is more to bones than they thought.
- Do front end evaluation – figure out what the audience already knows, what they have little understanding about
- Focus on the positive – cures – as opposed to disease/illness.
- Language of 11-12 year olds works for adults, too.
- Sometimes words (ex. – evolution) may get in the way. But not using the word may make people feel like they've been tricked.

Museum experiences are for a limited period of time. Connecting to more in-depth opportunities – we intend to do this but struggle with it. We get people excited, but then what…

- Teacher professional development is one way to extend the experience.
- Preaching to the public in a science center setting does not work.
- Give kids a "membership" card to give them a sense of belonging and keep them engaged and involved.

Should we go for behavior change?

- Present the science and let people make their own choices.
- Respect the visitors.
- Visitors respect the science center as a place for getting unbiased information. We don't want to trample on their trust.
- Do the science of food, but don't tell them what to eat.
- Provide opportunities for people who want to know more/do more.

How do you evaluate if we are being successful in an informal science setting?

- NSF Framework should be very helpful.
- We have good evaluation techniques for evaluating how effective the experience is directly after the program, but what about 9 months or more later? Have we changed people's attitudes? We have methods for doing this research, but not the funds to do it.

Large scale exhibitions, giant screen films – You need to develop evergreen the content and provide updated information on fast-moving science?

- Perhaps the solution is online. But how do you relate that to where the movie is being leased?
- Creating communities is important. FB is important.

In working with advisors, how do educators and advisors work together?

- Not sure we addressed this outright.

How do you train scientists to speak effectively to the public?

- Laura Martin has a guide for scientists on how to work with the public in a museum setting. She's happy to share.
- Portal to the Public, a NSF program that addresses this very project, would be a good resource.

Other thoughts:
Take a look at the NSF Science & Engineering Indicators report to get a sense of science literacy and how people get their science information.
Bilingual/multilingual programming – how to do it effectively, be sensitive to cultural issues. Bilingual labels, audio tours, co-development of content, cell phone tags

Participants

JoAnna Baldwin Mallory, Twin Cities Public Television
Barbara Baumstark, Georgia State University
Cheryl Bodnar, Pittsburgh Tissue Engineering Initiative
Val Davillier, Great Lakes Science Center
Nicole Garneau, Denver Museum of Nature & Science
Brittany Garvin, Edventure Children's Museum
Amanda Jones, Seattle Children's Museum
Kitty LaBounty, University of Alaska, Southeast
Bob Russell, Great Lakes Science Center
Joan Schanck, Pittsburgh Tissue Engineering Initiative
Michelle Ventura, Georgia State University
Rebekah Ward, Northwestern University
Martin Weiss, New York Hall of Science
Denise Young, University of North Carolina Morehead Planetarium and Science Center

Wednesday, May 16, 10:00am - 11:15am
Addressing Project Challenges in **Curriculum Development**

Facilitator: **Greg DeFrancis**, MA, Director of Education, Montshire Museum of Science
Report Submitted by **Susan A. DeRiemer**, PhD, Meharry Medical College

The participants identied the most pressing issue related to curriculum development. It became apparent that there is no "one size fits all" way to develop or disseminate curricula. It also became apparent that the issues below are interrelated. The team that develops a curriculum will affect its content and structure which in turn will affect the dissemination, adoption and sustainability. That said, the four major threads were:

1. How do the projects develop cooperative teams that include classroom teachers-scientists (content experts) – education specialists? This discussion touched on the issues of getting people to understand each others language, areas of expertise and goals.
2. What do we mean when we speak of curricula? Does it mean entire units, single lessons or activities, lab exercises, epidemiology cases, etc. One issue that came up was the "hidden curriculum" in our products that can transform the roles of teachers and students.
3. What are the strategies and barriers to dissemination and adoption of curricula that have been developed? Dissemination and adoption were clearly two interrelated, but different issues.
4. What supports do teachers need to allow them to successfully implement curricula and how can these be sustained after the grant ends

Collaboration issues and Models.

A key point was that teachers, curriculum specialists and scientists all have roles to play in this process and that all three elements need to be present. Scientists/content experts bring the subject area knowledge and a sense of what is significant and exciting. They also bring the technical skills and materials. Teachers know what topics and activities will sustain student engagement. They also have experience covering standards and identifying student problem areas. One issue that was raised as a barrier was the increasing specialization of teachers such that they may teach only a small area of their discipline or may be specialized curriculum writers. One model is to have teachers write curricula for teachers based on content area specialists, under the guidance of a curriculum specialist. Another model is to pair a content specialist with a teacher who writes curricula for his/her own classroom. A third model is to pair content specialists with teachers who work on curricula for other teachers. In all of these models there is a need to understand the others' language and their needs. A key point that was made was the time that is required. One strategy for reducing the burden on teachers was to have the content expert (in this case grad students) write up the lessons with input from the teachers. Time is one aspect of the requests of some teachers for ready to use materials, rather than programs where they have to develop their own. After school meetings with libations was one suggestion as to ways to grease the collaborative wheels.

