

FRIDAY NOV 10

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FRIDAY

ABBREVIATION KEY

E: Elementary School

MS: Middle School

HS: High School

2Y: Two-Year College

4Y: Four-Year College

GA: General Audience

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ST. LOUIS
2017

7:30 AM – 8:45 AM**First Timers' Breakfast**

Regency C • Meal Function (Tickets Required) • GA

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

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

**10:30 AM – 12:30 PM****ASM PRESENTS:****Combatting Superbugs Across Habitats**

Midway Suites 5 • Microbiology & Cell Biology • Symposium (120 min) • HS, 2Y, 4Y

Dr. Gautam Dantas published the first genetic evidence that soil microbes transfer multiple antibiotic resistance genes to human pathogens. Join us for his talk, followed by a hands-on classroom activity.

Katherine Lontok, American Society for Microbiology, Washington, D.C.; Gautam Dantas, Washington University School of Medicine, St. Louis, MO; and Dave Westenberg, Missouri Science and Technology University, Rolla, MO

9:15 AM – 10:15 AM**GENERAL SESSION SPEAKER****Mary Pat Wenderoth**

➔ See page 8 for biography.

End of Lecture: The Future of Evidence-based Teaching

Grand Ballroom D, E, F • Special Speaker • GA

Meta-analysis of 225 papers that compared student performance under active learning versus lecturing in undergraduate courses across the STEM disciplines will be presented. The results indicate that on average students are 1.5 times more likely to fail when being lectured to as compared to when the same course has an active learning component, and active learning increases exam scores by almost half a standard deviation. Research results that increase student achievement will be summarized, including discussion of how even small changes can close the gap between teaching and student learning; this has tremendous implications for all students, especially those from underserved groups. PORTAAL, a new classroom observation tool that identifies key elements of an active learning classroom associated with enhanced student learning, will be presented.

10:30 AM – 11:45 AM**SPECIAL PROGRAMMING PRESENTED BY HudsonAlpha****91 - Top 10 Biotech Stories of 2017**

Regency A • Biotechnology • Demonstration (75 min) • HS, GA

Want to include cutting edge genetic research in your class? See Dr. Neil Lamb present the top 10 discoveries of 2017 in student-friendly language and receive your free Guidebook.

Neil Lamb, HudsonAlpha Institute for Biotechnology, Huntsville, AL

313 - Constructing and Using Models to Investigate Ecological Relationships Using HHMI BioInteractive Resources

Regency B • Ecology / Environmental Science / Sustainability • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Join us for an engaging and interactive workshop highlighting new resources that will have participants constructing and using models to explore ecological relationships based on authentic field data.

Mark Eberhard, St. Clair High School, St. Clair, MI; Robin Bulleri, Carrboro High School, Carrboro, NC; and Mark Nielsen, HHMI, Chevy Chase, MD

BEACON EVOLUTION SYMPOSIUM: Emerging Research in Evolutionary Biology

10:30 AM – 12:30 PM • Midway Suites 6

Join us for this talk featuring cutting edge research in evolutionary biology, followed by a workshop on strategies to bring this authentic data into your classroom!

Living Laboratories: Using Islands to Track Natural Selection in Wild Lizards

Evolution • Symposium (60 min) • MS, HS, 2Y, 4Y

Evolution is often viewed in a historical sense, playing out over millions of years. We'll highlight research on anole lizards that focuses on evolution in action that can be observed today.

Robert Cox and Aaron Reedy, University of Virginia, Charlottesville, VA

BEACON Data Nugget Workshop

Evolution • Hands-on Workshop (60 min) • MS, HS, 2Y, 4Y

This hands-on workshop will follow the "Learning Laboratories" presentation and participants will go through a Data Nugget activity that can be used to bring the anole data back to their classrooms.

Melissa Kjelvik, Michigan State University, Hickory Corners, MI; and Elizabeth Schultheis and Louise Mead, Michigan State University, East Lansing, MI

The symposium is made possible by Michigan State University's BEACON Center and the American Society of Naturalists.

NABT 2017 EVOLUTION SYMPOSIUM



BEACON
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Evolution in Action



*American
Society of
Naturalists*

Emerging Research in Evolutionary Biology

Join us to hear about new research in evolutionary biology, and attend a Data Nuggets workshop to bring this authentic data into your classroom.

Living Laboratories: Using islands to track natural selection in wild lizards

Robert Cox, University of Virginia
Robert's talk focuses on cutting edge techniques in natural selection research, and the scientists exploring evolution in action in anole lizards.

Data Nugget Workshop: Is it dangerous to be a showoff?

Aaron Reedy, Elizabeth Schultheis, Melissa Kjelvik
Following the talk, we use Data Nuggets to model bringing authentic research, and the story of the scientists behind the data, into your classroom.





8:00 AM – 4:00 PM

SPECIAL PROGRAMMING PRESENTED BY Bio-Rad Laboratories

All sessions in Midway Suites 2

All sessions: Cassy Granieri, Bio-Rad Laboratories, Hercules, CA

8:00 AM – 9:15 AM

340 - Conserving Panda Population: One Hormone Test Design at a Time!

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

Come put your immunology and reproductive endocrinology systems knowledge basics to the test as you engineer a hormone detection system that can be utilized for Giant Panda Population Conservation efforts.

10:30 AM – 11:45 AM

341 - Investigate Photosynthesis and Cellular Respiration with Algae Beads

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

Use algae beads in a color-assay to study photosynthesis and cellular respiration through authentic inquiry investigations for AP and NGSS biology. Learn extensions to study the effects of various parameters.

12:00 PM – 12:30 PM

342 - Yes You Can! Equipping Students to Make Meaningful Contributions to the Scientific Community

Instructional Strategies • Paper (30 min) • HS, 2Y, 4Y

Students often demonstrate interest in biology, but believe meaningful contributions are years away. I'll share evidence of students' contributions and strategies used to equip learners to "make a difference".

2:00 PM – 3:15 PM

343 - Barcoding a Lionfish's Last Meal: A Citizen Science Project for the Classroom

Ecology / Environmental Science / Sustainability • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Learn about this student-centered project that dissects lionfish to see what other fish species it ate. Participants will observe lionfish dissection and extract DNA from fish bits for DNA sequencing.

3:30 PM – 4:00 PM

344 - Project-based Learning for High School and College: Sequencing Plant Species

Biotechnology • Paper (30 min) • HS, 2Y, 4Y

See how Tyler Zarubin (Concordia University) adapted a plant-based cloning and sequencing kit to engage students in original research. His students gained valuable research skills and experience, and published sequences!

10:30 AM – 11:45 AM cont.

NABT Committee Meeting: Nominating Committee

Switchman Room • Committee Meeting • GA

Donald French, Committee Chair

266 • Forensic Analysis of Ötzi the Iceman

Midway Suites 7 • General Biology • Hands-on Workshop (75 min) • E, MS, GA

Use the discovery of Ötzi the Iceman to integrate genetics, anthropology, and forensics. Pollen analysis and DNA isolation mimic techniques used to investigate the mysterious mummy's ancestry, health, and murder!

