Moving from VISION to CHANGE: 21st Century Transformation of the Undergraduate Biology Classroom

8:45am – 4:00pm • Pegasus A

November 2 Friday

2012 NABT Faculty Professional Development Summit

Conference-wide Morning Plenary

8:45am – 9:45am — **Introduction** (Overview): Vision and Change
Dr. Shirley Malcom
Head, Education and Human Resources
American Association for the Advancement of Science

PROFESSIONAL DEVELOPMENT SUMMIT

10:00am – 4:00pm — Summit moderated by:
Dr. Jacqueline McLaughlin, The Pennsylvania State University
Dr. Anneke Metz, Southern Illinois University School of Medicine

10:00am – 10:15am — **Summit introduction** via Skype uplink
Dr. Bruce Alberts
Editor-in-Chief, Science, AAAS

10:15 am – 11:00am — **Introductory Biology Project**
Dr. Gordon Uno
University of Oklahoma

11:00am – 11:45am — **Science in the Classroom**
Dr. Melissa McCartney
Editorial Fellow, Science, AAAS

11:45am – 12:30pm — **Lunch break** – bring lunch back for Mini-Workshop

12:30pm – 1:00pm — **Improving Undergraduate Education: A National Perspective**
Dr. Jay Labov
National Research Council/National Academy of Sciences

1:00pm – 3:00pm — **Mini Workshop: From Vision to Change – Ideas for Implementation**
Interactive session featuring best practices for changing biology education in the classroom, laboratory and in the field.
Presented by:
Dr. Jay Labov, National Research Council/National Academy of Sciences
Dr. Susan Singer, Carleton College
Dr. Jacqueline McLaughlin, Penn State University
Dr. Anneke Metz, Southern Illinois University Carbondale
(Includes stretch break with light refreshments: tea/coffee and cookies)

3:00pm – 3:30pm — **Concluding remarks:**
The Role of NSF in Fostering "Vision and Change"
Dr. Jose Herrera
National Science Foundation
Call to Action
Drs. Jacqueline McLaughlin and Anneke Metz

3:30pm – 4:00pm — **Presentation by the Recipient of the 2012 Four-Year College & University Biology Teaching Award**
Dr. Annie Prud'homme-Généreux, Quest University Canada

4:00pm — Adjourn

Sponsored by:
The National Science Foundation

Friday November 2

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

BioClub Breakfast

Reunion Ballroom C • Special Event

The NABT BioClub just keeps growing, and new clubs are being added at high schools and community colleges throughout the year. Both *current and future* BioClub advisors are invited to participate in this informational meeting and networking function. Join the club (BioClub that is)!

Sponsored by Carolina Biological Supply Company.

Four-Year College & University Section Breakfast Meeting

$ Reunion Ballroom B • Special Event • $45

Get to know the Four-Year College & University Section over breakfast. The breakfast will include a Section Business Meeting and a special presentation of the *Four-Year College & University Biology Research in Teaching* and *Four-Year College & University Biology Teaching Awards.* The winners of the *Student Research Award* and *Student Travel Award* will also be announced.

Two-Year College Section Business Meeting and Breakfast Meeting

$ Reunion Ballroom A • Special Event • $45

Join the members of the Two-Year College Section for breakfast and the business meeting that will occur immediately following. The winner of the *Two-Year College Biology Teaching Award* will be honored as well. All two-year and community college educators are welcome to attend.

8:45am – 9:45am

GENERAL SESSION

Shirley M. Malcom, Ph.D.

Bio appears on page 8.

Re-thinking Biology Education from the Grassroots Up

Landmark Ballroom A-B • Special Speaker

What should our goals be for biology education in the 21st century? This question has been the subject of discussion and debate across a number of reform/transformation initiatives, including Vision and Change (V&C) and AP® Biology.

As Dr. Malcom will discuss, the need to transform biology education is not just a recently recognized challenge. Well over 20 years ago, the late science educator, Dr. Mary Budd Rowe estimated that there were more new terms introduced in a typical high school biology text than in the first two years of a foreign language. Introductory biology courses in colleges and universities have focused on coverage of topics, and these courses have led to a vicious cycle of "teach as we are taught."

In moving toward a goal of having "the biology we teach reflect the biology we do," Dr. Malcom will highlight how faculty have revisited the concepts to be taught, the skills and competencies to be emphasized and the changes that are needed to move biology education into the 21st century.

This presentation is featured as part of the NABT Faculty Professional Development Summit.

10:00am – 4:00pm

NABT FACULTY PROFESSIONAL DEVELOPMENT SUMMIT: Moving from Vision to Change: 21st Century Transformation of the Undergraduate Biology Classroom

Pegasus A • Special Program

Vision and Change in Undergraduate Biology Education: A Call to Action was written by leading scientists and educators to prepare the next generation of students for today's increasingly complex scientific world. NABT is proud to heed this call to "transform" the biology classroom by offering this innovative, NSF funded summit. Nationally recognized V&C leaders will focus on helping undergraduate biology educators implement real change.

See complete Summit details on page 37.

10:00am – 11:15am

INVITED SPEAKER

Robert Dennison

Bio appears on page 9.

A Guest Appearance by Charles Darwin

Reunion A-B • Special Speaker

Come see and hear Charles Darwin, the greatest biologist in history. Mr. Dennison's portrayals of Darwin have garnered much acclaim. Mr. Dennison will appear as Darwin, to discuss his life and works, with special emphasis on the voyage of H.M.S. Beagle and the development of the ideas presented in *The Origin of Species.* Time will be allowed for questions and photographs.

