

November 13
SATURDAY

ABBREVIATION KEY

E: *Elementary School*

MS: *Middle School*

HS: *High School*

2Y: *Two-Year College*

4Y: *Four-Year College*

GA: *General Audience*

AP® is a registered trademark.

7:30am – 8:45am

BioClub Breakfast

Marquis Ballroom A • Meal Function
(75 min) • GA

You're invited to join the (Bio)Club!
The NABT BioClub continues to grow, with new chapters being formed at K-12 schools, community colleges, and informal learning organizations. Current and future BioClub advisors are invited to share their favorite stories and resources.

Sponsored by



8:15am – 10:15am

NABT Biology Education Poster Session & Coffee Break

Marquis Ballroom B • Poster Session
(75 min) • GA

The NABT Poster Session features practices, programs, and research in three distinct categories: general strategies for teaching biology, the scholarship of teaching, and mentored student research. Posters presented by students are eligible for two competitions, and winners will be announced before the closing general session.

See full poster listing on page 40

9:00am – 11:00am

3229 AP Biology Symposium

M103/104 • AP Biology • Symposium
(120 min) • HS, 2Y, 4Y

Meet with other AP Biology Teachers to discuss new approaches to incorporate science practices in the classroom, whether you are in-person, hybrid, or online. We will also share impressions about the new AP Exam and effective review strategies.

Coordinated by the NABT AP Biology Section

9:00am – 10:15am

INVITED SPEAKER

Amanda Glaze

See page 10 for biography.

Overcoming Barriers to Scientific Literacy in the United States: Reflections and Vision for Evolution Education

M101 • Special Speaker • GA

Despite major advancements in our technology and understanding of the natural world in the opening decades of the 21st century, the public remains skeptical of scientific knowledge and practice in ways that are detrimental to society. Today, science is pitted against culture, religion, and other personal beliefs in ways that we, as scientists and scientific thinkers, felt were surely becoming a phenomenon of the past. Evolution education is one of many areas prime for building bridges and removing the stigma of “science versus...” from conversations in the public and in our classrooms. Research shows that engaging thinking and fostering science literacy within worldviews is possible but requires more than teaching facts and sharing evidence. It is critical that voices speak for science outside of the echo chamber, seeking to build bridges that open space for science literacy to be welcomed into otherwise closed spaces.

9:00am – 10:15am

3136 The Gut Microbiome: A Diverse Ecosystem Thriving on Food and Fiber

L401-403 • General Biology • Hands-on
Workshop (75 min) • ML, HS, 2Y

Participants learn how food choices and the environment affect the complex gut microbiome ecosystem in humans. Students participate in two simulations, analyze research data, and more - accessible online or in-class.

Joan Griswold, University of Washington, Seattle, WA and Atom Lesiak, University of Washington, Seattle, WA

SPECIAL PROGRAMMING PRESENTED BY Lad-Aids

3233 The Power of CRISPR

L404 • Genetics • Hands-on Workshop
(75 min) • HS

View E.coli bacteria samples that have been transformed from red to green using a specific Cas-9 gene editing process and consider applications of CRISPR technology, including treating sickle cell disease.

Maia Binding, SEPUP/University of California, Berkeley, CA and Mark Koker, Lab-Aids, Ronkonkoma, NY

3090 Are You Up to the Tusk? Storylining with Elephant Conservation and Social Justice

L405/406 • Ecology / Environmental
Science / Sustainability • Hands-on
Workshop (75 min) • ML, HS, 2Y

Welcome conservationists! Come analyze DNA from simulated elephant ivory samples, use manipulatives to better understand this keystone species ecological role, and connect your learning to historical and present-day justice issues.

Rebecca Brewer, Troy High School, Troy MI

3043 The Credibility Games: The COVID Edition

L503 • Science Practices • Hands-on
Workshop (75 min) • GA

Engage your students in assessing the credibility of scientific claims in the public domain (NGSS Practices #8). Inoculate them against science con-artists. Many inquiry cases, including covid promises and pronouncements will be discussed.

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

NABT Biology Education Poster Session

8:15am - 10:15am

Marquis Ballroom B

GENERAL (NON-COMPETITION) CATEGORY

- 1. Creating Quantitative Biology 'Open Educational Resources' to Improve Mathematical Competency of Faculty and Students**

Jennifer Adler, Maysville Community and Technical College, Paris, KY
- 2. It's About Time: Exploring the Dose-dependent Effects of Active Learning on Student Social Personality in an Upper-level Biology Course**

William Beckerson, Jennifer Anderson, Siddhesh Kulkarni, John Perpich, & Deborah Yoder-Himes, University of Louisville, Louisville, KY
- 3. The Zombie Fungus Foray: Using iNaturalist for Community Science**

William Beckerson & Charissa de Bekker, University of Central Florida, Orlando, FL
- 4. Curricular Revision to Address Equity, Inclusion, and Identity in Biology**

Kaitlin Bonner, Maryann Herman, & Noveera Ahmed, St. John Fisher College, Rochester, NY
- 5. Confronting Myths and Lies about Immunization with Classroom Teachable Moments**

Kerry Cheesman, Capital University, Columbus, OH
- 6. Use of a CURE to Improve Experimental Design Skills in an Introductory Biology Course**

