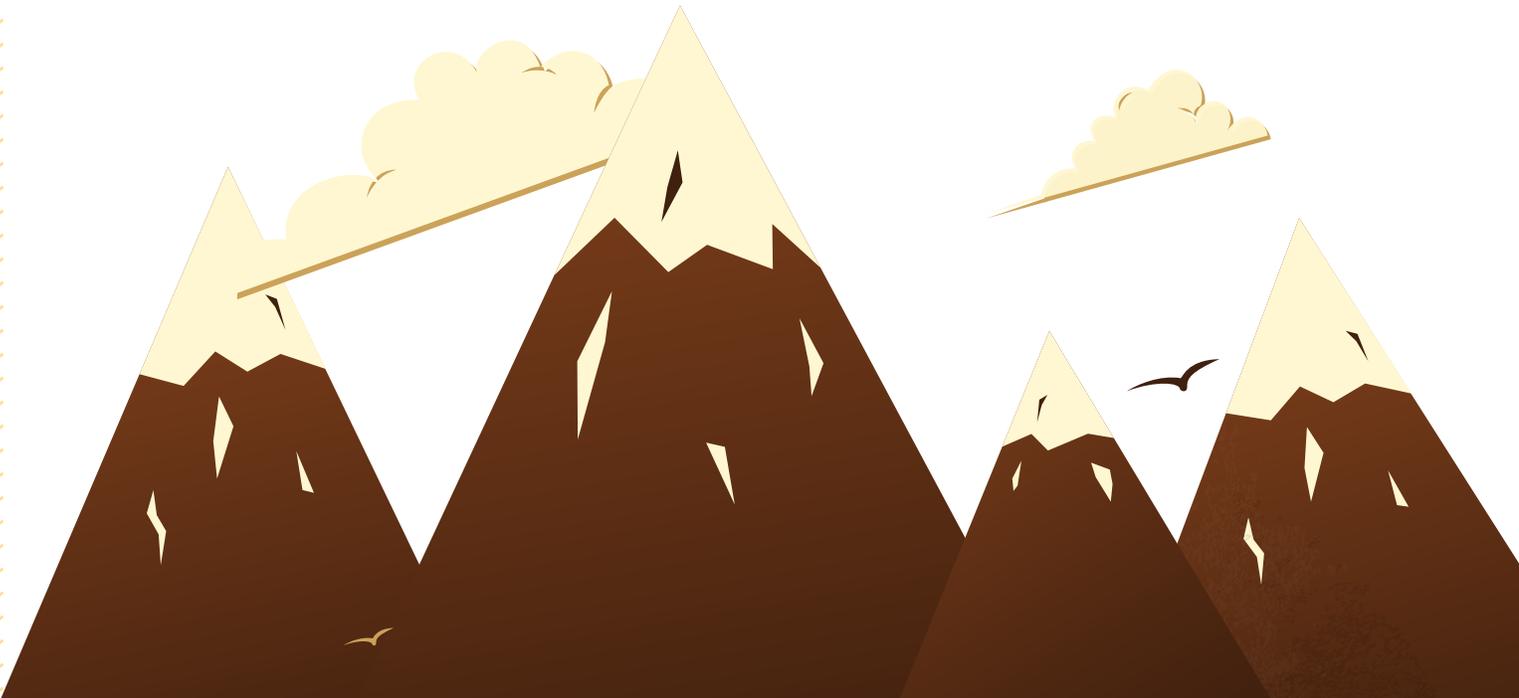


SATURDAY NOVEMBER 5

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.

SATURDAY



7:30AM – 8:45AM**Touching Triton Breakfast**

Plaza Ballroom E • Meal Function

(Tickets Required)

Join us for the special launch of *Touching Triton*, a new “serious game” that focuses on the interplay between genetics, the environment, and family history when determining risk for common complex diseases, like diabetes and cancer, set in a storyline of long term space flight. We’ll introduce *Touching Triton*, take a closer look at human space flight and modern genomics, and highlight educator resources for *Touching Triton*.

Neil Lamb and Adam Hott, HudsonAlpha Institute for Biotechnology, Huntsville, AL

**BioClub Breakfast**

Plaza Ballroom F • Meal Function

(Tickets Required)

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

**9:00AM – 10:15AM****NABT Committee Meeting: Membership Committee**

Director's Row F • Committee Meeting • GA

Sherry Annee, Committee Chair

944 | Sustainable Earth Speed Dating – In a Hurry to Find a Solution?

Director's Row H • Ecology/Environmental Science/Sustainability • Symposium (75 minutes) • GA

This life-science sustainability focused “speed dating” event will feature educators and members of environmental and sustainability organizations sharing their best practices and resources for science-based sustainability education. Prepare to participate in this FAST show-and-go session.

Teddie Mower, Indiana University, Bloomington, IN

INTRO BIO TASK FORCE**1140 | Enhancing Student Quantitative Literacy and Reasoning in Introductory Classrooms. What is it? How Do I Teach it? And How Do I Measure it?**

Director's Row I • Curriculum Development • Hands-on Workshop (75 min) • HS, 2Y, 4Y

What is quantitative literacy and reasoning, and how is it measured? We will explore answers to these questions while also showing you how to integrate quantitative skills throughout your course.

Jennifer Pfannerstill, North Shore Country Day School, Winnetka, IL; Brad Williamson, University of Kansas, Lawrence, KS; and Stacey Kiser, Lane Community College, Eugene, OR

9:00AM – 11:45AM**Special Programming Presented by Flinn Scientific****All sessions in Director's Row J**

Meg Griffith

9:00AM – 10:15AM

Flinn Favorite Biology Lab Activities and Games

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

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

10:30AM – 11:45AM

Flipping AP Biology with Flinn Prep

General Biology • Demonstration (75 min) • AP, HS

Flipping your AP Biology class will help create an engaging and active classroom. Learn how FlinnPrep, a supplemental digital curriculum with assessment solution, can ease your transition in a condensed form. Free teacher resources and door prizes.

9:00AM – 2:45PM

Special Programming Presented by Carolina Biological Supply Company

Plaza Court 2

9:00AM – 10:15AM

Inheritance and Variation of Traits in Wisconsin Fast Plants

Plant Physiology • Hands-on Workshop (75 min) • ES, MS, HS

Explore new models to teach genetics with Wisconsin Fast Plants seeds. It is easy to germinate seedlings that display genetic traits in 72 hours and produce offspring with heritable traits that can be scored and analyzed using Chi-squared analyses. *Carolina Teaching Partner*

10:30AM – 11:15AM

Discovering DNA with a Novel Way to Perform PCR, Anywhere!

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

Experts who engineered miniPCR demonstrate and field questions on this innovation that inspired the national contest Genes in Space. Show students that DNA Science is interactive and tangible. Never has Biotechnology been such a personal experience! *Dr. Sebastian Kraves*

1:30PM – 2:45PM

HudsonAlpha's Collecting Cancer Causing Changes

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

Use digital vignettes, beads, and dice to simulate the fate of cells across multiple cell divisions. Illustrates how a population of cells become more varied over time and how those changes may lead a group of cells to become more cancerous. *Jennifer Garden*

9:00AM – 10:15AM *continued*

963 | Come Create a Journal With Us! Providing an Authentic Research Experience through Publishing

Governor's Square 9 • Instructional Strategies & Technologies • Demonstration (75 min) • 2Y, 4Y, GA

In this session, participants will learn how to establish, manage, and publish a journal for their students. Participants will leave with information explaining how to connect their journal to the UndergradScienceJournals Network!

Lance Forshee and Donald French, Oklahoma State University, Stillwater, OK

1086 | "Fracking? Here? Let's Talk About it!" A Hands-on Exploration of "Fracking" and Other Socio-Scientific Issues That Will Get Students to "Engage in Argumentation"

Governor's Square 10 • Ecology/Environmental Science/Sustainability • Hands-on Workshop (75 min) • MS, HS, 4Y

Millions of us now live alongside oil and gas development. This session will model a hands-on way for students to understand the environmental costs and benefits of "fracking", and how to "engage in argumentation" about other controversial science issues.

Ben Graves, Delta High School, Delta, CO

984 | Creating Cognitive Models to Foster Connections Within the AP Biology Curriculum

Governor's Square 11 • AP Biology • Hands-on Workshop (75 min) • HS, MS

Constructing cognitive models is essential for student success in AP Biology and similar courses. Come learn how two successful IB and AP Biology teachers develop and use cognitive models in their classes, and walk out having built one of your own.

Lee Ferguson, Allen High School, Allen, TX; and Ryan Reardon, Jefferson County International Baccalaureate, Irondale, AL

1108 | Design, Implementation, and Evaluation of Faculty Mentoring Networks: A Model for Promoting Faculty Teaching Scholarship

Governor's Square 12 • Science Practices • Symposium (75 minutes) • 2Y, 4Y, HS

Teaching quantitative skills requires different pedagogical approaches and resources than teaching biology. Come learn about QUBES online faculty communities and how they support the implementation of effective teaching resources and practices.

Sam Donovan, University of Pittsburgh, Pittsburgh, PA; Kristin Jenkins, BioQUEST Curriculum Consortium, Germantown, MD; Alison Hale, University of Pittsburgh, Pittsburgh, PA; and Gabriela Hamerlinck, BioQUEST Curriculum Consortium, Madison, WI

970 | Of All The Nerve

Governor's Square 14 • Anatomy & Physiology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Construct models of cholinergic, dopaminergic, and GABAergic synapses! Explore the role of various ions in action potential generation and neurotransmitter release. Visualize neurotransmitter synthesis using 3D printed models. Hand-outs provided!