Amanda McBrien, Cold Spring Harbor Laboratory/
DNA Learning Center, Cold Spring Harbor, NY

228 - Pokemon in the Midst - Using Pokemon GO! as a Free and Accessible Proxy for Wildlife in Biology Education

Midway Suites 8 • Ecology / Environmental Science / Sustainability • Hands-on Workshop (75 min) • 2Y, 4Y, GA

Use Pokemon GO!, a game that populates your area with virtual wildlife (with data and traits), as a realistic proxy for real wildlife within biology and ecology education.

Quent Lupton, Craven Community College, New Bern, NC and Lynn Swafford, Wayne Community College, Goldsboro, NC

125 - Evolution: DNA and the Unity of Life

Midway Suites 9 • Evolution • Hands-on Workshop (75 min) • HS

Explore a curriculum unit that integrates NGSS three dimensions of learning with published scientific data to address core ideas in evolution including common ancestry, heredity, natural selection, and speciation. Free at learn.genetics.utah.edu

Louisa Stark and Molly Malone, Genetic Science Learning Center at the University of Utah, Salt Lake City, UT

10:30 AM – 4:00 PM**SPECIAL PROGRAMMING PRESENTED BY
Carolina Biological Supply Company****All sessions in Midway Suites 1****10:30 AM – 11:45 AM****332 - C4: Collecting Cancer Causing Changes**

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

Using digital vignettes, beads, and dice to simulate the fate of a cell population across multiple divisions. This model illustrates how cells become varied over time through mutations in regulatory genes.

Dhani Biscocho, Carolina Biological Supply Company, Burlington, NC

12:00 PM – 12:30 PM**333 - Arriving on the Scene: Collect and Analyze Evidence Like the Pros**

Instructional Strategies • Hands-on Workshop (30 min) • HS, 2Y, 4Y, GA

Expose your students to the fascinating world of forensics by using real-world techniques practiced by law enforcement agencies. Keep students captivated by analyzing and documenting evidence to recreate crime scenes.

Dhani Biscocho, Carolina Biological Supply Company, Burlington, NC

2:00 PM – 3:15 PM**334 - From Gene to Protein: Making a Green Fluorescent Protein Necklace**

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

Use a novel but simple purification procedure, requiring no centrifuges or purification columns to isolate GFP from freeze dried bacterial cells. Discover the biology and chemistry that makes this possible.

Dhani Biscocho, Carolina Biological Supply Company, Burlington, NC

3:30 PM – 4:00 PM**330 - Teaching Online Lab Science Courses: Challenges and Solutions**

General Biology • Demonstration (30 min) • 2Y, 4Y

How can we run lab sections of science courses online? Come and actively participate in hands-on lab investigations that your students will be doing from their homes.

Shannon McGurk, Carolina Biological Supply Company, Burlington, NC

10:30 AM – 11:45 AM cont.**293 - Scoring Health Literacy**

Midway Suites 10 • Instructional Strategies • Hands-on Workshop (75 min) • MS, HS

We are confronted daily with health information ranging from amazing science discoveries to snake oil. Come learn how students can develop rubrics to make sense of information from many sources.

Anne Westbrook, BSCS, Colorado Springs, CO

220 - Making the Most of Models

Station Master Room • Science Practices • Hands-on Workshop (75 min) • HS, 2Y, 4Y

We will demonstrate how to use this common mathematical model to help students understand scientific concepts more deeply, practice the scientific process and apply models to solve biological problems.

Kristin Jenkins, BioQUEST, Boyds, MD; Sam Donovan, University of Pittsburgh, Pittsburgh, PA; M. Drew LaMar, College of William and Mary, Williamsburg, VA; Gabriela Hamerlinck, BioQUEST, Madison, WI; and Hayley Orndorf, QUBES, Pittsburgh, PA

279 - Melanin and Other Phenomenon Used To Anchor NGSS Storylines

Burlington Route • General Biology • Demonstration (75 min) • MS, HS

Using melanin and albinism as the driving phenomenon to integrate multiple concepts in a cohesive storyline. Concepts integrated include genetics and evolution. Storylines currently in progress will also be discussed.

Michele Koehler, Riverside Brookfield High School, Riverside, IL and Jason Crean, Lyons Township High School, Western Springs, IL

Come Join Us!



Combatting Superbugs Across Habitats

Friday, November 10
10:30 a.m. – 12:00 p.m.
Midway Suites 5

This research update and live lesson demo features Dr. Gautam Dantas, the first researcher to provide genetic evidence that soil microbes exchange multiple antibiotic resistance genes with human pathogens.

This session is presented by the American Society for Microbiology (ASM).

You'll also be interested in...



ASM Conference for
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July 26-29, 2018 Austin, TX

Come see ASM in booth #94 to learn more about ASMCUE and other microbiology education resources.



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10:30 AM – 11:45 AM**SPECIAL PROGRAMMING
PRESENTED BY
LrnR****All sessions in Midway Suites 3****10:30 AM – 11:00 AM****400 - panOpen Invites You to Learn About Customized Open Educational Resource (OER) Learning Solutions for your Biology, A&P and Environmental Science Courses**

Curriculum Development • Symposium
(30 min) • MS, HS, 2Y, 4Y

Join panOpen to discover solutions to the main challenges of adopting OER and open courseware in the biological sciences. Participants will learn how Biology faculty at University of Kentucky utilized the panOpen platform to design an interactive and customized student-centered learning experience.

Jean Downs, LrnR, New York, New York

11:00 AM – 11:45 AM**401 - What Everyone Should Know About The Future Of Personalized Education Technology In The Life Sciences**

Curriculum Development • Symposium
(45 min) • MS, 2Y, 4Y, GA

Many technologies claim to be “personalized”, but what does it really mean? Join us on our mission to make personalized learning more accessible, affordable, and engaging, all while innovating the next generation of resources for the students of tomorrow!

Aravind Pochiraju, LrnR, San Francisco, CA

10:30 AM – 4:00 PM**SPECIAL PROGRAMMING PRESENTED BY
MiniOne Systems****All sessions in Midway Suites 4**

All sessions: Richard Chan, MiniOne Systems, San Diego, CA

10:30 AM – 11:45 AM**345 - Go Viral: Amplify From One to a Billion Copies in 20 minutes by PCR**

Technology in the Classroom • Hands-on Workshop
(75 min) • HS, 2Y, 4Y

Experience how engaging and accessible classroom biotechnology can be! Amplify DNA fragment using the fast and robust MiniOne PCR System and analyze the PCR products on the MiniOne Electrophoresis System.

