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NOVEMBER 12 - 15, 2014

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National Association of Biology Teachers

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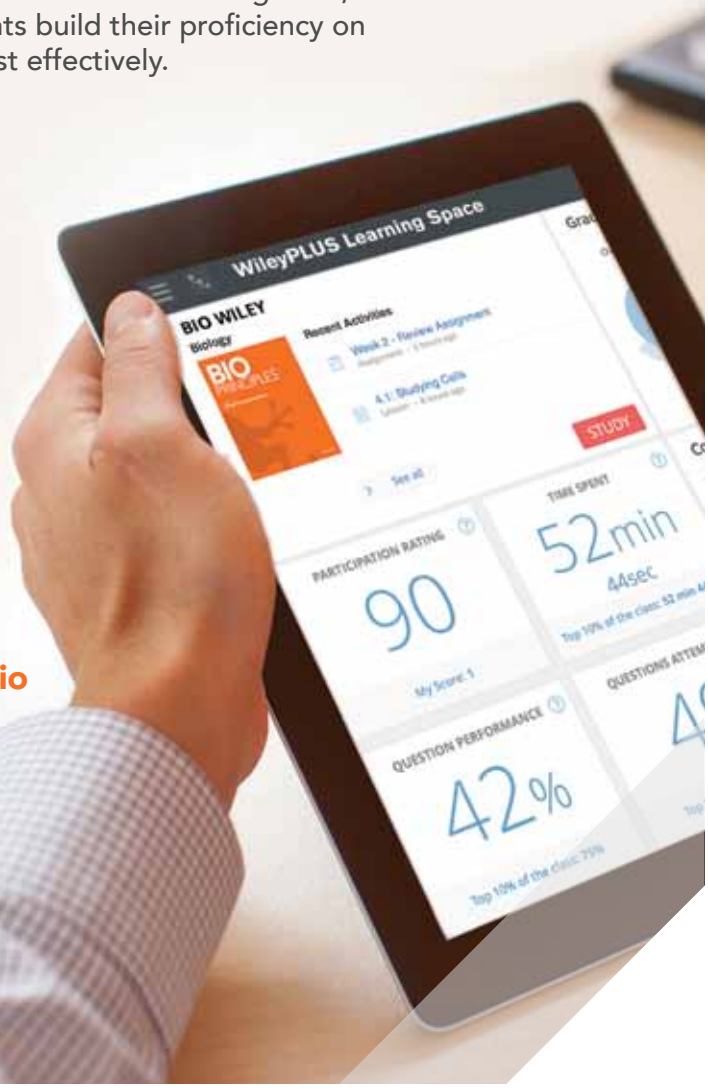

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2014 CLE

NABT PROFESSIONAL DEVELOPMENT CONFERENCE

Nov. 12–15, 2014 • Cleveland Convention Center

From the President

On behalf of the NABT Board of Directors, and Executive Director, we welcome you to NABT's 2014 Professional Development Conference in Cleveland, Ohio. We are excited to gather once again with you, our friends and colleagues, who make NABT the *Leader in Life Science Education*.

Conference planning goes on year-round. I extend a huge thank you to members of the Conference and Professional Development Committees. You give generously of your time so that we all have a great experience. The sponsors and exhibitors help to make our conference possible. Award sponsors are also key partners to help the NABT community recognize our peers for their contributions to biology education. Make sure to thank them when you visit the Exhibit Hall.

Beyond the conference, NABT relies upon volunteer committees to get the work done to maintain our professional society. Thank you to committee chairs for your leadership, and thank you to committee members for contributing your time and expertise.

NABT provides many leadership opportunities for professional growth. If you are interested in stepping up and helping out, you can find a list of committees on our website. Committee chairs are always recruiting, so look for them at conference and feel free to attend the meetings of committees you are interested in.

Personally, I am excited to meet people that I tell students about during my classes. I tell the story of Dr. Stanley Prusiner's work on prions in a case study to introduce the importance of protein structure to non-majors students. I use the book *The Immortal Life of Henrietta Lacks* for an Honors course. Bringing home stories and pictures from conference helps renew my enthusiasm (and our students enjoy seeing their teachers "geek" out).

I hope to meet you at a few key events during this year's conference. Bring your ideas and feedback to the annual **Town Hall Meeting** on Wednesday at 1:30 pm. Talk to the members of your Board of Directors, Jacki Reeves-Pepin, your Executive Director, and Bill McComas, the editor of *The American Biology Teacher*. All **first-time attendees** are welcome to the **First Timers' Breakfast,** where you can ask the NABT "mentors" all your questions about our conference and community. Don't miss ***HHMI's Night at the Movies*** on Friday at the Rock and Roll Hall of Fame.

Share your experiences on NABT's Facebook page and on Twitter using **#nabt2014.** We look forward to your pictures and videos, or posts letting people know about the cool thing you just learned about in a session.

My conference advice: make a flexible daily plan. With many great presentations it can be tough to choose. If you are here with a colleague, divide and conquer and compare notes at dinner. Use this opportunity to stretch yourself and think about your teaching in a new way. Meet new people that you will look forward to seeing next year in Providence, Rhode Island.

You can catch up on sleep when you fly home.

Stacey Kiser
NABT President 2014

welcome

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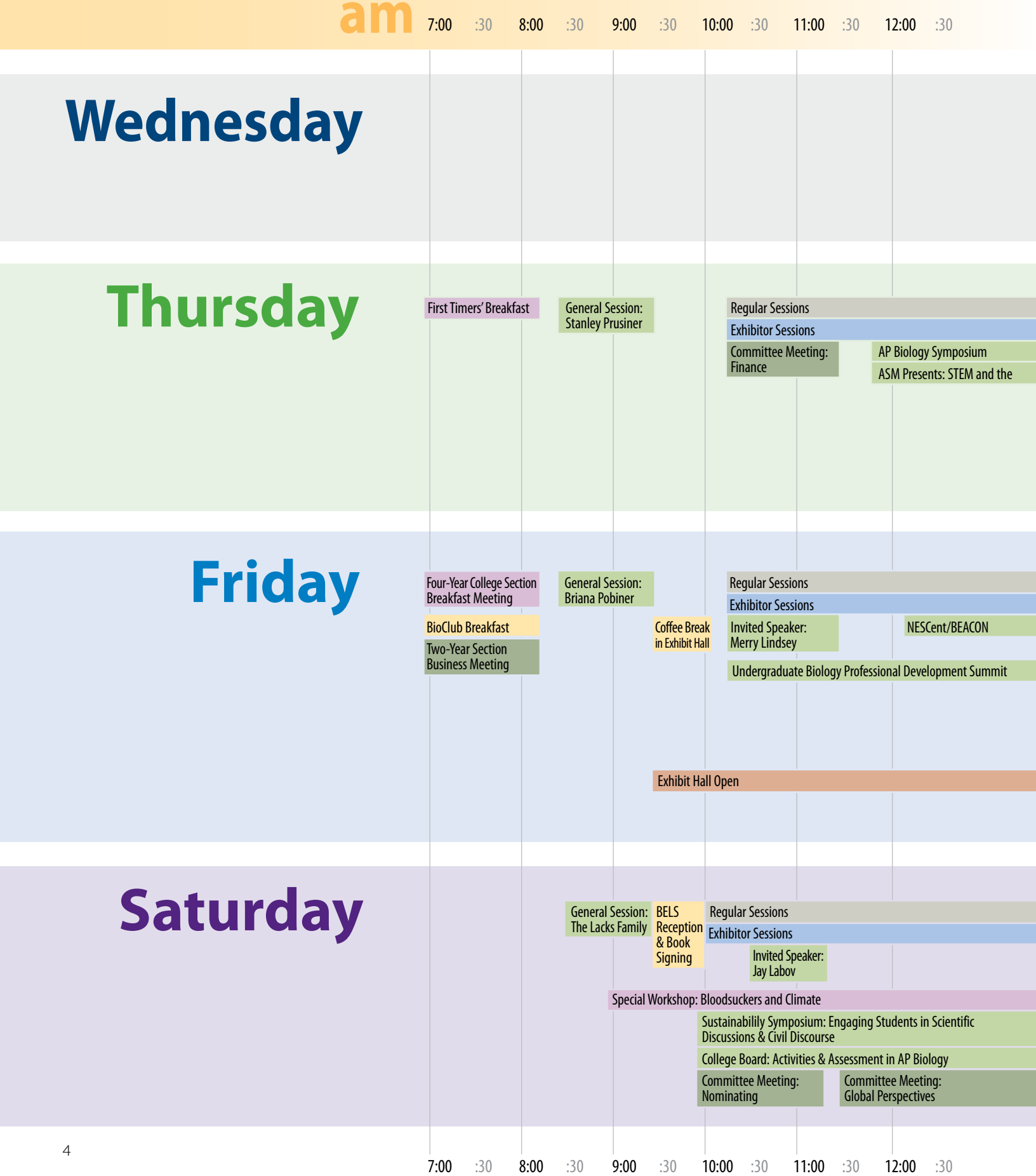
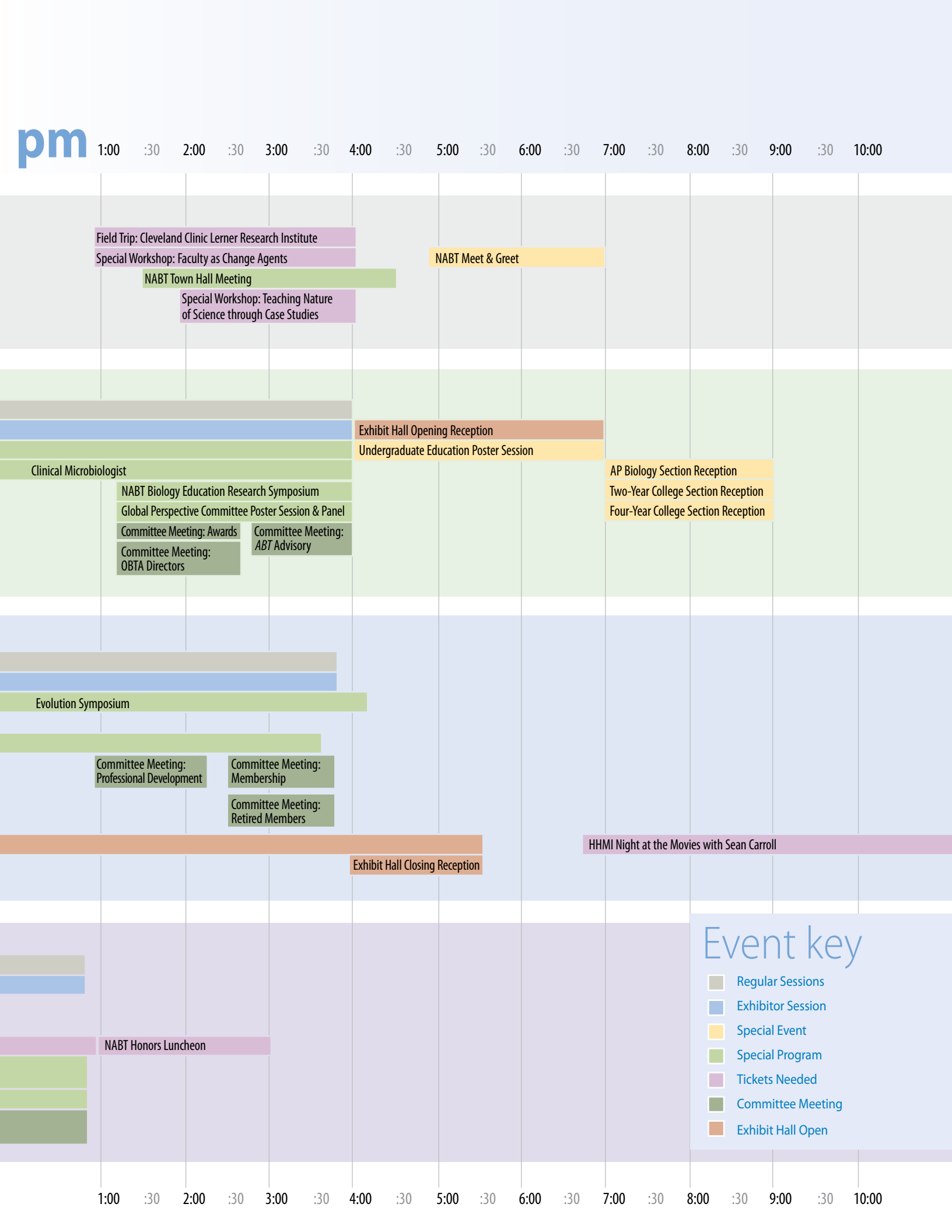
SCHEDULE AT A GLANCE

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Field Trip: Cleveland Clinic Lerner Research Institute
Special Workshop: Faculty as Change Agents
NABT Town Hall Meeting
Special Workshop: Teaching Nature of Science through Case Studies
NABT Meet & Greet
Exhibit Hall Opening Reception
Undergraduate Education Poster Session
Clinical Microbiologist
NABT Biology Education Research Symposium
Global Perspective Committee Poster Session & Panel
Committee Meeting: Awards
Committee Meeting: ABT Advisory
Committee Meeting: OBTA Directors
AP Biology Section Reception
Two-Year College Section Reception
Four-Year College Section Reception
Evolution Symposium
Committee Meeting: Professional Development
Committee Meeting: Membership
Committee Meeting: Retired Members
HHMI Night at the Movies with Sean Carroll
Exhibit Hall Closing Reception
NABT Honors Luncheon
Event key
Regular Sessions
Exhibitor Session
Special Event
Special Program
Tickets Needed
Committee Meeting
Exhibit Hall Open

General Conference Info

USE #nabt2014 to Tweet from Cleveland!

About NABT

The National Association of Biology Teachers (NABT) is the *leader in life science education.*™ Our association is the largest national organization dedicated exclusively to supporting biology and life science educators. Our members—representing all grade levels—teach more than one million students each year! Learn more by visiting www.NABT.org.

About the Professional Development Conference

All functions, meetings and exhibits will take place at the Cleveland Convention Center unless otherwise noted.

Session Survey

Help us ensure you see great sessions at the NABT Conference.
Use the QR code to link to the survey, or visit www.nabt.org/sessionsurvey

Visiting the Exhibit Hall

The NABT Exhibit Hall is your venue to interact with a variety of curriculum publishers, equipment manufacturers, software developers, non-profit partners, and other organization that have resources that can benefit you as a biology educator. Receptions, contests and wildlife experiences will also be featured in the Exhibit Hall. **Registration badges are required for admission to the Exhibit Hall.**

Exhibit Hall (Hall A) hours are:

Thursday, November 13	4:00pm - 7:00pm (Opening Reception)
Friday, November 14	9:30am – 5:30pm (Closing Reception starts at 4:00pm)

Transportation for Field Trip and HHMI Night at the Movies

The NABT Conference will feature two programs at locations other than the Cleveland Convention Center. Tickets are required to attend. Please visit the registration desk for more details.

Field Trip

Wednesday, November 12:

The shuttle for the field trip to the Cleveland Clinic Lerner Research Institute will depart the Cleveland Convention Center at 12:30pm. Please be in the lobby of the Convention Center by that time. The shuttles will depart the Lerner Research Institute at 4:00pm to return to the Convention Center.

HHMI Night at the Movies

Friday, November 14:

Shuttles will depart from both the Cleveland Marriott Downtown at Key Center and Westin Cleveland Convention Center starting at 6:45pm to allow people to arrive before the 7:30pm movie showing. Return shuttles will be departing the Rock & Roll Hall of Fame until 11:00pm to allow you plenty of time to enjoy the movie and the museum.

For Persons with Disabilities

Careful thought is given when planning the NABT Conference to make it accessible to all persons. Should you require special services, please go to the registration area to contact an NABT representative. We will strive to meet your needs.

Certificate of Attendance

See page 82.

Registration Hours

The NABT registration desk is located at the Cleveland Convention Center on the Concourse Level. It will be open during the following hours:

Wednesday, November 12
7:00am – 9:00am
Noon – 5:00pm

Thursday, November 13
First Timers' Registration:
6:30am - 7:00am
7:00am – 4:00pm

Friday, November 14
7:00am – 4:00pm

Saturday, November 15
7:00am – 10:00am

Future NABT Conference Dates & Sites

2015 Professional Development Conference
November 11-14, 2015
Rhode Island Convention Center
Providence, RI

2016 Professional Development Conference
November 3-6, 2016
Denver Sheraton - Downtown
Denver, CO

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National Association of Biology Teachers

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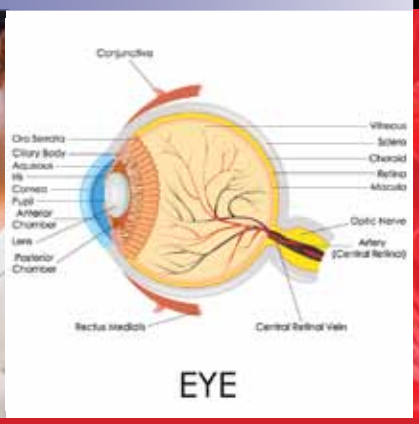
- The Reproductive System
- The Respiratory System
- The Skeletal System
- The Urinary System



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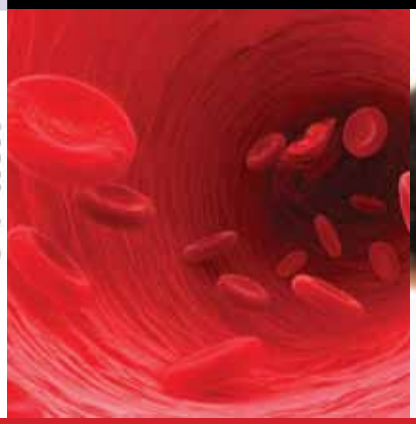

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general session speakers

THURSDAY, NOVEMBER 13

Photo © Russ Fischella

Stanley B. Prusiner, M.D.

Professor of Neurology and Director of the Institute for Neurodegenerative Diseases, University of California, San Francisco

Stanley B. Prusiner, M.D., is the author of *Madness and Memory: The Discovery of Prions—A New Biological Principle of Disease* (Yale University Press) and Director of the Institute for Neurodegenerative Diseases and Professor of Neurology at the University of California, San Francisco (UCSF). He received his undergraduate and medical school training at the University of Pennsylvania and his postgraduate clinical training at UCSF. He completed his military service as a lieutenant commander in the U.S. Public Health Service at the National Institutes of Health. Editor of 12 books and author of over 500 research articles, Dr. Prusiner's contributions to scientific research have been internationally recognized.

Dr. Prusiner is a member of the National Academy of Sciences, the Institute of Medicine, the American Academy of Arts and Sciences and the American Philosophical Society, and a foreign member of the Royal Society, London. He is the recipient of numerous prizes, including the Nobel Prize in Physiology or Medicine (1997) and the United States National Medal of Science (2009). Dr. Prusiner holds 50 issued or allowed United States patents, all of which are assigned to the University of California**.**

For session details, see page 25.

FRIDAY, NOVEMBER 14

Briana Pobiner, Ph.D.

Research Scientist and Museum Educator Human Origins Program, Department of Anthropology, National Museum of Natural History, Smithsonian Institution

Briana Pobiner has a B.A. in Evolutionary Studies from Bryn Mawr College (1997), where she created her own major, and an M.A. (2002) and Ph.D. (2007) in Anthropology from Rutgers University. Her research in Kenya, Tanzania, South Africa, and Indonesia centers on the evolution of human diet (with a focus on meat-eating), but has included topics as diverse as cannibalism in the Cook Islands and chimpanzee carnivory. Her favorite field moments include falling asleep in a tent in the Serengeti in Tanzania while listening to the distant whoops of hyenas, watching a pride of lions eat a zebra carcass on the Kenyan equator, and discovering fossil bones that were last touched, butchered and eaten by one of her 1.5 million year old ancestors. Since joining the Smithsonian in 2005, in addition to continuing her active fieldwork, museum collections studies, and experimental research programs, Dr. Pobiner leads the Human Origins Program's education and outreach efforts and manages the Human Origins Program's public programs, website content, social media, and exhibition volunteer training. She has been featured on NPR and Fox5 DC, and is an Associate Research Professor of Anthropology at the George Washington University. She is also currently leading an NSF-funded project to develop materials for AP Biology classes that use human examples to teach evolution, as well as materials to help teachers feel more comfortable and confident in teaching evolution.

For session details, see page 47.

SATURDAY, NOVEMBER 15

Shirley Lacks **Victoria Baptiste**

Official Representatives of the Lacks Family, recipients of the 2014 NABT Distinguished Service Award

For session details, see page 61.

Shirley Lacks is Henrietta Lacks' daughter-in-law and was friends with Deborah Lakes in high school. After retiring from the banking industry, Shirley dedicates a good portion of her time traveling around the country, keeping Henrietta's legacy alive. Shirley has two children and two grandchildren.

Victoria Baptiste is the great-granddaughter of Henrietta and travels regularly to share the Lacks Family's story. Inspired by Henrietta's life, she is a Medical Assistant at Sinai Hospital's Center for Urology Specialties and attends Chamberlain College of Nursing in Arlington, Virginia.

BELS PROGRAM

The presentation by the Lacks Family is a complimentary BELS event and will be followed by a book signing and coffee reception sponsored by

PASCO

HENRIETTA LACKS

invited speakers

FRIDAY, NOVEMBER 14

Merry L. Lindsey, Ph.D.

Director, Mississippi Center for Heart Research, Director, San Antonio Cardiovascular Proteomics Center
The University of Mississippi Medical Center
Jackson, Mississippi

Merry L. Lindsey, Ph.D. is the Director of the Mississippi Center for Heart Research. The Center is dedicated to performing cardiovascular research that involves developing multidimensional approaches to examine the mechanisms whereby the left ventricle responds to injury; applying the knowledge gained to develop therapeutic strategies to prevent, slow, or reverse the progression to heart failure; and disseminating their results to the general, scientific, and medical communities.

Dr. Lindsey's research has led to more than 120 publications, and she has received grant support from the American Heart Association (AHA), the Voelcker Foundation, Novartis, the Veterans Administration, and the National Institutes of Health. Dr. Lindsey serves on the editorial boards for the American Journal of Physiology-Heart and Circulatory Physiology, the Journal of Molecular and Cellular Cardiology, Circulation Research, and the Journal of Cardiac Failure. She has reviewed grants for the AHA, the Myocardial Ischemia and Metabolism (MIM) study section for NIH, and numerous international funding agencies.

For session details, see page 47.

Sponsored by aps American Physiological Society

SATURDAY, NOVEMBER 15

Jay B. Labov, Ph.D.

Senior Advisor for Education and Communication for the National Research Council and National Academy of Sciences

Jay B. Labov is Senior Advisor for Education and Communication for the National Research Council (NRC) and National Academy of Sciences (NAS). He has directed or contributed to 24 National Academies reports focusing on undergraduate education, teacher education, advanced study for high school students, K-8 education, and international education. He has served as Director of committees on K-12 and undergraduate science education, the National Academies' Teacher Advisory Council, and was Deputy Director for the Academy's Center for Education. He directed a committee of the NAS and the Institute of Medicine that authored *Science, Evolution, and Creationism* and oversees the NAS's efforts to confront challenges to teaching evolution in the nation's public schools. He oversees efforts at the Academy to work with professional societies and with state academies of science on education issues. He also oversees work on improving education in the life sciences under the aegis of the NRC's Board on Life Sciences.

Dr. Labov is a Kellogg National Fellow, a Fellow in Education of the American Association for the Advancement of Science, a Woodrow Wilson Visiting Fellow, and a 2013 recipient of the "Friend of Darwin" award from the National Center for Science Education. In 2013 he was elected to serve as chair-elect, chair and past chair of the Education Section of the American Association for the Advancement of Science. He received a B.S. in Biology from the University of Miami, and a M.S. in Zoology and Ph.D. in Biological Sciences from the University of Rhode Island.

Jay Labov has been named the 2014 NABT Honorary Member, the highest honor bestowed by the National Association of Biology Teachers.

For session details, see page 63.

NABT Leadership

NABT COMMITTEES

ABT Journal Advisory Committee Chair ..... William McComas

Awards Committee Chair ..... Priya DasSarma

Constitution & Bylaws Committee Chair ..... Ann Lumsden

Finance Committee Chair ..... George Sellers

Global Perspectives Committee Chair ..... Jacqueline McLaughlin

Archival Committee Co-chairs ..... Carrie Boyce & Sue Tramell

Honorary Membership Committee Chair ..... Jane Ellis

Long Range Planning Committee Chair ..... Todd Carter

Membership Committee Co-chairs ..... Sherry Annee & Sue Trammell

Nominating Committee Chair ..... Betsy Ott

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Professional Development Committee Chair ..... Catherine Ambos

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Region V ..... Bobbie Hinson

Region VI ..... Shelia Smith

Region VII ..... Bethany Lorenz

Region VIII ..... Marilyn Schmidt

Region IX ..... Bethany Dixon

Region X ..... Vacant

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AP Biology Section ..... Sharon Radford

NABT BioClub ..... Andrew Corless

Four-Year College & University Section ..... Kim Salder

Two-Year College Biology Section ..... Beverly Ranney

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NABT Awards Program

The National Association of Biology Teachers, with the support of our generous sponsors, is proud to offer a variety of awards that recognize both teachers and students. We congratulate the 2014 NABT Award Winners, and are honored to recognize their achievements.

BioClub Student Awards

Muriel Easton
Center for Advanced Professional Studies, Overland Park, KS

Brooke Rowlett
Vincennes University, Vincennes, IN

Outstanding student members of a NABT BioClub are eligible for this textbook scholarship. One student from each BioClub high school chapter and one student from each community college chapter can be nominated. The student must be a graduating senior who has been accepted to a two or four year college/university.