Characteristics of Curricula.
Characteristics discussed included the need for assessment items to evaluate student mastery and the need for modular curricula so that teachers could select parts. The discussion of project-based learning curricula was tied to a discussion of teacher expertise and the relationship between teacher and student (master or guide; expert or fellow learner). This issue also came up when discussing dissemination of lessons (and teacher guides) on websites without password protection. One program had teachers concerned that student access could undermine their authority or make them seem like "puppets". Other issues included converting afterschool program activities to in-classroom activities, and what defines "hands on" : epidemiology for instance.

Dissemination and Adoption of Curricula.
A key point here was the need to have data on efficacy to promote adoption in many districts. A second point was the trend towards adhering to canned or very structured curricula. There is increasing tension between encouraging inquiry and test prep. Technical aspects of dissemination centered around the issue of password protection and how to make the websites more accessible or more easily searched.

Supporting and Sustaining Curricula.
Whether we should be aiming for national dissemination as a goal was discussed, the point being made that local or regional curricula may be more effective. There needs to be a refining process that includes feedback from teachers. There also need to be resource centers and/or contact numbers teachers can access with questions when using new lessons. Lab materials need to be as user-ready as possible. While one-on-one pairings are the most effective, they are not easily sustained. Something else needs to be available to support teachers. Videocasts of actual lessons was one suggestion to complement web-based curricula. Training sessions for more complicated exercises can minimize failures and frustrations. There also need to be strategies to help teachers "own" curricula that they themselves do not develop.

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Wednesday, May 16, 10:00am - 11:15am
Addressing Project Challenges in **Research Experiences for Students and Teachers**

Facilitator: **Shannon Colton**, PhD, Milwaukee School of Engineering
Reported by **Tracey Meilander**, PhD, Great Lakes Science Center

Four major challenges to research experiences for students and teachers were discussed in the session.

1) Research mentor recruitment:
Challenge: As the research funding pool decreases, it is becoming more difficult to recruit mentors

Possible solutions:

- **Pay research mentors to participate.** Some projects pay up to $5000 for mentoring students and/or teachers; however, this decreases the funds available to students and teachers. Identify other sources of funding (private foundations/donors, supplemental grants, etc.). Provide small supply grants to mentors
- **Embed mentoring into the culture of science professionalism.** This should extend beyond undergraduate and graduate students to high school students and teachers, with emphasis on underserved populations. It would be helpful for NIH to emphasize the importance of mentorship to diverse populations. Include mentoring criteria in the promotion and tenure process.
- **Include mentors in the selection process.** Involve mentors in recruitment and selection of their student and teacher interns.
- **Build a professional network.** Market and promote internship opportunities to colleagues. Utilize your own professional network. Emphasize the significance of internship programs as providing community benefit.

2) How to measure literacy and effectiveness:
Challenge: Identifying appropriate evaluation tools; rigor in evaluation may harm impact

Possible solutions:

- **Recognition of qualitative and quantitative data and evaluation methods.** Forms of qualitative data (from focus groups, interviews, etc.) are important to evaluation of internship programs.
- **Continue discussion of evaluation methods and best practices.** Provide attention to qualitative methods.

3) Establishing a P-20 pipeline:
Challenge: Recruiting and retaining internship participants from underserved populations

Possible solutions:

- **Build trust with underserved populations** (e.g., faculty visit to underserved communities). Build professional relationships with teachers. Have researchers visit the classroom. Educating teachers increases efficacy.
- **Emphasize solutions to socioeconomic problems.** Pay students for their participation.
- **Promote programs through effective channels.** Utilize student participants, counselors, teachers, etc. Provide fieldtrips for students and teachers. Have researchers visit the classroom. Utilize video production.
- **Build in more interaction with scientists.** Engage the public in scientific discussions (e.g., Science Cafes). Emphasize extensions and applications.

