





ES - Elementary
GA - General Audience
ML - Middle, Junior High
HS - High School
2Y - 2-year College
4Y - 4-year College & University

FRIDAY

7:15 AM – 8:00 AM

NABT First Timers' Meet & Greet

Marsalis Hall · Meal Function

First-time conference attendees are invited to learn more about NABT, the 2026 Professional Development Conference, and connect with other "first timers." NABT leaders and prior "first timers" will also be available to answer questions and help you make the most of your time in Dallas. Grab breakfast in the Exhibit Hall and join us for some networking.

7:30 AM – 8:30 AM

NABT Continental Breakfast

Marsalis Hall · Meal Function · GA

Come grab your breakfast from Marsalis Hall, then join your colleagues at a section event, meet up with friends, visit the Exhibit Hall, or find a quiet spot to get ready for the day ahead.

8:00 AM – 9:00 AM

NABT NETWORKING MEETINGS

Elementary and Middle Level (K-8) Meeting

Cumberland L · General Biology · Section Meeting (60 min)

Meet up with other awesome K-8 educators at this informal networking breakfast designed to help you connect with colleagues to support our youngest scientists.

AP Life Science Section & High School Section Meeting

Reunion B · General Biology · Section Meeting (60 min)

If you teach funny freshmen, serious seniors, and everyone in between, you'll want to grab your breakfast, find a seat, and connect with other high-school biology teachers in this informal setting.

Two-Year College Section Meeting

Cumberland G/H · General Biology · Section Meeting (60 min)

Grab your breakfast from the Exhibit Hall and join a supportive community of two-year college educators to share strategies, struggles, and successes! The winner of the Two-Year College Biology Teaching Award will also be recognized.

Four-Year College & University Section Meeting

Reunion C · General Biology · Section Meeting (60 min)

Faculty, education researchers, graduate students, and anyone associated with four-year colleges and universities are invited to network, build community, and learn about section programs and opportunities. There will also be a special presentation of the Four-Year College & University Section awards.

MIT Presents:

1922-131458 Lesson Sampler with MIT Biology Hands-on Models

Pegasus B · Microbiology & Cell Biology · Hands-on Workshop (60 min) · HS, 4Y, GA

After a brief introduction to the basics, participants will choose an activity from a list of advanced physiology topics, such as COVID spike protein binding, antibody-antigen interactions, or the mechanisms of digestive enzymes.

Kathleen M. Vandiver, Massachusetts Institute of Technology, Lexington, MA; Amanda Gruhl Mayer, Massachusetts Institute of Technology, Dedham, MA

miniPCR Presents:

1922-132541 Antibiotic Resistance as a Case Study on Natural Selection

Reunion A · General Biology · Hands-on Workshop (60 min) · HS, 2Y, 4Y

Antibiotic-resistant bacteria have been traced to one farm. Students use PCR to test simulated samples from neighboring farms to track the spread. This robust experiment makes it easy to bring PCR to your classroom!

Robert Dennison, miniPCR bio, Cambridge, MA

8:00 AM – 9:00 AM CONT.

1922-133173 Bio-Rad Presents:

Why Tattoos Last. Solving a Cellular Transport Mystery Through Biology

Reunion E · AP Biology® · Hands-on Workshop (60 min) · HS, 2Y, 4Y

Investigate diffusion, osmosis, and endocytosis through tattoo science. In this hands-on workshop, use ELISA evidence to explore how immune cells capture pigment and connect cell transport, communication, and genetics.

Leigh Brown, Bio-Rad Laboratories, Hercules, CA

9:15 AM – 10:15 AM

GENERAL SESSION SPEAKER 1922-131477

Julia van Kessel, PhD

See page 19 for biography

Bridging Quorum-sensing Research and Education from K-12 to University

Reunion FH · Special Speaker (60 min) · GA

Dr. Julia van Kessel's research focuses on studying bacterial quorum sensing in marine Vibrio bacteria and has helped develop hands-on tools for microbial discovery across K-12 and undergraduate classrooms. In this seminar, participants will learn about three primary educational and community outreach platforms that connect marine Vibrio bacterial quorum sensing to live demonstrations and hands-on teaching tools for microbial discovery, designed for use in the classroom and the community.

Head to Reunion E right after this session for the hands-on Bio-Rad BacTalk workshop to try Julia van Kessel's research yourself, then join her for a live Q&A at 12:30 PM at the Bio-Rad Laboratories booth (#404).

Special thanks to Bio-Rad Laboratories for supporting this speaker.

10:30 AM – 12:30 PM

NABT EVOLUTION SYMPOSIUM BY NCSE

Conservation in the Anthropocene: The Intersection of Evolution, Ecology and Society

Reunion B · Evolution · Symposium (2 Hours) · HS, 2Y, GA

An early career scientist will share her journey integrating evolution, ecology, and genomics to understand how global change is affecting biodiversity. Her story highlights connections between science and society as well as conservation issues.

Céline Carneiro is a PhD candidate in the department of Integrative Biology at the University of Texas at Austin. She holds an M.S. in Interdisciplinary Ecology and a B.S. in Wildlife Ecology and Conservation from the University of Florida. Her work integrates evolution, ecology, and genomics to study the effects of global change on biodiversity.

Céline Carneiro, University of Texas at Austin, Austin, TX; Wendy Johnson & Britt Miller, National Center for Science Education, Oakland, CA

10:30 AM – 11:45 AM

1922-128968 2-Year Colleges: Networking for Change

Cotton Bowl · General Biology · Symposium (75 min) · HS, 2Y, 4Y

This symposium brings together two-year college biology faculty to build a national network supporting education reform, workforce development, and grant opportunities, while sharing strategies for adapting to new policies, technologies, and high-impact practices in biology education.

Stacey Kiser, Lane Community College, Eugene, OR; Melanie Lenahan, Raritan Valley Community College, Branchburg, NJ

10:30 AM – 11:45 AM CONT.