Sponsored by Carolina Biological Supply Company

Biology Educator Leadership Scholarship (BELS)

Kelly Boehmer
Randolph Middle School, Randolph, NJ

The Biology Educator Leadership Scholarship (BELS) program was established to encourage and support teachers who are furthering their education in the life sciences or science education. The award recipient is required to be a practicing educator who is also enrolled (or anticipates enrolling) in a graduate program at a Masters or Doctoral level.

Sponsored by NABT Member Donations and PASCO scientific

Distinguished Service Award

The descendants of Henrietta Lacks
Baltimore, MD

Established in 1988 to commemorate the 50th anniversary of the NABT, the Distinguished Service Award is presented to a nationally recognized individual who has made major contributions to biology education through his or her research, writing, and teaching.

Sponsored by the National Association of Biology Teachers

Ecology/Environmental Science Teaching Award

Ella Bowling
Mason County Middle School, Maysville, KY

This award recognizes a middle or high school teacher who has successfully developed and demonstrated an innovative approach in the teaching of ecology/environmental science and has carried his/her commitment to the environment into the community.

Sponsored by Vernier Software and Technology

Evolution Education Award

David Upegui
Central Falls High School, Central Falls, RI

This award recognizes innovative classroom teachers and their larger community education efforts to promote the accurate understanding of biological evolution.

Sponsored by BEACON, BSCS, and NESCent

Four-Year College & University Section Biology Teaching Award

Janice Handleman
Erskine College, Due West, SC

This award recognizes creativity and innovation in undergraduate biology teaching. This includes curriculum design, teaching strategies, and laboratory utilization that have been implemented and demonstrated to be effective.

Sponsored by NABT's Four-Year College & University Section

Four-Year College & University Section Research in Biology Education Award

Ellen Goldey
Wofford College, Spartenburg, SC

Recognizing innovation in research that furthers our understanding of undergraduate biology teaching, this award is given to an individual who displays creativity in scholarship and research in biology education.

Sponsored by NABT's Four-Year College & University Section

Genetics Education Award

Robert Gotwals
North Carolina School of Science & Mathematics, Durham, NC

This award recognizes innovative, student-centered classroom instruction that promotes the understanding of genetics and its impact on inheritance, health, and biological research.

Sponsored by ASHG and GSA

Honorary Membership

Jay Labov
National Academies of Science & National Research Council, Washington, D.C.

The highest honor from the association, this award recognizes those individuals who have achieved distinction in teaching, research, or service in the biological sciences and designates them lifetime members of NABT.

Sponsored by the National Association of Biology Teachers

The Kim Foglia AP® Biology Service Award

Cindy Gay
Steamboat Springs High School, Steamboat Springs, CO

The Kim Foglia AP® Biology Service Award was established to recognize an AP® Biology teacher who displays a willingness to share materials, serves as a mentor to both students and professional colleagues, creates an innovative and student centered classroom environment, and exemplifies a personal philosophy that encourages professional growth as an AP® Biology teacher and member of that community.

Sponsored by Pearson and the Neil A. Campbell Educational Trust

Outstanding Biology Teacher Award (OBTA)

See the full OBTA listing for 2014 honorees.

Every year, the Outstanding Biology Teacher Award (OBTA) program attempts to recognize an outstanding biology educator (grades 7-12) in each of the 50 states; Washington, DC; Canada; Puerto Rico; and overseas territories. Honorees are judged on their teaching ability and experience, cooperativeness in the school and community, creativity, inventiveness, initiative, and student-teacher relationships.

Sponsored by Carolina Biological Supply Company

Outstanding New Biology Teacher Achievement Award

Helen Snodgrass
North Forest YES Prep, Houston, TX

This award recognizes outstanding teaching (grades 7-12) by a "new" biology/life science instructor within his/her first three years of teaching biology who has developed an original and outstanding program or technique, while also making a contribution to the profession at the start of his/her career.

Sponsored by Pearson and the Neil A. Campbell Educational Trust, and Ken-A-Vision

Prof. Chan Two-Year College Award for the Engaged Teaching of Biology

Rebecca Abler
University of Wisconsin - Manitowoc, Manitowoc, WI

This award is given to a two-year college faculty member who has successfully developed and demonstrated an innovative, hands-on approach in the teaching of biology and has carried his/her commitment into the community.

Sponsored by Sarah McBride and John Melville

The Ron Mardigian Biotechnology Teaching Award

Megan Faliero
Durant High School, Plant City, FL

This award is given to a secondary school teacher or undergraduate college biology instructor who demonstrates outstanding and creative teaching of biotechnology by incorporating active laboratory work in the classroom.

Sponsored by Bio-Rad Laboratories

Two-Year College Biology Teaching Award

Tara Jo Holmberg
Northwestern Connecticut Community College, Winchester, CT

This award recognizes a two-year college biology educator who employs new and creative techniques in his/her classroom teaching. The recipient shows skill in teaching and scholarship demonstrated through publications or innovative techniques relating to teaching strategies, curriculum design, or laboratory utilization.

Sponsored by NABT's Two-Year College Section and Swift Optical

FOR OVER 50 YEARS

the National Association of Biology Teachers has been committed to recognizing **outstanding** biology teachers.

OUTSTANDING OBTA

OBTA Honorees 2014

Region I

Holly Buckley
East Lyme High School
East Lyme, CT

Amanda Tsoi
Somerville High School
Somerville, MA

Region II

Karen Lucci
Hopewell Valley Central High School
Pennington, NJ

Lori Kenny
Huntington High School
Huntington, NY

Richard Strauss
St. Patrick Catholic School
Norfolk, VA

Region III

Jennifer Pfannerstill
North Shore Country Day School
Winnetka, IL

Kim Terry
South Vermillion High School
Clinton, IN

JoAnn Miller
Oconto Falls High School
Oconto Falls, WI

Region IV

Jeremy Allar
Ottumwa High School
Ottumwa, IA

Michael Ralph
Olathe East High School
Olathe, KS

Kristin Wheaton
Sturgis Brown High School
Sturgis, SD

Eric Boles
Dexter High School
Dexter, MO

Region V

Lenny Beck
Boone County High School
Florence, KY

Rebecca Smith
Orange High School
Chapel Hill, NC

Chanda Jefferson
C.A. Johnson High School
Columbia, SC

Melinda Carpenter
Nicholas County High School
Summersville, WV

Region VI

Leah McRae
James Clemens High School
Madison, AL

Leslie Taylor
Leading Teacher
Fort Pierce, FL

Will Dyson, III
Velma Jackson High School
Ridgeland, MS

Laura Decker
Mandeville High School
Mandeville, LA

Region VII

Pam Dooling
Jones High School
Jones, OK

Judy Hunt
Westwood High School
Austin, TX

Leonard Zechiedrich
Rogers High School
Rogers, AR

Region VIII

Tamara Pennington
Windsor High School
Windsor, CO

Acacia McCombs
New Mexico School for the Arts
Santa Fe, NM

Karlene McCurry
Las Vegas Academy of the Arts
Las Vegas, NV

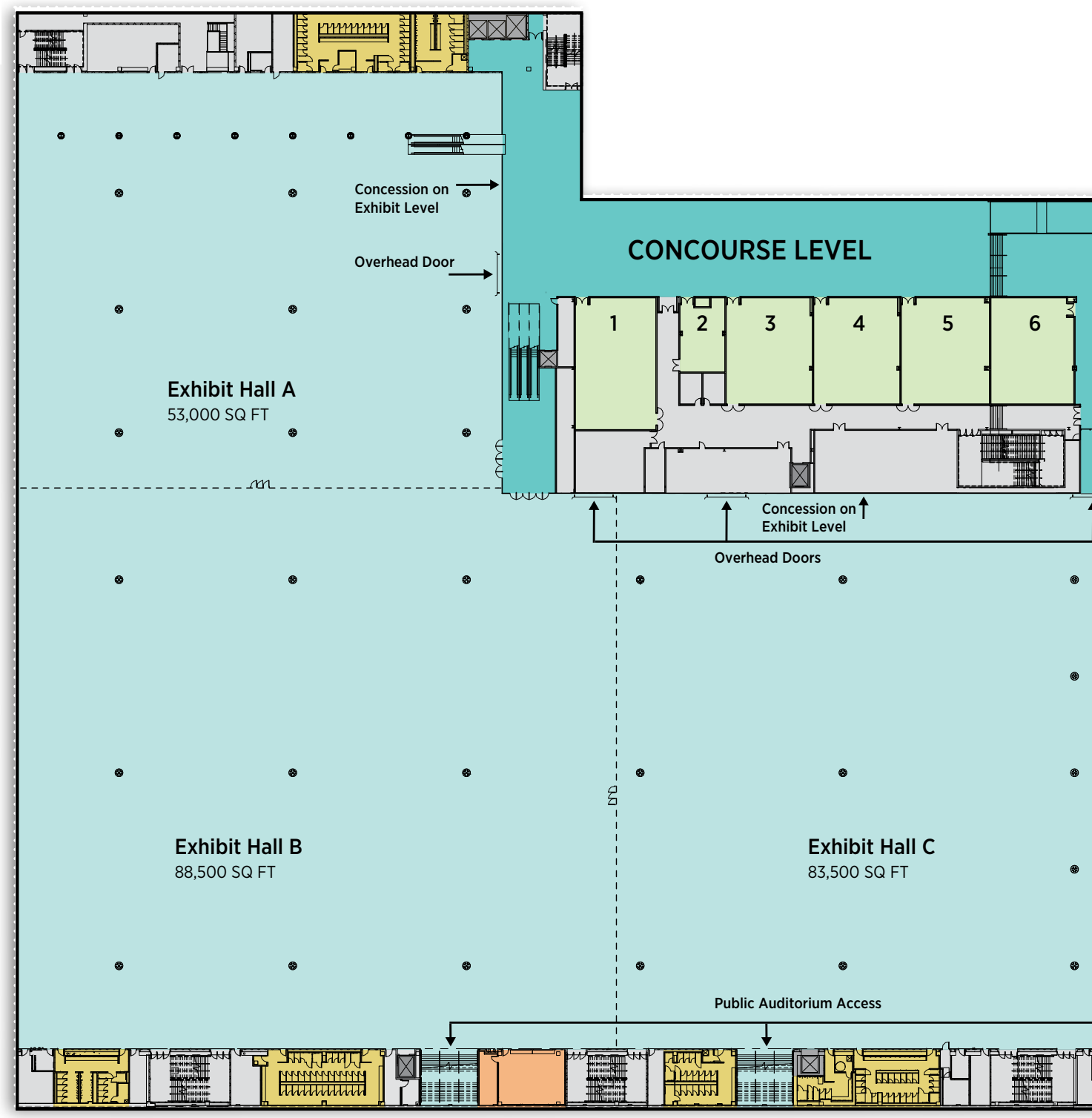
The Outstanding Biology Teacher Award is proudly sponsored by

CAROLINA
www.carolina.com

NABT would like to thank our OBTA Directors. Their service has helped NABT present this award to over two thousand outstanding teachers.

NABT
National Association of Biology Teachers

Cleveland Convention Center



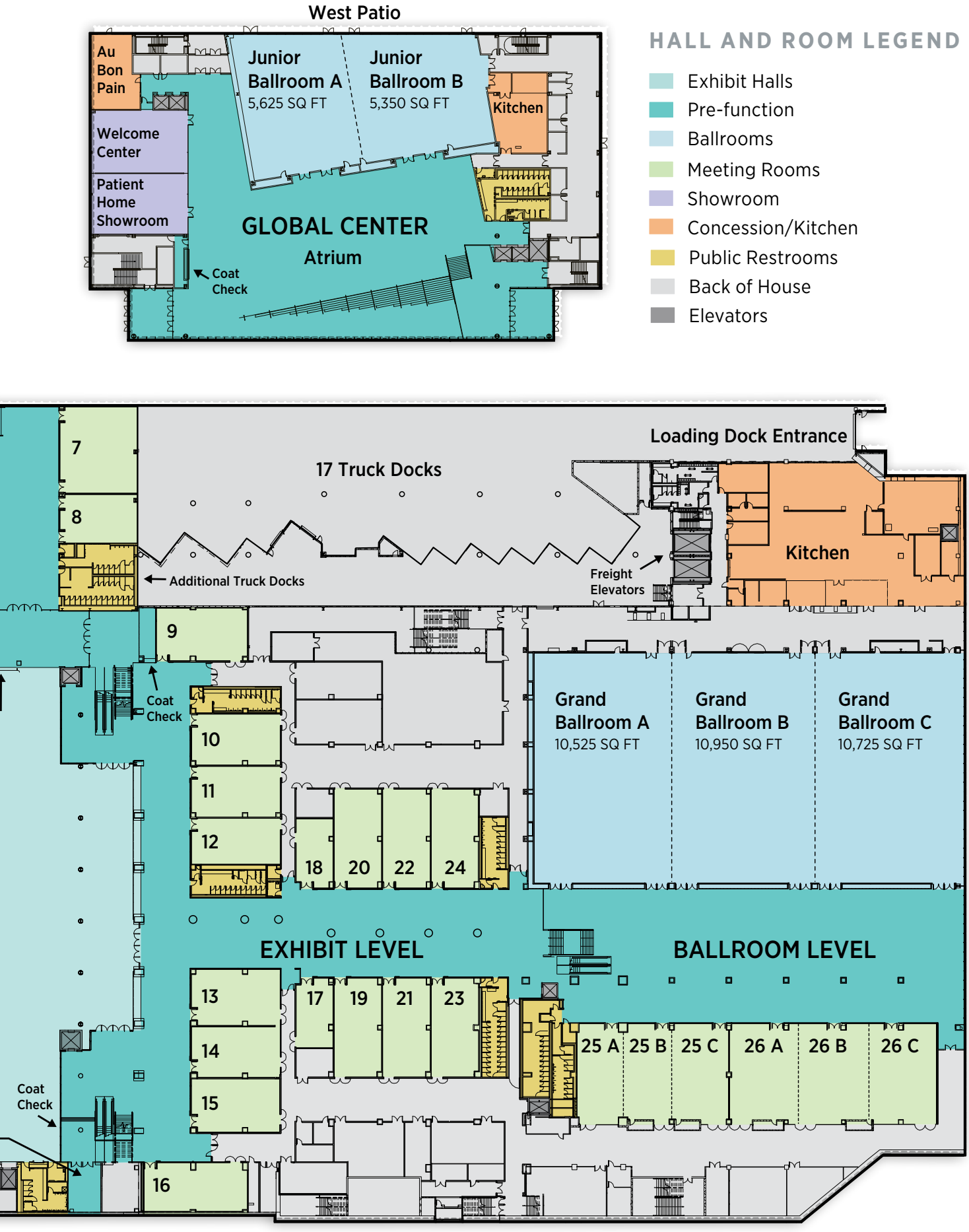

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Exhibit Halls
Pre-function
Ballrooms
Meeting Rooms
Showroom
Concession/Kitchen
Public Restrooms
Back of House
Elevators
7
8
17 Truck Docks
Loading Dock Entrance
Additional Truck Docks
Freight Elevators
Kitchen
9
Coat Check
Grand Ballroom A
10,525 SQ FT
Grand Ballroom B
10,950 SQ FT
Grand Ballroom C
10,725 SQ FT
10
11
12
18
20
22
24
EXHIBIT LEVEL
BALLROOM LEVEL
13
17
19
21
23
25 A
25 B
25 C
26 A
26 B
26 C
14
15
Coat Check
16

special events

special workshops

All prices listed are per person

Wednesday, November 12

Faculty as Change Agents: Facilitating Departmental Transformation toward Vision and Change

Presenters: Taylor Allen, Oberlin College, Oberlin, OH, William Davis, Washington State University, Pullman, WA, Sharon Gusky, Northwestern Connecticut Community College, Winchester, CT, and Karen Klyczek, University of Wisconsin-River Falls, River Falls, WI

1:00pm–4:00pm • Instructional Strategies and Technologies
2Y, 4Y, GA • Free

Participants will engage with the resources being developed by the *Partnership for Undergraduate Life Science Education (PULSE)* for implementing Vision and Change recommendations at the department/institutional level. You will learn leadership skills that will enable you to facilitate meaningful transformation in your department and institution. Using PULSE rubrics, you will gauge your department's progress toward Vision and Change and consider strategies for enhancing your programs by integrating evidence-based instructional practices.

Teaching Nature of Science through Case Studies

Presenter: Douglas Allchin, SHiPS Education Press, St. Paul, MN

$ 2:00pm–4:00pm • Instructional Strategies and Technologies
HS, 2Y, 4Y • $70

Experience a sample class that develops nature of science skills through an inquiry-styled case study—deciphering the cause of beriberi in Java in the 1890s. Discussion on practical skills and teaching strategy follows. Resource CD with over a dozen case studies will be included.

Saturday, November 15

Bloodsuckers and Climate: Insect-Borne Disease Investigations at the Yale Peabody Museum of Natural History

Presenter: Beth Biegler Hines, Yale Peabody Museum of Natural History, New Haven, CT

9:00am–1:00pm • Environment/Ecology • MS, HS, GA • Free

Investigate insect-borne infectious diseases (dengue, malaria, chikungunya , leishmaniasis) and expanding ranges due to climate changes (temperature, precipitation). Explore interdependent relationships in ecosystems. Grades 7-12. NIH/SEPA funded.

meal functions

Friday, November 14

Four-Year Section Breakfast Meeting

$ 7:00am–8:15am
$20

You are invited to join members of NABT's Four-Year College and University Section for their annual breakfast and business meeting. This event will also include a special presentation of the *Four-Year College & University Biology Research in Teaching Award* and *Biology Teaching Award.* The winners of the *Student Research Award* and *Student Travel Awards* will also be recognized.

Saturday, November 15

NABT Honors Luncheon

$ 1:00pm–3:00pm
$60

The grand finale of the NABT Conference, this popular celebration honors excellent biology teachers. Join us as we recognize the accomplishments and professional contributions of the 2014 NABT Award recipients, including this year's Outstanding Biology Teacher Award (OBTA) honorees. Everyone is welcome to attend!

field trip

Wednesday, November 12

Tour of the Lerner Research Institute

$ 12:30pm–4:00pm • The Cleveland Clinic (Transportation will be provided) • $25

You are invited to take a special tour of the Cleveland Clinic Lerner Research Institute (LRI). The LRI is home to all laboratory-based, translational and clinical research at the Cleveland Clinic. With a mission to understand the underlying causes of human diseases and to develop new treatments and cures, the institute focuses on disease-oriented research. This multidisciplinary approach combines expertise from various departments and throughout Cleveland Clinic. During this tour, you will visit three labs focused on genomic medicine, biomedical engineering and stem cell biology.

Building image © Donal Luse, Ph.D.

Cleveland Clinic
Lerner Research Institute

HHMI Night at the Movies

Friday, November 14th

Special Event: HHMI Night at the Movies with Sean Carroll

Presented by hhmi BioInteractive

6:45pm–11:00pm • Rock & Roll Hall of Fame (Transportation will be provided) • Current full- and part-time educators and student members of NABT • Free

Tickets are required and space is limited!

Join us for the 4th Annual *HHMI Night at the Movies with Sean Carroll.* This year's event will feature a special guest, University of Chicago paleontologist and award-winning author of *Your Inner Fish,* Dr. Neil Shubin. He will join Dr. Carroll for a screening of the film *Great Transitions: The Origin of Tetrapods*, providing a first-hand account of the painstaking search for *Tiktaalik,* a fossil creature with a mix of features common to fish and four-legged animals. The film will be followed by Q&A with Drs. Carroll and Shubin.

There will be two showings of the film, free food and drink, and full admission to the Rock Hall's museum—with plenty of time to tour the venue.

NOTE: **Due to limited seating in the theater, the film screening is only open to current full- and part-time educators and student members of NABT.** Non-teaching guests may purchase a special ticket ($25), which includes transportation, museum admission, and refreshments. Non-teaching guests will not be admitted to the film screening.

HONORARY MEMBERS

2014—Jay Labov
2013—Todd Carter
2012—Maura Flannery
2011—Louisa Stark
2010—Patricia Waller and Brad Williamson
2008—Donald Cronkite
2007—William H. Leonard
2006—Terry Hufford
2005—Randy Moore & Eugenie Scott
2004—John Penick
2003—Donald Emmeluth
2002—Leonard Blessing
2001—Gordon E. Uno
2000—Elizabeth Carvellas
1998—Ivo Lindauer
1997—Sam Rhine
1996—Kenneth S. House
1995—Joseph D. Novak
1994—Nancy V. Ridenour & Alton L. Biggs
1993—George S. Zahrobsky
1992—Jon R. Hendrix
1991—Robert E. Yager
1990—Jane Butler Kahle
1989—Joseph D. McInerney
1988—Thomas Mertens & Marjorie King
1987—Floyd Nordland
1986—Donald S. Dean
1985—Stanley Weinberg
1984—Jack Carter & Samuel Postlethwait
1983—Manert Kennedy
1982—Harold "Sandy" Wiper & Jerry P. Lightner
1981—Sophie Wolfe
1980—Sister M. Gabrielle, Ted F. Andrews & Sister Marian Catherine McGrann
1979—Ingrith Olsen
1978—John A. Moore
1977—Addison E. Lee
1976—Paul DeHart Hurd
1975—Garrett Hardin & Stanley E. Williamson
1974—H. Seymour Fowler
1973—William V. Mayer
1972—Chester A. Lawson, Paul E. Klinge & Robert L. Gantert
1969—Arnold B. Grobman
1965—John Breukelman, H. Bentley Glass, George W. Beadle, Paul B. Sears & Brother H. Charles Severin
1964—E. Laurence Palmer, Hermann J. Muller, Roger Tory Peterson, Oscar Riddle & Helen Irene Battle

DISTINGUISHED SERVICE AWARD RECIPIENTS

2014 The Lacks Family (descendents of Henrietta Lacks), Baltimore, MD

2013 Rita R. Colwell, University of Maryland College Park and Johns Hopkins University Bloomberg School of Public Health, College Park, MD

2012 Michael Pollan, UC Berkeley Graduate School of Journalism, Berkeley, CA

2011 Neil Shubin, Ph.D., University of Chicago, Chicago, IL

2010 Richard Dawkins, The Richard Dawkins Foundation for Reason and Science, Falcon, CO

2009 Mario Capecchi, University of Utah, Salt Lake City, UT

2008 Ken Miller, Brown University, Providence, RI

2007 Sean Carroll, University of Wisconsin — Madison, Madison, WI

2006 Shirley Malcom, AAAS, Washington DC

2005 James A. Thompson, V.M.D., University of Wisconsin–Madison, Madison, WI; and Nina Leopold Bradley, Aldo Leopold Foundation, Baraboo, WI

2004 Barbara Bancroft, RN, MSN, PNP, CPP Associates, Inc., Chicago, IL

2003 Roberta Pagon, M.D., Children's Hospital & Regional Medical Center, Seattle, WA

2002 Thomas E. Lovejoy, The H. John Heinz III Center for Science, Economics and the Environment, Washington, DC

2001 E.O. Wilson, Harvard University, Cambridge, MA

2000 Roger and Deborah Fouts, Chimpanzee and Human Communication Institute, Ellensburg, WA

1999 Jack Horner, Museum of the Rockies, Bozeman, MT

1998 Dr. Leroy Hood, University of Washington, Seattle, WA

1997 Neal Lane, Director, National Science Foundation, Washington, DC; and Donald Kennedy, Stanford University, Palo Alto, CA

1996 Dr. Francis Collins, National Institutes of Health, Bethesda, MD

1995 Carl Djerassi, Stanford University, Palo Alto, CA

1994 Bruce Alberts, National Academy of Sciences, Washington, DC

1993 Nancy S. Wexler, College of Physicians and Surgeons of Columbia University, New York State Psychiatric Institute, New York, NY

1992 Paul R. Ehrlich, Stanford University, Palo Alto, CA

1991 Stephen Jay Gould, Harvard University, Cambridge, MA

1990 Peter Raven, Missouri Botanical Garden, St. Louis, MO

1989 Stanley Cohen, Stanford University, Palo Alto, CA

1988 Lynn Margulis, University of Massachusetts, Boston, MA; and James D. Watson, Cold Spring Laboratory, Cold Spring Harbor, NY

PAST PRESIDENTS

2013—Mark Little
2012—Donald P. French
2011—Daniel Ward
2010—Marion "Bunny" Jaskot
2009—John H. Moore
2008—Todd Carter
2007—Patricia Waller
2006—Toby Horn
2005—Rebecca E. Ross
2004—Betsy Ott
2003—Catherine Ueckert
2002—Brad Williamson
2001—Ann S. Lumsden
2000—Phil McCrea
1999—Richard D. Storey
1998—ViviannLee Ward
1997—Alan McCormack
1996—Elizabeth Carvellas
1995—Gordon E. Uno
1994—Barbara Schulz
1993—Ivo E. Lindauer
1992—Alton L. Biggs
1991—Joseph D. McInerney
1990—Nancy V. Ridenour
1989—John Penick
1988—Jane Abbott
1987—Donald S. Emmeluth
1986—George S. Zahrobsky
1985—Thomas R. Mertens
1984—Marjorie King
1983—Jane Butler Kahle
1982—Jerry Resnick
1981—Edward J. Kormondy
1980—Stanley D. Roth
1979—Manert Kennedy
1978—Glen E. Peterson
1977—Jack L. Carter
1976—Haven Kolb
1975—Thomas J. Cleaver
1974—Barbara K. Hopper
1973—Addison E. Lee
1972—Claude A. Welch
1971—H. Bentley Glass
1970—Robert E. Yager
1969—Burton E. Voss
1968—Jack Fishleder
1967—William V. Mayer
1966—Arnold B. Grobman
1965—L.S. McClung
1964—Ted F. Andrews
1963—Philip R. Fordyce
1962—Muriel Beuschlein
1961—Paul V. Webster
1960—Howard E. Weaver
1959—Paul Klinge
1958—Irene Hollenbeck
1957—John Breukelman
1956—John P. Harrold
1955—Brother H. Charles Severin
1954—Arthur J. Baker
1953—Leo F. Hadsall
1952—Harvey E. Stork
1951—Richard L. Weaver
1950—Betty L. Wheeler
1949—Ruth A. Dodge
1948—Howard A. Michaud
1947—E. Laurence Palmer
1946—Prevo L. Whitaker
1945—Helen Trowbridge
1944—Merle A. Russell
1943—Merle A. Russell
1942—Homer A. Stephens
1941—George W. Jeffers
1940—Malcolm D. Campbell
1939—Myrl C. Lichtenwalter

PROVIDENCE • 2015

NABT PROFESSIONAL DEVELOPMENT CONFERENCE

NOVEMBER 11–14, 2015

NABT
National Association of Biology Teachers

Rhode Island Convention Center
Providence, RI

Make the **Migration**
to a whole new lab environment.