4) **Time for teachers to incorporate knowledge and activities learned:**
Challenges: Standardized, paced curriculum limits use of outside curricula and creativity, application, and extension

Possible solutions:

- **Raise the level of the teaching profession.** Teachers are educated professionals and should be treated as such. They are capable of selecting curricula and classroom activities that meet standards and engage students. Emphasize peer teaching and mentoring.
- **Integrate SEPA curricula into local, state, and national curricula.** SEPA curricula and activities have demonstrated effectiveness. Move to integrate into the curriculum in a more formal way.
- **Frame curricula with questions.** Focus on scientific inquiry and questioning. This can be done with limited resources and cost.
- **Limit sizes of science classes.** It is difficult to teachers to use inquiry-based methods with large groups. Smaller class sizes will allow students to explore the process of science safely.

Overall, it would be helpful for SEPA to have a greater voice in education at the national level.

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Wednesday, May 16, 10:00am - 11:15am
Addressing Project Challenges in **Student Science Enrichment**

Facilitator: **Judy Diamond**, PhD, University of Nebraska State Museum
Reported by **Amy N. Spiegel**, PhD, University of Nebraska, Lincoln

The discussion focused on student enrichment projects that included an afterschool hands-on science program, a partnership between scientists and teachers to integrate current research into science lessons, a program to put science graduate students into science classrooms, a program that provides an interest-based science-intensive "school within a school" academy, and a program that develops comics and other outreach materials focused on virology for use in and out of the classroom. Challenges that participants identified and discussed included the following (all bulleted comments below are direct or paraphrased quotes from the discussion):

How to disseminate materials?

- One project team questioned: "After developing materials, and making sure they work, then how do you get them out to people?" One solution is to put them on the web; another project partnered with a publisher to help to distribute project materials.
- Another group detailed its partnership between scientists and high school teachers to develop lessons and bring current research into curriculum. Eventually they want to have them available for anyone to use. These are very materials intensive, so teachers new to the lessons may not feel comfortable using them. The challenge is making them accessible and usable to teachers not involved in the development.

How to adapt programs to a new setting or situation?

- Economics posed a problem for one of the groups in the session. This team experienced a drop in the number of people coming to their campus given increasing transportation costs, etc., so they had to find a way to take their labs out to schools – especially in high poverty areas. This team felt that briefer programs are kind of looked down on as "one and done," but they are easier to distribute.
- One project is adapting an existing successful model from a high functioning school to a low functioning school – the challenge is adapting the curriculum to lowest performing school.
- It is challenging to implement current research into school lessons and be responsive to teachers' needs. Lessons at the 4th grade level, for example, must be more basic, general bioscience rather than more specialized information.

How to assess impacts? How to evaluate?

- Materials developed as part of informal science enrichment almost ensures projects develop add-ons, not curricular materials. This means the intervention is often small, and the challenge is measuring the impact of a small intervention.
- Knowledge gain may not be as great as the enthusiasm among learners impacted by enrichment projects. It is important to recognize the value of interest and engagement as predictors of longer-term outcomes, but how can these outcomes be measured?
- Is there a place for qualitative methods? Some projects record outcomes using video -- is this valid? One group has heard teachers say "Here's this girl who was never interested in science, and now she is actually participating" – how can those kinds of outcomes be captured?
- The community needs to recognize the value of higher-level impacts, such as reasoning and critical thinking skills.
- Surveying existing pre/post measures, some teams were unable to find existing instruments (or none that had been validated.). How can science enrichment projects develop effective, meaningful measurement tools?
- One challenge is tracking students longitudinally. One PI described their success in creating a long-term relationship with the director of the local school district's research office, where there may be more staff stability than in the schools.
- The SEPA community should develop a bank of customizable items that can be used across multiple, diverse programs so that 1) projects have resources that can be used to measure outcomes and not have to develop all the assessment tools from scratch and 2) it is possible to combine findings across projects to make them more generalizable, useful for meta-analysis. There is need for a core set across projects, with useful metrics for multiple kinds of interventions.
- Projects should work together to create these items and identify important constructs across programs, such as interest in science, importance of science, engagement, identity, and others. The community could create a set of metrics that everyone has input on and determine what the needs are so the final measurement products are useful.

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Wednesday, May 16, 10:00am - 11:15am
Addressing Project Challenges in **Teacher Professional Development**

Facilitator and Reporter: **Mary Jo Koroly**, PhD, University of Florida

This session was dedicated to addressing challenges faced in teacher professional development programs, as well as putting forth solutions to those challenges. The facilitators of the discussion put forth several topics for discussion, as well as opening up the floor for other suggestions. The following describes the basic challenges put forth, as well as the solutions suggested during group discussion by those participating in the session.