Gina Vogt and Tim Herman, MSOE Center for BioMolecular Modeling, Milwaukee, WI

1129 | Molecular Wars: Using Simple Models To Understand Viruses, Drugs, and Disease

Governor's Square 15 • Microbiology & Cell Biology • Hands-on Workshop (75 min) • HS
 Learn about HHMI BioInteractive's classroom resources that illustrate how understanding the molecular biology of viruses makes it possible to track and fight deadly diseases. We will share classroom-ready resources and tips for their implementation.

Ann Brokaw, Steve Rogg, and Javier Robalino, HHMI BioInteractive, Chevy Chase, MD

9:00AM – 11:45AM

Special Programming Presented by PASCO Scientific

All sessions in Plaza Court 1

Michael Blasberg

9:00AM – 10:15AM

Unleash Inquiry in AP Biology

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

Conduct quick and powerful inquiry labs— including enzyme activity and cellular respiration— using wireless sensors and spectrometer and free full-featured app (compatible with tablets, Chromebooks and phones). Win an Advanced Biology Manual: 22 AP® aligned labs!

10:30AM – 11:45AM

Environmental Monitoring with PASCO Wireless Sensors

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

PASCO's affordable wireless sensors enable long-term, remote data collection, allowing for long-term trend analysis without repeat site visits for samples. Transform your labs to conduct H2O quality and environmental monitoring activities— starting at just \$39.



LEARN HOW TO BECOME PART OF THE BIOTECH EDUCATION COMMUNITY!

LOCATION: Plaza Court 4
DATE: Friday, November 4, 2016
TIME SLOT: 2:00-3:15 p.m.

Bio-Link and the AC2 Bio-Link Regional Center at Austin Community College are helping college and high school biotechnology programs share information about best practices, new techniques, and the skills employers are looking for. With first-class professional development and connections to companies and educational institutions nationwide, Bio-Link and the AC2 Bio-Link Regional Center can help you figure out what to teach and how to do it.

Visit Biotech-Careers.org for career exploration resources and more.



9:00AM – 3:30PM

Special Programming Presented by OpenStax/Rice University

All sessions in Plaza Court 3

Instructional Strategies/Technologies • Demonstration (30 mins) • 2Y, 4Y, GA

9:00AM – 9:30AM

Integrating SimBio Virtual Labs with OpenStax's Bio Textbook

SimBio Virtual Labs allow students to learn difficult biology concepts through doing their own simulated experiments. Come for demos of several SimBio labs and see how SimBio has enhanced the OpenStax Biology textbook within our SimUText system. **SimBio**

9:30AM – 10:00AM

Personalized Learning with OER, An Educator's Best Friend

LRNR integrates content, homework, interactivity, assessment, and analytics into a single environment. Learn how our Course Positioning System® provides precise course control through level setting adaptivity, customized assignments, and more. **LRNR**

10:30AM – 11:00AM

Let's Get Digital: Teaching Biology with Adaptive Courseware

Join our session to learn what's behind the buzzword "adaptive learning" and take your content to the next level. Experience the benefits of adaptive technology for your teaching and the way it supports you in driving student success and retention. **CogBooks**

11:00AM – 11:30AM

An Easy-to-Use Platform for All Your Open Content Needs

Designed by educators, panOpen offers customization, assessment, analytics, LMS integration, and more. Learn about how our interactive OER radically reduces cost and delivers the quality, features, and ease-of-use faculty expect from their materials. **PanOpen**

1:30PM – 2:00PM

Future of the Textbook: Adaptive, Personalized Courseware

Join us to learn about OpenStax Tutor, our full-service digital courseware that incorporates proven cognitive science principles and machine learning to provide students with personalized learning paths, homework, and assessment. **OpenStax Tutor**

2:00PM – 2:30PM

Going Beyond the Biology Book with OpenStax and Odigia

Join us to experience how Odigia has enhanced OpenStax's high-quality Biology content with powerful learning tools to create a more relevant and engaging learning experience that improves student engagement, outcomes, and retention. **Odigia**

3:00PM – 3:30PM

Custom-Build High-Quality Course Materials with aerSelect

Learn how NACSCORP's online turn-key platform, aerSelect, allows faculty to create a book that is tailored to the needs of their classroom. The aerSelect platform empowers faculty with tools targeted at increasing student accessibility and success. **NACSCORP**

9:00AM – 10:15AM *continued*

1029 | Help Your Students Succeed in AP Biology

Governor's Square 16 • AP Biology • Hands-on Workshop (75 min) • HS

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

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

1023 | Evolution the NGSS Way

Governor's Square 17 • Evolution • Hands-on Workshop (75 min) • HS

Explore curriculum materials that integrate the NGSS three dimensions of learning with published scientific data to address core ideas in evolution such as common ancestry, heredity, natural selection, and speciation.

Free: learn.genetics.utah.edu

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

Special Programming Presented by Monsanto

How STEM & Modern Agriculture Bridge: A Look at Technology

Plaza Court 4 • Biotechnology • Hands-on Workshop (75 min) • MS, HS, 2Y, GA

Monsanto wants to help you understand the science and technology behind its products. Monsanto scientists will give a brief overview of our history, explain techniques used to make products, answer questions, and share our education outreach resources.

Valerie Bayes

1046 | The DataBlitz: Student Presentation of Authentic Research
 Plaza Court 5 • Science Practices • Hands-on Workshop (75 min) • MS, HS

The DataBlitz: an authentic scientific practice that emphasizes the SEP dimension of NGSS by having students deliver essential elements of their inquiry-driven research in cogent 60-second, single-slide (research poster-like) presentations.

Amy Welch, Brea Olinda High School, Brea, CA; and Ron Michelotti, Savanna High School, Anaheim, CA

1000 | Going Green With Algae: Algae as Energy

Plaza Court 6 • General Biology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Session participants will learn about the potential of algae as a biofuel and how to design inquiry-based labs using simple classroom algae photobioreactors made with water bottles.

Tom Freeman, Esperanza High School, Anaheim, CA; and Becky Sims, Boyce Thompson Institute, Ithaca, NY

1087 | Making the Impossible Possible - Leveraging Active Learning in Class and On the Go
 Plaza Court 7 • Instructional Strategies & Technologies • Hands-on Workshop (75 min)

• HS, 2Y, 4Y

Busy schedules killing content acquisition? This hands-on workshop will help overcome such hurdles with a toolbox of quick and easy active strategies that leverage building hierarchies, cell phones, and seeing the world through biology-tinted glasses.

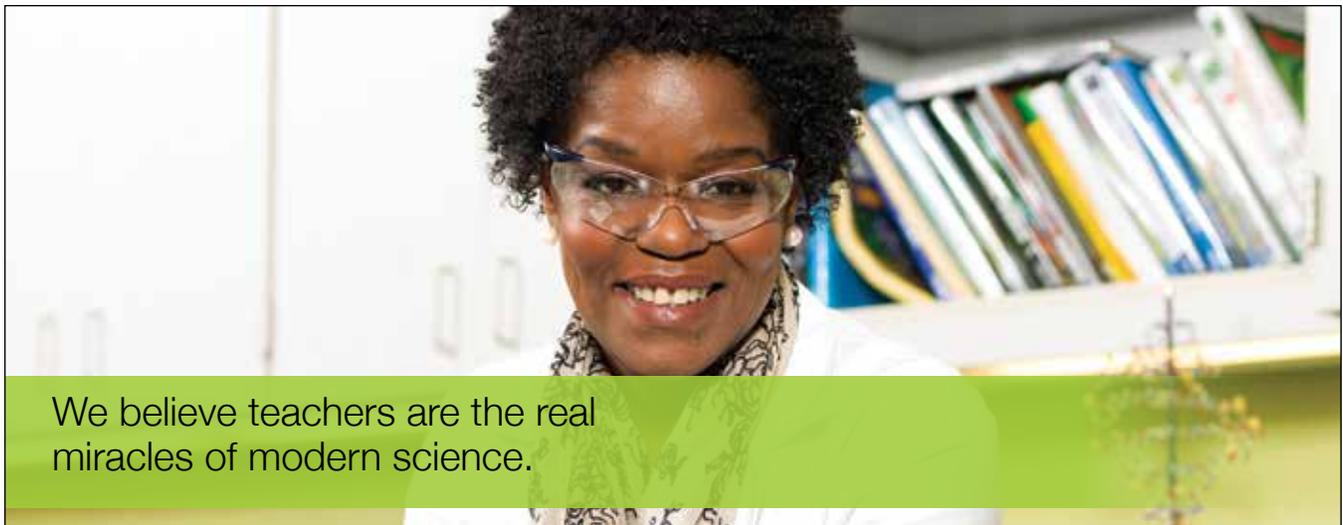
Kara Lukin, Western Governors University, Denver, CO

964 | Activities for the Anthropocene

Plaza Court 8 • Ecology/Environmental Science/Sustainability • Hands-on Workshop (75 min) • MS, HS

Combine history and environmental science in this hands-on session exploring how humans have shaped the earth and atmosphere since the Industrial Revolution. Engage in simulations and problem-solving challenges.