PASCO - Hands-On Sessions

Check NABT program for dates, times, and locations

- Lend Some Color to Your Spectrometry Labs
- Get Pumped Up with Human Physiology Using PASCO Probeware
- Turn Your iPad Into a Mobile Science Lab
- Oceans of Fun: Water Quality and PASCO Probeware
- Liven Up Your Lab: Sensors for Inquiry in AP®Biology

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See What's New - Booth #609

Lend Some Color for $399

Wireless Spectrometer. Comes with a FREE app and equipped with Bluetooth™ for wireless connectivity.

Wireless Spectrometer

Breath Easy at just $299.

Optical Dissolved Oxygen. Our newest probe is even easier to use.

Optical Dissolved Oxygen Probe

BELS PROGRAM

PASCO is a proud sponsor of the Biology Educator Leadership Scholarship

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WEDNESDAY

November 12

#NABT2014

8:00am – Noon

Board Meeting
Global Center for Health Innovation

8:30am – 4:30pm

University of Rochester Life Science Learning Center Workshop
Room 23 • Special Program • Invitation Only

NABT/BSCS AP Biology Leadership Academy Cohort II Workshop
Room 25B • Special Program • Invitation Only

NABT/BSCS AP Biology Leadership Academy Cohort III Workshop
Room 25C • Special Program • Invitation Only

12:30pm – 4:00pm

Field Trip: *Tour of the Cleveland Clinic Lerner Research Institute*
$ Cleveland Convention Center Lobby • Tickets Required

Take a special tour of the Cleveland Clinic Lerner Research Institute (LRI), home to all laboratory-based, translational and clinical research at Cleveland Clinic. With a mission to understand the underlying causes of human diseases and to develop new treatments and cures, the Institute focuses on disease-oriented research. During this tour, you will visit three labs focused on genomic medicine, biomedical engineering and stem cell biology.

See page 17 for full details.

*Shuttles will depart the lobby of the Cleveland Convention Center at **12:30pm.***

*Return shuttles will depart the Lerner Research Institute at **4:00pm.***

Special Workshop: *Faculty as Change Agents: Facilitating Departmental Transformation toward Vision and Change*
T Room 21 • Instructional Strategies/Technologies • 2Y 4Y GA • Tickets Required

Participants will engage with the resources being developed by the Partnership for Undergraduate Life Science Education (PULSE) for implementing Vision and Change recommendations at the department/institutional level. You will learn leadership skills that will enable you to facilitate meaningful transformation in your department and institution. Using PULSE rubrics, you will gauge your department's progress toward Vision and Change and consider strategies for enhancing your programs by integrating evidence-based instructional practices.

Taylor Allen, Oberlin College, Oberlin, OH; William Davis, Washington State University, Pullman, WA; Sharon Gusky, Northwestern Connecticut Community College, Winchester, CT; and Karen Klyczek, University of Wisconsin-River Falls, River Falls, WI

Committee Meeting: Two-Year College Section
Room 17 • Invitation Only

Committee Meeting: Four-Year College & University Section
Room 18 • Invitation Only

1:30pm – 4:30pm

NABT Town Hall Meeting
Room 3 • Special Program • GA

NABT is an association of teachers, for teachers, by teachers. Members and non-members alike are encouraged to let us know how we are doing at the Town Hall Meeting. Engage with volunteer leaders and fellow conference attendees in a format that will review "the State of the Association," provide updates on initiatives, and give you a sneak peek at new programs. Bring your best ideas and be ready to brainstorm.

2:00pm – 4:00pm

Special Workshop: #633 Teaching Nature of Science through Case Studies
$ Room 24 • Instructional Strategies/Technologies • HS 2Y 4Y • Tickets Required

Experience a sample class that develops nature of science skills through an inquiry-styled case study--deciphering the cause of beriberi in Java in the 1890s. Discussion on practical skills and teaching strategy follows. Resource CD with over a dozen case studies will be included.

Douglas Allchin, SHiPS Education Press, St. Paul, MN

4:30pm – 5:30pm

NABT/BSCS AP Biology Leadership Academy Reception
Room 25A • Special Program • Invitation Only

Sponsored by CAROLINA® www.carolina.com

5:00pm – 7:00pm

NABT Meet & Greet
Global Center for Health Innovation Atrium • Special Event

The Global Center for Health Innovation welcomes you to Cleveland with a special reception and tour of this one-of-a-kind facility. The Global Center showcases the latest in healthcare through state-of-the-art spaces and programs that highlight innovations in technology, biomedical equipment and delivery of care through cutting edge industry breakthroughs. With four floors highlighting different themes, each suite offers an interactive and informative experience that will be augmented by a fun activity just for NABT Meet & Greet attendees.

abbrev. key

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

WEDNESDAY
November 12

THURSDAY
November 13

#AIAB2014

7:00am – 8:15am

First Timers' Breakfast

T Room 26B • Special Program Tickets Required • GA

NABT Conference ***first timers*** are invited to learn more about the association and the Professional Development Conference over a complimentary breakfast. Each table will have an NABT mentor available to answer your questions and help you make the most of your time in Cleveland.

The NABT First Timers' Breakfast is made possible through the generous support of

hhmi BioInteractive

8:30am – 9:30am

GENERAL SESSION

Stanley Prusiner, M.D.

See page 8 for biography.

Madness and Memory

Grand Ballroom A •
Special Speaker

Dr. Prusiner will discuss his book, *Madness and Memory: The Discovery of Prions—A New Biological Principle of Disease*. He tells the remarkable story of his discovery of prions – infectious proteins that replicate and cause disease but surprisingly contain no genetic material – and reveals how superb and meticulous science is actually practiced with talented teams of researchers who persevere. He recounts the frustrations and rewards of years of research and offers fascinating portraits of his peers as they raced to discover the causes of fatal brain diseases. Prusiner's hypothesis, once considered heresy, now stands as accepted science and the basis for developing diagnoses and eventual cures. He closes with a meditation on the legacy of his discovery: What will it take to cure Alzheimer's, Parkinson's, Lou Gehrig's and other devastating diseases of the brain?

Dr. Prusiner will be available to sign copies of *Madness and Memory: The Discovery of Prions—A New Biological Principle of Disease* immediately after his presentation.

10:15am – 1:00pm

#557 Introducing and Exploring the Nature of Science

Room 25B • Hands-on Workshop • Instructional Strategies/Technologies • HS 2Y 4Y

This session presents an overview of the nature of science (NOS) as featured in the NGSS and is designed as an introduction for teachers to this complex but generally neglected topic. We will briefly examine the role of NOS in the NGSS and then consider nine specific elements that should be featured in science teaching. In the second hour of this workshop we will shift to a more exploratory mode and examine some of these NOS principles from the perspective of how they might be included in classroom settings. Some of the strategies will be addressed using hands-on strategies that will be referred to and/or experienced firsthand. Participants are advised to attend both sections of this workshop since the two elements are designed together to provide the most complete overview of this important topic.

William McComas (mccomas@uark.edu), University of Arkansas, Fayetteville, AR and John Moore (jhmoore@taylor.edu), Taylor University, Upland, IN

10:15am – 11:30am

#ES1 BIO Principles – Innovation and Value: All in One Place

Room 3 • Demonstration (75 min) • General Biology • HS 2Y 4Y GA

BIO Principles is a next-generation learning space that offers quality content in a dynamic and engaging format—all in one place and at an affordable price—made possible through partnership between Wiley and OpenStax College.

Bonnie Roth (broth@wiley.com), Wiley, Hoboken, NJ

Committee Meeting: Finance Committee

Room 7

George Sellers (georges1524@gmail.com), Committee Chair

#586 AP Biology

Room 9 • Hands-on Workshop (75 min) • AP Biology • HS

Join two experienced AP teachers for a lively session designed to help students incorporate Science Practices and learn more biology. We'll use modeling, mathematics and inquiry techniques, and share hints for resources, assessments, and test prep.

Theresa Holtzclaw and Fred Holtzclaw, Webb School of Knoxville, Knoxville, TN

#689 Engaging Students in Thinking Like Scientists Jointly Presented by BSCS & Carolina Biological

Room 10 • Hands-on Workshop (75 min) • General Biology • MS HS

Learn how science practices can engage students in thinking and working the way scientists do. Using an interactive experience, consider how to increase students'

abbrev. key

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

THURSDAY November 13

10:15am – 11:30am

continued

understanding of science through simple changes to activities you already do.

Paul Numedahl (pnumedahl@bscs.org), BSCS, Colorado Springs, CO

#538 Which Way Did the DNA Go? Fun with Electrophoresis!

Room 11 • Hands-on Workshop (75 min) • Biotechnology • MS HS 2Y

Which Way Did the DNA Go? Fun with Electrophoresis! demonstrates biotechnology concepts and techniques in a hands-on way! In addition, we will share tips and resources to help implement biotechnology in the classroom. For middle and high school teachers and others.

Barbara Bielec (barbara.bielec@btci.org), BTC Institute, Madison, WI

#514 Addressing the Unique Needs of Diverse Learners, Particularly Those with Learning Disabilities, in Biology Curricula.

Room 12 • Hands-on Workshop (75 min) • Instructional Strategies/Technologies • HS 2Y 4Y

Every classroom across the world contains students who have a range of learning styles. A student may be an abstract or concrete learner; a visual or auditory learner; learn best in a tactile/kinesthetic manner; have strengths or weaknesses in reading comprehension and/or writing ability; the possibilities are as diverse as the students in the course. Meeting the needs of each learning style can be a particular challenge in a biology course. This presentation will introduce specific techniques that may be beneficial to all students, yet are essential for students with learning disabilities.

Abigail Littlefield (alittlefield@landmark.edu), Landmark College, Putney, VT

#512 Affordable Anatomy

Room 13 • Hands-on Workshop (75 min) • Anatomy & Physiology • MS HS GA

Participants will complete several hands-on, affordable anatomy activities. These engaging activities are student driven, and can be completed in classrooms of varying sizes and levels using common household materials.

Laura Woerner (laura_woerner@montgomeryacademy.org), The Montgomery Academy, Montgomery, AL

#506 Comparing Faculty Use of Clicker Technology Across the Disciplines: A Comparative Study

Room 14 (Session A) • Paper (30 min) • Instructional Strategies/Technologies • 2Y 4Y

Personal response devices (clickers) are one means through which undergraduate students can be engaged in large biology classrooms. We present data comparing faculty use of clickers in a variety of disciplines at a large SE university.

Grant Gardner (Grant.Gardner@mtsu.edu), Middle Tennessee State University, Murfreesboro, TN

#530 Research@PRISMS: Learning to Inquire = Inquiring to Learn

Room 14 (Session B) • Paper (30 min) • Instructional Strategies/Technologies • HS 2Y 4Y

The Princeton International School of Mathematics and Science (PRISMS) is founded with authentic research and global studies at the very core of its curriculum. We present our research-based design, distinct features of our model, and experiences.

Steven Rogg (Steven.Rogg@PRISMSus.org), Princeton International School of Mathematics & Science, Princeton, NJ

#ES2 Comparative Vertebrate Anatomy with Carolina's Perfect Solution

Room 15 • Hands-on Workshop (75 min) • Anatomy & Physiology • HS 2Y 4Y

Participate in hands-on, guided dissections featuring 4 different vertebrates: a Carosafe® shark and Carolina's Perfect Solution® frog, rat, and pig. Participants will have the opportunity to dissect the vertebrate of their choice, compare it to other specimens, and then explore various similarities and differences. Great door prizes included!

Angela White (ashley.faucette@carolina.com), Carolina Biological Supply Company, Burlington, NC

#ES3 Using Cell Modeling to Understand Cells and Microscopy

Room 16 • Hands-on Workshop (75 min) • Microbiology & Cell Biology • E MS HS 2Y 4Y GA

We will be viewing and then modeling specific cells. Teachers will get hands-on experience in how this active and inclusive approach leads to a better understanding of both cell structure and microscopy.

Dawn Tamarkin (dawn@cellzone.org), Cell Zone, Springfield, MA

#ES4 Lend Some Color to Your Spectrometry Labs

Room 17 • Hands-on Workshop (75 min) • General Biology • HS 2Y 4Y

Perform these labs with flying colors: Emission spectra of light sources and effect on photosynthetic rates; Absorbance spectra of plant pigments; and Photosynthesis w/DPIP. Be tickled pink to learn how you can do all this and more with one apparatus!

Mark Little, PASCO scientific, Roseville, CA

NABT Biology Education Research Symposium

Thursday, November 13 • 1:15pm – 4:00pm • Room 25A

SCHEDULED PRESENTATIONS:

Preservice Teachers' Use of Content Knowledge to Inform Formative Assessment Strategies in an Integrated Life Sciences Methods Course

Jaime Sabel, Cory Forbes & Laura Zangori, University of Nebraska, Lincoln, NE

Undergraduate students who are preservice elementary teachers need to learn essential science concepts as well as how to apply those concepts to elementary science learning environments. In order to effectively engage students in scientific practices and connect students' ideas about science to appropriate instructional strategies, teachers should learn and engage in high-leverage instructional practices such as formative assessment. However, teachers may not understand formative assessment or have enough science content knowledge to effectively engage in the practice. To address this concern, we developed an innovative course for elementary preservice teachers built upon two pillars – life science content and formative assessment. Students learned essential biological science content and learned to connect that content knowledge to essential concepts in the biological sciences as defined in the K-12 science standards. In addition, the focus on formative assessment allowed preservice teachers to engage in identifying and responding to students' ideas. Here, we will present results of an embedded mixed methods study designed to evaluate the effect of this intervention on preservice teachers' content knowledge and ability to engage in formative assessment for science.

Producing Learner-Centered Future Faculty: FIRST IV – A Uniquely Effective Program of Professional Development

D. Ebert-May, Michigan State University, East Lansing, MI; T.L. Derting, Murray State University, Murray, KY; T. Henkel, Valdosta State University, Valdosta, GA; J. Middlemis Maher, University of Wisconsin-Madison, Madison, WI; B. Arnold, Illinois College, Jacksonville, IL; H.A Passmore, Murray State University, Murray, KY; & J.L. Momsen, North Dakota University, Grand Forks, ND

Challenges in training faculty in inquiry-based, learner-centered instruction include empirically evaluating the efficacy of training in teaching and sustaining long-term support for change. *Faculty Institutes for Reforming Science Teaching* (FIRST IV) provided new approaches to professional development in biology instruction for postdoctoral scholars. The goal was to develop early-career faculty who value and implement evidence-based pedagogies that facilitate learning. We report the activities and outcomes of FIRST IV, using comprehensive evidence derived from expert reviews of participants' teaching, self-reported data from participants and students, and comparisons with non-project faculty. Participants completed a workshop twice in two years, followed by teaching an entire or partial course at their institution and sustained mentoring by STEM education experts. Postdocs showed belief in learner- centered teaching, and 74% taught using primarily learner-centered practices. We followed a subset of participants into their first faculty positions and quantified how their instructional design and student assessments differed from a colleague at the same institution. External review of teaching indicated that FIRST IV faculty practiced significantly more learner-centered instruction and used more collaborative learning than their colleagues. We conclude that the FIRST IV model offers significant and unique contributions to current challenges in professional development in STEM education.

To What Extent is the Established Conceptual Framework of Animal Behavior used in Textbooks and the Primary Literature?

Andrea M.-K. Bierema, Baker College, Flint, MI &
Renee' S. Schwartz, Georgia State University, Atlanta, GA

In 1963, Tinbergen revolutionized the study of animal behavior in his paper *On Aims and Methods of Ethology (Zeitschrift Tierpsycholgie, 20,* p.410) by revamping the conceptual framework of the discipline. His framework suggests an integration of four questions: causation, ontogeny, survival value, and evolution. AAAS (2010) stated in their *Vision and Change in Undergraduate Biology Education* report that alignment between biological undergraduate education and current research should exist. Unfortunately, alignment has been rarely studied in college biology. The purpose of this study, therefore, is to determine if the conceptual framework used by animal behavior scientists, as presented in current primary literature, aligns with what students are exposed to in undergraduate biology education. Four popular textbooks and primary literature articles underwent content analysis in order to determine the extent that each of Tinbergen's four questions. It was discovered that both textbooks and articles covered primarily only two of Tinbergen's questions (survival value and causation). Therefore, neither textbooks nor current primary literature uses the conceptual framework as intended. Utilizing an integrated framework within textbooks and teaching this framework is recommended in order to increase the number of scientists in the next generation that study evolution and ontogeny of behavior.

Using Concept Maps to Measure Undergraduates' Nature of Science Conceptions During a Biology Course

Leah J. Cook, Renee Schwartz, Andrea Bierema &
Sarah Krajewski, Western Michigan University, Kalamazoo, MI

This study explored changes in undergraduates' cognitive structures of nature of science, as represented through concept maps, during a non-majors biology course. Understanding nature of science is part of being scientifically literate. We target the following aspects of nature of science: tentative, creative, subjective, empirical, observations and inferences, theories and laws, socio/cultural influences. Also targeted is the notion that there are multiple methods of scientific investigations. These aspects are related to each other, yet students often struggle to see and describe such connections. Explicit/reflective nature of science instruction was taught within an undergraduate biology course focused on cells, genetics, and molecular processes. A series of four concept-mapping tasks was used through the semester to determine what concepts were integrated into students' cognitive structure about nature of science. The concepts maps allowed the researchers to identify the progression of how participants represented nature of science and relationships among aspects throughout the course. Students increased the nature of science concepts they included in their maps, but the overall structures did not change significantly. By tracking the progression of student understanding from this study, the nature of science conceptual understanding of undergraduate, non-majors may impact future classrooms and future curriculum needs.

Effects on Self-Efficacy and Self-Regulated Learning

Michele J. Mann & Christopher Golubski, University of Texas, Austin, TX

Using the *Motivated Strategies for Learning Questionnaire* (MSLQ), scores were evaluated at the beginning and end of the semester in an entry-level biology course for biology majors comparing if the students had taken the Advanced Placement (AP) Biology test. The students that scored a 2 or 4 on the AP Biology test had a statistically significant decrease in MSLQ pre and post test scores than the students that did not take the AP Biology test, even though there was a trend upward in MSLQ for increasing AP scores in general. Students that took AP test in biology, calculus and/or chemistry had a higher GPA and better performance in the first term biology course for majors. The higher the students scored on the AP tests the higher their self-efficacy and their overall MSLQ scores. Knowing which students will potentially have MSLQ scores that will decrease during a semester helps professors identify students needing more encouragement and support. Students that are capable and interested in biology should have access to the degree.

Faculty and Student Perceptions of Learning in an Inquiry-Based Introductory Biology Course

Susann Yang, Presbyterian College, Clinton, SC &
Tarren Shaw, University of Oklahoma, Norman, OK

The benefits of active learning and inquiry-based instruction are well documented, though adoption of these practices face opposition from both faculty and students. We recently implemented a multi-section inquiry introductory biology curriculum at a small liberal arts college. The course utilized common instructional and assessment tools, and was taught by multiple instructors of varying experience with active learning strategies. These changes were met with some resistance; in particular, major concerns among faculty were that common assessments would not be fair to all students, and that students perceive the increased difficulty of the course as undesirable. Faculty and student perceptions of the course were both positive and negative. We found that negative perceptions of the course during implementation do not fully match the learning gains and perception of learning gains at the completion of the course. We did not find evidence that common assessments were unfair. Furthermore, we found that students did recognize progress in their abilities to think critically. We use our findings to propose interventions tailored to improve faculty and student experiences in the future.

Special Guest Presenter:

Ellen Goldey, Wofford College, Spartanburg, SC
Recipient of the 2014 NABT Four-Year College & University Section Research in Biology Teaching Award

10:15am – 11:30am

continued

#ES5 Mixing It Up: Combining Digital and Hands-On Biology Lesson

Room 18 • Hands-on Workshop (75 min) • General Biology • MS HS 2Y 4Y

In this workshop, teachers will experience digital simulations and connected hands-on activities related to a fundamental biological concepts like diffusion and osmosis and cell signaling.

Chris Nutting (chris.nutting@vwr.com), Ward's Science, Rochester, NY

#653 20 in 20…The Next Generation

Room 19 • Hands-on Workshop (75 min) • General Biology • MS HS GA

The next generation of 20 exciting, informative 20-minute activities to enhance Biology courses. New and exciting activities to help make your classes more student centered and inquiry based.

Whitney Hagins (whitney.hagins@massbio.org), Massachusetts Biotechnology Foundation, Cambridge, MA

#540 Inspired by Nature: Exploring Renewable Energy Solutions Based on Biological Principles

Room 20 • Hands-on Workshop (75 min) • General Biology • HS 2Y GA

Learn about energy technologies such as artificial photosynthesis and solar fuel production, anaerobic respiration and electricity generation, and the use of biomimicry in the design of renewable energy technologies.

Dana Haine (dhaine@unc.edu), UNC-Chapel Hill, Chapel Hill, NC

#619 Teaching Fundamental Neuroscience Concepts Through an Interactive, Problem-Solving Approach

Room 21 • Hands-on Workshop (75 min) • General Biology • HS, GA, 2Y

Experience neuroscience education materials developed by a multi-disciplinary team of software developers, teachers, scientists, and educational researchers. (Please bring a tablet to experience the software.)

Jared Jackson (jared@is3d-online.com), IS3D, Athens, GA, Georgia Hodges (georgiahodges@uga.edu) and Tom Robertson (tomrob@uga.edu), University of Georgia, Athens, GA

#601 Analysis of NGSS for Genetics Concepts: Implications for Implementation

Room 22 (Session A) • Paper (30 min) • Genetics • GA

A comprehensive analysis of the Next Generation Science Standards for coverage of genetics reveals strengths and weaknesses in the NGSS and raises concerns about fidelity of implementation.

Katherine Lontok (klontok@ashg.org) and Michael Dougherty (mdougherty@ashg.org), American Society for Human Genetics, Bethesda, MD

#636 Geniverse: Science Practices in a Web-Based Game Environment for Genetics

Room 22 (Session B) • Paper (30 min) • Genetics • MS HS 2Y

Geniverse is a game-like environment for immersive learning of genetics. We will report on our analyses of argumentation assessments compared to control classrooms, and on how teachers support learning, persistence and engagement with *Geniverse.*

Frieda Reichsman (freichsman@concord.org), The Concord Consortium, Concord, MA

#ES6 The MiniOne: A Complete Electrophoresis Experience

Room 23 • Hands-on Workshop (75 min) • Biotechnology • MS HS 2Y GA

The MiniOne™ delivers the complete, real-time electrophoresis experience in the palm of your hand. Separate, view and even take a picture of DNA bands within a single class period. It is a game-changer for teaching molecular biology in the classroom.

Richard Chan (info@theminione.com), The MiniOne Electrophoresis, San Diego, CA

#543 Tree-Thinking: A Models-Based Approach to Teaching Evolution

Room 24 • Hands-on Workshop (75 min) • Evolution • HS GA

Evolution is an important, but frequently misunderstood process. This session will present a "tree-thinking" approach to teaching evolution that addresses misconceptions, and engages students in data analysis, scientific modeling, and discussion.

Samuel Holloway (holloway_samuel@svvsd.org), Lyons Middle / Senior High School, Lyons, CO and Isaac Stewart (stewarti@fisher.k12.il.us) Fisher High School, Fisher, IL

#555 NCSE Presents: Being a Science Advocate in Your Classroom and Community

Room 25A • Hands-on Workshop (75 min) • Evolution • E MS HS

Controversy in the classroom? What can you do when evolution, climate change, or other scientific topics are under attack? The National Center for Science Education (NSCE) has practical advice, hands-on activities, and resources to help you.

Ann Reid (reid@ncse.com), National Center for Science Education, Oakland, CA

10:15am – 11:30am

continued

#701 The Blended Learning Cycle

Room 25C • Demonstration (75 min) • Instructional Strategies & Technologies • MS HS 2Y 4Y GA

Blending instruction in a lab-based classroom is difficult but not impossible. I'll show you how to make the shift by combining elements of the learning cycle with blended instruction by sharing several tools I have used to shift from a passive, teacher-centered learning environment to an active, student-centered learning environment.