Sponsored by the Texas Association of Biology Teachers (TABT).

Friday November 2

10:00am – 11:15am

continued

HHMI's *The Making of the Fittest: Gene Switches and Evolving Bodies*

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

Join us for a bonus HHMI film premiere as we explore the genetics behind the evolution of body form. We will screen the film and distribute supporting classroom resources, including an exciting new virtual laboratory in which students compare living stickleback populations to their fossil ancestors and measure, record, and graph their results to discover evolutionary patterns.

Ann Brokaw, Rocky River HS, Rocky River, OH and **Laura Bonetta,** HHMI, Chevy Chase, MD

Smithsonian Presents: Evolution Using Early Human Skulls

Cotton Bowl • Demonstration (75 min.) • Evolution • JH HS 2C

Scientists/educators from the Smithsonian's Human Origins Program will present activities using early human skull casts with related online activities to teach evolution in classrooms. The set of skull casts will then be available to borrow via NABT.

Briana Pobiner (pobinerb@si.edu) and **Rick Potts** (pottsr@si.edu), Smithsonian Institution, Washington, DC

Bio-Rad: Forensic DNA Fingerprinting Kit (AP Big Idea 3) (Part 1 of 2)

Reverchon A • Exhibitor Session • Biotechnology • HS 2C 4C

Create a DNA Fingerprint and explore pattern variations in a forensics scenario. Extend this kit with a plasmid mapping activity that utilizes more sophisticated mathematical practices.

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

Smoking and Lung Cancer Microarray (Part 1 of 2)

Reverchon B • Exhibitor Session • Biotechnology • HS 2C

Gene expression differences between smokers, non-smokers and former smokers will be revealed by hybridizing a DNA chip using genes related to lung cancer and smoking.

Theresa A. Dlugi (t.dlugi@fotodyne.com), FOTODYNE, Hartland, WI

Life Science: Learning Biodiversity Through Hands-on, Probeware-based Activities

Sanger A • Exhibitor Session • Instructional Strategies/Technologies • HS

Explore lab activities from the Sally Ride Science™ series, you'll get hands-on experience with a state-of-the-art way to meet Life Science standards.

Mike Blasberg (sales@pasco.com), PASCO scientific, Roseville, CA

The Science of Play: Teaching Science with Interactive Games

Sanger B • Exhibitor Session • General Biology • HS 2C

Play with science through games & multimedia designed to help students understand concepts in an engaging environment. Learn how to deploy a free platform for discovery based learning & student assessment in your class & integrate interactive educational media in every aspect of teaching.

Jeremy Friedberg (jeremy@spongelab.com), Spongelab Interactive, Toronto, ON, Canada

Carolina Investigations™ for AP® Biology

Moreno A • Exhibitor Session • General Biology • JH HS 2C 4C

Looking for a seamless transition from old to new? Join us for a hands-on approach to inquiry in the new AP curriculum.

Carolina Teaching Partner (ashley.faucette@carolina.com), Carolina Biological Supply Company, Burlington, NC

Biology Science Starters

Moreno B • Exhibitor Session • General Biology • HS 2C

Use *Science Starters* as daily, teacher-directed bell-ringers in a whole-class setting or for independent student study, flip teaching, tutorials, RTI, vocabulary enrichment or bilingual support.

Kathy Reeves, Scientific Minds, LLC, Orange, TX

Committee Meeting: History Committee

Pryor- Crockett

Chair: Pat Waller

Human Physiology with Vernier

McMillan • Exhibitor Session • Physiology • HS 4C

Learn how to integrate Vernier technology into a 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.

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

TECHNOLOGY IN TEXAS

Don't Let the Fast of Education Technologies Get You Furious!

Cumberland A • Demonstration (75 min.) • Instructional Strategies/Technologies • JH HS 2C

From Online/Hybrid to Web-Facilitated biology courses! Blackboard to Moodle! Clickers to Smartboards! Educational Technologies are emerging fast and furious! Learn how to effectively integrate technology to develop dynamic instructional strategies.

Alnisha Simmons, Bermuda College, Warwick, Bermuda

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

Friday November 2

10:00am – 11:15am

continued

Sea of Sound: Oceanic Sound in the Classroom

Cumberland B • Hands-on Workshop (75 min.) • Oceanography/ Marine Biology • JH HS 4C

Dive with us beneath the waves to explore the rich diversity of underwater sounds. Investigate how marine animals make and use sound. Then explore sources and impacts of oceanic human sound with authentic data exercises, webquests and hands-on lessons.

Ellie Rice, Franklin & Marshall College, Lancaster, PA and **Susan Dodge,** New School of Lancaster, Lancaster, PA

Emerging Ecology and Infectious Diseases

Cumberland C • Exhibitor Session • General Biology• HS

Bird flu, Mad Cow and West Nile appear out of nowhere, demonstrating that relationships between hosts and pathogens are dynamic and changing. Grab students' attention and demonstrate the value of ecological concepts with stories of ongoing research in this thrilling field.

Joe Levine, Pearson, Upper Saddle River, NJ

Divide & Conquer: Strategies for Teaching Cell Division

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

Understanding the details of complex processes such as mitosis and meiosis can be difficult for students. We will provide resources, lab activities and instructional strategies to engage students in understanding various forms of cell division.