William Baird, Auburn University (Retired), Castle Rock, CO



We believe teachers are the real miracles of modern science.

Teachers get up every morning knowing they have the potential to change the world – just by showing up in the classroom and inspiring a love of science. Yes, they may feel overworked and even underappreciated. But by some miraculous feat, they remain true to their mission, touching the lives of students by imparting the gifts of knowledge and curiosity. We know. Because Carolina equips them for the task.

Learn more about our commitment at www.carolina.com/withyou

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 Right there with you.

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9:00AM – 11:00AM
NABT Biology Education Poster Session

Plaza Court • Poster Session (120 min)
 NABT posters highlight research, programs, and techniques in three distinct categories: general strategies for teaching biology, scholarship of teaching and learning, and mentored undergraduate research. Posters submitted by students are entered into two competitions.

See page 50 for complete listings.

10:30AM – 11:00AM
NABT Committee Meeting: Retired Member Committee

Director's Row F • Committee Meeting • GA

Dennis Gathmann, Committee Chair

1123 | Getting Beyond the Obvious: Barriers to Teaching and Learning Evolution

Governor's Square 9 • Evolution • Demonstration (30 min) • 4Y

Join the winner of this year's *Four-Year Section Biology Teaching Award* as she discusses how Identity Protective Cognition (IPC) may play a role in teaching challenges while exploring appropriate interventions to help student's overcome their resistance to scientific conclusions.

Sehoya Cotner, University of Minnesota-Twin Cities, Minneapolis, MN

1104 | Data, Ecology, and More Data

Governor's Square 10 • Ecology/Environmental Science/Sustainability • Demonstration (30 min) • HS, 2Y, 4Y

In this session students will collect and analyze data using the resources available through the USGS data set online through the context of water quality. This exploration will engage students in scientific practices and descriptive statistics.

Kate Henson, University of Colorado, Boulder, CO

1145 | Join The American Biology Teacher Team: Writing and Reviewing for the ABT

Governor's Square 12 • Curriculum Development • Hands-on Workshop (30 min) • GA

The editor of the ABT will discuss preparation, submission, and review of manuscripts for the journal. Prospective authors are especially encouraged to share manuscript ideas during this lively discussion.

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

1125 | Go Extinct! An NGSS-Aligned Board Game Engaging Players with the Most Radical Idea in Biology

Governor's Square 17 • Evolution • Demonstration (30 min) • MS, HS, GA

Go Extinct! revitalizes classic Go Fish in a hilarious, easy-to-learn yet highly re-playable 30-45 minute activity that teaches players how to read evolutionary trees... and that all of these mind-bogglingly diverse animals share common ancestors.

Ariel Marcy, STEAM Galaxy Studios, North Ferrisburgh, VT

10:30AM – 11:45AM

1003 | Top 10: Genetics and Biotechnology Discoveries 2015

Director's Row E • Biotechnology • Symposium (75 minutes) • HS

Want to include cutting-edge genetic research in your class? Ever wonder where all of this new science fits into your curriculum? Hear the top biotech discoveries of 2015 in student friendly language. Free resource from HudsonAlpha.

Neil Lamb, HudsonAlpha Institute for Biotechnology, Huntsville, AL

INTRO BIO TASK FORCE

1138 | Enhancing Student Ability to Apply the Process of Science in Introductory Classrooms

Director's Row I • Curriculum Development • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Presenters will share ways in which they integrate the process of science skills including data interpretation, experimental design, and collaborative work in introductory courses.

Cindy Gay, Steamboat Springs School District, Steamboat Springs, CO; Sharon Gusky, Northwestern Connecticut Community College, Winstead, CT; Susan Finazzo, Gordon State College, Barnesville, GA; and Gordon Uno, University of Oklahoma, Norman, OK

1042 | Using Workshop in the Biology Classroom to Get Students to Think Like Scientists

Governor's Square 11 • Instructional Strategies & Technologies • Hands-on Workshop (75 min) • HS, 4Y, GA

We often teach biology content well but science research is inherently inquiry-based. The biology classroom workshop model can expose students, over the course of a curriculum, to real meta-cognition, which is much more than the simple "scientific method."

Paul Strode and Dylan Muzny, Fairview High School, Boulder, CO

1106 | Hands-on DNA Forensics Activity for the College Classroom

Governor's Square 14 • Instructional Strategies & Technologies • Hands-on Workshop (75 min) • HS, 2Y, 4Y

This hands-on workshop demonstrates how to use a crime scene investigation case study to promote active learning. Participants will learn to conduct DNA extraction, simulated STR DNA fingerprints, and calculation of allele frequencies without a lab.

Kevin Bonney and Lori Nicholas, New York University, New York, NY

W. W. Norton Biology



Please visit us in Booth 217 to see how W. W. Norton helps you reach every student, in and out of class.



Biology Now

ANNE HOUTMAN, MEGAN SCUDELLARI, CINDY MALONE, ANU SINGH-CUNDY

A balance of science and story, with a focus on the people doing biology now.

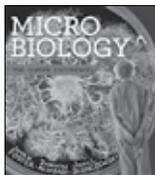


Discover Biology

SIXTH EDITION

ANU SINGH-CUNDY, GARY SHIN

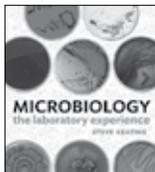
Developing scientific literacy through active learning.



Microbiology: The Human Experience

JOHN W. FOSTER, ZARRINTAJ ALIABADI, JOAN L. SLONCZEWSKI

A case history approach that helps students master concepts and apply them in a clinical context.



Microbiology: The Laboratory Experience

STEVE KEATING

The manual that helps students get the most out of their lab experience.

Interactive resources for engaging and assessing students

- **INQUIZITIVE**, Norton's formative, adaptive quiz system, helps students build knowledge and come better prepared for class through a personalized set of questions. Engaging, gamelike elements and a wide variety of question types motivate students to complete their assignments.
- **SMARTWORK5** is a powerful, customizable platform designed to assess students' understanding, provide answer-specific feedback that guides their mastery of the material, and give instructors the actionable student performance data they need to do what they do best: teach.
- **THE ULTIMATE GUIDE TO TEACHING BIOLOGY** includes curated collections of in-class activities from dozens of biology and microbiology instructors across the country; suggested online videos and other media with discussion questions; clicker questions; sample syllabi; and sample lecture plans.



STUDENT POSTER COMPETITION **Scholarship of Teaching and Learning****1. Aisles of Confusion: A Case Study Exploration of Food Production and Labeling Practices**

Enya Granados, Kaylee Wilburn, Justin Pruneski, Heidelberg University, Tiffin, OH

2. Are We Engaged In Evidence-Based Practice? A Cluster Analysis of Faculty Instructional Practices

Emily M. Walter, Mireya Lemus, Evelin Muñoz, California State University, Fresno, CA

3. Beginning to Explore the Effect of a Relevance Intervention to Reduce Achievement Gaps in Introductory Biology

Sy Truong, Paul M. Beardsley, California State Polytechnic University, Pomona, CA; Stephen Getty, Colorado College, Colorado Springs, CO; Chris S. Hulleman, University of Virginia, Charlottesville, VA

4. Bringing Invasive Species into the College Classroom

Kathryn M. Parsley, Tina Marie Waliczek, Paula S. Williamson, Texas State University, San Marcos, TX; Florence M. Oxley, Austin Community College, Austin, TX

5. Comparing Perspectives of Evolution Acceptance Between Students from the United States and Cambodia

E. Austin Leone, Kristy L. Daniel, Texas State University, San Marcos, TX

6. Creating a Personal Connection in Online Biology with the Addition of Video Feedback Comments

Julie A. Birt, Robin Hurst-March, University of Missouri, Columbia, MO

7. Do Active Learning Techniques Satisfy Student Psychological Needs?

Michael Moore, Oklahoma State University, Stillwater, OK; Jennifer Parrish, Grant E. Gardner, Middle Tennessee State, Murfreesboro, TN; Donald French, Oklahoma State University, Stillwater, OK

8. Do Students Want to Use Social Media? Assessing Students' Perceptions of Social Media in the Classroom

Zachary L. Nolen, Kristy L. Daniel, Karina Salinas, Karen Alvarado Rodriguez, Texas State University, San Marcos, TX

9. Effective Instructional Design for Online Activities: Development of an Inquiry-Based Activity for Phylogenetics

W. David Ford, Anna Hiatt, East Tennessee State University, Johnson City, TN

10. Epistemic Framing in Biology Classroom Discourse

Wendy R. Johnson, Charles (Andy) Anderson, Michigan State University, East Lansing, MI

11. How Introductory Biology Courses Affect Student Perceptions Throughout College

Kassandra Glover, Rachel Pigg, Troy Nash, Presbyterian College, Camden, SC; Suann Yang, State University of New York, Geneseo, NY

12. An Investigation on How Social Media Use Impacts Undergraduate Interest in Science Careers

Karen Alvarado Rodriguez, Karina Salinas, Zachary L. Nolen, Kristy L. Daniel, Texas State University, San Marcos, TX

13. Microbial Murders: An Infectious Disease Project Where Students Implement Active and Team-Based Learning Principles to Create and Identify Disease-Causing Pathogens in a Crime Scene Investigation

