



WEDNESDAY, NOVEMBER 11

8:30 am - 9:45 am

Assessing Inquiry-Based Microscopy Labs— Using Digital Tools To Enhance Critical Thinking

Director's Row E • Capacity: 60
Hands-On Workshop • 4C GA

This workshop will demonstrate various strategies for assessing inquiry-based microscopy labs that utilize digital microscopy tools. Participants will be able to experience an inquiry-based practical and review examples of formative and summative assessments that can be used to evaluate basic microscopy skills as well as targeted objectives normally assessed in biology laboratory.

- Connie Russell, Angelo State University, San Angelo, TX; Cyndi Syverson Mercer, Swift Optical Instruments, San Antonio, TX

Teaching About Antibiotic Resistance and the “Superbugs” Among Us

Governor's Square • 16 Capacity: 50
Hands-On Workshop • Human Health & Public Health • JH HS

Learn how to teach your students about antibiotic resistance, “superbugs,” and horizontal gene transfer (HGT). Leave this free workshop with all the information and instructions necessary to construct a cutting-edge, hands-on science demo for your students.

- Katrina Eike, Biological Science Initiative-Science Squad, Boulder, CO

9:00 am - 3:00 pm

Adventures in Science Through Reading and Writing

Tower Court A • Capacity: 24
Special Workshop #1 • Cost: \$60

CDs containing several pieces of written science material will be provided. The CDs include: Matt Ridley's *Genome Autobiography of the Species in 23 Chapters*, Simon Mawer's *Mendel's Dwarf*, David Bainbridge's *The X In Sex*, Dr. Seuss's *The Lorax*, Steven Johnson's

The Ghost Map, Gary Larson's *There's A Hair In My Dirt*, Ricki Lewis' *Stem Cell Symphony*, and Pulitzer Prize winner Amy Harmon's *New York Times* series “The DNA Age.”

Each of these learning experiences emphasizes autonomous learning and both critical and creative thinking, as well as an opportunity for students to explore personal connections to science and its influence on our daily lives. Above all, this genre of learning is a terrific contributor to the quest for science literacy across student populations. Quantitative and qualitative evidence of student learning will be presented through assessments using rubrics, concept-mapping, and written/oral presentations. Much of the session will be spent eliciting audience ideas and suggestions for future learning experiences.

- Sandra Latourelle, SUNY Plattsburgh, Plattsburgh, NY; Michelle Snyder, Clinton Community College, Plattsburgh, NY; Susan Holt, University of Rochester Life Science Learning Center, Rochester, NY; Ricki Lewis, Alden March Bioethic Institute, Albany Medical Center, Scotia, NY

9:30 am - Noon

Reinventing PCR as a New Two-Step Biology Activity

Tower Court B • Capacity: 24
Special Workshop #2 • Cost: \$80

The workshop includes a hands-on PCR experiment designed to stimulate student participation and discovery. This new two-step PCR DNA amplification will be performed from start to finish by all participants and is designed to be a fast, easy, and affordable classroom activity that brings cutting edge technology to biology. Participants will amplify a DNA target using the new EdvoCycler™ (researched with NIH SBIR grants) and will determine the size of the product by electrophoresis. During the PCR amplification, a PowerPoint presentation will demonstrate how PCR can be used to determine the presence of

ABBREVIATION KEY

- GA = General Audience
- E = Elementary
- JH = Middle School/Jr. High
- HS = High School
- 2C = Two-Year College
- 4C = Four-Year College

genetically modified soybean or corn in off-the-shelf foods and to differentiate GM plants from their natural counterparts. Participants will be provided with a detailed PCR protocol and a discount coupon for the purchase of the new two-step PCR experiment or any other Edvotek experiment.