12:00 PM – 1:15 PM**347 - Who Is Baby Whale's Father? DNA Fingerprinting Solves the Mystery!**

Technology in the Classroom • Hands-on Workshop
(75 min) • HS, 2Y, 4Y

Get hands-on experience in teaching electrophoresis and DNA fingerprinting in one classroom session. Pour, load, and run a gel to deduce a probable conclusion for a whale of a mystery.

1:30 PM – 2:45 PM**348 - Foodborne Outbreak Investigation Using Gel Electrophoresis**

Technology in the Classroom • Hands-on Workshop
(75 min) • HS, 2Y, 4Y

Learn firsthand how to engage students to use scientific reasoning by mimicking a foodborne outbreak investigation and designing an experiment with gel electrophoresis to determine the source of the outbreak.

3:00 PM – 4:00 PM**349 - Deduce the Genotype of PTC Taster versus Non-taster**

Technology in the Classroom • Hands-on Workshop
(60 min) • HS, 2Y, 4Y

Get hands-on experience teaching Mendelian genetics and genotyping by electrophoresis. Pour, load, and run a gel, analyze the results, and determine PTC taster genotype - all within one classroom session.

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HANDS-ON INQUIRY-BASED SCIENCE EDUCATION



NABT St. Louis Workshop Schedule

Join us at the St. Louis Union Station Hotel, Midway Suite 2, for our free workshops

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at Booth
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Friday November 10

8:00–9:15 AM Midway Suite 2

Conserving Panda Population: One Hormone Test Design at a Time!

Take on the role of giant panda conservation scientist using ELISA in this hands-on workshop.

10:30–11:45 AM Midway Suite 2

Investigate Photosynthesis and Cellular Respiration with Algae Beads

Use algae beads to study photosynthesis and cellular respiration in authentic inquiry investigations for AP and general biology.

12:00–12:30 PM Midway Suite 2

Yes you can! Equipping students to make meaningful contributions to the scientific community

Tyler Zarubin will share his strategies on equipping learners to make a difference now.

2:00–3:15 PM Midway Suite 2

Barcoding Lionfish Last Meal: A Citizen Science Project for the Classroom

Learn about this student-centered project where students dissect lionfish and use sequencing to identify the fish species they eat.

3:30–4:00 PM Midway Suite 2

Project-Based Learning for High School and College: Sequencing Plant Species

See how Tyler Zarubin engages students in original genetic research and publishes DNA sequences!

Saturday November 11

11:30 AM–2:00 PM The Midway

Special Event — Lab Skills: The Escape Room! Experience an escape room like no other. Space is limited. Get tickets at the Bio-Rad booth.

Visit us at bio-rad.com/explorer
Call toll free at 1-800-424-6723.
Outside the U.S. contact your local sales office.

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10:30 AM – 4:00 PM**SPECIAL PROGRAMMING PRESENTED BY
miniPCR****All sessions in Missouri Pacific**

All sessions: Zeke Alvarez-Saavedra, miniPCR, Cambridge, MA

10:30 AM – 11:45 AM**370 • DNA Fingerprinting: An Introductory DNA
Electrophoresis Lab**

Biotechnology • Demonstration (75 min) • MS, HS

This guided-inquiry activity exposes students to the fundamental principles of DNA analysis by comparing patterns of cleaved DNA separated by gel electrophoresis. You will gain familiarity with fast, classroom-friendly DNA gel electrophoresis techniques using the blueGel system.

12:00 PM – 12:30 PM**372 • Are You a Night Owl? A Morning Lark?
The Answer May be in Your Genes**

Biotechnology • Demonstration (30 min) • HS, 2Y, 4Y

Students test one of their own circadian clock genes by amplifying a VNTR that has been associated with sleep behavior (preference for morning vs. evening activity) and test this postulated association between circadian genotypes and sleep phenotypes. Contribute to a citizen science database! Includes PCR and electrophoresis activities.

2:00 PM – 3:15 PM**373 • PTC Taster Lab: From Phenotype to Genotype
in the Classroom!**

Biotechnology • Demonstration (75 min) • MS, HS, 2Y, 4Y

Are you a supertaster? Come explore the molecular genetics of taste. Introduce key molecular techniques to students, such as DNA extraction, DNA amplification of taster genes, DNA digestion, and gel electrophoresis to identify taste receptor variants. Come link your DNA to your taster phenotype!

3:30 PM – 4:00 PM**371 • Real Biotech, Real Free. No-Cost Biotech Resources
for Your Classroom**

Biotechnology • Demonstration (30 min) • MS, HS

Biotech resources at no cost, including a loaner Lab in a Box to run a complete biotech lab; miniPCR DNAdots, simple explanations of modern genetic techniques; Genes in Space™, a competition that sends DNA experiments to space; and LARPing with Bruce, to engage students through live action role-playing.

10:30 AM – 11:45 AM cont.**179 • Embedding Authentic
Research into Introductory
Biology Lab Courses**

Frisco • Instructional Strategies •
Hands-on Workshop (75 min) • 2Y, 4Y

Faculty who are developing authentic research for lab courses will disseminate the critical background and sample development plans so that other faculty can create their own course-based research experiences.

Christopher Beck and Rachele Spell, Emory University, Atlanta, GA; and Kristen Miller, University of Georgia, Athens, GA

**180 • Inquiry, Argumentative
Writing, and Data All-In-One!**

Illinois Central • Science Practices •
Demonstration (75 min) • MS, HS, 2Y

Learn a student presentation tool that emphasizes the SEP's of NGSS, integrating inquiry, data analysis, "CER," and communication. Participants will leave with inquiry examples and a rubric for efficient grading.

Amy Welch, Fullerton Joint Union High School District, La Habra, CA

**160 • Reconsidering the Role
of the Science Fair in Biology
Education**

Jefferson/Knickerbocker • Instructional
Strategies • Symposium (75 min) • GA

Participants will view the new documentary film titled "Uncontrolled Variables," which follows science fair students and teachers as they prepare projects and compete. The screening is followed by a panel discussion.

William McComas, University of Arkansas, Fayetteville, AR

**170 • Planting Inquiry in Science
Classrooms**

New York Central • Science Practices •
Hands-on Workshop (75 min) • MS,
HS, 2Y, 4Y

Experience a variety of activities that help students develop skills ranging from

10:30 AM – 11:45 AM cont.

generating observation-based questions to exploring alternative explanations for data. Learn simple techniques that enhance student-centered learning.

Catrina Adams, Botanical Society of America, Saint Louis, MO; Gordon Uno, University of Oklahoma, Norman, OK; and Marshall Sundberg, Emporia State University, Emporia, KS

261 - Understanding Real Research: Incorporating Primary Literature into Coursework

Wabash Cannonball • Technology in the Classroom • Demonstration (75 min) • HS, 2Y, 4Y

Science in the Classroom (SitC) is an expanding collection of research articles, carefully annotated for teaching. Learn about best practices for incorporating SitC into AP and college courses.

Beth Ruedi, Science in the Classroom, AAAS, Washington, D.C.

