



NABT 2021

ATLANTA

PROFESSIONAL DEVELOPMENT CONFERENCE

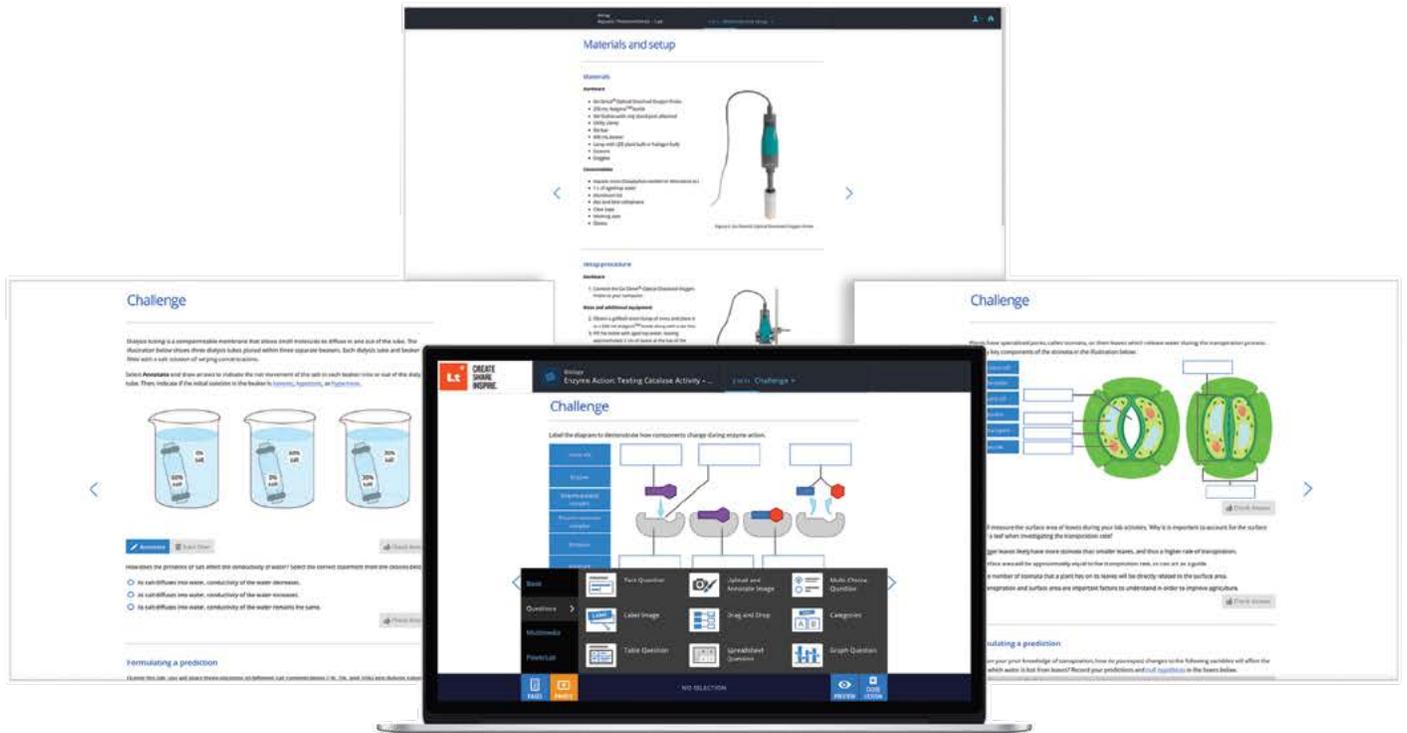
November 11 - 14
Atlanta Marriott Marquis
Atlanta, Georgia

PROGRAM
GUIDE





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NABT 2021 ATLANTA

PROFESSIONAL DEVELOPMENT CONFERENCE

November 11 - 14
Atlanta Marriott Marquis
Atlanta, Georgia

SPECIAL THANKS

NABT thanks these organizations for their generous support of activities at the 2021 Professional Development Conference.

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GOLD SPONSORS



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FROM THE PRESIDENT

Welcome to Atlanta for the 2021 NABT Professional Development Conference. The conference will look significantly different due to the ongoing Covid pandemic, but rest assured that NABT staff and volunteers have worked tirelessly to make the event safe and enjoyable.

NABT is still the place where life science educators, at all academic levels, find inspiration as they network with like-minded colleagues.

Thursday November 11: I encourage you to check out the NABT Open Forum to learn more about NABT. If you are an NABT conference newbie, come to the First Timers' Experience to meet other NABT members. If you are a graduate or undergraduate student, go to the NABT Student Meet Up. Then we will all be together to give an in-person round of applause to the 2020 NABT Awardees and attend the Opening General Session with Anne Schuchat.

Friday November 12: We start with a presentation by Marshall Shepard, and then you have multiple opportunities to learn-network-learn-network. New this year, NABT is hosting our attendees for lunch. If you teach K-8, high school, AP, two-year, or four-year, there is a networking lunch for you. The day concludes at the Exhibit Hall for a reception and a fun Find the President Drawing.

Saturday November 13: Start your morning at the Biology Education Poster session. This is a wonderful opportunity to learn more about the science and science education research conducted by our members. After lunch, there are more amazing conference sessions to choose from, then we cheer on the Poster Award winners and sit back for the closing session with Jeff Corwin, who will receive the *2021 NABT Distinguished Service Award*.

As a member of the NABT Board of Directors, I fully appreciate that conference planning is a year-round process and this year has been truly challenging. A big thank you is extended to our sponsors and exhibitors. Their generosity is what that makes this conference possible so please take time to visit the Exhibit Hall. Additionally, our award sponsors help us honor our outstanding colleagues. And finally, hats off to those NABT members who take the time to serve on committees, the Board of Directors, Regional Directors, State and Provincial representatives, BioClub Advisors, and our State Affiliates. I also extend my sincere gratitude to the Professional Development Committee for their time and vision in making the 2021 conference relevant, engaging, collaborative, and above all safe. NABT is truly a family of professional educators led by our Executive Director, Jacki Reeves-Pepin.

While you are at the NABT conference, learn new things and meet new people, and then share your experience at #NABT2021.

Thank you for attending NABT 2021. May you depart the conference energized, reinvigorated, and full of new ideas to bring back to your classroom.



Julie Angle
NABT PRESIDENT
2021

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At A Glance
SCHEDULE

THURSDAY

FRIDAY

6:00 am

7:00

8:00

9:00

10:00

11:00

12:00 pm

1:00

2:00

3:00

4:00

5:00

6:00

7:00

8:00

9:00



SATURDAY _____

SUNDAY _____



EVENT KEY

- Sessions
- Special Event
- Special Program
- Special Workshop (Tickets required)
- Committee Meetings
- Registration
- Tickets Required
- Exhibit Hall Open

GENERAL CONFERENCE INFO

ABOUT THE PROFESSIONAL DEVELOPMENT CONFERENCE

All functions, meetings, and exhibits will take place at the Atlanta Marriott Marquis unless otherwise noted. Please consult this guide and signage for room information.

ABOUT ACCESSIBILITY

Careful consideration is made during the planning of the NABT Conference to make it accessible to all participants. Should you require special services, please go to the registration area to contact an NABT representative. We will strive to meet your needs.

CERTIFICATE OF ATTENDANCE

See page 68.

REGISTRATION HOURS

The NABT registration desk is located in the Marquis Level toward the Imperial Ballroom. It will be open during the following hours:

Thursday, November 11

7:00am – 5:00pm

Friday, November 12

7:00am – 5:30pm

Saturday, November 13

7:00am – 6:00pm

Sunday, November 14

7:00am – 12:30pm

FUTURE NABT CONFERENCE DATES & SITES

2022 Professional Development Conference

November 10 - 13, 2022
JW Marriott Indianapolis
Indianapolis, IN

2023 Professional Development Conference

November 2 - 5, 2023
Baltimore Marriott Waterfront
Baltimore, MD



2021 NABT CONFERENCE APP

Search for NABT when you visit the App Store and Google Play to download the app and start using it today!



USE #NABT2021 TO TWEET FROM ATLANTA!

ABOUT NABT

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

VISITING THE EXHIBIT HALL

Located in the International Ballroom, the NABT Exhibit Hall is your venue to interact with a variety of curriculum publishers, equipment manufacturers, software developers, non-profit partners, and other organizations with resources to benefit you as a biology educator. Receptions, contests, and other special experiences will also be featured in the Exhibit Hall.

Registration badges are required for admission to the Exhibit Hall.

THURSDAY, NOVEMBER 11

5:30pm – 7:30pm

FRIDAY, NOVEMBER 12

8:00am – 5:30pm
(Closing Experience starts at 4:00pm)



WiFi Log-in details

SSID
NABT2021

Password
PIVOT4BIO!

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Transportation for Field Trip

The NABT Conference will feature one offsite program. Tickets are required to attend. Please visit the registration desk for more details.



Providing Session Feedback

All education sessions are reviewed by the NABT Professional Development Committee for acceptance. Help us ensure you see great sessions at the NABT Conference by sharing your comments at <https://www.surveymonkey.com/r/2021sessionfeedback>

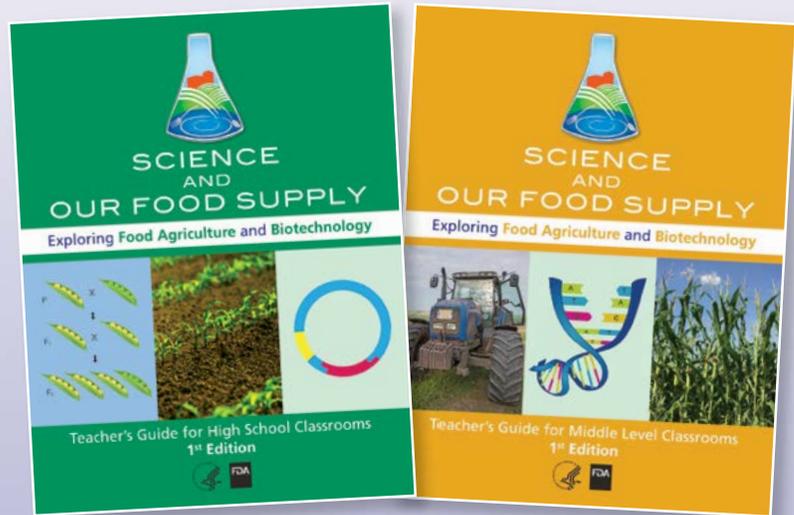


Phone: (888) 501-NABT
E-mail: office@NABT.org
Website: www.NABT.org

Science and Our Food Supply

Exploring Food Agriculture and Biotechnology

High School edition
suitable for high school
or college students



Food agriculture is a topic of great interest to farmers, consumers, scientists, educators, and many people of all ages. After all, all people and animals eat. *Science and Our Food Supply: Exploring Food Agriculture and Biotechnology* introduces science-based agricultural concepts of crop characteristics, planning, and selection. This new curriculum introduces selective breeding and a subset of techniques commonly referred to as genetic engineering (GE). GE techniques allow scientists to specifically modify DNA of a microorganism, plant, or animal in order to achieve a desired trait. For example, genetic engineering can be used to add one or more genes to an organism to confer a trait the organism does not have or to modify a trait already existing in the organism (increasing or decreasing the expression of a particular trait).

Safe and nutritious food is the foundation of good health, and people in the United States have more food choices than ever before. Several of these choices are due to continuously improving technologies in food agriculture. Many people want to know more about how their food is produced so they can make the right choices for themselves. *Science and Our Food Supply: Exploring Food Agriculture and Biotechnology* aims to empower you and your students to make those choices. It incorporates key scientific knowledge and education resources to help students understand how biotechnology is used to produce food for humans and animals.

Your students will learn about:

- Selective breeding
- DNA in food crops
- Environmental challenges and impacts of growing crops
- Approaches to developing food crops for countries with high rates of malnourishment
- GE methods, including genome editing techniques such as CRISPR
- How food from GE plants is evaluated
- Current labeling for food containing ingredients from GE plants



www.fda.gov/teachsciencewithfood

THURSDAY, NOVEMBER 11



Anne Schuchat, M.D.
Principal Deputy Director (retired)

Centers for Disease Control and Prevention, Washington, DC

Anne Schuchat, M.D. is an internist and epidemiologist whose career at the Centers for Disease Control and Prevention spanned 33 years. She was the agency's Principal Deputy Director from 2015-2021 and served twice as acting CDC director. From 2006-2015, she was the first Director of CDC's National Center for Immunization and Respiratory Diseases (NCIRD), leading the nation's immunization program through recommendations for several new vaccines and the global deployment of vaccines against pneumonia and meningitis. Prior to becoming NCIRD director, Dr. Schuchat was Chief of the Respiratory Diseases Branch from 1998-2005. She first joined CDC as an Epidemic Intelligence Service officer in 1988. She's been instrumental in decades of CDC emergency responses including the COVID-19 pandemic, the 2019 outbreak of vaping associated lung injuries, the 2009 H1N1 influenza pandemic, and the 2003 SARS outbreak where she deployed to Beijing. She collaborated on meningitis, pneumonia, and Ebola vaccine trials in West Africa and surveillance and prevention projects in South Africa. In the 1990's, Dr. Schuchat spearheaded the effort to establish guidelines for the prevention of newborn infections from group B streptococcus, saving an estimated 100,000 newborn lives so far. Her contributions have been recognized by election to the National Academy of Medicine, receipt of the USPHS Distinguished Service Medal, and the Association of State and Territorial Health Officials Lifetime Achievement Award and is a finalist for the Paul A. Volcker Career Achievement Medal from the Partnership for Public Service. Dr. Schuchat retired as a Rear Admiral in the Commissioned Corps of the United States Public Health Service in 2018 and from the CDC in 2021.

FRIDAY, NOVEMBER 12



J. Marshall Shepherd, Ph.D.
Georgia Athletic Association Distinguished Professor of
Atmospheric Sciences and Geography;
Director, UGA Atmospheric Sciences Program &
Full Professor, Department of Geography

University of Georgia, Athens, GA

Dr. Marshall Shepherd is the Georgia Athletic Association Distinguished Professor of Geography and Atmospheric Sciences at the University of Georgia and Director of its Atmospheric Sciences Program. Dr. Shepherd was the 2013 President of American Meteorological Society (AMS). Prior to academia, he spent 12 years as a scientist at NASA Goddard Space Flight Center and was Deputy Project Scientist of the Global Precipitation Measurement Mission. Dr. Shepherd is the host of The Weather Channel's *Weather Geeks* Podcast and a senior contributor to Forbes Magazine. In 2021, Dr. Shepherd was elected to the National Academy of Sciences, National Academy of Engineering, and the American Academy of Arts and Sciences. The only member of the University of Georgia faculty to ever achieve this trifecta. He has received numerous awards including the 2004 White House PECASE Award, the Captain Planet Foundation Protector of the Earth Award, the 2019 AGU Climate Communication Prize, the 2020 Mani L. Bhaumik Award for Public Engagement with Science and the 2018 AMS Helmut Landsberg Award. He received his B.S., M.S. and Ph.D. in meteorology from Florida State University. He has two TEDx talks on climate science and communication that collectively exceed two million viewers. He is routinely asked to brief the media, Congress, and the White House on weather-climate-science related topics. Dr. Shepherd has almost 100 peer-reviewed publications on various topics.

SATURDAY, NOVEMBER 13



NABT DISTINGUISHED SERVICE AWARD

Jeff Corwin, M.S.

Biologist, Wildlife Conservationist, Author, and TV Host & Producer

Marshfield, MA

For nearly three decades, **Jeff Corwin** has been telling stories of wildlife and nature to a global audience through his many celebrated television series on ABC, NBC, Travel Channel, Food Network, Disney Channel, and Discovery Networks. Jeff is currently executive producing and presenting a new, groundbreaking television series debuting on a major network in October 2021. This incredible series will explore the remarkable story of wildlife conservation while highlighting heroes working to save endangered species and wilderness. The mission is to empower a diverse community with stories of environmental stewardship, conservation, and the plight of imperiled wildlife.