1922-129034 Scaffolding Cancer Concepts in General and Advanced High-school Biology

Cumberland A · Instructional Strategies · Hands-on Workshop (75 min) · HS, 2Y, GA

Participants will explore strategies for embedding cancer concepts into general and advanced high-school biology. The session demonstrates scaffolded lessons using conceptual modeling and data analysis, supported by professional development experiences through the RUYES program.

Natalia Coleman, Neril Sandeep & Rudy Baez, Jose Marti STEM Academy, Union City, NJ; Casandra Gabriele, Rutgers State University of New Jersey, New Brunswick, NJ

1922-129281 IGELS (Interactions in General Education Life Science courses) Instructor/ Faculty Professional Development

Cumberland B/C · Instructional Strategies · Hands-on Workshop (75 min) · 2Y, 4Y, GA

This session will demonstrate all the educational tools the IGELS project has created for instructors of undergraduate biology courses to help their students learn about biology, develop lifelong skills, and engage with real-world problems.

Gordon Uno, University of Oklahoma, School of Biological Sciences, Norman, OK

1922-128554 Investigating Human–Environment Systems: Activities on Climate, Population and Resources

Cumberland E/F · Ecology / Environmental Science / Sustainability · Hands-on Workshop (75 min) · ML, HS

Engage in inquiry-based, hands-on activities that build students' environmental awareness, data skills, and problem-solving abilities while inspiring them to take informed action on real-world sustainability challenges.

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

10:30 AM – 11:45 AM CONT.

1922-131696 Biotech Stories Too New For Textbooks: The HudsonAlpha Guidebook

Cumberland G/H · General Biology · Hands-on Workshop (75 min) · HS

Meet the HudsonAlpha Guidebook, a free "too new for textbooks" resource written in student-friendly language. Hear fascinating stories from the 2026 edition and how the Guidebook can bring cutting-edge genomics to your classroom.

Kelly East & Madelene Loftin, HudsonAlpha Institute for Biotechnology, Huntsville, AL

Edvotek Presents:

1922-132254 Tick Talk: Tick-Borne Disease Diagnostics using the Polymerase Chain Reaction (PCR)

Cumberland I/J · Biotechnology · Hands-on Workshop (75 min) · HS, 2Y, 4Y

Explore tick-borne disease in this hands-on workshop! Students investigate simulated tick populations through observation, DNA extraction, and PCR analysis. Connect results to local health trends. Gain experience with biotechnology, disease diagnostics, and public-health surveillance.

Danielle Snowflack, Edvotek, Inc., Washington, D.C.

1922-128756 Real Research, Real Learning: Student-sourcing Antibiotic-Discovery

Cumberland K · Science Practices · Hands-on Workshop (75 min) · HS, 2Y, 4Y

Authentic classroom research builds science identity and lasting learning in students. Explore how searching for antibiotic-producing bacteria in local soil can instill confidence in students and excitement in instructors.

Drew Rholl, District 219, Skokie, IL; Bob Kuhn, Innovation Academy STEM High School, Alpharetta, GA

1922-129081 You Are What You Eat? A 16S Human-gut Microbiome Modular Miniaturized Course-based Undergraduate Research Experience (miniCURE) for Introductory Biology Classes

Cumberland L · Microbiology & Cell Biology · Hands-on Workshop (75 min) · 2Y, 4Y

C-MOOR miniCURES are modular curricula focused on teaching genomic data science through student research in undergraduate biology classes. Participants will explore modules profiling the microbial community of the human gut on the cloud platform AnVIL.

Sayumi York, Notre Dame of Maryland University, Baltimore, MD; Rosa Alcazar, Clovis Community College, Fresno, CA

Carolina Science Presents:

1922-130145 Photosynthesis, Cellular Respiration, and Enzymes: Teaching Common Biology Concepts with Alginate Beads

Pegasus A · General Biology · Hands-on Workshop (75 min) · ML, HS, 2Y

Participants will make and use alginate beads containing either algae, yeast, or an enzyme. They will learn how the beads can be used to teach photosynthesis, cellular respiration, and enzymatic processes.

Crystal Risko, Carolina Biological Supply Company, Burlington, NC

MIT Presents:

1922-131459 Introduction to DNA, Proteins, and Protein Synthesis with MIT Biology Hands-on Models

Pegasus B · Microbiology & Cell Biology · Hands-on Workshop (75 min) · ML, HS, 4Y

Introducing the MIT models, designed to teach molecular processes, not just structure. Experience cellular functions firsthand – just like your students will! Build all 4 levels of protein structure and explore transcription and translation.

Kathleen Vandiver, Massachusetts Institute of Technology, Lexington, MA; Amanda Gruhl Mayer, Massachusetts Institute of Technology, Dedham, MA

miniPCR Presents:

1922-132550 Avian Genetics Lab Activities for Biology Education

Reunion A · Genetics · Hands-on Workshop (75 min) · HS, 2Y, 4Y

Genetic tests used in avian-breeding programs can provide students with authentic hands-on lab experience. Explore PCR kits to genotype birds for sex and for desirable phenotypes that follow both Mendelian and non-Mendelian inheritance patterns.

Ally Huang, miniPCR bio, Cambridge, MA

10:30 AM – 11:45 AM CONT.

1922-131903 Leveraging Dimensional Scoring and Point-by-point Data to Improve Student Performance

Reunion C · AP Biology® · Demonstration (75 min) · GA

Dimensional scoring provides quantitative data that allows us to identify which parts of a free-response question (FRQ) are most challenging for students. This can enhance our approach to areas for growth, allowing more targeted teaching. In this session, an AP Environmental Science teacher will guide participants through an analysis of data from dimensional scoring on the AP Environmental Science Exam. We'll consider how student strengths vary with respect to content knowledge across units and science practices. We'll also consider what point-by-point scores reveal about student performance when using different task verbs. This will be an interactive session with opportunities to analyze why and how students perform differently when responding to specific prompts. By participating in this session, teachers will gain a greater understanding of the various applications of point-by-point data for supporting student success on the AP Environmental Science Exam.

