

MCCB NEWS

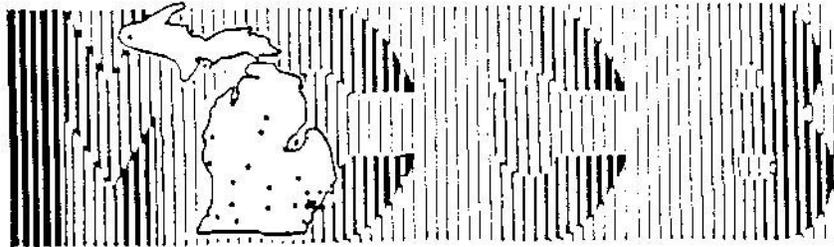
Winter 2007

Michigan Community College Biologists:

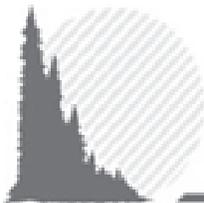
The ONLY organization
whose sole purpose is
to support

Michigan Community
College Biology

Educators



Michigan Community College Biologists



Montcalm Community College

MCCB Spring 2008 Conference: March 29 & 30

Montcalm Community College will be the site of the Spring Conference. The campus is located 15 minutes NE of Greenville, MI (or 45 NE of Grand Rapids). MCC was established ~ 40 years ago and has a student body is 2700+.

Friday evening will be held at MTEC in Greenville from 6 -9 pm. The evening's speaker/topic will be either Kevin (United Solar) on Solar Power and Technology or Chuck (MCC) on Global Warming: the Carbon Footprint and You. (The Executive Board Meeting, which is for all officers and campus reps, is scheduled for earlier on Friday afternoon, but the specific time and place have not yet been determined.)

Saturday's schedule is tentatively as follows:

1. 8 – 9am: Breakfast & Tours
2. 9 - 10:15am: A Sessions (Teaching w/Tech)
3. 10:15 - 10:45am: Snacks with Sponsors
4. 10:45 - 12:00am: B Sessions (Topic Break-Outs)
5. 12:00 - 1:15pm: Lunch and General Membership meeting
6. 1:15 - 2:30pm: C Sessions (Learning Strategies)
7. 2:30pm (*until the fun stops*): Field Trips: Option 1 - Nature Trails/Savanna/Restoration/Fire Ecology (on campus); Option 2 - TBD

A possible amenity to be offered at this and possibly subsequent conferences if it is well received is ACTIVITES FOR KIDS! Several single parents, or parents who both would like to attend session, have stated that they can't attend conferences because they have no care options available for their kids. Heather has stated she will look into getting Biology students to plan some activities, like exploring the Nature Trails, to keep kids close, safe and happy while Mom &/or Dad are at the sessions. Please let Heather know if you are interested in this option by contacting her at hresp@montcalm.edu. All for the AMAZING LOW PRICE of just \$40 for both days.

Lodging options include the [AmericInn](#), (on M-57 in Greenville, near Walmart); [The Winter Inn](#) (on M-91 in downtown Greenville), and Westwood Inn (616)754-8734 (behind K-Mart, 1 minute from MTEC)

In Greenville there are several restaurant options, including Applebee's, Big Boy's and the New Mexican Place, Taco Bell, BK, Arby's, McDonald's, Subway, KFC, Domino's and STARBUCKS!!!

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Spring Meeting, Michigan Branch of the American Society for Microbiology

There is now have a firm date for the Spring meeting for MIASM: April 11-12. The theme will be "Microbes, Biomass and Alternative Energy Sources". It will be held at Central Michigan University. There will be a student mixer on Friday, 4/11 and the speakers and poster viewing on 4/12. The two invited speakers have interesting websites, with links below. MCCB and MIASM have been trying to coordinate so their meetings don't conflict, as they have several times recently.