Advertising/Marketing: Getting the word about your program out to the public

- Social Media Ads (Facebook, YouTube, EdModo, Teacher/School Tube)
- Flyers
- Email Blasts
- Physical presence at science fairs, festivals, conferences, etc.
- Word of mouth – ask participants to pass the word on
- Publications – in conjunction with past participants
- Newsletters (i.e. NSTA – Free!)
- Pre-Professional Students – med, grad, etc. students still in contact with their earlier teachers

Recruiting: Getting the number of participants in your program up

- Cold Calling – department heads in direct contact with teachers
- Science supervisors (i.e. Association of Science Supervisors)
- District Contacts/Campus Resources
- Incentivization (monetary, grad credits, etc)
- Online Recruiting (listservs)
- ABRs – Associations of Biomedical Research (state level)
    - States United for Biomedical Research
- Word of Mouth – teachers recruit other teachers
- Regional Offices of Education
- State Dept. of Education

Lack of Resources/School Support – teachers interested in PD, but no support from schools

- Incentivization – for help in the classroom (equipment, money, etc)
- Provide money for substitutes so teachers can attend PD programs
- Flexibility – timing, implementation, etc.
- Posters/Reflection – physical representation of time spent at PD – "the proof is in the pudding"

Deliverables – many teachers participate, but then some do not finish all program components

- Incentivization – however it is important to not give all incentives at once, particularly if there is more than one segment to the program – i.e. "half now, half on delivery" type deal.
- Provide clock hours for teachers
- Be very clear on expectations
- Paying by the hour for work
- Smaller, more manageable segments to programs
- Content integration/diversity – across multiple subjects to include what teachers are paid for (i.e. science teachers being paid based on how their students test in English, so content should reflect those other subjects that are necessary)

Funding – where to get money for programs/stipends

- Private Foundations/Charitable Trusts
- Company sponsors
- Academies/Small Learning communities
- District/University support
  - Superintendants
- Educational foundations associated with districts

Program Retention – keeping participants involved after the program

- Networking/Partnerships
- Clustering – multiple teachers in the same area
- Give them resources they need and can actually use
  - Saturday Science Talks
  - Lending libraries

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Wednesday, May 16, 10:00am - 11:15am
Addressing Challenges in **Technology-based Educational Materials**

Facilitator: **Leslie Miller**, PhD, Rice University

Reported by **Yvonne Klisch**, PhD, Rice University

Challenge 1: Antiquated equipment and slow Internet connection in schools – should technology developers create on the lowest or highest end of possible technology?

Solution 1: Many students have better equipment at home than their schools have; students could bring their own
(Problem: often school don't allow students to bring devices into/use their own devices in schools)
Solution 2: Aim for the middle
(Problem: Developers are criticized if their products are not cutting edge)
Solution 3: Establish lending libraries for equipment and software
Solution 4: Provide the high end technology as part of the grant such as mobile labs with the latest technology.
Solution 5: Use digital cameras to replace the need for higher end microscopes.

Challenge 2: Students spend too much time on learning the technology vs. learning the content – technology often overburdens students and teachers.

Solution: Create different versions of the same content to accommodate different learners (example: make a low-tech board game based on a computer game)

Challenge 3: Dissemination of materials – there is a wide variety of technology, but only a fraction is actually used in classrooms.

Solution 1: Present projects at teacher conferences
Solution 2: Collaborate with other NIH programs on dissemination
Solution 3: Have related websites link to your programs
Solution 4: Use e-blast lists of cooperating institutions such as NASA, NSTA to better target teachers

Challenge 4: How can we help teachers with the overall problem of technology integration?

Solution 1 (for games): Make it easier for teachers to learn the game mechanics; make an effort to connect "learning the mechanics" with "learning the content"
Solution 2: Provide strategies for accountability (e.g., integrate assessment)
Solution 3: Connect materials to educational frameworks teachers already use, such as the 5E model

Challenge 5: How can we avoid creating materials that are "exercises in clicking the mouse" vs. learning the content?

Solution 1: Build systems that reward knowledge (for example, connect leaderboards and scores to content learning)
Solution 2: Offer different learners different types of paths
Solution 3: Increase engagement by making materials more dynamic, with an opportunity for players to change the path of a game (engagement is predictor of learning)

Challenge 6: How can we best assess our materials?

Solution 1: Museum exhibits can provide a survey as optional assessment (one museum gathered over 4,000 completed survey that way)
Solution 2: Build tracking into software, including tracking in-game questions
Solution 3: Create mobile applications that facilitate easy feedback
(Problem: availability of mobile devices in schools – computers might be better options at this point)

Challenge 7: Cost – how can we get enough money upfront to create materials?

