

Kansas Association of Biology Teachers Newsletter

Volume 43 Number 3 - December 2002



KABT Web Site

<http://kabt.org>

NABT Web Site

<http://www.nabt.org>

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Editors Message Harry McDonald

As most of you know, John Wachholz has retired as Secretary/Newsletter Editor. It will take two of us to fill his shoes and, as the lateness of this newsletter attests, that may not be enough.

As the new newsletter editor, I will try to uphold the high standards established by John. Please bear with me as I learn the ropes. John had a system for acquiring information for the newsletter and it has taken me several months to pull mine together. Now that I am started, expect to see the newsletter in a more timely fashion. The next edition should be out in early May.

For those of you seeking professional development points, consider sending in a lab or activity you have developed or modified. This can be emailed to me as an attachment. Send papers to biologyctrack@hotmail.com.

You will notice that there is no such activity included in this newsletter. I know this is a valued feature of the

newsletter, so either send in one of your own, or prod a colleague into sending in one of theirs.

To put some of my own spin on the newsletter, I would like to publish student papers. These can be either research reports, book reviews, or any other paper you find to have exceptional merit. It would be a pleasant task to have to sort through numerous entries to select one for publication each newsletter. Email entries as an attachment to biologyctrack@hotmail.com.

This issue finds work from one of my students, Eric Min, a freshman at Blue Valley High School. Eric has contributed a book report on *Genome* by Matt Ridley. Eric submitted this report in partial fulfillment of requirements for his Honors Biology class. At the time of this report, Eric had not studied about molecular genetics in class. I hope you enjoy his work. Let me know what you think of Eric's review and what you think of the idea of including

Letters to the Editor

I read and re-read the “shocking excerpt” on page 7 of the August, 2002 KABT Newsletter regarding mice and genetically modified food. I found it to be shocking, but not in the same way the writer of the article did.

The excerpt stated that the GM-free mouse food consisted of “some rodent mix, some Kellogg’s and Quaker cereals and that the GM food consisted of maize and soya.” It appears to me there were far too many variables to warrant any conclusions from the results. The two groups of food were not comparable in any way. A more logical conclusion would be that mice prefer rodent mix, Kellogg’s and Quaker cereals and oatmeal over maize and soya. There is no sound science in the way the experiment was conducted.

Regarding the force feeding: were both groups of mice force fed? Were they fed the exact same foods, except for the GM factor? Were they fed the same amount of food? The fact that one mouse died is not significant—it could have been traumatized by the force feeding.

I am concerned about KABT publishing non-science for two reasons: 1) This information may be used in some classrooms as good information; 2) This may be read by other persons who may be shocked into believing that Biology teachers do not follow sound scientific procedures.

Sincerely
Paul Willis

Response from the editor

I published the article in hopes that people would realize that it is really non-science. However, it does come from a well known English publication called the Ecologist.

I really do appreciate your comments. This was my last newsletter and I wanted to put something in it that was controversial. I feel that I have succeeded.

All of you comments are 100% correct and well taken. Thanks.

John Wachholz

Teacher Training Opportunities

- The National Tropical Botanical Garden is offering a 7-12 training course in Hawaii, July 14-25. There are 12 spots and the course may be taken for credit. Teachers are responsible for transportation, lodging and some meals. Lodging is \$1200 for two weeks, double occupancy. All participants will get a \$500 stipend and there are eight fellowships worth \$1200. Go to: http://ntbg.org/crs_int.html for further description and an application
- The Kansas State Department of Education is offering a secondary science inquiry workshop this summer. This is a five-day workshop. The workshop is free with lunch provided, but participants are responsible for lodging and transportation. There are two locations: July 7-11 –Blue Valley West HS, Overland Park and July 14-18 –ESSDACK Service Center, Hutchinson. Contact Greg Schell, KSDE, gshell@ksde.org for registration forms.
- The NSTA Institute is currently offering science content courses online. Courses are currently in session, but go to www.scienceteacher.org or call (800) 282-6062 for information about future offerings.