The Speakers: MIASM will invite Daniel Bond <http://www.bti.umn.edu/bond/Home.html> and Brue Dale <http://www.everythingbiomass.org/>

The mixer on April 11th: The the upstairs area at the Brass Café and Saloon has been reserved. It will hold at least 50 people..<http://thebrasscafe.com/>

Steven Gorsich, Ph.D., Assistant Professor of Genetics, Department of Biology, Central Michigan University
230 Brooks, Mt. Pleasant, MI 48859, 989-774-1865, steven.gorsich@cmich.edu

-submitted by Ralph Gorton, LCC retired (and soon-to-be our new Web Master)

News from Campus:

-Theresa VanVeelen of Muskegon Community College has confirmed that they will host MCCB for Fall 2008. No details are available yet, but there have been indications that at least some activities will be joint activities with MCCB and high school teachers. This has the potential for high school students being better prepared for our classes.

-Lu Anne Clark is the new MCCB liaison on MSTA. She has also taken over as LCC rep. Why? Because Meg Elias (the previous campus rep) had a son Dec 9, 2007: Michael Oliver Elias at 8 lbs 2 oz. (maybe we should report measurements in metrics?)

-Wilma Kime, former Lake Michigan College campus rep and former MCCB president, has been enjoying her retirement, although far from laying back and relaxing! Since May 2006, when she retired, she took the NeoTropical Rainforest course Winter semester 2006 and travelled to Costa Rica. "It was wonderful!", says Wilma. She went on an Alaska tour, flying into Fairbanks and making her way to a tour boat in Whittier. She cruised for a week and ended her tour in Vancouver, BC. In February this year she was a participant in a retreat held in Buenos Aires, Argentina. "A really exciting and a grand city." But the best trip was following the Lewis and Clark Trail to the mouth of the Columbia River, then following the Pacific Coast highway to San Diego and finally following as much of Route 66 as she could find back home. To do this she pulled a 25 foot travel trailer, following a fellow camping companion who had planned the trip. They spent 10 weeks on the road. "What a fantastic country", she says. "You can also make reference to my blog I wrote while on the road. The address is <http://wilkime.blog.com>. I had a great time!!! And next fall I will be teaching at Lake Michigan College as a result of the Biology & Chemistry staff having released time to restructure their curriculum as part of a Title III grant The Title III thing is pretty big thing. And we have a terrific rapport within the department. I am going to teach not so much because I can't stay away from the classroom but because I know I can make a difference. On the other hand, if something better comes along..... (just kidding)."

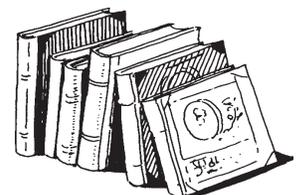
Michael Oliver Elias



Off the Shelf

-The Judas Strain by James Rollins - great action adventure type book with lots of great bacteria information and fun facts thrown in (and an integral part of the plot). If you like this book, the author has written many more.- recommended by Heather Wesp

-The Species Imperative Servies (Survival, Migration, and Regeneration) by Julie E. Czerneda - this three book science fiction series is written by "former" biologist (one never really stops being a biologist) and really integrates many aspects of biology and the biologist's life (academic, research, etc) into a great story about Earth and aliens, including one species who seems to be transforming and migrating... but is it their doing? a biological imperative? are they being manipulated by another species? I really couldn't put these down!! .- recommended by Heather Wesp



“iPS”: Induced Stem Cell Technology

The following is a report on an MCCB Professional Development Event: Sam Rhine's Genetic update, Tuesday, November 6, 2007 at Seaholm High School Auditorium in Birmingham, MI from Harry Benson. The event was attended by Harry and Lori Bean and Tracy Kling from Monroe CC. (for those of you who did not know, Harry and Sam attended college together and are good friends)

“iPS” technology; it's exciting stuff and will most likely become a critical turning point in Medicine. I read an interesting report in the Ann Arbor News (AP news release) that Dr. Ian Wilmut has announced he will abandon his cloning work (that would be “Goodbye Dolly”) in favor of pursuing the new iPS research here on out; now, that's an endorsement of the potential promise if anything is. - Harry

