



# The Nucleus

*Official Quarterly Newsletter of the  
Texas Association of Biology Teachers*

Volume 15, Issue III

Winter, 2002

## From the President:

FALL! The leaves in East Texas are beginning to reveal their vivid colors. The red, orange, and yellow in the countryside, and the cooler and shorter days providing relief from the heat of summer, make this season one of my favorites.

FALL! The time of the year when a new school year is well underway, and we again go about dealing with the everyday rigors of teaching biology to our students.

We have an opportunity to begin again with that new group of young people who will shape our world in the future. The question is if we all begin again, or do we continue that which we have done in the past? If, indeed, what we have done in the past has been successful, then we should be doing just fine with a few modifications to allow for differences in the students we have today. If, on the other hand, what we have done in the past has *not* been as successful as we would like it to have been, then it is time for us to find some new ways of doing what it is that we do.

FALL! It is this time of the year when we also think about our professional responsibilities. When you read this piece, I will have returned from representing TABT at the NABT Convention in Cincinnati and from CAST in El Paso. I know that El Paso is a long way for those of us who live in the eastern part of the state, and if attending CAST was not possible, consider the benefits of membership in STAT and more specifically, NABT, of which TABT is an

affiliate. *The American Biology Teacher*, NABT's journal, consistently provides new information and ideas that can be used immediately in the classroom.

FALL! The time of the year when new leadership is elected. Robert Dennison will assume the role of President for 2003 and our new President-elect will be Dan Wivagg. I would like to say to all members that it is YOU, the members, that make TABT strong. When I have called upon people to serve on committees or to take care of the incidental items in the business of TABT, I have been met with complete cooperation. I would like to take this opportunity to tell you that I have completely enjoyed serving as President of TABT this year. I wish Robert Dennison the best as he enters his year as your TABT President and to all the others who have tirelessly helped me, a big THANK YOU from the bottom of my heart.

## Inside this issue:

**pg. 2: CAST - El Paso**

**pg. 3: OBTA award winners**

**pg. 4-5: Basic genetics activity:**

*Fundamentally Genetics*

**pg. 6: Conservation Education**

**pg. 6: new BSCS module**

**pg. 7: 2003 workshops from Science  
Kit & Boreal Labs**

# CAST - El Paso: A Great Success

**By Debbie Richards**

The annual TABT meeting was held at CAST in El Paso. We had a great luncheon speaker (Jerry Johnson, UTEP herpatologist) and gladly won twenty-six door prizes which had been secured by our president, Keith Watson.

Keith himself received a plaque and a copy of Stephen Jay Gould's book, "The Structure of Evolutionary Theory" in appreciation for his work as TABT president.



*Robert Dennison presents thank you gifts to Keith Watson in honor of his tenure as President of TABT.*

Several items were discussed in the executive and general business meetings:

\*Given that an adoption year is approaching, TABT will ask publishers to include our TABT flyer in the information mailed out to the schools by the textbook companies in the spring and fall. Alton Biggs suggests this strategy to both increase awareness about TABT and increase our membership with little expense incurred.

\*A TABT t-shirt is being designed and should be available for purchase at next year's CAST in Houston.

\*TABT members, Anita Gordon and Debbie Richards will put together a TABT Drive-in Workshop for the 2003 summer. This will be an excellent opportunity for our organization to hear from some excellent speakers and to hear from the textbook publishers. Look for more informa-

tion in the next *Nucleus* and on our weekly updates.

\*Irene Pickhardt, from TEA spoke briefly to the group. She reminded members that TABT efforts rallied support for the addition of biology books to the 2001 proclamation. We were encouraged to work to insure the adoption of quality materials. Nomination forms for the biology adoption committee. were provided. Irene encouraged nominees to secure the backing of their legislator or state Board of Education member because that support means you are more likely to be selected to serve.

Irene further explained that in the field tests the biology TAKS objectives 2 & 3 came in lower than the IPC 4 & 5 which was unexpected. She recommended that science teachers make an overt effort to integrate biology with physical science whenever possible in both IPC and Biology. Further, she explained that teachers can access "the official" definitions of precision and accuracy.