Solution 1: Work with small developer companies who allow spacing of payments
Solution 2: Funding could be changed so that budgets are higher in some years and lower in others to provide large payments for technology development
Solution 3: Use graduates students or places like Carnegie-Mellon Entertainment Center to work on projects. Costs are lower than commercial companies.
Solution 4: Consider selling products after funding period has ended so as to provide steady income to continue to update the product.

Challenge 8: How to communicate about technology issues among the SciEd NIH projects?

Solution: Suggestion was made to start a interest group dedicated to technology.

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NIH **SciEd** 2012 Poster Presentations
Monday, May 14 – **3:45 – 5:00pm**

Session A: **Informal Science Education I**

Facilitator: Ginger Cross, Mississippi State University

Posters are ordered alphabetically by contact PI

Poster #	Project Name	Institution	Contact PI	Funder
A-1	Partnerships to Promote Healthy Lifestyles for Children and Communities	Mississippi State University	Cross, Ginger	SEPA
A-2	Genes, the Environment, and ME (GEM)	University of Washington	Munn, Maureen	SEPA
A-3	Science Montana: Engaging 4-H Teens with Bioscience Research	Montana State University	Obbink, Kimberly	SEPA
A-4	Regenerative Medicine Partnership in Education	Duquesne University	Pollock, John	SEPA
A-5	Fat Dogs and Coughing Horses: Animal Contributions towards a Healthier Citizenry	Purdue University	Ratliff, Timothy	SEPA
A-6	Heart Smart	University of Miami	Saab, Patrice	SEPA Pending
A-7	If a Starfish Can Grow an Arm, Why Can't I?	Pittsburg Tissue Engineering Initiative	Schanck, Joan	SEPA
A-8	Human Health and 'Human Bulletins': Scientists and Teens Explore Health Sciences	American Museum of Natural History	Scott, Monique Renee	SEPA
A-9	Addressing the Science of Really Gross Things: Engaging Young Learners in Biomedical Science Through a Fulldome Planetarium Show and Supporting Curricula	UNC Morehead Planetarium and Science Center	Young, Denise	SEPA Pending

Session B: **Student Science Enrichment I**

Facilitator: Barbara Baumstark, Georgia State University

Poster #	Project Name	Institution	Contact PI	Funder
B-1	Helping K-12 Students Become Fluent in the Language of DNA	Georgia State University	Baumstark, Barbara	SEPA
B-2	Sowing the Seeds of Neuroscience	University of Washington	Chudler, Eric	Blueprint for Neuroscience
B-3	World of Viruses	University of Nebraska Lincoln	Diamond, Judy	SEPA
B-4	Would you like to be a scientist? Discover Biomedical Sciences!	Charles R Drew University of Medicine & Science	de Lacalle, Sonsoles	SEPA
B-5	Building Bridges: Health Science Education in Native American Communities	University of Nebraska Medical Center	Godfrey, Maurice	SEPA
B-6	Science Promotion in Rural Middle Schools	Texas A&M University	Johnson, Larry	SEPA
B-7	The Big Sky Brain Project	University of Montana	Kavanaugh, Michael	Blueprint for Neuroscience
B-8	Science Club: Building a Science Community Partnership with the Boys & Girls Club	Northwestern University	Kennedy, Michael	SEPA
B-9	Spectrum: Building Pathways to Biomedical Research Careers for Girls and Women	San Francisco State University	Tanner, Kimberly	SEPA

Session C: **Teacher Professional Development I**

Facilitator: Leonard Munstermann, Yale Peabody Museum

Poster #	Project Name	Institution	Contact PI	Funder
C-1	Collaborations to Advance Research and Ethics (CURE)	Northwest Association for Biomedical Research	Chowning, Jeanne	SEPA
C-2	Addiction Research and Investigation for Science Educators (ARISE)	University of California, Davis	de la Torre, Adela	SEDAPA
C-3	Meharry Health Sciences Leadership Academy	Meharry Medical College	Dereimer, Susan	SEPA
C-4	Changing Brains Through Inquiry, Not Drugs	University of Minnesota Twin Cities	Dubinsky, Janet	SEDAPA
C-5	From Bench to Bedside: Molecular Stories of Research-Based Health Care	Milwaukee School of Engineering	Herman, Tim	SEPA
C-6	Biomedical Partnership for Research Education Pipeline in Alaska (Alaska BioPREP)	University of Alaska Fairbanks	Hills, Susan	SEPA
C-7	Biomedical Explorations: Bench to Bedside	University of Florida	Koroly, Mary Jo	SEPA
C-8	Climate Change and Patterns of Vector-borne Disease: Development of Translational Science Curricula	Yale Peabody Museum	Munstermann, Leonard	SEPA
C-9	Pacific Education and Research for Leadership in Science (PEARLS)	University of Hawaii at Manoa	Withy, Kelley	SEPA