Jeff's television work has been awarded with multiple Emmys and top broadcast industry awards. His very first TV series was the wildly successful *Going Wild with Jeff Corwin* on Disney Channel. His Animal Planet series the *Jeff Corwin Experience* was a global sensation. Jeff is also the creator and co-presenter of CNN's groundbreaking documentary *Planet in Peril*, hosted alongside Anderson Cooper and Sanjay Gupta. Jeff is Executive Producer and host of ABC's *Ocean Treks*, five seasons of powerful and compelling stories exploring journeys of culture, adventure, and nature around the globe. Jeff is an Executive Producer and Presenter for the giant screen film *Expedition Chesapeake* and the Narrator for David Attenborough's powerful, cinematic documentary *Galapagos, Nature's Wonderland*. During the Gulf oil spill, Jeff served as an environmental correspondent for both CBS and NBC News. In April 2020, Jeff created and executive produced the critically acclaimed TV series *Alaska Animal Rescue* for Nat Geo Wild, now on Disney Plus.

Beyond television, Jeff's acclaimed NBC documentary and book, *100 Heartbeats*, engaged both the readers and broadcast audience in the 21st Century plight of endangered species. Jeff is also the author of 10 books on wildlife and nature, including *Living on the Edge*, *Amazing Relationships in the Nature World*. Jeff is a leader in conservation, recognized through his work as a television host, producer, journalist, author, explorer, and wildlife biologist. Jeff's education includes Bachelor of Science Degrees in Anthropology and Biology from Bridgewater State University and a Master of Wildlife and Fisheries of Conservation from the University of Massachusetts, Amherst. Jeff is the recipient of numerous Honorary Doctorate Degrees in Education and Environmental Science. His lifelong global exploration, academic training, and partnerships with top scientists allow Jeff exclusive access to the compelling stories from the battlefield of conservation. Jeff's love for adventure and discovery has fueled his life-long career. He has been striving to change the world one species at a time and leave a vital legacy for future generations.

"We cannot protect what we do not cherish, and we will not cherish what we do not know..." -
Jeff Corwin



Amanda L. Glaze, Ph.D.
Associate Professor of Science Education

Georgia Southern University, Statesboro, GA

Amanda L. Glaze, Ph.D. specializes in science teacher education, evolution education research and science literacy focused public outreach, alternating her time between the classroom and the field as an Associate Professor of Middle Grades & Secondary Science Education at Georgia Southern University where she was honored with the University Award for Excellence in Research in 2021. She is a deeply engaged advocate of science for all and hands-on, minds-on science, working directly with schools, teachers, and other public-facing entities to support the accurate and comprehensive teaching of science at all levels of study. Her research centers on the intersections of science and society, specifically the acceptance and rejection of evolution in the Southeastern United States and the impact of the perceived conflicts between evolution and religion and/or culture on science literacy. Having been reared in a Southern Baptist ministry family, she brings to her research and outreach first-hand experience with the challenges faced where there is divergence between scientific understanding and personal beliefs.

A recipient of the 2018 NABT Evolution Education Award and 2020 NABT Four Year College & University Biology Education Research Award, Dr. Glaze’s work has also been featured on NPR’s video/radio series Science Friday as well as on social media outlets such as the National Center for Science Education Blog, ErrantScience.com, and RealScientists.org. She served as an expert panelist for Science Friday’s education focus #TeachTheE and works with organizations including the Smithsonian Human Origins Program, and the National Geographic funded *Umsuka* project at the Cradle of Humankind in South Africa. Her research has been referenced in mainstream media outlets such as *Scientific American*, *Forbes*, and *Newsweek* and can be found in scholarly journals such as *Science Education*, *The American Biology Teacher*, *Education Sciences*, *the International Journal of Mathematics & Science Education*, and others.

She resides outside of Savannah, Georgia with her beau Don, their children Kassidy, Jaymon, Brantlee, Maddox, and Delanie, as well as a menagerie of flora and fauna befitting a biologist!

NABT is looking for a few good leaders: leaders like you. Committee and section meetings are open to all NABT members and you are invited to learn more about – and help develop – the programs that support you.

FULL MEETING SCHEDULE

ABT Advisory Committee	Friday	10:30am – 11:45am	M108
Archival Committee	Saturday	2:00pm – 3:15pm	M108
Awards Committee	Friday	2:00pm – 3:15pm	M108
Informal Science Education Committee	Saturday	9:00am -10:15am	M109
Member Resources Committee	Friday	12:00pm – 12:30pm	M108
Nominating Committee	Saturday	2:00pm – 3:15pm	M109
OBTA Directors & Regional Coordinators Meeting	Friday	3:30pm – 4:00pm	M108
Professional Development Committee	Saturday	10:30am – 11:00am	M108
Retired NABT Members Committee	Saturday	9:00am -10:15am	M108
Social Media Committee	Saturday	10:30am – 11:00am	M109

BOARD OF DIRECTORS

President: **Julie Angle**
 President-Elect: **Chris Monsour**
 Past President: **Sharon Gusky**
 Secretary/Treasurer: **Steven Christenson**
 Director-at-Large: **Cindy Gay**
 Director-at-Large: **Anna Hiatt**
 Director/Coordinator: **Kevin English**
 Director/Coordinator: **Madelene Loftin**

Executive Director: **Jaclyn Reeves-Pepin**

REGIONAL COORDINATORS

REGION I (CT, ME, MA, NH, RI, VT): **Todd Ryan**
 REGION II (DE, DC, MD, NJ, NY, PA, VA): **Karen Lucci**
 REGION III (IL, IN, MI, OH, WI): **Kevin English**
 REGION IV (IA, KS, MN, MO, NE, ND, SD): **Heather Essig**
 REGION V (KY, NC, SC, TN, WV): **Robin Bulleri**
 REGION VI (AL, FL, GA, LA, MS, PR): **Madelene Loftin**
 REGION VII (AZ, AR, NM, OK, TX): **Kristy Daniel**
 REGION VIII (CO, ID, MT, NV, UT, WY): **Cindy Gay**
 REGION IX (AK, CA, HI, OR, WA, Pacific Territories): **Tom Freeman**
 REGION X (Canadian Provinces & Territories): **Vacant**

SECTION CHAIRS

NABT BioClub: **Ashlie Gowitzka**
 AP Biology Section: **Mark Little**
 Four-Year College & University Section: **Jacqueline Washington**
 Two-Year College Biology Section: **Vedham Karpakakunjaram**

COMMITTEE CHAIRS

ABT Journal Advisory Committee: **William McComas**
 Archival Committee: **Vacant**
 Awards Committee: **Jason Crean**
 Equity & Inclusion Committee: **Vacant**
 Finance Committee: **Steven Christenson**
 Honorary Membership Committee: **Chris Monsour**
 Informal Science Education Committee: **Vacant**
 Member Resources Committee: **Catherine Ambos**
 Nominating Committee: **Bob Melton**
 Past President Advisory Council: **Chris Monsour**
 Professional Development Committee: **Vacant**
 Retired Member Committee: **Dennis Gathmann**

BOARD APPOINTED REPRESENTATIVES

OBT National Coordinator: **Mark Little**
 Introductory Biology Task Force: **Anna Hiatt & Cindy Gay**
 Social Media Task Force: **John M. Moore & Stacey Kiser**
 Pre-Service Teacher Advisory Committee: **Julie Angle**

AFFILIATE MEMBERS

Biology Teachers Association of New Jersey (**BTANJ**)
 Colorado Biology Teachers Association (**CBTA**)
 Cleveland Regional Association of Biologists (**CRABS**)
 Connecticut Association of Biology Teachers (**CTABT**)
 Delaware Association of Biology Teachers (**DABT**)
 Empire State Association of Two-Year College Biologists (**ESATYCB**)
 Hong Kong Association of Biology Teachers (**HKABT**)
 Illinois Association of Biology Teachers (**IABT**)
 Illinois Association of Community College Biologists (**IACCB**)
 Indiana Association of Biology Teachers (**IABT**)
 Kansas Association of Biology Teachers (**KABT**)
 Louisiana Association of Biology Teachers (**LABT**)
 Massachusetts Association of Biology Teachers (**MABT**)
 Michigan Association of Biology Teachers (**MABT**)
 Mississippi Association of Biology Educators (**MSABE**)
 Missouri Association of Biology Teachers (**MOBioTA**)
 New York Biology Teachers Association (**NYBTA**)
 South Carolina Association of Biology Teachers (**SCABT**)
 Texas Association of Biology Teachers (**TABT**)
 Tennessee Association of Biology Teachers (**TNABT**)
 Virginia Association of Biology Teachers (**VABT**)

NABT AWARDS

BIOCLUB STUDENT AWARDS

Elizabeth Bennett

Mary Persons High School, Forsyth, GA

Dakota Barnett

Snow College, Ephraim, UT

Outstanding student members of a NABT BioClub are eligible for this textbook scholarship, with one student from a BioClub high school chapter and one student from a community college chapter being eligible each year.

Sponsored by Carolina Biological Supply Company

Biology Educator Leadership Scholarship (BELS)

Mia Scardina

Washington State University, Pullman, WA

The Biology Educator Leadership Scholarship (BELS) supports teachers who are furthering their education in the life sciences or science education. The award recipient is a practicing educator who has been accepted into a graduate program at a Masters or Doctoral level.

Sponsored by NABT Member Donations

Distinguished Service Award

Jeff Corwin

Marshfield, MA

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

Sponsored by the National Association of Biology Teachers

Ecology/Environmental Science Teaching Award

Lisa Pavic

Glenbrook South High School, Glenview, IL

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

Sponsored by Vernier Software and Technology

Evolution Education Award

Sara Brownell

Arizona State University, Tempe, AZ

Elizabeth Barnes

Middle Tennessee State University, Murfreesboro, TN

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

Sponsored by BSCS Science Learning & NCSE

Four-Year College & University Section Biology Teaching Award

Jason Bruck

Stephen F. Austin State University, Nacogdoches, TX

This award recognizes creativity and innovation in undergraduate biology teaching, including

curriculum design, teaching strategies, and laboratory utilization that have been implemented and demonstrated to be effective.

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

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

Jason R. Wiles

Syracuse University, Syracuse, NY

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

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

Genetics Education Award

Susan Arrigoni

Millburn High School, Millburn, NJ

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

Sponsored by ASHG and GSA

Honorary Membership

Patsye Peebles

Retired Teacher, Baton Rouge, LA

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

Sponsored by the National Association of Biology Teachers

JENNIFER PFANNERSTILL TRAVEL AWARD

Not Awarded

Established to honor the memory of Jennifer Pfannerstill, this award is a need-based scholarship to support a teacher who has demonstrated a commitment to personal and professional development by helping that individual attend the NABT Conference for the first time.

Sponsored by NABT & Private Donations

The Kim Foglia AP® Biology Service Award

Tiffany Jones

Rockdale Magnet School for Science & Technology, Conyers, GA

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

Sponsored by the Neil A. Campbell Educational Trust and Pearson

Outstanding Biology Teacher Award (OBTA)

See the full OBTA listing for 2021 Honorees

For over 50 years, the Outstanding Biology Teacher Award (OBTA) honors outstanding biology educators from grades 7-12 who are judged on their teaching ability and experience, cooperativeness in the school and community, creativity, inventiveness, initiative, and student-teacher relationships.

Sponsored by Carolina Biological Supply Company, with special consideration from Bio-Rad Laboratories, the Botanical Society of America, miniPCR, and Population Connection.

Outstanding New Biology Teacher Achievement Award

Enya Granados

Alabama Connections Academy, Athens, AL

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

Sponsored by the Neil A. Campbell Educational Trust and Pearson

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

Erica Kipp-Sinanis

Norwalk Community College, Norwalk, CT

This award recognizes a two-year college faculty member who has successfully developed and demonstrated an innovative, hands-on approach in the teaching of biology and has carried their commitment into the community to promote biology education.

Sponsored by Sarah McBride and John Melville

The Ron Mardigian Biotechnology Teaching Award

Lindsey L'Ecuyer

Andover High School, Andover, MA

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

Sponsored by Bio-Rad Laboratories

Two-Year College Biology Teaching Award

Evdokia Kastanos

Montgomery College, Rockville, MD

This award recognizes a two-year college biology educator who employs new and creative techniques to demonstrate excellence in teaching and scholarship through publications, teaching strategies, curriculum design, or laboratory utilization.

Sponsored by NABT's Two-Year College Section and Cell Zone, Inc.



Outstanding Biology Teacher Award

For over 50 years the National Association of Biology Teachers has been committed to recognizing outstanding biology teachers.

THE OUTSTANDING BIOLOGY TEACHER AWARD IS PROUDLY SPONSORED BY:



Other consideration provided by Bio-Rad Laboratories, the Botanical Society of America, miniPCR, and Population Connection.

THANK YOU TO OBTA DIRECTORS

NABT would like to thank our OBTA Directors, whose ongoing commitment to this program has helped NABT present the award to thousands of outstanding teachers.



OBTA Honorees 2021

Region I

David Upegui
Central Falls High School
Central Falls, RI

Debora O'Reilly
Essex North Shore Agricultural and Technical High School
Hathorne, MA