Scott Sowell, Atlantic Coast High School, Jacksonville, FL

Bio-Rad Presents:

1922-133214 Give Your Classroom a New Glow Up: Hands-on Quorum Sensing, Real Data

Reunion E · AP Biology® · Demonstration (75 min) · HS, 2Y, 4Y

Ready to make students glow with curiosity? In this hands-on workshop, run Bio-Rad's BacTalk Cell Signaling Kit yourself — real Vibrio campbellii cultures, no simulations — building your own evidence for quorum sensing and bioluminescence through co-plating.

Sherry Annee, Brebeuf Jesuit, Indianapolis, IN

HHMI BioInteractive Presents:

1922-131358 Who Are the Parents? Uncovering a Reproductive Mystery with Genetic Data

Reunion G · Genetics · Hands-on Workshop (75 min) · HS, 2Y, 4Y

Participants will analyze real shark genetic data to uncover a reproductive surprise — parthenogenesis. This data-driven BioInteractive activity connects core genetics concepts, including alleles, meiosis, and genetic diversity, while engaging students in authentic scientific practices.

Valerie May, Woodstock Academy, Woodstock, CT; Michele L Koehler, Riverside Brookfield High School, Riverside, IL

12:00 PM – 12:30 PM

1922-127768 Multilingual Biology Strategies

Cotton Bowl · General Biology · Hands-on Workshop (30 min) · ES, ML, HS

Review the WIDA standards and learn 25 activities to incorporate language domains into a biology classroom.

Brandon Tucker, Glenbrook South High School-Science Dept GBS, Glenview, IL

1922-128452 Task Trackers: Cultivating Independent Scientists in the Lab and Beyond

Cumberland A · Instructional Strategies · Hands-on Workshop (30 min) · HS, 2Y, 4Y

Looking for a better way to manage and assess laboratory courses? Join us to learn about and design your own task trackers to save you time and help your students become more independent and accountable.

Kim Geier & Erin Friedman, University of Lynchburg, Lynchburg, VA

12:00 PM – 12:30 PM CONT.

1922-127983 Using Self-pacing and Blended Learning in a Mastery-based AP Biology® Class

Cumberland B/C · AP Biology® · Hands-on Workshop (30 min) · HS, 4Y

Students come to AP Biology with different exposure to both the content and AP-style learning. Using blended lessons, create self-paced units and mastery before moving to the next lesson.

Kirsten Landry, Battle Ground Academy, Franklin, TN

1922-128730 From Classroom to Discovery: Implementing SEA-PHAGES in Introductory Biology I and II

Cumberland E/F · Curriculum Development · Demonstration (30 min) · 2Y, 4Y

Montgomery College implemented the SEA-PHAGES CURE in Introductory Biology I and II, expanding research access for community-college students. The program improved engagement, supported authentic inquiry, and increased student interest and persistence in STEM pathways.

Evdokia Kastanos, Aubrey Smith & Ishrat Rahman, Montgomery College, Rockville, MD

BFW Presents:

1922-132615 Master AP® Biology with Achieve: Save Time, Boost Scores, and Win Big!

Cumberland G/H · AP Biology® · Demonstration (30 min) · HS

Discover how Biology for the AP® Course (2e) and Achieve elevate your classroom. Our CED-aligned program saves time and boosts AP® scores. Join our session for a chance to win a free Teacher's Edition!

Cassidy Krogulski, BFW Publishers, Austin, TX

2026 Biology Education Research Symposium

1:45 PM - 3:45 PM
Reunion C

The symposium is coordinated by the NABT Four-Year College & University Section's Research Committee.

Proceedings will be posted online at www.NABT.org

Using Virtual Reality Simulation Labs to Enhance Undergraduate Biology Laboratory Preparation: A Mixed-Methods Pilot Study

Amin Ali, Khalifa University, Abu Dhabi, United Arab Emirates

Undergraduate science students often struggle to learn new laboratory activities, which can lead to increased accidents and unsatisfactory results. Although recent literature suggests that virtual reality (VR) enables safe, repeatable experiential practice, there is still limited evidence supporting its use as an augmented educational tool in STEM education. This study aimed to evaluate students' perceptions, clarity, confidence, and perceived complexity of lab experiments after exposure to VR labs. We created VR videos for selected courses and collected survey data from 92 undergraduate students across multiple majors. Students viewed the materials either on a computer device or using VR goggles. Students' mean scores for clarity and confidence increased significantly, while mean scores for perceived complexity decreased, with no significant differences observed among students from different science majors. Qualitative analysis revealed three key themes: enhanced clarity and confidence, reduced perceived complexity of the material, and a consistent impact across science majors. Overall, VR lab recordings were found to be a feasible and acceptable adjunct to undergraduate science laboratory teaching.

Investigating the Impact of Highlighting Counterstereotypical Scientists in Biology Tests

Suann Yang, Alexander Chimera, Jude Lofton, and Hannah Loughner, SUNY Geneseo, Geneseo, NY; Jeremy Hsu, Chapman University, Orange, CA

How questions are worded on biology tests can influence students' performance and attitudes. Specifically, students have been shown to prefer self-referential framing (in which the student is presented as a researcher) instead of the same questions framed around a scientist conducting the experiment, because of a lower perceived cognitive load and a greater affirmation of STEM identity when reading the self-referential version. However, it is unknown if highlighting counterstereotypical scientists–which has been shown to increase students' STEM identity–diminishes this preference for self-referential framing, especially if formative assignments feature these scientists.

To investigate the impact on preferences, we offered students the choice of self-referential or scientist-framed versions on their tests in a course with stories of scientists embedded in the curriculum. Students selected the two test versions equally, and the performance of students who chose different versions was equivalent. Through post-test surveys and post-semester interviews, we found students were equally split in their preferences for self-referential and scientist-framed question formats and cited the same primary reason of reduced cognitive load, in contrast to prior work that showed a preference for self-referential framing. Thus, preferences may depend on the context in which self-referential and scientist-framed questions are implemented.