Allison D'Costa, Cindy Achat-Mendes, Judy Awong-Taylor, Joshua Edwards, Latanya Hammonds-Odie, Pat Ulmen Huey, Elizabeth Javazon, & Candace Timpte, Georgia Gwinnett College, Lawrenceville, GA
- 7. If At First You Don't Succeed: Allowing Retakes of Course Exams to Improve Student Success in an Introductory Biology Course**

Johnathan Davis, Young Harris College, Young Harris, GA
- 8. Perceived Stress During COVID-19**

Ben England & Dulce Vega, Saint Louis University, St. Louis, MO; Kelly Barry, Southern Illinois University-Edwardsville, Edwardsville, IL; Latanya Hammonds-Odie, Georgia Gwinnett College, Lawrenceville, GA
- 9. Exploring the Role of Student Engagement with Modeling on Differential Performance Outcomes**

Bethany Gettings, Michigan State University, East Lansing, MI; Joelyn de Lima – École polytechnique fédérale de Lausanne (EPFL), Switzerland; Tammy Long, Gettings, Michigan State University, East Lansing, MI
- 10. HISTEM Program: An NSF S-STEM Funded Program to Support High Achieving, Financially-needy Students Majoring in STEM Degrees**

Tami Imbierowicz & Supawan King, Hartford Community College, Hartford, CT
- 11. Development of the Life Science Maker Education Program for the High School Biodiversity Learning and its Application Effects**

Sung-Ha Kim, Korea National University of Education, Cheongju-si, Chungbuk, Korea; Hye-In Kim, Pungdong High School, Goyang-si, Gyeonggi-do, Korea
- 12. Evaluating the Use of Avida-ED Digital Organisms to Teach Evolution and Natural Selection**

Neil Lax, Thiel College, Greenville, PA
- 13. Quantitative Enzyme Activity Laboratory Module for Remote and In-Person Teaching**

Melanie Lenahan, Raritan Valley Community College, Clinton, NJ; Evdokia Kastanos, Ishrat Rahman, & Aubrey Smith, Montgomery College, Rockville, MD; Allison Burlyn, Horry-Georgetown Technical College, Myrtle Beach, SC
- 14. Teaching a Cell and Molecular Biology Laboratory on Cloning During the COVID-19 Pandemic**

Fran Norflus, Clayton State University, Morrow, GA
- 15. Biology Everywhere: Easy Activities to Bring the Real World into the Classroom**

Melanie Peffer, University of Colorado Boulder, Boulder, CO
- 16. Investigating Epistemological Beliefs about Science in Biological Inquiry**

Melanie Peffer, University of Colorado Boulder, Boulder, CO
- 17. Testing Predictions: Helping Students Understand Island Biogeography Theory**

Lisa Pike, Francis Marion University, Florence, SC
- 18. Examining Self Efficacy, Science Identity, and Sense of Belonging within a Cohort-Based STEM Program**

Malcolm Schug, University of North Carolina - Greensboro, Greensboro, NC; Ayesha Boyce, Arizona State University, Phoenix, AZ; Cherie Avent, University of Illinois, Champaign, IL; Adeyemo Adetogun, Chris Hall, Lynn Sametz, Lee Phillips, Amelia Kane, Jeffrey Patton, & Kimberly Peterson, University of North Carolina - Greensboro, Greensboro, NC

19. Teaching an Old Dog New Tricks: Effects of Teaching Evidence-based Study Strategies on Student Learning

Tara Slominski, Mary Jo Kenyon, & Jennifer Momsen, North Dakota State University, Fargo, ND

20. How the Cereal Crumbles: A Hands-on Activity for Enzyme Kinetics and Thermodynamics in Introductory Biology

John Stanga, Troy Nash, & Megan Pannell, Mercer University, Macon, GA

21. How Does it Connect? Investigating Students' Understanding of the Intradisciplinary Nature of Biology

Parker Stuart, University of Central Missouri, Warrensburg, MO

22. Using Art for Micropipetting

Lynn Ulatowski, Ursuline College, Pepper Pike, OH

23. Why Not STEM? Techniques for STEM Retention

LeAnna Willison, Thomas University, Tallahassee, FL

24. Impact of Low Stakes Assessment in Biology College Courses

Heather Zimble-DeLorenzo, Georgia State University Perimeter College, Decatur, GA

BIOLOGY EDUCATION RESEARCH POSTER COMPETITION – GRADUATE STUDENTS

25. Centering an Undergraduate Ecology Course on Systems

Caitlin Anderson & Jennifer Momsen, North Dakota State University, Fargo, ND

26. Comparing the Acceptance and Teaching of Evolutionary Theory in Public and Private High Schools in Arkansas

Brittney Berumen & Mark Bland, University of Central Arkansas, Conway, AR

27. What is the Current State of Evolution Education in Arkansas?

Misty Boatman & Mark Bland, University of Central Arkansas, Conway, AR

28. Exploring Technological Pedagogical Content Knowledge (TPACK) of Higher Education Biology Instructors

Olena James & Grant Gardner, Middle Tennessee State University, Murfreesboro, TN

29. A Mixed-methods Evaluation of Students' Science Identity and Science Communication Self-efficacy in a Hybrid CURE Lab