Aquaporins

Ever hear of aquaporins? If not, join the crowd. They are, however, an active area of research. Turns out they are transport proteins specific to water. You know how we say that ions and polar molecules have trouble diffusing through the phospholipid bilayer? Since water is polar, it too should have trouble diffusing and, this recent research may demonstrate that it, in fact, moves only through appropriate protein channels. If you have knowledge in this area, consider writing an article for a future newsletter. In the meantime, check out the following resources: <http://arbl.cvmbs.colostate.edu/hbooks/molecules/aquaporins.html>
<http://www.ks.uiuc.edu/Research/aquaporins/>
<http://mbclserver.rutgers.edu/CPGN/AquaporinWeb/Aquaporin.group.html>

State School Board News

With the election of new members to the State Board of Education, the board is, once again, split with five conservatives and five moderates. KABT does not endorse candidates, but our mission does require us to promote quality science education in Kansas. In 1999, we did take an official position in opposition to the science standards adopted in August of that year. A 5-5 split may not result in any changes to our current standards, but we need to be ever vigilant.

For the latest in what is happening on science education in Kansas, consider joining Kansas Citizens for Science. KABT and KCFS have enjoyed a cooperative relationship since 1999 and have produced several all-day workshops on evolution at KATS Kamp. To join, send you name, address and email address to KCFS, P.O. Box 442136, Lawrence, KS 66044 along with a check for \$15. Identify yourself as a teacher. Regular memberships are \$25.

National Events in Biology/Science Education ID/Creationism

The forces promoting creationism as science continue to be active. In the past year, Ohio, Pennsylvania, West Virginia, and others have experienced the same push for creation science that we encountered in 1999. The new stepchild of creationism is intelligent design. This idea attempts to make no reference to God and to argue that life could not have evolved and that leaves only an intelligent designer to explain whence it came.

This has become enough of a problem nation-wide that the American Association for the Advancement of Science has taken an official position on this matter. Here is that position statement.

AAAS Board Resolution on Intelligent Design Theory

The contemporary theory of biological evolution is one of the most robust products of scientific inquiry. It is the foundation for research in many areas of biology as well as an essential element of science education. To become informed and responsible citizens in our contemporary technological world, students need to study the theories and empirical evidence central to current scientific understanding.

Over the past several years proponents of so-called "intelligent design theory," also known as ID, have challenged the accepted scientific theory of biological evolution. As part of this effort they have sought to introduce the teaching of "intelligent design theory" into the science curricula of the public schools. The movement

presents "intelligent design theory" to the public as a theoretical innovation, supported by scientific evidence, that offers a more adequate explanation for the origin of the diversity of living organisms than the current scientifically accepted theory of evolution. In response to this effort, individual scientists and philosophers of science have provided substantive critiques of "intelligent design," demonstrating significant conceptual flaws in its formulation, a lack of credible scientific evidence, and misrepresentations of scientific facts.

Recognizing that the "intelligent design theory" represents a challenge to the quality of science education, the Board of Directors of the AAAS unanimously adopts the following resolution:

Whereas, ID proponents claim that contemporary evolutionary theory is incapable of explaining the origin of the diversity of living organisms;

Whereas, to date, the ID movement has failed to offer credible scientific evidence to support their claim that ID undermines the current scientifically accepted theory of evolution;

Whereas, the ID movement has not proposed a scientific means of testing its claims;

Therefore Be It Resolved, that the lack of scientific warrant for so-called "intelligent design theory" makes it improper to include as a part of science education;

Therefore Be Further It Resolved, that AAAS urges citizens across the nation to oppose the establishment of policies that would permit the teaching of "intelligent design theory" as a part of the science curricula of the public schools;

Therefore Be It Further Resolved, that AAAS calls upon its members to assist those engaged in overseeing science education policy to understand the nature of science, the content of contemporary evolutionary theory and the inappropriateness of "intelligent design theory" as subject matter for science education;

Therefore Be Further It Resolved, that AAAS encourages its affiliated societies to endorse this resolution and to communicate their support to appropriate parties at the federal, state and local levels of the government.

Approved by the AAAS Board of Directors on 10/18/02

Rewriting Science

It appears that the current administration, through its appointed heads of governmental agencies, is **possibly** "distorting and suppressing scientific information for ideological purposes." These last words come from a letter from 14 House Democrats to Tommy G. Thompson, Secretary of Health and Human Services.