- Jack Chirikjian, Georgetown University, Washington, DC; Khuyen Mai, Edvotek, Bethesda, MD

9:30 am - 2:30 pm

Denver Zoo and Museum of Nature and Science

Field Trip #25 • Cost: \$50

Since 1896, when a small, orphaned black bear named Billy Bryan became its first resident, the Denver Zoo has been providing homes for endangered and threatened species, while fostering “an education-based” approach to wildlife conservation. An accredited member of the Association of Zoos and Aquariums, Denver Zoo spans more than 80 acres in Denver's historic City Park and boasts over 650 animal species. Next door to the Denver Zoo is the Denver Museum of Nature and Science. It features a new exhibit entitled *Expedition Health*, a tour of the human body—how it is constantly changing and adapting in ways you can see, measure, and optimize through the choices you make. The museum also houses traditional exhibits including wildlife dioramas, dinosaur skeletons, cultural artifacts, two Egyptian mummies, a planetarium, and an IMAX theatre.

10:30 am - Noon

Dispelling The Myth of Effectively Teaching Biology Fully Online – Yes It's Possible!

Tower Court C • Capacity: 40
Special Workshop #3 • Cost: \$20

This workshop is a combination of PowerPoint, laboratory experimentation, and Q & A session. The workshop will focus on three primary areas: (1) The importance of institutions to offer biology and other lab science courses fully online to meet a fast growing demographic of both traditional and non-traditional students. These students are dependent on online courses and programs to meet their educational and professional needs. (2) Present real concrete examples of how online lab science courses enable the instructor to teach complex thinking skills beyond that of what can be taught in a traditional face-to-face course. Presenters will share data reflecting how their online students' learning outcomes and grades compare to those of their face-to-face students. (3) Attendees will perform a real "wet" biology experiment and learn firsthand how labs are performed by students and the critical thinking skills associated with the labs.

- Kate Lormand, Colorado Community Colleges Online & Red Rocks Community College, Denver, CO; Marge Vorndam, Colorado Colleges Online, Denver, CO; Laszlo Vass, Monarch HS, Colorado State Science Commission, Colorado Colleges Online, Denver, CO

10:45 am - Noon

Inquiry-Based Microscopy: The Case of the Missing Cockatoo

Director's Row E • Capacity: 60
Hands-On Workshop • Instr.Strategies & Technologies • 4C GA

This workshop will allow participants to experience an inquiry-based laboratory that teaches basic microscopy skills while allowing students to "solve" a whodunit-type crime. Participants will leave with "evidence" bag samples, basics for prepping the laboratory, and teaching tips for conducting and modifying the laboratory on their own.

- Connie Russell, Angelo State University, San Angelo, TX; Cyndi Syverson Mercer, Swift Optical Instruments, San Antonio, TX

Life in an Extreme Environment—Halobacterium sp. NRC-1: A New Model Organism for the Laboratory

Director's Row H • Capacity: 75
Exhibitor Demonstration • Biotechnology • HS

Introducing the model microbe, *Halobacterium sp. NRC-1*. This member of Archaea, the third domain of life, requires growing medium so salty, few other organisms can survive it. Safe, easy to handle, and colorful, *Halobacterium sp. NRC-1* is great for teaching microbiology, molecular biology, as well as other subjects.

- Carolina Biological Supply Company, Burlington, NC

Inquiring About Drug Abuse ... Without Actually Using Drugs

Governor's Square 10 • Capacity: 100
Hands-On Workshop • Instr.Strategies & Technologies • JH HS

Most students have had drug abuse education, but not many have learned how drugs change brain function. Learn how your students can use inquiry and critical-thinking skills to learn the science of drug abuse and addiction.

- Anne Westbrook, BSCS, Colorado Springs, CO

Advances in New Media Techniques for Biology Laboratory Curriculum

Governor's Square 17 • Capacity: 100
Exhibitor Demonstration • Curr. Development/Supervision • 2C 4C

The higher education student laboratory should incorporate proficient curriculum content and delivery, taking full advantage of digital resources available to biology educators. Hands-on laboratory exercises can benefit from software tools that streamline and heighten the laboratory experience for both the student and educator. Host Dr. Wes Colgan will discuss common curriculum pitfalls and introduce the latest computer-based strategies deployed by leading colleges and universities.