12:00 PM – 12:30 PM**310 - Using Primary Literature to Teach Science Literacy**

Regency B • Nature of Science • Hands-on Workshop (30 min) • HS, 2Y, 4Y

HHMI BioInteractive's "Data Points" are resources featuring figures from primary literature to engage students in the process of interpreting graphs. Participants will analyze and interpret trends and patterns in data.

Bob Kuhn, Centennial High School, Roswell, GA and Bridget Conneely, HHMI, Chevy Chase, MD

NABT Committee Meeting: Archival Committee

Switchman Room • Committee Meeting • GA

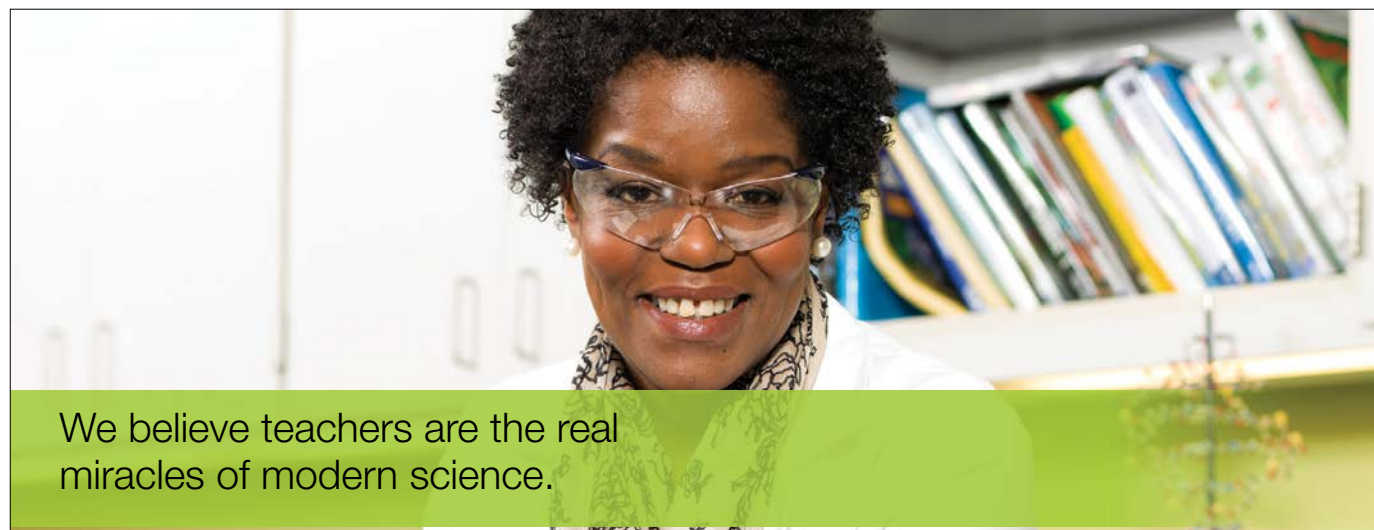
Carrie Bucklin and Jill Maroo, Committee Chairs

SPECIAL PROGRAMMING PRESENTED BY AC2-Bio-Link Regional ATE Center**335 - Do You Have the Skill Set to Work in the Biotechnology Industry?**

Midway Suites 3 • Biotechnology • Hands-on Workshop (30 min) • HS, 2Y, 4Y

Learn about the skills and knowledge needed to work in the biotechnology industry. Dr. Fletcher and Dr. Porter, field experts, have over 20 years of experience educating students for the biotechnology industry.

Linnea Fletcher, AC2 Bio-Link Regional Center, Austin, TX and Sandra Porter, Digital World Biology LLC, Seattle, WA



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12:00 PM – 12:30 PM continued**143 - How to Integrate Personal Genetics into a Biotechnology Curriculum****Midway Suites 7** • Biotechnology • Demonstration (30 min) • HS, 2Y

The session will outline how to effectively integrate personal genetics into a biotechnology course, and associated ethical considerations. Course material from the Personal Genetics Education Project will be highlighted.

Julie Boehm, Wellesley High School, Wellesley, MA

196 - On the Cheap: Care and Use of Invertebrates in the Classroom**Midway Suites 8** • General Biology • Demonstration (30 min) • HS, 4Y, GA

Instructors without previous experience can learn to maintain invertebrates for use in their classrooms with these effective protocols. Lesson plan ideas will also be discussed with handouts provided.

Elizabeth Davis-Berg and Julie Minbiole, Columbia College Chicago, Chicago, IL; and Michael LaBarbera, University of Chicago, Chicago, IL

288 - Sacred Bovines “Live!”: Understanding the Naturalizing Error in Science**Midway Suites 9** • Nature of Science • Paper (30 min) • HS, 4Y, GA

Douglas Allchin, author of the “Sacred Bovines” column in *The American Biology Teacher*, presents several cases from his new book focusing on critical strategies about recognizing ideological positions disguised as claims about nature.

Douglas Allchin, University of Minnesota, St. Paul, MN

58 - A CURE: Vertebrate Heart Development and Physiology**Midway Suites 10** • Anatomy & Physiology • Demonstration (30 min) • HS, 2Y, 4Y, GA

This CURE on vertebrate heart development and physiology investigates how cardiovascular drugs affect heart rate and contractility of surgically isolated living hearts of chicken embryos, the vertebrate model system.

Jacqueline McLaughlin and Mit Patel, Penn State Lehigh Valley, Center Valley, PA

219 - Live from the Morgue**Station Master Room** • Anatomy & Physiology • Hands-on Workshop (30 min) • HS

Learn about our live-feed, interactive, video-educational program on the autopsy. Join us for an open discussion at the intersection of anatomy, health, death, and scientific investigation.

Ben Margolis, Autopsy Center of Chicago, Chicago, IL and Caroline Milne, Barrington High School, Barrington, IL

92 - Expedition to the Enchanted Isles – Facilitating a Student Trip to the Galápagos Islands**Burlington Route** • Evolution • Demonstration (30 min) • HS

In the summer of 2015, we toured and studied the Galápagos Islands with a group of high school students. This session covers planning, logistics, lessons learned, and suggestions for planning such an adventure with your students.

James Reid, Woodberry Forest School, Woodberry Forest, VA and John Leighton Reid, Missouri Botanical Garden, St. Louis, MO

320 - Turning the Classroom into a Crime Scene: An Evidence-based Discussion on how Active Team-based Learning Enhances Student Enthusiasm and Comprehension of Microbial Pathogens**Frisco** • Instructional Strategies • Demonstration (30 min) • 2Y, 4Y, GA

The 2017 winner of the *Four-Year Section's Biology Teaching Award* will present his in-class project, “Microbial Murders: A Crime Scene Investigation”, and explain the logistics of implementing the project and evidence that this active team-based learning project is effective at engaging students and helping them understand the microbial sciences.