Co-designing Species Identification Apps with Undergraduates: An AI-assisted, Participatory Approach by A Non-programming Instructor

Martina Muller and Roland Duhaime, University of Rhode Island, Kingston, Rhode Island

Repeated, formative retrieval practice builds durable memory, yet species identification, which demands exactly this kind of practice across many photographs of each taxon, is poorly served by generic flashcard tools that know nothing about a course's local species or field conditions. Building a custom alternative has historically required programming skill or funding most biology instructors lack. We document one instructor, with no software background, using AI-assisted natural-language coding to build four browser-based species-identification apps across a single semester, one per taxonomic unit, in an upper-division undergraduate wildlife biology course. Each app was shaped by the previous unit's anonymous student survey: critiques and ranked feature requests became the next build's design, producing a traceable participatory loop in which write-in answers, a progress dashboard, study and adaptive modes, and an expanding photo library all originated as student requests. Across the four apps, students logged 45,105 voluntary identification attempts in 505 study bouts, with near-universal adoption; accuracy tracked taxonomic difficulty and rose within students' own practice, and 91–100% rated each app highly. The work offers a replicable, near-zero-cost model for instructor-built tools, a lightweight mechanism for genuine student partnership, and evidence that such tools can draw sustained practice.

Nondisjunction in Meiosis: A Four-Part Kinesthetic Modeling Activity

Bhooma Srinivasan, University of North Texas at Dallas, Dallas, Texas

Distinguishing between nondisjunction in Meiosis I and Meiosis II is one of the most persistent conceptual challenges in undergraduate biology courses, yet few published instructional activities target this distinction as their primary learning objective. This study evaluated a four-part kinesthetic chromosome modeling activity designed to help students differentiate between these two segregation errors and predict the resulting gamete outcomes. Using color-coded pipe cleaners as chromosome models, students modeled normal meiosis, Meiosis I nondisjunction, Meiosis II nondisjunction, and sex chromosome nondisjunction while completing guided discussion questions that emphasized mechanistic reasoning and connections to human chromosomal disorders. The activity was implemented in two undergraduate courses: Biology for Science Majors I (n = 20) and an upper-division Genetics course (n = 12). A matched five-item multiple-choice pre/post assessment was administered via Microsoft Forms. Statistically significant learning gains were observed in both courses and across the combined sample (N = 32), with effect sizes ranging from d = 0.77 to d = 0.86. Post-assessment accuracy ranged from 92% to 100% across all five items. No student's score declined. Item-level analysis showed the largest gains on items directly targeting the Meiosis I versus Meiosis II distinction, indicating the activity effectively addressed its primary instructional goal.

12:00 PM – 12:30 PM CONT.

Vaccine Education Center Presents:

1922-131989 New High School Immune System Lesson Plan

Cumberland I/J · General Biology · Demonstration (30 min) · HS, 2Y, GA

Introducing a lesson plan on "How Cells Defend Against Foreign DNA." Available in "The Human Immune System" unit from the classroom-based program of the Vaccine Education Center at the Children's Hospital of Philadelphia (vaccinemakers.org).

Laura A. Gibson, University of Pennsylvania, Philadelphia, PA; Charlotte A. Moser, Vaccine Education Center/ Children's Hospital of Philadelphia, Philadelphia, PA

1922-128858 QUBES Platform 101: Your Home for Open Education Resources and STEM Education Reform

Cumberland K · Curriculum Development · Hands-on Workshop (30 min) · 2Y, 4Y, GA

This hands-on workshop will introduce the QUBES Platform's open educational resource library. Learn tips and tricks for finding high-quality materials, saving your favorites, and finding projects that fit within your interests.

Deborah Rook, BioQUEST, Vienna, VA; Sarah Prescott, BioQUEST, Raymond, NH; Sam Donovan, BioQUEST, Pittsburgh, PA; M. Drew LaMar, BioQUEST, Williamsburg, VA

1922-128981 Bringing Computational Biology Tools into Your Classroom

Cumberland L · Technology in the Classroom · Demonstration (30 min) · ML, HS, 2Y

Explore the Computational Biology Learning Lab, a free browser-based platform that brings DNA, RNA, protein structure, and AI-driven biology to life. Walk away with ready-to-use activities and tools that require no software installation.

Derek Peng, The Pingry School and Computational Biology Learning Lab, Bedminster, NJ

1922-130146 Carolina Science Presents:

Unlocking Genetics: Hands-on Learning with Model Organisms

Pegasus A · Genetics · Hands-on Workshop (30 min) · ML, HS, 2Y, 4Y, GA

Discover how model organisms can transform genetics teaching and student learning. This interactive workshop showcases classroom-tested species, aligns them with key concepts and constraints, and equips instructors to create engaging, inquiry-driven experiences for diverse students.

Crystal Risko, Carolina Biological Supply Company, Burlington, NC

1922-131460 MIT Presents:

Cytochrome P450 Proteins, Vaping, and Cancer with MIT Biology Hands-on Models

Pegasus B · Genetics · Hands-on Workshop (30 min) · HS, 4Y, GA

Investigate the molecular mechanisms behind drug-drug interactions, nicotine addiction, and cancer risk! Discover how metabolism of different drugs and toxicants can affect behavior and disease by comparing CYP protein active sites for different individuals.

Kathleen Vandiver, Massachusetts Institute of Technology, Lexington, MA; Amanda Gruhl Mayer, Massachusetts Institute of Technology, Dedham, MA

1922-132551 miniPCR Presents:

Interactive Digital Labs for Biology Classrooms

Reunion A · General Biology · Demonstration (30 min) · HS, 2Y, 4Y

Explore interactive, narrative-driven digital labs that make complex biology topics more accessible. Students analyze authentic experimental data while investigating topics such as the central dogma, sickle cell disease, and bacterial transformation.

Kristin Hennessy-McDonald, miniPCR bio, Cambridge, MA

12:00 PM – 12:30 PM CONT.

1922-133216 Bio-Rad Presents:

Beyond the Glow: Advanced Quorum Sensing with a Sneak Preview of the BacTalk Cell-signaling Advanced Kit

Reunion E · AP Biology® · Hands-on Workshop (30 min) · HS, 2Y, 4Y

A preview of the BacTalk Advanced Kit, where students use genetics and pathway inhibitors to investigate signaling like real researchers.