Paul Andersen (paul@bozemanscience.com), Bozeman High School, Bozeman, MT

#696 HHMI Presents: Fossil and Genetic Evidence of Human Evolution

Room 26B • Hands-On Workshop (75 min) • Evolution • HS 2Y 4Y

Discover free classroom-ready activities, animations, and interactives for teaching about the origin of humans and how our species continues to evolve in changing environments. Be among the first to learn about our latest short films and videos.

David Knuffke, Deer Park High School, Deer Park, NY and Laura Bonetta, Howard Hughes Medical Institute, Chevy Chase, MD

#642 PULSE Programs & Products for Facilitating Implementation of Vision and Change Recommendations

Room 26C • Symposium • General Biology • 2Y 4Y

Updates on PULSE projects include online professional development workshops, virtual resource toolbox, departmental self-study rubrics and certification, Ambassadors who assist departments with implementation, and regional networks for collaboration.

Karen Klyczek (karen.k.klyczek@uwrf.edu), University of Wisconsin-River Falls, River Falls, WI; Sharon Gusky (sgusky@nwcc.edu), Northwestern Connecticut Community College, Winsted, CT; and Taylor Allen (taylor.allen@oberlin.edu), Oberlin College, Oberlin, OH

11:45am – 4:00pm

NABT AP Biology Symposium

Room 25C • Special Program • Instructional Strategies/ Technologies • HS 2Y 4Y

Learn short activities that use Wisconsin Fast Plants to teach selection and phenotypic variation that occurs through sexual reproduction. Then use resampling and simulation to help students develop statistical skills to address the increased emphasis on quantitative skills and their application throughout biology education. Designed for AP Biology, this symposium will ehnance your teaching in other courses as well.

Designing and Conducting Selection Experiments with Wisconsin Fast Plants

(11:45am – 1:00pm)

In this interactive session, we will explore considerations for effectively conducting selection inquiries with Fast Plants. You will compare a variety of data collected from investigations that involved manipulating environmental variables and selectively breeding (artificial selection). We will take an in-depth look at types of data students can generate — using Fast Plants — to build evidence-based explanations for core concepts linked to variation, natural selection, and evolution.

Hedi Baxter Lauffer (hfbaxter@wisc.edu) and Dan Lauffer (dlauffer@wisc.edu), University of Wisconsin-Madison, Madison, WI

Developing Quantitative Skills for Artificial Selection Experiments

(2:00pm - 4:00pm)

Bring your own computer with a spreadsheet application. We will explore strategies and ideas for helping our students develop quantitative analysis skills specific to artificial selection experiments. Using data from actual experiments we will explore data presentation, data analysis, and hypothesis testing. In addition to regular statistical tests such as t-tests we will also explore the use of computer based resampling and simulation which students often find to be more intuitive than statistical formulae. This presentation is particularly suited for *AP Biology Laboratory 1 - Artificial Selection.*

Brad Williamson, University of Kansas, Lawrence, KS

Sponsored by CAROLINA® www.carolina.com

11:45am – 1:00pm

#ES7 BIO Concepts–Innovation and Value in Biology

Room 3 • Demonstration (75 min) • General Biology • HS 2Y 4Y

BIO Concepts is a next-generation learning space for non-majors Biology that offers quality content in a dynamic and engaging format—all in one place and at an affordable price—made possible through partnership between Wiley and OpenStax College.

Clay Stone (cstone@wiley.com), Wiley, Hoboken, NJ

11:45am – 1:00pm

continued

#578 Co-Evolution in the High School Classroom: Constructing and Applying Phylogenies to Interpret Plant and Pollinator Interactions

Room 9 (Session A) • Paper (30 min) • AP Biology • HS 2Y

Incorporating phylogenetics facilitates student understanding of evolutionary relationships. Using flowering plants, participants construct morphological and molecular phylogenetic trees. Modifications for differing classroom contexts are shared.

Jacob Landis (jblandis@ufl.edu), University of Florida, Gainesville, FL; Jennifer Broo (jsunderman@saintursula.org), St. Ursula Academy, Cincinatti, OH; Jessica Mahoney (jessica.mahoney@ocps.net), Edgewater High School, Orlando, FL; and Julie Bokor, (julie@cpet.ufl.edu), University of Florida, Gainesville, FL

#552 Teaching the Big Ideas with Models of Operons

Room 9 (Session B) • Demonstration (30 min) • AP Biology • HS 2Y 4Y

An activity will be presented that engages students in model-based reasoning, requiring them to predict the behavior of the trp and lac operons under different conditions. Students apply the AP Framework's Big Ideas to account for operon behavior.

Robert A. Cooper, Pennsbury High School, Fairless Hills, PA

#690 BSCS and The Botanical Society of America Presents: Engaging Students in STEM-oriented Investigations with *PlantingScience*

Room 10 • Demonstration (75 min) • Plant Biology • MS HS 4Y

This session will explore www.plantingscience.org, a free research-based online opportunity for students and scientists to collaborate on original student-led projects.

Jane Larson (jlarson@bscs.org), BSCS, Colorado Springs, CO and Catrina Adams (cadams@botany.org), Botanical Society of America, St. Louis, MO

#664 "Build a Baby—What Will My Baby Look Like?"

Room 11 • Hands-on Workshop (75 min) • Genetics • HS MS

This inquiry based activity allows students to visualize the difficult concept of gene expression, inheritance and mutations. These abstract concepts can be intertwined in one activity making it student centered and engaging students in a great co-operative learning experience.

Shubhada Bhamre, Plum School District, Oakmont, PA

#588 Flipping Out! How Far We've Come and How Far We Have Left to Go

Room 12 • Paper (75 min) • Instructional Strategies/Technologies • 2Y 4Y GA

We present our ongoing quest to modify a student-centered, inquiry based introductory biology class using the flipped method. The data collected and compiled over three semesters includes: observations, student reflections, and assessments.

Michael Moore (michael.e.moore@okstate.edu) and Donald French (dfrench@okstate.edu), Oklahoma State University, Stillwater, OK

#502 Simulate STEM Online Through Virtual Clinical Trials

Room 13 (Session A) • Demonstration (30 min) • Anatomy & Physiology • MS HS GA

Expose high school students to scientific and biomedical engineering practices using FREE online simulations that engage students in technology while designing authentic neuroscience-based clinical trials. Built in assessment notebook.

Kristi Bowling (kristi.bowling@rice.edu), Rice University Center for Technology in Teaching and Learning, Houston, TX

#618 Using Interactive Simulations to Engage and Immerse Students in the Molecular World of Biology

Room 13 (Session B) • Demonstration (30 Min) • General Biology • HS 2Y GA

Learn how to integrate interactive simulations in your classroom to engage students in their learning. This new software enables students to learn biological processes by applying key concepts to build biological systems. Bring a tablet.

Jared Jackson (jared@is3d-online.com) and David Ducrest (david@is3D.com), IS3D, Athens, GA, and Georgia Hodges, (georgahodges@uga.edu) University of Georgia, Athens, GA

#602 Finding Out What Your Students Know...Literacy in the Science Classroom

Room 14 • Hands-on Workshop (75 min) • Instructional Strategies/Technologies • MS HS

What do your students know? How can you find out? Lets talk about how to better practice reading, writing, and talking about science every day. Reading comprehension; scientific reasoning, and citing evidence from data practice included.

Mary Busbee (mary.busbee@sccboe.org), St. Clair County High School, Odenville, AL

#ES8 Adaptations for Lab-Based Online Biology Courses

Room 15 • Hands-on Workshop (75 min) • Instructional Strategies/Technologies • 2Y 4Y

Science education has been challenged by the demands and rapid growth of online education. The use of lab kits as part of a hands-on, inquiry approach to online courses will accomplish the essential skills and learning outcomes. This session explores prospective ideas for a hands-on, inquiry model for online labs.

Norma Hollebeke (ashley.faucette@carolina.com), Carolina Biological Supply Company, Burlington, NC

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1:00 – 2:15 pm	Field Biology with Vernier
2:30 – 3:45 pm	Introduction to Biofuels with Vernier and Bio-Rad Laboratories

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11:45am – 1:00pm

continued

#ES9 Driving Change in Biology Education

Room 16 • Demonstration (75 min) • General Biology • HS 2Y 4Y

Discover and discuss an affordable textbook alternative for college level biology that increases access, engagement, and effectiveness for students and supports you in teaching the way you want to—without adding to your workload.

Lydia LeStar (lydia.lestar@macmillan.com), Nature Education, Cambridge, MA

#ES10 Get Pumped Up with Human Physiology using PASCO Probeware

Room 17 • Hands-on Workshop (75 min) • Anatomy & Physiology • 2Y 4Y

Get your finger on the pulse of Physiology with PASCO's SPARKvue software. Your heart will race with excitement when you collect data with our EKG, blood pressure, heart rate and other sensors. You're a heartbeat away from making class come alive!

Mark Little, PASCO scientific, Roseville, CA

#ES11 Inquiry Tips for AP Bio

Room 18 • Hands-on Workshop (75 min) • AP Biology • HS

During this workshop, we'll present a typical "tried and true" AP Bio lab activity and discuss some possible ways to incorporate inquiry into the lesson.

Michelle Pagani (michelle.pagani@vwr.com), Ward's Science, Rochester, NY

#646 Organelle of the Day

Room 19 • Hands-on Workshop (75 min) • General Biology • MS HS

An innovative approach to teaching and learning about cell structure and function while using proper microscope technique. Digital cameras and iPads are used to document student work.

Whitney Hagins, Massachusetts Biotechnology Foundation, Cambridge, MA

#583 Wading Into Water Chemistry and Biology

Room 20 • Symposium • General Biology • HS 2Y 4Y

Join us in a hands-on exploration of the chemical and physical properties of water, and how water influences the way proteins fold into their final tertiary structure.

Tim Herman (herman@msoe.edu) and Diane Munzenmaier, Milwaukee School of Engineering Center for BioMolecular Modeling, Milwaukee, WI

#639 "Speak Up!" — Incorporating Discourse into Your Life Science Classroom Instruction

Room 21 • Demonstration (75 min) • General Biology • MS HS 2Y

Discourse tools allow teachers to assess scientific thinking both formatively and summatively. We will model strategies that build confidence, deepen student partnerships, and foster risk-taking as we promote scientific argumentation from evidence.

Cheryl Hach (chach@kamsc.k12.mi.us), Kalamazoo Area Math and Science Center, Kalamazoo, MI and Roberta Cramer (robby_cramer@msta-mich.org), Michigan Science Teachers Association, Grand Haven, MI

#563 Top 10: Genetics and Biotechnology Discoveries 2014

Room 22 • Paper (75 min) • Biotechnology • MS HS

Want to use cool new science to engage your students? This discussion based on the 2013 Biotechnology Guidebook is designed to make recent findings in biotechnology both understandable and applicable. Findings are presented in brief vignettes.

Neil Lamb, HudsonAlpha Institute for Biotechnology, Huntsville, AL

#ES12 Effortlessly Integrate Inquiry with Glowing Bacteria

Room 23 • Hands-on Workshop (75 min) • Biotechnology • HS 2Y

Learn new ways to advance inquiry from guided to open. Establish a strategy that integrates essential and real-world scientific practices that will encourage your students to direct the scientific investigation using the glowing bacteria from pGLO™.

Leigh Brown (Leigh_brown@bio-rad.com), Bio-Rad Laboratories, Hercules, CA

#621 Telling Short Stories: Bring Science in the News to Life

Room 24 (Session A) • Demonstration (30 min) • General Biology • 2Y 4Y GA

Vignettes about new science discoveries brings the curriculum alive for students. The stories spark interest in topics, stimulate student creativity and imagination, and foster critical thinking. Stories introduce students to the wonders of science.

Elizabeth Cowles (cowlese@easternct.edu), Eastern Connecticut State University, Willimantic, CT

#603 Understanding Evidence for Evolution – Create a Rotating Lab

Room 24 (Session B) • Demonstration (30 min) • Evolution • MS HS 4Y

Students explore fossils, bones, DNA sequences and more! In this activity students observe multiple lines of evidence that all converge to support the theory of evolution by natural selection. This lab is flexible based on materials that you have.

Jennifer Katcher (jkatcher@pima.edu), Pima Community College, Tucson, AZ

#695 HHMI Presents: Great Transitions in Evolution

Room 26B • Hands-on Workshop (75 min) • Evolution • HS 2Y 4Y

Learn what transitional fossils reveal about the evolutionary history of life on our planet with free ready-to-use resources from BioInteractive. They include new online interactives, hands-on activities, and a brand new short documentary film.

Mark Eberhard, St. Clair High School, St. Clair, MI and Laura Bonetta, Howard Hughes Medical Institute, Chevy Chase, MD

11:45am – 1:00pm

continued

#656 ASM Presents: Microbiology Testing in the Pharmaceutical Industry

Room 26C • Paper (75 min) • Microbiology & Cell Biology • HS, 2Y, 4Y

This presentation will describe the role of microbiologists in the pharmaceutical industry and how STEM education prepares students for diverse careers. Attendees will learn how microbiologists help ensure pharmaceutical products meet regulatory requirements for sterility, endotoxin, and non-viable particulates. The presenter will describe test methods, environmental monitoring of production, investigation of procedural deviations, and what happens when results are out of specification.

Jon Kallay, Ben Venue Laboratories, Bedford, OH

Presented as part of the American Society of Microbiology's Symposium *Stem and the Clinical Microbiologist*

1:15pm – 4:00pm

NABT Biology Education Research Symposium

Room 25A • Special Program (150 min) • Instructional Strategies/Technologies • HS 2Y 4Y GA

You are invited to the *6th Annual Biology Education Research Symposium*. Presentations were accepted through a double blind review process that was open to biology educators and researchers at all levels. Full abstracts are available in the program and proceedings will be posted online.

See page 27 for abstracts.

NABT Global Perspectives Committee 2014 Poster Session & Discussion Panel

Room 25B • Special Program (150 min) • Global Perspective • GA

The NABT Global Perspectives Committee is proud to present this year's conference session focused on *Promoting Global Sustainability in the Teaching and Learning of Biology.*

See the following page for more details.

1:15pm – 2:30pm

#ES13 Adaptive Practice for Better Assessments in Human Biology

Room 3 • Demonstration (75 min) • Instructional Strategies/Technologies • HS 2Y 4Y GA

WileyPLUS with ORION tracks aggregate and individual student proficiency at the objective or chapter level. With these analytics, you can see where your students excel and where they need reinforcement so that you can tailor instruction accordingly.

Bonnie Roth (broth@wiley.com), Wiley, Hoboken, NJ

Committee Meeting: Awards Committee

Room 7

Priya DasSarma (PDasSarma@som.umaryland.edu), Committee Chair

OBTA Directors Meeting

Room 7

Mark Little (mark.little@bvsd.edu), Committee Chair

#568 Biology by the Numbers

Room 9 • Hands-on Workshop (75 min) • Instructional Strategies/Technologies • HS 2Y 4Y

This session focuses on helping students master quantitative skills for biology. We will explore inquiry activities that use real data, tools for graphing, and modeling to increase student confidence and skills. This workshop is offered by BioQUEST.

Kristin Jenkins, Sam Donovan, and Stacey Kiser, BioQUEST, Madison, WI

#648 Case Studies for Teaching about Ecosystem Services and Biodiversity Conservation

Room 10 (Session A) • Paper (30 min) • Environment/Ecology • 2Y 4Y GA

Students often do not connect biodiversity decline with loss of ecosystem services. Case studies will be explored to provide examples of how protecting ecosystems and their services are vital to human health and material needs.

Kathy Gallucci, Elon University, Elon, NC

#546 Engaging Activities for Introductory Biology

Room 10 (Session B) • Demonstration (30 min) • General Biology • MS HS

An interactive session sharing activities and formative assessments that appeal to reluctant, unengaged learners. Use easily obtainable materials to reinforce key concepts and keep students active.

Joe Evans (jevans@kent.k12.md.us), Kent County High School, Worton, MD

#561 They Come in Pairs: Using Socks to Identify and Address Student Misconceptions about Chromosomes

Room 11 • Hands-on Workshop (75 min) • General Biology • MS HS

Misconceptions about chromosome behavior make grasping genetics concepts challenging. Dig into how to identify and address many of those misconceptions utilizing socks.

Madelene Loftin and Jennifer Carden, HudsonAlpha Institute for Biotechnology, Huntsville, AL

Presented in partnership with Carolina Biological Supply Company

THURSDAY
November 13

NABT Global Perspective Committee's 2nd Annual
POSTER SESSION & PANEL DISCUSSION
Promoting Global Sustainability in the Teaching and Learning of Biology

Room 25B

1:15pm – 1:45pm Poster Introductions (1 minute presentations)

1:45pm – 3:00pm Poster Viewing and Conversation

3:00pm – 4:00pm PANEL DISCUSSION

Moderator:

Dr. Kathleen Fadigan – Assistant Professor of Science Education, The Pennsylvania State University, Abington

Panel Members:

Dr. Carlos de la Rosa – Director, La Selva Biological Station, Organization for Tropical Studies (OTS), Costa Rica

Dr. Martin Linder – Professor, Biology and Geography Education, Martin-Luther University, Germany

Dr. Jacqueline McLaughlin – Associate Professor of Biology; Founding Director, CHANCE, The Pennsylvania State University, Lehigh Valley

POSTER PRESENTATIONS

Climate Change and Student Research: Real Data, Real Science, Real Actions
Carlos de la Rosa, La Selva Biological Station, Organization for Tropical Studies (OTS), La Selva, Costa Rica

Global Sustainability Leadership for Future Teachers
Kathleen Fadigan, The Pennsylvania State University, Abington, PA

Epistemological Shift: Teaching a Well-Rounded Person
Gus Gregorutti, Andrews University, Berrien Springs, MI & Humboldt University, Berlin, Germany

Foliar Bacteria Decrease Tree Seedling Performance in a Tropical Rain Forest: Research in Tandem with the CHANCE Undergraduate Program in Panama
Eric Griffin, J. N. Pruitt, and W. P. Carson, University of Pittsburgh, Pittsburgh, PA and S. J. Wright, Smithsonian Tropical Research Institute, Balboa, Panama

Buen Vivir - Implications and Perspectives of a New Trend in Teaching Sustainability?
Martin Linder, Anne Lindau, and Anna V. Gruenewaldt, Martin-Luther University, Halle-Wittenberg, Germany

Using Active Learning in an International Field Experience to Develop Global Sustainability Awareness
Karen Kackley, Eileen Grodziak, and Vinod Jeyaretnam, The Pennsylvania State University, Lehigh Valley, PA

THE COMMONS: A Multi-Year Program to Engage All Students in Global Sustainability
Sarah Mallory, Nickie Cauthen, and Melinda Pomeroy-Black, LaGrange College, La Grange, GA

Penn State CHANCE: Impacting Student Learning, Attitudes, Behaviors, and Career Choices through Real-World Conservation Experiences
Jacqueline McLaughlin, CHANCE and The Pennsylvania State University, Lehigh Valley, PA

Living Like a Black Bear: Teaching for Sustainability
Peter McLean, St. Andrew's School, Middletown, DE

EPICS - Developing a Living Laboratory Model for Sustainability at Penn State Schuylkill
Darcy Medica, The Pennsylvania State University, Schuylkill Valley, PA

Field Experience in Costa Rica Creates a Phenological Monitoring Project
Cinda Murray, Northwestern High School, Albion, PA

Authentic Conservation Experiences at San San Beach Create Depth of Knowledge About Sea Turtle Conservation
Cinda Murray, Northwestern High School, Albion, PA

Teaching, Research, and Industry Partnerships to Advance Global Scientific Understanding in Chile through the National Science Foundation GK-12 Program
Kim Cleary Sadler, Rachel Lytle, Tony Farone, and Mary Farone, Middle Tennessee State University, Murfreesboro, TN

1:15pm – 2:30pm

continued

#675 Get Out of Your Seat and Learn on Your Feet!

Room 12 • Paper (75 min) • Instructional Strategies/ Technologies • HS 2Y 4Y

Join us as we demonstrate role-playing activities designed to get your students out of their seats and actively engaged in learning key concepts and processes in biology!

Caroline McNutt (cmcnutt@schoolcraft.edu), Stacey Gray (sgray@schoolcraft.edu), Kristin Fruth (kfruth@schoolcraft.edu) and Patti Crowley-Harpenau (pcrowley@schoolcraft.edu), Schoolcraft College, Livonia, MI

#ES14 Flinn Scientific Favorite Biology Lab Activities and Games

Room 13 • Hands-on Workshop (75 min) • General Biology • MS HS

Students learn faster and better when involved in fun, hands-on activities that create learning opportunities. Join Flinn as we share biology-based inquiry labs, demonstrations and games you can use to motivate your students.

Jennifer Sternberg (djones@flinnsci.com), Flinn Scientific, Batavia, IL

#ES15 CSI In the Classroom: STEM Approach to Biology

Room 14 • Hands-on Workshop (75 min) • General Biology • MS HS 2Y 4Y

Discover how STEM can be integrated into your biology curriculum to engage your students. Join a unique hands-on experience with Nasco's *Cause of Death Autopsy Kit*, incorporating forensic science and biology to learn about mammalian structure.

Jordan Nelson (jnelson@enasco.com), Nasco, Fort Atkinson, WI

#ES16 Evolving Enzymes: Bioinformatics, Enzymes, and Inquiry in Your AP Biology® Classroom

Room 15 • Hands-on Workshop (75 min) • AP Biology • HS 2Y 4Y

Looking for inquiry activities for AP® Biology? Enrich your students' experience with unique solutions from Carolina designed to align with the College Board curriculum. As you go hands-on with our new *Evolving Enzymes* activity, you'll also have an opportunity to discuss other laboratory activities and best practices with your peers.

Angela White (ashley.faucette@carolina.com), Carolina Biological Supply Company, Burlington, NC

#ES17 Driving Change in Biology Education

Room 16 • Demonstration (75 min) • General Biology • HS 2Y 4Y

Discover and discuss an affordable textbook alternative for college level biology that increases access, engagement, and effectiveness for students and supports you in teaching the way you want to - without adding to your workload.

Lydia LeStar (lydia.lestar@macmillan.com), Nature Education, Cambridge, MA

#ES18 How To Turn Your iPad® into a Mobile Science Lab

Room 17 • Hands-on Workshop (75 min) • Instructional Strategies/Technologies • GA

Turn the tables on your tablet in (or out of) your lab with PASCO sensors and SPARKvue HD software. Transform lessons with this practical session using a SPARKlab to show how easy it is to integrate technology into hands-on, inquiry investigations.

Ryan Reardon (droofner@pasco.com), PASCO scientific, Roseville, CA

#ES19 Maximize Your Biotech Budget and Simplify Your Prep

Room 18 • Hands-on Workshop (75 min) • Biotechnology • MS HS 2Y 4Y GA

Learn how to prep gels months in advance, teach genotype/phenotype with dyes, and analyze gels in minutes not hours. We'll do it all with the context of a real human disease that will help make it more meaningful for your students.

Liam Casey (liam_casey@vwr.com), Ward's Science, Rochester, NY

#638 Integrating Math in a Biology Classroom

Room 19 • Hands-on Workshop (75 min) • General Biology • MS HS GA

Explore student-driven activities that cover key biological concepts and integrate math practices identified in the NGSS and CCSS. Students practice data analysis, graphing, and scale through an experiment, a series dilution, and a microbe mural.

Sahid Rosado Lausell, Chandana Jasti, and Barbara Hug, Project NEURON, Champaign, IL

#613 Real Time Assessment of Critical Thinking and Problem-Solving Skills in the Biology Classroom

Room 21 • Hands-on Workshop • General Biology • HS 4Y GA

Attendees will use software that presents fundamental biology concepts in the context of solving real-world problems, and see how student performance can be assessed in real time by teachers. Please bring your own device (laptop or tablet).

David Ducrest (david@is3D.com), IS3D, Athens, GA, Tom Robertson (tomrob@uga.edu) and Georgia Hodges (georgiahodges@uga.edu), University of Georgia, Athens, GA

1:15pm – 2:30pm

continued

#625 How Are Genes Moved?

Room 22 • Hands-on Workshop (75 min) • Biotechnology • HS

Do you need strategies to make complicated biotechnology techniques more understandable to high school students? Join us for activities that help explain the concepts behind genetic engineering. FREE materials.

Pam Snyder (PSnyder5396@gmail.com), Columbus City Schools/Ft. Hayes Career Center, Columbus, OH

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#ES20 Bats, iPads And Citizen Science in the Classroom

Room 23 • Hands-on Workshop (75 min) • Environment/Ecology • E MS HS 2Y 4Y GA

See how the Echo Meter Touch, an iPad®/iPhone®-powered bat detector/recorder/analyzer can open the amazing world of bats and bioacoustics. Learn how Bat Conservation International's *Discover Bats!* curriculum guide is used with the Echo Meter Touch.

Sherwood Snyder (sherwood@wildlifeacoustics.com), Wildlife Acoustics, Inc., Maynard, MA

#630 Engaging in Argumentation: Why GREEN is *Green*

Room 24 • Hands-on Workshop (75 min) • Instructional Strategies/Technologies • HS 4Y GA

Participants will be engaged in the process of argumentation and constructing arguments while understanding the basis for color recognition using both simple devices and spectrometers.

Jay Meyers (jay.meyers@sjsd.k12.mo.us), St. Joseph School District, Saint Joseph, MO

#694 HHMI Presents: Implementing Statistics in the Biology Classroom

Room 26B • Hands-on Workshop • Instructional Strategies/Technologies • HS 2Y 4Y

This workshop will provide participants with free classroom-ready resources and strategies for incorporating math and statistics into their biology classroom in line with AP and IB Biology, NGSS, the Common Core, and Vision-and-Change.