Jordan Steel, Colorado State University - Pueblo, Pueblo, CO

28 - AP Biology Culminating Inquiry Laboratory Experience**Illinois Central** • AP Biology • Hands-on Workshop (30 min) • HS

An AP biology culminating laboratory experience will be presented where students review required AP labs. Timeline, requirements, student examples, supplies, and a demo of the inquiry process will be modeled.

Kate Silber and Roxanne Jamroz, Highland Park High School, Highland Park, IL

158 - A Comprehensive Program to Boost Student Success in Large Enrollment Introductory Biology Courses**Jefferson/Knickerbocker** • Curriculum Development • Paper (30 min) • 4Y

Results will be presented for an ongoing comprehensive student success program to improve both course completion rates and retention through modified teaching practices and improved learning strategies among students.

Richard Knapp, University of Houston, Houston, TX

12:00 PM – 12:30 PM *continued*

240 • PlantingScience: Using an Online Mentoring Platform to Enhance Student-Driven Plant Science Investigations

New York Central • Technology in the Classroom • Demonstration (30 min) • MS, HS, 2Y

The free PlantingScience.org online mentoring community supports students through all stages of an investigation. Feel overwhelmed advising multiple teams with diverse interests in your classroom? Our volunteer scientists can help!

Catrina Adams, Botanical Society of America, Saint Louis, MO

68 • How Active Learning Instruction Motivates Students to Learn Biology

Wabash Cannonball • General Biology • Paper (30 min) • 2Y, 4Y, GA

Come and learn as we present our research showing how active learning can increase students' intrinsic motivation to learn biology. Practical implications for teaching college biology will also be addressed.

Michael Moore, Baylor University, Waco, TX; Donald French, Oklahoma State University, Stillwater, OK; Grant Gardner, Middle Tennessee University, Murfreesboro, TN

12:45 PM – 1:15 PM

SPECIAL PROGRAMMING PRESENTED BY Washington University

339 • Master Teacher Share-a-Thon

Midway Suites 3 • Instructional Strategies • Symposium (30 min) • MS, HS, 2Y

Come share in 5-10 minutes your favorite lesson plan, lab, or teaching resource with teachers from across the country who participated in Washington University's Master of Science in Biology program.

Margo Hathaway, Charles McWilliams, and Victoria May, Washington University in St. Louis, St. Louis, MO




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JOIN OUR HANDS-ON WORKSHOPS:

Friday, Nov. 10, 2017, Midway Suites 4

- 10:30 - 11:45 am PCR DNA Amplification
- 12:00 - 1:15 pm DNA Fingerprinting
- 1:30 - 2:45 pm Foodborne Outbreak Investigation
- 3:00 - 4:00 pm PTC Taste by Genotyping

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NABT BIOLOGY EDUCATION RESEARCH SYMPOSIUM

2:00 PM – 4:00 PM • Midway Suites 6

SCHEDULED PRESENTATIONS:

A Critical Review of the Literature on Biology Graduate Teaching Assistant Professional Development

Joshua Reid, Penny Carroll, and Grant Gardner, Middle Tennessee State University, Murfreesboro, TN; Miranda Chen and Elisabeth Schussler, University of Tennessee, Knoxville, TN; Gili Marbach-Ad, University of Maryland, College Park, MD; Kristen Miller, University of Georgia, Athens, GA; and Judith Ridgway, The Ohio State University, Columbus, OH

Graduate Teaching Assistants (GTAs) are critical yet under-appreciated instructors in the movement to reform undergraduate STEM instruction. In biology specifically, GTAs teach a large proportion of undergraduate “gateway” courses shown to be critical for success and retention of biology students. Yet GTA Teaching Professional Development (TPD) continues to be limited or nonexistent nationwide. This study is a critical review of the GTA professional development literature. We focus on a subsample of $n = 23$ studies of biology GTAs in the larger sample of $n = 117$ reviewed manuscripts. Findings highlight the types of TPD being published in the literature and the types of outcomes variables being measured including: GTA cognitive outcome variable, GTA teaching practice outcome variables, and undergraduate student learning outcomes. Implications for research and practice in this field will be discussed.

Comparing Learning Objective Communication between Professors and Students in the Classroom

Jennifer L. Idema, Zachary L. Nolan, E. Austin Leone, Kathryn M. Parsley, Sara Salisbury and Kristy L. Daniel, Texas State University, San Marcos, TX

University courses have learning objectives that are commonly found in course syllabi. Because students and professors place different values on syllabi, perceptions of learning objectives vary. Previous studies have investigated the relationship between student-teacher expectations and syllabi content, but do not address the role of explicit syllabi content. Our study used qualitative methods to investigate the relationships among student-reported perceptions of course learning objectives, professor-reported intended course learning objectives, and explicit syllabus content. We used interviews from two professors who taught introductory biology courses for non-majors, course syllabi, and student responses to an open-ended questionnaire about course learning objectives. After deductively coding students' responses, we found only 33% of students accurately identified a learning objective listed in the course syllabus. We identified three main themes in student reported learning objectives: Knowledge (83.9%), Practice (11.3%), and Performance (4.8%). Two of these (Knowledge and Practice) are in line with professor intended learning goals. Our findings show that the syllabus alone is an ineffective tool for communicating course learning objectives. Other communication methods should be employed to convey course learning objectives to students. By understanding how students interpret learning objectives, professors are better equipped to help students succeed.

Formative Assessment in Online Science Classes: Exploring how Assessments Drive Teacher Practices that Aid Learning

Shannon M. Burcks and Marcelle A. Siegel, University of Missouri, Columbia, MO

Science curricula integrated into virtual formats have shown promise meeting the goals set forth in the Next Generation Science Standards (NGSS Lead States, 2013). In online courses, assessments are presented in a virtual format where they are also incorporated into a teacher's practice. Therefore, it is essential to understand how assessments in online courses impact teachers' formative assessment practices. In this study, we chose to consider how aspects of course assessments in an online undergraduate introductory non-majors nutrition course influenced a teacher's practices to support student learning of science content. We used the Assessment Literacy conceptual model (Abell and Siegel, 2011) with a specific focus on Interpretation and Action Taking to analyze our data. Our findings demonstrate how online assessments may aid or unintentionally constrict teacher practices which support learning. Additionally, we show that a teacher with a high-level of assessment literacy can reduce the impact of limitations presented by an assessment. Our study suggests further support for developing teachers' assessment literacy and the use of assessments that provide the opportunity for customization during multiple interactions with students would help teachers to better interpret student needs and take action to support student learning.