Kathy Kresge (kkresge@northampton.edu) and **Sharon Lee-Bond** (Slee-bond@northampton.edu), Northampton Community College, Bethlehem, PA

Digital Resources: "See" Blood-Typing at Molecular Level

Cumberland D (Session II) • Demonstration (30 min.) • General Biology • HS 2C 4C

Virtual interactive models help students "see" cellular, molecular, hereditary concepts like ABO / Rh blood types. Free resources presented help students use digital RBC models to conceptualize blood typing, transfusion reactions, and Rh incompatibility.

Carol Wake (carol.wake@sdstate.edu), South Dakota State University, Omaha, NE

Observing Beyond Our Senses: Inquiry Drives Technology

Cumberland E • Hands-on Workshop (75 min.) • Biotechnology • JH HS 2C

Explore 7 STEM lessons that introduce students to a Death Valley case study that cannot be answered without "new" technology. Students are then led through the process of developing the needed technology to confidently present their findings.

Claudia Ludwig, Institute for Systems Biology, Seattle, WA

Help Your Students Succeed in AP® Biology

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

Two experienced teachers share hints on how to implement and assess inquiry labs, develop skills in Science Practices, write better essays, and resources that will help. Join us for a lively session on transitioning to the new Curriculum Framework.

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

Using Nature to Teach ZZBiology (or Take Your Students Outside!!)

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

Combat student boredom! Come learn about many ways to engage students by using the environment to teach biological concepts. Enjoy learning by participating in some activities at the session. Find out how to access all activities on line.

Judy Jones, Chapel Hill Carrboro School, Chapel Hill, NC and **George Sellers,** Ware Shoals School District, Greenwood, SC

Dive In with Physical Models: Exploring Water and Protein Structure

Cumberland H • Hands-on Workshop (75 min.) • General Biology • JH HS 2C

Discover the physical and chemical properties of water using magnetic water molecules. Explore how these chemical principles of water influence protein structure using physical models. Participants will fold a protein, following basic principles of chemistry.

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

Darwin Makes Better Cars: Lessons Evolving Online Vehicles

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

Come see evolution in action as we share inquiry-based lessons that use the free, web-based software program *BoxCar2D* to teach evolution. *BoxCar2D* incorporates mutation, recombination, and selection to evolve vehicles in a digital environment.

Anne Royer (royerann@msu.edu), **Elizabeth Schultheis** and **Louise Mead,** Michigan State University, East Lansing, Michigan

BioQUEST Inquiry Labs for AP® Biology

Cumberland J • Hands-on Workshop (75 min.) • Instructional Strategies/Technologies • HS

One of the exciting aspects of the new AP® Biology Framework is the focus on the process of science. This workshop will focus

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on AP® Biology labs, demonstrating student centered guided inquiry labs and exploring ways to link labs to the four Big Ideas.

Kristin Jenkins, Brad Williamson, Stacey Kiser, Ethel Stanley, and **Sam Donovan,** BioQUEST, Madison, WI

DNA Subway in the Classroom

Cumberland K • Demonstration (75 min.) • Genetics • HS 2C 4C

Engage your students in discovering the principles of molecular biology while using the bioinformatics tools in *DNA Subway* (dnasubway.org) to find genes and compare genomes.

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

What About Humans? Hominid Evolution: Skull Volume Lesson

Cumberland L • Hands-on Workshop (75 min.) • Evolution • JH HS

Experience a two-part inquiry activity on human evolution through the study of hominid skull sizes. Discuss and share strategies for teaching evolution. Standards-based lesson and resource guide provided.

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

11:30am – 12:45pm

Continuation NABT FACULTY PROFESSIONAL DEVELOPMENT SUMMIT: Moving from Vision to Change: 21st Century Transformation of the Undergraduate Biology Classroom

Pegasus A • Special Program

Vision and Change in Undergraduate Biology Education – a summit focused on real solutions to transform undergraduate biology classrooms using inquiry and research-based biology curriculum.

See complete Summit details on page 37.

HHMI's *The Making of the Fittest: Natural Selection in Humans* in Your Classroom

Pegasus B • Hands-on Workshop (75 min.) • Evolution • GA

View HHMI's short film, *Natural Selection in Humans* and learn how Dr. Tony Allison discovered the link between sickle-cell disease and malaria. Relive the exciting journey that confirmed his hypothesis that the sickle-cell mutation provides protection against malaria. Participants will receive free, classroom-ready resources appropriate for all levels of biology.

Mary Colvard, STANYS, Deposit, NY

AP® Biology Open Forum

Cotton Bowl • Hands-on Workshop (75 min.) • Instructional Strategies/ Technologies • HS

Bring your questions and have them answered! This session will focus on the changes to the AP® Biology Course and Exam. An overview of the course, exam and labs will be presented. College Board instructional materials and professional development opportunities will be highlighted as well.

Gordon Uno, University of Oklahoma, Norman, OK, **Sharon Radford,** The Paideia School, Atlanta, GA and **Elizabeth Cowles,** Eastern Connecticut State University, Willimantic, CT

Bio-Rad: Forensic DNA Fingerprinting Kit (AP Big Idea 3) (Part 2 of 2)

Reverchon A • Exhibitor Session • Biotechnology • HS 2C 4C

Create a DNA Fingerprint and explore pattern variations in a forensics scenario. Extend this kit with a plasmid mapping activity that utilizes more sophisticated mathematical practices.

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

Smoking and Lung Cancer Microarray (Part 2 of 2)

Reverchon B • Exhibitor Session • Biotechnology • HS 2C

Gene expression differences between smokers, non-smokers and former smokers will be revealed by hybridizing a DNA chip using genes related to lung cancer and smoking.