Sherry Annee, Brebeuf Jesuit School, Indianapolis, IN

HHMI BioInteractive Presents:

1922-131359 Simulating Hardy-Weinberg and Evolutionary Change with BioInteractive's Population Genetics Explorer

Reunion G · Evolution · Hands-on Workshop (30 min) · HS, 2Y, 4Y

Discover BioInteractive's free Population Genetics Explorer tool and other engaging resources to help students test predictions and interpret data on the effects of evolutionary mechanisms on allele and genotype frequencies.

Kristine Grayson, University of Richmond, Richmond, VA

12:30 PM – 1:45 PM

NABT Leader Lunch

Cotton Bowl · General Biology · Special Event (Tickets Required)

This event is by invitation only.

12:45 PM – 1:15 PM

1922-132552 miniPCR Presents: Bacterial transformation made easy with True Blue

Reunion A · AP Biology® · Demonstration (30 min) · HS, 2Y, 4Y

Finally, an easy-to-implement, high-yield transformation lab! Change bacteria from white to blue with simple teacher prep, a 45-minute student protocol, and minimal equipment. Augment the lab with a virtual simulation and gene regulation extension.

Kristin Hennessy-McDonald, miniPCR bio, Cambridge, MA

Bio-Rad Presents:

1922-133218 Ozempic and Semaglutide Science: Understanding Diabetes and Weight Loss

Reunion E · Biotechnology · Hands-on Workshop (30 min) · HS, 2Y, 4Y

Explore Ozempic's dual action on diabetes and weight loss. Learn about semaglutide's role in blood sugar and appetite regulation through ELISA.

Damon Tighe, Bio-Rad Laboratories, Hercules, CA

1:45 PM – 3:45 PM

BIOLOGY EDUCATION RESEARCH SYMPOSIUM

Reunion C · Instructional Strategies · Symposium (2 Hours) · 2Y, 4Y, GA

NABT is proud to present the 17th Annual Biology Education Research Symposium. Presentations were accepted through a double-blind review process open to biology instructors and education researchers at all levels. The symposium format is traditional 15-minute presentations of papers by individuals or co-authors, followed by Q&A.

See pages 34-35 for a full listing of abstracts.

1:45 PM – 2:15 PM

1922-129191 From Pedagogy to Payout: Developing a Competitive ASPB BLOOME Application

Cumberland A · Curriculum Development · Hands-on Workshop (30 min) · ES, ML, HS

Get paid to share your instructional ideas! The American Society of Plant Biologists (ASPB) BLOOME grant funds plant biology-teaching resource development. Engage with past winners to brainstorm and shape classroom innovations into competitive proposals.

Erin Friedman, University of Lynchburg, Lynchburg, VA; Jennifer Robison, Manchester University, North Manchester, IN

1922-129185 The Science & Engineering of Food: Producing the Perfect Apple

Cumberland B/C · General Biology · Hands-on Workshop (30 min) · HS, GA

Experience a new storyline for how to produce the perfect apple to meet the growing demands of human consumption. Students explore the phenomenon of the Honeycrisp through the lens of genetics, engineering and food production.

Shane Cullian, Agricultural Biology Storyline Team, Lake Geneva, WI; Kathy Van Hoeck, Agricultural Biology Storyline Team, Cedar Rapids, IA; Kristin Rademaker, NSTA, Freeport, IL

1922-129237 Synthesizing Systems: Using Coral Reef Fragility to Drive Accelerated Biology Inquiry

Cumberland E/F · General Biology · Hands-on Workshop (30 min) · HS, 2Y, 4Y

Activities to bridge the gap between microscopic processes and macroscopic realities. By using endangered coral as a case study, we link molecular genetics and biochemistry to exciting, real-world ecological-conservation challenges.

Brittany Moss, Harris County High School, Pine Mountain, GA

1:45 PM – 2:15 PM CONT.

1922-129177 Growing Futures: Marsh Grass Restoration Curriculum for Young Environmental Stewards.

Cumberland G/H · Ecology / Environmental Science / Sustainability · Demonstration (30 min) · ML, HS

Teachers engage in hands-on activities to explore a salt marsh curriculum designed to bring the importance of this ecosystem into any classroom, featuring data-driven labs, modeling, and adaptable activities for teaching environmental-science concepts.

Maribel Gendreau, Hampton Roads Academy, Newport News, VA

1922-129106 Increasing Knowledge Transfer and Retention Through Core Concept Teaching Tools (CCTTs)

Cumberland I/J · Curriculum Development · Hands-on Workshop (30 min) · HS, 2Y, 4Y

The core concepts of biology—evolution, structure–function, information flow, energy and matter, and systems—help guide understanding across scales. We will present multimodal, scaffolded Core Concept Teaching Tools that integrate ideas, boost engagement, support learners, and promote concept-centered learning through practice.

Seena S. Mathew, University of Mary Hardin-Baylor, Belton, TX; Jorge Trujillo, University of Texas Rio Grande Valley, Edinburg, TX

1922-128559 From Copy-Paste to Critical Thinking: Designing AI-Resistant Biology Assignments

Cumberland K · Instructional Strategies · Hands-on Workshop (30 min) · GA

Biology educators will learn to design AI-resistant assignments that promote scientific reasoning, authentic learning, and AI literacy by incorporating strategies such as data analysis, iterative work, and critical evaluation of AI-generated responses.

Tanya Quiroz, Galen College of Nursing, Alcolu, SC; Jacqueline McCray, Galen College of Nursing, Houston, TX

1922-128114 Graph It, Model It, Explain It: Building Mathematical Literacy in Life Science

Cumberland L · Science Practices · Demonstration (30 min) · HS, 2Y, 4Y

Explore practical strategies for helping life-science students make sense of biological data through graphing, modeling, and explanation. Participants will see classroom examples that build quantitative reasoning while supporting a deeper understanding of biological concepts.

Kyla Hooker, Los Alamos Public Schools, Los Alamos High School, Los Alamos, NM

MIT Presents:

1922-131461 Hemoglobin and Sickle Cell Disease with MIT Biology Hands-on Models

Pegasus B · Genetics · Hands-on Workshop (30 min) · HS, 4Y, GA

Discover the molecular mechanisms and historical advantage behind sickle cell disease! Model how oxygen binding changes the shape of hemoglobin proteins and why sickling occurs only in low-oxygen conditions.