Acceptance of Evolution among American College Students at Two Arkansas Regional Universities

Holli Hall, Arkansas Tech University, Russellville, AR and Mark W. Bland, University of Central Arkansas, Conway, AR

Evolutionary theory is the unifying concept across all branches of biology, and higher levels of acceptance of this theory correlates with a better understanding of science and scientific processes. Demographic factors such as religiosity, age, gender, ethnic heritage, attendance of a public vs. private high school, and their choice of major were additional factors influencing students' acceptance rates of evolution as a unifying concept. A Likert scale survey (the MATE) was administered to students enrolled in a freshman level biology course at the beginning of each of three semesters. At the end of each semester, after lecture and testing on evolutionary concepts, the students were administered the same survey. Results were evaluated by topic question for each demographic group using average MATE scores, ANOVA, and Pearson's R values for statistical analysis. The religious background and age of the students were found to predict their acceptance of evolutionary concepts. Results further indicated that a students' level of religiosity has the greatest influence on students' MATE scores. Significant results between the demographic groups including major vs. non-major, age, gender, ethnic heritage, religious affiliation, and their attendance in a public high school vs. a private high school were all found to be predictors for students' MATE scores.

Instructors' Formative Assessment in Undergraduate Biology: Influences, Context, and Practices

Julie A. Birt, Marcelle A. Siegel, Linh T. Ngo, Hai T. Nguyen, Elizabeth M. Gammel, Keala Cummings and Bethany R. Mordhorst, University of Missouri, Columbia, MO

In this multiple case study, drawing on the personal practice assessment theory (PPAT) model from Box, Skoog & Dabbs (2015), we investigated two experienced college biology instructors' theories and contextual influences on their formative assessment practices. Data collected included classroom observations, instructor interviews, course artifacts and student focus group. Qualitative analysis of the data revealed that each instructor's differing PPATs affected their purpose, planning, and implementation of formative assessment. Tasha's PPATs led her to believe that assessment should be a carefully planned motivational and learning opportunity for students, while Jack viewed assessment as a diverse and stress-free student learning experiment. Tasha's many years of teaching acted as a barrier in that she felt she could anticipate all student difficulties while Jack's adaptable assessment practices were facilitated by his confidence in his tenured status. Cross-case analysis affirmed that both instructors chose assessment practices they enjoyed and focused on assessment for student learning, but only Jack allowed the assessment results to effect an immediate change in his practices while Tasha planned changes for the following semester. Overall we present a focused glimpse into the private classrooms of college biology instructors which shed valuable insights into the personal practice theories of experienced college instructors.

The Hidden Role of "Buy-In": How Faculty and Student Attitudes Impact Curricular Reform

Tarren Shaw, University of Oklahoma, Norman, OK; Suann Yang, SUNY Geneseo, Geneseo, NY; Troy Nash, Mercer University, Macon, GA; Rachel Pigg, Presbyterian College, Clinton, SC; and Jeff Grim, University of Tampa, Tampa, FL

Vision & Change recommends transformation in undergraduate biology education, but some faculty may be reluctant to reform their courses for fear of student resistance. Faculty may use many measures to evaluate the extent of student resistance, such as student evaluations of teaching or verbal comments from students or colleagues. It is less common for faculty to use a thorough assessment of both student learning gains and self-efficacy to inform curricular change. We assessed both of these measures in a mixed-majors biology course at a small liberal arts college. Students self-reported increases in learning gains on surveys, and formative and summative assessments demonstrated actual learning/performance gains. STEM majors were more likely to report positive opinions than non-STEM majors, though more positive compared to negative opinions were expressed by students who took the course, regardless of major. Because of a decrease in interest in biology by non-majors, we suggest that offering a non-majors introductory biology course may be more successful in engaging these students.

12:45 PM – 1:45 PM

Two-Year College Section Luncheon

Grand A • Meal Function (Tickets Required) • 2Y

Help build the two-year college community by sharing your successes, challenges, epiphanies, and best practices (and worst jokes) over lunch. The winner of the *Two-Year College Biology Teaching Award* will also be recognized.

Four-Year College and University Section Luncheon

Grand B • Meal Function (Tickets Required) • 2Y

Do you teach at a four-year college or university? Join faculty, education researchers, graduate students, and others for some networking and nourishment. The lunch will include a meeting to highlight projects and initiatives of the section, including a special presentation of the *Four-Year College and University Section Awards*.

AP Biology Section Luncheon

Grand C • Meal Function (Tickets Required) • HS

Meet other AP Biology teachers in a friendly informal setting to ask questions, share insight, and build community. You may even finally get to meet some of your favorite fellow AP teachers in person. The luncheon also includes a special presentation of the *Kim Foglia AP Biology Service Award*.

The AP Biology Section Luncheon is sponsored by



2:00 PM – 3:15 PM

INVITED SPEAKER

Kathryn M.S. Johnson

➔ See page 10 for biography.



Horse Hormones: Predicting and Preventing Painful Lameness Initiated by Insulin Resistance

Regency A • Special Speaker • GA

Horses are popular pets, and horse owners are eager to keep their pets happy and healthy. Extreme lameness in horses is typically very painful for the animal, and it is a common reason that horses are euthanized. One of the most severe types of lameness in horses is laminitis, which occurs when blood vessels are damaged within the hoof. As opposed to lameness caused by a traumatic injury, the damage within the hoof that occurs with laminitis is linked to obesity and changes in blood hormone levels, such as insulin. Laminitis is also more common in some breeds than others.

During this presentation, Dr. Johnson will explore what a horse's gait and breed can tell us about how nutrients and hormones are changing in its blood, and what horse owners can do to prevent painful implications of laminitis.

2:00 PM – 3:15 PM

315 • Made for Each Other: Pairing HHMI Resources with Case Studies

Regency B • Instructional Strategies • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Combine HHMI Biointeractive resources with case studies to engage students in problem-solving. In this session, you will experience such a classroom and dissect how to do it effectively.

Annie Prud'homme-Généreux, Quest University Canada/TELUS World of Science - Edmonton, AB, Canada; Sarah Wojiski, Jackson Laboratory for Genomic Medicine, Farmington, CT; and Mark Nielsen, HHMI, Chevy Chase, MD

NABT Committee Meeting: Equity Committee

Red Cap Room • Committee Meeting • GA
Committee Chair to be Selected

NABT Committee Meeting: ABT Advisory Committee

Switchman Room • Committee Meeting • GA

William McComas, Editor of the ABT

SPECIAL PROGRAMMING PRESENTED BY Princeton University Press

329 • Everything is Regulated: How to Use The Serengeti Rules, Storytelling, and a New Curriculum Supplement to Enhance Your Biology Curriculum

Midway Suites 3 • Ecology / Environmental Science / Sustainability • Workshop (75 min) • HS, 2Y, 4Y

Join a discussion with Sean B. Carroll and Paul Strode about how you can use Sean's book, "The Serengeti Rules", to better engage your students in your biology curriculum.

Paul Strode, Fairview High School, Boulder, CO and Sean Carroll, University of Wisconsin/Howard Hughes Medical Institute, Madison, WI

2:00 PM – 3:15 PM cont.