Kristina Gremski Ardito
Sacred Heart Greenwich
Greenwich, CT

Region II

Christine Lesh
Winters Mill High School
Westminster, MD

Jamie Castle
Pennsylvania Leadership Charter School
West Chester, PA

Jennifer Falin
Louisa County High School
Mineral, VA

Region III

Andrew Zenczak
Brunswick City Schools
Brunswick, OH

Jeff Grant
Downers Grove North High School
Downers Grove, IL

Kristi Phillippe
Marion High School
Marion, IN

Region IV

Daryle LaFleur
Elkhorn North High School
Omaha, NE

John Maddux
Festus High School
Festus, MO

Sara Abeita
Free State High School
Lawrence, KS

Tucker Tornberg
Centerville School District
Centerville, SD

Region V

Albert Wartski
Northern High School
Durham, NC

Region VI

Claudia Ochatt
Ransom Everglades Upper School
Coconut Grove, FL

Erica Johns
Northwest Rankin High School
Flowood, MS

Nicole Harvey
Zachary High School
Zachary, LA

Paul McEwan
Hoover High School
Hoover, AL

Region VII

Kate Nall
Basha High School
Chandler, AZ

Patricia Nicoll
Saint Mary's Hall
San Antonio, TX

Region VIII

Kristin Shapiro
Florence Jr/Sr High School
Florence, CO

Region IX

Lenelle Wylie
Helix Charter High School
La Mesa, CA

PAST PRESIDENTS & CONFERENCE LOCATIONS

- 2020 — Sharon Gusky, Online Conference
- 2019 — Sherry Annee, Chicago, IL
- 2018 — Elizabeth Cowles, San Diego, CA
- 2017 — Susan Finazzo, St. Louis, MO
- 2016 — Bob Melton, Denver, CO
- 2015 — Jane Ellis, Providence, RI
- 2014 — Stacey Kiser, Cleveland, OH
- 2013 — Mark Little, Atlanta, GA
- 2012 — Donald French, Dallas, TX
- 2011 — Dan Ward, Anaheim, CA
- 2010 — Bunny Jaskot, Minneapolis, MN
- 2009 — John M. Moore, Denver, CO
- 2008 — Todd Carter, Memphis, TN
- 2007 — Pat Waller, Atlanta, GA
- 2006 — Toby Horn, Albuquerque, NM
- 2005 — Rebecca E. Ross, Milwaukee, WI
- 2004 — Betsy Ott, Chicago, IL
- 2003 — Catherine W. Ueckert, Portland, OR
- 2002 — Brad Williamson, Cincinnati, OH
- 2001 — Ann S. Lumsden, Montreal, QC, Canada
- 2000 — Phil McCrea, Orlando, FL
- 1999 — Richard D. Storey, Ft. Worth, TX
- 1998 — VivianLee Ward, Reno, NV
- 1997 — Alan McCormack, Minneapolis, MN
- 1996 — Elizabeth Carvellas, Charlotte, NC
- 1995 — Gordon E. Uno, Phoenix, AZ
- 1994 — Barbara Schulz, St. Louis, MO
- 1993 — Ivo E. Lindauer, Boston, MA
- 1992 — Alton L. Biggs, Denver, CO
- 1991 — Joseph D. McInerney, Nashville, TN
- 1990 — Nancy V. Ridenour, Houston, TX
- 1989 — John Penick, San Diego, CA
- 1988 — Jane Abbott, Chicago, IL
- 1987 — Donald S. Emmeluth, Cincinnati, OH
- 1986 — George S. Zahrobsky, Baltimore, MD
- 1985 — Thomas R. Mertens, Orlando, FL
- 1984 — Marjorie King, Purdue Univ., IN
- 1983 — Jane Butler Kahle, Philadelphia, PA
- 1982 — Jerry Resnick, Detroit, MI
- 1981 — Edward J. Kormondy, Las Vegas, NV
- 1980 — Stanley D. Roth, Boston, MA
- 1979 — Manert Kennedy, New Orleans, LA
- 1978 — Glen E. Peterson, Chicago, IL
- 1977 — Jack L. Carter, Anaheim, CA
- 1976 — Haven Kolb, Denver, CO
- 1975 — Thomas J. Cleaver, Portland, OR
- 1974 — Barbara K. Hopper, New York, NY
- 1973 — Addison E. Lee, St. Louis, MO
- 1972 — Claude A. Welch, San Francisco, CA
- 1971 — H. Bently Glass, Chicago, IL
- 1970 — Robert E. Yager, Denver, CO
- 1969 — Burton E. Voss, Philadelphia, PA
- 1968 — Jack Fishleder, Anaheim, CA
- 1967 — William V. Mayer, New York, NY w/AAAS
- 1966 — Arnold B. Grobman, Washington, D.C. w/AAAS
- 1965 — L. S. McClung, U of CA, Berkeley w/AAAS
- 1964 — Ted F. Andrews, Boulder, CO w/AIBS
- 1963 — Philip R. Fordyce, U of MA, Amherst, MA w/AIBS
- 1962 — Muriel Beuschlein, Corvallis, OR w/AIBS
- 1961 — Paul V. Webster, Denver, CO w/AAAS
- 1960 — Howard E. Weaver, New York, NY w/AAAS
- 1959 — Paul Klinge, Chicago, IL w/AAAS
- 1958 — Irene Hollenbeck, Washington, D.C. w/AAAS
- 1957 — John Breukelman, Indianapolis, IN w/AAAS
- 1956 — John P. Harrold, New York, NY w/AAAS
- 1955 — Bro. H. Charles Severin, Atlanta, GA w/AAAS
- 1954 — Arthur J. Baker, Berkeley, CA w/AAAS
- 1953 — Leo F. Hadsall, Boston, MA w/AAAS
- 1952 — Harvey E. Stork, St. Louis, MO w/AAAS
- 1951 — Richard L. Weaver, Philadelphia, PA w/AAAS
- 1950 — Betty L. Wheeler, Cleveland, OH w/AAAS
- 1949 — Ruth A. Dodge, New York, NY w/AAAS
- 1948 — Howard A. Michaud, Washington, D.C. w/AAAS
- 1947 — E. Laurence Palmer, Chicago, IL w/AAAS
- 1946 — Prevo L. Whitaker, Boston, MA w/AAAS
- 1945 — Helen Trowbridge, St. Louis, MO w/AAAS
- 1944 — Merle A. Russell, No Meeting
- 1943 — Merle A. Russell, No Meeting
- 1942 — Homer A. Stephens, No Meeting
- 1941 — George W. Jeffers, Dallas, TX w/AAAS
- 1940 — Malcolm D. Campbell, Philadelphia, PA w/AAAS
- 1939 — Myrl C. Lichtenwalter, Columbus, OH w/AAAS
- 1938 — First Formal Meeting*, Richmond, VA w/ AAAS

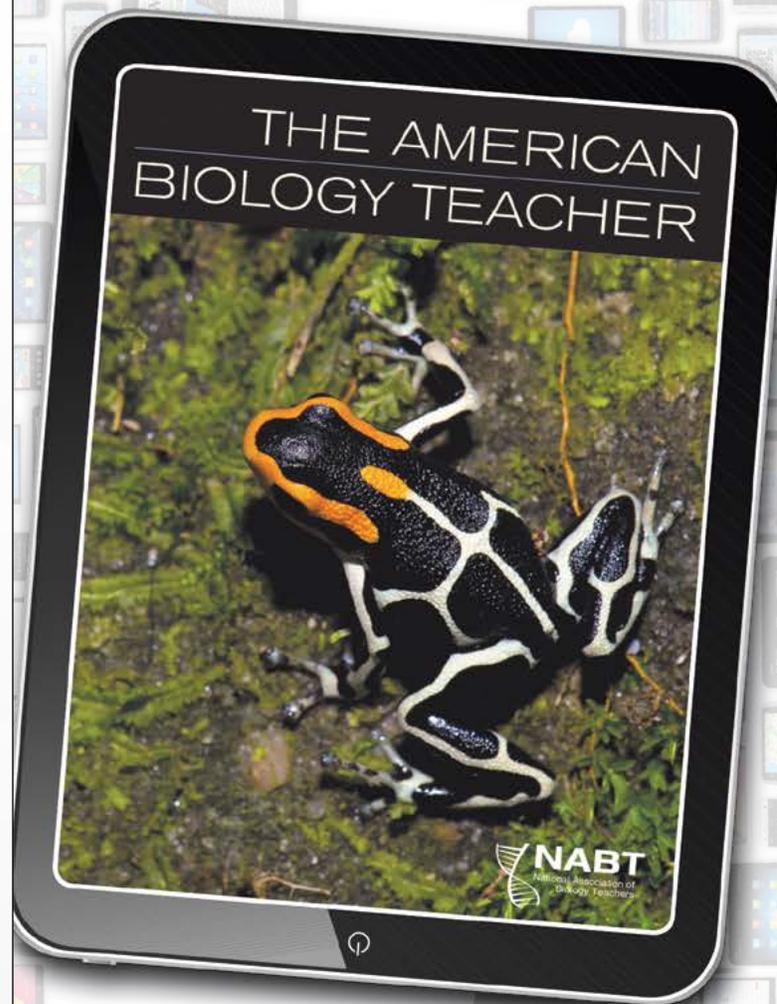
* birth of NABT occurred on July 1, 1938 in New York City, NY

HONORARY MEMBERS

- 2020 — Bob Melton
- 2019 — Dennis Gathmann
- 2018 — Michael Sipes
- 2017 — John M. Moore
- 2016 — Margaret (Betsy) Ott
- 2015 — Sharon Radford
- 2014 — Jay Labov
- 2013 — Todd Carter
- 2012 — Maura Flannery
- 2011 — Louisa Stark
- 2010 — Patricia Waller, Brad Williamson
- 2009 — NOT AWARDED
- 2008 — Donald Cronkite
- 2007 — William H. Leonard
- 2006 — Terry Hufford
- 2005 — Randy Moore, Eugenie Scott
- 2004 — John Penick
- 2003 — Donald Emmeluth
- 2002 — Leonard Blessing
- 2001 — Gordon E. Uno
- 2000 — Elizabeth Carvellas
- 1999 — NOT AWARDED
- 1998 — Ivo Lindauer
- 1997 — Sam Rhine
- 1996 — Kenneth S. House
- 1995 — Joseph D. Novak
- 1994 — Nancy V. Ridenour, Alton L. Biggs
- 1993 — George S. Zahrobsky
- 1992 — Jon R. Hendrix
- 1991 — Robert E. Yager
- 1990 — Jane Butler Kahle
- 1989 — Joseph D. McInerney
- 1988 — Thomas Mertens, Marjorie King
- 1987 — Floyd Nordland
- 1986 — Donald S. Dean
- 1985 — Stanley Weinberg
- 1984 — Jack Carter, Samuel Postliethwait
- 1983 — Manert Kennedy
- 1982 — Harold "Sandy" Wiper, Jerry P. Lightner
- 1981 — Sophie Wolfe
- 1980 — Sister M. Gabrielle, Ted F. Andrews, Sister Marian Catherine McGrann
- 1979 — Ingrith Olsen
- 1978 — John A. Moore
- 1977 — Addison E. Lee
- 1976 — Paul DeHart Hurd
- 1975 — Garrett Hardin, Stanley E. Williamson
- 1974 — H. Seymour Fowler
- 1973 — William V. Mayer
- 1972 — Chester A. Lawson, Paul E. Klinge, Robert L. Gantert
- 1971 — NOT AWARDED
- 1970 — NOT AWARDED
- 1969 — Arnold B. Grobman
- 1968 — NOT AWARDED
- 1967 — NOT AWARDED
- 1966 — NOT AWARDED
- 1965 — John Breukelman, H. Bentley Glass, George W. Beadle, Paul B. Sears, Brother H. Charles Severin
- 1964 — E. Laurence Palmer, Hermann J. Muller, Roger Tory Peterson, Oscar Riddle, Helen Irene Battle

NABT DISTINGUISHED SERVICE AWARD RECIPIENTS

- 2020 — NOT AWARDED
- 2019 — Bonnie Bassler, Princeton University, Princeton, NJ
- 2018 — Ed Yong, The Atlantic, Washington, D.C.
- 2017 — May Berenbaum, University of Illinois Urbana-Champaign, Urbana, IL
- 2016 — Temple Grandin, Colorado State University, Fort Collins, CO
- 2015 — Carl Zimmer, Yale University, New Haven, CT
- 2014 — The Lacks Family (descendents of Henrietta Lacks), Baltimore, MD
- 2013 — Rita R. Colwell, University of Maryland College Park and Johns Hopkins University Bloomberg School of Public Health, College Park, MD
- 2012 — Michael Pollan, UC Berkeley Graduate School of Journalism, Berkeley, CA
- 2011 — Neil Shubin, University of Chicago, Chicago, IL
- 2010 — Richard Dawkins, The Richard Dawkins Foundation for Reason and Science, Falcon, CO
- 2009 — Mario Capecchi, University of Utah, Salt Lake City, UT
- 2008 — Ken Miller, Brown University, Providence, RI
- 2007 — Sean Carroll, University of Wisconsin — Madison, Madison, WI
- 2006 — Shirley Malcom, AAAS, Washington, D.C.
- 2005 — James A. Thompson, University of Wisconsin—Madison, Madison, WI; and Nina Leopold Bradley, Aldo Leopold Foundation, Baraboo, WI
- 2004 — Barbara Bancroft, RN, CPP Associates, Inc., Chicago, IL
- 2003 — Roberta Pagon, M.D., Children's Hospital & Regional Medical Center, Seattle, WA
- 2002 — Thomas E. Lovejoy, The H. John Heinz III Center for Science, Economics and the Environment, Washington, D.C.
- 2001 — E.O. Wilson, Harvard University, Cambridge, MA
- 2000 — Roger and Deborah Fouts, Chimpanzee and Human Communication Institute, Ellensburg, WA
- 1999 — Jack Horner, Museum of the Rockies, Bozeman, MT
- 1998 — Leroy Hood, University of Washington, Seattle, WA
- 1997 — Neal Lane, National Science Foundation, Washington, D.C.; and Donald Kennedy, Stanford University, Palo Alto, CA
- 1996 — Francis Collins, National Institutes of Health, Bethesda, MD
- 1995 — Carl Djerassi, Stanford University, Palo Alto, CA
- 1994 — Bruce Alberts, National Academy of Sciences, Washington, D.C.
- 1993 — Nancy S. Wexler, College of Physicians and Surgeons of Columbia University, New York State Psychiatric Institute, New York, NY
- 1992 — Paul R. Ehrlich, Stanford University, Palo Alto, CA
- 1991 — Stephen Jay Gould, Harvard University, Cambridge, MA
- 1990 — Peter Raven, Missouri Botanical Garden, St. Louis, MO
- 1989 — Stanley Cohen, Stanford University, Palo Alto, CA
- 1988 — Lynn Margulis, University of Massachusetts, Boston, MA; and James D. Watson, Cold Spring Laboratory, Cold Spring Harbor, NY



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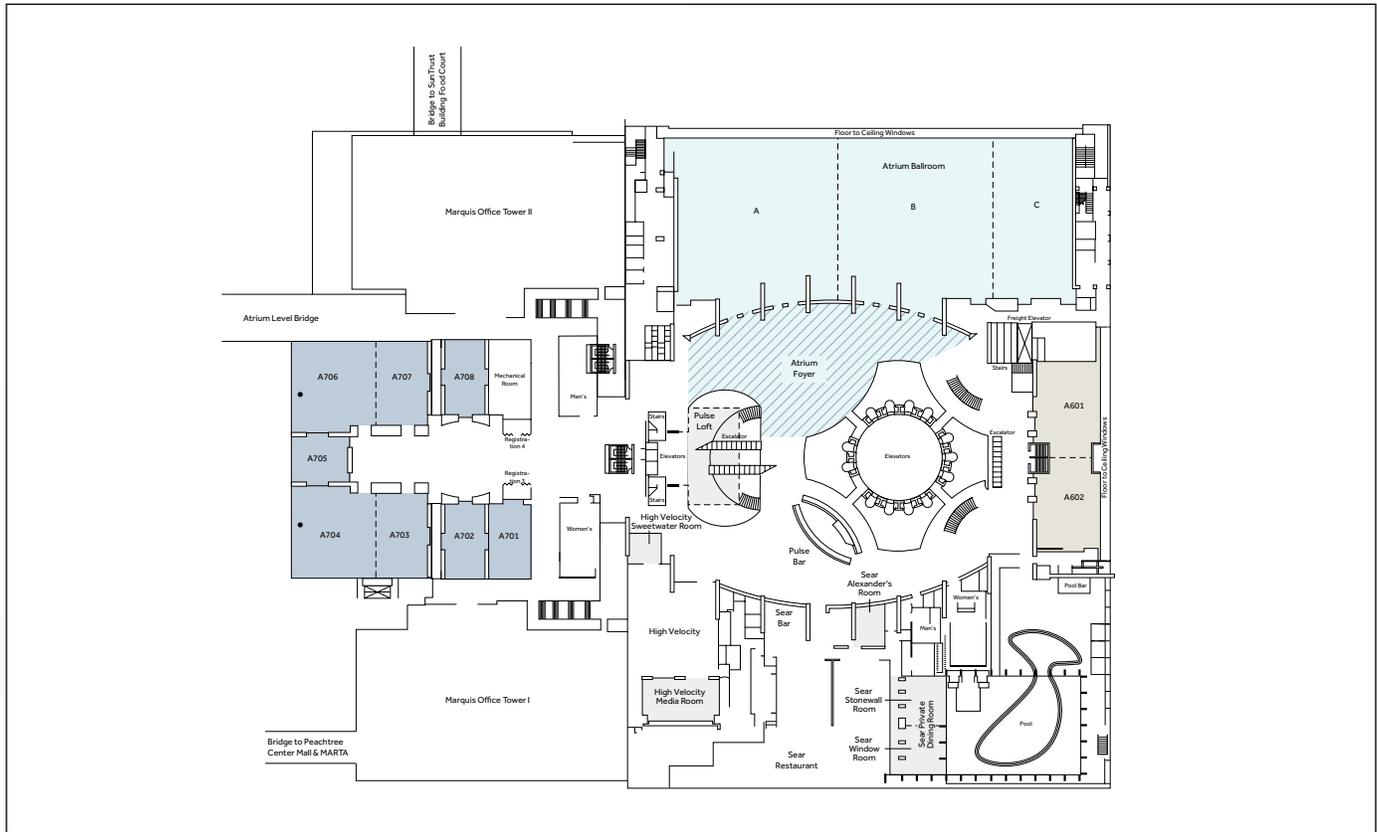
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Visit www.nabt.org/Resources-American-Biology-Teacher
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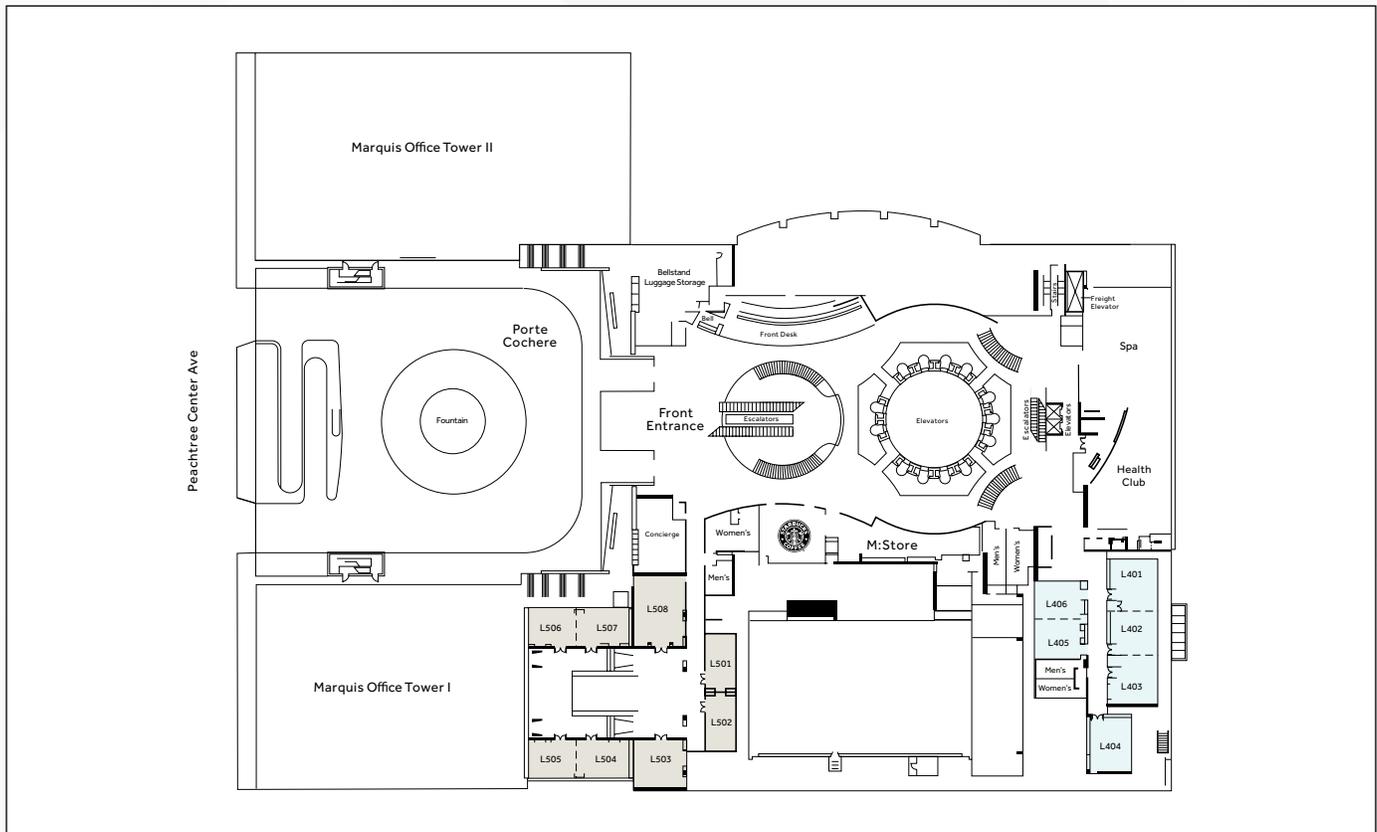