Theresa A. Dlugi (t.dlugi@fotodyne.com), FOTODYNE, Hartland, WI

Enhancing Microscope Labs with Image Analysis & Data Collection

Sanger A • Exhibitor Session • General Biology • HS 2C

Discover how much easier teaching and assessing students in microscope labs can be by doing classic labs with SPARK Science and Ken-a-Vision digital microscopes.

Mike Blasberg (sales@pasco.com), PASCO scientific, Roseville, CA

Committee Meeting: Long Range Planning

Pryor-Crockett

Chair: Todd Carter

Biology Basics with Vernier

McMillan • Exhibitor Session • General Biology • HS

In this hands-on workshop, you will learn how to integrate Vernier technology into your biology class. Activities from our *Biology with Vernier* lab book will be performed using a variety of easy-to-use sensors, including our Gas Pressure Sensor and CO_2 Gas Sensor. 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

> "NABT is the organization that best represented my profession as a biology educator, but I maintain my membership for a host of reasons. The organization is made up of my colleagues and more importantly by many of my friends. It continues to keep me abreast of the best practices in biology education."
>
> **Alton Biggs**
> member since 1979
> & Honorary Member
> since 1994

Friday November 2

11:30am – 12:45pm

continued

Introductory Biology: Training Majors to be Scientists

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

In our recently created majors-only introductory biology labs, we created and redesigned labs to focus on building technical and critical thinking skills and practicing data generation, presentation, description, and interpretation.

Nickie Cauthen, Melinda Pomeroy-Black and **Sarah Beth Mallory,** LaGrange College, LaGrange, GA

The State of Cheating (Academic) in America

Cumberland A (Session II) • Demonstration (30 min.) • Curriculum Development/Supervision • GA

Ninety five percent of high school students admit they participated in some form of cheating. Clearly this suggests an epidemic in American education. The methods and reasons used by students to cheat will shock and amaze.

Michael Battaglia, Greenville Technical College, Greenville, SC

National Geographic's High School Marine Ecology Curriculum

Cumberland B • Hands-on Workshop (75 min.) • Oceanography/ Marine Biology • HS

Experience National Geographic's FREE multimedia high school ecology unit: "Marine Ecology, Human Impacts, and Conservation", developed with classroom testing and input from 60 biology teachers. The activities feature NatGeo videos, photos, and maps.

Kim Houtz, Marysville, KS; **Samantha Zuhlke, Julie Brown,** and **Mary Ford** (mford@ngs.org), National Geographic Society, Washington, DC

Investigating the Environment's Influence on Gene Networks

Cumberland C • Hands-on Workshop (75 min.) • Microbiology & Cell Biology • HS 2C

An intro to lessons used to teach the concepts of gene and protein networks, multi-level data analysis, microbiology, biotechnology, and systems biology. Students act as collaborative scientists and design their own experiment. Free cultures provided.

Claudia Ludwig, Institute for Systems Biology, Seattle, WA

Hook Line and Sinker: How to Reel Your Students In

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

Who is in charge, you or the students? Is your classroom a place of rebellion/frustration for you and students, or is it teacher facilitated and student-centered? Come discover the style that engages students and lets them know you truly care.

Diane Dabney, Dabney Consulting, Victoria, TX

Mastering Biology Content with the Art of Investigation

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

Ensure student mastery of biology content with the art of investigation using classroom ready activities that give students the opportunity to design and conduct authentic research projects within in the parameters of proper experimental design.

Brittany Stanford, Center for the Integration of Science Education and Research (CISER) – Texas Tech University, Lubbock, TX

Introduce Exercise Physiology into your Anatomy Class

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

The PIT Crew Program: Physicians In Training prepares your students for a career in healthcare through community partnerships, clinical trial design, physiology probeware use, and even an after-school book club.

Stephen Biscotte (sbiscotte@rcs.k12.va.us), Roanoke County Schools, Roanoke, Virginia

Assembling Models as an Exploratory Phase of the 5E's

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

Reading or listening to someone read descriptive passages allows for guided visualization occasions to assess student's prior knowledge. Join me to discuss methods & techniques.

Sandra Latourelle, SUNY Plattsburgh, Plattsburgh, NY

How to Achieve High Test Scores in Urban Schools!

Cumberland H • Hands-on Workshop (75 min.) • General Biology • HS 4C GA

State biology test scores of 96% basic and higher in urban LA! We'll demonstrate/share proven brain research-based strategies to improve motivation, retention, and success for all. Genetics resources provided!

Gerard Vargas, Green Dot Public Schools, Hawthorne, CA and **Mark Friedman,** Animo High School, Inglewood, CA

The Effects of Avida-ED on Student Learning of Natural Selection

Cumberland I (Session I) • Paper (30 min.) • Evolution • HS 2C 4C

We report on the conclusions of a study of the effectiveness of classroom inquiry using digital evolution software on students' understanding of natural selection. The study was

conducted with high school juniors during the 2011-2012 school year.

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

My Sister is a Polar Body

Cumberland I (Session II) • Paper (30 min.) • General Biology • GA

This true case study develops the transition between meiosis and transmission genetics. Participants will be asked to examine evidence to determine what meiosis products could lead to traits evident in twin girls with a surprising result.

Jean DeSaix and **Peter DeSaix,** University of North Carolina, Chapel Hill, NC

Hybrid Biology Classes and the Flipped Classroom: The Best of Both Worlds

Cumberland J • Paper (75 min.) • Instructional Strategies/Technologies • HS 2C 4C

What happens when students take charge of their own learning using online resources, without giving up face-to-face interactions and on-campus labs? Can hybrid classes match the academic rigor of traditional classes? Come and find out!