Ann Brokaw (abrokaw44@gmail.com), Rocky River High School, Rocky River, OH and Sandra Blumenrath (blumenraths@hhmi.org), Howard Hughes Medical Institute, Chevy Chase, MD

#655 ASM Presents: Antimicrobial Resistance Detection in the Clinical Laboratory

Room 26C• Paper • Microbiology & Cell Biology • HS 2Y 4Y

This presentation will describe ongoing research efforts in the detection of microorganisms resistant to antimicrobial agents. The presentation will focus on development of methods to improve detection and testing sensitivity.

Sandra Richter, Cleveland Clinic, Cleveland, OH

Presented as part of the American Society of Microbiology's Symposium *Stem and the Clinical Microbiologist*

2:45pm – 4:00pm

#ES21 Spot Test for BPA in Store Receipts

Room 3 • Hands-on Workshop (75 min) • Biotechnology • MS HS 2Y

BPA (bisphenol A) is an estrogen mimic that appears in plastic and epoxy-lined food and drink containers. But, ordinary store receipts may have 200,000 X that level. Our "BPAssay" is a teal to lavender spot test for BPA ideal for classroom use.

William Ward (wward@brighterideasinc.com), Brighter Ideas, Inc. and Rutgers University, North Brunswick, NJ

Committee Meeting: *ABT* Advisory Committee

Room 7

William McComas (ABTeditor@nabt.org), Committee Chair

#549 Free Online Stem Cell Curriculum: A Menu of Options for Any Class

Room 9 • Demonstration (75 min) • General Biology • HS 2Y

California's stem cell agency, a UC Berkeley team and high school teachers created a five-module stem cell curriculum. This workshop will walk through how the menu of activities can be fit into the existing standards, and two new modules fit the NGSS.

Don Gibbons, California Institute for Regenerative Medicine, San Francisco, CA

#ES22 Skeletons in the Classroom: Basics of Osteology

Room 10 • Hands-on Workshop (75 min) • Anatomy & Physiology • HS 2Y

In this hands-on workshop, you will learn the basics of osteology using Bone Clones® skeletal reproductions. Attendees will gain knowledge of human and mammalian osteology and ideas of lessons that may be created using Bone Clones® replicas.

Michelle Tabencki (michelle@boneclones.com), Bone Clones, Canoga Park, CA

#669 Genes, the Environment, and Me: Glucose Balance and Type 2 Diabetes

Room 11 • Demonstration (75 min) • General Biology • MS HS GA

Type 2 Diabetes provides a context for learning concepts like homeostasis and how genes and environment determine

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For more information on workshop descriptions and schedules, visit us at **explorer.bio-rad.com/workshops**.

NABT Cleveland Workshop Schedule

Join us and our partners for these great workshops.

Thursday November 13
11:45 AM – 1:00 PM *Room 23*
Effortlessly Integrate Inquiry with Glowing Bacteria *(AP Big Idea 3)*

Friday November 14
10:15 – 11:30 AM *Room 24*
***Investigating Animal Behavior with* C. elegans** *(AP Big Ideas 1, 2, 3, and 4)*
A special presentation by Cindy Gay of Steamboat Springs High School, Colorado

2:30 – 3:45 PM *Room 15*
Introduction to Biofuels with Vernier and Bio-Rad Laboratories

Saturday November 15
11:30 AM – 12:45 PM *Room 24*
Fixing the Need for a Nicotine Fix: Exploring Novel Methods in Treating Drug Addiction!
A special presentation by Tamica Stubbs of Phillip O. Berry Academy of Technology High School, North Carolina

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BIO-RAD

2:45pm – 4:00pm

continued

our traits. This new curriculum explores physiological, behavioral, and social factors that affect glucose balance and diabetes risk.

Joan Griswold (jcgriz@uw.edu) and Maureen Munn (mmunn@uw.edu), University of Washington, Seattle, WA

#612 NGSS and Standards Based Grading: The Perfect Match

Room 12 (Session A) • Paper (30 min) • Instructional Strategies/ Technologies • MS HS

Assessing NGSS performance expectations will require that students have multiple assessment opportunities to demonstrate their understanding of these expectations. Come and see how formative assessments and SBG can be the perfect fit to NGSS.

Jim Clark (healthandmedicinejclark@yahoo.com) and Samantha Johnson (Samantha.johnson2@gmail.com), Arroyo High School, San Lorenzo, CA

#585 Fun with Formative Assessment (Yes, We Said Fun!)

Room 12 (Session B) • Paper (30 min) • Instructional Strategies/ Technologies • 2Y GA

How do you know if your students understand the concepts you are teaching? How do you assess their skills and understanding before an exam? We will provide you with some quick and fun ways to assess learning in your classroom.

Sharon Lee-Bond (slee-bond@northampton.edu) and Kathy Kresge (kkresge@northampton.edu), Northampton Community College, Bethlehem, PA

#ES23 Biology for the Informed Citizen

Room 13 • Hands-on Workshop (75 min) • General Biology • HS 2Y 4Y

Oxford University Press author Donna Bozzone will be discussing her recently published non-majors Biology textbook *Biology For The Informed Citizen.*

Donna Bozzone (dbozzone@smcvt.edu), St. Michael's College, Colchester, VT

#ES24 Backyard Brains: Revealing the Body's Electrical Signals

Room 14 • Demonstration (75 min) • Neuroscience • MS HS 2Y 4Y

Do you want to bring neuroscience experiments into your classroom but cannot figure how or why? We are here to help with our experiments on insects and humans. See the signals of neurons, muscles, and your heart.

Timothy Marzullo (tim@backyardbrains.com), Backyard Brains, Ann Arbor, MI

#ES25 DNA Barcoding: Independent Student-Driven Inquiry

Room 15 • Hands-on Workshop (75 min) • AP Biology • HS 2Y 4Y

Need a new activity for AP® Biology, genetics, or molecular biology? Unlock the power of DNA barcodes right in your classroom and take student research to a new level. Using a simple protocol, students investigate the biodiversity of plants, mammals, fish, insects, and fungi.

Bruce Nash, Cold Spring Harbor Laboratory DNA Learning Center, Cold Spring Harbor, NY

Presented in partnership with Carolina Biological Supply Company

#ES26 Capturing Student Interest with Digital Interactivity

Room 16 • Hands-on Workshop (75 min) • Instructional Strategies/ Technologies • 2Y 4Y

Join an exploration of digital activities in biology courses by viewing interactives created by biology educators and designing your own interactive within a small group. Interactives will be shared prior to a brief conclusion and parting message.

Hannah Robus (hannah.robus@saplinglearning.com), Sapling Learning, Austin, TX

#ES27 The Struggle to Feed the World

Room 17 • Hands-on Workshop (75 min) • Environment/Ecology • MS HS 2Y

Participants complete lessons found on GrowNextGen.org that challenge students to analyze insect populations in real world applications. A panel of experts discuss soybeans and potential threats to their growth. Additional web curriculum explored.

Carol Warkentien (carol@educationprojects.org), Education Projects & Partnerships, Worthington, OH

#ES28 Simple Straight-Forward Probeware for Biology

Room 18 • Hands-on Workshop (75 min) • General Biology • MS HS

Come experience our new Ward's DataHub, a multi-funuctional probeware solution for Biology and Environmental Science. You'll find that data collection can be smart and simple with the right equipment.

Kelly Smith (kelly.smith@vwr.com), Ward's Science, Rochester, NY

2:45pm – 4:00pm

continued

#626 Integrating Biology and Physics: Lessons on Light and Sight

Room 19 • Hands-on Workshop (75 min) • General Biology • MS HS 2Y

Our workshop engages participants in several activities that could be integrated into a course map organized by conceptual ideas (as suggested in NGSS). Here we show an interdisciplinary example of color perception within biology and physics.

Hillary Lauren (lauren1@illinois.edu), Chandana Jasti (cjasti@illinois.edu), and Barbara Hug (bhug@illinois.edu), University of Illinois at Urbana-Champaign, Champaign, IL

#573 Teach Marine Biology Instead of Biology to NGSS Standards & Ocean Principles

Room 20 • Hands-on Workshop (75 min) • Marine Biology • MS HS 2Y

Comprehensive biology course focusing on marine life; teaching all required, various state/national biology standards! Includes lesson plans, labs, activities, games, web inter-actives/web-quests. Course components tried & test scores were exemplary.

Mark Friedman (Marklewisfriedman@gmail.com), Animo Leadership/Green Dot Public Schools, Inglewood, CA

#580 The ABCD's of Modeling: An NGSS Authentic Practice of Science

Room 21 • Hands-on Workshop (75 min) • General Biology • GA

Teachers will be introduced to four different modeling activities to engage students in an exploration of how models are used as an authentic practice of science.

Tim Herman (herman@msoe.edu) and Diane Munzenmaier, Milwaukee School of Engineering Center for BioMolecular Modeling, Milwaukee, WI

#593 Introduction to Epigenetics

Room 22 • Hands-on Workshop (75 min) • Genetics • HS 2Y GA

Experience an activity that promotes student learning about epigenetics and the role of diet, lifestyle and the environment in influencing gene expression within an individual and in some cases across generations.

Dana Haine (dhaine@unc.edu), UNC-Chapel Hill, Chapel Hill, NC

#ES29 Molecular Evolution: What Can Dogs Teach Us?

Room 23 • Hands-on Workshop (75 min) • Evolution • HS 2Y 4Y

FOTODYNE makes it possible to demonstrate the principles of evolution by looking at the DNA. Use electrophoresis to count the number of DNA differences of seven modern dog breeds and the gray wolf, their wild ancestor, then build a phylogenetic tree.

Theresa Dlugi (t.dlugi@fotodyne.com), FOTODYNE Inc., Hartland, WI

#681 SSE Presents: Say Hello to the Junco! Learning Evolution & Science with a Remarkable Backyard Bird

Room 24 • Demonstration (75 min) • Evolution • 4Y, HS, GA

Introduce yourself to one of North America's most common & abundant—yet amazing & diverse—groups of songbirds. Our science film brings students along on an international quest to understand evolution, behavior, ecology, & genetics. www.juncoproject.org.

Jonathan Atwell (jwatwell@indiana.edu), Indiana University, Bloomington, IN

#693 HHMI Presents: Good Cells Gone Bad: The Genetics of Cancer

Room 26B • Hands-on Workshop (75 min) • Genetics • HS 2Y 4Y

Learn how to use cancer to teach core cell biology and genetics concepts including genetic mutations, gene regulation, the cell cycle, and cell signaling pathways. Receive HHMI's free, classroom-ready resources for high schools and college courses.

Melissa Csikari (csikarimm@staffordschools.net), Colonial Forge High School, Stafford, VA and Megan Stine (stinem@hhmi.org), Howard Hughes Medical Institute, Chevy Chase, MD

#654 ASM Presents: Lab Safety and Bioterrorism Readiness Curricula

Room 26C • Paper • Microbiology & Cell Biology • HS 2Y 4Y

Laboratory personnel need continuing education training to be well prepared for emergency situations ranging from bioterrorism to pandemics. This presentation will discuss hands-on and active learning strategies for training clinical staff.

Christopher Woolverton, Kent State University, Kent, OH

Presented as part of the American Society of Microbiology's Symposium *Stem and the Clinical Microbiologist*

4:00pm – 7:00pm

Exhibit Hall Opening Reception

Hall A • Special Event

You are the guest of honor at this special opening reception showcasing the NABT exhibitor community. The NABT Exhibit Hall is the place to enhance your teaching with the latest and greatest tools and technologies, programs and resources. Mix business with pleasure by scoping out products, visiting with your favorite partners and meeting some new ones! The Exhibit Hall is all about exploration, and with a treasure hunt and special display from the Greater Cleveland Aquarium, this is not an event you want to miss!

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THURSDAY
November 13

4:00pm – 7:00pm

Undergraduate Education Poster Session
Hall A • Special Event

See the following page for full listing of poster titles and authors.

7:00pm – 9:00pm

Four-Year College & University Section Reception
Room 4 • Special Event

Join faculty, education researchers, graduate students, and others who make four-year colleges and universities their professional home. Network with colleagues and friends (and make new ones) at this popular reception.

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Two-Year College Section Reception
Room 5 • Special Event

Two-year college students are only as unique as their instructors. Share your challenges, epiphenies, and best practices with other two-year and community college teachers who "get it." The winner of the *Two-Year College Biology Teaching* and *Prof. Chan Teaching Award* will also be announced.

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AP Biology Section Reception
Room 6 • Special Event

You know the big ideas and your students are learning the enduring understandings. But what about that exam? And the labs? Meet other AP Biology teachers in this informal reception to network, share questions, and insight. You may even finally meet some of your favorite fellow AP teachers in person.

Sponsored by

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POSTER TITLES AND AUTHORS

1. **An Authentic Undergraduate Research Experience: Development and Maintenance of Student Identities**

   Jennifer A. Mraz, Chandrani Mishra, Kristy L. Halverson, Carrie J. Boyce, and Laila Ali, The University of Southern Mississippi, Hattiesburg, MS

2. **A Biology Module for the Integrative STEM Classroom: Nucleotide Base Colorimetric Detection using Silver Nanoparticles**

   Jennifer Schablik, Joyce Seifried, Manuel Figueroa, The College of New Jersey, Ewing, NJ

3. **Developing A Standards-Based Lesson that Aligns with NGSS on Photosynthetic Feedback Mechanisms using Data from a Research Experience for Undergraduate Pre-Service Science Teachers**

   Kaytlyn Goodwin, Julie Angle, Andrew Doust, and John Stewart, Oklahoma State University, Stillwater, OK

4. **High School Students' Understanding of Basic Scientific Concepts**

   Patrick Ward, Mark W. Bland, University of Central Arkansas, Conway, AR

5. **The Impact of GK-12 Biology Graduate Fellow Classroom Interactions on High School Students' Attitudes Toward Science**

   Rachel Lytle, Kim Sadler, Anthony Farone, Mary Farone, and Ginger Rowell, Middle Tennessee State University, Murfreesboro, TN

6. **An Integrative STEM Approach to Teaching about Hydrophobic Interactions using Self Assembled Monolayers**

   Joyce Seifried, Jennifer Schablik, and Manuel Figueroa, The College of New Jersey, Ewing, NJ

7. **Investigating the Impacts of an International STEM Service-Learning Course on College Students**

   Chandrani Mishra, Kristy L. Halverson, and Brian T. Gearity, The University of Southern Mississippi, Hattiesburg, MS

8. **Quantitative Assessment of Mobile Technology Efficacy on Student Achievement**

   Adam Lehnig, Steven Nagel, Cynthia Dassler, Rob Denton, and Roman Lanno, The Ohio State University, Columbus, OH

9. **Teaching and Assessing Student Awareness of Biodiversity**

   Steven Nagel, Steve Rissing, The Ohio State University, Columbus, OH

10. **What Chemistry Do Faculty Think Biology Students Have to Know to Understand Cellular Respiration?**

    Jay Lance Forshee II and Donald P French, Oklahoma State University, Stillwater, OK

ENTRIES NOT IN THE COMPETITION

11. **Class Generated Community Clicker Cases: Applying a Novel Pedagogic Approach to a Non-Major's Introductory Biology Class**

    Tamar L. Goulet, Lainy Day, Kristen A. Byler, and Kathleen Sullivan, University of Mississippi, University, MS

12. **Culturally Relevant Pedagogy to Increase Interest in Science for Non-Science Majors**

    Andrea L. Moore, Savannah State University, Savannah, GA

13. **Engaging Non-Science Majors in Biology, One Disease at a Time**

    Janette Klein and Rebecca Garcia, Hunter College, New York, NY

14. **Exploring Drivers of Variation in Marine Ecosystems: A Dynamic Ocean Lesson Plan**

    Jessica R. Bean and Lisa D. White, University of California-Berkeley, Berkeley, CA

15. **Growing a Thicker Skin: Organismal Adaptations for Terrestrial Habitats**

    Troy Nash, Suann Yang, and John Inman, Presbyterian College, Clinton, SC

16. **Improving Course Coherence and Refining Assessments: Using Understanding by Design in an Undergraduate Course**

    Julie E. Minbiole, Columbia College, Chicago, IL

17. **In-Class Meta-Analysis to Teach Scientific Consensus**

    Emily Rauschert, Cleveland State University, Cleveland, OH

18. **Instrument Development to Assess Student Conceptual Understanding in Biology**

    Tawnya Cary, Caroline Jakuba, and Janet Branchaw, University of Wisconsin-Madison Madison, WI

19. **Integrating Statistics and Biology in the AP Biology Classroom**

    Kari Clase, Loran Carleton Parker, Georgia Everett, Kathy Daniels, Kerry Quillen, and Joe Ruhl, Purdue University, West Lafayette, IN

20. **New Dimensions in Lab Course Assessment**

    Lisa Corwin Auchincloss, Aspen Robinson, Sarah Merkel, and Erin Dolan, University of Texas, Austin, TX

21. **Non-Majors Intro Biology: A Student Survey of Biology Topics**

    Anna Hiatt, Jane Ellis, Amanda Orenstein, Kim Sadler, and Margaret Carroll, East Tennessee State University, Johnson City, TN

22. **Professional Development for Naturalists-in-Training**

    Aimee K. Thomas, Marks McWhorter, and Kristy L. Daniel, Loyola University, New Orleans, LA

23. **Seeing the Forest by Interpreting the Trees: An Assessment Instrument for Evaluating Undergraduate Student Understanding of Evolutionary Trees**

    Kristin Jenkins, Louise Mead, Kristy Halverson, David Baum, and Carrie Boyce, BioQUEST, Madison, WI

24. **A Time- and Cost-Effective Lab Activity for Exploring Lysozyme**

    Jessica Habashi and Grant Wilson, Utah State University-Brigham City Regional Campus, Brigham City, UT

25. **Too Quick to Flip?**

    William H. Heyborne, Southern Utah University, Cedar City, UT

26. **Using Authentic Environmental Data to Enhance Biology Understanding**

    William Kroen, Wesley College, Dover, DE

27. **Using Contract Grading to Improve Performance of At-Risk Students in an Introductory Biology Course**

    Angela Hodgson, North Dakota State University, Fargo, ND

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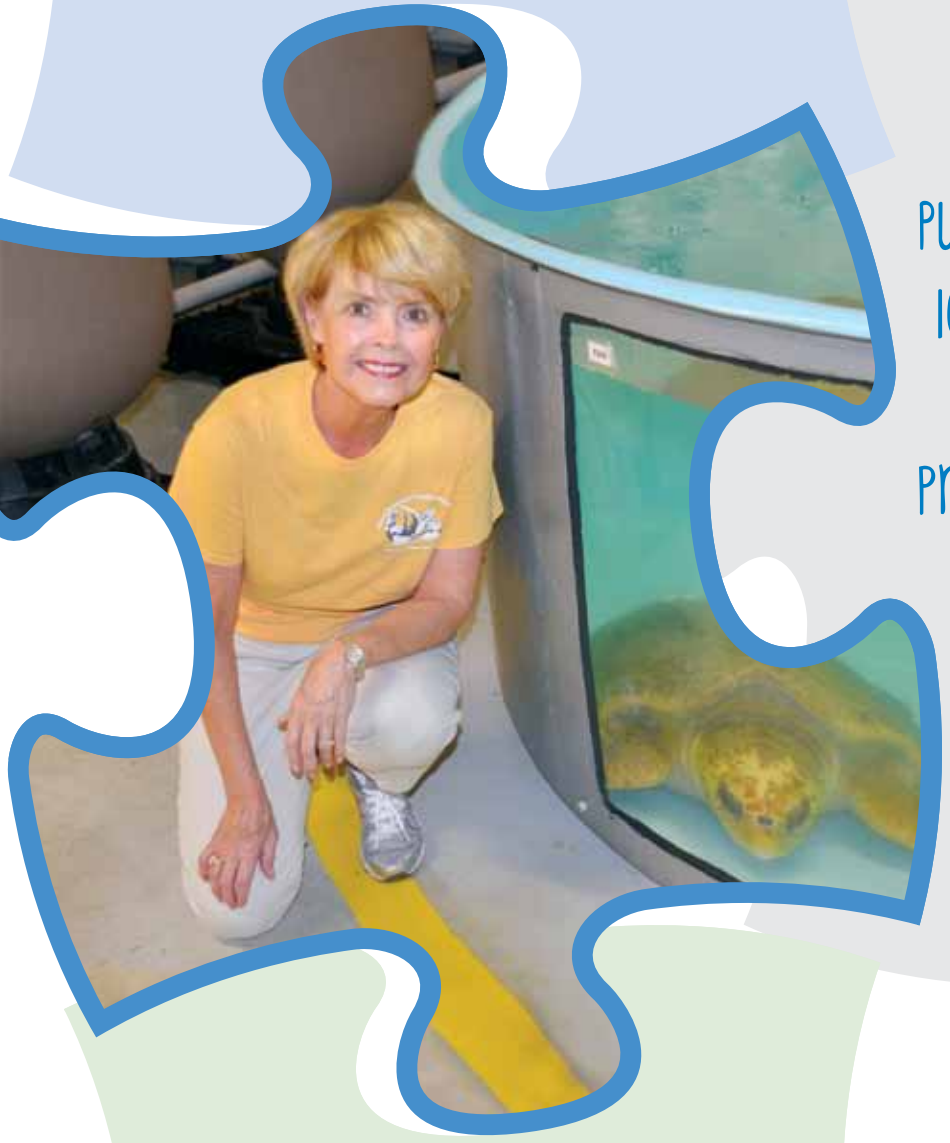

Put the pieces together to learn more about Jane. Once you find the next President of NABT, make sure you get your ticket to win some great prizes from PASCO scientific.

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AMERICAN SOCIETY FOR MICROBIOLOGY


FRIDAY
November 14

2014 NABT Undergraduate Biology Professional Development Summit

Friday, November 14
10:15am – 3:45pm
Room 23

"Bridging the Gap"

This year's summit focuses on solutions for the diffusion of innovation and projects that foster stronger connections between faculty across departments, institutions, and the biology education community.

Summit moderated by: **Jacqueline McLaughlin,** The Pennsylvania State University, Center Valley, PA
Anneke M. Metz, Southern Illinois University Carbondale, IL

10:15am – 10:25am **Symposium Introduction: Bridging the Gap** — Anneke M. Metz

10:25am – 11:00am **Keynote: Undergraduate Biology Education: The View from 20,000 Feet**
Erin Dolan, University of Texas at Austin, Austin, TX, Executive Director of the Texas Institute for Discovery Education in Sciences, Editor-in-Chief, *CBE-Life Science Education*

MORNING SESSION — TRAINING AND TRANSITIONS

11:00am – 11:25am **A Cross-Departmental Initiative for Implementing an Active-Learning Curriculum in a Non-Majors Biology Course**
Jeffery W. Bonner and Grant E. Gardner, Middle Tennessee State University, Murfreesboro, TN
Jennifer M. Landin, Miriam Ferzli & Damian Shea, North Carolina State University, Raleigh, NC

11:25am – 11:50am **Engaging Faculty and Students in Informed Design Case Studies that Reinforce Course Content Application**
Brian R. Shmaefsky, Lone Star College – Kingwood, Houston, TX

11:50am – 12:15pm **Let's BEGIn: Building Excellence in Genetics Instruction**
Michael J. Dougherty, American Society of Human Genetics, Bethesda, MD

12:15pm – 1:30pm **LUNCH BREAK**

AFTERNOON SESSION — INTERCOLLEGE CONNECTIONS

1:30pm – 1:55pm **Bringing an Inquiry-based Research Experience to a General Biology Laboratory Course: A Partnership between a 4-Year University and a 2-Year College**
Christine M. Goedhart, Citrus College, Glendora, CA
Melissa S. Coyle & Jacqueline S. McLaughlin, The Pennsylvania State University, Center Valley, PA

1:55pm – 2:20pm **Using Society Memberships and Vision and Change to Bridge the Gap between 2- and 4-Year Institutions**
Sharon Gusky and Tara Jo Holmberg, Northwestern Connecticut Community College, Winchester, CT
Barbara Nicholson, Central Connecticut State University, New Britain, CT

2:20pm – 2:45pm **The Northwest Biosciences Consortium: Bringing Vision and Change to Introductory Biology in Variable Institutions**
Erin Baumgartner, Western Oregon University, Monmouth, OR
Lori Kayes, Oregon State University, Corvallis, OR
Stacey Kiser, Lane Community College, Eugene, OR

2:45pm– 3:10pm **Wrap up and Future Directions**
Susan Musante, American Institute of Biological Sciences
& , Washington State University

STRETCH BREAK

3:15pm – 3:45pm **Nature's Pharmacy, Foraging for Plants That Can Heal, A Lab for Multi-Level Biology**
2014 NABT Four-Year College & University Section Biology Teaching Award Winner,
Jan Haldeman, Erskine College, Due West, SC

7:00am – 8:15am

Four-Year Section Breakfast Meeting

$ Room 4 • Special Program
Tickets Required • 4Y GA

Join the Four-Year College & University Section for their annual breakfast and business meeting. This event will include a special presentation of the Four-Year College & University Biology Research in Teaching and Four-Year College & University Biology Teaching Awards. The winners of the *Student Research Award* and *Student Travel Award* will also be recognized.

Two-Year Section Business Meeting

Room 5 • Special Program • 2Y GA

Get your breakfast to-go and head to the Two-Year College Section Meeting. Join other community college instructors to discuss initiatives impacting undergraduate education, challenges unique to teaching at this level, and programs and opportunities that will enhance your practice. All two-year and community college instructors are invited to attend.