Austin Leone & Donald French, Oklahoma State University, Stillwater, OK

30. Influence of Visual Scaffolding on an Outdoor Elementary Science Inquiry

Rachel Lincoln, Kristy Daniel, & Shelly Forsythe, Texas State University, San Marcos, TX

31. Exploring How a Faculty Member Transitions a New Active Learning Biology Course to an Emergency Online Environment

Myra McConnell, Paula Williamson, Rachel Davenport, & Kristy Daniel, Texas State University, San Marcos, TX

32. Service-Learning Curriculum Increases Climate Change Awareness

Daniel Mendoza, University of Florida, Gainesville, FL; Sarah Adkins, University of Alabama at Birmingham, Birmingham, AL; Jay Bhatt, Creighton University, Omaha, NE; Jeff Morris & Sami Raut, University of Alabama at Birmingham, Birmingham, AL

33. The Impacts of Using Personalized Emails from the Instructor in an Online Upper-level Physiology Course

Erika Nadile, Elonna Okuagu, Katelyn Cooper, & Sara Brownell, Arizona State University, Tempe, AZ

34. What Can Your Schoolyard Do for You? Exploring the Ecology Education Opportunities Provided by a Place-based and Science as-Practice Lesson

Sara Salisbury & Fonya Scott, Middle Tennessee State University, Murfreesboro, TN

35. An Analysis of Students' Mindsets as Related to their Academic Success

Kendra Wright & Jaime Sabel, University of Memphis, Memphis, TN

NABT Biology Education Poster Session

8:15am - 10:15am

Marquis Ballroom B

BIOLOGY EDUCATION RESEARCH POSTER COMPETITION – UNDERGRADUATE STUDENTS

36. Creativity in Science: Biology Undergraduate Beliefs About Creative Abilities

Zena Alhaj, Mya Malaykhan, Robel Yohannes, Halle Mastronardo, Taylor Farragut, Kelly Lane, & Lisa Limeri, University of Georgia, Athens, GA

37. Isolation, Resilience, and Faith: Experiences of Black Christian Students in Biology Graduate Programs

Chloe Bowen, Angela Google, & Lisa Hanson, Middle Tennessee State University, Murfreesboro, TN; Sara Brownell, Arizona State University, Tempe, AZ; Elizabeth Barnes, Middle Tennessee State University, Murfreesboro, TN

38. Peer Engagement: In-person vs. Online Using Learning Assistants

David Caldwell & Michael Moore, University of Arkansas at Little Rock, Little Rock, AR

39. Understanding How Undergraduate Students Think about Viruses and Vaccines During the COVID-19 Pandemic

Makenzie Chapman, Asia White, & Jaime Sabel, University of Memphis, Memphis, TN

40. Hesitant or Resistant: Impact of a COVID-19 Interventional Study Among Undergraduate Students' Perceptions of the Pandemic and the COVID-19 Vaccines

Derek Dang, Bianca Convers, Sloan Almehti, Tristan Boling, Christina Morra, & Samiksha Raut, University of Alabama at Birmingham, Birmingham, AL

41. Service-Learning Module Improves Non-STEM Majors' Understanding of Opioid Epidemic

Ryleigh Fleming, Sarah Adkins-Jablonsky, & Cinnamon Cross, University of Alabama at Birmingham, Birmingham, AL; Marco Esteban, California Dougherty Valley High School, San Ramon, CA; J. Jeffrey Morris & Samiksha Raut, University of Alabama at Birmingham, Birmingham, AL

42. Perceptions of Modality Differences in Human Anatomy Labs During the COVID-19 Pandemic

Brayden Koch, Brianna Brunson, Jennifer Mraz-Craig, & Mary Jo Tufte, Southern Utah University, Cedar City, UT

43. A Case for Teaching Fractals as a Fundamental Topic in Introductory Biology Courses

Kate Kucinski, Alissa Ray, Sachi Chaudhari, & John Cogan, Ohio State University, Columbus, OH

44. Zeroing in Nonmajors

Joshua Olaniran, Marguerite Brickman, & Austin Heil, University of Georgia, Athens, GA

45. A Comparison of Religious Cultural Competence in Evolution Education Online Versus In-Person and its Association with Students' Outcomes

Alexa Summersill & Chloe Bowen, Middle Tennessee State University, Murfreesboro, TN; Jamie Jensen, Brigham Young University, Provo, UT; Sara Brownell, Arizona State University, Tempe, AZ; Elizabeth Barnes, Middle Tennessee State University, Murfreesboro, TN

46. Understanding Vaccine Hesitancy Among Black and African American Biology Students During the COVID-10 Pandemic

Asia White, Makenzie Chapman, & Jaime Sabel, University of Memphis, Memphis, TN

47. Imposters Among Us? Analyzing Correlations in Imposter Phenomenon and Learning Gains

Sanaa Yusuf & Troy Nash, Mercer University, Macon, GA

**MENTORED
UNDERGRADUATE
RESEARCH POSTER
COMPETITION**

**48. Community Buy-In
of Innovative Water
Management to
Facilitate Change**

Vairleene Einstein & Aimée Thomas,
Loyola University New Orleans,
New Orleans, LA