Amanda Gruhl Mayer, Massachusetts Institute of Technology, Dedham, MA; Kathleen Vandiver, Massachusetts Institute of Technology, Lexington, MA

miniPCR Presents:

1922-132554 Diagnosing Sickle Cell Disease: Hands-on and Virtual Genetics Labs

Reunion A · General Biology · Demonstration (30 min) · HS, 2Y, 4Y

Track the sickle cell allele in a family using gel electrophoresis and connect inheritance and protein function. Available as a hands-on lab and a virtual activity featuring authentic experimental data.

Kristin Hennessy-McDonald, miniPCR bio, Cambridge, MA

NCSE Presents:

1922-132157 Using the Claim, Evidence, Reasoning (CER) Framework to Support and Assess Learning

Reunion B · Science Practices · Hands-on Workshop (30 min) · ML, HS, 2Y

CER scaffolds students in engaging in argument from evidence and constructing explanations. CER can also be a helpful tool for assessing students' learning. We will share free CER resources for both learning and assessment.

Wendy Johnson & Britt Miller, National Center for Science Education, Oakland, CA

Animalearn Presents:

1922-126520 Put the Life Back into Life Science Using Inclusive Lab Strategies

Pegasus A · Anatomy & Physiology · Hands-on Workshop (30 min) · ES, ML, HS

Rethink your traditional anatomy labs and explore innovative non-animal methods. This session will give teachers the opportunity to dissect a Kind Frog and Simulated Owl Pellets, plus experience AR/VR tech tools which will amaze and engage your students!

Nicole Green, Animalearn, Jenkintown, PA

1:45 PM – 2:15 PM CONT.

Bio-Rad Presents:

1922-133219 Turn Bacteria into Biosensors: From DNA to Detection

Reunion E · Biotechnology · Demonstration (30 min) · HS, 2Y, 4Y

What if bacteria could be programmed to "turn on" in response to their environment? Explore how a transformation-based lab becomes a biosensor model, where students control gene expression and visualize cellular responses — connecting promoters, regulation, and protein expression to real biotechnology.

Leigh Brown, Bio-Rad Laboratories, Hercules, CA

HHMI BioInteractive Presents:

1922-131360 Sorting Out Science: Teaching Primary, Secondary, and Tertiary Sources with HHMI BioInteractive

Reunion G · Science Practices · Hands-on Workshop (30 min) · HS, 2Y, 4Y

Participants will explore a new, freely available resource from BioInteractive to help their students evaluate the intended audience, purpose, and reliability of different types of scientific sources.

Mark Randa, Rowan College of South Jersey, Vineland, NJ

2:30 PM – 3:45 PM

1922-131891 Writing for the ABT

Cotton Bowl · Instructional Strategies · Demonstration (75 min) · GA

Join the editorial team of The American Biology Teacher for this session designed to encourage and support prospective authors. Turn your idea for an article into an action plan.

Julie Minbiole, Columbia College Chicago, Oak Park, IL

1922-125963 Redesigning School Lunch: Using Nutrition and Biochemistry to Drive Student Sensemaking

Cumberland A · General Biology · Hands-on Workshop (75 min) · ML, HS, GA

Explore a 7-lesson OpenSciEd-aligned biology unit where students redesign school lunches through biochemistry, nutrition, anatomy, and engineering, engaging in authentic sensemaking, analysis of USDA changes, and student-designed school lunch menus.

William Baur, Washougal HS, Washougal, WA

1922-129084 From Watershed to Classroom: Investigating Microplastics Through Local Inquiry and Science Communication

Cumberland B/C · Ecology / Environmental Science / Sustainability · Hands-on Workshop (75 min) · HS, 2Y, 4Y

Learn how to identify microplastics from local watersheds through this hands-on activity! This workshop will demonstrate laboratory methods and explore strategies for teaching scientific inquiry, data literacy, and community-focused science communication.

Angelica Dziurzynski & Nikolai Revels, University of Georgia, Athens, GA

1922-129270 How Teachers Can Avoid Perpetuating Genetic Essentialism and Determinism in the Classroom

Cumberland E/F · Genetics · Hands-on Workshop (75 min) · HS, 2Y, 4Y

Discuss and explore research-based and classroom-tested curricula that help disrupt student misconceptions about inheritance, trait expression, and human genetic variation and that help students understand that genetic variation is greater within than between groups.

Paul K. Strode, Fairview High School, Boulder, CO; Micaela Seaver, University of Colorado-Boulder, Boulder, CO

BFW Presents:

1922-132614 On Time: A Hands-on Workshop Exploring the History of Life

Cumberland G/H · Evolution · Hands-on Workshop (75 min) · HS, 4Y, GA

In this workshop, we'll do an activity together that introduces students to the long sweep of Earth's history, key events in evolution, and a sense of time and scale.

James Morris, Brandeis University, Waltham, MA

2:30 PM – 3:45 PM CONT.

1922-128548 NABT Two-Year Roundtable: Building Engagement and Transforming the Biology Classroom for the Modern Two-Year Student

Cumberland I/J · Science Practices · Symposium (75 min) · HS, 2Y, 4Y

Rotating roundtable discussions led by area experts will explore strategies for engaging modern two-year college biology students, in topics including community building, active learning resources, research experiences, online teaching, and global engagement.

Heather Zimbler-DeLorenzo, Georgia State University Perimeter College, Mableton, GA; Jewels Morgan, Georgia State University Perimeter College, Newton, GA; Heather Seitz, Johnson County Community College, Overland Park, KS; Erin Morrey, Georgia State University Perimeter College, Atlanta, GA; Kelly Moore, Walters State Community College, Morristown, TN; Christy Askea, SAU Tech, Camden, AR; Tanya Quiroz, Galen College of Nursing, Alcolu, SC; Ashli Wright, Columbus State Community College, Columbus, OH

1922-132713 Purple Grain: Seeing the Genotype of Purple Brassicas

Cumberland K · AP Biology® · Demonstration (75 min) · HS, 2Y, 4Y

Come try a lab that makes the abstract concept of genotype visible through PCR and DNA banding in electrophoresis. Compare the Brassica seedling purpleness to its genotype to learn about anthocyanin expression in plants.