NABT BioClub Breakfast

Room 6 • Special Program • MS HS 2Y 4Y GA

The NABT BioClub continues to grow, and boasts clubs from middle schools to community colleges throughout the United States and Canada. Both *current* and *future* BioClub Advisors are invited to share resources, feedback and stories about their chapters. Join the club (BioClub that is)!

Sponsored by CAROLINA www.carolina.com

8:30am – 9:30am

GENERAL SESSION

Briana Pobiner, Ph.D.

See page 8 for biography.

The Real Paleodiet: What Our Ancestors Ate and How We Know

Grand Ballroom A • Special Speaker

"What was the *real* "paleodiet," and how do we know? Dr. Briana Pobiner presents facts, fallacies, and fantasies in our understanding of the prehistoric human diet. She outlines the three significant changes in the evolution of human diets with a focus on the increase in meat-eating starting about 2.6 million years ago, discussing what makes human meat-eating unique, followed by the advent of cooking and the domestication of animals and plants. Using a variety of lines of evidence including the morphology, bone chemistry, and tooth microwear of early human fossils, butchered animal bone fossils, microscopic plant fossils left on the teeth of early humans, ancient stone tool technology, and living human hunter-gatherer and chimpanzee diets, she argues that prehistoric human diets most likely varied widely by season, time period, and geography. Finally, she gives examples of more recent human dietary evolution and questions the notion that many modern diseases are a result of us being 'maladapted' to our current diets.

9:30am – 10:15am

Exhibit Hall Coffee Break

Hall A • Special Event

Stop by the Exhibit Hall for a quick "pick me up" before you embark on another great day of NABT conference programs.

Sponsored by BIO CORPORATION

10:15am – 3:45pm

Undergraduate Biology Development Summit: *Bridging the Gap*

Room 23 • Symposium • 2Y 4Y

Building on last year's summit on *Vision and Change*, the theme of this year's event will highlight current efforts that are "Bridging the Gap." The summit will showcase solutions for the diffusion of innovation as well as projects that foster stronger connections between faculty across departments, institutions, and the biology education community.

See the previous page for a full listing of featured presentations.

10:15am – 11:30am

INVITED SPEAKER

Merry Lindsey, Ph.D.

See page 10 for biography.

Cardiac Wound Healing After a Heart Attack

Room 25B • Special Speaker

Following myocardial infarction (MI), the left ventricle (LV) responds by undergoing a series of changes that involve wall thinning, dilation, and infarct expansion; inflammation and necrotic myocyte resorption; and fibroblast accumulation and scar formation. Collectively, these events are referred to as LV remodeling. While LV remodeling is initially a compensatory response, the transition to adverse remodeling frequently culminates in the development of congestive heart failure (CHF), and CHF is a significant contributor to high cardiovascular morbidity and mortality rates for the MI patient. This talk will define LV remodeling, with particular emphasis on the inflammatory cell (macrophage) and enzyme (matrix metalloproteinase) dependent mechanisms that stimulate the extracellular matrix wound healing process.

abbrev. key

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

FRIDAY
November 14

10:15am – 11:30am

continued

#ES30 Cellular Respiration, Natural Selection, Experimental Design

Room 3 • Hands-on Workshop (75 min) • General Biology • 2Y 4Y

SimBio Virtual Labs explore biology topics using interactive simulations. Three new modules that let students tinker with the machinery of cellular respiration, investigate the mechanisms of natural selection, and learn how to design good experiments.

Eli Meir (kat@simbio.com), SimBio, Ithaca, NY

#629 Carbon TIME: Free Research-Based Curriculum for Teaching Carbon-Transforming Processes to Develop Environmental Science Literacy

Room 9 (Session A) • Demonstration (30 min) • Environment/Ecology • MS HS GA

Free online Carbon TIME materials are aligned to NGSS and focus on tracing matter & energy through photosynthesis, cellular respiration, digestion, biosynthesis, and combustion to support students in developing scientific accounts of these processes.

Wendy Johnson (john3062@msu.edu), Michigan State University, East Lansing, MI

#672 Implementing Vision and Change: Concept Maps as a Student-Centered Approach for Teaching Photosynthesis to Undergraduate Students

Room 9 (Session B) • Paper (30 min) • Plant Biology • 4Y

Results presented comparing two student groups to demonstrate the value of concept maps as an active-learning tool. Results also permitted identification of common misconceptions prevalent in both groups.

Valerie Haywood (vxh20@case.edu), Case Western Reserve University, Cleveland, OH

#691 BSCS Presents: Build Students' Understanding of Ecology Concepts Through Scientific Argumentation

Room 10 • Hands-on Workshop (75 min) • Environment/Ecology • HS 2Y

Experience an activity to help students learn ecology concepts and build scientific explanation skills. Consider adaptions of the activity for different points in your unit.

April Gardner and Jane Larson, BSCS, Colorado Springs, CO

#572 "Can You Explain That?" Inquiring Minds Want to Know

Room 11 • Hands-on Workshop (75 min) • Instructional Strategies/Technologies • MS HS

Want to experience evidence-based reasoning? Improve your students' science writing skills? Help your students make Evidence-Based Claims? Learn new reading & writing strategies to support the AP Biology Science Practices, NGSS, and Common Core (CCS).

Cheryl Ann Hollinger (biobabe07@hotmail.com), Science Consultant, Portland, OR and Nicole Veltre-Luton, Digital Harbor High School, Baltimore, MD

#649 NABT Teacher Cafe: Connecting Secondary and College Classroom Teachers

Room 12 • Hands-on Workshop (75 min) • Global Perspective • HS 2Y 4Y

Why are you coming to NABT? To collaborate with other great biology teachers? Bring your ideas to this facilitated building session designed to foster a dialogue between high school and college teachers about building bridges for student success.

Bethany Dixon (bdixon@rocklinacademy.org), Western Sierra Collegiate Academy, Rocklin, CA

#684 Joining *The American Biology Teacher* Team: Writing and Reviewing for the *ABT*

Room 13 • Demonstration (75 min) • Instructional Strategies/Technologies • E MS HS 2Y 4Y GA

The editors of *The American Biology Teacher* (*ABT*) will discuss all aspects of the journal from an introduction to the vision for *ABT* to the preparation, submission and review of manuscripts. Potential authors are especially encouraged to bring ideas to be discussed in a lively workshop designed to help focus an idea into a manuscript worthy of submission. So, if you want to offer suggestions on *The American Biology Teacher,* would like to assist with the important task of reviewing, or have an idea for an article, this is the session for you.

William McComas (ABTeditor@nabt.org), University of Arkansas, Fayetteville, AR

#577 Drugs, Drug Targets and You: An NIH-NIDA Project

Room 14 • Hands-on Workshop (75 min) • Neuroscience • HS 2Y 4Y

Let's talk about drugs! Join us for an exploration of the molecular nature of drugs and drug targets using hands-on engaging materials, including a neurosynapse construction kit to model action potentials and synaptic transmission.

Tim Herman (herman@msoe.edu) and Diane Munzenmaier, Milwaukee School of Engineering Center for BioMolecular Modeling, Milwaukee, WI

#ES41 Inquiry-Based Biology with Vernier

Room 15 • Hands-on Workshop (75 min) • AP Biology • HS 2Y 4Y

Need to add inquiry to your Advanced Placement Biology course? In this hands-on workshop, you will perform investigations using LabQuest 2 with our Gas Pressure Sensor and SpectroVis Plus Spectrophotometer to study enzymes.

John Melville (aharr@vernier.com), Vernier Software & Technology, Beaverton, OR

NEW *from* NORTON

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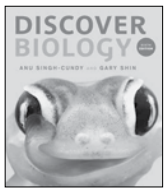

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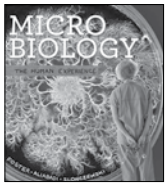

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Join us for the 2014 NESCent/BEACON Evolution Symposium

Evolution in Action!

Friday November 14th, 2014
Room 25B, Cleveland Convention Center

Evolution in Action draws on the idea that evolutionary change occurs in any system when *replication*, *variation* (mutation) and *differential fitness* (competition) are present. The 2014 Evolution Symposium highlights BEACON Center scientists who explore evolutionary processes in experimental systems, apply evolutionary principles of adaptation and resiliency in computer science and engineering design, and use computational systems in tandem with biological experiments to test complex biological hypotheses.

12:15 PM **Welcome/Introduction**

12:30 PM **Digital Darwin: Evolution in Action in Your Computer**
Robert Pennock, Professor, Lyman Briggs College, Dept. of Philosophy, Dept. of Computer Science and Engineering, Ecology and Evolutionary Biology and Behavior Program, Michigan State University. Evolutionary processes that shape the biological world can also be instantiated in virtual environments in a computer, making possible new sorts of evolutionary experiments and exciting new approaches for inquiry-based learning.

1:15 PM **Examining the Evolution of a Novel Trait in a Long-Term Experiment with *E. coli***
Zachary David Blount, Postdoctoral Research Associate, Michigan State University. Long-term experiments with microorganisms give scientists opportunities to study evolution in action, and to even observe novel traits and reconstruct how they evolve.

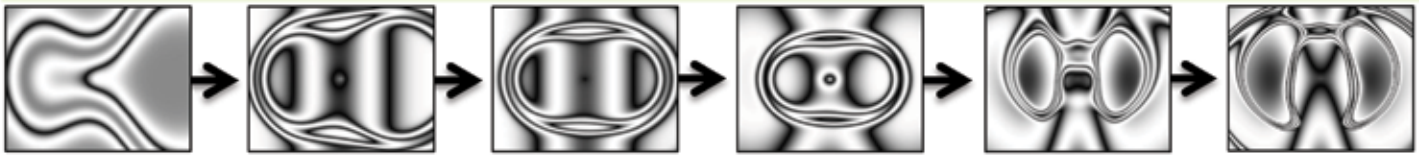
2:00 PM **Break**

2:15 PM **Making Scents: How Birds Use Odors to Communicate**
Danielle Whittaker, Managing Director, BEACON Center, Michigan State University. Contrary to long-held beliefs, birds do produce and detect odors, and these new findings have implications for understanding mate choice, speciation, and evolution.

3:00 PM **Ladybugs and Robots: Using Evolutionary Computation to Evolve Complex Behaviors**
Terrence Soule, Professor of Computer Science, University of Idaho. Evolution isn't just biological. Applying the same processes of variation, competition, and replication, in a computational environment, can evolve complex behaviors in robots, and develop learning tools for students.

3:45 **Wrap-up** and book giveaway.

4:15 **End**



Evolution in Action Teacher Workshop; Saturday November 15th 10am-12pm
Room 17, Cleveland Convention Center

10:15am – 11:30am

continued

#ES32 Capturing Student Interest with Digital Interactivity

Room 16 • Hands-on Workshop (75 min) • Instructional Strategies/Technologies • 2Y 4Y

Join an exploration of digital activities in biology courses by viewing interactives created by biology educators and designing your own interactive within a small group. Interactives will be shared prior to a brief conclusion and parting message.

Hannah Robus (hannah.robus@saplinglearning.com), Sapling Learning, Austin TX

#ES33 Oceans of Fun with Water Quality and PASCO Probeware

Room 17 • Hands-on Workshop (75 min) • Environment/Ecology • GA

Have a field day with innovative activities from PASCO's biology lab manuals and water quality sensors including the Optical Dissolved Oxygen Sensor. You'll be blown out of the water when you see how we make field sampling easier than ever before.

Ryan Reardon (droofner@pasco.com), PASCO scientific, Roseville, CA

#ES34 Pipelines, Partnerships, and Finding Funding

Room 18 • Hands-on Workshop (75 min) • General Biology • GA

The purpose of this workshop is to help teachers and other grant-seekers position themselves and their classrooms to find and become maximally competitive for grants and funding for their science projects.

Rusti Berent (rusti_berent@vwr.com), Ward's Science, Rochester, NY

#535 Student Choice AND Standards! A Reflective Portfolio Aligned to the AP Biology Framework

Room 19 • Hands-on Workshop (75 min) • AP Biology • HS

AP Biology requires students to do a large volume of rigorous work. Come see how a standards-based portfolio can collect students' best work, provide opportunities for metacognition, and simplify your grading all at once!

Stephen Traphagen (stephen@mrtraphagen.com), Rolling Meadows High School, Rolling Meadows, IL

#666 Biology's Best from Michigan!

Room 20 • Hands-on Workshop (75 min) • General Biology • MS HS 2Y

Award winning biology teachers from Michigan will present inquiry based lesson plans and units. We will also share engagement strategies and technology we use with our students to keep them actively involved in lessons and driving the curriculum.

Heather Peterson (hpeterso@hpsk12.net), Holt High School, Holt, MI

#542 Peer-Led Team Learning: Deepening the College Introductory Biology Experience

Room 21 • Paper (30 min) • General Biology • 2Y 4Y

Hear about Peer-Led Team Learning (PLTL) and how introductory biology students develop learning skills as they collaboratively solve real-world problems in challenging workshops. We present a study comparing student success with and without PLTL.

Judith Ridgway (ridgway.14@osu.edu, Sara Faust (Faust.60@osu.edu), Amy Kulesza (kulesza.5@osu.edu), Jonathan Horn (Horn.179@osu.edu), and Caroline Breitenberger (breitenberger.1@osu.edu), The Ohio State University, Columbus, OH

#610 What DNA Says About Our Human Family

Room 22 • Demonstration (75 min) • General Biology • HS 2Y 4Y

Come up to the minute with DNA research on human origins and learn simple methods to continue the exploration of this unfolding story in your classroom, including isolating student DNA and performing online analysis of DNA sequences.

Bruce Nash, CSHL- DNA Learning Center, Cold Spring Harbor, NY

#662 Investigating Animal Behavior with *C. elegans*

Room 24 • Hands-on Workshop (75 min) • AP Biology • HS 2Y 4Y

In this hands-on session, use the model organism *C. elegans* to investigate animal behavior and learning. In addition to studying behavior, students can observe developmental stages of the first multicellular organism to have its genome sequenced.

Cindy Gay (cgay@sssd.k12.co.us), Steamboat Springs High School, Steamboat Springs, CO

#645 Tiny Bubbles, Popcorn and More: Modeling Population Demographics

Room 25A • Hands-on Workshop (75 min) • AP Biology • HS

Ecology is all about energy and relationships. Participants will model student learning activities which explore the concepts of logistic and exponential growth, carrying capacity, survivorship curves, and Batsian mimicry.

Pam Close (pclose@columbia.k12.mo.us), Hickman High School, Columbia, MO

#698 HHMI Presents: Transcription and Gene Regulation

Room 26B • Hands-on Workshop (75 min) • Genetics • 2Y 4Y

Explore how HHMI's multimedia resources can be used to demonstrate different mechanisms for regulation of gene expression from molecular, cellular,

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10:15am – 11:30am

continued

and evolutionary perspectives. Particular emphasis will be placed on transcriptional regulation.

Elizabeth Rice (ricee@hhmi.org), Howard Hughes Medical Institute, Chevy Chase, MD

#531 American Association of Immunologists Presents: High School Teachers Research Program – Immunology Lessons for the Classroom

Room 26C • Symposium • AP Biology • HS

Join our teacher researchers from the *AAI High School Teachers Summer Research Program in Immunology* as they show you units that they developed which bring the excitement of immunology research to students in the classroom.

Clinton Mathias, Western New England University, Springfield, MA; Catherine Dollard, Northampton High School, Northampton, MA; Lori Fretta, Otter Valley Union High School, Brandon, VT; Edwina C. Kinchington, Pittsburgh Science & Technology Academy, Pittsburgh, PA; Beth R. Krauss, Manlius Pebble Hill School, DeWitt, NY; Amy Loewen, Hinkley High School, Aurora, CO; John Seifert, Conrad Weiser High School, Robesonia, PA; and Kindra M. Zuberbueller, Middle Creek High School, Apex, NC

11:30am – 12:45pm

Undergraduate Biology Task Force Meeting

Room 5 • Invitation Only

11:45am – 12:45pm

Lunch Break

It's time to take a break and "digest" what you've learned while you digest some food. Don't forget to stop by the Exhibit Hall during this free time.

12:15pm – 4:15pm

2014 NESCent & BEACON Evolution Symposium: *Evolution in Action*

Room 25B • Symposium • Evolution • GA

Evolution in Action draws on the idea that evolutionary change occurs in any system when replication, variation (mutation) and differential fitness (competition) are present. The 2014 Evolution Symposium highlights BEACON Center scientists who explore evolutionary processes in experimental systems, apply evolutionary principles of adaptation and resiliency in computer science and engineering design, and use computational systems in tandem with biological experiments to test complex biological hypotheses.

See page 50 for a full listing of featured presentations.

1:00pm – 3:45pm

NABT Graduate Student Panel: CV Workshop

Room 13 • Symposium • Instructional Strategies/Technologies • 4Y

How will your CV stack up to the competition? What are your strengths and weaknesses when it comes to getting that first job? Come join a panel of faculty experts to review and critique your CV. You will be able to sit down one on one with a faculty member and have your questions answered! Don't forget to bring an electronic or paper copy of your CV.

Presented by the NABT Graduate Student Committee

#637 Wisconsin Fast Plants Presents: Student-Centered Inquiry

Room 26C • Hands-on Workshop • Instructional Strategies/Technologies • GA

Genetic Variation and the Flowering Plant Life Cycle with Wisconsin Fast Plants (1:00pm – 2:15pm)

Join us in this highly interactive session to learn four short activities that use Wisconsin Fast Plants to teach about structures and their functions in flowering plants and the genetic and phenotypic variation that occurs through sexual reproduction.

Hedi Baxter Lauffer (hfbaxter@wisc.edu), University of Wisconsin-Madison, Madison, WI

Teaching Quantitative Skills with Wisconsin Fast Plants (2:30pm – 3:45pm)

Bring your computer. Using data from genotypic and phenotypic variation in Fast Plant activities, we will explore the essential role that computers play to help students develop quantitative skills from data exploration to hypothesis testing.

Brad Williamson, University of Kansas, Lawrence, KS

1:00pm – 2:15pm

#ES35 Increase Student Engagement Using Learning Catalytics™

Room 3 • Hands-on Workshop (75 min) • Instructional Strategies/Technologies • HS 2Y 4Y

Bring your web-enabled laptop, smartphone, or tablet to try the *Learning Catalytics* student engagement, assessment, & classroom intelligence system. Biologist Rebecca Orr of Collin College will share active learning examples & results from her class.

Rebecca Orr (rorr@collin.edu), Pearson / Collin College, Plano, TX

Committee Meeting: Professional Development Committee

Room 7

Catherine Ambos (msambos@gmail.com), Committee Chair

#678 Ecology Meets Molecular Biology: Let's Hear it for the Frogs

Room 9 • Paper (75 min) • Environment/Ecology • HS 2Y 4Y

This project would be a wonderful interface between high school students

continued

and a local university. It involves both ecology and molecular biology. Students can enjoy the best of both worlds: outdoors and at the lab bench.

Sandra Latourelle (latours@plattsburgh.edu) and Nancy Elwess (elwessnl@plattsburgh.edu), SUNY Plattsburgh, Plattsburgh, NY

#688 BSCS Presents: Using Evidence-Based Medicine to Teach NGSS Science Practices

Room 10 • Hands-on Workshop (75 min) • General Biology • HS 2Y 4Y

EvidenceWorks is a video case-based module aimed at advanced high school and early college students. Participants will engage in a portion of the evidence-based medicine process to consider a medical question of therapy.

Jody Bintz (jbintz@bscs.org), BSCS, Colorado Springs, CO

#539 Modeling Using Digital Simulations

Room 11 • Hands-on Workshop (75 min) • Instructional Strategies/Technologies • HS

Attend this session to learn how to use and revise digital simulations to model biological concepts. All simulations are available for free, and they are created with free modeling software called NetLogo.

Robert Wallon (rwallon2@illinois.edu), Hillary Lauren (hzg.lauren@gmail.com), and Barbara Hug (bhug@illinois.edu), University of Illinois at Urbana-Champaign, Champaign, IL

#492 Standards-Based Learning in the Biology Classroom

Room 12 • Symposium (75 min) • Instructional Strategies/Technologies • MS HS GA

This session will discuss standards-based learning/standards-based grading approaches to assessment and instruction in the biology classroom. Participants will be exposed to the "how" and the "why" of the standards-based grading approach.

David Knuffke, Deer Park High School, Deer Park, NY and Robert Kuhn, Centennial High School, Roswell, GA

#579 Genomics and Personalized Medicine: An NIH-SEPA Project

Room 14 • Hands-on Workshop (75 min) • Genetics • HS 2Y 4Y

Come and experience new instructional tools that will expand your teaching of the Central Dogma

1:00pm – 2:15pm

continued

of molecular biology to include new developments in genomics. Learn about how genome sequencing impacts health care and precision medicine.

Tim Herman (herman@msoe.edu) and Diane Munzenmaier, Milwaukee School of Engineering Center for BioMolecular Modeling, Milwaukee, WI

#ES36 Field Biology with Vernier

Room 15 • Hands-on Workshop (75 min) • Environment/Ecology • HS 2Y 4Y

Engage students by collecting field data in your Advanced Placement, field biology, and ecology courses. Use Data Matrix mode and internal GPS on LabQuest 2 to get the most out of your long-term field studies.

John Melville (jmelville@vernier.com), Vernier Software & Technology, Beaverton, OR

#ES37 Capturing Student Interest with Digital Interactivity

Room 16 • Hands-on Workshop (75 min) • Instructional Strategies/Technologies • 2Y 4Y

Join an exploration of digital activities in biology courses by viewing interactives created by biology educators and designing your own interactive within a small group. Interactives will be shared prior to a brief conclusion and parting message.

Hannah Robus (hannah.robus@saplinglearning.com), Sapling Learning, Austin, TX

#ES38 Liven Up Your Lab: Sensors for Inquiry in AP® Biology

Room 17 • Hands-on Workshop (75 min) • AP Biology • HS GA

Migrate over to explore how PASCO sensors can help deliver content and inquiry in the new AP® Biology labs. And you'll breathe easy knowing our free SPARKvue software is easy to use to help grow your students' critical thinking and analysis skills.

Mark Little, PASCO scientific, Roseville, CA

#ES39 Designing For Dollars

Room 18 • Hands-on Workshop (75 min) • General Biology • GA

The purpose of this workshop is to help teachers turn their science education ideas into well designed projects that will engage and excite funders.

Rusti Berent (rusti.berent@vwr.com), Ward's Science, Rochester, NY

#643 From Surviving to Thriving: Making Strides Toward an Amazing AP Biology Career Part II

Room 19 • Symposium (75 min) • AP Biology • HS GA

What's the difference between teaching AP Biology and being a Rock Star AP Biology teacher? How can early-career teachers transition from surviving to innovating in the profession? What keeps great AP Biology teachers in the profession and how can we keep them there? Two novices and a panel of veteran special guests share stories of survival and success in this dialogue. Bring your questions and strategies for enjoying the ride.

Bethany Dixon (bdixon@rocklinacademy.org), Western Sierra Collegiate Academy, Rocklin, CA, Jenny Sarna (jennysarna@gmail.com), Farragut Career Center, Chicago, IL, and Valerie May (vmay@woodstockacademy.org), Woodstock Academy, Woodstock, CT

#651 Digital Biology

Room 20 • Demonstration (75 min) • General Biology • MS HS

Are your students technologically ahead of you? Come learn how to excite and engage them by turning your classroom into a digital classroom using iPads, digital microscopes, wireless cameras, and computers.

Whitney Hagins, Massachusetts Biotechnology Foundation, Cambridge, MA

#670 Gene-Environment Interactions in the Nematode *Caenorhabditis elegans*

Room 21 • Hands-on Workshop • General Biology • HS 2Y

Participants will compare the activity of two nematode strains - wild type and an OSM mutant - at two salt concentrations. Based on analysis of their own and published data, they will describe how gene-environment interactions determine traits.

Maureen Munn (mmunn@u.washington.edu) and Joan Griswold (jcgriz@uw.edu), University of Washington, Seattle, WA

#520 Small World Initiative: Crowdsourcing Antibiotic Discovery in the Lab

Room 22 • Demonstration (75 min) • Microbiology & Cell Biology • 2Y 4Y

We have developed an undergraduate independent research lab course in antibiotic discovery from soil bacteria obtained locally. We will demonstrate how you can implement this in your lab, and share your results online with students nationwide.

Todd Kelson, Brigham Young Univ-Idaho, Rexburg, ID and Barb Murdoch, Eastern Connecticut State Univ, Willimantic, CT

#600 Understanding Genomics Through Complex Traits

Room 24 • Hands-on Workshop (75 min) • Genetics • HS 2Y 4Y

Genomics increasingly focuses on complex traits such as autism and height, which expand our understanding of the genetics of "single-gene" traits. Help your students learn the concept of polygenic inheritance using an inquiry-based activity.

Michael Dougherty (mdougherty@ashg.org), American Society of Human Genetics, Bethesda, MD

1:00pm – 2:15pm

continued

#647 Challenging Students (and Us) to Listen, Evaluate, and Think Creatively

Room 25A • Symposium (75 min) • Instructional Strategies/Technologies • 2Y 4Y

This session will address ways to develop students' abilities to listen empathetically, generate ideas, and evaluate their work. Examples from introductory biology and advanced physiology courses will be demonstrated.

Taylor Allen (tallen@oberlin.edu), Oberlin College, Oberlin, OH, Sharon Gusky (sgusky@nwcc.edu), Northwestern Connecticut Community College, Canton, CT and Karen Klyczek (karen.k.klyczek@uwrf.edu), University of Wisconsin-River Falls, River Falls, WI

#584 Rethinking the Role of Engineering in the Biology Classroom: Designing a Cell to Do Anything You Want!