**49. Evaluation of *Pseudomonas
aeruginosa* Susceptibility to
Antimicrobials and Studies
on Resistant Isolates**

Afaf Sobhi Mohamed Eladl, Kyoto
University, Kyoto, Japan

**50. The Effect of Far Red Light on
Root Growth in the C4 grass,
*Sertaria viridis***

Sofia Gomez, Julie Angle, & Andrew
Doust, Oklahoma State University,
Stillwater, OK

**51. The Annotation of the
Gordonia Phage Hortense
Genome**

Renee Dunbar & Amanda Gregg,
Northwestern Connecticut Community
College, Winsted, CT; Marbelyn
Benavides, Torrington High School,
Torrington, CT; Meegan Rossier, Tunxis
Community College, Farmington,
CT; Kelly Ruiz Borja, Torrington High
School, Torrington, CT; Jennifer
Redrovan, Naugatuck Community
College, Waterbury, CT; Sharon Gusky,
Northwestern Connecticut Community
College, Winsted, CT

**52. Soil Microbe Identification:
An Innovative Approach to
Teaching Microbiology Labs**

Autumn Kelsch & Jessica Habashi,
Utah State University, Brigham City, UT

**53. Bacterial Assessment for
Production of Antibiotic
Compounds in Lake
Allatoona,**

Samantha Lewis, Ericka Walczak, &
Erin Shufro, Georgia Highlands College,
Cartersville, GA

**54. Combined Sewer Systems,
Climate Change Impacts,
Vulnerability, and Adaptations
in the Great Lakes Region**

Anna Sitzman & Aimée Thomas, Loyola
University New Orleans, New Orleans,
LA; Nancy Beller-Simms, NOAA,
Silver Springs, MD

**55. Utilizing Bioanalytical
Software to Examine the
Genomes of *Gordonia*
Bacteriophages Sahara
and SoilAssassin**

Logan Wilson & Fhasal Alam, Torrington
High School, Torrington, CT; Amanda
Gregg, Northwestern Connecticut
Community College, Winsted, CT;
Amit Banik, Torrington High School,
Torrington, CT; Sharon Gusky,
Northwestern Connecticut
Community College, Winsted, CT

**56. Exploring Undergraduate
Biology Students' Attitudes
and Science Communication
about COVID-19 and COVID-
19 Vaccines: The Influence of
Major, Politics, Religion, and
Race/Ethnicity**

Elizabeth Wybren, Mariana de Araujo
Bryan, Thippaphone Niravong, Ying
Jin, Chloe Bowen, & Elizabeth Barnes,
Middle Tennessee State University,
Murfreesboro, TN

9:00am – 10:15am continued

3026 Improving the Student Experience during Examinations by Building Scenario-based Assessments from the Primary Literature

L504/505 • General Biology • Hands-on Workshop (75 min) • 2Y, 4Y

Participants will learn how to transform primary literature into scenario-based assessments and how our students have responded positively to this form of assessment.

Rachel Pigg, University of Louisville, Louisville, KY; Emily Rauschert, Cleveland State University, Cleveland, OH; Suann Yang, SUNY Geneseo, Geneseo, NY

3125 Formative Assessment: The Other F Word

L506/507 • Instructional Strategies • Hands-on Workshop (75 min) • ML, HS

Learn examples of fun, fast and easy formative assessments to use in the classroom. You won't see shoulder partners or think- pair- share here.

Julia Davis and Linda Alloju, Plano West Senior High School, Plano, TX

3024 Incorporating Authentic Research into a Course Through CUREs (Course-Based Undergraduate Research Experiences)

L508 • Instructional Strategies • Demonstration (75 min) • HS, 2Y, 4Y

Authentic research experiences are critical for developing discipline-specific and U.S. "workforce" skills. This session will demystify them and provide resources to help faculty make research accessible in the biology laboratory.

Jacqueline McLaughlin, Penn State University, Lehigh Valley, Center Valley, PA and Josh Slee, DeSales University, Center Valley, PA

3085 People and the Biosphere: Hands-on Activities for Environmental Science

M105 • Ecology / Environmental Science / Sustainability • Hands-on Workshop (75 min) • ML, HS

Discover data-rich lessons to help your students explore human population, biodiversity, climate change, land and natural resource use, as well as paths to sustainability.

Marni Landry, Grand Canyon University, Phoenix, AZ

SPECIAL PROGRAMMING PRESENTED BY Bio-Rad Laboratories

3231 Did You Really Do CRISPR? How Good Experimental Controls Let Students Make Real Scientific Claims

M106/107 • Biotechnology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Only a well-controlled experiment lets your students make solid scientific claims. Learn how the controls in Bio-Rad's *Out of the Blue* CRISPR Kit show students they really did CRISPR!

Cassandra Granieri and Leigh Brown, Bio-Rad Laboratories, Hercules, CA

Retired NABT Members Committee

M108 • Committee Meeting (75 min) • GA

Dennis Gathmann, Committee Chair

Informal Science Education Committee

M109 • Committee Meeting (75 min) • GA

Committee chair to be determined.

3173 Storylining in Biology Courses: Figuring Out Over Learning About!

M301 • General Biology • Demonstration (75 min) • HS

Storylines led by engaging phenomena improve student engagement. An overview of the Illinois Biology Storylines that are now being used across the country and internationally will be provided.