Whitney Hagins, Retired, Bolton, MA

1922-128665 From Shortcut to Learning Tool: Prompt Engineering for Authentic Biology Assessment

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

Transform AI into a learning tool for biology education. Practice prompt engineering and design assessments requiring authentic student thinking across labs, research, data interpretation, and field observations. Gain frameworks from three years of classroom iteration.

Joni M. Criswell, Anderson University, Anderson, SC

MIT Presents:

1922-131462 Biotechnology and Lab Techniques with MIT Biology Hands-on Models

Pegasus B · Biotechnology · Hands-on Workshop (75 min) · HS, 4Y, GA

Experience lab procedures on the molecular level! Model restriction enzyme digestions and gel electrophoresis. Perform PCR cycles with primers and temperature changes. Learn the original function of the CRISPR Cas9 system and its potential uses.

Amanda Gruhl Mayer, Massachusetts Institute of Technology, Dedham, MA; Kathleen Vandiver, Massachusetts Institute of Technology, Lexington, MA

miniPCR Presents:

1922-132555 Explore Ecology and Conservation Biology with Lemurs

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

Has an extinct lemur species been rediscovered? Test DNA with gel electrophoresis, build phylogenetic trees, and analyze authentic field data from the Duke Lemur Center. Available as a hands-on lab or virtual simulation.

Lydia Greene, miniPCR bio, Cambridge, MA

NCSE Presents:

1922-132158 Beyond Just Facts: Overcoming Climate-change Misconceptions, Misinformation and Apathy

Reunion B · Instructional Strategies · Hands-on Workshop (75 min) · ES, ML, HS, 2Y, 4Y, GA

Why do facts alone often fail to change minds? Countering climate-change misconceptions, misinformation, and apathy requires more than presenting scientific evidence. Explore research-based strategies and free classroom resources to address this challenge.

Britt Miller & Wendy Johnson, National Center for Science Education, Oakland, CA

1922-130063 BIOZONE's New AP Biology®: Supporting Instruction, Engagement, and Exam Readiness

Pegasus A · AP Biology® · Demonstration (75 min) · HS

Explore BIOZONE's new AP Biology title, written specifically to match the 2025 CED. Discover how it supports confident instruction and exam readiness. Attendees receive a FREE print copy and 90-day trial to BIOZONE WORLD.

Richard Allan, Biozone International, Parker, CO

2:30 PM – 3:45 PM CONT.

Bio-Rad Presents:

1922-133229 Cut, Repair, Confirm: Hands-On CRISPR Gene Editing

Reunion E · Biotechnology · Hands-on Workshop (75 min) · HS, 2Y, 4Y

A cut alone isn't CRISPR editing. This hands-on workshop directs homology-directed repair of a chromosomal gene, confirming the edit via phenotypic readout. Fits genetics, cell biology, microbiology, and biotechnology courses alike, and includes an optional Genotyping Extension.

Damon Tighe, Bio-Rad Laboratories, Hercules, CA

HHMI BioInteractive Presents:

1922-131361 Should We Trust This? Using the SIFT Method to Evaluate the Reliability of Scientific Texts

Reunion G · Science Practices · Hands-on Workshop (75 min) · ML, HS, 2Y

We have all fallen victim to an unreliable source. Come engage with a strategy that helps students evaluate sources of scientific claims, and leave with free resources to implement this strategy immediately in your classes.

Samantha Johnson, Arroyo High School, San Lorenzo, CA; Bernice Brythorne, Monticello High School, Charlottesville, VA

4:00 PM – 4:30 PM

1922-131705 Student Poster Practice Session

Cotton Bowl · Instructional Strategies · Hands-on Workshop (30 min) · HS, 2Y, 4Y

Join other student poster presenters (and their mentors) for some informal practice to help you prepare for the NABT Biology Education Poster Session.

1922-127642 Vaccines – Data, Doubt, and Defense

Cumberland A · General Biology · Hands-on Workshop (30 min) · ML, HS

This session reframes vaccine literacy as an essential modern survival skill. By mastering the science of immunization, students become informed citizens equipped to combat misinformation, protect community health, and value vaccines as collective resources.

Vyjayanti Joshi, Alyssa Martin & Olivia Doe, Lake View High School, Chicago, IL

1922-129260 It Is an RNA World: How Nucleotides Control Cellular Functions

Cumberland B/C · General Biology · Hands-on Workshop (30 min) · HS, 2Y, 4Y

Nucleotides are used for more than RNA, DNA, and energy currency. We will explore the various biochemical pathways and cellular processes in which nucleotides play major roles.

Elizabeth Cowles, Eastern Connecticut State University, Willimantic, CT

1922-129250 Decoding Cancer

Cumberland E/F · General Biology · Hands-on Workshop (30 min) · ML, HS

"Decoding Cancer," an innovative and interactive biology and genetics education program, enhances science literacy and increases cancer education and awareness. Explore career profiles in the health and biomedical fields and cancer lesson comprehension. DecodingCancer.org

Casandra Gabriele, Rutgers State University of New Jersey and Rutgers Cancer Institute, Bloomfield, NJ

1922-128659 Life Science in the Garden Classroom

Cumberland G/H · Ecology / Environmental Science / Sustainability · Demonstration (30 min) · ES, ML, HS

This session walks through the journey students at Cut Bank HS took in planning, designing, building, and utilizing a campus native plant garden, including knowledge sharing through a Native Plant Garden STEM Trunk.

Bess Hjartarson, Cut Bank High School, Cut Bank, MT

1922-128322 BIO 101: An EPIC Success for Biology Students

Cumberland I/J · Curriculum Development · Paper (30 min) · 2Y, 4Y

Responding to post-pandemic academic struggles, Valparaiso University Biology designed a seminar series for Biology majors to increase success and retention. We present data on the successes of the program and recommendations for implementing similar courses.