Here is the iPS story:

When a somatic nucleus is inserted into an enucleated egg in the standard cloning procedure, somatic cell nuclear transfer, it has to be reprogrammed, by factors in the egg cytoplasm back to a pluripotent condition, before it can direct the formation of a reproductive clone like Dolly. Therefore there must be signals in the egg cytoplasm responsible for that reprogramming. If we could determine the nature of those signals, we might be able to reprogram any differentiated somatic nucleus back to a pluripotent state using exogenous signals rather than using egg cytoplasm. That was accomplished in 2006 (Cell - Aug 25, 2006) when skin cells from a mouse were reprogrammed (or dedifferentiated) in vitro with only four molecular signals: Oct 3/4, Sox-2, c-Myc and Klf-45. That was all confirmed by three major groups in July of 2007 (Nature - August 19, 2007 and Cell Stem Cell - July 2007). They reprogrammed or dedifferentiated mouse skin cells backwards to an Embryonic Stem Cell-Like condition. They are not Embryonic Stem Cells because those are only found in a blastocyst. They are named iPS - induced Pluripotent Stems. They are pluripotent and therefore have the potential to form any of the 220 specialized cells in the human body - but they come from skin - therefore no ethical or political concerns and no restriction in funding.



-Sam Rhine, Genetic Update Conferences, 14000 East 113th Street, Fortville , IN 46040-9623

Interesting tidbits:

1-The New Oxford American Dictionary chose *locavore*, a person who seeks out locally produced food, as its word of the year. The local foods movement is gaining momentum as people discover that the best-tasting and most sustainable choices are foods that are fresh, seasonal, and grown close to home. Some locavores draw inspiration from the 100-mile diet or from advocates of local eating like Barbara Kingsolver. Others just follow their taste buds to farmers' markets, community supported agriculture programs, and community gardens. Check out Local Harvest to find sustainably grown food near you, and make a New Year's Resolution to be a locavore in 2008!



2-New experimental evidence from a multi-university study indicates that frogs and other amphibian populations may be at risk from the large amounts of nutrient pollution generated by industrial agriculture. The authors of the study show that increased nutrients in bodies of water leads to excessive algal growth, which supports larger populations of certain snails. The snails carry parasites that cause severe limb deformities and death in frogs—and more snails mean more of the parasites. With the increasing industrialization of agriculture, ever more massive amounts of nutrients flow into waterways around the world each year, both from fields treated with synthetic fertilizers and manure from CAFOs (confined animal feeding operations). This new research suggests that the trend may intensify the pressure on amphibians, which are key species in many ecosystems. (From UCS)

JOB POSTINGS!

INSTRUCTOR OF BIOLOGY Macomb Community College

(2 Positions) Full-Time, South Campus (Warren, 48088)

First position - Teach introductory classes, also propose / create new courses, refine / modify existing courses.

Second position - A background in microbiology is needed with a primary responsibility to teach microbiology classes, refine / modify existing courses.

Both: Assist in course assessments and identify teaching and lab materials for assigned classes.

Academic Credentials: Master's degree or higher in Biology/Biological Sciences req'd. Transcripts must be submitted with your application. Copies are acceptable for use during the screening process.

Academic Preparedness: A comprehensive, current knowledge of biology providing a foundation for effective teaching and learning is req'd. Evidence beyond the degree may be demonstrated by participation in professional associations, or professional development.

Experiential Background: Relevant, recent teaching and related exp, college or university pref'd. A well rounded background in biology is desirable. Areas of specialization such as microbiology, physiology and anatomy should be noted.

\$43,071 – \$64,607 comm. w/exp, plus potential for overload compensation up to \$22,000. Benefits.

TO APPLY: To ensure consideration, required application materials (1 - 6 listed below) must be received by 1/30/08. The search may continue until the position is filled. For more information, visit our website.