\*The election committee chairperson, Susan Cory, reported that Dan Wivagg is the president elect. Susan thanked the election committee members for their help in the election process.

\*Robert Dennison was introduced as the new president. Robert presented Keith Watson with a plaque and a book on behalf of TABT thanking Keith for his work as president.

\*Robert also serves as awards committee chairperson. During our CAST luncheon, he presented the Outstanding Biology Teacher Award to Kathyrn Leatham and the TABT Outstanding Biology Teacher Award to Susan Coffey. Congratulations ladies!

**Mark your calendars for  
CAST 2003 in Houston.....  
October 30 - Novembewr 1st**

# Scenes from the OBTA Presentations

Much excitement was evident as NABT and CAST honored two outstanding teachers during their 2002 luncheons. The NABT Outstanding Biology Award this year went to **Katherine Leatham** of The Kinkaid School in Houston.



When contacted about her reaction to this honor, Katherine wrote: "I came to Texas 25 years ago from the East Coast not knowing a bluebonnet from a piece of Town

Mountain granite! Through summer continuing education opportunities in the Texas University system especially at Texas A & M, I grew academically and was inspired by the enthusiasm and passion science teachers of Texas (there are so many!) have for the discipline and their students.



*Katherine Leatham with Robert Dennison, Katherine's department chair, at the Kinkaid School in Houston.*

Furthermore, I was encouraged by the fact that educators from public and private institutions share common values and goals. It is a great honor to be recognized by so many esteemed professional colleagues. I accept the honor with humility knowing that there is much work still to be done."

Katherine was accompanied to the ceremony by her daughter. There, Katherine was presented a pair of binoculars by Ken Miller of Prentice Hall, and a microscope by a Leica representative.



**Sandra Coffey** of Cypress Springs High School received TABT's Outstanding Biology Teacher Award.



*TABT's Outstanding Biology Teacher for 2002, Sandra Coffey of Cypress Springs High School, with the Science Coordinator of Cy-Fair ISD, Charlotte Burns; taken at the TABT Luncheon during CAST El Paso.*



*Sandra Coffey with the Principal of Cy-Springs High School, Ms. Sarah Harty; taken at the TABT Luncheon, CAST.*

## **Spider Silk from Goat's Milk?**

Silk-producing genes from spiders have been inserted in goat eggs to produce a goat that secretes silk in its milk. The silk is processed for use in fishing lines, sutures, tennis rackets, and body armor for military personnel.

Lawrence Osborne, New York Times on the Web, June 16, 2002

# Teachers Sharing with Teachers

In this issue of *The Nucleus*, we share a modified version of a TexTeams Biology Institute activity called “Fundamentally Genetics”. These institutes provide intense training on TAKS-related objectives, especially genetics and evolution. Check your local Education Service Center for TexTeams training opportunities.

## **Fundamentally Genetics:**

In one 50 minute period, students practice the protocol used for describing genetic traits. Materials needed are one PTC strip per student and the Blackline Master (on page 5).

## **Background Information for the Teacher:**

Why study genetics? One of the most obvious answers is that it is a way to achieve a better understanding of ourselves. However, this interest in actuality can be extended well beyond the realm of the human species and applied to the genetics of other living things as well.

Another reason to study genetics is its practical application to the welfare of humans. As we study human genetic variation, we discover and describe its roles in human diseases such as cancer, heart disease, and diabetes. One has only to look at the large number of organizations involved in raising significant funds for research, to realize how important this area is to many people.

A third reason to study genetics is that it provides us with data that can be used to describe human evolution. Today we have augmented our ability to trace evolutionary history at the molecular level in addition to the traditional physical anthropology used in the past.

One of the steps used to study how traits are inherited is to design a key. Here, the student uses a key to engage in the process of linking letters to their own characteristics. Students should understand that capital letters are used to represent dominant traits and lower case letters represent recessive traits.

A dominant trait occurs when a piece of DNA called an allele masters or controls the alternate piece of DNA (allele) it is paired with.