CONVENTION MAPS

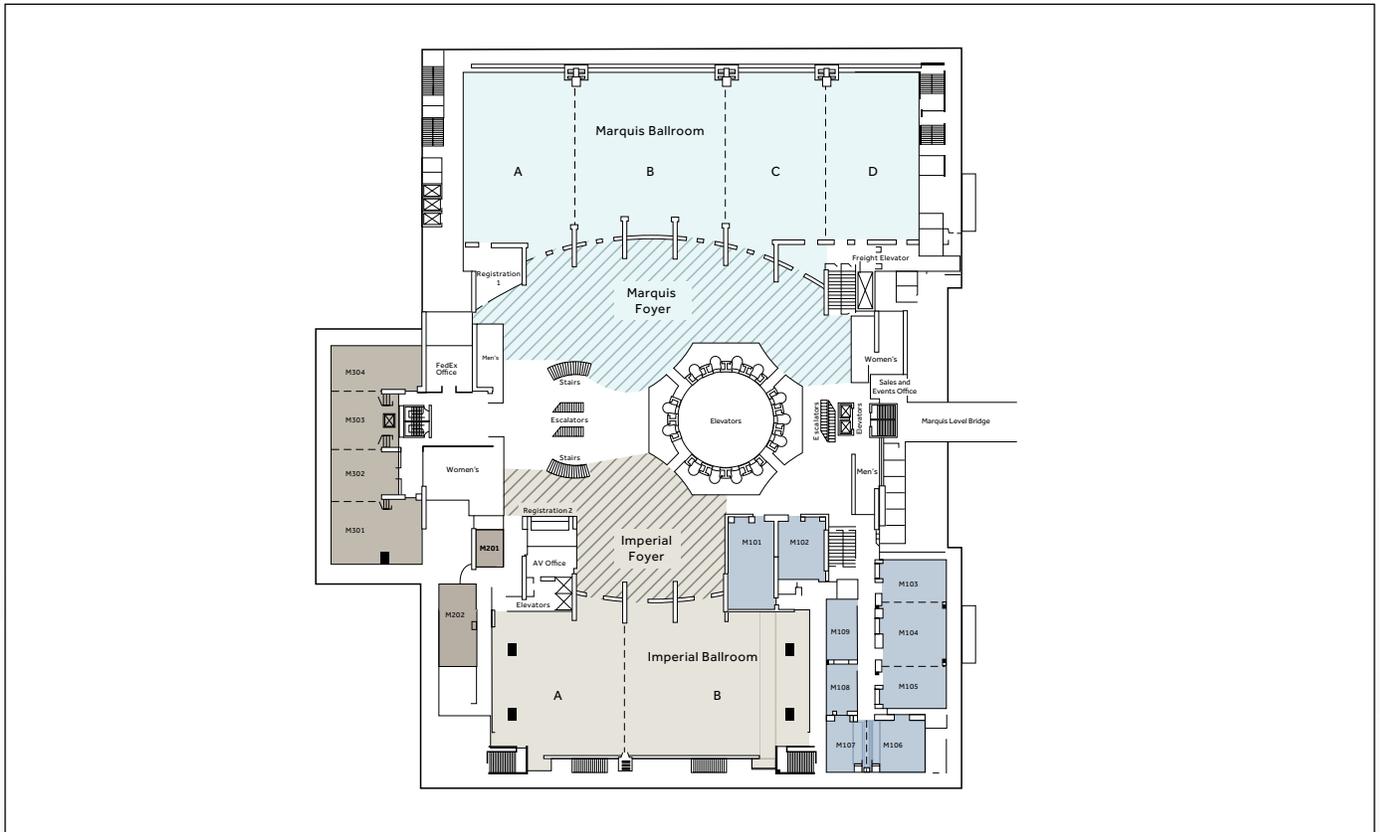
ATRIUM LEVEL



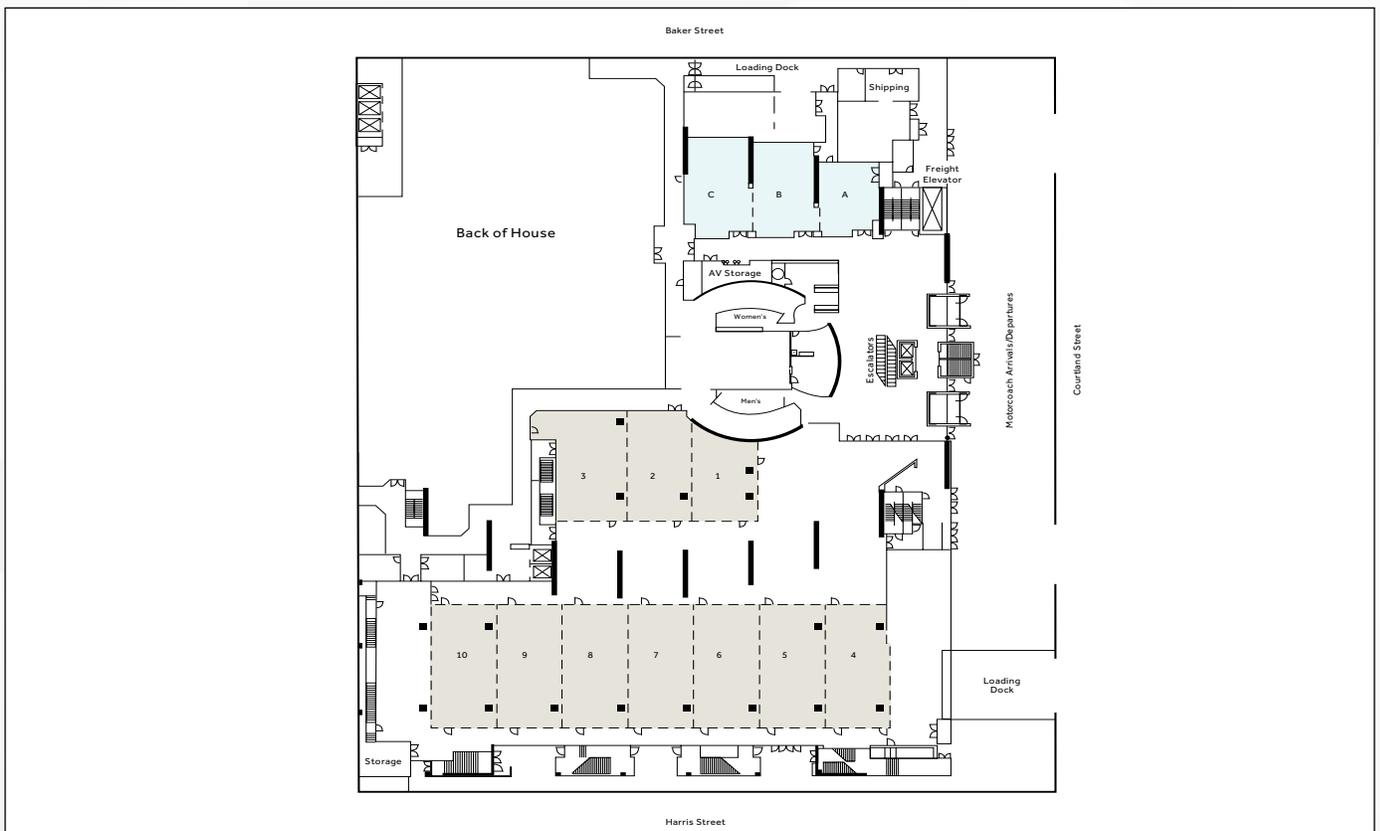
LOBBY LEVEL



MARQUIS LEVEL



INTERNATIONAL LEVEL



SPECIAL EVENTS

SPECIAL WORKSHOPS

Thursday, November 11

Using Societal Challenges to as Phenomena in Three Dimensional Units to Develop Student Agency

Free (Tickets Required)
12:30pm – 3:30pm

Experience how leveraging complex culturally relevant societal challenges as phenomena in three -dimensional teaching and learning supports student motivation and development of agency.

Using Guided Inquiry to Teach Anatomy and Physiology Core Concepts

Free (Tickets Required)
2:30pm – 3:30pm

Participants will explore inquiry-based activities addressing homeostasis and, more specifically, cardiovascular physiology. In these activities, students use scientific process skills to develop understanding of core concepts in anatomy and physiology.

Sunday, November 14

Bridging Disciplines to Bring Research into Biology Classrooms

Free (Tickets Required)
8:30am – 12:30pm

Instructor, biology educational researcher, and learning scientist collaborations can create major impacts on classroom learning. This interactive workshop explores what it takes to form successful and productive interdisciplinary research teams.

Storylining in Biology for Coherent Instruction

Advance \$10 / Onsite \$10
8:30am – 12:30pm

Storylines led by engaging phenomena improve student engagement and understanding of the overarching biological concepts. Presenters model how to use phenomena to anchor instruction and lead instruction in this workshop.

MEAL FUNCTIONS

Friday, November 12

Note about Luncheons:

This year, conference registration fees include a grab-and-go lunch option. We invite you to get lunch and join a level/section luncheon or find another comfortable place to take a break.

Elementary & Middle Level Teachers Luncheon

Free
12:45pm – 1:45pm

Grab your lunch and meet up with other K-8 teachers at this informal networking lunch designed to help you connect with colleagues.

AP Biology Section Luncheon

Free
12:45pm – 1:45pm

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

Sponsored by



High School Teachers Luncheon

Free
12:45pm – 1:45pm

If you teach funny Freshmen, serious Seniors and/or everyone in-between, you will want to grab your lunch, grab a seat, and connect with other high school biology teachers in this informal setting.

Two-Year College Section Luncheon

Free
12:45pm – 1:45pm

Join a supportive community of two-year college educators to share your strategies, your struggles, and your successes. The winners of the *Two-Year College Biology Teaching Award* and the *Professor Chan Teaching Award* will also be recognized.

Four-Year College & University Section Luncheon

Free
12:45pm – 1:45pm

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

Saturday, November 13

BioClub Breakfast

Free (Tickets Required)
7:30am – 8:45pm

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



FIELD TRIP

Thursday, November 11

Wild Day at Zoo Atlanta

Advance \$50 / Onsite
Tickets Not Available
(9:30am Departure – 2:00pm Return)

Zoo Atlanta is excited to welcome you for a WILD day of exploration and education. Observe hundreds of species, including giant panda and the African Savanna exhibit, and take a special behind-the-scenes look at how Zoo staff care for their animal ambassadors. Transportation and a lunch voucher are included.

SPECIAL EVENTS

Saturday, November 13

2021 NABT Honors Luncheon

Advance \$50 / Onsite \$60
11:30am – 2:00pm

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 join us and congratulate these remarkable professionals.

A Magical Evening with NABT

Advance \$25 / Onsite \$40
6:15pm – 8:30pm

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 in 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.



Help NABT continue to grow.

NABT empowers the individual educator and fosters a supportive professional environment to create a diverse community who continually improves and enhances biology education.

Donate now at
www.nabtdonations.org

**NABT**
National Association of
Biology Teachers



President-elect
**CHRIS
MONSOUR?**

**From Boston to Brisbane, Cleveland to Capetown, Chris is always on the go.
And we know where he's going next!**

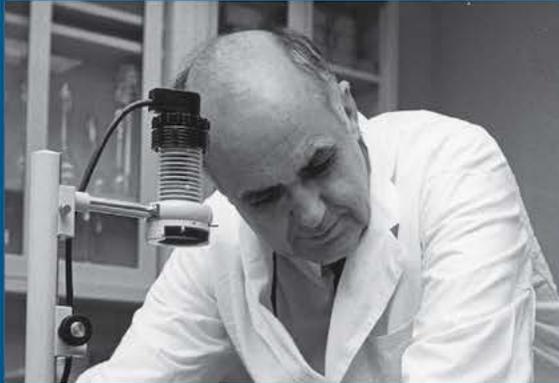
Catch Chris in Atlanta and enter to win some great prizes from NABT.

The drawing will be Friday, November 13th at NABT2021!

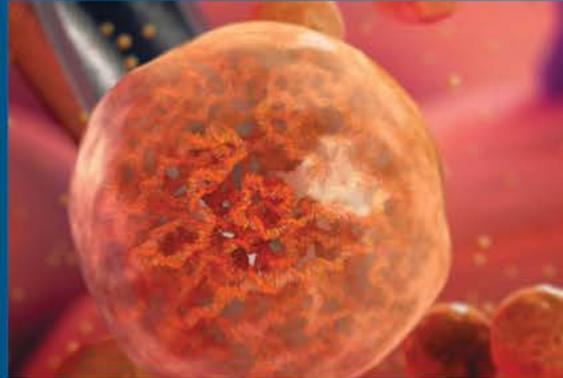


FIND MORE AT NABT 2021!

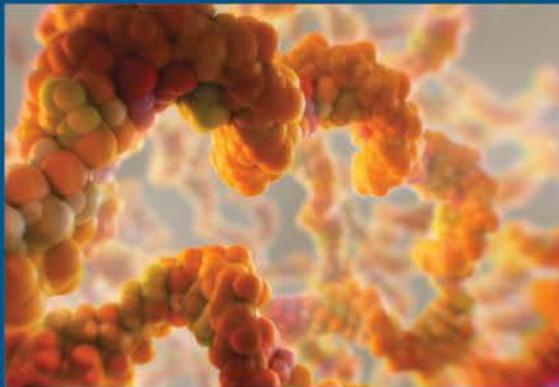
Please visit our
NABT-dedicated
page to see
what's new!