It seems that in the past year, the web page for the Centers for Disease Control has deleted references to scientific studies showing that education about condom use did not lead to earlier or increased sexual activity. Also deleted were references to

international studies showing no connection between abortion and breast cancer.

Bill Pearce, Department of Health and Human Services, denied that there was anything political about the changes. Gloria Feldt, president of Planned Parenthood Federation of America, said that “scientific and medical misinformation jeopardizes people’s lives.”

If this apparent filtering of scientific information to fit a particular religious/political agenda continues, the very fabric of our scientific enterprise may be jeopardized.

Information about this came from an article in the NY Times by Adam Clymer, December 27,2002. One article, and a letter from house Democrats does not a conspiracy make, but it certainly raises a red flag.

This editor encourages you to follow developments in this arena and to share that knowledge by forwarding new information to biologyctrack@hotmail.com

NCLB

By now I’m sure you are all aware that the renewal of the Elementary and Secondary Education Act (ESEA), commonly referred to as the leave-no-child-behind (NCLB) act, will have a significant affect on science education and science teachers.

One provision calls for annual testing in science, beginning in several years. The KSDE is reviewing its current testing policy and is developing a plan to be implemented in this regard. Commissioner of Education Dr. Andy Tompkins indicates that this test will likely be available online, so that it can be taken by students right there in science class. Feedback to schools, on student performance, should be almost instantaneous. The problem of which science standards to assess is made more difficult by the variety of sequencing of science classes in high schools across the state. Since schools will have to show adequate-yearly-progress (AYP) by its students, such decisions are not without impact on the curricular offerings by schools. This editor hopes that you , your school and your school district will participate in these decisions as they are made.

Another aspect of NCLB is the requirement that 100% of teachers be “highly qualified” by the 2005-06 school year. Kansas is currently developing measures to determine who is and who is not HQ. Before you jump to the conclusion that this has negative consequences, consider several things.

Don’t we acknowledge that the best education occurs when teachers have command of the content they are to teach? The requirement does not call for teachers to be fired if they are not judged HQ, but rather that they work,over the next few years, to attain that rating.

Current plans call for anyone with a major in the area they teach, an advanced degree in that area, national board certification in science, or anyone passing a content test in that area to be judged as highly qualified.

If those criteria are not met, current plans call for teachers to gain points using a rubric where years teaching the subject, college credit in the subject, professional activities in the content area, and other criteria can be used to justify the teacher as HQ.

It is likely that some schools will be asked to pilot these criteria this spring.

You are encouraged to monitor such efforts and provide comment/suggestions to Beth Fultz at KSDE,bfultz@ksde.org.

PETA Active as Always

If you occasionally are confronted to your use of animals, be they live or for dissection, in your classroom, consider learning ahead of time what the current round of objections will entail. Go to www.peta2.com/tc/t-dissection.html for PETA’s advice to kids on how to combat dissection in the classroom.

Web Opportunites

- Have you considered having your students publish their research work? Pathfinder Science (formerly KanCRN) has announced the reinstitution of the Student Research Publication Area. Go to <http://pathfinderscience.net/research/>. This opportunity is open to students in grades 4-18, with top papers being published in an annual print publication in July. A tutorial for the publication system can be found at: http://pathfinderscience.net/research/publication/public_tutorial/.
- The APSnet Education Center is a new, free site for teachers with information on plant health and plant diseases. Go to <http://www.apsnet.org/education>

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Editors Message Continued.

samples of student work as a regular inclusion in our newsletter.

Another new feature I plan on adding is response from members to printed articles, letters-to-the-editor, if you will. I include the first of such responses in this issue. You might remember an article in the August, 2002, newsletter about mice and genetically altered food. Paul Willis wrote in about that article and his letter is published in this newsletter along with a brief response by John Wachholz. Send comment to biologyctrack@hotmail.com.