Any trait that is hidden or mastered by the dominant trait is called a recessive trait. Since having a straight hairline is a recessive trait, the allele would be assigned a lowercase *w*. The allele for the dominant trait, a widow’s peak, would use a capital *W*.

The only letter combination that would represent a straight hairline would be *ww*. This would mean that both parents contributed one *w* allele in the fertilization process.

The combination of alleles inherited from your parents is called a genotype. When a person shows a dominant trait, they do not know exactly what their genotype is. The alleles could be identical (ex: *WW*). This combination is referred to as homozygous. Sometimes the combination of alleles inherited from your parents is different (ex: *Ww*). For example, you could receive a recessive allele from your mom and a dominant allele from your dad (or vice versa). This combination is called heterozygous.

In a simple inheritance pattern involving only two alleles, the person who shows the recessive trait always knows their genotype because no dominant traits are present. So, an individual who cannot roll their tongue would have the genotype *rr*.

The physical appearance of the person, that is if they are a tongue-roller or not a tongue-roller, widow’s-peak or straight hairline, is called their phenotype. A phenotype is what you look like.

## **Advance Preparation:**

1. Prepare copies of the investigation pages for each student. (see next page)
2. Have students report their results. (Note: You may want to have examples of the genetic traits listed in the investigation pages to show students.)
3. Have students report their results, then construct charts or graphs of the frequencies of the dominant and recessive traits in the class.

# Fundamentally Genetics

## Looking at Your Traits

Do you exhibit the dominant or recessive phenotype for the following traits? You and your group will have to look at each other to figure this out. Record your responses in the appropriate blanks.

**1. PTC** Taste the PTC paper. PTC is a chemical called phenylthiocarbamide and is harmless. It is used in medical genetics and as a diagnostic tool in medicine. The ability to taste the chemical is a dominant trait. People who cannot taste this chemical are recessive for the trait.

---

Dominant or Recessive

**2. Tongue Rolling** Some people can roll their tongue into a taco or U shape. This is a dominant trait. If you cannot roll your tongue into a taco or U shape you are recessive for this trait.

---

Dominant or Recessive

**3. Earlobes** It is a dominant trait to have earlobes that hang down. People that have earlobes attached directly to the side of their head are recessive for this trait.

---

Dominant or Recessive

**4. Earbump** Some people have a bump on the inside rim of the upper part of their ear ridge. It is called Darwin's ear point. If you have the bump it is due the presence of a dominant allele. If you are lacking the bump you are recessive for this trait.

---

Dominant or Recessive

**5. Widow's Peak** If you have a hairline that comes to a point in the middle of your forehead like Eddie Munster, you possess a dominant allele for widow's peak. A straight or even hairline indicates you are recessive for this trait.

---

Dominant or Recessive

**6. Hitchhiker's Thumb** People who can bend the last joint of their thumb back to a 90-degree angle are dominant for hitchhiker's thumb. Those who lack this ability are recessive for this trait.

---

Dominant or Recessive

**7. Polydactyly** People born with six fingers or toes, possess the dominant trait for polydactyly. Having five fingers and toes is a recessive trait. In the US, people with extra toes or fingers usually have them removed shortly after birth.

---

Dominant or Recessive

**8. Syndactyly** Having webbed fingers and toes is a dominant trait. Sometimes only a pair of fingers or toes are webbed. If you have fingers and toes that separate, then you are recessive for this trait.

---

Dominant or Recessive

**9. Cleft Chin** If you have a chin that has a split in the middle like John Travolta, you have a cleft chin. This is a recessive trait. The absence of a cleft chin is a dominant feature.

---

Dominant or Recessive

**10. Hair Whorl** Have someone in your group look at the back of your head to determine if your hair whorls to the right (clockwise) or to the left (counterclockwise). If you use hairspray or gels on your hair this may be a hard one to do. A clockwise whorl is dominant over the recessive trait of a counterclockwise whorl.