Jason Crean, Saint Xavier University/ASEC, Orlando, FL; Kristin Rademaker, ASEC, Freeport, IL; Kathy Van Hoeck, ASEC, Marion, IA

SPECIAL PROGRAMMING PRESENTED BY Visible Body

3240 Introducing Visible Biology - The Groundbreaking 3D Biology Platform!

M302 • Technology in the Classroom • Demonstration (75 min) • HS, 2Y, 4Y

Visible Biology provides a hands-on immersive learning experience. Virtual biology models can be dissected and manipulated to learn difficult concepts. Come see this new way of teaching and learning biology!

Emily Genaway, Megan McGloughlin, Max Frank, and Meredith McHale, Visible Body, Framingham, MA

3054 Isn't it just XX and XY? Students Building Inclusive Scientific Models of Human Sex Determination

M304 • General Biology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

High school and college students actively build and refine models to explore high-interest scientific data, leverage critical reasoning, and uncover how assigned sex and gender are culturally situated globally.

Kirstin Milks, Bloomington High School South, Bloomington, IN; Chris Anderson, New Trier High School, Winnetka, IL; Brittany Franczowski, Wilde Lake High School, Columbia, MD; Enya Granados, Russell County High School, Seale, AL; Meghan Mosher, Monarch High School, Louisville, CO

10:30am – 11:00am

3133 Using Human Rights Issues to Engage Students in Biology Courses

L405/406 • Science Practices • Hands-on Workshop (30 min) • HS, 2Y, 4Y

This presentation demonstrates how human rights issues can equitably engage students without compromising content. Research on this strategy shows improvements in content application and content relevancy, particularly for underserved students.

Brian Shmaefsky, Lone Star College-Kingwood, Kingwood, TX

10:30am – 11:00am continued

3215 Strategies in a Virtual Introductory Biology Course at a Historically Black University During Covid Pandemic

L503 • General Biology • Paper (30 min) • HS, 2Y, 4Y

This presentation shares the results from a US Department of Education Minority Science and Engineering Improvement Program (MSEIP) Grant implementation, that was designed to increase student performance in introductory biology.

Catherine Quinlan, Iesha Fields, Amber Williams, Clarence Lee, and Daina Potter, Howard University, Washington DC

3199 Richness, Diversity, Abundance, and Classification of Garden Species: An At-home Discovery Experiment

L504/505 • Ecology / Environmental Science / Sustainability • Hands-on Workshop (30 min) • HS, 2Y

Identification of bird, insect, and plant species, and calculation of richness, diversity, and abundance along the seasons - A discovery activity to promote local environmental stewardship

Claudia Ochatt, Ransom Everglades School, Miami, FL

3150 Teaching Central Dogma using COVID-19 Nucleic Acid Vaccines as a Case Study

L506/507 • Genetics • Hands-on Workshop (30 min) • 4Y

A real-world relevant classroom exercise that uses the flow of information from DNA to RNA to protein explains how nucleic acid vaccines lead to immunity.

Todd Kelson, Brigham Young University - Idaho, Rexburg, ID and Rivka Glaser, Stevenson University, Owings Mills, MD

3123 Assessing Motivation in Introductory College Biology for Improved Student Success

L508 • Instructional Strategies • Paper (30 min) • 2Y, 4Y, GA

Stubborn attrition rates are not unique and this research complements implementation of active learning and metacognition strategies in STEM classrooms. By understanding students, instructors may deliver pedagogy towards student success.

William Martin, Aurora University, Aurora, IL

SPECIAL PROGRAMMING PRESENTED BY Bio-Rad Laboratories

3236 Track the Mysterious Spread of SARS-CoV-2 Using a Flexible Gel Electrophoresis Kit

M106/107 • Biotechnology • Demonstration (30 min) • HS, 2Y, 4Y

A COVID-19 outbreak at a restaurant made headlines in 2020. How the virus spread was mysterious. Now your students will analyze swab samples by gel electrophoresis and propose an explanation.

Cassandra Granieri and Leigh Brown, Bio-Rad Laboratories, Hercules, CA

Professional Development Committee

M108 • Committee Meeting (30 min) • GA

Committee chair to be determined.

Social Media Committee

M109 • Committee Meeting (30 min) • GA

John Moore & Stacey Kiser, Committee Chairs

3162 Using March Mammal Madness to Add Excitement to Biology!

M301 • General Biology • Demonstration (30 min) • ML, HS, GA

March Mammal Madness is a tournament of simulated fights between animals, using science to determine the outcomes. It's an exciting way to learn about zoology, ecology, adaptations, and more.

Eric Rude, Pocatello High School, Pocatello, ID

CLASSROOM GRANTS UP TO \$1,000

Do you want to integrate humane education tools into your science curriculum? NAVS' BioLEAP Classroom Grants can help you introduce your students to alternatives to dissection.

Dissection alternatives:

- ✎ can meet learning objectives associated with dissection
- ✎ can cost far less than animal specimens
- ✎ can be used in conjunction with remote learning
- ✎ are often reusable
- ✎ save animal lives!

Grants are available in amounts **up to \$1,000**.

Apply at BioLEAP.org or visit us at Booth 318 at NABT 2021.



