November 3

Saturday

"I belong to NABT because I continuously grow into the biology educator I want to be, the educator that makes a difference in her students' lives. NABT provides me with the tools, role models, collegiality, and up-to-date pedagogical research data that allows me to transform a lecture, lab, or field experience into an inquiry-based question and critical thinking forum."

Jacqueline McLaughlin
member since 1999

Saturday November 3

TECHNOLOGY IN TEXAS

In a world of online resources, smartboards, tablets, apps, and the "cloud," teachers must be ready and able to incorporate some cool tools into their curriculum. Put a Texas size T in STEM with these sessions focused on using 21st century technology.

These sessions are featured in gold boxes throughout the program.

7:30am – 8:30am

Past Presidents' Breakfast

Centennial Café • Invitation Only

8:45am – 9:45am

GENERAL SESSION

William McComas, Ph.D.

Bio appears on page 8.

Darwin's Mad Dream: What Error and Invention Can Tell Us about How Science Works

Landmark Ballroom A-B • Special Speaker

Darwin's "Mad Dream" as he put it refers to pangenesis, an idea he proposed to describe the rules of inheritance and explain the source of new variation. These conceptions were vital to evolution by natural selection. Beyond historians of biology, few others are familiar with pangenesis because it was ultimately shown to be inaccurate and represents one of Darwin's few errors. Dr. McComas shows us that the case of pangenesis is not interesting just because it was incorrect, but because the account of its development provides an interesting case study into how science works and offers a rare glimpse into Darwin's thinking and personality. Pangenesis can illustrate important "nature of science" ideas such as the need for empirical evidence, the use of inductive reasoning, the creative component of science, the role of bias and subjectivity, social and personal influences on science, and the notion that scientific knowledge is tentative but durable and ultimately self correcting.

NABT is proud to feature Dr. William McComas as the Tenth Annual Christine Chantry Memorial Speaker.

10:00am – 11:15am

INVITED SPEAKER

Sam Rhine

Bio appears on page 10.

Stem Cells and the Future of Medicine

Reunion Ballroom A-B • Special Speaker

Mr. Rhine will present an overview of the basic biology of current stem cell technologies including their connections with both reproductive and therapeutic cloning. Special attention will focus on the distinctions among ESCs (embryonic stem cells) derived from human embryos; ASCs (adult stem cells) derived from adult human bone marrow, umbilical cord, placenta, adipose and/or amniocentesis; and iPSCs (induced pluripotent stem cells) derived from human somatic cells such as skin or blood *in vitro*. The normal embryonic origin of these cells and their *in vitro* derivations will be discussed with special emphasis on their epigenetic determinants. Potential medical applications of these cells include: cell replacement therapy, human disease modeling and therapeutic drug screening. The production of cells for regenerative medicine will also be discussed. There will be special emphasis on MSCs (mesenchymal stem cells), adult stem cells which have unique therapeutic properties. Sam will conclude with a look at 'Cancer Stem Cells' and their role in tumor formation and therapy.

Enhance Your Teaching of the New AP® Biology Curriculum Framework with Resources from HHMI

Pegasus B • Hands-on Workshop (75 min.) • General Biology • HS 2C 4C

Learn about and receive classroom activities, virtual labs, and information for utilizing these free HHMI resources to enhance your classroom instruction of AP® Biology. The vast resources on BioInteractive.org are organized into two teacher guides arranged by and focused on the four Big Ideas, including the Enduring Understandings, of the new AP® Biology Curriculum Framework.

Ann Brokaw, Rocky River HS, Rocky River, OH

Bio-Rad: A Comprehensive Research Project for AP® Biology (Big Ideas 1, 2, 3, 4) (Part 1 of 2)

Reverchon A • Exhibitor Session • General Biology • HS 2C 4C

Clone a key glycolysis gene and integrate transformation, PCR, electrophoresis, sequencing and bioinformatics in one student-led project. The workshop will focus on BLAST analysis and learning objectives alignment.