269 - Sense in Molecules: Modeling Personalized Medicine

Midway Suites 7 • Biotechnology • Demonstration (75 min) • HS, 2Y, 4Y

Analyzing their DNA, students predict their ability to taste a bitter substance. This lab highlights the relationship between phenotype and genotype, illustrating personalized medicine - predicting drug responses using DNA.

Bruce Nash, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY

37 - Zoo Genetics Plus: A Free Curriculum Rooted in Real World Data

Midway Suites 8 • General Biology • Hands-on Workshop (75 min) • HS, 2Y, GA

Zoo Genetics Plus is a free curriculum based on the partnership between teacher and scientist. Dr. Jason Crean will showcase this data-driven curriculum written with wildlife geneticist Dr. Jean Dubach.

Jason Crean, Lyons Township High School/Saint Xavier University, Western Springs, IL

36 - Using Simulations and Computational Models to Teach Scientific Practices

Midway Suites 9 • Science Practices • Hands-on Workshop (75 min) • HS, 2Y, 4Y, GA

Computational models can simplify complex dynamic systems for students by constraining parameters. Learn how to effectively use simulations to have students discover relationships and practice science by incrementally perturbing parameters.

Jon Darkow, Seneca East High School, Attica, OH

2:00 PM – 4:00 PM

NABT AP BIOLOGY SYMPOSIUM

Student Misconceptions and Challenge Areas: What Does the AP Exam Tell Us?

Midway Suites 5 • AP Biology • Symposium (60 min) • MS, HS, 2Y, 4Y

Student responses on the AP Exam provide teachers with insight into misconceptions and challenge areas. Find out what concepts and skills are challenging, and how to scaffold activities addressing those misconceptions.

Jennifer Pfannerstill, North Shore Country Day School and The College Board, Winnetka, IL and Tanya Sharpe, The College Board, Duluth, GA

Un“covering” AP Biology: A Community Conversation about Content and Skills

Midway Suites 5 • AP Biology • Symposium (60 min) • HS, 2Y, 4Y

Work with mentor teachers in small groups to answer questions every AP Biology teacher has, and join our community conversation on how “doing biology” will improve your students’ exam scores.

Jennifer Pfannerstill, North Shore Country Day School and The College Board, Winnetka, IL; Brad Williamson, University of Kansas, Lawrence, KS; Chris Monsour, Tiffin Columbian High School, Tiffin, OH; Theresa Holtzclaw, The Webb School, Knoxville, TN; Gordon Uno, University of Oklahoma, Norman, OK; Cindy Gay, BSCS, Colorado Springs, CO; and Sara Brownell, Arizona State University, Tempe, AZ

286 - When Elementary Learners “Become” Veterinarians: A Serious Educational Game Designed to Examine Diabetes, Obesity, and the Human Body Systems

Midway Suites 10 • Technology in the Classroom • Demonstration (75 min) • E, MS, GA

Students immerse in the “Virtual Vet”, a serious educational game designed to engage elementary learners with critical thinking skills in the context of the body systems.

Georgia Wood Hodges, Kayla Pritchard, and Sandhya Krishnan, University of Georgia, Athens, GA

2:00 PM – 4:00 PM

NABT Biology Education Research Symposium

Midway Suites 6 • Instructional Strategies • Symposium (120 min) • MS, HS, 2Y, 4Y

NABT is proud to present the 9th Annual Biology Education Research Symposium. Presentations were accepted through a double-blind review process that was open to biology instructors and education researchers at all levels.

➔ Full abstracts are available on page 38 and proceedings will be published online at <https://www.nabt.org/2017-Research-Symposium>

Coordinators: Erin Baumgartner, Western Oregon University, Monmouth, OR and Jaime Sabel, University of Memphis, Memphis, TN

2:00 PM – 3:15 PM cont.**129 • The Neuroscience of Our Senses****Station Master Room • Neuroscience • Hands-on Workshop (75 min) • MS, HS**

Touch. Hear. Balance. See. Taste and Smell. Explore with five iOS apps, companion activities, and related content that examine perception at molecular, cellular, and tissue levels. Free: Learn.Genetics.utah.edu and iTunes.

Louisa Stark and Molly Malone, Genetic Science Learning Center at the University of Utah, Salt Lake City, UT

194 • Modifying Existing Curriculum to Mirror Local Environments to Benefit Students**Burlington Route • Curriculum Development • Hands-on Workshop (75 min) • MS, HS**

This workshop provides a methodology for converting existing curricula from other regions into locally relevant curricula that meet local and national standards using a USVI project as a model.

Carrie Bucklin, Southern Utah University, Cedar City, UT

96 • Save the Polar Bear! Ecology Escape Game**Frisco • Instructional Strategies • Hands-on Workshop (75 min) • MS, HS**

Using ecology knowledge, work to find clues, solve puzzles, and free a (toy) polar bear from the black market! Discuss application to your classroom and leave with classroom-ready resources.

Laura Schisler, Missouri Southern State University, Joplin, MO and Shana Kelley, Parkway Central High School, Chesterfield, MO

115 • The American Association of Immunologists Presents: AAI Teachers Research Program - Immunology Lessons for the Classroom**Illinois Central • AP Biology • Hands-on Workshop (75 min) • MS, HS**

Learn how to bring the excitement of immunology research to students in the classroom with units presented by teachers from the American Association of Immunology Summer Research Program for Teachers.

Courtney Pinard, Mary Litzinger, and Megean Garvin, American Association of Immunologists, Rockville, MD and Clinton Mathias, Western New England University, Springfield, MA

120 • A Flexible Approach to Integrating Authentic Research Experiences into Various Types of Introductory Biology Courses**Jefferson/Knickerbocker • Curriculum Development • Symposium (75 min) • HS, 2Y, 4Y**

From subtle shifts to massive changes - learn how we use different approaches to offer students research experiences in their first biology, biochemistry, botany, chemistry, microbiology, and zoology courses.

Donald French, Lucy Bailey, John Gelder, John Gustafson, Wouter Hoff, Janette Steets, and John Stewart, Oklahoma State University, Stillwater, OK

19 • Plants Suck...Carbon Dioxide! 30 Ready-to-Use Plant-Based Activities to Bring to Your Classroom**New York Central • Botany & Plant Biology • Hands-on Workshop (75 min) • HS**

Come to our "Jeopardy" style session to learn about 30 engaging plant-based activities and labs that are ready to use in your classroom.

Michael LeDuc and Chris Hilvert, Glenbrook South High School, Glenview, IL

149 • Investigating Innovations in Community College Biology Teaching and Learning: What We Learned from CC faculty at the Forefront of Biology Education Research**Wabash Cannonball • Instructional Strategies • Symposium (75 min) • 2Y, 4Y**

Engage with Community College faculty conducting Biology Education Research (CC-BER). Learn about the current state of CC-BER, how CC-BER relates to student success, and peer networks that support CC-BER.