Kelcie Smith, Jordan Steel, Colorado State University, Pueblo, CO

14. A Multifactorial Analysis of the Acceptance of Evolution in College Students

Ryan Dunk, Syracuse University, Syracuse, NY; Andrew Petto, Benjamin Campbell, University of Wisconsin, Milwaukee, WI

15. PTL Enhances Retention in STEM Majors Among Women and First-Generation College Students

Jeremy D. Sloane, Julia J. Snyder, Ryan Dunk, Christina I. Winterton, Jason R. Wiles, Syracuse University, Syracuse, NY

16. The Survey Matters: Instructors Using Different Surveys to Measure Acceptance of Evolution May Be Reaching Different Conclusions about Their Students

Elizabeth Barnes, Sara E. Brownell, Arizona State University, Tempe, AZ

17. Using Social Media in Biology in Effort to Increase Student Interest in Science

Karina Salinas, Karen Alvarado Rodriguez, Zachary L. Nolen, Kristy L. Daniel, Texas State University, San Marcos, TX

NABT POSTER SESSIONS | 9:00AM – 11:00AM • PLAZA COURT

STUDENT POSTER COMPETITION **Mentored Research****18. Assessing Misconceptions of Evolution Among Students Enrolled in Freshman Biology Courses at a Mid-Sized University in the Mid South**

Shonqualla West, Mark W. Bland, University of Central Arkansas, Conway, AR

19. Effect of Photoperiod on *Setaria Viridis* Flowering

Caitlin Snider, Oklahoma State University, Stillwater, OK; Tammy Will, Morrison Public Schools, Morrison, OK; Julie Angle, Andrew Doust, Oklahoma State University, Stillwater, OK

20. Effects of White-Tailed Deer on Southeast Louisiana Spider Populations

Michael Pashkevich, Aimée K. Thomas, Loyola University, New Orleans, LA

21. An Exploration of Evolution Acceptance Profiles as Measured by the Measure of Acceptance of the Theory of Evolution (MATE)

Ephiram Bosse, Emily M. Walter, California State University, Fresno, CA

22. From Virgins to Fathers: Onset of Paternal Behavior in Algerian Mice *Mus spretus*

Danielle Foster, Dineesha Premathilake, Polly Campbell, Julie Angle, Oklahoma State University, Stillwater, OK

23. Hard Mast Production and Food Availability for Oklahoma Black Bears

Payton Walters, Julie Angle, Danielle Techentin, Sue Fairbanks, Oklahoma State University, Stillwater, OK

24. Manipulation of Host Cell Metabolism Affects *Sindbis* Virus Replication

Jessica L. Costlow, Jordan Steel, Colorado State University, Pueblo, CO

25. Student versus Faculty Impressions of Concept Coverage in Biology Courses

Erin Kirkelie, Amy S. Beadles-Bohling, University of Portland, Portland, OR

26. The Painted Predicament: The Interaction Between Temperature and Food Limitation in Painted Ladies

Shannon Beck, Kristen Baum, Kelsey Deal, Julie Angle, Oklahoma State University, Stillwater, OK

27. The Relationship between Religiosity and Acceptance of Evolutionary Theory Among Students in an Introductory Zoology Course

Austin Wilkes, Donald French, Oklahoma State University, Stillwater, OK; Kristy Daniel, Texas State University, San Marcos, TX; Michael Moore, Oklahoma State University, Stillwater, OK

28. Use of Invasive Plants by Honeybees in an Urban Setting

Melanie Sferrazza, Aimée K. Thomas, Loyola University, New Orleans, LA

Non-Competition Posters**29. Assessing the Prevalence of Antibiotic-Resistance in the Environment (PARE): Implementation of a Course-Based Undergraduate Research Experience in a Microbiology Course**

Adam Kleinschmit, Adams State University, Alamosa, CO; Carol Bascom-Slack, Tufts University, Medford, MA

30. A Biology Placement Test for Introductory Majors Biology

Sarah Boomer, Michael Baltzley, Kristin Latham, Angela Poole, Jesse Poole, Western Oregon University, Monmouth, OR

31. BLAST It! Begin Learning About Scientific Tests

William Beachly, Amy Morris, Hastings College, Hastings, NE

32. Bringing Hands-On Science to the Elementary School Classroom: An Overview of the Science Partners Course at the University of Nevada-Reno

Julie A. Stoughton, University of Nevada, Reno, NV

33. Confronting the Challenges of Bringing Research Data into Undergraduate Classrooms Using Online Faculty Mentoring Networks

Arietta Fleming-Davies, QUBES, Radford University, Radford, VA; Gabriela Hamerlinck, BioQUEST Curriculum Consortium; Alison Hale, University of Pittsburgh, Pittsburgh, PA; Tom A. Langen, Clarkson University, Potsdam, NY; Teresa Mourad, Ecological Society of America, Washington, D.C.; Sam Donovan, University of Pittsburgh, Pittsburgh, PA

34. Connecting Undergraduate Classroom Knowledge to Real World Biology Experiences Through Student Travel to Ecuador

Kerry Cheesman, Nancy Swails, Alan Stam, Maryann Cheesman, Capital University, Columbus, OH

35. Differential Effect of Active-Based-Learning on Exam Performance of Different Student Populations

Judith Maloney, Khadijah Makky, Marquette University, Milwaukee, WI

36. Examining the Relationship Between Overall Motivation for Learning Biology and Learner Acceptance and Understanding of Evolution

Lilian Shabani, Paul M. Beardsley, California State Polytechnic University, Pomona, CA

Non-Competition Posters *continued*

37. Examining the Relationship Between Students' Perception of the Flipped-Learning and Their Academic Performance in an Undergraduate Genetics Course

Judith L. Leatherman, University of Northern Colorado, Greeley, CO

38. A Format to Develop Students' Higher Bloom's Thinking - Does It Work?

Melanie Sanchez-Dinwiddie, University of New Mexico-Valencia Campus, Los Lunas, NM

39. Helping Elementary Teachers Uncover Misconceptions in Science through Connections to Non-Fiction Texts

Kerry Cheesman, Alan Stam, Nancy Swails, Terry Shiverdecker, Capital University, Columbus, OH

40. IDEAS: Interdisciplinary Disease Ecology Across Scales

B. Elijah Carter, University of Georgia, Athens, GA

41. Incorporating Bioenergy into the Curriculum - BioenergizeME Infographic Challenge

Leslie Ovard, Idaho National Laboratory, Idaho Falls, ID; Maria Zeitlin, Smithtown High School East, St James, NY; Alexis Wolf, Zachary Peterson, Shannon Zaret, Sheila Dillard, Department of Energy - Bioenergy Technologies Office, Washington, D.C.

42. Incubators for Learning Resources: A Model to Support the Collaborative Development, Augmentation, and Customization of OER

Sam Donovan, University of Pittsburgh, Pittsburgh, PA; Mark Pauley, University of Nebraska, Omaha, NE; William Morgan, The College of Wooster, Wooster, OH; Neal Grandgenett, University of Nebraska, Omaha, NE; Alison Hale, University of Pittsburgh, Pittsburgh, PA; Hayley Orndorf, University of Pittsburgh, Pittsburgh, PA

43. Lessons Learned from the Math/Science Student Preparation and Retention (M/S SPARC) Collaborative at Wesleyan College

Holly Boettger-Tong, Vivia L. Fowler, Brooke Bennett-Day, Wesleyan College, Macon, GA

44. Online Homework Only Helps Students Who Do It

William Kroen, Wesley College, Dover, DE

45. Project-Based Learning Programs Cultivate Mentoring Relationships Among Science Faculty that Improve the High School-to-College Transition

Cayle S. Lisenbee, Natalie Nailor, Arizona State University, Phoenix, AZ

46. A Redesign of Introductory Biology for Majors: Experimental Implementation of the Supplemental Model of Instruction

Michael K. Moore, Virginia A. Young, Mercer University, Macon, GA

47. Redesigning Undergraduate Biology Lab with Vertical Scaffolding and Alignment

John Moore, Taylor University, Upland, IN

48. Responsible Conduct of Research Workshop for a Summer Research Program: Helping Our Young and Future Researchers Stay in Check with Their Moral Judgment

Khadijah Makky, Marquette University, Milwaukee, WI

49. Strategies to Improve Retention in Introductory Majors Biology

Sarah Boomer, Michael Baltzley, Kristin Latham, Angela Poole, Jesse Poole, Western Oregon University, Monmouth, OR

50. Success of Active Learning Compared to Lecture in a Mid-Level Cell Biology Course

Shannon Stevenson, University of Minnesota, Duluth, MN

51. Teaching Indigenous Knowledge in the Biology Classroom Using Problem-Based Approaches

Neal Petersen, North-West University, Potchefstroom, North-West Province, NZ

52. Terrestrial Slugs as a Model Organism for Inquiry-Based Experimentation in a Majors General Biology Laboratory

Brenda J. Peters, Amy C. Blair, St. Ambrose University, Davenport, IA

53. To Use a Virtual Lab or Not to Use a Virtual Lab

Carrie J. Bucklin, Southern Utah University, Cedar City, UT; Kristy L. Daniel, Texas State University, San Marcos, TX

54. Use of Scaffolds to Support Undergraduate Students in Learning and Understanding Biological Concepts

Jaime Sabel, University of Memphis, Memphis, TN

55. Using Remediation and Peer Mentoring to Increase Quantitative and Analytical Skills in At-Risk College Students

Amy Morris, Hastings College, Hastings, NE

56. A Vision for Changing Introductory Biology with Mathematical Models

Laurie J. Heyer, A. Malcolm Campbell, Christopher J. Paradise, Davidson College, Davidson, NC

57. Warning: Active Learning May Cause Anxiety

Ben England, Elisabeth Schussler, The University of Tennessee, Knoxville, TN; Jennifer Brigati, Maryville College, Maryville, TN

58. What Will I Need to Know: Teaching Students to Navigate through a Tsunami of Information

Joyce Hardy, Ann Buchmann, Wendy Jamison, Chadron State College, Chadron, NE

10:30AM – 11:45AM *continued*
**1119 | Trophic Cascades:
 A Force of Nature**

Governor's Square 15 • Ecology/Environmental Science/Sustainability • Hands-on Workshop (75 min) • 4Y, HS, 2Y

Trophic cascades are a fundamental concept in ecology that describe the relationships between organisms. Discover the new BioInteractive film and supporting activities that describe the classic experiments that first illustrated trophic cascades.