Leigh Brown (biotechnology_explorer@bio-rad.com), Bio-Rad, Hercules, CA

Special Workshop: Planting Inquiry in Science Classrooms

Moreno A • Instructional Strategies/Technologies • HS GA

Free. Space is Limited to 30 people.

Science practices play prominent roles in the Next Generation Science Standards and the revised AP® Biology Curriculum. In this interactive workshop, we share simple yet effective techniques to help students develop skills ranging from generating questions based on observations of the usual and unusual to exploring alternative explanations. Leave with tested examples, ideas for using them in your own classroom, and increased confidence to up the ante on student-centered learning or to introduce inquiry into what you already do.

Gordon Uno (guno@ou.edu), University of Oklahoma, Norman, OK and **Marshall Sundberg** (msundber@emporia.edu), Emporia State University, Emporia, KS

Saturday November 3

TECHNOLOGY IN TEXAS

Observing Natural Selection in the Classroom with Avida-ED

Gaston B • Hands-on Workshop (75 min.) • Evolution • HS 2C 4C

Experience evolution in action: come try out *Avida-ED,* a free program that allows students to develop and test questions about evolution and natural selection. Software and lesson plans will be provided. Participants are encouraged to bring a laptop.

Amy Lark (majchrz1@msu.edu), Michigan State University, Lansing, MI and **Wendy Johnson** (wjohnson@lansingcatholic.org), Lansing Catholic High School, Lansing, MI

AIBS/NESCent/BEACON Workshop

Moreno B • Special Program • Evolution • HS 2C 4C

Join us for ideas and strategies to introduce materials from yesterday's Evolution Symposium (*Evolutionary Transformations: The Legacies of Two Influential Scientists on Evolutionary Thought*) in your classroom.

Louise Mead, BEACON, East Lansing, MI, **Kristin Jenkins** and **Jory Weintraub,** NESCent, Durham, NC

Committee Meeting: Conference Committee

Pryor-Crockett

Chairs: Matt Wells and **Alton Biggs**

BSCS Presents: Helping Students Construct Meaningful Scientific Explanations

Gaston A • Hands-on Workshop (75 min.) • Instructional Strategies/ Technologies • JH HS

Constructing explanations is one of the practices of science in the Next Generation Science Standards. In this session, you will take part in an investigation and learn about a tool to help your students link activities to science concepts in order to construct good scientific explanations.

Brooke Bourdélat-Parks and **Anne Westbrook,** BSCS, Colorado Springs, CO

Publishing Isn't Just For PhD's, Students Can Do It Too!

Cumberland A • Demonstration (75 min.) • Instructional Strategies/ Technologies • JH HS

Introducing a new program at Harvard: *The Journal of Emerging Investigators,* a free, peer-reviewed scientific journal that publishes the research performed by 6th-12th grade students. Learn how to turn lab reports into publishable articles.

Sarah Fankhauser (paglioni@fas.harvard.edu), Harvard Journal of Emerging Investigators, Boston, MA

DNA Barcoding In Your Classroom

Cumberland B • Demonstration (75 min.) • Evolution • HS 2C 4C

Engage students in their own learning by identifying plants, animals and food sources through their unique DNA barcodes.

David Micklos and **Bruce Nash,** DNA Learning Center, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY

Drugs, Drug Targets and You: A Molecular Perspective

Cumberland C • Hands-on Workshop (75 min.) • Neuroscience • HS 2C 4C

Drugs are simply small molecules - natural products or man-made - that bind to specific protein targets to alter their normal function. We will explore the molecular mechanisms

highlighted speakers

Read their bios on pages 8-10.

abbrev. key

GA: General Audience
E: Elementary
JH: Middle/Jr. High School
HS: High School
2C: Two-Year College
4C: Four-Year College

Saturday November 3

10:00am – 11:15am

continued

whereby common prescription drugs, and drugs of abuse, elicit their well-known responses in our bodies.