KSG Poster

The Kansas Geological Survey has a new poster featuring Kansas fossils. It covers 29 plant and animal fossils which are common in the state or are some of our most interesting fossils. Cost is \$9.66 including shipping. Contact: KGS, Attn: Publications, 1930 Constant Ave., Lawrence, KS 66047-3726

Free Material on Brain Science

The Dana Sourcebook of Brain Science: Resources for Secondary and Post-Secondary Teachers and Students, Second Edition, is available from Dana Press and the Charles A. Dana Foundation. The offer includes two video tapes. Contact: The Dana Press, Attention: David Balog, 745 Fifth Avenue, Suite 700, New York, NY 10151. The request must be on school letterhead, state the number of books you want (up to 30), whether you would like to receive the tapes, your name and title and the courses for which you intend to use the guides.

More Web Opportunities

The web resources listed here have not all been reviewed by the editor, but have come to his attention and are listed for your critical analysis. Comment on any of these sites, or others with which you have personal experience is welcome for future newsletters. Send comment to: biologyctrack@hotmail.com.

- Try www.humandesign.com - focuses on current advances in human reengineering including the areas of cancer, genetics, medicine, public health, etc.

- AIBS is maintaining a virtual library of lectures for free. The site has 28 lectures by some of the world's premier biologists. Go to: <http://aibs.digiscript.com/>
- Try out the BBC's evolution site: www.bbc.co.uk/education/darwin/biblio/etoday.htm.
- Try out AAAS's focus on human origins. It contains both current articles and classic papers. Go to: www.nature.com/nature/ancestor/index.html
- A similar site from AAAS deals with cell division at: www.nature.com/celldivision/
- Another AAAS site deals with stem cell research. Go to: www.nature.com/nature/stemcells/.
- Howard Hughes Medical Institute maintains a site with virtual labs, animations and a virtual museum. Go to: www.biointeractive.org. Also go to: www.holidaylectures.org to order copies of the annual lecture series.
- If you are interested in the writings of Charles Darwin, go to: <http://pages.britishlibrary.net/charles.darwin/>. This site archives most of Darwin's writings.
- If you like remote sensing information, the following site contains remote satellite sensing of various global ecological, geological and social phenomena. Go to: <http://sus.gsfc.nasa.gov/vis/9000000/a002100/a002113/>.

National DNA Day

This spring marks the 50th anniversary of Watson and Crick's paper revealing the structure of DNA. Certainly our lives and our world has been changed by this event. Join your colleagues across the nation and plan a special event to mark this day. The day is being celebrated nation-wide on April 25th. Check out: www.dnai.org for a wonderful interactive site on DNA.

Genome By Matt Ridley

A book review by Eric Min, Blue Valley High School

Every single organism on this planet is brilliantly constructed with a biological code. This code comes together and forms the instructions to create a biological life form, covering every single aspect of it, which will be discussed later. These instructions are expansive and complex, and are separated into many different sections varying in size. But, the complete set of instructions utilized to create a life form is called the genome. The book by Matt Ridley, which is also called Genome, talks about those specific instructions, and how they affect each of us individually.

The human genome is built upon a simple alphabet, containing four letters: A (adenine), C (cytosine), G (guanine), and T (thymine). These four letters rearrange to form words only 3 letters in length. These words are written upon a long chain called a DNA molecule. Altogether, there are approximately a billion 3-letter words in the human genome, which calls for a considerable amount of reading. This long chain of words pairs with another chain. When this occurs, the result of the pairing is called a chromosome.

The complete human genome is split into 23 large pieces, which are called chromosomes. The largest chromosome is called Chromosome 1, while the next largest is called Chromosome 2, and so on. This book supposedly contains 23 chapters, with each chapter representing a chromosome of the human genome. Each of these 23 chromosomes contains tens of thousands of tidbits called genes, which are all the smaller fragments of directions to help form an organism.

The genome is has many different features. It is able to copy itself, which is called replicating, and can also read itself, which is called translating. Genes have the ability to translate itself into RNA, which is similar to DNA, and are then translated into amino acids. The amino acids link up together in the same order as they began, and form themselves into different shapes called proteins. Nearly the entire body of an organism is built out of proteins, which are basically genes that have changed form.

This book, containing 23 chapters, basically attempts to convey 23 different ideas, or topics.