Caroline McNutt and **Bonnita Taylor,** Schoolcraft College, Livonia, MI

20 in 20

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

Come learn about and try twenty 20-minute activities to put the inquiry back in biology! The activities are geared towards AP but can be adapted for any level. Make your lessons more student-centered with these engaging and cost effective activities.

Whitney Hagins, Lexington High School, Lexington, MA

TECHNOLOGY IN TEXAS

Integrating Bioinformatics in Introductory Biology Classes

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

Learn how to integrate basic bioinformatics concepts and tools into introductory biology classrooms using a case study about genetic testing for breast cancer. Receive our 7-lesson, NSF-funded curriculum on CD.

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

11:30pm – 1:45pm

Lunch Break in the Exhibit Hall

Marsalis Ballroom • Cash & Carry Lunch Available

12:00pm – 1:45pm

TABT Luncheon

Monduel's • Special Event

There is no better way to enjoy the NABT Conference in Dallas than to join our friends from the Texas Association of Biology Teachers (TABT) for lunch. They won't hold it against you too much if you aren't from the lone star state, and everyone is invited.

1:00pm – 1:45pm

Regional, State, & Province Leadership Luncheon

Marsalis Ballroom

Calling all regional coordinators, state/province reps, OBTA directors, affiliate chairs and other "local leaders" from NABT. Grab your lunch and head to this meeting of the minds as we make plans for 2013!

1:00pm – 5:00pm

Evolutionary Transformations: The Legacies of Two Influential Scientists on Evolutionary Thought

Pegasus B • Special Program

This year's symposium will highlight the impact of two transformational thinkers in evolutionary biology who died in 2011: Lynn Margulis and Jim Crow.

Introductions and Welcome to the 2012 NABT Evolution Symposium

(1:00pm – 1:15pm)

Robert Pennock, Michigan State University and BEACON Center for the Study of Evolution, East Lansing, MI

Six Major Transitions of Evolutionary Thought

(1:15pm – 2:00pm)

This talk will highlight six major transitions of evolutionary thought, situating each in its historical moment of emergence and describing its continuing role in research.

Lynn K. Nyhart, University of Wisconsin - Madison, Madison, WI

Natural History as the Ground Truth for Molecular Biology

(2:00pm – 2:45pm)

Traditional practices meet new technology and the combination yields new insights into the biological world and the process of evolution

Betsey Dexter Dyer, Wheaton College, Wheaton, IL

Mutation, Sex and Genomic Evolution

(3:00pm – 3:45pm)

Mutation ultimately drives all evolutionary change and therefore plays a fundamental role in understanding classic questions. Where is genomic technology taking us now?

Patrick Phillips, University of Oregon, Eugene, OR

Friday November 2

"... it is the best way to keep learning about what is happening in biology education. The journal and yearly conference give me valuable information about the field of natural science and current practices in teaching. I gladly share activities with my courses that I originally found in *ABT* or at the conference."

William Kroen
member since 1994

Friday November 2

1:00pm – 5:00pm

continued

The Unexpected Practical Applications of Evolutionary Biology

(3:45pm – 4:30pm)

The work of James Crow and Lynn Margulis has fueled many practical applications of evolutionary biology, impacting both our society and our planet.

David Hillis, Ph.D., University of Texas, Austin, TX

Final Thoughts and Wrap Up

(4:30pm – 5:00pm)

The 2012 NABT Evolution Symposium is sponsored by AIBS, NESCent, and BEACON

2:00pm – 3:15pm

INVITED SPEAKER

Stephen Secor, Ph.D.

Bio appears on page 9.

The Python: Mystery of Nature, Model of Science

Reunion Ballroom A-B • Special Speaker

Pythons possess an unprecedented capacity to alter their physiological performance during the digestion of a meal. Upon the completion of digestion, pythons shut down their digestive tracts to conserve energy during bouts of fasting. Feeding triggers the rapid growth of tissues and organs, dramatic increases in metabolic rate and blood flow, and the initiation of digestive processes. During this talk, Dr. Stephen Secor of the University of Alabama will discuss the adaptive interplay between snake feeding habits and digestive physiology, why snakes vary in their responses to feeding and fasting, and the existence of this relationship among reptiles and amphibians will be described. The Burmese python is used as a model to examine mechanisms of cardiac hypertrophy and microvillus lengthening, to explore the dynamics of gut bacteria, and to discover a novel process that removes ingested calcium.

Sponsored by the American Physiological Society

Continuation NABT FACULTY PROFESSIONAL DEVELOPMENT SUMMIT: Moving from Vision to Change: 21st Century Transformation of the Undergraduate Biology Classroom

Pegasus A • Special Program

Vision and Change in Undergraduate Biology Education – a summit focused on real solutions to transform undergraduate biology classrooms using inquiry and research-based biology curriculum.

See complete Summit details on page 37.

BSCS Presents: Designing Effective Professional Development [AP Bio Emphasis]

Cotton Bowl • Special Session• General Biology • HS

This session is designed to provide information and time for you to explore the characteristics of effective professional development and become familiar with a design framework for effective professional development.

Janet Carlson and **Brooke Bourdélat-Parks,** BSCS, Colorado Springs, CO

This session is presented as part of the BSCS & NABT AP Biology Leadership Academy.

Bio-Rad: Engineer the Tools for Inquiry of Food Dyes (Part 1 of 2)

Reverchon A • Exhibitor Session • Biochemistry • HS 2C 4C

What's in your candy? Extract and identify food dyes from candy by separating them on a DIY electrophoresis box. Integrate STEM, biotech and chemistry!