2021 Hilleman Contest
Winning Essays



Creativity in Science
Event Film



How COVID-19 mRNA
Vaccines Work (animation)



Special Message
from a Mystery Guest

HILLEMANTHAT.COM/NABT

Congrats to the
2021 Hilleman
Essay Contest
teacher winners:

JoAnn G
New York

Tanea H
Arizona

Mary B
Texas



November 11
THURSDAY

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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9:30am – 3:00pm

Wild Day at Zoo Atlanta

Meet at International Level for Bus • Field Trip (Tickets Required) • General Biology • GA

Zoo Atlanta is excited to welcome you for a WILD day of exploration and education. Observe hundreds of species, including giant panda and the African Savanna exhibit, and take a special behind-the-scenes look at how Zoo staff care for their animal ambassadors. Transportation and a lunch voucher are included.

11:30am – 1:30pm

NABT Board of Directors Meeting & Leader Lunch

L508 • Invitation Only • Committee Meeting • GA

12:30pm – 3:30pm

3146 Using Societal Challenges to as Phenomena in Three Dimensional Units to Develop Student Agency

M302 • General Biology • Special Workshop (Tickets Required) • HS, GA

Experience how leveraging complex culturally relevant societal challenges as phenomena in three dimensional teaching and learning supports student motivation and development of agency.

Cindy Gay, BSCS Science Learning, Colorado Springs, CO

3027 Using Guided Inquiry to Teach Anatomy and Physiology Core Concepts

M304 • Anatomy & Physiology • Special Workshop (Tickets Required) • HS, 2Y, 4Y

Participants will explore inquiry-based activities addressing homeostasis and, more specifically, cardiovascular physiology. In these activities, students use scientific process skills to develop understanding of core concepts in anatomy and physiology.

Murray Jensen, University of Minnesota, New Brighton, MN and Kerry Hull, Bishop's University, Sherbrooke, Quebec, Canada

2:30pm – 3:00pm

NABT Open Forum

M103/104 • Committee Meeting • GA

The volunteer leaders and executive director of NABT will lead this interactive discussion focused on the “state of the association.” Learn more - and provide feedback – on the programs that support you as a biology educator. Everyone is welcome to get more involved with NABT.

3:00pm – 3:45pm

NABT First Timers' Reception

M101 • Special Event (Invited Guests & First Timers) • GA

First time attendees are invited to learn more about NABT, the 2021 Professional Development Conference and grab a snack with former “first timers”. Each table will have an NABT Mentor to answer your questions and help you make the most of your time in Atlanta.

NABT Students Meet-Up

M102 • Special Event • GA

Come meet fellow biology students! All graduate and undergraduate students are invited for refreshments and introductions to other students.

Coordinated by the NABT Student Committee

4:00pm - 5:30pm

GENERAL SESSION SPEAKER

Anne Schuchat

See page 8 for biography.

My Impersonation of a Biology Teacher Through Three-plus Decades at the CDC

Imperial Ballroom • Special Speaker • GA

Dr. Anne Schuchat will provide reflections on public health, prevention, and pandemic responses from the perspective of her three-plus decades at the Centers for Disease Control and Prevention (CDC). She will share stories from the trenches - as well as inside the Beltway - and make a case for the value of evidence, risk communication, and creative arts in linking data to action. She will explore the need to expand the depth, diversity, and adaptability of the public health workforce. Dr. Schuchat will also highlight opportunities for training open to high school through postgraduate level students.

5:30pm – 7:30pm

Exhibit Hall Grand Opening Reception

International Level • Special Event • GA

We welcome you to Atlanta with a special reception in the 2021 NABT Exhibit Hall. Our vendor and partner community will showcase the latest and greatest resources for teaching biology, helping you find those familiar favorites and new innovations.

6:30pm – 7:30pm

NABT Past President's Advisory Council Meeting & Reception

Presidential Suite • Invitation Only

November 12
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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8:00am - 9:00am

Meet & Greet with NABT Leaders
International C • Committee Meeting • GA

Is it time for you to get more involved with the NABT Community? Learn more about different opportunities from NABT committee chairs, section chairs and regional coordinators.

10:30am – 12:30pm

3218 2021 NABT Evolution Symposium: Squamate Speciation

M103/104 • Evolution • Symposium (120 min) • HS, 2Y, GA

The National Center for Science Education (NCSE) is proud to present this year's Evolution Symposium on "Squamate Speciation". We begin with a presentation from Edward L. Stanley focused on the evolutionary biology of snakes. Then NSCE Teacher Ambassadors will lead a workshop bringing this research into your classroom through an NGSS-storyline.

See page 26 for full details.

10:30am – 2:00pm

Zoo Atlanta Animal Experience
International Ballroom • Special Event • GA

The Exhibit Hall is your destination for a wild encounter with the animal ambassadors from Zoo Atlanta.

10:30am – 11:45am

3211 A Revisit and Deep Dive into the Floating Leaf Disk Assay – a classic

L401-403 • AP Biology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Think you know "The Floating Leaf Disk Assay"? This presentation is a deep dive into methods, analysis, troubleshooting, student research, and a way to measure oxygen production directly.

Brad Williamson, University of Kansas (Retired), Lawrence, KS and Bob Kuhn, Innovation Academy, Alpharetta, GA

9:15am – 10:15am

GENERAL SESSION SPEAKER**J. Marshall Shepherd**

See page 8 for biography.

The Extreme Weather - Climate Change Connection: Perspectives on the Science, Vulnerability and the Message
Imperial Ballroom • Special Speaker • GA

Dr. Shepherd will discuss how current research is attributing extreme weather events to contemporary climate change. He will also address how highly disproportionate vulnerability is to such events within certain communities, and he will share strategies for communicating the risks of climate change to non-scientists.

10:30am – 11:45am continued

SPECIAL PROGRAMMING PRESENTED BY CGHI & Innovate Bio**3239 Lesson Resources for Bringing Biotechnology to Your High School Biology Class**

L404 • Biotechnology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Teachers review and plan how they might implement a series of lessons introducing students to Biotech skills and careers, and have an opportunity to join InnovATEBIO's high school network.

Philip Gibson, CGHI, Atlanta, GA; Tamara Mandell, University of Florida, Alachua, FL; Bridgette Kirkpatrick, Collin College, Plano, TX; Jennifer Lazare, Austin Community College, Austin, TX; Michael, Fuller, Elizabeth Doggett, and Ying-Tsu Loh, BABEC, Burlingame, CA

3079 More Math, Please! Incorporating Quantitative Skills in Biology Courses

L405/406 • General Biology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Come experience ready-to-use quantitative biology modules as learners and then as educators. Learn about the QB@CC community and different ways to collaborate, create and contribute to the network.

Vedham Karpakakunjaram, Montgomery College, Rockville, MD; and John Starnes, Southcentral Kentucky Technical & Community College, Bowling Green, KY

3050 Non-majors Matter - Vision and Change for Everyone

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

Participants will work with members of the NSF-funded IGELS project (Improvement of General Education Life Science courses) to modify/reflect on activities for their students that align with new, equitable outcomes, focusing on Reasoning and Relevance.

Heather Rissler, North Iowa Area Community College, Mason City, IA; Sam Donovan, University of Pittsburgh, Pittsburgh, PA; Bryan Dewsbury, Florida International University, Miami, FL

SPECIAL PROGRAMMING PRESENTED BY Pivot Interactives**3238 Introduction to Pivot Interactives: Active Learning Made Easy**

L506/507 • Technology in the Classroom • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Experience Pivot Interactives in this active session. Explore the variety of learning modes you can implement in any science classroom: interactive video, sensor integration, Co-Labs™, and more. Bring a laptop/tablet!

Eric Friberg, Pivot Interactives, Minneapolis, MN and Lee Ferguson, Allen High School, Allen, TX

2021 NABT Evolution Symposium

M103/104 • Evolution • Symposium (120 min) • HS, 2Y, GA

How Snakes Lost Their Legs but Won the Race

Snakes are really odd, really successful kinds of lizards. They are so successful and so unusual that most people don't even think they are lizards. The origin of snakes has led to a deep well of questions: When and why did they lose their limbs? Why don't snakes have eyelids? What's up with all the tongue flicking? This session will talk about the origins of limblessness, the discovery of the largest snake of all time, Titanoboa correjonensis, and how 3D imaging of museum specimens opens up a whole new world of opportunities for scientists and educators alike.

Edward L. Stanley, OvERT Program/Florida Museum, University of Florida, Gainesville, FL

NCSE Teacher Workshop: A Snake in the Grass - An NGSS Storyline

This interactive session spotlights free evolution lesson plans that explore the speciation of squamates (i.e., scaled reptiles such as lizards and snakes) by examining the genetic and environmental factors that led to limb reduction, the human impact on snake morphology, and conservation efforts to preserve snake biodiversity. Teachers will explore a complete unit that begins with the discovery of Titanoboa. From this anchoring phenomenon, we will backtrack through time to study the last of the limbed snakes, the evolution of limblessness, and study a variety of pigmented morphs. and the ecological consequences of human actions on wild populations.

Rebecca Brewer, Troy High School, Troy, MI, and Lin Andrews, NCSE, Oakland, CA

This symposium is made possible by the National Center for Science Education.

2021 NABT EVOLUTION SYMPOSIUM



NCSE National Center for
Science Education

Squamate Speciation

How Snakes Lost Their Legs but Won the Race

Edward L. Stanley, *Florida Museum of Natural History, Univ. of Florida*

Stanley tackles the deep well of questions surrounding the evolution of snakes and details opportunities for educators to make use of museum resources.



NCSE TEACHER WORKSHOP:

A Snake in the Grass—An NGSS Storyline

Rebecca Brewer, Lin Andrews

Brewer and Andrews spotlight free teacher-developed evolution lessons that explore the speciation of squamates.

10:30am – 11:45am continued

3077 Creating Engaging Phenomena Aligned Units for NGSS Implementation

L508 • Curriculum Development • Hands-on Workshop (75 min) • ML, HS

Use a planning guide to help you develop a phenomenon-aligned unit. Guide includes science practices scaffolding. Come learn strategies to make your science favorites the phenomena for a unit!

Kelly Kveton and April Pence, Huntington Beach Union High School District, Huntington Beach, CA

3217 Using Educative Materials that Highlight the Cultural Resources of Black Heritage to Explore Biology Concepts

M101 • Curriculum Development • Hands-on Workshop (75 min) • ELEM, ML, GA

This workshop implements and shares a unit created from a larger National Science Foundation Grant that uses the narratives and lived experiences of Black African heritage to learn biology concepts.

Catherine Quinlan, Howard University, Washington, DC

3149 Half-Earth Project Guided Inquiry: Mapping Hummingbirds and Other Species to Understand Patterns in Biodiversity

M105 • Ecology / Environmental Science / Sustainability • Hands-on Workshop (75 min) • ML, HS, 2Y

The Half-Earth Map (half-earthproject.org/map) reveals Earth's species, nature reserves, and human impacts. Explore team-based, hands-on student inquiries that reveal biodiversity fundamentals using charismatic species.

Dennis Liu, E.O. Wilson Biodiversity Foundation, Potomac, MD; Jonathan Bower, Del Mar High School, San Gabriel, CA; Erika Mitkus, Governor's Academy, Newbury, MA

SPECIAL PROGRAMING PRESENTED BY miniPCR

3243 Knockout! Bringing Authentic CRISPR/Cas to Your Class

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

Use CRISPR/Cas to disable, or knock out, a gene in bacteria and then use simple phenotypic screening to confirm successful gene knockout in this authentic but accessible lab activity.

Zeke Alvarez-Saavedra, miniPCR bio, Cambridge, MA

ABT Advisory Committee Meeting

M108 • Committee Meeting (75 min) • GA

William McComas, ABT Editor

3177 Using Anatomy Analogies to Anchor and Advance Student Learning

M301 • Anatomy & Physiology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Anatomy analogies can come in many sizes – simple to complex – as well as many formats – written, drawn, even kinesthetic. Come discuss my favorites and create your own!

Jennifer Welch, Madisonville Community College, Madisonville, KY

NABT Student Un-Conference Session

M302 • Instructional Strategies • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Help NABT better support its student members during this participant-oriented session featuring an agenda and discussion topics decided upon by the attendees. This session will result in an online student event in the spring of 2022.

Organized by the NABT Student Committee



Let's do science! Join a free in-person hands-on workshop.

Visit Us at Booth #317

NABT Atlanta Workshop Schedule

Saturday, November 13 – Room 106/107

9:00–10:15 am *Did you really do CRISPR? How good experimental controls let students make real scientific claims.*

10:30–11:00 am *Track the mysterious spread of SARS-CoV-2 using a flexible gel electrophoresis kit.*

11:15–12:30 pm *Catch up on the latest CRISPR tech and do the real thing in your classroom!*

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10:30am – 11:45am continued

3210 Exploring Phenomenon with CODAP Data Excursions

M303 • General Biology • Hands-on Workshop (75 min) • HS

Engage in a data excursion within the inquiryHub biology curriculum. Analyze data to determine if changes in feeding and migration caused the population increase for large mammals in the Serengeti.

Kate Hensen, University of Colorado - Institute of Cognitive Science, Boulder, CO

3047 Infusing 21st Century Skills into Undergraduate Biology Courses while Helping 3rd-8th Grade Students Conduct Research

M304 • Instructional Strategies • Demonstration (75 min) • ML, 2Y, 4Y

Come learn about iBEARS, a program that trains undergraduate biology majors to virtually mentor 3rd - 8th-grade students through authentic research experiences. Attendees will learn about iBEARS and opportunities to join.

Micheal Moore, University of Arkansas at Little Rock, Little Rock, AR; Tracey Sulak, Baylor University, Waco, TX; Alex Tolar, Texas Christian University, Fort Worth, TX

12:00pm – 12:30pm

3046 A New Approach for Non-Majors-Laboratory and Active Learning Exercises Using Computer Simulations

L401- 403 • General Biology • Paper (30 min) • HS, 2Y, 4Y

We discuss a new approach for non-majors biology with laboratory exercises using computer simulations, impossible to perform in traditional labs. The free software (NetLogo) contains numerous models; we developed more.

George Shiflet and Angela Shiflet, Wofford College, Greenville, SC

SPECIAL PROGRAMING PRESENTED BY CGHI & Innovate Bio

3242 Biotechnician Assistant Credentialing Exam (BACE)

L 404 • AP Biology • Demonstration (30 min) • HS, 2Y, 4Y

Developed from a framework of industry-defined standards, BACE has gained national attention within industry and academia as the standard for documenting mastery of competencies and skills valued for technician-level positions.

Philip Gibson, CGHI, Atlanta, GA; Tamara Mandell, University of Florida, Alachua, FL; Bridgette Kirkpatrick, Collin College, Plano, TX

3017 Making It Personal: How to Teach Cancer with Personalized Medicine

L405/406 • Biotechnology • Demonstration (30 min) • HS, 2Y

We will feature a suite of biology lessons, taught through a social justice lens, which will include pgEd materials, making pedigrees with gel electrophoresis, and integration of clinical trials.

Julie Boehm and Ken Bateman, Wellesley High School, Wellesley, MO



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12:00pm – 12:30pm continued

3176 The Introductory Biology Experience (IBEx): Evaluating Progress in the Adoption of a Multidimensional Curriculum**L503** • General Biology • Paper (30 min) • 2Y, 4Y

We will feature a suite of biology lessons, taught through a social justice lens, which will include pgEd materials, making pedigrees with gel electrophoresis, and integration of clinical trials.

Anna Hiatt, Daniel Gutzmann, and Joshua Jolton, University of Nebraska – Lincoln, Lincoln, NE

3081 Citizen Science within Formal Classrooms using Common Milkweed**L504/505** • Ecology / Environmental Science / Sustainability • Paper (30 min) • ML, HS, 4Y

This session addresses the absence of citizen science (CS) in 6-16 classrooms using local adaptation of common milkweed. We report on ways that CS supported principles of evolution and the NGSS.