- Wesley Colgan, ADInstruments, Colorado Springs, CO

1:00 pm - 2:15 pm

Building Inquiry-Based Microscopy Labs

Director's Row E • Capacity: 60
Hands-On Workshop • Curr. Development/Supervision • 4C GA

Trying to design an inquiry-based microscopy lab? We will design one novel laboratory investigation and work with participants in converting their own favorite lab.

- Connie Russell, Angelo State University, San Angelo, TX; Cyndi Syverson Mercer, Swift Optical Instruments, San Antonio, TX

Autopsy: Forensic Dissection Featuring Carolina's Perfect Solution® Pigs

Director's Row H • Capacity: 75
Exhibitor Demonstration • General Biology • HS

Are you ready for a forensic dissection activity that is on the cutting edge? Engage students and revitalize your instruction of mammalian structure and function with a "real" classroom autopsy! Participants, working in pairs, dissect a pig by modeling the autopsy protocols of a forensic pathologist.

- Carolina Biological Supply Company, Burlington, NC

Infusing Biotechnology Activities in the Middle School Curricula

Governor's Square 10 • Capacity: 100
Hands-On Workshop • Biotechnology • JH

The workshop will introduce teachers to several inexpensive biotechnology and nanotechnology hands-on, inquiry activities that can be easily incorporated in the middle school classroom. The workshop will share many wonderful biotechnology and nanotechnology web sites and on-line resources available for classroom use.

- Mary Phillips, Tulsa Community College, Tulsa, OK

Three Domains Versus Five Kingdoms: Understanding the Change in Classification and Its Importance

Governor's Square 16 • Capacity: 50
Hands-On Workshop • Biotechnology • HS

An exploration of how cutting-edge molecular techniques and a more detailed understanding of cellular com-



Hands & Minds^{inc}

An authorized licensee for limited use of Jon Zahourek's
Copyrights, Trademarks and other Proprietary Rights

“Hands-On Teaching with the Anatomy in Clay[®] Learning System” Workshop

**Friday, Nov. 13th
8—9:15 A.M.**

Plaza Court 2, Crescent Rounds HC 2C

Hands & Minds is at Booth 216

ponents have led to the reorganization of the traditional five-kingdom classification system into a system with three domains and more than 40 kingdoms.

- Kristin Swihart and Tammy Maldonado, Biological Sciences Initiative, CU Boulder, Boulder, CO

NASA Earth System Connections

Governor’s Square 17 • Capacity: 120
Hands-On Workshop • Environment/
Ecology • E

Earth Systems Connections is aimed at helping students recognize the interconnected nature of the Earth system and appreciate the technology used to study our planet.

- Mike McGlone and Lisa Brown, NASA - Aerospace Education Services Project, Houston, TX

Organelles of the Day II

Tower Court C • Capacity: 20
Exhibitor Demonstration • Genetics • HS
4C

Organelles of the Day II, sponsored by Swift Optical, is an innovative approach to teaching about cell structure while learning proper microscope and digital microscopy techniques. The traditional teaching approaches tend to lead to

chaos in the classroom. This workshop addresses this issue through the use of Swift microscopes and Swift Digital imaging products.

- Whitney Hagins, Lexington HS, Lexington, MA; Cynthia Syverson-Mercer, Swift Optical Instruments, San Jose, CA

officers will highlight funding opportunities, informal breakout sessions will offer details on obtaining funding, and a special Section business meeting will be held.

- Sponsored by Vernier Software & Technology

1:00 pm - 4:00 pm

Outreach Coordinator & Informal Educator Symposium

Governor’s Square 11 • Capacity: 50

Every year, thousands of students and teachers benefit from unique learning opportunities designed by “teachers without classrooms.” From zoos and museums, universities and scientific societies, outreach coordinators and informal educators complement traditional lessons to enhance learning, engage students and support teachers. To better serve this community of biology teachers, NABT has created its new Outreach Coordinator & Informal Educator Member Section. We invite you to join us at this special afternoon session to address the unique challenges posed when teaching in unique settings. Presentations by NSF and NIH program