10:30am – 11:00am continued

3051 A New Project for Undergraduate Non-majors Biology Courses and Instructors

M303 • Instructional Strategies • Hands-on Workshop (30 min) • 2Y, 4Y

The new NSF-funded IGELS project (Improvement of General Education Life Science courses) Steering Committee will introduce its activities, seek comments on a survey for undergraduate instructors, and guidance for future work.

John Moore, Taylor University, Upland, IN; Tamar Goulet, University of Mississippi, University, MS; Gordon Uno, University of Oklahoma, Norman, OK

3100 Teaching How the mRNA Vaccines Work Against SARS CoV-2 with Paper Models

M304 • Anatomy & Physiology • Hands-on Workshop (30 min) • HS, 2Y, 4Y

Participants will complete a hands-on paper model learning activity that illustrates how the mRNA Covid vaccines perform translation, T-cell activation, and antibody production to protect from SARS-CoV-2 infections.

Joe Krumm, Great Oaks Career Campuses, Milford, OH

11:15am – 12:30pm

3224 How the Evolution of Human Skin Colors Contradicts Racial Categorization and Teaches for Social Justice

L401-403 • Evolution • Hands-on Workshop (75 min) • HS, 4Y, GA

Global distribution of the diversity of human pigmentation can be demonstrated with manipulatives that show how the three common patterns of natural selection contributed to genetic changes in indigenous populations.

Leslie Sandra Jones, Valdosta State University, Valdosta, GA

11:15am – 12:30pm continued

SPECIAL PROGRAMMING PRESENTED BY Lab-Aids

3232 Looking for Patterns in Species Diversity

L404 • Ecology / Environmental Science / Sustainability • Hands-on Workshop (75 min) • HS

Look for patterns in species diversity in coral reef ecosystems and other animals to determine cause and effect relationships and understand how ecosystem interactions affect patterns of biological diversity.

Maia Binding, SEPUP/University of California, Berkeley, CA and Mark Koker, Lab-Aids, Ronkonkoma, NY

3160 STEM Educators as Civic Educators

L503 • Instructional Strategies • Hands-on Workshop (75 min) • HS, 2Y, 4Y, GA

Our session will introduce the ideals and strategies of SENCER (Science Education for New Civic Engagements and Responsibilities) that connect interdisciplinary challenges to teach foundational knowledge and build civic awareness.

David Smyth, Texas A&M University-San Antonio, San Antonio, TX and Eliza Reilly, National Center for Science and Civic Engagement (NCSE), Saugerties, NY

3117 The Origin and Diversity of Armor in Girdled Lizards: A Case Study in Convergent Evolution

L504/505 • Evolution • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Participants in this session will examine specimens to classify lizards based on morphological characteristics (percent osteoderm coverage) and DNA sequence data using both paper-based and digital platforms.

Julie Bokor, University of Florida Center for Precollegiate Education and Training, Gainesville, FL; Jennifer Broo, Mariemont High School, Cincinnati, OH; David Blackburn, Jaimi Gray, and Ed Stanley, University of Florida/ Florida Museum of Natural History, Gainesville, FL; Catherine Early, Science Museum of Minnesota, St. Paul, MN

3147 E.O. Wilson in the Comics: Biophilia and Biodiversity for a Broader More Inclusive Audience

L506/507 • Nature of Science • Hands-on Workshop (75 min) • ML, HS, 2Y

E.O. Wilson's memoir *Naturalist* (1994) told his science story in the context of a youth finding his way. Explore the new graphic version with classroom activities for a fresh-diverse audience.

Dennis Liu, E.O. Wilson Biodiversity Foundation, Potomac, MD

3180 Building Mathematical Equations to Promote Sensemaking and Conceptual Understanding in Biology

L508 • Instructional Strategies • Hands-on Workshop (75 min) • HS, 2Y, 4Y, GA

Participants will work together to build a mathematical equation representing a biological phenomenon (mathematical modeling). Participants will leave with a strategy and materials for teaching mathematical modeling in the classroom.

Anita Schuchardt, University of Minnesota - Twin Cities, Minneapolis, MN

3219 BIRDD - Using Galapagos Data to Explore Ecological and Evolutionary Concepts

M101 • Evolution • Hands-on Workshop (75 min) • 2Y, 4Y, GA

Join us for a hands-on workshop to explore the use of diverse data resources from the Galapagos Islands to address ecological concepts. This is a special presentation from the *2021 SSE Huxley Award Winners*.

John Jungck, University of Delaware, Newark, Delaware and Sam Donovan, University of Pittsburgh, Pittsburgh, PA

11:15am – 12:30pm continued

3063 Climate, COVID, Conspiracy, and Classrooms: How Educators Can Respond to Science Denial

M103/104 • Nature of Science • Demonstration (75 min) • ML, HS, GA

Scientific information is vital to protect physical and economic health and security. Yet efforts to undermine public understanding of - and trust in - science are disturbingly effective. How can educators respond?

Joseph Levine, Author, Concord, MA

3112 Exploring Stream Ecology in High School Classrooms: Aquatic Inverts, Eutrophication and Riffle Dancing

M105 • General Biology • Hands-on Workshop (75 min) • ML, HS

Engage students with a biodiversity activity in a model stream, explore eutrophication, and elaborate with a field stream experience. Collect, analyze and present data. High school level, can be modified.