Room 25C • Hands-on Workshop (75 min) • Microbiology & Cell Biology • MS HS 2Y

Synthetic biology provides an unique opportunity to blend different fields and approaches to spark engagement and learning in a single learning experience. Synthetic Biology is part science, part engineering, part imagination and design.

Lynne Williams, Coronado High School, Colorado Springs, CO, Vyjayanti Joshi, Lake View High School, Chicago, IL and Sherry Annee, Brebeuf Jesuit Preparatory School, Indianapolis, IN

#697 HHMI Presents: Resources for Exploring DNA-Based Phylogenies

Room 26B • Hands-on Workshop (75 min) • Evolution • 2Y 4Y

Discover how to introduce students to basic bioinformatics concepts, explore sequence alignment and tree-building tools, and guide interpretation of alignments and phylogenetic trees with free multimedia resources from HHMI.

Satoshi Amagai (amagais@hhmi.org), Howard Hughes Medical Institute, Chevy Chase, MD

2:30pm – 3:45pm

#ES40 MasteringBiology™ Greatest Hits and New Releases

Room 3 • Demonstration • General Biology • HS 2Y 4Y

Whether you're new to *MasteringBiology* or a long-time user of Pearson's widely-used online assessment & tutorial program, this session is for you! Join us for refreshments & share your feedback on existing assignments & new items in development.

Joshua Frost (josh.frost@pearson.com), Pearson Education, San Francisco, CA

Committee Meeting: Membership Committee

Room 7

Sherry Annee (sannee@brebeuf.org) and Sue Trammel (suetrammell@jalc.edu), Committee Co-chairs

Committee Meeting: Retired Members Committee

Room 7

Dennis Gathmann (mpidig@yahoo.com), Committee Chair

#560 Using Simulations in the Environmental Science Classroom

Room 9 • Hands-on Workshop (75 min) • Environment/Ecology • HS 2Y 4Y

Participate in two simulations on environmental issues. *NIMBY,* a landfill-siting scenario, examines the difficulties in dealing with solid waste.

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continued

Kildare, an environmental health scenario, investigates a strange disease outbreak in a lakeside town.

Linda Sigismondi (lindas@rio.edu), University of Rio Grande, Rio Grande, OH

#605 Achieving Success and Motivation with the Common Core and Next Gen Standards in Urban Schools

Room 10 • Hands-on Workshop (75 min) • General Biology • HS

We'll demonstrate and share proven brain research-based differentiation strategies to improve motivation, retention and success for all students.

Gerard Vargas (gvargas@greendot.org), Green Dot Public Schools, Los Angeles, CA and Mark Friedman (mfriedman@animo.org), Animo Leadership Charter High School, Inglewood, CA

#627 Games as Models: Engaging Students in the NGSS Practices

Room 11 • Hands-on Workshop (75 min) • Instructional Strategies/Technologies • MS HS 2Y

Explore how the same learning goals and skills (collecting data, making predictions) utilized in the practice "Developing and Using Models" can be addressed through engaging role-playing games. Join us to play and discuss! Free NIH SEPA materials.

Hillary Lauren (hillary@strangeloopgames.com), Strange Loop Games, Seattle, WA and Barbara Hug (bhug@illinois.edu), University of Illinois at Urbana-Champaign, Champaign, IL

#541 Unpacking Protein Synthesis: A High School Biology Lesson Study

Room 12 (Session B) • Paper (30 min) • General Biology • MS HS

Learn how eight Chicago science teachers tackled the hard-to-teach topic of Protein Synthesis. In this session, hear takeaways from our collaborative process, receive NGSS-aligned materials, and consider how lesson study can transform your teaching.

Jenny Sarna (jasarna@cps.edu), Chicago Public Schools, Chicago, IL

#589 Using Scientific Data to Promote Student Learning About Epigenetic Inheritance

Room 14 • Hands-on Workshop (75 min) • Genetics • HS 2Y 4Y

Receive and conduct two classroom activities that invite students to interact with data emerging from two epigenetic research projects pertaining to environmental health at University of North Carolina's Gillings School of Public Health.

Dana Haine (dhaine@unc.edu), UNC-Chapel Hill, Chapel Hill, NC

#ES31 Introduction to Biofuels with Vernier and Bio-Rad Laboratories

Room 15 • Hands-on Workshop (75 min) • Biotechnology • HS 2Y 4Y

In this workshop, use LabQuest 2 with a SpectroVis Plus Spectrophotometer and the Biofuel Enzyme Kit from Bio-Rad. Learn how to use our CO_2, Gas Pressure, and Ethanol Sensors in activities developed by the Great Lakes Bioenergy Research Consortium.

John Melville (jmelville@vernier.com), Vernier Software & Technology, Beaverton, OR

#ES42 Increasing Student Engagement with an Online Learning System

Room 16 • Demonstration (75 min) • Instructional Strategies/Technologies • 2Y 4Y

Created by and for educators, Sapling Learning online homework combines freedom of choice, passionately crafted content, targeted feedback, and a personal relationship with a dedicated Technology TA to engage students and empower educators.

Mickey Scherrer, OpenStax College, Houston, TX

#ES43 How To Turn Your iPad® into a Mobile Science Lab

Room 17 • Hands-on Workshop (75 min) • Instructional Strategies/Technologies • GA

Turn the tables on your tablet in (or out of) your lab with PASCO sensors and SPARKvue HD software. Transform lessons with this practical session using a SPARKlab to show how easy it is to integrate technology into hands-on, inquiry investigations.

Ryan Reardon, PASCO scientific, Roseville, CA

#ES44 Cellular Respiration, Natural Selection, Experimental Design

Room 18 • Hands-on Workshop (75 min) • General Biology • 2Y 4Y

SimBio Virtual Labs explore biology topics using interactive simulations. Three new modules that let students tinker with the machinery of cellular respiration, investigate the mechanisms of natural selection, and learn how to design good experiments.

Eli Meir (kat@simbio.com), SimBio, Ithaca, NY

#544 How Do You Know What They Know?

Room 19 • Hands-on Workshop (75 min) • AP Biology • HS 2Y

This workshop will introduce participants to one of the new AP Biology inquiry labs. We will provide data and then use several formative assessment strategies to enable teachers to quickly check for understanding and guide their instruction.

Cindy Gay (cindyjgay@gmail.com), Steamboat Springs High School, Steamboat Springs, CO and Tamara Pennington (tamara.pennington@weldre4.k12.co.us), Windsor High School, Windsor, CO

2:30pm – 3:45pm

continued

#562 Round Holes and Square Pegs: How do Traditional Biology Activities fit into NGSS?

Room 20 • Hands-on Workshop (75 min) • General Biology • MS HS

Join us as we explore an Expanded DNA Extraction Lab as a model for evaluating traditional biology activities in light of NGSS. Discussion will include: Approaching alignment and modifying existing activities with NGSS. When do I need a new peg?

Jennifer Carden and Madelene Loftin, HudsonAlpha Institute for Biotechnology, Huntsville, AL

#496 The Human Microbiome

Room 21 • Hands-on Workshop (75 min) • General Biology • HS

Explore the ecosystem of the human body. Learn what we're discovering about the body's microbes and how they influence our health. Free materials at http://learn.genetics.utah.edu

Louisa Stark, Genetic Science Learning Center, Salt Lake City, UT

#609 Analyzing DNA Sequences to Understand Evolutionary Relationships

Room 22 • Demonstration (75 min) • General Biology • HS 2Y 4Y

Engage students in student-driven research by identifying plants, animals, and food sources through unique DNA barcodes. Use online bioinformatics tools to analyze DNA sequences and create phylogenetic trees.

Bruce Nash, CSHL-DNA Learning Center, Cold Spring Harbor, NY

#532 Anatomy & Physiology - Activities & Strategies

Room 24 • Hands-on Workshop (75 min) • Anatomy & Physiology • MS HS

This presentation demonstrates techniques that make learning human anatomy and physiology both vivid and memorable. The presentation will highlight modeling, activities, games, and projects that appeal to a variety of learning styles and abilities.

Sylvia Tufts, Dominican University, River Forest, IL

#657 You Can Test the New Skills and Standards with Multiple Choice Questions

Room 25A • Symposium (75 min) • Instructional Strategies/Technologies • MS HS GA

Well-written multiple-choice questions can assess the higher-level skills found in the AP Biology learning objectives and the NGSS. Test developers from Educational Testing Service will share the techniques you can use to write these questions.

Israel Solon (isolon@ets.org) and Mitch Price (mprice@ets.org), Educational Testing Service, Princeton, NJ

#575 How Do I Use the New Next Generation Science Standards in My High School Classroom?

Room 25C • Hands-on Workshop (75 min) • Curriculum Development • MS HS

Experience active learning as you work to familiarize yourself with the newly released NGSS and sample some of the many free resources available in the *Archive of Teaching Resources* that can help. Engage in two hands-on activities from teacher-developed lessons designed to inspire participants to have their students move beyond normal textbook learning into actively engaging students in higher level thinking. Hand-outs of the activities will be provided.

Margaret Shain (mshain@the-aps.org) and Miranda Byse (mbyse@the-aps.org), American Physiological Society (APS), Bethesda, MD

FRIDAY
November 14

FRIDAY
November 14

4:00pm – 5:30pm

Exhibit Hall Closing Reception

Hall A • Special Event

It's *last call* in the Exhibit Hall, and your last chance to talk with exhibitors. And don't forget those freebies for your classroom. It's all fun and games, with prizes and a Cleveland Zoo experience to close the Exhibit Hall in style.

Reception Sponsored by

ward's science

Cleveland Zoo Animal Show Sponsored by

wildlife ACOUSTICS
BIOACOUSTICS MONITORING SYSTEMS

6:45pm – 11:00pm

HHMI Night at the Movies with Sean Carroll

T Rock & Roll Hall of Fame • Tickets Required

Join us at the 4th Annual *Night at the Movies with Sean Carroll* at the Rock & Roll Hall of Fame.

This year's event will feature a special guest, University of Chicago paleontologist and award-winning author of *Your Inner Fish,* Dr. Neil Shubin. He is joining Dr. Carroll for a screening of the film *Great Transitions: The Origin of Tetrapods.* Starring Dr. Shubin, the film provides a first-hand account of the painstaking search for *Tiktaalik,* a fossil creature with a mix of features common to fish and four-legged animals. The film will be followed by Q&A with Drs. Carroll and Shubin.

There are two showings of the film (7:30pm and 8:30pm), free food and drink, and full admission to the Rock Hall's museum—with plenty of time to tour the venue.

Shuttles will depart from both the Cleveland Marriott Downtown at Key Center and Westin Cleveland Convention Center ***starting at 6:45pm.***

Return shuttles will be departing the Rock & Roll Hall of Fame ***until 11:00pm.***

Sponsored by

hhmi BioInteractive

NABT Video Contest

Coming in 2015!

NABT
National Association of Biology Teachers

NABT
National Association of Biology Teachers

THANKS
the many volunteers
who worked so hard to make the 2014 Conference
a success.

2014 CLEVELAND
NABT PROFESSIONAL DEVELOPMENT CONFERENCE

SATURDAY
November 15

#NABR2014

7:00am – 8:15am

Past President's Breakfast
David's Restaurant, Marriott Key Center • Invitation Only

Four-Year College and University Section Executive Meeting
Room 7 • Invitation Only

8:30am – 9:30am

GENERAL SESSION

The Lacks Family represented by Shirley Lacks & Victoria Baptiste
Recipients of the 2014 NABT Distinguished Service Award

Bio appears on page 9.

Henrietta Lacks: Treasured Memories and Her Family's Journey
Grand Ballroom A • Special Speaker

During this presentation, the Lacks Family will share visual images and stories of their journey discovering Henrietta Lacks' great contributions to medicine and society, while answering some of the key questions that readers of the bestselling The *Immortal Life of Henrietta Lacks* often wonder about. The presentation will reflect on Henrietta as a woman and as a medical icon who has affected people lives worldwide. Discussions with the family will explore aspects of the roles we all play related to moral obligations, religion, health care, education and family. The presentation will also include a moderated Q&A Session.

9:30am – 10:00am

BELS Special Event: Book Signing & Reception
Grand Ballroom A • Special Speaker

Join members of the family of Henrietta Lacks for a special reception and book signing event.

Sponsored by PASCO

10:00am – 12:45pm

#687 The College Board Presents: Integrating Inquiry-Based Activities and Assessment in AP Biology
Room 16 • Symposium • AP Biology • HS

Session I:
Strategies for Designing and Implementing an Effective AP Biology Curriculum

In this session, participants will investigate the use of project based learning in AP Biology. Projects allow students to apply skills to integrated content areas and provide instructors with opportunities to use formative assessment to provide real-time feedback to students about their knowledge of content, as well as their ability to act and think like scientists. We will also highlight some of the ways that formative assessment differs from summative assessment in design and implementation.

Session II:
Transitioning Traditional AP Biology Activities to Inquiry-Based Critical Thinking Activities

In this session, participants will transition a traditional classroom and/or lab activity to one that integrates skills and content to align with the Learning Objectives of the Curriculum Framework. Participants will learn techniques for easily transitioning existing labs, how to modify the duration of inquiry activities, and the role of assessment during and after the activities.

Session III:
Writing and Reviewing Assessment Questions for the AP Biology Examination

In this session, participants will participate in a debrief of the *2014 AP Biology Free Response Examination.* Participants will also learn techniques for writing and reviewing questions that integrate skills and content in AP Biology.

Jennifer Pfannerstill (jpfannerstill@nscds.org), North Shore Country Day School, Winnetka, IL; Gordon Uno (guno@ou.edu), University of Oklahoma, Norman, OK; Jim Smanik (jsmanik@gmail.com), Sycamore High School, Cincinnati, OH; Sharon Radford (radford.sharon@paideiaschool.org), Paideia School, Atlanta, GA; and Tanya Sharpe (lsharpe@collegeboard.org), The College Board, Duluth, GA

9:00am – 1:00pm

Special Workshop: #597 Bloodsuckers and Climate: Insect-Borne Disease Investigations at the Yale Peabody Museum of Natural History

T Room 25A • Environment/Ecology • MS HS GA
Tickets Required

Investigate insect-borne infectious diseases (dengue, malaria, chikungunya, leishmaniasis) and expanding ranges due to climate changes (temperature, precipitation). Explore interdependent relationships in ecosystems. Grades 7-12. NIH/SEPA funded.

Beth Biegler Hines (beth.hines@yale.edu), Yale Peabody Museum of Natural History, New Haven, CT

abbrev. key

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

SATURDAY
November 15

sustainability

Sustainability Symposium: Engaging Students in Scientific Solutions & Civil Discourse

Saturday • 10:00am – 12:45 pm
Room 25B

Highlighting resources to teach sustainability concepts, the symposium will give you practical tools to engage your students in meaningful dialogue about climate change and explore solutions for the world's most pressing issues. The symposium will also review NABT's involvement in the "Sustainability Improves Student Learning (SISL)" project and the Association's ongoing commitment to promote sustainability education.

Taking initiative, solving problems, implementing ideas, and being able to participate in civil discourse about interconnected scientific, economic, and social ideas are important skills that our students need so they can meet the challenges of work, citizenship, and a changing climate.

This workshop will:

- Provide a platform to discuss issues related to teaching about climate change and sustainability,
- Offer research based, practically-sound pedagogical ideas to overcome challenges and teach safely about climate,
- Cover common misconceptions and points of disagreement,
- Create opportunities to practice communication (discourse) techniques,
- Provide in-class activities (with modifications for the large lecture course),
- Provide concrete suggestions for campus-community project based learning based on experiences,
- And include guidance on how to evaluate student and project outcomes.

Symposium Facilitators include:

Debra Rowe, Ph.D. is the President of the U.S. Partnership for Education for Sustainable Development, Co-Founder of the Higher Education Associations Sustainability Consortium, Founder/Facilitator of the Disciplinary Associations' Network for Sustainability (www.aashe.org/dans), Senior Fellow at Second Nature, and Senior Advisor to the Association for the Advancement of Sustainability in Higher Education (www.aashe.org). Debra has also been professor of energy management and renewable energies at Oakland Community College for over 30 years and teaches *Campus Sustainability* and *Corporate Sustainability* for the University of Vermont.

Teddie Phillipson-Mower is the *NABT Representative for Sustainability Education* and has been a biology and environmental educator for over 25 years in both formal and informal contexts, and at all levels, from pre-school through university graduate training. Teddie is currently a consultant for science and environmental program assessment and evaluation, teaches courses in habitat analysis and sustainability at Indiana University, teaches and practices permaculture, is the Program Officer of the Bluegrass and Hoosier Bioneers, and acts as a community sustainability outreach liaison for the University of Louisville.

NABT is a proud participant in the project entitled "Sustainability Improves Student Learning (SISL)," a multi-disciplinary STEM initiative funded by the U.S. Department of Education.

10:00am – 12:45pm

continued

#519 BEACON/NESCent Evolution Teacher Workshop - "Evolution in Action"

Room 17 • Hands-on Workshop • Evolution • 4Y

Attend this hands-on workshop to learn about classroom resources and activities focusing on "Evolution in Action". This workshop is a follow-up to the BEACON/NESCent Evolution Symposium on "Evolution in Action".

Louise Mead (lsmead@msu.edu), BEACON, East Lansing, MI and Jory Weintraub (jory@nescent.org), NESCent, Durham, NC

Sustainability Symposium: Engaging Students in Scientific Solutions & Civil Discourse

Room 25B • Symposium • Environment/Ecology • 2Y 4Y GA

Highlighting resources to teach sustainability concepts, the symposium will give you practical tools to engage your students in meaningful dialogue about climate change and explore solutions for the world's most pressing issues. The symposium will also review NABT's involvement in the "Sustainability Improves Student Learning (SISL)" project and the Association's ongoing commitment to promote sustainability education.

See the previous page for more details.

Regional Teacher Academy (RTA) Planning Meeting

Room 25C • Invitation Only

10:30am – 11:15am

INVITED SPEAKER

Jay Labov, Ph.D.

Recipient of the 2014 NABT Honorary Membership

See page 10 for biography.

Musings of a Policy Wonk on Working With, Having Been, and Being a Teacher

Room 23 • Special Speaker

Before spending almost 20 years at the National Academy of Sciences working on the improvement of biology and science education, Jay Labov was a practitioner of these disciplines. This presentation will look back on 30 years of his own teaching career, as well as his close work with teachers, and how those experiences have influenced and improved his current work regarding education policy.

10:00am – 11:15am

Committee Meeting: Nominating Committee

Room 7

Betsy Ott (bott@tjc.edu), Committee Chair

#ES45 Custom Digital Solutions for Biology Labs

Room 9 • Symposium • General Biology • 2Y 4Y

Demonstration of our custom digital capabilities highlighting some examples of pre-lab solutions, online lab courses, videos, online lab manuals and more.

Katy Trionfi (ktrionfi@hmpublishing.com), Hayden-McNeil Publishing, Plymouth, MI

#518 Using Manipulatives to Teach Surface Area Volume Ratio

Room 10 • Hands-on Workshop (75 min) • General Biology • HS 2Y 4Y

Surface area/volume ratio is a fundamental concept to understand the cell size and its

SATURDAY
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10:00am – 11:15am

continued

functions. Students will use manipulatives to explore perimeter/area ratio and then build to a more complex three-dimensional surface area/volume concept.

Umadevi Garimella (ugarimel@uca.edu), University of Central Arkansas, Conway, AR

#559 Testing the Effectiveness of Herbal Medicines

Room 11 • Hands-on Workshop (75 min) • General Biology • HS 2Y 4Y

Many different cultures have claimed curative powers of certain plants and many plant preparations are for sale as herbal medicines. In this workshop, participants will explore a fun lab to test these claims using common microbes and local plants.

Linda Sigismondi (lindas@rio.edu), University of Rio Grande, Rio Grande, OH

#507 Enhancing Classroom Learning through Digital Dissection

Room 12 • Hands-on Workshop (75 min) • General Biology • MS HS 2Y

This interactive workshop will introduce the range of alternatives to dissection now available, discuss their benefits and provide hands-on tutorials of several popular software programs such as *Froguts*.

Samantha Suiter (SamanthaS@peta.org), Trident Technical College/PETA, Summerville, SC

#640 Technology Tips and Tricks for the Biology Classroom.

Room 13 • Demonstration (75 min) • Instructional Strategies/ Technologies • E MS HS

Twitter, Evernote, and Google Apps are three of the most powerful tools available for Biology Teachers today. Come learn how to tweet, remember everything, and create a paperless classroom using these three amazing and FREE tools!

Josh Hubbard (joshhubbard@intercity.org), Inter-City Baptist School, Allen Park, MI

#528 Hands-On Human Ecology for the Next Generation

Room 14 • Hands-on Workshop (75 min) • Environment/Ecology • MS HS

Discover innovative activities for the Next Generation Science Standards that explore population growth, carrying capacity, resource consumption, human impacts on the environment and paths to sustainability. Receive curricula on CD.

Elizabeth Katoa (elikatoa@att.net), North Ridgeville High School, North Ridgeville, OH

#650 Addressing Mendelian Misconceptions: Using Accurate Models in Genetics Education

Room 15 • Hands-on Workshop (75 min) • Genetics • HS 2Y 4Y

Did you know that there's no evidence that a widow's peak or free earlobes are single-locus, completely dominant traits? We'll provide hands-on activities you can use to teach inheritance of single gene and polygenic traits using accurate examples.

Sarah Redd (sredd@rtc.edu), Renton Technical College, Renton, WA

#522 3D Printing in a Biology Curriculum: A Project-Based Learning Approach

Room 18 • Paper (75 min)• AP Biology • HS 4Y

Learn how 3D-printing technology can be used in a biology curriculum to help understanding of structure and function of proteins, evolution, and phylogeny through a project-based learning module focused on antibiotic resistance.

Kevin Crowthers (kevin.crowthers@worcesteracademy.org), Worcester Academy, Worcester, MA

#494 Using Bioethics Case Studies to Enhance a Biology Curriculum

Room 19 • Hands-on Workshop (75 min) • Bioethics • MS HS 2Y

Science teachers are often confronted with questions from their students about bioethical issues. Many teachers have concerns about time constraints or the controversial nature of the topics, but the study of bioethics can encourage important critical thinking skills.

Terry Maksymowych (tmaksymowych@ndapa.org), Academy of Notre Dame de Namur, Villanova, PA

#660 Worms and Cell Biology: Connect Students to Scientists' Work

Room 21 • Hands-on Workshop (75 min) • General Biology • HS 2Y

Teach students cell growth, division, and differentiation with a planarian experiment, video, and simulation. Activities are based on research techniques and findings of University of Illinois scientists who study planarian regeneration and behavior.

Barbara Hug, Chandana Jasti, and Hillary Lauren, University of Illinois, Champaign, IL

#614 Flipping a Large Lecture Introductory Biology Course: The Good, the Bad and the Ugly

Room 22 • Paper (75 min) • Instructional Strategies/ Technologies • HS 2Y 4Y

We will discuss how flipping can increase student engagement, critical thinking and interactions. We will also discuss the pitfalls, and strategies for overcoming these challenges, in large (400+ students) lecture courses with limited resources.

Bethany Stone (StoneB@missouri.edu), University of Missouri - Columbia, Columbia, MO

11:30am – 12:45pm

Committee Meeting: Global Perspectives Committee

Room 7

Jacqueline McLaughlin (jshea@psu.edu), Committee Chair

#ES46 Student Engagement & Learning Outcomes in the Modern Learning

Room 9 • Demonstration (75 min) • Curriculum Development • HS 2Y GA

Late Nite Labs is the leading innovator of digital science labs. In this session you will receive an in-depth look at how our realistic science lab simulations offer an authentic, accessible experience that moves learning beyond the classroom.

Matthew Nelson (nikki@latenitelabs.com), Late Nite Labs, New York, NY

#521 Micro Mysteries

Room 10 • Hands-on Workshop (75 min) • General Biology • HS

Participants will work through a case study role-playing as CDC scientists. They will try to determine the source of a disease outbreak, then present their findings (with evidence) to the other participants.

Bonnie Schutte (bschutte@mvcsd.us), Mount Vernon High School, Mount Vernon, OH

#674 Let Your Students Detect Meningitis! A Student-Centered, Active Learning Approach

Room 11 • Hands-on Workshop (75 min) • Microbiology & Cell Biology • HS 2Y 4Y

This simulated lab diagnosis test is a student centered, hands on activity which engages the students, simulate the real scenarios, and makes learning more interesting and personal. It has three parts, and can be completed in 45 minutes of class period.

Srinivasan Durairaj (durairaj@richland.edu), Richland Community College, Decatur, IL, Sangeetha Srinivasan (ssrinivasan@millikin.edu), Millikin University, Decatur, IL, and Carol Stokes (cstokes@richland.edu), Richland Community College, Decatur, IL

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11:30am – 12:45pm

continued

#526 EcoImm in Your Biology Classroom

Room 12 • Hands-on Workshop (75 min) • AP Biology • HS

Curious about Ecological Immunology? Come learn about this emerging discipline and how to include it in your biology classroom. Teachers will have the opportunity to try out an activity and discuss how Ecoimm topics would best fit into their classes.

Susan Dodge (lalimule@verizon.net), The New School of Lancaster, Lancaster, PA and Tara Flick (tara_flick@cvsd.k12.pa.us), Conestoga Valley School District, Lancaster, PA

#553 Quiz Time! Do You Know What CCSS, NGSS, AP, ELA, DOK, PARCC, DCI, CCs and PEs Mean? Come Find Out!