Jim Clark, Samantha Johnson, and Mark Nielsen, HHMI BioInteractive, Chevy Chase, MD

**1090 | Un-"covering" AP Biology:
 How "Doing Biology" Connects the
 Course to the Exam**

Governor's Square 16 • AP Biology • Partner Presentations (75 min): Reserved for non-profit organizations highlighting free teaching resources • HS

Participants will work in small groups with senior AP teachers to learn how "doing" instead of "covering" biology supports a great AP course and prepares students for the AP exam. Participants will share activities, syllabi, and assessment ideas.

Jennifer Pfannerstill, North Shore Country Day School, Winnetka, IL; Brad Williamson, University of Kansas, Lawrence, KS; Paula Phillips, Trinity Preparatory School, Orlando, FL; and Theresa Holtzclaw, Fred Holtzclaw, and Brenda Royal, The Webb School, Knoxville, TN

**ES20 | The MiniOne
 Electrophoresis and Mass
 BioTeach Present: *Molecular
 Scissors, Mission (Im)Possible,
 and PTC: Personal Genetics
 Presenters***

Plaza Court 4 • Biotechnology • Hands-on Workshop (75 min) • HS, GA

Come try three new inquiry-based molecular biology labs that will challenge your students but not your budget!

Michelle Mischke and Whitney Hagins, Massachusetts Biotechnology Education, Cambridge, MA

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10:30AM – 11:45AM continued

939 | Authentic Modeling in Biology Class

Plaza Court 5 • Instructional Strategies & Technologies • Hands-on Workshop (75 min) • MS, HS, GA

The Next Generation Science Standards (2013) have redefined what intellectually honest science teaching looks like. Most teachers know that they are supposed to focus on developing causal explanations – but how? Explore one answer in this session!

Alisha Ragan, Relay Graduate School of Education, New York, NY

1041 | Finding the Genetic Basis of Diseases and Traits: RB, CF, and BMI

Plaza Court 6 • General Biology • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Twin studies combined with genomics can reveal the causes of rare diseases and the genetic and environmental contributions to common traits such as diabetes and BMI. Teach these concepts using a lesson from the American Society of Human Genetics (ASHG).

Michael Dougherty and Kanika Pulliam, American Society of Human Genetics, Bethesda, MD

920 | Bringing a Pharmaceutical to Market

Plaza Court 7 • Biotechnology • Hands-on Workshop (75 min) • HS

This session looks at a course designed for a HS biotechnology class to show the upstream and downstream process of designing a pharmaceutical. Topics include aseptic techniques, biotechnology techniques, and the clinical trial component.

Ingrid Burke and Roxanne Puhalski, Northwestern Regional High School, Winsted, CT

1097 | Designing Authentic Field Studies for Secondary Students and Teachers

Plaza Court 8 • Ecology/Environmental Science/Sustainability • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Sue Arlidge from University of Calgary's Biogeoscience Institute and AP Biology teacher Mike Mckillop have run winter ecology field trips where students ask real science questions, gather real data, and analyze their results all in 1.5 days. Come see!

Sue Arlidge, University of Calgary, Biogeoscience Institute, Kananaskis, Alberta, Canada; and Mike Mckillop, Dr. E.P. Scarlett High School, Calgary, Alberta, Canada

**12:00PM – 2:00PM
NABT Honors Luncheon**

Windows Room • Special Event (Tickets Required)

Join us as we recognize the accomplishments and professional contributions of the 2016 NABT Award recipients, including the Outstanding Biology Teacher Award (OBTA) honorees. This celebration honors exceptional biology teachers and everyone is welcome to attend!

1:30PM – 2:45PM

INTRO BIO TASK FORCE

1139 | Enhancing Student Ability to Model Complex Processes and Ideas in Introductory Classrooms

Director's Row I • Curriculum Development • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Presenters will share information on planning, developing, and carrying out integrated lessons on the ability to model biological processes like cellular respiration and physiological processes.

Steven Christenson, BYU Idaho, Rexburg, ID; Cindy Gay, Steamboat Springs School District, Steamboat Springs, CO; and Anna Hiatt, East Tennessee State University, Johnson City, TN

1:30PM – 2:45PM

INVITED SPEAKER

Sam Kean

See page 10 for biography.

The Violinist's Thumb

Plaza Ballroom E • Special Speaker • GA

Did the human race almost go extinct? Can genetics explain a crazy cat lady's love for felines? How does DNA lead to people with no fingerprints, or humans born with tails? And how did the right combination of genes create the exceptionally flexible thumbs and fingers of a truly singular violinist? Unraveling the genetic code hasn't always been easy—from its earliest days, genetics has been rife with infighting, backstabbing, and controversial theories—but scientists can now finally read the astounding stories about human history buried in our DNA.

Presented in partnership with The College Board.

1150 | BSCS Biology A Human Approach – An Inquiry-based, NGSS Aligned Curriculum

Governor's Square 9 • General Biology • Hands-on Workshop (75 min) • HS

Join this interactive session to experience an inquiry-based, constructivist high school biology curriculum. Come learn about the key features of the fifth edition, which was published this year and is aligned to NGSS.

Brooke Bourdélát-Parks, BSCS, Colorado Springs, CO

965 | Using Data and Graphics to Stimulate Student Learning

Governor's Square 10 • Ecology/Environmental Science/Sustainability • Hands-on Workshop (75 min) • HS, 2Y, 4Y

Learn how to use available data and graphics to generate activities that require students to

observe, ask questions, and generate conclusions. Examples will include population growth, ozone depletion, global climate change, and energy use.

Linda Sigismondi, University of Rio Grande, Rio Grande, OH

987 | Using Interactive Notebooks to Improve Student Learning in AP Biology

Governor's Square 11 • Instructional Strategies & Technologies • Hands-on Workshop (75 min) • MS, HS

Participants will learn how the use of interactive notebooks has improved student learning in an AP Biology classroom. Participants will build a sample notebook and will receive resources for using this tool to maximize student learning.

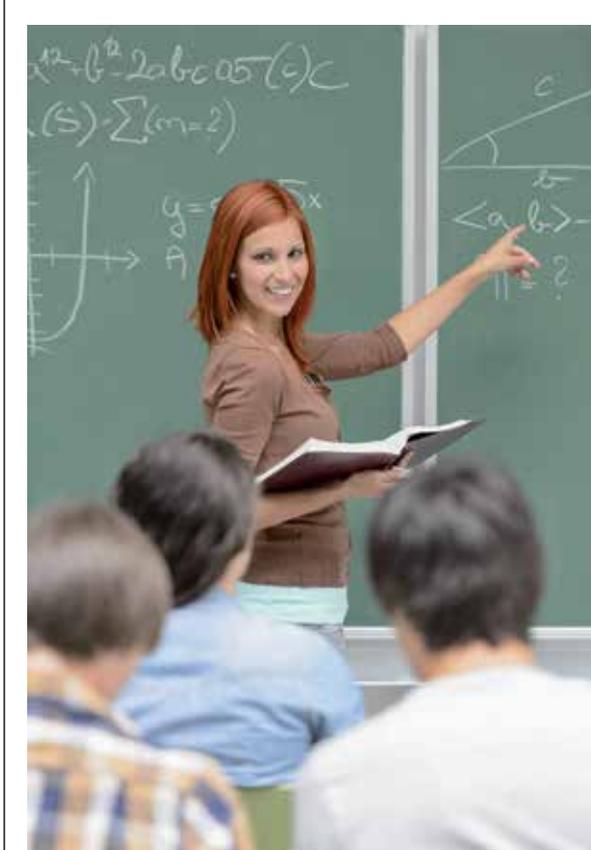
Lee Ferguson, Allen High School, Allen, TX

1107 | Integrating Undergraduate Research into the Curriculum of Introductory Biology Courses for Majors and Nonmajors

Governor's Square 12 • General Biology • Demonstration (75 min) • HS, 2Y, 4Y

The value of undergraduate research experiences for all types of students has been thoroughly documented, yet still remains challenging. This session will present feasible options to integrate research into the curriculum successfully.

Kristen Genet, Anoka-Ramsey Community College, Coon Rapids, MN



So, You Want to be a Biomedical Engineer!