Sue Flaming, Caney Valley High School, Ramona, OK

SPECIAL PROGRAMMING PRESENTED BY Bio-Rad Laboratories

3237 Catch Up on the Latest CRISPR Tech and Do the Real Thing in Your Classroom!

M106/107 • Biotechnology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Hear the latest applications of CRISPR technology in gene therapy and walk through the real gene editing laboratory activity (cut AND repair) in Bio-Rad's *Out of the Blue* CRISPR Kit.

Cassandra Granieri and Leigh Brown, Bio-Rad Laboratories, Hercules, CA

SPECIAL PROGRAMMING PRESENTED BY Visible Body

3240 Introducing Visible Biology - The Groundbreaking 3D Biology Platform!

M302 • Technology in the Classroom • Demonstration (75 min) • HS, 2Y, 4Y

Visible Biology provides a hands-on immersive learning experience. Virtual biology models can be dissected and manipulated to learn difficult concepts. Come see this new way of teaching and learning biology!

Emily Genaway, Megan McGloughlin, Max Frank, and Meredith McHale, Visible Body, Framingham, MA

3076 Exploring the Use of Biomarkers to Investigate the Impact of E-Cigarettes on Airway Inflammation

M303 • Anatomy & Physiology • Hands-on Workshop (75 min) • HS, 2Y

How are biomarkers used to study the effects of e-cigarettes on the respiratory system? Learn about a digital interactive notebook and wet-lab simulation that enables students to analyze research data.

Dana Haine, University of North Carolina-Chapel Hill, Chapel Hill, NC and Dina Markowitz, University of Rochester Medical Center, Rochester, NY

11:30am – 2:00pm

2021 NABT Honors Luncheon

Marquis Ballroom C • Special Event (Tickets Required) • GA

NABT is proud to recognize the 2021 NABT Award Recipients during this celebration. We will honor exceptional biology teachers from all levels, and everyone is welcome to help us congratulate these remarkable professionals.

12:45pm – 1:45pm

Lunch Break

Marquis Ballroom A&B • Meal Function (Free) • GA

Everyone is welcome to pick up today's lunch in the Marquis Ballrooms A&B and find a spot to relax and recharge.

AP[®] Biology Teachers: The Lynx is Loose.



Catch it at
BFW BOOTH #412

Fully aligned to the
AP[®] Biology CED

 bedford, freeman & worth
high school publishers

BFW is a proud Gold Sponsor of NABT 2021.

Learn more about the new AP[®] Biology program you've been asking for, ready for Fall 2022, at go.bfwpub.com/NABT2021.

AP[®] is a trademark registered by the College Board, which is not affiliated with, and does not endorse, this product.

2:00pm – 3:15pm

3095 Dismantling Misconceptions that Impede Scientific Understanding in the Classroom

L401-403 • Instructional Strategies • Hands-on Workshop (75 min) • ML, HS, GA

Engage with free data-driven inquiry lessons that use a misconception-based pedagogy to inoculate students against misinformation while teaching about the nature of science, evolution, and climate change.

Lin Andrews, National Center for Science Education, Oakland, CA; Blake Touchet, Abbeville High School, Abbeville, CA; Tom Freeman, Esperanza High School, Anaheim, CA

3135 Anchored Inquiry Learning: Designing Meaningful Instruction to Explore Phenomena

L405/406 • Instructional Strategies • Hands-on Workshop (75 min) • HS, GA

Experience firsthand how the Anchored Inquiry Learning instructional model can be used to design learning experiences that motivate students to engage with significant, real-world phenomena and problems in biology!

Cindy Gay, BSCS Science Learning, Colorado Springs, CO

3033 Laughing in Lab Equals Learning: Utilizing Impairment Goggles to Teach Science Practices and Science Literacy

L503 • Nature of Science • Hands-on Workshop (75 min) • HS, 2Y, 4Y, GA

Impairment goggles immerse students in the scientific processes and promote science literacy through active learning. Handouts with answer keys and data files provided to assist participants with incorporation across grades.

Carrie Bucklin and Lindsey Roper, Southern Utah University, Cedar City, UT

3256 Empowering Women and Minorities to Picture Themselves as Scientists through IF/THEN® Ambassadors

L504/505 • Instructional Strategies • Paper (75 min) • HS, 2Y, 4Y

Relatable role models can captivate students to stick with science through their K-12 and college experience. How to use role models in the classroom and free resources will be discussed.

Tamar Goulet, University of Mississippi, University, MS

3161 Using Scenario Planning to Teach Pre-Nursing Students About Antibiotic Resistance

L506/507 • Microbiology & Cell Biology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

This workshop demonstrates a scenario planning activity asking participants to imagine a future without antibiotic resistance in order to better understand the causes and consequences of the current resistance crisis.

Toni Mac Crossan and Julie Westerlund, Texas State University, San Marcos, TX

3028 Experiments with Simulations: Teaching Experimental Design with Free Online System Dynamics Simulations

L508 • Science Practices • Hands-on Workshop (75 min) • HS, 2Y, 4Y, GA

Design experiments and explore dynamic systems found in biology, like feedback loops and evolution. Learn how students can investigate complex systems and interpret a variety of patterns using simulations.