Session D: **Curriculum Development I**

Facilitator: Cathrine Ennis, University of North Carolina

Poster #	Project Name	Institution	Contact PI	Funder
D-1	ONE-DA – Online Neuroscience about Drug Addiction	University of Washington	Cunningham, Susanna	SEDAPA
D-2	The Science of Healthful Living	University of North Carolina	Ennis, Catherine	SEPA
D-3	CityLab Promotes Understanding of Clinical Trials	Boston University Medical Campus	Franzblau, Carl	SEPA
D-4	Critical Appraisal to Improve Neuroscience Education (CAINE)	University of Texas Health Science Center San Antonio	Lichtenstein, Michael	Blueprint for Neuroscience
D-5	Neuroscience Activities for Hands-on Learning	University of Rochester	Markowitz, Dina	Blueprint for Neuroscience
D-6	Problem-Based Learning for Drug Abuse and Addiction Education	University of Rochester	Markowitz, Dina	SEDAPA
D-7	The Learning Brain – Interactive Inquiry for Teachers and Students	Baylor College of Medicine	Moreno, Nancy	Blueprint for Neuroscience
D-8	Foundations for Student Success: National After School Network	Baylor College of Medicine	Moreno, Nancy	NIAID
D-9	Science Education in Health Education Class: Tobacco and Addiction	Duke University	Schwartz-Bloom, Rochelle	SEDAPA
D-10	The Stanford SEPA Project	Stanford University	Winkleby, Marilyn	SEPA

Session E: **Technology-Infused Educational Materials**

Facilitator: Neil Lamb, HudsonAlpha Institute for Biotechnology

Poster #	Project Name	Institution	Contact PI	Funder
E-1	BrainCASE: The Golden Hour, a Video Game Examining the Science Behind Traumatic Brain Injury	University of Illinois Urbana-Champaign	Hug, Barbara	SEPA
E-2	It's Complex! Engaging Student Discussions around Complex Genetics and Individuals	HudsonAlpha Institute for Biotechnology	Lamb, Neil	SEPA
E-3	iNeuron: A Contemporary Platform for Neuroscience Education	Adventium Labs	Michalowski, Martin	SBIR
E-4	Virtual Clinical Trials	Rice University	Miller, Leslie	Blueprint for Neuroscience
E-5	Virtual Sprouts: Web-based Gardening Games to Teach Nutrition and Combat Obesity	University of Southern California and California Science Center	Spruijt-Metz, Donna	SEPA
E-6	The Neuroscience of Our Senses	University of Utah	Stark, Louisa	Blueprint for Neuroscience
E-7	SIMLAB: Using Patient Simulation for Student Exploration of Community Health Issues	Museum of Science and Industry	Ward, Patricia	SEPA
E-8	K-12 Virtual Clinical Research Center & Medical Ignorance Exploratorium	University of Arizona	Witte, Marlys	SEPA
E-9	CyberSurgeons: Live Simulation, PBL Development, and Dissemination	Wheeling Jesuit University	Wood, Charles	SEPA

Tuesday, May 15 – **3:45 – 5:00pm**

Session F: **Informal Science Education II**

Facilitator: Meena Selvakumar, Pacific Science Center

Poster #	Project Name	Institution	Contact PI	Funder
F-1	Unlocking the Mysteries of Chronic Disease: Bioinvestigatins of Family and School	Edventure Children's Museum	Bonk, Susan	SEPA
F-2	The Zoo in You: Exploring the Human Microbiome	Oregon Museum of Sciences and Industry	Coats, Victoria	SEPA
F-3	BioMedTech: Students Translating and Exploring Medicine (BMT: STEM)	Great Lakes Science Center	Davillier, Valence	SEPA
F-4	Weighing the Evidence: Making Informed Healthcare Decisions.	Science Museum of Minnesota	Fink, Laurie	SEPA Pending
F-5	Framing New Pathways to Medical Discoveries for Families, Students and Teachers	Arizona Science Center	Martin, Laura	SEPA
F-6	Forensic Web Adventures	Rice University	Miller, Leslie	SEDAPA
F-7	Out of the Lab and Into the Spotlight: Bringing Current Health Research to the Public	Pacific Science Center	Selvakumar, Meena	SEPA
F-8	Life Lab	Marian Koshland Science Museum of the National Academy of Sciences	Shugart, Erika	National Library of Medicine
F-9	Evolution & Health Traveling Exhibition and Education Programs	New York Hall of Science	Weiss, Martin	SEPA