The MOOC will cover:

- Overview of this wildly popular and vast field
- How to chart your own career
- Advances going on in each of the areas of focus
- Earn a Certificate of Completion, Continuing Education Units (CEUs) or Professional Development Hours (PDHs)
- Great for HS students to include on college applications and undergraduates for CEUs



Launch dates

September 1- November 30, 2016

Find this course at EdX:

<https://www.edx.org/course>



NABT GLOBAL PERSPECTIVES COMMITTEE'S 4th ANNUAL 2016 POSTER SESSION

Local to Global: Citizen Science Across Borders

PLAZA BALLROOM F • 1:30PM – 2:45PM

This session will highlight innovative and successful citizen science projects that help teachers create collaborations between countries to explore and analyze real data, and enrich learning through the use of interdisciplinary content and global perspectives.

Moderator: Jacqueline McLaughlin
The Pennsylvania State University – Lehigh Valley, Center Valley, PA
Global Perspectives Committee, Chair

Poster Presentations

Monarch Waystation Network

- Matt Tucker, Education Coordinator, Monarch Watch, University of Kansas, Lawrence, KS
- Carol Williamson, UKan Teach Master Teacher, Center for STEM Learning, University of Kansas, Lawrence, KS

Site Platforms for Climate Change and Citizen Science Outreach in the Southwest United States and Northern Mexico

- Francisco Delgado, Biology Department, Pima Community College, Tucson, AZ
- Diana Elbirt, Landscape Architecture Department, University of Arizona, Tucson, AZ

Teaching Indigenous Knowledge in the Biology Classroom Using Problem-based Approaches

- Neal Petersen, Director: School of Natural Sciences and Technology for Education, North-West University, South Africa
- Josef de Beer, Research Professor, School of Natural Sciences and Technology for Education, North-West University, South Africa

Going from Local to Global: Students Training an International Citizen Science Community

- Brian R. Shmaefsky, Professor of Biology and Environmental Sciences, Lone Star College, Kingwood, TX

Citizen Science: Research and Conservation Project on Cottontails

- Juan C. Garcia, Early Undergraduate Research Student, Metropolitan Community College, South Omaha Campus, Elkhorn, NE
- Jeba Inbarasu, Professor of Biology, Metropolitan Community College, South Omaha Campus, Elkhorn, NE

Living Like a Black Bear Under an Oak Tree: Teaching for Sustainability

- Peter K. McLean, Life Science Teacher, St. Andrew's School, Middletown, DE

What's Bugging You: Using iNaturalist and Bioblitzes to Promote Citizen Science in our Parks

- Aimée K. Thomas, Department of Biological Sciences, Loyola University, New Orleans, LA
- Stacy Meyers, Park Ranger, Jean Lafitte National Historical Park and Preserve, New Orleans, LA
- Aleutia Scott, Interpretive Supervisor, Jean Lafitte National Historical Park and Preserve, New Orleans, LA

Students Discover: ANTS - Connecting Science and Education

- Daniela Magdalena Sorger, Post-Doctoral Researcher, North Carolina Museum of Natural Sciences, Raleigh, NC

- Paige Derouin, Science Teacher, Wake Young Men's Leadership Academy, Raleigh, NC
- Michelle Hafey, Science Teacher, Penderlea Middle School, Willard, NC
- Maggie McKinley, Science Teacher, Burgaw Middle School, Burgaw, NC

Shark Tooth Forensics: Using STEAM to Power 21st Century Citizen Science Curriculum

- Christopher Clark, Middle School Educator, Chicod School, Greenville, NC
- Nathaniel Bourne, Middle School Educator, Broadview Middle School, Burlington, NC
- Brittany Argall, Middle School Educator, Centennial Campus Magnet Middle School, Raleigh, NC
- Terry Gates, North Carolina State University, Raleigh, NC

1:30PM – 2:45PM continued
**1128 | Coupling Case Studies
 And Multimedia To Increase
 Engagement In Introductory
 Biology Courses**

Governor's Square 15 • Microbiology & Cell
 Biology • Hands-on Workshop (75 min)
 • MS, HS, 2Y

Capitalize on student interest in cancer to teach
 core biology concepts. This hands-on workshop
 pairs case studies and HHMI BioInteractive
 resources to teach enzymatic actions,
 mutations, the cell cycle, and cell signaling
 in an engaging way.

Rebecca Orr, Sarah Wojiski, and Melissa Csikari,
 HHMI BioInteractive, Chevy Chase, MD

**1008 | The Ins and Outs of Construct-
 ing and Crossing the Cell Membrane!**

Governor's Square 16 • General Biology •
 Hands-on Workshop (75 min) • MS, HS, 2Y
 Explore the unique properties of the phospholip-
 ids that comprise cell membranes in this hands-
 on workshop. Construct the cell membrane,
 investigate various transport proteins, and model
 active and passive transport of molecules.
 Handouts provided!

Gina Vogt and Tim Herman, MSOE Center for
 BioMolecular Modeling, Milwaukee, WI

**940 | Drowsy Drosophila:
 Rapid Evolution in the Face of
 Climate Change**

Governor's Square 17 • Evolution • Hands-on
 Workshop (75 min) • HS, 2Y, GA

This three-lesson curriculum investigates real
 time effects of climate change, using genetic
 variation observed in the chill coma recovery trait
 in *Drosophila* as a model of inquiry. Attendees
 will preview the lessons and receive free
 curriculum materials.

Jessica Mahoney, Edgewater High School, Orlando, FL;
 and Jennifer Broo, St. Ursula Academy, Cincinnati, OH

hhmi
*Night at the Movies
 with Sean Carroll*

Friday, November 4, 2016
 Reception 5:30–6:30 p.m.
 Movie Event Starts at 6:30 p.m.

Food and Drink Provided

Plaza Ballroom

hhmi | **BioInteractive**

1:30PM – 2:45PM *continued*

**Special Programming
Presented by Cogent Education**

**Interactive Case Studies for
Biology, AP Bio, & Anat-Phys**

Plaza Court 4 • General Biology • Hands-on Workshop (75 min) • HS, 2Y, 4Y
Students play the role of a scientist and apply standards-aligned scientific practices to solve a real world problem. Data is sent to teachers in real time, which is proven to improve student outcomes by NIH & NSF research – attendees can try a case!

Tom Robertson

**Special Programming
Presented by miniPCR**

**miniPCR and blueGel
electrophoresis
Transforming Biotech!**

Plaza Court 1 • Biotechnology • Hands-on Workshop (75 min) • MS, HS, 2Y, 4Y
The DNA Discovery System is a portable biotech lab that includes a PCR, electrophoresis and a pipette. Teach hands-on Genetics, Food Safety, Forensics, and more with miniPCR Learning Labs. miniPCR puts DNA analysis entirely in the hands of students.

Zeke Alvarez Saavedra

1069 | Do You See What I See?

Plaza Court 5 • Science Practices • Hands-on Workshop (75 min) • MS, HS, GA

We will demonstrate how students can use the SEP's of modeling and data analysis to show their knowledge of various concepts in biology. All participants will leave with a goody bag and ready-made lesson plans that can be used immediately.

Jim Clark, San Lorenzo Unified School District, San Lorenzo, CA; and Nicole Fernandes, Northwood High School, Silver Spring, MD

**951 | Zoo Genetics: A Free,
Phenomenon-driven Curriculum**

Plaza Court 6 • General Biology • Symposium (75 minutes) • MS, HS, 2Y

Zoo Genetics Plus is a free curriculum created through a collaboration of teacher and geneticist. The activities look at real world conservation issues that will increase student interest and explain how genetics helps to answer scientific questions.

Jason Crean, Lyons Township High School, Western Springs, IL; Kathy van Hoeck, York Community High School, Elmhurst, IL; and Jean Dubach, Wildlife Genetics Lab, Maywood, IL

1101 | My Flippin' Classroom

Plaza Court 7 • Instructional Strategies & Technologies • Hands-on Workshop (75 min) • 2Y, 4Y, GA

Learn methods of implementing the flipped classroom in and outside class. Come prepared by watching a video on Flipped Learning (<https://www.youtube.com/watch?v=BGz0k3vfkOM>) and

be prepared to play the role of a student. Active participation is expected.

Becky Kapley, Cuyahoga Community College, Parma, OH

**993 | Project-Based Learning in the
Biology Classroom**

Plaza Court 8 • Curriculum Development • Hands-on Workshop (75 min) • MS, HS

What are the components of a Project-Based classroom? What can it look like in a variety of contexts? We'll explore what PBL looks like in our classrooms, take a look at example projects, and find time to brainstorm driving questions and resources.

Camden Hanzlick-Burton, Summit Sierra High School, Seattle, WA

4:00PM – 5:00PM

GENERAL SESSION SPEAKER

Temple Grandin

See page 9 for biography.

Different Kinds of Minds Contribute to Science

Plaza Ballroom ABC • Special Speaker • GA

To advance in science, people who approach problems in different ways need to work together. In a recent editorial in *Nature*, Assaf Zaritsky stated that when cross disciplinary research is being done it is a mistake for scientists to attempt to do both bench biology and computer analysis. Instead, a better approach is for two people who are specialists to collaborate. Scientists in different disciplines can complement each other's skills. There are three types of specialized thinking: photo realistic visual, pattern/math, and verbal. Dr. Grandin will share her increasing concern about our current educational system and its potential to screen out some of the visual thinkers who have difficulty with quantitative skills like algebra. She reminds us that we need these visionaries to move biological science forward because they help solve problems with associative thinking.