---

Dominant or Recessive

# Summer Opportunity to Enhance Conser- vation Instruction

Conservation Across Boundaries is a two-week, grant-supported, graduate level course for junior and senior high school science teachers interested in integrating natural resource conservation into their curricula. The course uses outdoor field and lab settings and a hands-on approach to learning about and comparing two distinct ecological regions of North America and the science behind the conservation and management of wildlife species in those systems.

Teachers will have the opportunity to travel from south Texas to central Montana, learning and working with a variety of wildlife, conservation, and natural resource professionals. The course is co-sponsored by Welder Wildlife Foundation and the Boone and Crockett Club. Dates for this year's course are June 9-26, 2003. For more information, contact: Selma Glasscock  
Welder Wildlife Foundation  
P.O. Box 1400  
Sinton, TX 78387  
Phone: (361) 364-2643  
Email: selmaglass@aol.com

## **TABT thanks our generous sponsors**

### **Corporate members:**

Carolina Biological  
Fisher Scientific - Educational Materials  
Div.  
Glencoe/McGraw-Hill Publishing Co.  
Holt, Rinehart, and Winston Publishing Co.  
Prentice Hall Publishing Co.  
Science Kit & Boreal Laboratories

### **Sustaining members:**

Flinn Scientific / George Seidel  
NASCO  
Ward's Natural Science Establishment

# Free Curriculum Module Available from BSCS

*How can computers "find" genes?  
Why is sequence data from other organisms  
so important?*

*Do genetic databases pose a threat to our  
privacy?*

Biological Sciences Curriculum Study or BSCS is a non-profit organization established in 1958 to develop curriculum and professional development to improve science instruction. Their high school programs promote inquiry and encourage students to view science instruction as a dynamic, ongoing process.

The development and distribution of free curriculum modules is one method of achieving this goal. Past modules include *Cell Biology and Cancer*, *Emerging and Re-emerging Infectious Diseases*, *Human Genetic Variation* and *The Brain: Understanding Neurobiology Through the Study of Addiction*.

"In the Spring of 2003, BSCS, with the support of the Department of Energy will release a new curriculum for high school biology classes that explores how scientists extract useful information from the Human Genome Project.

The curriculum, BSCS's fifth module related to the Human Genome Project, includes background information for teachers and five classroom lessons. The lessons use both print and Web-based activities to help students learn how computers are used to assemble DNA sequences, locate genes, and obtain clues about gene functions. In this context, the ethical, social, and legal implications of genetic databases and informed consent are considered.

To receive your free copy of *Bioinformatics and the Human Genome Project* go to the BSCS Web site at <http://www.bcs.org> and fill out a request form. Requests received prior to January 31, 2003 will receive their copy free of charge, while requests received later will be charged \$5.00 for shipping and handling.

# Science Kit & Boreal Laboratories

## 2003 Hands-On Professional Development Workshops

All workshops are eligible for funding from a variety of sources including:

- Federal Title II Part A (**Teacher & Principal Training & Recruiting**), **Sec. 2123, Parts 3 & 5**
- Federal Title II Part D (**Enhancing Education Through Technology**), **Sec. 2416**
- National Challenge Grants for Technology
- Individual with Disabilities Act of 1997
- Local and State Professional Development and Technology Funding Initiatives

### Introducing Digital Microscopy Into Your Classroom

**This workshop will introduce you to the exciting world of digital microscopy. It is given from an application point of view with demonstrations and hands-on activities of how to integrate this technology into your existing curriculum.** All participants will receive 4-hours of CPE training and their choice of a Digital Microscope w/ Mechanical Stage or Digital Stereoscope, Motic software, manual, 7-lab activities, accessories and Lunch(\$600+ value). **Cost of registration is \$900.00.**

#### 2003 Locations and Date

Houston, TX...January 31<sup>st</sup>, 2003      and      Corpus Christi, TX...June 6<sup>th</sup>, 2003      Dallas, TX.....June 13<sup>th</sup>, 2003  
and      El Paso, TX.....Oct. 24<sup>th</sup>, 2003      San Antonio.....Dec. 5<sup>th</sup>, 2003