Michele Koomen, Jolie Grimes, Jake Ross, Ellen Hofstede, and Emelia Hinrichs, Gustavus Adolphus College, St. Peter, MN

SPECIAL PROGRAMING PRESENTED BY**Pivot Interactives****3250 Introducing Pivot Interactive's Simulations: Gene to Protein and Mutations****L 506/507** • Technology in the Classroom • Hands-on Workshop (30 min) • HS, 2Y, GA

Use the simulations within Pivot Interactives that will change how you teach gene expression and mutations. Students become active directors of these processes. General and advanced modes. Bring a laptop/tablet!

Eric Friberg, Pivot Interactives, Minneapolis, MN and Lee Ferguson, Allen High School, Allen, TX

3204 Math Prereqs for Intro Biology: What are the Effects at One Community College?**M101** • General Biology • Paper (30 min) • 2Y, 4Y

This workshop implements and shares a unit created from a larger National Science Foundation Grant that uses the narratives and lived experiences of Black African heritage to learn biology concepts.

Stacey Kiser, Lane Community College, Eugene, OR

3044 Social Justice in the Biology Classroom**M102** • General Biology • Paper (30 min) • GA

Social justice is of-the-moment. Does science have a role? Yes. Facts matter to understanding the consequences of social policy and finding effective solutions. Learn about some cases using standard topics.

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

3208 A Discovery into Wild Insect Responses to Chemical and Physical Stimuli using Chi-Square and Smartphones**M105** • Ecology / Environmental Science / Sustainability • Paper (30 min) • ML, HS

Identify insect species and how they behave using a home-made behavioral chamber and running Chi-square analysis for chemical and physical attractants and repellants.

Claudia Ochatt, Ransom Everglades School, Miami, FL

SPECIAL PROGRAMING PRESENTED BY miniPCR**3245 Explore the Tools and Techniques Behind COVID Testing****M106/107** • General Biology • Demonstration (30 min) • MS, HS, GA

Introduce students to how qPCR and molecular diagnostic tools can manage disease outbreaks. Use affordable PCR with a fluorescent readout to test fictional patients for COVID-19.

Zeke Alvarez-Saavedra, miniPCR bio, Cambridge, MA

Member Resources Committee**M108** • Committee Meeting (30 min) • GA

Catherine Ambos, Committee Chair

3191 Science for All, One Microbiome at a Time**M301** • Microbiology & Cell Biology • Demonstration (30 min) • HS, 2Y, 4Y

The session will describe environmental microbiome projects in the context of class-based research experiences (CREs). The session will include sample collection and microbiome data analysis and quantitative measurements of biodiversity.

Theodore Muth, Brooklyn College-CUNY, Brooklyn, NY

3124 Synchronous Student Teamwork in an Asynchronous Course**M303** • Instructional Strategies • Demonstration (30 min) • 2Y, 4Y

Participants will learn tips for incorporating teamwork in their classes- even asynchronous online courses- including how to create teams, hold team members accountable, and create metacognitive activities.

Andrea Bierema, Michigan State University, East Lansing, MI

12:00pm – 12:30pm

3016 Beyond Current Events: Using Contemporary Readings and Media to Support Student Science Practice

M304 • Instructional Strategies • Hands-on (30 min) • 2Y

Help students become critical consumers of science and media through practicing analysis of data and improving their evidence-based claims. See how to support these inter-related goals through guided activities.

Stephen Traphagen, Oak Park and River Forest High School, Oak Park, IL and Julie Minbiole, Columbia College, Chicago, IL

12:45pm – 1:45pm

SPECIAL PROGRAMING PRESENTED BY miniPCR

3245 Explore the Tools and Techniques Behind COVID Testing

M106/107 • General Biology • Demonstration (30 min) • MS, HS, GA

Introduce students to how qPCR and molecular diagnostic tools can manage disease outbreaks. Use affordable PCR with a fluorescent readout to test fictional patients for COVID-19.

Zeke Alvarez-Saavedra, miniPCR bio, Cambridge, MA

2:00pm – 4:00pm

3230 12th Annual Biology Education Research Symposium

M103/104 • Instructional Strategies • Symposium (120 min) • 2Y, 4Y, GA

NABT is proud to present the 12th Annual Biology Education Research Symposium. Accepted presentation went through a double-blind review process that was open to biology instructors and education researchers at all levels. The format for the symposium is a traditional presentation of papers by individual or co-authors lasting 15 minutes each.

See page 34 for full listing.

12:45pm – 1:45pm continued

THIS YEAR, NABT INVITES YOU TO GRAB A LUNCH IN THE EXHIBIT HALL AND JOIN YOUR COLLEAGUES DURING A LEVEL/SECTION LUNCHEON.

Elementary & Middle Level Teachers Luncheon

International A • Meal Function (60 min) • ELEM, ML

Grab your lunch and meet up with other K-8 teachers at this informal networking lunch designed to help you connect with colleagues

Two-Year College Section Luncheon

International B • Meal Function (60 min) • 2Y

Join a supportive community of two-year college educators to share your strategies, your struggles, and your successes. The winners of the *Two-Year College Biology Teaching Award* and the *Professor Chan Teaching Award* will also be recognized

High School Teachers Luncheon

International C • Meal Function (60 min) • HS

If you teach funny Freshmen, serious Seniors and/or everyone in-between, you will want to grab your lunch, grab a seat, and connect with other high school biology teachers in this informal setting.

AP Biology Section Luncheon

International 9 • Meal Function (60 min) • AP

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

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Four-Year College & University Section Luncheon

International 10 • Meal Function (60 min) • 4Y

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

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Communicate BACE attributes via InnovATEBIO and CAMCTP networks as the IRCS, and provide professional development for educators.



2:00pm – 3:15pm

3227 Guy Harvey Ocean Foundation Collections

L401-403 • Ecology / Environmental Science / Sustainability • Hands-on Workshop (75 min) • ELEM, ML, HS

Hands-on exploration of the Guy Harvey Ocean Foundation's Curriculum collection available free to educators. Lessons for grades 2-5, 6-8, and HS aimed to increase understanding of sharks and their role.

Lesley Kirkley, Pasco County Schools, Land O' Lakes, FL

3118 Having a BLAST: Getting Comfortable Using Sequence Comparison Program

L405/406 • AP Biology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Participants will go through exercises that will help them navigate with confidence various websites/software to compare DNA/protein sequences (such as BLAST) and determine evolutionary relationships based on sequence comparisons. BYOD

Dessy Dimova, Franklin High School, Somerset, NJ

3067 Tick-Borne Diseases: One Health Lessons Connecting Humans, Animals, and the Environment

L503 • General Biology • Hands-on Workshop (75 min) • HS

Investigate the spread of tick-borne diseases in humans and animals. Experience hands-on, minds-on, NGSS practice-based lessons related to One Health – the connections between human, animal, and environmental health.

Dina Markowitz, University of Rochester, Rochester, NY; Lisa Brosnick, SUNY College at Buffalo, Buffalo, NY

3209 The Ethics of Access: A Framework for Making Decisions about Access to Vaccines and Insulin

L504/505 • General Biology • Hands-on Workshop (75 min) • ML, HS, GA

You've taught the biology. Now engage students in using ethical frameworks and decision-making models to support systematic, rational ways to work through social dilemmas about access to vaccines and insulin.

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

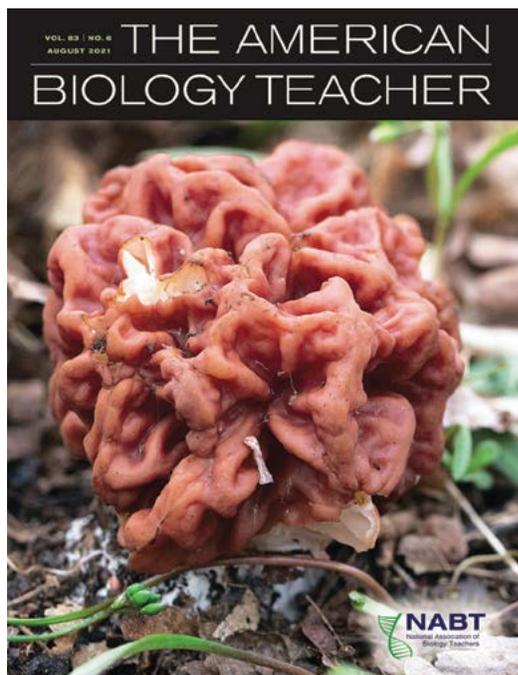
SPECIAL PROGRAMING PRESENTED BY Pivot Interactives

3251 Fill in the Gaps in your AP Biology Lab Activities

L506/507 • AP Biology • Demonstration (75 min) • HS, 2Y, 4Y

Missing relevant phenomena for specific topics? Unreliable lab data obscuring learning goals? Let Pivot Interactives help fill the gaps. Topics featured: respiration, biodiversity index, energy flow, genetics. Bring a laptop/tablet!

Eric Friberg, Pivot Interactives, Minneapolis, MN and Lee Ferguson, Allen High School, Allen, TX



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The American Biology Teacher is an award-winning, peer-refereed professional journal for K-16 biology teachers. Topics covered in the journal include modern biology content, teaching strategies for the classroom and laboratory, field activities, applications, professional development, social and ethical implications of biology and ways to incorporate such concerns into instructional programs, as well as reviews of books and classroom technology products.

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2:00pm – 3:15pm continued

3154 Death from Above or Below? Designing Curriculum to include NGSS Nature of Science Representations

M101 • Nature of Science • Hands-on Workshop (75 min) • HS

Participants will experience an overview of the nature of science (NOS) in NGSS, examine NOS in sample lessons, then collaboratively plan to implement NOS in their own classrooms.

John Maddux, Festus High School, Festus, MO and Jim Lane, Mahtomedi High School, Mahtomedi, MN

3260 Writing for the ABT

M106 • Instructional Strategies • Hands-on Workshop (75 min) • GA

The editorial team of *The American Biology Teacher* will jointly present a workshop for all those who would like to be authors and/or reviewers with a practice review and article development session.

William McComas, ABT Editor and University of Arkansas, Fayetteville, AR

SPECIAL PROGRAMMING PRESENTED BY miniPCR

3247 Investigate Lemurs, Conservation Genetics, and Evolution with the Duke Lemur Center and miniPCR bio

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

Analyze authentic genetic and ecological data to identify a species of lemur. Use gel electrophoresis, build phylogenetic trees, and help identify threats to a species on the verge of extinction.

Zeke Alvarez-Saavedra, miniPCR bio, Cambridge, MA

Awards Committee

M108 • Committee Meeting (75 min) • GA

Jason Crean, Committee Chair

SPECIAL PROGRAMMING PRESENTED BY Bedford, Freeman & Worth High School Publishers

3255 Efficiently Teaching the Science Practices in AP® Biology - Part 1

M302 • AP Biology • Demonstration (75 min) • HS

This session will provide AP® Biology teachers ideas, bell ringers, and activities for numerous opportunities to practice the process of science and much more (assessment, etc!) throughout the school year.

Thomas Menna, BFW Publishers, Hamilton, NJ; Jim Smanik, Sycamore High School, Cincinnati, OH; Paula Phillips, Lansing High School, Lansing, NY

3086 Sharing Science with Skeptical Students

M304 • Science Practices • Symposium (75 min) • GA

Dr. Lamb, an award-winning educator, shares best practices for communicating science. Using his Beyond the Blog video series, Lamb shares how he opens doors to the curious, unsure, or skeptical.

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

3:30pm – 4:00pm

3031 Equity and Belonging through Modified Biology Storylines

L401/403 • General Biology • Demonstration (30 min) • HS

Explore strategies to modify storylines that increase belonging. Testimonies from biology and special education teachers who have implemented storylines to bring NGSS and equity to students with learning needs will be shared.

Lisa Pavic and Madeline Thomas, Glenbrook South High School, Glenview, IL

3052 Using Biotechnology for Inquiry-Based Genetic Studies in AP Biology

L405/406 • AP Biology • Demonstration (30 min) • HS, 2Y, 4Y

Learn how to guide students through developing an inquiry-based genetics project incorporating biotechnology. This will encompass AP biology Units 5 and 6 as well as all science practices.

Heidi Tarr, The Emery/Weiner School, Houston, TX

3:30pm – 4:00pm continued

3073 Implementing the Plant Awareness Disparity Index in Undergraduate Classrooms

L503 • Botany & Plant Biology • Paper (30 min) • 4Y

Learn about and how to administer and analyze results from the Plant Awareness Disparity Index (PAD-I), a survey designed to measure students' plant awareness disparity (PAD, formerly plant blindness).

Kathryn Parsley, University of Memphis, Memphis, TN

3145 How COVID-19/SARS-CoV-2 Can Be Used to Anchor Concepts and Science Practices in AP Biology

L504/505 • AP Biology • Hands-on Workshop (30 min) • HS, 2Y

Concepts of gene expression, protein structure, gene technology, cell receptors and signaling, viral life cycles, phylogeny, and natural selection are made accessible and engaging through modeling and study of COVID-19/SARS-CoV-2.

Jennifer Newitt, Friends Academy, Locust Valley, NY

SPECIAL PROGRAMMING PRESENTED BY Pivot Interactives

3252 Integrate Numeric Questions to Teach, Practice, and Assess Math Skills for Biology

L506/507 • Science Practices • Demonstration (30 min) • HS, 2Y, 4Y

We will demonstrate randomization and auto-graded numeric questions within Pivot Interactives. Embed more math skills within your biology curriculum. This session will feature the chi-square statistic. Bring a laptop/tablet!

Eric Friberg, Pivot Interactives, Minneapolis, MN and Lee Ferguson, Allen High School, Allen, TX

3:30pm – 4:00pm continued

3166 Woolly Bully: Exploring Science Identity and Attitudes through Citizen Science

L508 • Ecology / Environmental Science / Sustainability • Paper (30 min) • ML, HS, 2Y

Citizen science immerses students in science practices and builds content knowledge. In this study, students participating in the Harvard Forests' Woolly Adelgid project experienced increases in science identity and attitudes.

Tara Alcorn, Greater Lowell Technical High School, Tyngsboro, MA

3064 Building Evolution Curriculum from a Feminist Perspective

M101 • Curriculum Development • Paper (30 min) • HS, 4Y, GA

Explore an NGSS-aligned evolution curriculum designed from a feminist perspective that uses scientific practice as its pedagogical strategy and encourages all students to “do science”.

Heather Page, New York City Department of Education, Brooklyn, NY

3089 Algal Blooms! Designing Solutions to Reduce the Impact of Human Activity on the Environment

M102 • Ecology / Environmental Science / Sustainability • Demonstration (30 min) • ML, HS, GA

Experience a lesson where students take on roles of stakeholders while engaging in guided research, discussion, and design of solutions to address algal blooms in Florida. Plans/Templates will be shared.

Steve Kuninsky, The Gwinnett School of Mathematics, Science, and Technology, Lawrenceville, GA

3183 Experimenting on Enzyme Velocity and Allosteric Regulators Using Smartphone Applications at Home

M105 • AP Biology • Paper (30 min) • HS, 2Y

Solutions to isolate potato peroxidase and guaiacol from tree bark, pH strip making with coffee filters and cabbage, smartphone applications to detect RGB hue, or sound produced to quantitate the reaction.

Claudia Ochatt, Ransom Everglades, Miami, FL

SPECIAL PROGRAMING PRESENTED BY miniPCR

3248 BioBits: Central Dogma - Experiment Directly with Transcription and Translation Using Simple Tools and Procedures

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

Bring the Central Dogma of molecular biology to life. With the BioBits® cell-free system, you can use fluorescence to watch transcription and translation in real time.

Zeke Alvarez-Saavedra, miniPCR bio, Cambridge, MA

OBTA Directors & Regional Coordinators Meeting

M108 • Committee Meeting (30 min) • GA

3099 Ecosystem Explorers: What's in your Neighborhood?

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

Learn about an inquiry-based investigation that gets students venturing out of the classroom and exploring nature through the use of iNaturalist. Help them become Ecosystem Explorers!