Engaging Students Using Live and Virtual Sea Urchin Embryology Labs

Tower Court D • Capacity: 35
Special Workshop #5 • Cost: \$65

Sea urchins provide a fascinating model for investigating core biological principles and applying the scientific method. Use of this material is simplified since it is now possible to order gametes for live classroom labs, eliminating the need to obtain and maintain live sea urchins. Biologists at Stanford’s Hopkins Marine Station will present a sea urchin developmental biology lab in which participants observe live fertilization of eggs and development of embryos. Inquiry-based labs using sea urchins will be introduced during the session that will make use of current research. The team will also demonstrate a Web-based project of virtual labs that supports understanding of central biology concepts and promotes development of lab skills. Inquiry-based

1:00 pm - 4:00 pm

continued

lab experiences that may be difficult to conduct within the typical classroom setting become possible in this virtual setting. The Virtual Urchin NSF project (posted at virtualurchin.stanford.edu) complements the first Stanford Sea Urchin Embryology project (www.stanford.edu/group/Urchin) and applies recent advances in educational technology to create an interactive Web site for classroom and independent lab experiences. Teachers will leave this workshop with experience and instructional materials to help them conduct the hands-on, inquiry-based wet labs and virtual labs and will be prepared to coordinate these activities with state and national science standards.

– David Epel, Pam Miller and Jason Hodin, Stanford University-Hopkins Marine Station, Pacific Grove, CA

1:30 pm - 3:45 pm

\$ Incorporating Biotechnology Experiments in Environmental Sciences

Tower Court B • Capacity: 24
Special Workshop #4 • Cost: \$80

New approaches that link biotechnology to environmental sciences will be demonstrated and discussed with an emphasis of how best to incorporate and link traditional ecology to cutting edge environmental science. Experiments will include water testing using chromogenic reagents to detect bacterial pollution, PCR experiments for predicting a rapid identifier of polluting organisms, DNA damage caused by exposure to short wave (260 nm) UV light, and toxicity detection of pollutants in freshwater using *Daphnia* as a bio-indicator. Discussion and PowerPoint demonstration will include bioremediation by oil-eating microbes. Participants will take home experiment protocols and a discount coupon for the purchase of an environmental experiment. Sample reagents for use as classroom demonstrations will also be provided.

– Jack Chirikjian, Georgetown University, Washington, DC; Khuyen Mai, Edvotek, Bethesda, MD

2:30 pm - 3:45 pm

Barbie and Ken: Culture Versus Biology

Governor's Square 16 • Capacity: 50
Hands-On Workshop • Curr. Development/Supervision • JH HS

Body circumference data will be obtained on "Barbie" and "Ken" dolls, scaled to adult size, and compared to published data on American women and men age 20-29 years. In addition, BMI will be calculated for Barbie and celebrity fashion models to contrast immediate mortality risks associated with eating disorders with long term mortality risks due to obesity.

– Kimberly Nichols, Tammy Maldonado and Kristin Swihart, University of Colorado, Boulder, CO

Observing the Environment from Space

Governor's Square 17 • Capacity: 120
Hands-On Workshop • Environment/Ecology • JH HS

Deforestation, changes in the ice cap, and many other changes in Earth systems can be observed and mapped from space for use in the classroom.

– Mike McGlone and Lisa Brown, NASA - Aerospace Education Services Project, Houston, TX

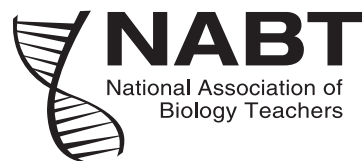
3:15 pm - 4:30 pm

AP® Biology: Enhance Labs and Learning with Probeware

Director's Row H • Capacity: 75
Exhibitor Demonstration • General Biology • HS 4C

Enhance student learning, plus save time and money, when you integrate technology into the AP® Biology curriculum. Participants do a version of Lab 5, Cell Respiration, with probeware. They then discuss how probeware can enhance other labs and reduce the need to dispose of used chemicals and those associated costs.

– Carolina Biological Supply Company/PASCO scientific, Burlington, NC



would like to thank

LabPaq®

for
sponsoring the

**Two-Year
College
Reception**