---

### Teach Smart With Technology Workshop

**This workshop will teach you how to use Qwizdom, an interactive software program utilizing remotes to teach, quiz, test, and review with games. This program engages and inspire students of all skill levels, provides instant feedback to teacher and student, documents compliance with national and state standards (TEKS), and improves student performance.** All Participants receive 4 hour of training and 1 copy of Qwisdom TA Software, 8 Student Remotes, 1 Teacher Remote, 1 Infrared Receiver, 1 copy of any single curriculum program worth \$50.00 and Lunch(\$865+ value). **Cost of registration is \$950.00.**

#### 2003 Locations and Dates

Houston, TX....Feb. 1<sup>st</sup>,      Dallas, TX...June 14<sup>th</sup>,      and      San Antonio, TX....Dec. 6<sup>th</sup>

---

### We've Got DIBS\* on Technology Training

**This workshop will teach the K-8 Teacher how to use the Digiscope 150 Digital Microscope and our Physical Science Activity Kit covering over 5 topics. Materials and activities are aligned to the National Standards and meet TEKS requirements.** All participants receive 4 hours training, the Digiscope, Motic Software, Physical Science Activity Kit and Lunch(\$400+ value). **Cost of registration is \$695.00.**

#### 2003 Location and Date

Houston, TX.....February 7<sup>th</sup>, 2003      and      Dallas, Tx.....June 20<sup>th</sup>, 2003

**For additional information and/or registration form for any of our workshops** please contact Tom Avery at (800) 828-7777, ext. 402 or (817)721-7497 or [avery@sciencekit.co](mailto:avery@sciencekit.co).



Texas Association of Biology Teachers  
c/o Alton Biggs, Computer Records Clerk  
1003 Madera Court  
Allen, Texas 75013-3639



**Membership Application  
(Please Print)**

Name: \_\_\_\_\_ Telephone: (\_\_\_\_) \_\_\_\_\_

Home Street Address, City, State, Zip: \_\_\_\_\_

E-mail address (if available): \_\_\_\_\_

Type of membership: \_\_\_\_\_ Active (\$10) \_\_\_\_\_ Student (\$5) \_\_\_\_\_ Retired (\$5) \_\_\_\_\_ Life (\$250)

Please complete the following to assure balanced representation in planning TABT activities.

1. Professional Class (**Check one only**)

\_\_\_\_\_ Biology Teacher \_\_\_\_\_ Department Chairman \_\_\_\_\_ Curator/Interpreter  
\_\_\_\_\_ Supervisor/Administrator \_\_\_\_\_ Teacher Training \_\_\_\_\_ Student  
\_\_\_\_\_ Other \_\_\_\_\_

2. \_\_\_\_\_ Male \_\_\_\_\_ Female (**OPTIONAL**)

3. Have you ever received the OBTA? \_\_\_ No \_\_\_ Yes If yes, what year? \_\_\_\_\_

4. Number of years teaching? \_\_\_\_\_

5. Organizational Class (**Check one only**)

\_\_\_\_\_ Elementary \_\_\_\_\_ Middle/Junior High \_\_\_\_\_ Secondary \_\_\_\_\_ College/University \_\_\_\_\_ Zoo/Aquarium  
\_\_\_\_\_ Business/Institution \_\_\_\_\_ Other \_\_\_\_\_

6. Special Interests (**Check no more than 2**)

\_\_\_ Cellular/Molecular \_\_\_ Botany/Plant Science \_\_\_ Laboratory Science \_\_\_ Reproduction/Evolution \_\_\_ Zoology  
\_\_\_ Computer Instruction \_\_\_ Environmental Biology \_\_\_ Teaching Materials \_\_\_ Other \_\_\_\_\_

7. I am also a member of (**Check all that apply**)

\_\_\_ National Association of Biology Teachers (NABT)  
\_\_\_ National Science Teachers Association (NSTA) \_\_\_ Science Teacher Association of Texas (STAT)

**Please send membership application and dues to:** Alton L. Biggs, TABT Records Clerk -1002 Madera Court -Allen, TX 75013-3639

**Make all checks payable to:** Texas Association of Biology Teachers