REQUIRED APPLICATION MATERIALS:

1) APPLICATION FORM may be printed directly from our website at www.macomb.edu/JobsAtMacomb or by calling Human Resources at 586.445.7885.

2) COVER LETTER: State specifically how you meet the education and exp qualifications for the position and how your background and exp relate to the listed responsibilities.

3) TRANSCRIPTS: Copies are acceptable for use during the screening process. If you are offered the position, official transcripts must be provided before you begin working.

4) RESUME: Include starting and ending month and year for each position held with each employer and a brief statement of responsibilities for each position.

5) STATEMENT OF PEDAGOGY. No more than 2 pages of your various approaches to teaching, include an analysis of what methods are successful and why.

6) TWO LETTERS OF REFERENCE.

SUBMIT to Macomb Community College, Office of Human Resources:

US MAIL to: 14500 E 12 Mile Road, Warren, MI 48088 IN PERSON to: 16000 Hall Rd., Ste 3A, Clinton Twp. (between Hayes and Garfield Rds), MI 48038. FAX to: 586-445-7874

AA/EEO EMPLOYER: Michigan Relay Center 1.800.649.3777 (Voice and TDD).

One of the largest community colleges in Michigan, Macomb has over 21,000 degree-credit students in liberal arts, business, public service, science and health, and technical education. The College's 4 (South, Center, East and MTEC) campuses are located in the northeastern area of Metropolitan Detroit, which is home to twelve Fortune 500 companies, five major league sports teams, and many cultural attractions, including the Detroit Symphony Orchestra, the Detroit Institute of Arts, the Michigan Opera Theater, and Wayne State and Oakland Universities. Within easy driving distance are also the campuses of the University of Michigan and Michigan State University and the shorelines of Lakes Huron, Erie and St. Clair.

Tenure Track Life Sciences Instructor Bay College West, Iron Mountain, Michigan

Bay de Noc Community College, EOE, is seeking a highly-motivated person to serve as a Tenure Track Life Sciences Instructor at the Bay College West Campus located in Iron Mountain, MI.

SEE www.mccb1.org for complete posting

POSITION SUMMARY:

This faculty member will teach courses in life sciences as well as entry level and non major classes in Biology and Chemistry, as needed. This person is expected to develop outcome-based course syllabi, curriculum and instructional delivery modes, and collaborate with other faculty, staff and administration to ensure that all students receive instruction and supervision that promotes learning and personal growth. This person will report directly to the Dean of Arts & Sciences and the Executive Dean at West campus.

DUTIES & RESPONSIBILITIES:

- Instruct a full spectrum of courses including Anatomy and Physiology, Microbiology, Human Chemistry, Human Biology, (as well as biology and chemistry for non majors and at the entry level as needed) to a population consisting primarily of, but not limited to, nursing, life sciences and/or pre-health care students.
- Maintaining science laboratories and equipment. Stocking science laboratories.
- Responsible for instruction and facilitating student learning:
- Develop course syllabi that share with students the standards, the policies, and learning objectives
- Be committed to student retention and success
- Recognize and respond to different student learning styles and needs
- Develop and use supplementary learning materials and resources
- Evaluate student progress
- Use best practices in the teaching and learning process
- Advise students on academic and vocational curricula and on other career issues
- Maintain student attendance records, grades, and other required records.
- Maintain regularly scheduled office hours in order to advise and assist students
- Participate in professional activities such as, but not limited to, curriculum planning, syllabus writing, examination development, textbook selection, program revision, and outcome assessment
- Collaborate with other teaching faculty, staff and administration to ensure that all students receive instruction and supervision that promote learning and personal growth
- Coordinate instruction and scheduling with the nursing department.
- Participate in division and college activities, including student advising, placement, and registration activities.

DESIRED EDUCATION and EXPERIENCE QUALIFICATIONS:

- Post Secondary teaching experience
- Successful experience working with at-risk students
- Familiarity with active and collaborative learning strategies, teaching of critical thinking and critical literacy skills.
- Willingness to learn and implement new teaching strategies related to active learning.