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

Introduction to *Drosophila* with Carolina™ Easy Fly™

Moreno A • Exhibitor Session • Genetics • JH HS 2C 4C

Whether you are a seasoned vet or a newcomer to *Drosophila,* Carolina's Easy Fly system will change the way you approach genetics in your classroom.

Carolina Teaching Partner (ashley.faucette@carolina.com), Carolina Biological Supply Company, Burlington, NC

AP® Biology: BIOZONE'S NEW Workbooks for the New Curriculum

Moreno B • Exhibitor Session • General Biology • JH HS 2C 4C

BIOZONE's authors describe how these new books are written specifically to address the four big ideas in AP® Biology. A thematic, interdisciplinary approach utilizing contextual examples and case studies encourages understanding of core content. Attendees receive FREE copies.

Tracey Greenwood and **Richard Allan,** BIOZONE International Ltd, Hamilton, New Zealand

Committee Meeting: Professional Development Committee

Pryor-Crockett

Chair: Catherine Ambos

Committee Meeting: Nominating Committee

Kessler

Chair: Betsy Ott

Biology Basics with Vernier

McMillan • Exhibitor Session • General Biology • HS 2C

In this hands-on workshop, you will learn how to integrate Vernier technology into your biology class. Activities from our *Biology with Vernier* lab book will be performed using a variety of easy-to-use sensors, including our Gas Pressure Sensor and CO_2 Gas Sensor. 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

Friday November 2

Collecting Carbon Cycle Data With *GLOBE*

Cumberland A • Demonstration (75 min.) • Environment/Ecology • JH HS 4C

We describe our efforts to engage various student populations in scientific investigations in a longleaf pine preserve in the Southeastern U.S. using GLOBE protocols and the new "Investigating the Carbon Cycle in Terrestrial Ecosystems".

Sherry Herron, Jennifer Robertson and **Laila Ali,** University of Southern Mississippi, Hattiesburg, MS; **Chad Garrick,** Jones County Junior College, Ellisville, MS, and **Monica Moss Watkins,** University of Southern Mississippi, Cottleville, MO

TECHNOLOGY IN TEXAS

Case It! - An Effective System for Case-Based Learning in Molecular Biology

Cumberland C • Demonstration (75 min.) • Microbiology & Cell Biology • HS 2C 4C

Case It! A NSF-sponsored project to provide molecular biology computer simulations and associated cases to the educational community, free of charge.

Mark Bergland (mark.s.bergland@uwrf.edu) and **Karen Klyczek,** River Falls, WI

iBiology: Online Biology Videos for the Classroom

Cumberland D (Session I) • Demonstration (30 min.) • General Biology • HS 2C 4C

iBiology is a free online collection of biology videos ranging from short stories about scientific discoveries to full-length science seminars. Here, we will describe our video and assessment resources for using *iBiology* in the classroom.

Sarah Goodwin (sgoodwin@ascb.org), iBioSeminars, San Francisco, CA

All Your Eggs in One Basket: Flu Vaccines Adapting to Change

Cumberland D (Session II) • Demonstration (30 min.) • Biotechnology • JH HS 2C

Only the fragile chicken egg stands between the next flu pandemic and us. Learn how the production of the flu vaccine is poised to change dramatically, pushing the industry to adopt cell based vaccine methods and to seek out a universal flu vaccine.

Diana Brandner (dbrandner@matcmadison.edu), Madison Area Technical College, Madison, WI and **Diane Catron** (dcatron@comcast.net), Santa Fe Prep School, Santa Fe, NM

Teaching Big Idea 3 in AP® Biology with Three Proteins

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

AP® Biology teachers are working hard to promote conceptual understanding and student directed labs. Come find how three proteins can pull together all the topics in Big Idea Three in an exciting and engaging way.

Diane Sweeney (dsweeney@punahou.edu) and **Mike Judge** (mjudge@punahou.edu), Punahou School, Honolulu, HI

Geniverse: Engaging Students with Genetics Through Dragons!

Cumberland F • Hands-on Workshop (75 min.) • Genetics • HS

Picture this: instruction incorporating meaningful technology, science teaching best practices, and skills of scientific practice while deeply engaging students with genetics content. Visit http://bit.ly/geniverse. Find us for more. Bring laptops!

Frieda Reichsman (Freichsman@concord.org), The Concord Consortium, Concord, MA and **Lisa Marchi** (lmarchi@mmsa.org), Maine Mathematics and Science Alliance, Augusta, ME

Learning Bioenergetics: Cell Respiration & Photosynthesis

Cumberland G • Demonstration (75 min.) • Instructional Strategies/Technologies • HS 2C 4C

The purpose of this session is to provide the participant with an overview of the bioenergetic processes and the current understanding of the dynamic processes that occur in the mitochondrion and photosynthesis. Modules will be provided.

John Moore (jhmoore@taylor.edu), Taylor University, Upland, IN

A Focus on Cancer

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

Incorporate lessons and activities surrounding this free, rich video resource and bring meaningful real-world examples into your classroom discussions of cell division, cell cycle regulation, cancer diagnosis and therapies.

Madelene Loftin (mloftin@hudsonalpha.com) and **Jennifer Carden** (jcarden@hudsonalpha.com) HudsonAlpha Institute for Biotechnology, Huntsville, AL

ARKive School Museum: Turning Students into Species Experts

Cumberland I • Demonstration (75 min.) • Environment/Ecology • E JH HS

By combining biodiversity knowledge with museum strategies, the innovative "ARKive School Museum" program guides teachers and students in creating their own school-based museum exhibits about threatened species which are shared with their community.