Session G: **Student Science Enrichment II**

Facilitator: J. Michael Wyss, University of Alabama at Birmingham

Poster #	Project Name	Institution	Contact PI	Funder
G-1	ASSET: Advancing Secondary Science Education with Tetrahymena	Cornell University	Clark, Theodore	SEPA
G-2	Environmental Health Science Education for Rural Youth	University of Montana	Holian, Andrij	SEPA
G-3	"TRY-IT" Translating Research to Youth through Information Technology	University of Kentucky	Leukefeld, Carl	SEPA
G-4	Life Science Learning Center: Strengthening Connections Between Scientists & Classroom Learning	University of Rochester	Markowitz, Dina	SEPA
G-5	Transforming STEM Learning in Urban Schools Using the SSMV Model	Vanderbilt University	Shepherd, Virginia	SEPA
G-6	Pathways: Promoting Access to the Health Sciences through Partnership	University of California San Francisco	Smith, Rebecca	SEPA
G-7	Neuroscience in Your World: A Partnership for Neuroscience Education Across the K-12 Spectrum	The Franklin Institute	Farah, Martha & Snyder, Steve	Blueprint for Neuroscience
G-8	PathOlogical Life Sciences Training Program for Students and Families	University of Kansas Medical Center	Thomas, Patricia	SEPA
G-9	Meta!Blast: An Immersive Interactive Learning Module for Cell Biology	Iowa State University	Wurtle, Eve	SEPA
G-10	Birmingham Science Education Partnership: Middle School Inquiry-Based Learning	University of Alabama at Birmingham	Wyss, Michael	SEPA

Session H: **Teacher Professional Development II**

Facilitator: S. Monroe Duboise, University of Southern Maine

Poster #	Project Name	Institution	Contact PI	Funder
H-1	Project CRESST: Enhancing Clinical Research Education for Science Teachers, Students and the Community	Virginia Commonwealth University	Abrams, Lisa	SEPA
H-2	EvidenceWorks: How Doctors Use Evidence-Based Medicine	Foundation for Blood Research	Allan, Walter	SEPA
H-3	How Do I Learn: Neurosciences Advances Inform Learning	University of Washington	Cunningham, Susanna	Blueprint for Neuroscience
H-4	BRAIN to High Schools	University of Minnesota Twin Cities	Dubinsky, Janet	SEPA
H-5	Micro-and Nano-Space Explorations of Health and Disease	University of Southern Maine	Duboise, S. Monroe	SEPA
H-6	Research, Education, and Linking Science Careers: REAL Science Careers	Wake Forest University Health Sciences	Lambros, Ann	SEPA
H-7	Positively Aging: Maximizing the Healthspan	University of Texas Health Science Center San Antonio	Lichtenstein, Michael	SEPA
H-8	Six Star Science for Student-Centered Learning	American Physiological Society	Matyas, Marsha	SEPA
H-9	A Collaborative Approach to Real-World Science in the Classroom	Tufts University Boston	Meiri, Karina	SEPA

Session I: **Curriculum Development II**

Facilitator: Naomi Luban, Children's Research Institute

Poster #	Project Name	Institution	Contact PI	Funder
I-1	Connecting Classrooms and Community with the Health Sciences	Montshire Museum of Science	Defrancis, Gregory	SEPA
I-2	FoodMASTER: Impacting Middle Grade Science and Mathematics Learning Environments	East Carolina University	Duffrin, Melani	SEPA
I-3	Fighting with Food: Battling Chemical Toxicity with Good Nutrition	Miami University	Hershberger, Susan	SEPA
I-4	Project NEURON (Novel Education for Understanding Research On Neuroscience)	University of Illinois Urbana-Champaign	Hug, Barbara	SEPA
I-5	Being Me	Children's Research Institute	Luban, Naomi	SEPA
I-6	How sure are you? Science, Biostatistics and Cancer Education	University of California Davis	Molinaro, Marco	SEPA
I-7	Gene U: Inquiry-based Genomics Learning Experiences for Teachers and Students	Baylor College of Medicine	Moreno, Nancy	SEPA
I-8	Learning Biological Processes Through Animations and Inquiry: A New Approach	University of Georgia	Oliver, J Steve	SEPA
I-9	Inside Your Body: Web-based Curricula for Secondary Science	University of Utah	Stark, Louisa	SEPA
I-10	You're Body's Microbial Ecosystem: Web-Based Curriculum for Secondary Science	University of Utah	Stark, Louisa	NIAID