If one were to create an extremely condensed version of these topics into a single idea, I would have to put it this way: The human genome is the code of all life. It is a universal language. It is a complex and mind-boggling language, yet at the same time is very simple. The intimate combination of the genes within our genomes hold the instruction manual on how our bodies are to assemble and function. The natural or artificial combining of this language has also been a large reason for evolution of organisms, some genetic disorders/diseases, and also the cures for some other sicknesses. These instructions include our life span, our thirst for knowledge, our attitude towards others, our ability to remember, our blood type, our sexual orientation, our physical appearance down to the last hair, followed by an infinite other possibilities. The human's curiosity about the "manual of life" has lasted countless years, and the mystery behind it being vast. But, in recent years many secrets of this manual have been uncovered, and incredible scientific feats are occurring with our newly acquired knowledge. But, with so much power, the ethics behind the artificial manipulation of life's language have gone under fierce debate. With the human genome decoded and written on paper, what will happen next?

The science that is written within the two covers of this book is rather new. Up until this last decade, a large portion of this book would not even be dreamed up of being written on. The information in this book is complex and places some responsibility of having to think on the reader, but when comprehended, makes one read in awe. The author of this book had the ability to take such a complex branch of science and simplify it down as closely to layman terms as he can. Some of the things written in Genome are not definite as of the present moment, but are constantly being worked on to be made definite. All in all, a majority of the things written in this book are still young, and some questions unanswered, but from what the author writes, answers are coming quickly. Scientists may not have figured out everything yet, but the things they do know are still quite amazing, and will keep them busy for years to come.

Personally, I thought this book was incredible. Once I began reading this book, I suddenly had a realization that in reality I had almost no knowledge of genetics. After a couple chapters went by, I had to shake my head and get everything to settle down in my brain. I'm not quite sure that I can really give educated responses to the science that Matt Ridley brings up; this is the first place that I have learned anything about the genome, so any opinion I were to give on the author's thoughts would be one-sided and not credible. But for now, all I can say is that every single page that I read was astounding and opened door after door of a new world.

Matt Ridley's talent in writing threw me off as well. As any person who reads this book may notice, many things mentioned in this book can be difficult to understand upon being read. But, Matt Ridley has the ability to relate everyday occurrences and knowledge to the science of the genome, which makes understanding this book, a much simpler task. He does not write in a textbook-like manner, but has a more conversational form of voice, which is much more inviting and comforting to the reader. The casual voice is a lot more enjoyable to read than an author copying out science reports word for word. In my opinion, the author, Matt Ridley, knew exactly what he was talking about through the entire book. I understand that it is not a walk in the park to write a book such as this if you don't have the tiniest idea what you're saying.

If you are reading this report and have not yet read the book Genome, you are committing a terrible crime. If I had the powers of hypnosis, I would order you to get up and find the book. Any person who questions life and who we are (basically everyone and anyone) should give this book a chance. But be forewarned: this book is not for casual reading. A great amount of effort and attention must be paid to this book, because if you half-heartedly read this book, you will learn nothing. If you're going to read Genome, read it alone, without many distractions. I remember many times when I attempted to read this while extremely tired or preoccupied. The day after, when I pick up the book, I realized that I couldn't recall anything I had read before. So remember, be prepared. Also, be open-minded; oftentimes, some material in this book may not be the most comforting to read or ponder about, but just go with it. It's science, and whether you know something or not, it's always going to be there.

In retrospect, Genome is one of the most interesting non-fiction books I've read. It goes in-depth into the dark chasms of life and it's awesome powers, and how these things called chromosomes, genes, and the genome affect us even if we are unaware of such things. It explains the programming language that nature has produced, including its terse 4-letter alphabet. The book mentions so many things filled with mystery and wonder. Read Genome. It will simply unlock entire sections of your mind. In fact, if you're feeling interested about this book, it just may be that chromosome 6 is working ceaselessly in your body, making you want to learn. Interesting, isn't it?