Shannon Colton, Tim Herman, and **Margaret Franzen** (franzen@msoe.edu), MSOE CBM, Milwaukee, WI

What Do College Students Know About Sex?

Cumberland D (Session I) • Paper (30 min.) • General Biology • 2C 4C GA

We found that students entering introductory biology have highly variable knowledge about sex and that this knowledge was related to students attitudes toward science. We advocate for the inclusion of sex education in introductory biology.

Deena Wassenberg (deenaw@umn.edu), University of Minnesota, St. Paul, MN and **Sehoya Cotner,** University of Minnesota, Minneapolis, MN

Wikis: Everything You Always Wanted to Know about STD's and How Your Students Can Tell You

Cumberland D (Session II) • Paper (30 min.) • Instructional Strategies/Technologies • HS 2C 4C

A Wiki was used to introduce sensitive subject matter to students in a 100-level non-majors human reproduction course. Learn how using a Wiki engaged students to collaborate, create and share content and ultimately fostered increased course discourse.

Monica Hall-Woods and **Alane Breitmeyer,** St. Charles Community College, Cottleville, MO

Delivering Biology Online: Wet Labs vs. Virtual Simulations

Cumberland E (Session I) • Paper (30 min.) • Instructional Strategies/Technologies • 2C 4C GA

Online biology education needs to address whether virtual biology simulations can deliver an equivalent laboratory experience as on-campus students receive. A campus-based introductory biology course was compared to an online biology course.

Beverly Ranney, University of Northern Colorado, Evans, CO

Service Learning in a Current Topics in Cell Biology Course

Cumberland E (Session II) • Demonstration (30 min.) • Microbiology & Cell Biology • 2C 4C GA

This presentation will analyze a cell biology service-learning course designed to engage students in addressing scientific literacy issues in the community. Strengths and challenges of this teaching method in a science curriculum will be evaluated.

Janine Bartholomew, Carlow University, Pittsburgh, PA

Using Socratic Seminars in Science

Cumberland F • Hands-on Workshop (75 min.) • Instructional Strategies/Technologies • JH HS 4C

Socratic Seminars can be used to foster discussion of a challenging science-related text or to analyze scientific data. Participants will receive resources for conducting a seminar and will engage in an actual seminar during the session.

Jeanne Chowning (jchowning@nwabr.org) and **Joan Griswold** (jgriswold@nwabr.org), NW Association for Biomedical Research, Seattle, WA

Conceptual Frameworks of Core Biological Principles

Cumberland G (Session I) • Paper (30 min.) • Physiology • 2C 4C GA

This presentation will share a conceptual framework for core biological principles, discuss common student misconceptions that interfere with students' learning and explain how misconceptions can be used in assessment of students' learning.

Ann Wright, Canisius College, South Wales, NY

Using Allometry and SA/V: Do Endothermic Dinosaurs Work?

Cumberland G (Session II) • Demonstration (30 min.) • Physiology • HS 2C 4C

Learn techniques your students can use to measure volume and surface area of model dinosaurs and apply allometry to scale up to the real thing to research and discuss the consequences of this important ratio in the value of endothermy.

William Beachly, Hastings College, Hastings, NE

Shaken Not Stirred! Get Control of Your Classroom

Cumberland H • Symposium (75 min.) • Instructional Strategies/Technologies • E JH HS

Classroom management was rated as the most important variable to building and sustaining a high achieving classroom and Time To Teach offers the most powerful classroom management strategies that gets results! Firm but fair discipline!

Michael Moretta (michael@mjmedcon.com), Time To Teach, Dallas, TX

Authentic Scientific Collaborations in Phage Biology

Cumberland I • Paper (75 min.) • Genetics • HS 2C 4C

Learn how you and your students become collaborators with scientists at the University of Pittsburgh Phagehunting Program.

Deborah Jacobs-Sera, University of Pittsburgh, Pittsburgh, PA

NASA Kepler Mission: The Search for Habitable Worlds

Cumberland J • Hands-on Workshop (75 min.) • General Biology • JH HS

What is a habitable world? How do we find habitable worlds beyond our solar system? This session compares stellar and exoplanet parameters to those in our system and con-

Saturday November 3

nects them to the requirements of life on Earth. Check out NASA resources.