MINIMUM EDUCATION and EXPERIENCE REQUIREMENTS:

- A Master of Science Degree with a focus in the life sciences. Doctorate Preferred.
- Teaching experience in a broad range of topics, especially biology and chemistry
- Demonstrated skill in effective written and oral communications
- Commitment to quality instruction in a learner-centered environment
- Demonstrated literacy in information technology and computer use
- Commitment to the community college philosophy

SALARY RANGE AND BENEFITS: Dependent upon education and experience. Annual salary range \$43,302 – 53,001. Benefits include health, life, and dental insurance, Michigan Public School Employees Retirement Systems or TIAA/CREF, YMCA membership, Wellness Program, Tuition reimbursement and professional development support.

Anticipated Start Date: August 2008, **Application Deadline: March 6, 2008. All applicants are required to submit:**

1. Completed Bay College Application available from our website at: <http://www.baycollege.edu/hr>
2. Cover letter
3. Resume
4. All graduate and undergraduate transcripts
5. Names and contact information for at least three (3) references **along** with three (3) letters of recommendation

Thomas J. Griggs, Director of Human Resources, Bay de Noc Community College, 2001 North Lincoln Road
Escanaba, MI 49829-2511, Ph: 800-221-2001 ext. 1159 or ext. 1145 Fax: 906-789-6925

Email Applications to: employapp@baycollege.edu

Web: <http://www.baycollege.edu/hr>

Genetically Modified Plants (GM)

C. Neal Stewart, Jr from the University of Tennessee presented the Saturday morning talk at the Fall Conference in Alpena. He described how GM can display an orange fluorescent protein which marks them for research. Herbicide-resistant soybeans are available, which are resistant to Roundup. GM tobacco is now available, too.

Bt, a bacterial product, can be spliced into crop plants. Bt corn kills corn earworm & European cornborer. Bt cotton is grown which uses reduced insecticide, and is used by organic farmers. It has a special class of protein. Dr. Stewart went through several ideas he called myths, the first of which was: GMO plants are inherently dangerous. He called it Chicken Little Syndrome. There have been 1 billion acres and 75 billion plants with GM technology, which is 20 years old now. With 30000 genes or so total, the speaker figured changing 1-2 is not making problems, but can have profound effects.

Domestication of corn was used as an example of genetic modification that has happened without technology. Teosinte corn in Mexico and modern corn are both *Zea mays*, but produce very different amounts of food. Plant genes are very plastic. *Daucus carota*, Queen Anne's Lace was domesticated into carrots, even though they produce very different roots. Domesticated dogs are the same species as wolves, but vary in terms of ferality and strength. The speaker used these as a metaphor for what humans can do with genetics.

Brassica oleracea is wild cabbage, but it has mutated in 2000 years to kale, then head cabbage, then cauliflower, then broccoli, then Brussels sprouts, Kohlrabi, and ornamental kale. Canola is a close relative too. GM Canola can have green fluorescent flowers which excite under UV light. Green fluorescent pollen was shown on a bee leg, which can be used to monitor gene flow.

Another myth was that risks outweigh benefits. He countered this with the idea that GM encourages and increases no-till agriculture in some areas. GM results in >1 million unsprayed gallons of herbicide/year.

He then explored risks: Monarch butterflies are famous for their huge commutes and ridding milkweed from farms. Monarch problems have been researched by observing eating GM pollen. The speaker said in the research that butterflies were force-fed pollen in an unrealistic scenario to cause media hysteria. Folks feel the Monarch is too pretty to kill, but corn pollen doesn't travel that far.

Gene flow was then discussed, involving *Brassica rapa* canola, with the Bc1 and Bc2 genes. Canola is commonly rotated with wheat, so GM *Brassica* is found in wheat fields. Horizontal gene flow is flow between species like plants and bacteria. This is being studied.