**Join us for the Spring Field Trip
June 7
Tallgrass Prairie Preserve, Pawhuska, OK
Details to follow in the next newsletter including
directions, camping information and an itinerary.**

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Cheyenne	Rawlins	Decatur	Norton	Phillips	Smith	Jewell	Republic	Washington	Marshall	Nemaha	Brown	Doniphan
Sherman	Thomas	Sheridan	Graham	Rooks	Osborne	Mitchell	Cloud	Clay	Riley	Pottawatomie	Jackson	Atchison
Wallace	Logan	Gove	Trego	Ellis	Russell	Lincoln	Ottawa	Dickinson	Geary	Wabaunsee	Cherokee	Wagoner
Greeley	Wichita	Scott	Lane	Ness	Rush	Barton	Ellsworth	Saline	McPherson	Marion	Chase	Lyon
Hamilton	Kearny	Finney	Hodgeman	Paunee	Stafford	Reno	Harvey	Butler	Greenwood	Woodson	Allen	Bourbon
Stanton	Grant	Haskell	Gray	Ford	Kiowa	Pratt	Kingman	Sedgwick	Elk	Wilson	Neosho	Crawford
Morton	Stevens	Seward	Meade	Clark	Comanche	Barber	Harper	Sumner	Cowley	Chautauque	Montgomery	Lafayette
												Cherokee

Counties In Region 1

Cheyenne, Decatur, Ellis, Gove, Graham, Logan, Norton, Osborne, Phillips, Rawlins, Rooks, Russell, Sheridan, Sherman, Smith, Thomas, Trego, Wallace

Counties, In Region 2

Chase, Clay, Cloud, Dickinson, Ellsworth, Geary, Jewell, Lincoln, Lyon, Marion, Marshall, McPherson, Mitchell, Morris, Ottawa, Pottawatomie, Republic, Rice, Riley, Saline, Shawnee, Wabaunsee, Washington

Counties In Region 3

Atchinson, Brown, Doniphan, Douglas, Franklin, Jackson, Jefferson, Johnson, Leavenworth, Miami, Nemaha, Osage, Wyandotte

Counties In Region 4

Barber, Barton, Clark, Comanche, Edwards, Finney, Ford, Grant, Gray, Greeley, Hamilton, Haskell, Hodgeman, Kearny, Kiowa, Lane, Meade, Morton, Ness, Pawnee, Pratt, Rush, Scott, Seward, Stafford, Stanton, Stevens

Counties In Region 5

Butler, Coffey, Cowley, Harper, Harvey, Kingman, Reno, Sedgwick, Sumner

Counties In Region 6

Allen, Anderson, Bourbon, Chautauqua, Cherokee, Crawford, Elk, Greenwood, Labette, Linn, Montgomery, Neosho, Wilson, Woodson

Your membership **expiration date** can be found on your mailing label. Starting immediately, all dues received before June 30th will be applied to the current year if you are past due. If your dues are current, they will apply for the extended year of your current due date. Dues received and postmarked between June 30th and September 30th will be applied to the next year of membership. The membership list was last updated **March, 2003**.

KABT Membership Application or Renewal Form—ONLY USE CURRENT NEWSLETTER FORM!

Name: _____

(Mr.-Mrs.-Ms.-Dr.-Miss) First Name Last Name

Mailing Address: _____

City: _____ County _____ State: _____ Zip: _____ - _____

School/Institution: _____

Position: _____

City: _____ State: __ Zip: _____ - _____

Phone: Work (____) _____ - _____ Home: (____) _____ - _____

FAX: (____) ____ - _____ Email Address: _____@_____

Enclosed Dues For KABT **\$15 / Year**—Life Membership Available For **\$300**

National Association of Biology Teacher Dues: **\$65.00 / Year**

Dues Payment For Next Year Must Be Received Between Dates Of June 1st to September 30th

Dues Received On Dates Preceding June 1st Or After September 30th Will Be Applied To Current Year

Make Check Payable To KABT - Tax ID #: 48-0945206

Send Dues & Information To:

Kansas Association of Biology Teachers

18258 W. 157th Terrace

Olathe, KS 66062



Kansas Association of Biology Teachers

CALENDAR

Date Event

June 7, 2003 Spring Field Trip to Tallgrass Prairie Preserve near Pawhuska, Oklahoma. Details in the next newsletter.

October 8-11, 2003 NABT Annual Convention - Portland, Oregon

Please send meeting dates and other items of interest to biology teachers to: Harry McDonald,
11917 W. 143rd, Olathe, KS 66062, 913-897-9630 E-mail: biologyctrack@hotmail.com