Pamela Harman, SETI Institute Education and Public Outreach, Mountain View, CA

Hands-On Inquiry-Based Evolution Lab Activity: EVO-DEVO

Cumberland K • Hands-on Workshop (75 min.) • Evolution • HS 2C 4C

This lab activity explores a specific evolutionary event from the combined perspectives of fossil evidence, natural selection, and molecular genetics. The lab serves as a good introduction to the concepts of gene-switches and EVO-DEVO.

David Wollert, Chattanooga State Community College, Chattanooga, TN

10:00am – 12:00 noon

NABT & SCST *Vision & Change* Implementers Meeting

Reunion C • Invitation Only • Special Event

Sponsored by McGraw-Hill

10:00am – 2:00pm

Field Trip: Trinity River Audubon Center

$ Pick Up In Lobby $45

This field trip will feature at least one guided tour, lunch and time to enjoy bird watching. Transportation to and from the Hyatt Regency Dallas will be provided.

With very little equipment, birding provides a relaxing, educational hobby and the Trinity River Audubon Center is a great birding site that all ages can enjoy.

11:30am – 12:45pm

Bio-Rad: A Comprehensive Research Project for AP® Biology (Big Ideas 1, 2, 3, 4) (Part 2 of 2)

Reverchon A • Exhibitor Session • General Biology • HS 2C 4C

Clone a key glycolysis gene and integrate transformation, PCR, electrophoresis, sequencing and bioinformatics in one student-led project. The workshop will focus on BLAST analysis and learning objectives alignment.

Leigh Brown (biotechnology_explorer@bio-rad.com), Bio-Rad, Hercules, CA

Continuation Special Workshop: Planting Inquiry in Science Classrooms

Moreno A • Instructional Strategies/Technologies • HS GA

Science practices play prominent roles in the Next Generation Science Standards and the revised AP® Biology Curriculum. In this interactive workshop, we share simple yet effective techniques to help students develop skills ranging from generating questions based on observations of the usual and unusual to exploring alternative explanations. Leave with tested examples, ideas for using them in your own classroom, and increased confidence to up the ante on student-centered learning or to introduce inquiry into what you already do.

Gordon Uno (guno@ou.edu), University of Oklahoma, Norman, OK and **Marshall Sundberg** (msundber@emporia.edu), Emporia State University, Emporia, KS

Continuation AIBS/NESCent/BEACON Workshop

Moreno B • Special Program • Evolution • HS 2C 4C

Join us for ideas and strategies to introduce materials from yesterday's Evolution Symposium ("Evolutionary Transformations: The Legacies of Two Influential Scientists on Evolutionary Thought") in your classroom.

Louise Mead, BEACON, East Lansing, MI, **Kristin Jenkins** and **Jory Weintraub,** NESCent, Durham, NC

Committee Meeting: Retired Members Committee

Pryor-Crockett

Chair: Dennis Gathmann

BSCS Presents: Inquiry? Science Practices? What's Up with the Next Generation Standards?

Gaston A • Hands-on Workshop (75 min.) • General Biology • HS 2C 4C

Come learn about the section of the Next Generation Science Standards concerned with the practices of science. How is this similar and different from scientific inquiry? How does this approach relate to other recommendations such as those for AP® Biology and undergraduate biology education?

April Gardner and **Brooke Bourdélat-Parks,** BSCS, Colorado Springs, CO

Is Evolution Selfish?

Gaston B (Session I) • Paper (30 min.) • Evolution • HS 4C GA

Does natural selection promote selfishness? If so, how did cooperation and morality evolve? This paper updates you on research from the last few years about the evolution of trust and cooperation. Free CD with class presentation & images will be available.