This session includes a special presentation of the 2016 *NABT Distinguished Service Award*.

NABT UNDERGRADUATE BIOLOGY SUMMIT

Scalable Change in Undergraduate Biology Education

SATURDAY, NOVEMBER 5 • 1:30PM–3:30PM • Director's Row F

1:30PM – 1:40PM

Welcome and Introduction

Grant Gardner, Middle Tennessee State University, Murfreesboro, TN; and Emily Walter, California State University-Fresno, Fresno, CA. Co-Chairs, NABT Four-Year Section Professional Development Committee.

1:40PM – 2:10PM

Keynote Presentation

Stephanie Chasteen, University of Colorado, Boulder, CO

2:10PM – 2:25PM

Faculty Mentoring Networks: A Model for Promoting Teaching Scholarship in Quantitative Biology Education

Alison Hale, University of Pittsburgh, Pittsburgh, PA; Arietta Fleming-Davies, Radford University, Radford, VA; Gabriela Hamerlinck, BioQUEST Curriculum Consortium, Germantown, MD; Jeremy Wojdak, Radford University, Radford, VA; Kristin Jenkins, BioQUEST Curriculum Consortium, Germantown, MD; and **Sam Donovan**, University of Pittsburgh, Pittsburgh, PA

Summary: Faculty Mentoring Networks (FMNs) are designed to support the development of teaching scholarship by promoting teacher identity, self-efficacy, and knowledge/experience via four core design principles. We draw these principles from our experience developing and running 13 FMNs with over 200 participants.

2:25PM – 2:40PM

Removing the Hierarchy Structure from Within Faculty Ranks to Disseminate Wide-scale Pedagogy and Curriculum Reform

Kelly A. Hogan and Blaire J. Steinwand, University of North Carolina at Chapel Hill, Chapel Hill, NC

Summary: Faculty report one of the most significant barriers to change is time. We've transformed all introductory sections by pairing a mentor (often a term faculty member) with an apprentice (often a tenure-track or tenured faculty member) in an individual course. We'll report our methods and initial findings.

2:40PM – 2:55PM

Integrating Biology and Inquiry Skills (IBIS) Spreads its Wings: Implementation Insights from Three Institutions

Troy N. Nash, Presbyterian College, Clinton, SC; Rachel M. Pigg, Presbyterian College, Clinton, SC; **Suann Yang**, State University of New York-Geneseo, Geneseo, NY; Tarren J. Shaw, University of Oklahoma, Norman, OK; and Jeffrey M. Grim, University of Tampa, Tampa, FL

Summary: We developed IBIS, an introductory course aligned with Vision and Change. We designed several strategies to support faculty and student engagement at a variety of institutions; here we demonstrate the program's impact and scalability. Successful outcomes rely on a collaborative culture that recognizes that implementing curricular change can be turbulent.

2:55PM – 3:10PM

The Northwest Biosciences Consortium: Easing the Transfer from Introductory to Upper Division Coursework, Within and Between Institutions

Erin Baumgartner, Western Oregon University, Monmouth, OR; Amy Beadles-Bohling, University of Portland, Portland, OR; Jeffrey Brown, Whitman College, Walla Walla, WA; Jason Duncan, Willamette University, Salem, OR; Lori Kayes, Oregon State University, Corvallis, OR; Stacey Kiser, Lane Community College, Eugene, OR; Anne Krutchen, Linfield College, McMinnville, OR; Walter Shriner, Mt. Hood Community College, Gresham, OR; and Stasinos Stavrianaeas, Willamette University, Walla Walla, WA

Summary: The Northwest Biosciences Consortium brought together faculty from institutions across Oregon to examine barriers for students transferring from introductory to upper division coursework both across and within institutions. Our goal is a consistent, Vision and Change-aligned introductory biology experience, with development of modules that can be used to teach threshold concepts.

3:10PM – 3:30PM

Roundtables and Deliverable Share-Outs

** Authors are listed in order. Primary presenters are highlighted in bold.*

NABT

BioClub



MEMBERS

Ada High School, Ada, OK
Alcott High School for the Humanities, Chicago, IL
All Saints Studies Group, Cincinnati, OH
Alverno High School, Sierra Madre, CA
Anderson V Career Campus, Anderson, SC
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Convent of the Sacred Heart, New York, NY
Cuyahoga Community College, Parma, OH
Durant High School, Plant City, FL
Edgewater High School, Orlando, FL
El Centro College, Dallas, TX
Fayetteville High School, Fayetteville, AR
Florida SouthWestern State College, Naples, FL
Forsyth Central High School, Cumming, GA
Frankford High School, Philadelphia, PA
Freedom High School, Freedom, WI

George Mason High School, Falls Church, VA
Grafton High School, Grafton, WI
Grand View University, De Moines, IA
Grants Pass High School, Grants Pass, OR
Great Plains High School, Watertown, SD
Greensburg Salem High School, Greensburg, PA
Harnett Central High School, Angier, NC
Hazel Park High School, Hazel Park, MI
Heathwood Hall Episcopal School, Columbia, SC
Helena High School, Helena, MT
Hidden Valley High School, Roanoke, VA
Incarnate Word Academy, Houston, TX
International School of Minnesota, Eden Prairie, MN
Iowa City West High, Iowa City, IA
John Overton High School, Nashville, TN
KC Distance Learning, Bloomsburg, PA
Kenmore West High School, Buffalo, NY
Lake Metro Parks, Concord, OH
Lexington High School, Lexington, OH
Lincoln High School, Esko, MN
Marysville High School, Marysville, KS
Midland Park High School, Midland Park, NJ
MLK Magnet High School, Nashville, TN
Moscow High School, Moscow, ID
Mount Abraham Union High School, Bristol, VT
Mount Saint Mary Academy, Watchung, NJ
Nashville State Community College, Nashville, TN
Nassau Community College, Garden City, NY
Naugatuck Valley Community College, Waterbury, CT
Newport High School, Bellevue, WA
North Pitt High School, Bethel, NC
Packer Collegiate Institute, Brooklyn, NY
Parkland Magnet Middle School, Rockville, MD
Paul Cuffee Upper School, Providence, RI
Philip O. Berry Academy of Technology High School, Charlotte, NC

Pikeview High School, Princeton, WV
Rickover Naval Academy, Chicago, IL
Riverside City College, Riverside, CA
Ronald Reagan College Prep School, Milwaukee, WI
Salem High School, Salem, IN
Saltsburg High School, Saltsburg, PA
Seneca East High School, Attica, OH
Skyline High School, Sammamish, WA
Southern Vermont College, Bennington, VT
Southern Wells High School, Poneto, IN
St. Clair High School, St. Clair, MI
Steamboat Springs High School, Steamboat Springs, CO
Stillwater High School, Stillwater, OK
The Summit County Day School, Cincinnati, OH
Sycamore High School, Cincinnati, OH
T. Wingate Andrews HS Center for Sci & Tech, High Point, NC
The Barstow School, Kansas City, MO
The Independent School, Wichita, KS
Tiffin Columbian High School, Tiffin, OH
Tower Hill School, Wilmington, DE
Troy High School, Troy, MI
Unionville High School, Kennett Square, PA
Vincennes University, Vincennes, IN
Visitation Academy - Saint Louis, St. Louis, MO
West Island College, Calgary, AB
West Mifflin Area High School, West Mifflin, PA
Western Sierra Collegiate Academy, Rocklin, CA
Whiting High School, Laramie, WY
Windsor High School, Windsor, CO
Wise County Alternative Education Center, Wise, VA
Woodrow Wilson High School, Portsmouth, VA
Woodstock High School, Woodstock, IL
Worthington Christian High School, Worthington, OH
York Community High School, Elmhurst, 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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1:30PM – 3:30PM

1121 | Global Perspectives Committee Poster Session

Plaza Ballroom F • Global Education • Poster Session (120 min) • GA

Join the NABT GPC for an interactive poster session to learn about innovative and successful citizen science projects.

See page 56 for complete poster listings.

1037 | Touching Triton Implementation Workshop

Director's Row E • General Biology • Special Workshop (Tickets Required) • HS, 2Y, 4Y
Touching Triton is a serious game designed for grades 9-16 focused on common complex disease risk. This workshop will provide educators with the knowledge and tools needed to successfully implement *Touching Triton* in the classroom.

Madelene Loftin, Adam Hott, and Kelly East, Hudson-Alpha Institute for Biotechnology, Huntsville, AL

NABT Undergraduate Biology Summit

Director's Row H • General Biology • Symposium (120 minutes) • HS, 2Y, 4Y
 This year's symposium supports the sharing of projects that are currently undergoing scalable (group-level) and transferable change at the institutional, college, departmental, or working group levels (e.g. professional learning communities).

See page 59 for featured presentations.

3:00PM – 3:30PM

NABT Committee Meeting: ABT Advisory Committee

Director's Row F • Committee Meeting • GA

William McComas, Committee Chair

NABT Committee Meeting: Awards & OBTA Committees

Director's Row J • Committee Meeting • GA

Priya DasSarma and Mark Little, Committee Chairs

Special Programming Presented by The MiniOne

Twenty Minute Biotech

Plaza Court 1 • Biotechnology • Hands-on Workshop (30 min) • HS, 2Y, 4Y

See how easy and engaging hands-on biotechnology can be. Come experience fast PCR and real-time electrophoresis techniques that will allow you to bring cutting-edge technology into the classroom and run a complete investigation in one class period.