Kristi Bugajski & Jane Kenney-Hunt, Valparaiso University, Valparaiso, IN

4:00 PM – 4:30 PM CONT.

1922-129213 From Classroom to Career Pathways: Exploring Biomanufacturing in Practice

Cumberland K · Biotechnology · Hands-on Workshop (30 min) · ML, HS

Educators learn how to use game-based learning to connect classroom content to STEM careers, by utilizing a bio-manufacturing simulation to introduce key industry concepts to students.

Hannah Schoeppner, Learning Undefeated, Gaithersburg, MD

1922-129063 Transforming Bioenergy Research into Classroom Case Studies: Alternative Fuels and Feedstocks Office BRIDGES Program

Cumberland L · Biotechnology · Demonstration (30 min) · HS, 2Y, 4Y

Discover free case studies from U.S. Department of Energy National Laboratories on cutting-edge bioenergy research that help upper-level high school and community-college students develop technical skills, explore real-world challenges, and envision career pathways.

Mike Kollasch, Argonne National Laboratory, Lemont, IL

1922-128248 Connect the Dots

Pegasus A · AP Biology® · Hands-on Workshop (30 min) · ML, HS, 4Y

A dynamic NGSS adaptable teaching strategy where students learn to cross book chapter lines, creating a powerful visual of how everything in life is connected by creating a unique web generated by the participants. Learn how to implement Connect the Dots in classrooms from 6th grade through higher ed.

Aggie Veld, Olivet Nazarene University, Bourbonnais, IL

MIT Presents:

1922-131463 Cytochrome P450 Proteins, Vaping, and Cancer with MIT Biology Hands-on Models

Pegasus B · Genetics · Hands-on Workshop (30 min) · HS, 4Y, GA

Investigate the molecular mechanisms behind drug-drug interactions, nicotine addiction, and cancer risk! Discover how metabolism of different drugs and toxicants can affect behavior and disease by comparing CYP protein active sites for different individuals.

Kathleen Vandiver, Massachusetts Institute of Technology, Lexington, MA; Amanda Gruhl Mayer, Massachusetts Institute of Technology, Dedham, MA

miniPCR Presents:

1922-132556 Central Dogma Made Visible: Hands-on and Digital Labs

Reunion A · General Biology · Demonstration (30 min) · HS, 2Y, 4Y

Watch genetic information flow from DNA to RNA to protein in real time, using cell-free protein expression in a test tube. Now in digital format, suitable for stand-alone delivery or integrated with a hands-on laboratory experience.

Kristin Hennessy-McDonald, miniPCR bio, Cambridge, MA

NCSE Presents:

1922-132160 Learn about NCSE's Sound Science Teacher Community

Reunion B · General Biology · Hands-on Workshop (30 min) · ML, HS

Are you teaching evolution, climate change, or data & media literacy skills at the high-school level? Want to try free standards-aligned resources with a community of passionate teachers? If so, join us to learn more.

Britt Miller & Wendy Johnson, National Center for Science Education, Oakland, CA

4:00 PM – 4:30 PM CONT.

Science Communication Lab Presents:

1922-130936 One Film, Three Classrooms: Three Ways Teachers Used Corals on the Brink to Inspire Scientific Thinking and Engage Students

Reunion C · Ecology / Environmental Science / Sustainability · Hands-on Workshop (30 min) · ML, HS, 4Y

Discover how the film Corals on the Brink inspired three educators to create distinct NGSS-aligned lessons that engage students in ecosystem modeling, scientific argumentation, conservation decision-making, and science communication while exploring one of today's most urgent environmental challenges.

Jennifer Broo, Mariemont High School, Cincinnati, OH; Rosa Veguilla, Science Communication Lab, San Diego, CA

Bio-Rad Presents:

1922-133236 Built for One: Inside the First Personalized CRISPR Therapy

Reunion E · Biotechnology · Demonstration (30 min) · HS, 2Y, 4Y

The world's first patient received a CRISPR therapy built for their mutation alone. Explore what made this milestone historic, how personalized editing could transform rare genetic-disease treatment, and how classroom kits make this science tangible.

Damon Tighe, Bio-Rad Laboratories, Hercules, CA

HHMI BioInteractive Presents:

1922-131362 From Wonder to Investigation: Using HHMI's Beautiful Biology in the Classroom

Reunion G · Instructional Strategies · Hands-on Workshop (30 min) · ML, HS

Explore how to use student-centered strategies and HHMI's Beautiful Biology – a repository of stunning scientific images with annotations – to spark curiosity, support inquiry-based learning and strengthen science practices in your students.

Catherina Sammons, Tates Creek High School, Lexington, KY

4:00 PM – 5:30 PM

Exhibit Hall Closing Reception

Marsalis Hall · Special Event

It's last call in the NABT Exhibit Hall. It's also your last chance to visit booths, talk to exhibitors, and get those freebies for your classroom. This special experience will include Treasure Hunt prize drawings, giveaways, and the drawing for the "Find the President" contest.

7:00 PM - 9:00 PM

NABT Science Disco & Halloween Party

Pegasus A/B · Special Event

Get ready to dance the night away at NABT's Science Disco & Halloween Party! This unique event will feature food, fun, and friends catching up and getting down. Don't have boogie fever? You can still show up in costume and enjoy a night of games, contests, and laughs. Tickets are not needed, and everyone is welcome!

Booth 400

minipcr bio®

Join us on Friday for Workshops in Room Reunion A



8:00 – 9:00 AM	Antibiotic resistance as a case study on natural selection
10:30 – 11:45 AM	Avian genetics lab activities for biology education
12:00 – 12:30 PM	Interactive Digital Labs for biology classrooms
12:45 – 1:15 PM	Bacterial transformation made easy with True Blue
1:45 – 2:15 PM	**Diagnosing sickle cell disease:** Hands-on and virtual genetics labs
2:30 – 3:45 PM	Explore ecology and conservation biology with lemurs
4:00 – 4:30 PM	**Central dogma made visible:** Hands-on and Digital labs

See all of our hands-on labs!