Douglas Allchin, University of Minnesota, Minneapolis, MN

> "… I find myself among a community of like-minded colleagues that are devoted professionals to the teaching and learning of biology. The NABT Conference offers something for everyone and I leave the meeting each year with new resources, ideas, and conversations about biology that last the entire year."
>
> **Kim Sadler**
> member since 2007

Saturday November 3

11:30am – 12:45pm

continued

Using Primary Literature to Test Darwin's Principles of Natural Selection

Gaston B (Session II) • Paper (30 min.) • Evolution • HS 2C 4C

Readable primary literature can be used to evaluate the principles of the theory of natural selection. Instructional strategies for reading and analysis in general biology classes will be presented. Student responses and results will be discussed.

Mark Bland and **Ruth Bland,** University of Central Arkansas, Conway, AR

Human Physiology with Vernier

McMillan • Exhibitor Session • Physiology • JH

In this hands-on workshop, you will learn how easy it is to integrate Vernier technology into your Human Anatomy and Physiology curriculum. Activities from our *Human Physiology with Vernier* lab book will be performed using a variety of easy-to-use sensors, including our EKG Sensor and Hand Dynamometer. Come try our intuitive and innovative products, including our new LabQuest 2.

John Melville (jmelville@vernier.com) and **Mike Collins** (mcollins@vernier.com), Vernier Software & Technology, Beaverton, OR

The SAT Subject Test in Biology: A Useful Assessment Tool

Cumberland A • Paper (75 min.) • Instructional Strategies/Technologies • JH HS

The ETS test developers of the *SAT Subject Test in Biology* will explain how it is assembled and scored. Members of the Development Committee will explain how teachers can use both test results and pretest opportunities to improve their instruction.

Israel Solon and **Nancy Olds,** Educational Testing Service, Princeton, NJ, **Fred Holtzclaw,** The Webb School of Knoxville, Knoxville, TN and **David Hyink,** Shorcrest Preparatory School, St. Petersburg, FL

TECHNOLOGY IN TEXAS

Bioinformatics for Dummies

Cumberland B • Demonstration (75 min.) • Biotechnology • HS

Whether you are a novice or experienced user of bioinformatics tools and data bases, you will find a few helpful hints to share with your students. Go beyond BLAST, join the DNA Barcoding of Life Project, or design PCR primers for student research.

Randy Dix, Olathe Schools, Olathe, KS and **LB Fogt,** Olathe Schools, Overland Park, KS

Integrating Biodiversity Issues into an Evolution Classroom

Cumberland C • Hands-on Workshop (75 min.) • Evolution • HS 2C GA

Learn about how to engage students by integrating issues related to biodiversity and conservation into a standards-based evolution unit at the high school level. Take home classroom-tested strategies to use in your biology class.

Maia Willcox (mwillcox@berkeley.edu) and **Barbara Nagle** (bnagle@berkeley.edu), SEPUP/Lawrence Hall of Science, Berkeley, CA

Creating a Course in Socioscientific and Bioethical Issues

Cumberland D (Session I) • Paper (30 min.) • Bioethics • 2C 4C GA

Socioscientific & bioethical issues lend themselves to merging reasoning, real world issues and science/technology in order to involve our students in learning. What better way to bring home the content message and actually have fun in the process?

Sandra Latourelle, SUNY Plattsburgh, Plattsburgh, NY

Twelve Science Books All Biology Teachers Should Read

Cumberland D (Session II) • Paper (30 min.) • General Biology • JH HS GA

Twelve books from the last 60 years, a golden age of science writing, will be introduced and described. The choices will be personal, wide-ranging in subject matter, and suitable for students as well as biology teachers. Copies will be given away.

Peter Langley, Portland, OR

Focus on Success: Teaching Scanning Electron Microscopy at the Community College

Cumberland E • Symposium (75 min.) • General Biology • 2C 4C GA

A Scanning Electron Microscope (SEM) is a technological asset typically reserved for the sole use of graduate students or research faculty. Can the SEM serve as a catalyst for sparking interest in STEM disciplines? Is it an effective teaching tool?