Callen Hyland

1031 | Using an Active Learning Strategy To Impact Students' Acceptance of Evolutionary Theory

Governor's Square 9 • Evolution • Paper (30 min) • HS, 2Y, 4Y

This study explores the effectiveness of an active learning strategy aimed at reducing the threat university students' may perceive when studying evolutionary theory.

Mary Ellen Lohr, Middle Tennessee State University, Murfreesboro, TN

1116 | Exploring The Violinist's Thumb Study Guide

Governor's Square 11 • AP Biology • Demonstration (30 min) • HS

Companion guide authors will describe how to incorporate *The Violinist's Thumb* into the curriculum by highlighting a chapter-based reading guide that assesses comprehension and develops critical thinking.

Julianne Zedalis, The Bishop's School, San Diego, CA; Sam Kean, Washington, D.C.; and Tanya Sharpe, College Board, Atlanta, GA

ENHANCE YOUR SKILLS WITH NYCC'S ONLINE **MASTER OF SCIENCE DEGREE IN Human Anatomy and Physiology Instruction**

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CHIROPRACTIC COLLEGE

Finger Lakes School of Acupuncture & Oriental Medicine of New York Chiropractic College
 School of Health Sciences & Education

2360 Route 89
Seneca Falls, NY 13148



3:00PM – 3:30PM continued

1091 | Testing the Testing Effect: Modifying Summative Assessments to Enhance Learning

Governor's Square 12 • General Biology • Paper (30 min) • 2Y, 4Y, GA

Summative assessments strategies in a large, introductory biology course were compared over several semesters. Student performance and attitude data were collected in sections using three unit exams, and sections using five shorter, cumulative unit exams.

Tarren Shaw, University of Oklahoma, Norman, OK

1134 | Using Primary Literature to Teach Data Literacy

Governor's Square 15 • Science Practices • Hands-On Workshop (30 min) • HS, 2Y, 4Y

HHMI BioInteractive presents "Data Points", a monthly series featuring a figure from primary literature to engage students in the process of interpreting graphs. Participants will analyze and interpret graphs and explain what the results mean.

Natalie Dutrow, Bob Kuhn, and Bridget Conneely, HHMI BioInteractive, Chevy Chase, MD

1126 | The Red Queen's Race: An Experimental Card Game to Teach Coevolution

Governor's Square 17 • Evolution • Demonstration (30 min) • HS, 2Y, 4Y

I will present an educational tool to bring rapid evolution and parasites into the classroom. It is a simple, hands-on game in which students collaborate to generate data and test predictions of a core hypothesis of evolutionary biology.

Amanda Gibson, Indiana University, Indianapolis, IN

1005 | Engaging Students with Literacy Strategies

Plaza Court 5 • Instructional Strategies & Technologies • Demonstration (30 min) • MS, HS

The audience will take away practical ways to engage students in text and be willing to try more challenging passages. It includes several examples of pre, during and post reading activities that will allow students to better access the information.

Kellie Dean and Christine Pfaffinger, Adlai E. Stevenson High School, Lincolnshire, IL

1063 | Utilizing Models in Biology

Plaza Court 6 • General Biology • Hands-on Workshop (30 min) • HS

Explore engagement strategies that incorporate models and enable students to gain a deeper understanding of biological concepts. Experience creative approaches to instruction that clarify complex processes while making the learning process enjoyable.

Rebecca Brewer, Troy High School, Troy, MI

961 | What are My Students Thinking? Preparing for Your Flipped Biology Class.

Plaza Court 7 • Instructional Strategies & Technologies • Paper (30 min) • 2Y, 4Y, GA

How do students perceive flipped classes? Come hear us present on six semesters of student perception data. We use this data to show motivational trends of students walking into biology classrooms and offer practical advice on how to prepare for them.

Michael Moore, Rachel Hawkins, and Donald French, Oklahoma State University, Stillwater, OK

977 | Making Natural Phenomena Central in the Biology Classroom

Plaza Court 8 • Science Practices • Hands-on Workshop (30 min) • MS, HS

We will discuss the rationale and strategies for making natural phenomena central in science teaching and learning. Participants will engage in sample activities from a unit of Carbon TIME, a free, NSF-funded curriculum aligned to the NGSS.

Wendy Johnson, Michigan State University, East Lansing, MI

3:00PM – 4:00PM

Book Signing with Sam Kean and Temple Grandin

Plaza Court

Enjoy a meet and greet and book signing with two of our featured speakers. Multiple titles from each speaker will be available for sale and signing.

6:00PM – 8:00PM

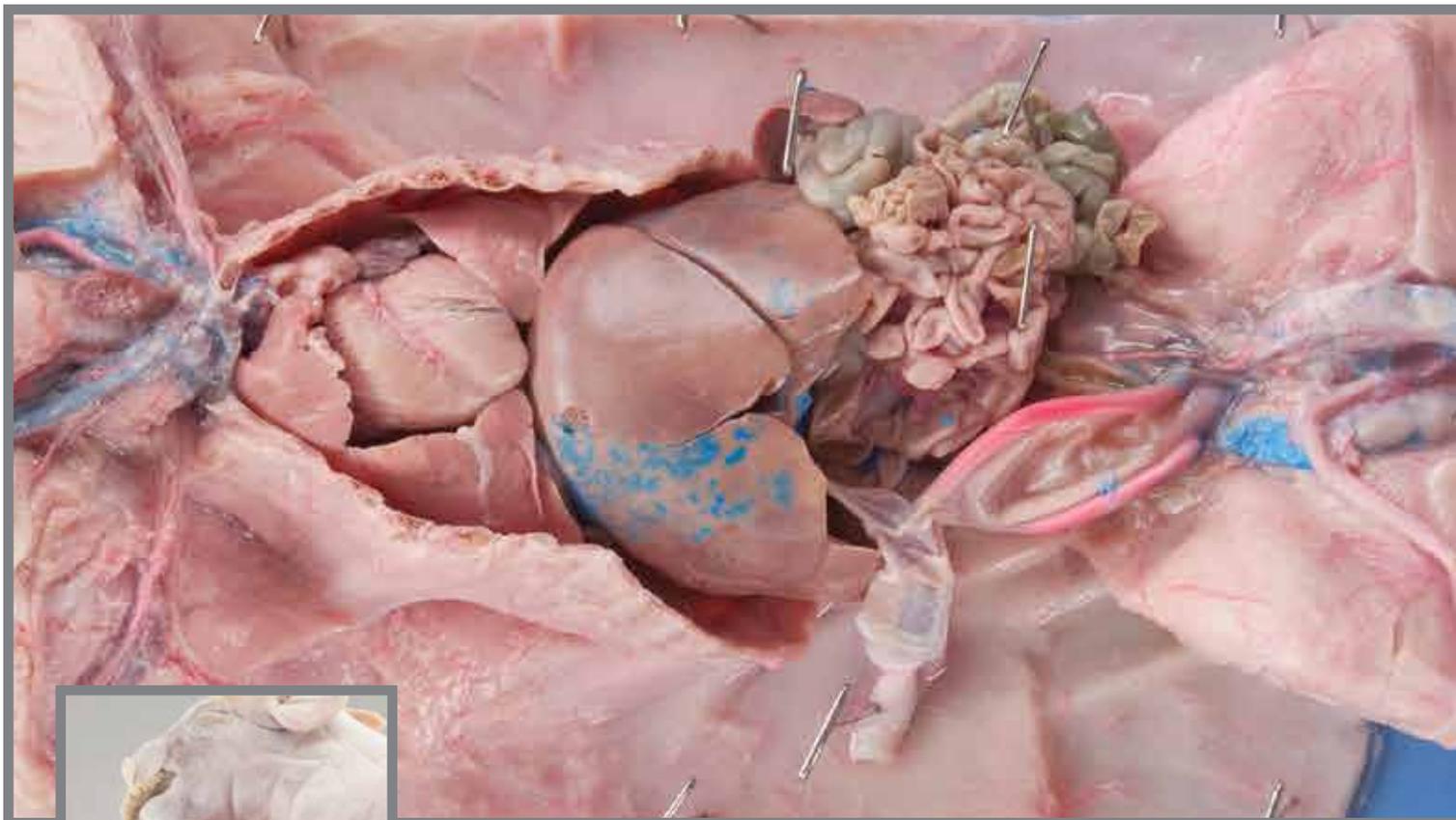
The Biology of Brewing

Lobby to Wynkoop Brewery • Special Event (Tickets Required)

Colorado has long been known as a "beer" state, with giants like Coors sharing the scene with over 284 craft breweries. Colorado knows its beer, and it also knows that brewing means biology. As the industry grows, biology faculty are crossing departmental lines to offer undergraduate degrees and certificates in fermentation and brewing science. Learn more about the biology used by today's craft brewers, and the educational programs that will support tomorrow's, for a special event at the Wynkoop Brewery.

Special program presented with





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Give students a better hands-on understanding of living systems without compromising specimen quality or comfort in your classroom.

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- Pre and post **product support**

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*Check with your school or district for specific state disposal requirements. However, because there are no volatile organic compounds, you should be able to routinely dispose of specimens.