Session J: **Research Experiences for Students and Teachers**

Facilitator: David Petering, University of Wisconsin Milwaukee

Poster #	Project Name	Institution	Contact PI	Funder
J-1	West Virginia HSTA Students Design Public Health Clinical Trials	West Virginia University	Chester, Ann	SEPA
J-2	Investing in the Future: Collaborative Research Experiences for Students and Teachers	Pennsylvania State University Hershey Medical Center	Chorney, Michael	SEPA
J-3	Genetics of Taste: A Flavor for Health -- Community Lab and Education Programs	Denver Museum of Nature and Science	Coughlin, Bridget	SEPA
J-4	Building an Infrastructure for Research Collaborations	University of Georgia	Dolan, Erin	SEPA
J-5	Epidemiology and the Energy Balance Equation	Montclair State University	Kaelin, Mark	SEPA
J-6	BioStart: Clinical Research and Education Experiences for Students, Teachers, Parents and Community	Louisiana State University Health Science Center Shreveport	Kleiner, Heather	SEPA
J-7	Biology-Environmental Health Science Nexus: Inquiry, Content, and Communication	University of Wisconsin Milwaukee	Petering, David	SEPA
J-8	CHIDR Chatter: Translating Community Research Data for Classroom Use	Oregon Health & Science University	Marriott, Lisa & Shannon, Jackilen	SEPA
J-9	Going to Middle and Early High School Classes with Near-Peer Mentors	U.S. Walter Reed Army Institute of Research	Yourick, Debra	SEPA

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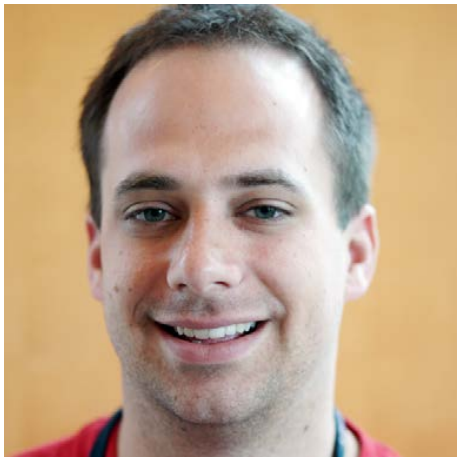

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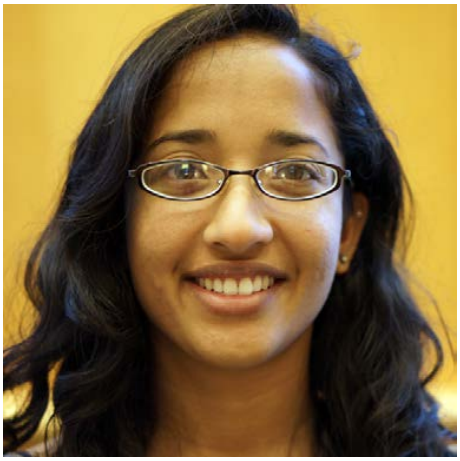

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		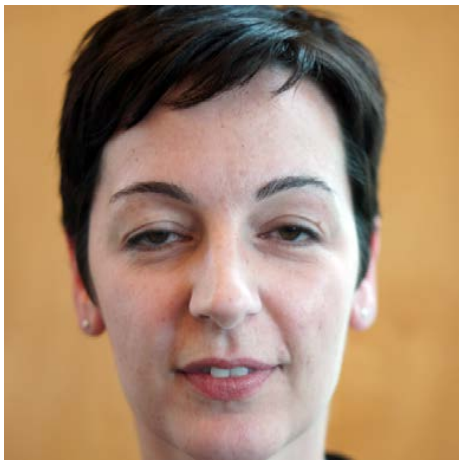
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Leonard Munstermann
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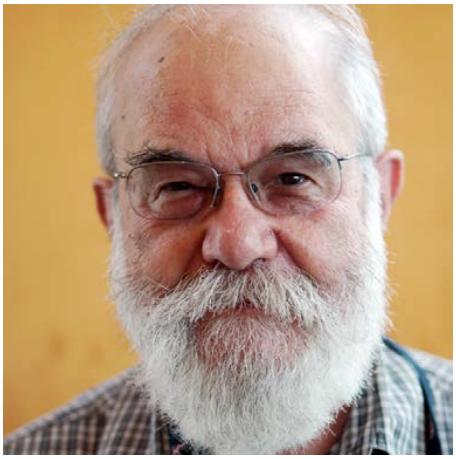		
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