Nickolas Butkevich, Schoolcraft College, Livonia, MI

Making Science Content Comprehensible for English Learners

Cumberland F • Demonstration (75 min.) • Instructional Strategies/Technologies • JH HS

Do you have questions about English learners who have reading or learning problems? Are these learners struggling academically in your classroom because of these problems? The presenter will share a tool - the SIOP Model - to address these problems.

Peter Mecca, George Mason High School, Falls Church, VA

Saturday November 3

No Cost, Hands-On Activities for Health Science Content

Cumberland G • Hands-on Workshop (75 min.) • Physiology • JH HS 2C

Student participation activities for functional anatomy/pathology of: 1) Heart Sounds - Murmurs, 2) Building an atheroma, 3) Smoker's CO poisoning - hypoxia - heart attack, 4) Ciliary wave – smoker's cough, 5) Smoker's black lungs, 6) etc.

Bob Burns, Ph.D. (burnsbob@uams.edu), University of Arkansas, College of Medicine, Little Rock, AR,

Place-based Collaboration STEM Studies: Tools and Tips

Cumberland H • Hands-on Workshop (75 min.) • Environment/Ecology • E JH HS

Learn how to set up a successful, scientific collaborative study. Motivate your students by combining biology, engineering and the outdoors with opportunities for student experimental design, data collection and analysis. Tools and tips provided.

Marcee Camenson and **Jean Carpenter,** City of Ft. Collins Utilities, Ft. Collins, CO and **Carol Seemueller,** Poudre School District, Ft. Collins, CO

Anatomy and Physiology: Techniques and Activities

Cumberland I • Hands-on Workshop (75 min.) • Physiology • JH HS GA

This presentation demonstrates techniques that make learning human anatomy and physiology both vivid and memorable. The presentation will highlight modeling, activities, games, and projects that appeal to a variety of learning styles and abilities.

Sylvia Tufts, Thornton HS District - Retired, Flossmoor, IL

DNA Sequencing in 3 Steps: Pop-it-beads to Personal Sequence

Cumberland J • Hands-on Workshop (75 min.) • Biotechnology • HS 2C 4C

Students learn how DNA sequencing is done by using a simple hands-on pop-it-bead exercise. Examples of real sequences are analyzed to identify an unknown gene. In the final step, students sequence a portion of their own mitochondrial DNA.

Paul DeLange, Kettering College, Kettering, OH

An Evolutionary Showcase from a New Intro Biology Curriculum

Cumberland K • Hands-on Workshop (75 min.) • Evolution • HS 2C 4C

Dive into a series of activities on the origin of birds developed as part of a new introductory biology curriculum. Participants will receive access to the full range of our inquiry-driven materials covering everything from ecosystems to genetics.

Deborah Donovan, Western Washington University, Bellingham, WA; **Irene Salter** and **Leslie Atkins,** California State University, Chico, Chico, CA; and **John Rousseau,** Whatcom Community College, Bellingham, WA

Investigating Ecological Disturbances Using Systems Biology

Cumberland L • Hands-on Workshop (75 min.) • Environment/Ecology • JH HS 2C

Explore eight lessons that teach general concepts of systems biology, microbiology and ecology. Introduce network concepts through hands-on lessons and a human disturbance case study, leading to a lab investigation and reverberating systems-wide effects.

Claudia Ludwig, Institute for Systems Biology, Seattle, WA

1:00pm – 3:00pm

NABT Honors Luncheon

$ Bryan Beeman • Special Event • $60

Help us salute the 2012 **NABT Award** recipients, including the winners of the **Outstanding Biology Teacher Award (OBTA).** We'll be celebrating 50 years of OBTA and you are invited to join us as we end the conference highlighting excellence in teaching by professionals that are an inspiration to us all.

"NABT is the only organization where I feel a common bond among all the members. We are all biology educators who strive for students to gain an understanding of biology while enjoying their learning."

Dawn Tamarkin
member since 2008