Liana Vitali (liana.vitali@wildscreenusa.org), ARKive, Washington, DC

"I belong to NABT for many reasons: to network with and to be mentored by dedicated biology educators, to engage in professional development opportunities at the annual and regional conferences, and to have access to diverse resources (e.g., website, publications) that provide me ideas to enhance the learning experiences of my students with different teaching strategies."

Sharon Lee Bond
member since 2002

Friday November 2

2:00pm – 3:15pm

continued

Genomics and Personalized Medicine: Teaching Tomorrow's Science

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

We can now sequence a patient's entire genome for less than $1,000. This workshop will present a collection of hands-on physical models and instructional tools that explore this new DNA sequencing technology and its impact on personalized medicine.

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

Bioinformatics for Every Biology Student

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

Learn how students can use sophisticated databases to answer biological questions. We will share lessons and demonstrate how bioinformatics can be incorporated in every biology class. Handouts provided. Resources at: teachingbioinformatics.fandm.edu

Ellie Rice, Franklin & Marshall College, Lancaster, PA; **Susan Dodge,** New School of Lancaster, Lancaster, PA, and **Tara Flick,** Conestoga Valley High School, Lancaster, PA

3:30pm – 4:45pm

Continuation NABT FACULTY PROFESSIONAL DEVELOPMENT SUMMIT: Moving from Vision to Change: 21st Century Transformation of the Undergraduate Biology Classroom

Pegasus A • Special Program

Vision and Change in Undergraduate Biology Education – a summit focused on real solutions to transform undergraduate biology classrooms using inquiry and research-based biology curriculum.

See complete Summit details on page 37.

Continuation Evolutionary Transformations: The Legacies of Two Influential Scientists on Evolutionary Thought

Pegasus B • Special Program

This year's symposium will highlight the impact of two transformational thinkers in evolutionary biology who died in 2011: Lynn Margulis and Jim Crow.

The 2012 NABT Evolution Symposium is sponsored by NESCent, BEACON, and AIBS.

BSCS Presents: Introducing Inquiry into AP® Biology Laboratories

Cotton Bowl • Special Session • General Biology • HS

The new AP® Biology laboratory manual focuses on student-directed investigation and inquiry. Come experience a lab that uses this approach and learn more about what it means to facilitate an inquiry-based lab. You will also consider how to best support students in this kind of lab experience.

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

This session is presented as part of the BSCS & NABT AP Biology Leadership Academy.

Bio-Rad: Engineer the Tools for Inquiry of Food Dyes (Part 2 of 2)

Reverchon A • Exhibitor Session • Biochemistry • HS 2C 4C

What's in your candy? Extract and identify food dyes from candy by separating them on a DIY electrophoresis box. Integrate STEM, biotech and chemistry!

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

AUTOPSY: Forensic Dissection Featuring Carolina's Perfect Solution® Pigs

Moreno A • Exhibitor Session • General Biology • JH HS 2C 4C

Revitalize your mammalian structure and function activity with a "real" classroom autopsy. Dissect a Carolina's Perfect Solution pig modeling the protocols of a forensic pathologist.

Carolina Teaching Partner (ashley.faucette@carolina.com), Carolina Biological Supply Company, Burlington, NC

Junkyard Digestion

Gaston A • Hands-on Workshop (75 min.) • Physiology • JH HS

Explore digestive physiology using this teacher developed hands on inquiry lesson, view resources developed by teachers and scientists, and learn about a year-long professional development fellowship opportunity with APS.

Margaret Shain (mshain@the-aps.org), American Physiological Society, Bethesda, MD; **Robert Manriquez,** Stanley High School, Logansport, LA, and **Stephen Secor,** University of Alabama, Birmingham, AL

Committee Meeting: Membership Committee

Pryor-Crockett

Chairs: Sherry Annee and **Sue Trammell**

Committee Meeting: Constitution & Bylaws Committee

Kessler

Chair: Ann Lumsden

Investigate Biology through Inquiry with Vernier

McMillan • Exhibitor Session • General Biology • HS 2C 4C

In this hands-on workshop, you will learn how easy it is to integrate inquiry activities and Vernier technology into your AP, IB, or college biology curriculum. Activities from

our new *Investigating Biology through Inquiry* lab book will be performed using a variety of easy-to-use sensors, including our SpectroVis Plus spectrophotometer. 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

Preparing for NABT's 75th Anniversary

Cumberland A • Hands-on Workshop (75 min.) • Instructional Strategies/Technologies • GA

In 2013, NABT celebrates its 75th Anniversary. As we put the final touches on our plans, come offer some suggestions. We will present a slide show: *NABT's Past, Planning for the Future.* Come to this session to learn about next year's celebration!

NABT History Committee

Integrating Bioethical Case Studies into the Science Curriculum

Cumberland C • Hands-on Workshop (75 min.) • Bioethics • JH HS

Participants will practice effective strategies for incorporating bioethics into their curriculum. They will participate in sample activities and learn how to design a unit of their own to enhance their students' interest and understanding.

Terry Maksymowych (tmaksymowych@ndapa.org), Academy of Notre Dame de Namur, Villanova, PA

Do Plants Forage for Food? Roots Do!

Cumberland D (Session I) • Paper (30 min.) • Botany & Microbiology • HS 2C 4C

I explain how students can grow plants in glass cylinders to see that roots grow more in soil than in perlite. They can measure the growth, test hypotheses, and control for statistical artifacts.