Room 13 • Hands-on Workshop (75 min) • Curriculum Development • MS HS

This hands-on presentation will explain what these acronyms mean and also examine what Next Generation Science Standards (NGSS), Common Core State Standards (CCSS) and the New AP Biology Standards expect of teachers. Hand-outs will be provided.

Peggy Deichstetter (peggy.deichstetter@collegecareer.org), Common Core Institute, Chicago, IL

#498 Forest for the Trees: 5E Lesson Addresses NGSS

Room 14 • Hands-on Workshop (75 min) • Environment/Ecology • E MS

5E lesson on community structure and succession addresses NGSS middle school level. Highlights integration of NGSS dimensions within performance expectations. Designed to take place inside classroom, but can also be used as a primer prior to outdoor experiences. Handouts provided.

Christopher Dobson, Grand Valley State University, Allendale, MI

#622 Integrating Science and Art: A New Strategy to Teach Protein Synthesis

Room 15 • Hands-on Workshop (75 min) • Genetics • HS 2Y

Learn how inquiry unites art and science by promoting student thinking. Participants will create a representative work of art that models transcription and translation. Info on FREE workshops & FREE curriculum materials.

Pam Snyder (PSnyder5396@gmail.com), Columbus City Schools, Ft, Hayes Career Center, Columbus, OH, Kerry Dixon (kerrydixon001@gmail.com), Hodos Education Consulting, Columbus, OH, and Rachael Moore (moore.1666@gmail.com), Pre-K-12 Licensed Visual Arts Teacher, Columbus, OH

Sponsored by the Ohio Soybean Council

#616 Next Generation Botany: Infusing Plant Biology into the Curriculum with Redbud (*Cercis canadensis L.*)

Room 18 (Session A) • Paper (30 min) • Plant Biology • HS 2Y 4Y

This presentation details an NGSS aligned lesson on the ecology of redbud, a beetle seed predator (*Gibbobruchus mimus Say*), and several species of parasitoid wasps (Superfamily: *Chalcidoidea*). Topics include trophic interactions and carbon cycling.

Stephen Rybczynski (rybczyns@gvsu.edu), Grand Valley State University, Allendale, MI

11:30am – 12:45pm

continued

#587 Incorporating Climate Change into Your Biology Curriculum

Room 19 • Hands-on Workshop (75 min) • Global Perspective • HS 2Y 4Y

An acidifying ocean? Plants flowering earlier? A shifting range for disease vectors? We'll be discussing the many opportunities to incorporate the impacts of climate change on organisms and entire ecosystems into the biology classroom.

Dana Haine (dhaine@unc.edu), UNC-Chapel Hill, Chapel Hill, NC

#581 The Cellular Landscapes of David Goodsell: Biology at the Mesoscale

Room 21 • Hands-on Workshop (75 min) • General Biology • HS 2Y 4Y

Connect microscopic and molecular views of the cell using a unique teaching tool – the vibrant, accurate and engaging cellular landscapes painted by David Goodsell.

Tim Herman (herman@msoe.edu) and Diane Munzenmaier, Milwaukee School of Engineering Center for BioMolecular Modeling, Milwaukee, WI

#599 Open Minds: Seeing How Your Students Are Thinking

Room 22 • Paper (75 min) • Curriculum Development • MS HS

NGSS requires a different type of thinking by our students. When teachers create activities and design lessons that make student thinking visible they are better equipped to adjust their teaching strategies to increase student engagement and success.

Jim Clark (healthandmedicinejclark@yahoo.com) and Samantha Johnson (Samantha.johnson2@gmail.com), Arroyo High School, San Lorenzo, CA

#606 Case It! - An Effective Tool for Case-Based Learning and Undergraduate Research in Molecular Biology

Room 23 • Hands-on Workshop (75 min) • Instructional Strategies/ Technologies • HS 2Y 4Y

Case It! is an award winning, NSF-supported project that provides molecular biology computer simulations and cases free of charge, based primarily on genetic and infectious disease. It is also a useful tool for undergraduate research applications.

Mark Bergland (mark.s.bergland@uwrf.edu) and Karen Klyczek (karen.k.klyczek@uwrf.edu), University of Wisconsin - River Falls, River Falls, WI

#582 Fixing the Need for a Nicotine Fix: Exploring Novel Methods in Treating Drug Addiction

Room 24 • Hands-on Workshop (75 min) • Neuroscience • HS 2Y 4Y

You are invited to become a researcher in a fictional drug addiction research facility which utilizes the body's natural immunity to prevent nicotine's diffusion across the blood brain barrier and test an assortment of patients' responses to your developed vaccine via ELISA.

Tamica Stubbs (tamica.stubbs@cms.k12.nc.us), Phillip O Berry Academy of Technology High School, Charlotte, NC

1:00pm – 3:00pm

NABT Honors Luncheon

$ Junior Ballroom A • Special Program • Tickets Required • GA

The grand finale of the NABT Conference, this popular celebration honors excellent biology teachers. Join us as we recognize the accomplishments and professional contributions of all of the 2014 NABT Award recipients, including the Outstanding Biology Teacher Award (OBTA) honorees. Everyone is welcome to attend!

SATURDAY November 15

Exhibitor Key

Sponsorship Package Tiers

Diamond, Platinum, Gold, Silver, Other

Treasure Hunt Exhibitors

Noted by

2014 Exhibitors

3D Molecular Designs — Booth 401

Milwaukee, WI — www.3dmoleculardesigns.com

Our innovative, hands-on kits focus on core ideas and cross-cutting concepts in biology, chemistry, and the physical and life sciences. We involve teachers in developing kits, writing materials and field testing. Kits meet STEM and Next Gen standards. New Kits: Flow of Genetic Information, Phospholipid and Membrane Transport and Enzymes In Action.

American Physiological Society — Booth 210

Bethesda, MD — www.the-aps.org

APS Education programs promote excellence in science teaching and learning and in the training of the physiologists of the future. Resources include curricula and PD for teachers such as national teacher workshops, fellowships, online courses, and outreach events for K-14 educators.

American Phytopathological Society — Booth 219

Saint Paul, MN — www.apsnet.org

The American Phytopathological Society (APS) and its members are dedicated to high-quality, innovative plant pathology research. APS members make and share significant breakthroughs, and provide educational resources to help spread the word on the importance of the science and study of plant pathology.

American Society for Microbiology — Booth 518

Washington, DC — www.asm.org

The ASM Education Board offers microbiological science resources for students, early career scientists and faculty. Information on microbiology careers, research fellowships, curriculum materials, and ASM events is available at the booth. Featured this year are K-12 outreach posters and peer-reviewed K-12 classroom activities about microbial discovery.

2014 Exhibit Hall Floor Plan

Exhibit Hall (Grand Hall) Hours

THURSDAY — Exhibit Hall Opening Reception • 4:00pm – 7:00pm
Sponsored by Vernier SOFTWARE & TECHNOLOGY

FRIDAY — Exhibit hours • 9:30am – 5:30pm
Coffee Break • 9:30am – 10:15am • *Sponsored by* BIO CORPORATION

Closing Reception and Treasure Hunt prize announcements
4:00pm–5:30pm • *Sponsored by* ward's science

American Society of Plant Biologists — Booth 217

Rockville, MD — www.aspb.org

Plants are not optional! So ASPB is devoted to advancing plant science worldwide. Its 4,500 members conduct scientific research and participate in formal & informal education to enhance & disseminate plant biology research. ASPB cultivates awareness of the importance of plant science research for scientific discovery, human health, & the economy.

Animalearn — Booth 400

Jenkintown, PA — www.animalearn.org

Stop by Animalearn's booth to see the latest alternatives to animal dissection, including lifelike frog models, which students can dissect like real specimens! Animalearn's *The Science Bank* is the largest FREE loan program of over 500 new and innovative software programs, realistic models, and educational products for life science classrooms.

Backyard Brains, Inc. — Booth 519

Ann Arbor, MI — www.backyardbrains.com

We provide affordable neuroscience experiment kits for students of all ages to learn (hands-on) about electrophysiology. Now everyone from schoolchildren to grad students and every grade in between can experiment with similar tools used by real neuroscientists worldwide!

Beacon Center for the Study of Evolution — Booth 303

East Lansing, MI — www.beacon-center.org

The BEACON Center for the Study of Evolution in Action is an NSF funded Science and Technology Center that brings together biologists, computational scientists, and engineers to study evolution as it happens and apply this knowledge to solve real-world problems. BEACON programs include K-16 outreach and education.

Bio Corporation — Booth 404

Alexandria, MN — www.biologyproducts.com

Bio Corporation: Quality products, competitive pricing, specimens in stock, free disposal, specimen guarantee! We specialize in preserved specimens and dissecting equipment. Visit our booth for your FREE gift and request your FREE sample specimen.

Bio-Rad Laboratories, Inc. — Booth 505

Hercules, CA — explorer.bio-rad.com

Are you passionate about biotech education? We share your passion and make it easy to bring biotech skills into your classroom. More than just a lab in a box, Bio-Rad provides you with a completely supported biotech experience. Best in class curriculum, kits, equipment, and support ensure your students' success.

Bone Clones, Inc. — Booth 412

Canoga Park, CA — www.boneclones.com

Bone Clones, Inc manufactures high-quality osteological reproductions of skeletal elements. In addition to producing specimens exhibiting trauma & pathology, we have an extensive range of skulls & skeletons providing age, sex, and ancestry differences. Our durable replicas obviate the need for a dedicated teaching collection of real human remains.

Brighter Ideas, Inc. — Booth 313

North Brunswick, NJ — http://www.brighterideasinc.com

Brighter Ideas, Inc, a Rutgers spin-off company, leads in Green-Fluorescent Protein (GFP) technology via ongoing research and education. We market GFP and antibodies and hold IP for three GFP-related inventions. At Booth 313, Bii will demo and then give away 100 "BPAssay" kits—colorimetric spot tests for BPA in thermal paper and store receipts.

Carolina Biological Supply Company — Booth 600

Burlington, NC — www.carolina.com

From our beginnings in 1927, Carolina Biological Supply Company has grown to become a leading supplier of science teaching materials. Today, from our headquarters in Burlington, North Carolina, we serve customers worldwide, including teachers, professors, home-school educators, and professionals in health and science-related fields.

Cell Zone, Inc. — Booth 604

Springfield, MA — http://cellzone.org

Cell Zone provides interactive materials, designed by a biology teacher, that incorporate active learning and UDL to engage students. Our products target traditionally difficult topics in biology and facilitate learning for more students. Visit our booth to see how you can make your classroom more inclusive, interactive and fun!

Cengage Learning — Booth 504

San Francisco, CA — www.cengage.com

Cengage Learning is a leading educational content, software and services company for the K12, higher education, and professional markets with operations all around the world. The company provides superior content, personalized services and course-driven digital solutions that accelerate student engagement and transform the learning experience.

Center for Biomolecular Modeling (MSOE) — Booth 403

Milwaukee, WI — www.cbm.msoe.edu

As an instructional materials development laboratory, we create kits and models for the molecular biosciences. Through our professional development experiences, teachers learn active teaching skills and are involved in developing and field testing new kits. Ask about our outreach programs – SMART Teams and Science Olympiad Protein Modeling Event.

Clemson University — Booth 516

Clemson, SC — http://www.clemson.edu/cafls/departments/biosci/

Online M.S. in Biological Sciences

Dage - MTI — Booth 204

Michigan City, IN — www.dagemti.com

Dage-MTI provides HD and IR cameras for the Scientific, Educational and Industrial imaging markets. Live, 60 frames per second images with 1920x1080P output is the perfect medium to project live laboratory demonstrations, Histology preps and living specimens. See the difference with the HD-210-U camera - designed for today's HD displays.

2014 Exhibitors

Dallas Learning Solutions - Dallas County Community College District — Booth 111

Dallas, TX — https://dls.dcccd.edu/

Dallas Learning Solutions introduces Biology Online for Non-Science Majors. Lesson and lab videos and self-assessment activities engage students and encourage active learning. This mobile accessible courseware is easily assembled and reassembled to fit an instructor's objectives and preferences. A customized lab kit is available from eScience Labs.

Ecology Project International — Booth 212

Missoula, MT — www.ecologyproject.org

Ecology Project International is a non-profit organization that develops place-based, ecological education partnerships between local experts and high school students to address critical conservation issues. We engage youth from local communities and the U.S. in conservation as they learn about and help protect threatened species and habitats.

Edvotek, Inc — Booth 419

Washington, DC — www.edvotek.com

Edvotek (www.edvotek.com) manufactures robust research grade biotechnology education experiments, biologics, reagents and equipment for high schools and colleges. Experiments include DNA science, electrophoresis, forensics, PCR, molecular cloning, immunology, environmental science and AP Biology.

Evolve Tours — Booth 106

Toronto, ON Canada — www.evolvetours.com

Evolve Tours is an educational, biological travel company. Our customized trip itineraries engage your students in meaningful and real scientific research in locations across the globe. From the Galapagos to Costa Rica, Australia to our own backyard, we integrate travelers into communities, biological research, adventure and fun.

Flinn Scientific, Inc. — Booth 308

Batavia, IL — www.flinnsci.com

Flinn Scientific is the leader in science and laboratory chemical safety. Publisher of the world-renowned Flinn Science Catalog Reference Manual, Flinn develops and offers a full line of chemistry, biology, physics, life science, Earth science, physical science, and safety products for middle and high schools.

FOTODYNE Incorporated — Booth 112

Hartland, WI — www.fotodyne.com

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Genetics Society of America/American Society for Human Genetics — Booth 114

Bethesda, MD — www.genetics-gsa.org; www.ashg.org

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GrowNextGen — Booth 612

Columbus, OH — www.educationprojects.org

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Hayden-McNeil Publishing — Booth 510

Plymouth, MI — www.hmpublishing.com

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Hiram Genomics Store — Booth 113

Hiram, OH — www.hiramgenomicsstore.com

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Holbrook Travel — Booth 205

Gainesville, FL — holbrooktravel.com

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Labster — Booth 318

Copenhagen, Denmark — www.Labster.com

Labster is an award-winning Copenhagen based company that focuses on revolutionizing the way science is taught to students all over the world. Our platform offers a cutting-edge and innovative Virtual Laboratory where students can work with real-life challenges in an online environment that simulates reality and increases learning outcome.

Maderas Rainforest Conservancy — Booth 405

Miami, FL — www.maderasrfc.org

Maderas Rainforest Conservancy (MRC) is a 501 c(3) non-profit organization that operates educational/research field stations in Costa Rica and Nicaragua. MRC was established to promote the conservation, protection, and management of Meso-American forests through education, research, reforestation, & community outreach. Groups and teachers welcome!

miniPCR — Booth 319

Cambridge, MA — www.minipcr.com

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Nasco — Booth 509

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National Library of Medicine — Booth 305

Bethesda, MD — www.nlm.nih.gov

The National Library of Medicine provides K-12 teachers and students with FREE, reliable science and health information resources and programs to help introduce, reinforce, and supplement education programs. Resources include biology, careers, chemistry, environmental health science, forensics, general health, genetics, and HIV/AIDS. For more information, please visit sis.nlm.nih.gov/outreach/k12.html

Nature Education — Booth 513

Boston, MA — www.nature.com/principles

Nature Education, the educational division of Nature Publishing Group, is publisher of the Principles of Science series of interactive textbooks designed for the world we live in today. The first textbook in the series, Principles of Biology, is a research-oriented, affordable interactive textbook for university-level introductory biology courses.

NCSE — Booth 502

Oakland, CA — ncse.com

The National Center for Science Education (NCSE) is a not-for-profit membership organization that defends the teaching of evolution and climate science in the public schools. The NCSE provides information, resources, and advice to those defending science education--teachers, scientists, interested citizens, and more.

New York Chiropractic College — Booth 116

Seneca Falls, NY — www.nycc.edu

New York Chiropractic College offers a Master of Science degree in Human Anatomy & Physiology Instruction.

Nutrients For Life Foundation — Booth 209

Washington, DC — www.nutrientsforlife.org

The Nutrients for Life Foundation provides free educational resources about soil science and crop nutrients. The Foundation reinforces that soil and soil nutrients play a vital role in feeding the world, nourishing plants, and contribute to our overall well-being.

Ohaus Corp. — Booth 610

Parsippany, NJ — www.ohaus.com

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Houston, TX — www.openstaxcollege.org

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Oxford University Press — Booth 310

New York, NY — www.oup.com

Oxford University Press is a publisher of some of most respected and prestigious books and journals in the world. They include Biology for the Informed Citizen by Donna M. Bozzone and Douglas S. Green. Visit our stand to browse books and to pick up a sample copies of our journals, or visit online at www.oup.com for more information.

PASCO scientific — Booth 609

Roseville, CA — www.pasco.com

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Pearson — Booth 312

San Francisco, CA — www.pearsonhighered.com/educator

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Richmond, VA — www.phippsbird.com

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Sapling Learning — Booth 511

Austin, TX — www2.saplinglearning.com

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Science Take-out — Booth 418

Pittsford, NY — www.sciencetakeout.com

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Ithaca, NY — www.simbio.com

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San Diego, CA — www.theminione.com

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Birmingham, AL — www.todaysclass.com

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Top Hat — Booth 109

Toronto, ON Canada — www.Tophat.com

Top Hat is an active learning platform, exclusively focused on higher education, which allows professors to engage with their students in a way that makes learning more fun and interactive. Top Hat allows students to use any mobile device they have such as a cell-phone, smartphone, laptop or tablet.

University College, Washington University in St. Louis — Booth 500

St. Louis, MO — ucollege.wustl.edu/msinbiology

Teachers can earn their Master of Science in Biology degree in two years through this hybrid program that combines life science content knowledge with pedagogy & leadership projects. It consists of two summer institutes, three weeks each, in residence. The remaining course work during the 2 academic years is completed through distance learning.

Vernier Software & Technology — Booth 409

Beaverton, OR — www.vernier.com

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Putnam, CT — www.viewpointlaboratories.com

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W.H. Freeman & Company — Booth 417

New York, NY — www.whfreeman.com

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W.W. Norton & Company — Booth 517

New York, NY — wwnorton.com

The oldest and largest publishing house owned wholly by its employees, W. W. Norton, Inc. publishes about 400 trade, college, and professional titles each year.

Ward's Science — Booth 501

Rochester, NY — wardsci.com

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Wildlife Acoustics, Inc. — Booth 613

Maynard, MA — www.wildlifeacoustics.com

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Wiley — Booth 413

Hoboken, NJ — www.wiley.com

Wiley is a global provider of content and content-enabled workflow solutions in areas of scientific, technical, medical, and scholarly research; professional development; and education.

Wisconsin Fast Plants Program — Booth 302

Madison, WI — www.fastplants.org

The Wisconsin Fast Plants Program is an education and research support organization from within the College of Life Sciences at the University of Wisconsin—Madison.


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The mission of the NABT BioClub is to recruit, support, nurture, and promote students who have an interest in biological sciences for personal reasons, academic preparation, the betterment of society, and possible career opportunities by providing guidance, resources, and activities to meet these goals.

Look for the BioClub logo to indicate recommended articles for NABT BioClub members. If you are interested in forming a chapter of the NABT BioClub, contact NABT at office@nabt.org.

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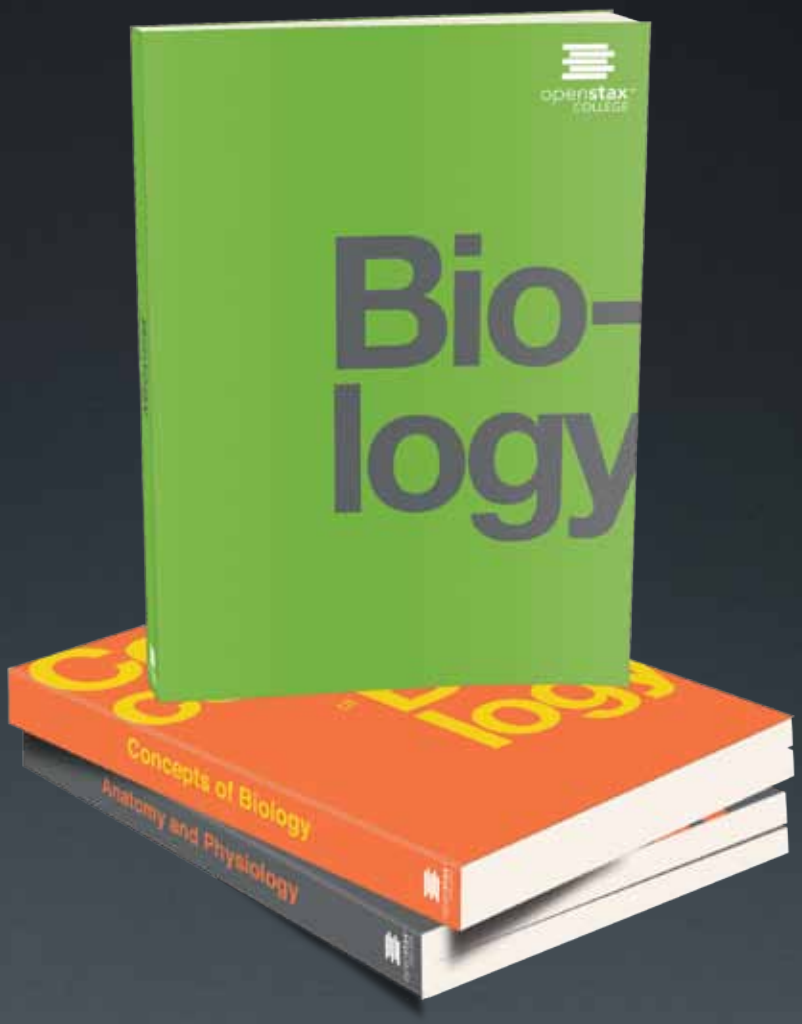

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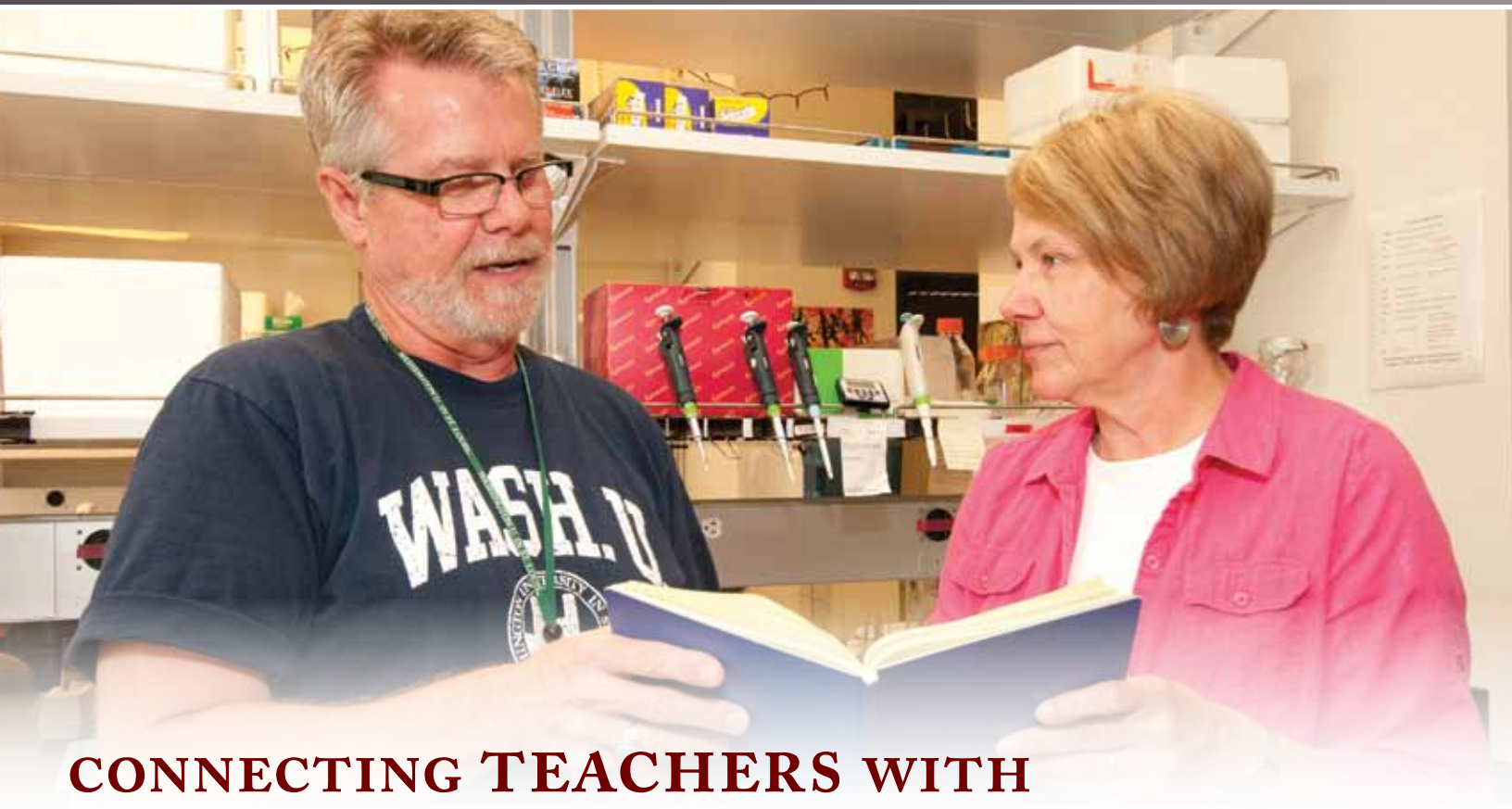

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