Alexander Eden, Greater Lowell Technical High School, Tyngsborough, MA

SPECIAL PROGRAMMING PRESENTED BY

Bedford, Freeman & Worth High School Publishers

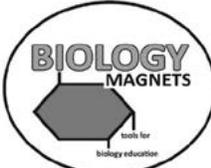
3255 Efficiently Teaching the Science Practices in AP® Biology - Part 2 Q&A

M302 • AP Biology • Demonstration (30 min) • HS

A continuation of the session “Efficiently teaching the science practices in AP® Biology - Part 1” talk with the presenters and learn more about “Biology for the AP Course”.

Thomas Menna, BFW Publishers, Hamilton, NJ; Jim Smanik, Sycamore High School, Cincinnati, OH; Paula Phillips, Lansing High School, Lansing, NY





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2:00 PM – 4:00 PM
M103/M104

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

Proceedings will be posted online at www.NABT.org.

Differences in How STEM Students Define Themselves as a “STEM Person”: Implications for College STEM Instructors

Valentina Espinosa Suarez, Heidi Cian, & Remy Dou, Florida International University, Miami, FL

Recognition by others in the STEM community plays a crucial role in STEM identity construction, which is related to the pursuit of and persistence in STEM careers. For undergraduate students, recognition that is especially formative to their STEM identity comes from their university STEM instructors. Identity research with STEM professionals suggest that the types of recognition needed to sustain STEM pursuits differ depending on career aspirations—particularly noting differences for those in research compared to health fields—implying that students may need different identity-supportive experiences based on their career intentions. We extend that work to pre-career individuals by using mixed methods to explore how premed students differ from their peers in how they see themselves as a “STEM person.” Results show that, while students rate themselves as a “STEM person” similarly regardless of premed status, the reasons that contribute to this self-perception differ in ways that align with their chosen fields. Results additionally highlight some intersection between gender and experiences that contribute to STEM identity. Implications for college biology instructors include the potential value in selecting laboratory experiences that reflect diverse ways of “doing STEM” and in explicitly communicating the relationship between their discipline and career aspirations associated with care.

Instructor Conceptions and Implementation of Course-based Undergraduate Research Experience (CURE) Features

Ruth Kaggwa, Lisa Walsh, & Kristine Callis-Duehl, Donald Danforth Plant Science Center, St. Louis, MO

Course-based undergraduate research experiences (CUREs) defined by five features/attributes; use of scientific practices/process, iteration, collaboration, broad relevance and discovery, are a unique form of pedagogy that incorporates authentic research into classroom teaching. Despite their contributions to improving student outcomes, CUREs are not widespread. Insights into the conceptions of instructors that implement CUREs might inform efforts towards increased adoption and improved student outcomes. The goal of our study was therefore to investigate instructor conceptions of the CURE features and their influence on implementation. We developed a survey informed by research goals targeting biology undergraduate instructors and shared it on the online platform Qualtrics to professional scientific organization directories. Our respondents comprised 53 instructors with CUREs experience including faculty and graduate students. Of the five CURE features, the highest proportions of misaligned conceptions were in the discovery and broad relevance aspects. Furthermore, fewer respondents reported including broad relevance and iteration in implementation of their CUREs relative to the other three. Our findings suggest the need for greater professional development efforts focused on the framework of CUREs to improve fidelity of implementation and consequently student outcomes; and a revision of the current framework to incorporate new instructor suggested aspects such as student-centered communication.

Performance, Prediction, and Preparedness: Do Biology-Major-Specific Courses Provide an Advantage?

Emily Weigel, Georgia Institute of Technology, Atlanta, GA and Juanita Pardo-Sanchez; University of Michigan, Ann Arbor, MI

Active learning's success in STEM courses has sparked hope in lessening the fear non-STEM majors have towards STEM courses (Garcia et al, 2015). But what of STEM majors in STEM coursework that does not match their major? We hypothesized that student major will not dictate performance, but rather differences in how students prepare for and anxiety around exams. We used two sections (Biology vs. Any-STEM Major) of an identically-taught introductory-level biology course at a large, southeastern R1 university. Each section was team-taught in an active-learning format for 50 minutes three times a week. Throughout the semester, 4 multiple-choice exams with questions spanning all Bloom's levels were administered alongside an 'exam wrapper' survey (Thompson, 2012) which included 5-item Likert-scale and short, open-ended questions regarding student's perceived anxiety and satisfaction levels, preparation for the exam, and predicted scores. No significant difference was found in anxiety levels, days spent preparing for exams, studying satisfaction levels, total hours studying, and test score predictions. This suggests that students may treat STEM courses similarly, regardless of being in-major, which may relieve teaching burdens on departments where efforts may be better spent on providing cohort-like or additional external classroom experiences to provide community within-major and increase persistence.

Evaluating Science Identity, Communication Self-efficacy, Value, and Skills Gained in a Hybrid CURE Lab

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

Disseminating research and communicating scientific findings is an accepted part of the research experience, but few science programs include explicit curricula for practicing oral science communication at the undergraduate level. Course-based undergraduate research experiences (CUREs) can provide opportunities for students to practice oral science communication, but few studies describe or assess authentic oral science communication activities within CUREs. Additionally, existing literature lacks substantial evidence for how science communication activities impact students' science identity, science communication self-efficacy, and the relationships therein. To address this, we collected students' quantitative perceptions of science identity and science communication self-efficacy and qualitative perceptions of a poster activity in a hybrid lab CURE. While we found students' science identity and science communication significantly improved, we did not find a significant relationship between these perceptions. Students reported gaining personal development, quantitative process skills, and conversational science skills. They also reported valuing the more focused and straightforward approach of research posters, their improved communication about science, and the authentic nature of research posters. Our results will be valuable to educators who are interested in improving their students' science identity and science communication self-efficacy, as affective factors strongly relate to students' persistence in science

Collaboration Affects Student Learning and Sense of Belonging in Introductory Biology

Sayali Kukday, Iowa State University, Ames, IA; Patricia Habersham; College of William & Mary, Williamsburg, VA; J. Elizabeth Richey; Carnegie Mellon University, Pittsburgh, PA

Although there is a large body of research on collaborative learning, less is known about the impact of collaboration on student belonging, especially in undergraduate biology courses. Addressing student belonging could be one pathway to achieve greater diversity and inclusion in STEM disciplines. We investigated social and cognitive impacts of collaboration in introductory biology by asking the research question: How does collaboration impact cognitive and social outcomes in collaborative teams compared to students working independently? This study was conducted in introductory biology courses at two institutions (n=731). We varied the conditions under which the students completed specific learning activities either in teams or individually. Students' test performance and pre-post responses to student affect assessments were analyzed using analyses of covariance. Initial results indicate that a positive team experience is better for fostering an increased sense of belonging. Unexpectedly, we found that a less-positive team experience correlated with significantly higher test scores indicating that productive struggle is beneficial to student learning. Our work identifies a relatively simple instructional intervention to increase students' experiences of belonging while achieving better course learning outcomes.

SPECIAL PRESENTER

Jason R. Wiles

Syracuse University, Syracuse, NY

Recipient of the 2021 NABT Four-Year College & University Section Research in Biology Education Award

3:30pm – 4:00pm continued

3121 What Happened to the Fat? A Storyline for Teaching Cellular Respiration and Growth

M303 • General Biology • Demonstration (30 min) • HS, 2Y

I will share an NGSS-aligned storyline (including all resources) that engages students in figuring out what happens to matter and energy when a person gains or loses weight.

Wendy Johnson, Kentwood Public Schools, Kentwood, MI

3042 DNA Club - Student Biology Research Incubator

M304 • Biotechnology • Demonstration (30 min) • HS

DNA Club provides students a holistic way to perform quality biology research as a, low pressure, collaborative, and equitable experience. I'd like to show you how to get started.

Bob Kuhn, Innovation Academy, Alpharetta, GA

4:00pm – 5:30pm

Exhibit Hall Closing Reception

International Level • Special Event • GA

It's last call in the NABT Exhibit Hall. It is also your last chance to visit booths, talk to exhibitors, and get those freebies for the classroom. We're closing the 2021 Exhibit Hall in style with a special reception, giveaways, and grand prize drawings!

4:15pm – 5:00pm

SPECIAL PROGRAMING PRESENTED BY miniPCR

3249 Connect Genotype to Phenotype with PTC Tasting using PCR and Gel Electrophoresis

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

Presenting new, updated curriculum to one of our most popular labs. Connect genotype and phenotype. Explore signal transduction and G-protein coupled receptors, and use quantitative approaches to measure taste response.

Zeke Alvarez-Saavedra, miniPCR bio, Cambridge, MA

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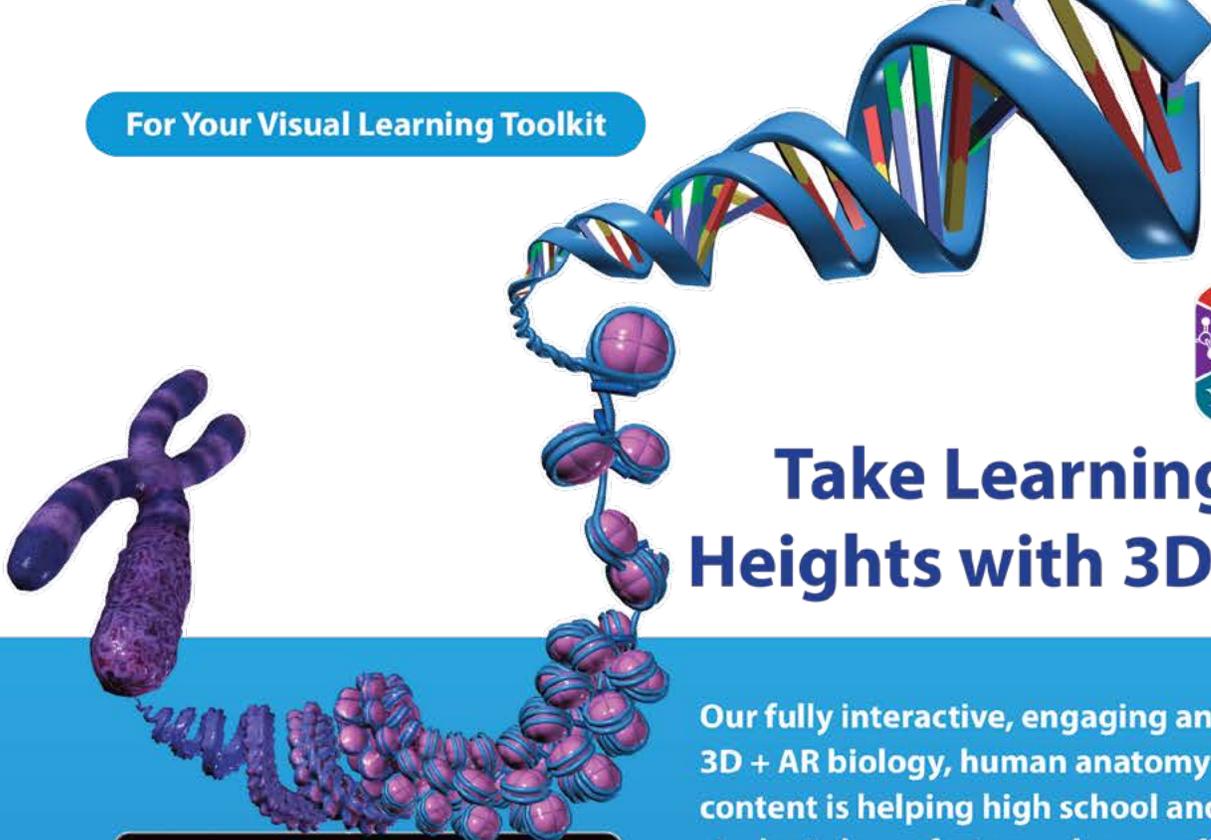
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November 13
SATURDAY

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

CAROLINA®

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.

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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

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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.

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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.

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WHAT?
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Bio Corporation
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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.

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NABT

BioClub



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Bishop Garcia Diego High School, Santa Barbara, CA
Brentwood Academy, Brentwood, TN
Broad River Elementary, Beaufort, SC
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Concord, NC
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Caney Valley High School, Ramona, OK
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Central Carolina Technical College, Sumter, SC
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Clayton High School, Clayton, MO
Colonia High School, Colonia, NJ
Coronado High School, Colorado Springs, CO
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Jacksonville, FL
DeVry Advantage Academy, Chicago, IL
Dora R-III School, Dora, MO
Dougherty Valley High School, San Ramon, CA

Eastern Mennonite High School, Harrisonburg, VA
El Centro College, Dallas, TX
Emmett High School, Emmett, ID
Fairhaven High School, Fairhaven, MA
Florida SouthWestern State College, Naples, FL
Freedom High School, Freedom, WI
George Washington High, Charleston, WV
Gillette College, Gillette, WY
Grafton High School, Grafton, WI
Grand View University, De Moines, IA
Greater Lowell Technical High School,
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Greater New Bedford Regional Vocational
Technical High School, New Bedford, MA
Greensburg Salem High School, Greensburg, PA
Harmony School in Innovation, Katy, TX
Heathwood Hall Episcopal School, Columbia, SC
Hillsboro High School, Hillsboro, OR
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The Independent School, Wichita, KS
Kenmore West High School, Buffalo, NY
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Kettle Run High School, Nokesville, VA
Lake Metroparks, Concord, OH
Lakeville North High School, Lakeville, MN
Lexington High School, Mansfield, OH
Los Fresnos High School, Los Fresnos, TX
Martin Luther College, New Ulm, MN
Mary Persons High School, Forsyth, GA
Marysville High School, Marysville, KS
Metropolitan Community College, Omaha, NE
Midland Park High School, Midland Park, NJ
Minnetonka High School, Minnetonka, MN
Moscow High School, Moscow, ID
Mount Abraham Union High School, Bristol, VT
Nassau Community College, Garden City, NY

Northampton Area High School, Northampton, PA
Palm Tree School, Fairfax, VA
Panorama High School, Panora, IA
Perkins High School, Sandusky, OH
Pike High School Freshman Center, Indianapolis, IN
Pikeview High School, Princeton, WV
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Stillwater High School, Stillwater, OK
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Whitchurch-Stouffville, ON, Canada
The Summit County Day School, Cincinnati, OH
Sunlake High School, Land O'Lakes, FL
Tiffin Columbian High School, Tiffin, OH
Unionville High School, Kennett Square, PA
University Christian High School, Hickory, NC
Valley View High School, Archbald, PA
Vincennes University, Vincennes, IN
Visitation Academy - Saint Louis, St. Louis, MO
West Mifflin Area High School, West Mifflin, PA
Worthington Christian High School, Worthington, OH
York Community High School, Marion, IL

The mission of the NABT BioClub is to recruit, support, nurture, and promote students who have an interest in biological sciences for personal reasons, academic preparation, the betterment of society, and possible career opportunities by providing guidance, resources, and activities to meet these goals.

Look for the BioClub logo to indicate recommended articles for NABT BioClub members. If you are interested in forming a chapter of the NABT BioClub, contact NABT at office@nabt.org.

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November 14
SUNDAY

ABBREVIATION KEY

E: *Elementary School*

2Y: *Two-Year College*

MS: *Middle School*

4Y: *Four-Year College*

HS: *High School*

GA: *General Audience*

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8:30am – 10:30pm

Four-Year College & University Section Meeting

L503 • Committee Meeting • 4Y, GA

Pop-Up Meeting Room #1

L506 • Committee Meeting • GA

Pop-Up Meeting Room #2

L507 • Committee Meeting • GA

8:30am – 12:30pm

3072 Bridging Disciplines to Bring Research into Biology Classrooms

L504/505 • Instructional Strategies • Special Workshop • HS, 2Y, 4Y

Instructor, biology educational researcher, and learning scientist collaborations can create major impacts on classroom learning. This interactive workshop explores what it takes to form successful and productive interdisciplinary research teams.