Jeff Schinske, Foothill College, Los Altos Hills, CA and Lisa Corwin, University of Colorado, Boulder, Boulder, CO

3:30 PM – 4:00 PM**309 • Picture This! Using HHMI's Image of the Week in Phenomena-Driven, Three-Dimensional Lessons****Regency B • Instructional Strategies • Hands-on Workshop (30 min) • MS, HS, GA**

Interested in learning how to use phenomena to drive your three-dimensional lessons? HHMI's images of the week spark student curiosity and inquiry, leading to student-created models, investigations, and scientific explanations.

Samantha Johnson, Arroyo High School, San Lorenzo Unified School District, San Lorenzo, CA and Bridget Conneely, HHMI, Chevy Chase, MD

NABT Committee Meeting: Retired Members Committee**Switchman Room • Committee Meeting • GA**

Dennis Gathmann, Committee Chair

**SPECIAL PROGRAMMING
PRESENTED BY
Washington University**

**339 - Master Teacher
Share-a-Thon**

Midway Suites 3 - Instructional Strategies - Symposium (30 min) - MS, HS, 2Y

Come share in 5-10 minutes your favorite lesson plan, lab, or teaching resource with teachers from across the country who participated in Washington University's Master of Science in Biology program.

Margo Hathaway, Charles McWilliams, and Victoria May, Washington University in St. Louis, St. Louis, MO

259 - Breaking Down Barriers to Evolution by Going "Into The Jungle"

Midway Suites 8 - General Biology - Demonstration (30 min) - HS, 2Y, 4Y

Learn how the combination of Sean B. Carroll's book, "Into The Jungle", HHMI BioInteractive videos, and group discussion has created opportunities to remove stereotypes and broaden understanding of how evolution works.

Jess Robbins, Vincennes University, Vincennes, IN

215 - Evolutionary Movers and Shakers: Researching, Debating, and Ranking the "Top 20" Evolutionary Scientists of All Time - Dig Deeper with the Pioneers of Evolutionary Theory

Midway Suites 9 - Evolution - Hands-on Workshop (30 min) - MS, HS, 4Y

Expand and enliven your evolution curriculum by having students research, debate and rank the "Top 20" evolutionary scientists. How do they compare with the opinions of our Expert Panel!

John Mead, St. Mark's School of Texas, Dallas, TX and Amanda Glaze, Georgia Southern University, Statesboro, GA



DO YOU HAVE THE SKILL SET TO WORK IN THE BIOTECHNOLOGY INDUSTRY?

DR. FLETCHER AND DR. PORTER

LOCATION: Midway Suites 3

DATE: Friday, November 10, 2017

TIME SLOT: 12:00-12:30 p.m.

Bio-Link college programs and high school affiliates have been educating students in workforce oriented biotechnology and bioscience areas for the past 20 years. They exemplify the combination of core skills, knowledge and pedagogical practices discussed in the Next Generation Science Standards, the AP Biology Framework and the Vision and Change document.

Learn to locate biotechnology jobs both nationally and locally, about emerging biotechnology and bioscience workforce trends and identify different kinds of careers. Connect with the biotech education community on national and local levels!



3:30 PM – 4:00 PM cont.**161 - Unlocking the Mysteries of Science: Using Breakout 'Escape' Boxes to Engage Students in Case Study Problem-Solving in the Sciences****Midway Suites 10** • Instructional Strategies • Hands-on Workshop (30 min) • E, MS, HS

No better way to stimulate curiosity than a locked box mystery, especially when clues to the lock combinations are about SCIENCE! Participate in a mini-breakout using this exciting classroom strategy.

Pamela Close and Jessica Platto, David H. Hickman High School, Columbia, MO

26 - What's New in Neuroscience Activities**Station Master Room** • Neuroscience • Hands-on Workshop (30 min) • MS, HS, 2Y, GA

Neuroscience is becoming more accessible to highschool-aged students. This workshop allows first-hand experience with three new neuroscience activities that integrate physiology and technology principles equally well. Excite their curiosity!

Susan Park, The Hotchkiss School, Lakeville, CT

64 - Engaging Students of Science with SAMR - Redefine Your Assessments**Burlington Route** • General Biology • Symposium (30 min) • MS, HS

Increase classroom engagement with lessons that align to NGSS. Use the SAMR model of Substitution, Augmentation, Modification, and Redefinition to infuse technology into learning. Easily adaptable for middle and high school classes.

Caroline Milne, Laura Turngren, Erin Tantillo, Julie Baylor, and Vanessa Fennig, Barrington High School, Barrington, IL

11 - Graduate Student Workshop: Navigating Graduate School and Transitioning into Academia**Illinois Central** • Instructional Strategies • Symposium (30 min) • GA

Join us for an opportunity to network, connect with mentors, and learn about opportunities for growth as a biology education scholar.

NABT Graduate Student Committee

145 - Development of an Innovative Science Methods Course that Strengthens Preservice Biology Teachers' Understanding about Nature of Science Through the Lens of Authentic Research**Jefferson/Knickerbocker** • Instructional Strategies • Paper (30 min) • 2Y, 4Y

Come learn how we use authentic research experiences, during a secondary science methods course, to strengthen preservice biology teachers' understanding of scientific practices and nature of science.

Julie Angle and Donald French, Oklahoma State University, Stillwater, OK

265 - The Flipped Classroom: What the Students Say**Wabash Cannonball** • Instructional Strategies • Paper (30 min) • 2Y, 4Y

The viewpoints of general biology students in the flipped classroom, summarized from discussions, surveys, and interviews, will be presented. Practical advice on how to make the flip will be offered.

Kathy Gallucci, Elon University, Elon, NC

4:00 PM – 5:30 PM

Exhibit Hall Closing Reception

Midway • Special Program

It's last call in the Exhibit Hall. This is your last chance to talk with exhibitors and get those freebies for the classroom. Join us for a special reception, prize giveaways, and more!

Sponsored by 

5:30 PM – 8:00 PM

HHMI Night at the Movies with Sean Carroll



Grand Ballroom D, E, F • Special Event (Tickets Required)

HHMI BioInteractive (www.biointeractive.org) and NABT are pleased to host the 7th Annual *HHMI Night at the Movies with Sean Carroll*. Join Dr. Carroll for the premiere of a new release and discussion. This free red-carpet event will begin at 5:30 pm with a reception including free food and drink.

Movie Night Pre-Reception to be held in Grand Ballroom Foyer. Movie will be shown promptly at 6:30 PM in Grand Ballroom D, E, F.



HHMI Night at the Movies with Sean Carroll

Friday, November 10, 2017

Movie Night

Reception and Book Signing
Foyer A,B,C 5:30–6:30 p.m.
Food and Drink Provided

Screening 6:30 p.m.
Grand Ballroom D,E,F



NOV



SATURDAY

ABBREVIATION KEY

E: Elementary School

MS: Middle School

HS: High School

2Y: Two-Year College

4Y: Four-Year College

GA: General Audience

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