Jon Darkow, Seneca East High School, Attica, OH

**GREATER
COMPREHENSION.**

Give your students the convenience of accessing their textbook and homework from one online platform with Enhanced Biology from Expert TA. In addition to end-of-chapter problems and instructor test-bank questions from OpenStax Biology 2e, we partnered with the authors to bring enhanced learning exercises to your students, including advanced graphical questions, interactive exercises, and fill-in-the-blank chapter summaries.

To learn more, find us in the exhibitor hall at Booth 405.

EXPERT TA A GREATER WAY TO EDUCATE.™
theexpertta.com/biology
main@theexpertta.com

2:00pm – 3:15pm continued

3:30pm – 4:00pm

3041 2021/22 HudsonAlpha Guidebook

M101 • Genetics • Demonstration (75 min) • HS, 2Y, GA

Want to include cutting-edge genetic discoveries in your class? Meet the HudsonAlpha Guidebook. This free resource is packed with 'too new for textbooks' content, phrased in student-friendly language.

Neil Lamb and Madelene Loftin, HudsonAlpha Institute for Biotechnology, Huntsville, AL

Archival Committee

M108 • Committee Meeting (75 min) • GA

Committee chair to be determined.

Nominating Committee

M109 • Committee Meeting (75 min) • GA

Bob Melton, Committee Chair

3034 What's Stress Got to Do with It: Using Primary Literature in Your AP Biology Classroom

M301 • AP Biology • Hands-on Workshop (75 min) • HS

Finding primary literature appropriate for the AP classroom is challenging. We will provide tips in locating papers and how to guide your students into reading and understanding primary literature.

Lee Ferguson, Allen High School, Allen, TX and Elizabeth Cowles, Eastern Connecticut State University, Willimantic, CT

3039 Beyond The Finches: New Phenomena from the Galápagos

M303 • Evolution • Demonstration (75 min) • ML, HS, 2Y

Presenters will demonstrate two new NGSS-aligned lesson plans on Galápagos iguana speciation and impacts of invasive species. Participants will be given educator/student guides and access to more free Galápagos resources!

Erika Mitkus, Governor's Academy, Byfield, MA; Sara Abeita, Free State High School, Lawrence, KS; Jonathan Bower, Del Mar High School, San Jose, CA

3045 Using Digital Escape Rooms as a Form of Lab Assessment

M304 • Technology in the Classroom • Demonstration (75 min) • HS, 2Y, 4Y, GA

This session will focus on how to use free software to create customized digital escape rooms to supplement online lab practicals and promote student active learning in an online setting.

Joni Criswell, Anderson University, Anderson, SC

PEERs Meeting Peers

Pulse Loft (Atrium Level) • Special Event • PEERs/URM/BIPOC

Build your professional network and enhance your connection to the NABT community at this informal coffee reception for PEERs (bit.ly/RaceMattersAsai)

Announcement of 2021 Poster Winners

Imperial Ballroom • Instructional Strategies • Special Event (30 min) • GA

Join us for announcement of the student winners of the 2021 *Biology Education Research* and *Undergraduate Mentored Research* competitions.

FREE!

WHAT?

Who?
What?
When?
Where?

Bio Corporation
free specimen
NABT '21 conference
booth 312

4:15pm – 5:30pm

GENERAL SESSION & PRESENTATION OF THE 2021 NABT DISTINGUISHED SERVICE AWARD

Jeff Corwin

See page 9 for biography.

An Evening with Jeff Corwin

Imperial Ballroom • Special Speaker (75 min) • GA

For close to 30 years, families have welcomed Jeff Corwin into their homes to share in his animal adventures. His television series have been featured on ABC, NBC, Travel Channel, Food Network, Disney Channel, and Discovery and have garnered three Emmys and other top broadcast industry awards. Jeff is a compelling storyteller who shares his passion for wildlife conservation in a way that is both educational and entertaining. As Jeff is often quoted, “We cannot protect what we do not cherish, and we will not cherish what we do not know...” In this interactive presentation, Jeff will discuss highlights from his work as a television host, producer, journalist, author, explorer, and wildlife biologist. Have your questions ready for what is guaranteed to be an engaging session with Jeff Corwin.

NABT is proud to name Jeff Corwin the recipient of the *2021 Distinguished Service Award for Enhancing Education through Biological Research*.

A special thanks to Enya Granados for serving as the moderator for this session.

6:15pm – 8:30pm

SATURDAY NIGHT EVENT

A Magical Evening with NABT

Marquis Ballroom C •
(Tickets Required) • GA

Experience a special evening of entertainment with magician and comedian Peter Morrison. This fully interactive experience will carefully weave classical illusions with modern conjuring techniques. Add a bit of Peter’s charm and comedic wit, and you will find this performance is no ordinary magic show! Tickets include food and drink, and the performance.

ZOO ATLANTA

VIRTUAL PROGRAMS

Take a trip to the Zoo without getting on a bus!

Harnessing technology as the vehicle, connect your students to animals, careers, conservation, and all things Zoo Atlanta through a Virtual Field Trip.

Aligned with the Georgia Standards of Excellence (GSE), these programs engage students in STEM concepts as they learn about Zoo Atlanta’s animal ambassadors and conservation initiatives.



Learn more at
zoatlanta.org/virtual