Kristy Daniel, Texas State University, San Marcos, TX; Melanie Pepper, University of Colorado Boulder, Boulder, CO; Anita Schuchardt, University of Minnesota, Minneapolis, MN; Myra McConnell, Texas State University, San Marcos, TX

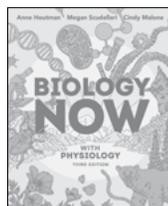
3197 Storylining in Biology for Coherent Instruction

L508 • General Biology • Special Workshop (Tickets Required) • ELEM, ML, HS

Storylines led by engaging phenomena improve student engagement and understanding of the overarching biological concepts. Using phenomena to anchor instruction and lead instruction are modeled in this workshop.

Jason Crean, Saint Xavier University/ASEC, Orlando, FL and Kristin Rademaker, ASEC, Freeport, IL

NEW from W. W. Norton & Company



Biology Now, Third Edition

Anne Houtman, Megan Scudellari, Cindy Malon

With Physiology: 978-0-393-53370-5
Without Physiology: 978-0-393-53374-3

In *Biology Now*, Third Edition, science news stories are paired with a powerful pedagogical structure and online tools to emphasize the scientific literacy skills nonmajors students need to become informed citizens.

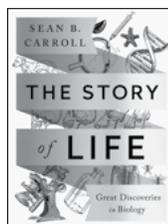


Biology Now, Third High School Edition

Anne Houtman, Megan Scudellari, Cindy Malon, Rebecca Brewer

978-0-393-54010-9 • Forthcoming 2021

The High School Edition adds specific high school content to both the text and the resources, while retaining the compelling science stories that engage students deeply with the world around them. *Biology Now* puts the science they learn in context, preparing them for the scientific literacy skills they need in college and beyond.

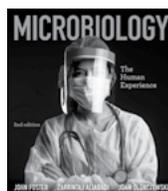


The Story of Life: Great Discoveries in Biology

Sean B. Carroll

978-0-393-63156-2

Written by one of the greatest science storytellers of our time, this enriching text follows the structure of an introductory biology course, with brief stories that span the breadth of the life sciences.



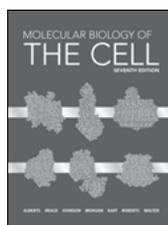
Microbiology: The Human Experience, Second Edition

John Foster, Zarrintaj Aliabadi, Joan Slonczewski

978-0-393-53324-8 • Forthcoming 2021

Microbiology: The Human Experience delivers foundational microbiology concepts through applied examples, getting your health science students excited about their future careers.

Also available



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Bruce Alberts, Rebecca Heald, Alexander Johnson, David Morgan, Martin Raff, Keith Roberts, Peter Walter

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2021 NABT Program Guide Addendum

Additions

Friday, November 12

10:30am - 11:15am

3257 Mesofauna Investigation: Soil Biodiversity and Climate in Room L504-505

Explore the importance of mesofauna in capturing carbon and building soil structure. Determine cause and effect relationships and how ecosystem interactions affect biological diversity patterns. Free PD, curriculum from nourishthefuture.org.

Susan Sherer, Heather Bryan, and Jane Hunt, Educationprojects.org, Columbus, OH

Saturday, November 13

2:00pm - 3:15pm

3258 Climate Challenges and Renewable Fuels in Room M302

How can renewable resources open future sustainability possibilities? Investigate impacts of renewable fuels on climate. Complete a hands-on lesson using biodiesel, repeatable in the classroom. Free PD, curriculum at grownextgen.org.

Susan Sherer, Heather Bryan, and Jane Hunt, Educationprojects.org, Columbus, OH

Corrections

Friday, November 12

12:45pm - 1:45pm

3246 Bringing Molecular Genetics to Your Biology Classroom with miniPCR bio in Room M106/107

Join us as we show you all we have to offer. Try our equipment, explore our curriculum offerings, and discuss how you can implement molecular biology in your classroom.

Zeke Alvarez-Saavedra, miniPCR bio, Cambridge, MA

Canceled Sessions

Saturday, November 13

10:30am - 11:00am

3215 Strategies in a Virtual Introductory Biology Course at a Historically Black University During Covid Pandemic in Room L503

Canceled Exhibitors

All Species Education Consulting

Booth 411

EXHIBITORS

EXHIBIT HALL HOURS

Thursday

5:30 PM – 7:30 PM

Exhibit Hours

+ Exhibit Hall Opening Reception

Friday

8:00 AM – 5:30 PM

Exhibit Hours

8:00 AM - 9:00 AM

Meet & Greet with NABT Leaders

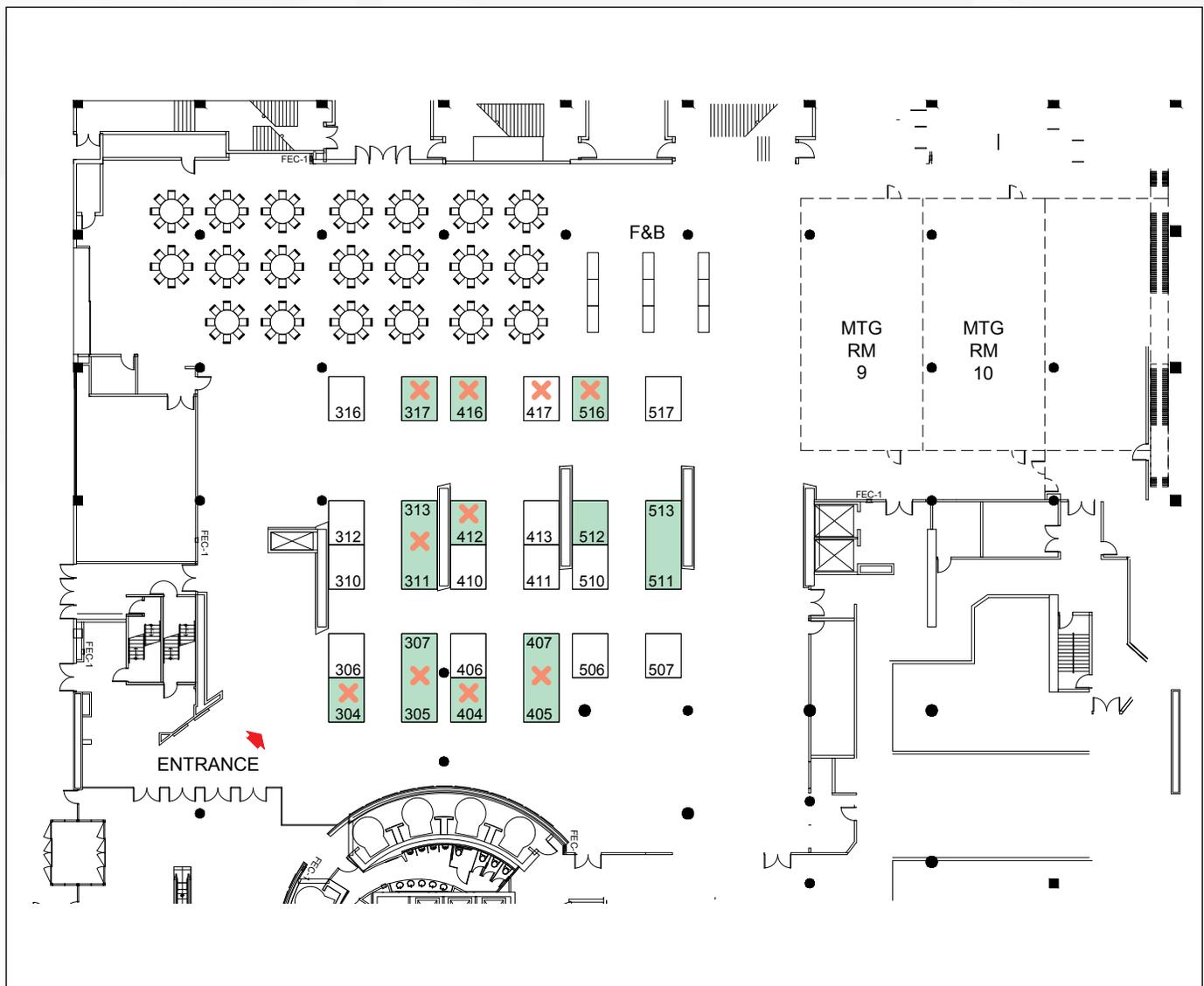
4:00 PM – 5:30 PM

Exhibit Hall Closing Reception

EXHIBIT HALL MAP

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● **ADInstruments, Inc.** 

Booth 311 & 313
Colorado Springs, CO
adinstruments.com

All Species Education Consulting

Booth 411
allspeciesconsulting.com

● **Amplify (miniPCR)** 

Booth 305 & 307
Cambridge, MA
minipcr.com

At miniPCR bio we reimagine what is possible in the biology classroom. We design equipment and curriculum for affordable, hands-on, truly engaging biology education for learners from middle school through college. Our DNA Discovery System, which combines miniPCR and blueGel electrophoresis, offers teachers and students unprecedented access to complete DNA analysis, and our curriculum products bring biology out of the black box by rendering complex concepts visible and tangible.

Anatamage

Booth 413
San Jose, CA
anatamage.com

Anatamage is a medical company, driving innovation through advanced solutions in hospitals and educational institutions. Our products include medical tables, surgical devices, and radiology software. Our cutting-edge equipment has been featured numerous times in journals, publications, and the media, including: TED Talks, BBC, CBC, Japanese Fuji TV, and PBS.

Animalearn

Booth 506
Jenkintown, PA
animalearn.org

Animalearn works to end the harmful use of animals in education. We strive to build awareness about animal use in the classroom and help to nurture a respect for all creatures. Animalearn helps both educators and students find the most effective non-animal methods to teach and study science. Our alternatives to dissection loan program, The Science Bank, is home to over 650 high-quality, animal-friendly humane science education products, from which educators can borrow for free.

● **Bedford, Freeman & Worth High School Publishers** 

Booth 412
Hamilton, NJ
highschool.bfwpub.com

Bedford, Freeman & Worth (BFW) High School Publishers is your source for innovative science resources. We publish the best-selling book, Environmental Science for AP®, as well as Principles of Life for AP® Biology and Living by Chemistry for pre-AP® Chemistry. Stop our booth to receive more information on these programs.

BioCorporation

Booth 312
Alex, MN

biologyproducts.com

Bullfrogs an fetal pigs an eyes...oh my! All joking asides, we have what you need for your dissection labs. Come check out our selection and choose a free sample.

Biology Magnets

Booth 310
St. Simons Island, GA

biologymagnets.com

Biology Magnets produces educational products for use on magnetic white boards or chalkboards. These magnets are for teaching and modeling biological processes such as photosynthesis, respiration, cell division, cell signaling, transcription, translation, genetic engineering, and food webs. Also available are modules for learning biological structures such as organic molecules, parts of a cell, and parts of the human anatomy. Biology Magnets have a relatively low price point as compared to traditional classroom models, and provide greater flexibility in teaching.

Exhibitor Key

Sponsorship Tiers

- Diamond
- Gold
- Silver
- A La Carte
-  Treasure Hunt Exhibitors

● **Bio-Rad Laboratories** 

Booth 317
Hercules, CA
bio-rad.com

Bio-Rad provides a completely supported life science experience. Starting with the highest quality curriculum and reagents, Bio-Rad provides peace of mind each time you spend your precious lab budget. We focus on providing teachers with the best resources possible so you can focus on what you do best – teach!

BIOZONE

Booth 406
Parker, CO
thebiozone.com

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EXHIBITORS

● Carolina Biological Supply Company

Booth 304
Burlington, NC

carolina.com

Carolina Biological Supply Company is a worldwide leader in science education, providing top-quality, innovative materials for educators. Carolina serves the K-16 market with everything needed to equip science laboratories and classrooms. Products, kits, NGSS lab solutions, and free teacher resources are available at carolina.com. Carolina™ Science catalog available upon request.

● CGHI & InnovATEBIO

Booth 416

innovatebio.org

InnovATEBIO is the ATE National Center for Biotechnology whose mission is to enhance biotechnology programs by providing professional development, improving curriculum, and sharing information among programs, faculty, administrators, students, alumni, trade organizations, and industry. The mission of the IRCS Project is to anchor a credentialing system for the bioscience industry by expanding adoption of the Biotechnician Assistant Credentialing Exam (BACE). This provides a validated talent pool to industry and job candidates a mechanism to showcase mastery of competencies and skills.

Education Projects & Partnerships LLC

Booth 511 & 513
Alex, MN

educationprojects.org

For more than 25 years EducationProjects.org has been connecting industry to the SCIENCE classroom. We are teachers, creative thinkers and problem solvers using a combination of expertise, relationships and know-how. We care about creating exceptional learning experiences for teachers. Experience our promise and visit us at our exhibits booths, 511 and 513!

Fisher Science Education

Booth 410
El Dorado Hills, CA

biotechd.com

Biotechnology coursework increases student interest in real-world biology. Featuring Ellyn Daugherty's Biotechnology: Science for The New Millennium, 2E and Biotechnology Basics™ by Ellyn Daugherty, Fisher Science Education, G-Biosciences and EMC Publishing provide you with all the curriculum and materials needed to bring real-world science into your science classroom. Visit Booth #208 for booth workshops and bioscience teaching materials and meet with Ellyn one on one.

● Lab-Aids

Booth 516
Ronkonkoma, NY

lab-aids.com

● Labster

Booth 512
Somerville, MA

labster.com

Labster is a company dedicated to developing fully interactive advanced lab simulations for higher education and high school levels. Labster's virtual labs are designed to stimulate students' natural curiosity and highlight the connection between science and the real world, improving student learning outcomes and retention rates.

National Center for Science Education (NCSE)

Booth 510
Oakland, CA

ncse.ngo

The National Center for Science Education (NCSE) works to ensure that what is taught in science classrooms and beyond is accurate and consistent with the best current understanding in the scientific community. Currently, NCSE focuses on climate change and evolution -- well-established areas of science that are societally controversial. Additionally, NCSE is working to provide nature of science resources to teachers during a time that understanding the process of science has never been more important.



Introducing Science and Global Issues: Biology, a full-year, hands-on course, designed for the NGSS.

Visit us at Booth #516, in our NABT workshops, or online at lab-aids.com/SGI

● Pivot Interactives

Booth 405 & 407

pivotinteractives.com

Pivot Interactives delivers *active learning* experiences to supplement science curriculum. With an extensive library of labs and activities crafted by veteran science educators, Pivot Interactives helps students develop critical thinking skills through active investigation of natural phenomena in biology, environmental science, chemistry, and physics. Within each activity, students make observations, form and test predictions, design and execute experiments, collect and analyze data, and draw conclusions. Pivot Interactives makes it easy for teachers to integrate active learning in any science course.

PlantingScience/ Botanical Society of America

Booth 507
St. Louis, MO

plantingscience.org

PlantingScience is a free online resource for teachers and schools. We are a learning community where scientists provide online mentorship to student teams as they design and think through their own inquiry projects. The open education resources (OER) support NGSS-aligned plant investigations that integrate scientific practices and big ideas in biology.

Teach Kind

Booth 306
Los Angeles, CA

teachkind.org

TeachKind—PETA's humane education division—helps schools integrate compassion for animals into existing curricula through free lesson plans, presentations, and more. As former classroom teachers, we know that educators have the power to plant seeds of kindness and we want to make humane education easy! TeachKind also partners with school districts to replace outdated animal dissections with superior, trauma-free, cutting-edge learning tools and support educators nationwide. Check out TeachKind.org and start building empathy for *all* right now!

Virginia Tech Academy of Integrated Science

Booth 316
Blacksburg, VA

ais.science.vt.edu

● Visible Body

Booth 404
Boston, MA

visiblebody.com

Visible Body creates best-in-class 3D biology and AR human anatomy, physiology content, labs, apps and teaching and learning platforms that are improving in-class and online education outcomes while making learning anatomy easy and fun. Courseware, our 3D customizable LMS, has proved invaluable to teachers and students. Courseware allows teachers to auto-grade labs, customize & annotate 3D models & easily share them with students. Read how students and professors feel about Visible Body: visiblebody.com/customer-stories

Zoo Atlanta

Booth 417
Atlanta, GA

zooatlanta.org



Visit us at
Booth 405!

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- LMS integration makes for seamless class set-up and management

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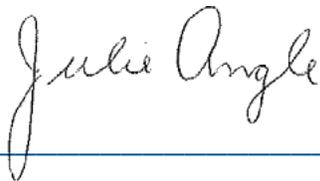
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