Stanley Rice, Southeastern Oklahoma State University, Durant, OK

Miracle Berries: Protein Chemistry of Signal Transduction

Cumberland D (Session II) • Demonstration (30 min.) • General Biology • 2C 4C GA

Participants will be invited to try miraculin, a glycoprotein extracted from the "miracle plant" *Synsepalum dulcificum*. When eaten, miracle berries make sour foods taste sweet. Hints for incorporating miracle berries into class will be presented.

Eric Simon (esimon@nec.edu), New England College, Henniker, NH

Investigating the Biology of Circadian Rhythms

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

Come explore hands-on activities addressing core science concepts within real-world contexts relevant to students' lives. Free NIH-funded SEPA curriculum materials will be distributed.

Kristen Talbot (ktalbot2@illinois.edu), **Hillary Lauren, Chandana Jasti, Robert Wallon** and **Barbara Hug** (bhug@illinois.edu) University of Illinois at Urbana-Champaign, Urbana-Champaign, IL

Biology at a Distance - What About Labs?

Cumberland E • Hands-on Workshop (75 min.) • General Biology • 2C 4C

Although your students aren't on campus, they can still perform experiments and analyze data. Join us to experience some lab activities that distance learning students can complete without the need for a traditional laboratory setting.

Cassandra Moore-Crawford (moorecm@pgcc.edu) and **Mimi Bres,** Prince George's Community College, Largo, MD

"NABT provides student members with several opportunities to have ongoing discussions with other students and full members from all sections about teaching biology. As a student and as future educators, it's nice to know we have such tremendous support and a community that values and encourages our ideas and appreciates our membership."

Anna Hiatt
member since 2009

Friday November 2

3:30pm – 4:45pm

continued

Food for 9 Billion: Can Science and Politics Feed the World?

Cumberland G • Hands-on Workshop (75 min.) • General Biology • JH HS 4C

Use recent radio and tv stories as your launching pad for data-rich exercises that help students learn more about nutrition, agriculture, famine, and how to feed the world. Handouts provided. Online resources demonstrated.

Ellie Rice, Franklin & Marshall College, Lancaster, PA; **Susan Dodge,** New School of Lancaster, Lancaster, PA, and **Tara Flick,** Conestoga Valley High School, Lancaster, PA

Let's Get Helical: Exploring DNA with Interactive Physical Models

Cumberland H • Hands-on Workshop (75 min.) • General Biology • JH HS 2C

Explore DNA structure and information storage with an interactive, magnetic DNA model and a paper bioinformatics exercise focusing on the beta subunit of hemoglobin. These materials emphasize how a sequence of nucleotides in DNA encode a sequence of amino acids in a protein.

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

Using Issues to Teach Ecosystem and Population Dynamics

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

Learn how to integrate sustainability issues such as fisheries management and invasive species into ecology and population dynamics lessons as demonstrated in *Science and Global Issues: Biology.*

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

TECHNOLOGY IN TEXAS

Take Your Biology Class to the Cloud

Cumberland J • Demonstration (75 min.) • General Biology • HS 2C GA

This presentation will offer ideas to maximize student learning experiences through unique digital exercises, concept extensions, online homework, or stand-alone lessons. Blend traditional methods with online practices that students can access anytime.

Amy Bridges (abridges@dcccd.edu), **Colleen Ambler-Biles** (jca2460@dcccd.edu), **Phil Shelp** (pshelp@dcccd.edu), and **Randy Malone** (rmalone@dcccd.edu), CFBISD/DCCCD, Carrollton/Dallas, TX

Silencing Genomes

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

Using RNA interference, students can "silence" virtually any gene at will in the nematode *C. elegans* and develop hands-on an understanding of gene function.

Bruce Nash, DNA Learning Center, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY

The Science and Ethics of Animals in Research

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

Why do scientists use animals? What are the ethical considerations? Engage in practical lessons that bring this challenging issue into the science classroom. Receive our NIH-funded 5-lesson unit on CD.

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

4:45pm – 6:00pm

NABT Graduate Student Panel: CV Workshop

Pegasus A • Special Symposium

How will your CV stack up to the competition? What are your strengths and weaknesses when it comes to getting that first job? Come join a panel of faculty experts to review and critique your CV. You will be able to sit down one-on-one with a faculty member and have your questions answered! Please bring an electronic or paper copy of your CV.

6:00pm – 7:00pm

Pre-BELS Cocktail Reception

Reunion Ballroom Foyer • Special Event • Cash Bar

Even if you're not going to the BELS Benefit Dinner, you may want to grab a drink and visit with some friends. Besides, you never know who you could rub elbows with.

7:00pm – 10:00pm

BELS Benefit Dinner featuring Michael Pollan

$ Reunion A-C
Special Event • $105

NABT is proud to feature best-selling author and journalist Michael Pollan during a special dinner event benefiting the NABT Biology Educator Leadership Scholarship (BELS). Mr. Pollan is the author of titles including *The Botany of Desire, The Omnivore's Dilemma,* and *Food Rules.* He will be awarded the 2012 NABT Distinguished Service Award.

Join us as Pollan talks about his books, your dinner, and whatever else comes to mind at this informal event. Questions from the audience are encouraged, and bring your books for a private signing to follow.

See his bio on page 10.

The Biology Educator Leadership Scholarship (BELS) is made possible through the generous support of PASCO scientific and NABT member donations. The dinner speaker is made possible with consideration from BSCS.