There was some description of backcrossed hybrids where the transgenic weed becomes "weedier", or the weed gene is disrupted by crop genes. Researchers use gene flow intentionally.

In the future, plants which can detect landmines and TNT and other explosives will be available; they will produce a protein that turns color in the presence of those chemicals. A Croatian minefield is being used for beta testing. Plants take up explosives which can apparently safely rid the soil of these dangerous chemicals. Mercury can also be taken up for phytoremediation and at least dilute it to the atmosphere where it lands elsewhere. A gene for dwarf crop plants often helps plants stay safely out of the wind. This is a result of the Green Revolution, and has not been good for weed plants. A second Green Revolution may result from GM organisms. The speaker said European countries with a romantic view of farming resist GM most, as opposed to developing countries like India and China who don't seem to care. Some countries don't have regulatory agencies, like those in Africa. We need to address that, and the needs of the subsistence farmers there.

There were some very interesting questions, some of which may directly challenge the speaker, but he was going to look into them. I spoke with one colleague who pointed out that the speaker is probably funded by a chemical company, and it would be interesting to also hear from a well-researched opposing view.

(If you would like a copy of the PowerPoint presentation [in Adobe reader] used for the talk, please contact me: biologysusie@yahoo.com- Ed)

-Melissa Howse-Willard, Lake Michigan College

TOXICOLOGY: presented by Jay Vanhouten, Delta College

"All substances are poisons; there is none that is not a poison. The right dose differentiates a poison and a remedy." This quote from Paracelsus, a 16th century physician, served as an introduction to the topic of toxicology in a stimulating presentation by Jay Vanhouten, Associate Professor of Biology at Delta College.

Professor Vanhouten related several fascinating anecdotes from the history of toxicology. For example the use of lead plates and goblets in ancient Rome may have resulted in lead poisoning and contributed to the decline of the Roman empire. Similarly, the storage of acidic fruit in containers soldered with lead may have helped to seal the fate of the Franklin expedition, a 19th century attempt to explore the Canadian arctic in which their ship was trapped in ice and all members were lost. The Mad Hatter in Alice in Wonderland went mad due to the effects of mercury poisoning. Mercury was used in the making of beaver hats. Arsenic, possibly administered by his physician, may have played a role in the death of Napoleon, payback for an alleged dalliance between the emperor and the doctor's wife. Professor Vanhouten next described the basic terminology used in toxicology such as acute effect, chronic effect, dose-response, mutagen, and teratogen, among others, and provided us with a list of definitions.

It is important to understand what happens to toxic chemicals when they enter the human body. The liver is the major target of many toxins because of its role in metabolizing so many substances found in the blood. In some instances the metabolism of a drug by the liver may itself be the problem. Methanol is metabolized into formaldehyde by the liver. The metabolism of thalidomide, once given to pregnant women for morning sickness, produced a substance which caused major birth defects in the 1950s and 60s.

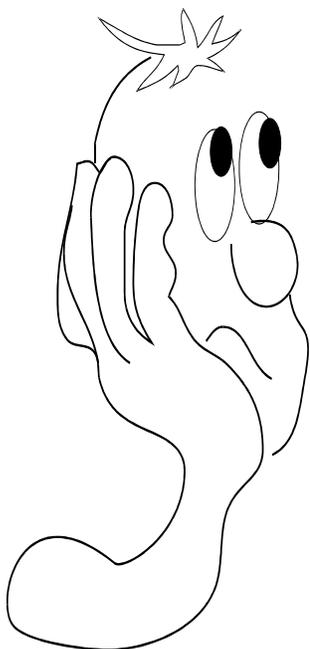
Professor Vanhouten provided a fascinating insight into the subject of toxic synergy. Two or more toxins acting together produce a more severe and/or or quicker effect than either toxin would by itself. For example, asbestos exposure and smoking together produce lung cancer rates 90 to 100 times the rate of smoking alone. Hundreds of 9/11 emergency responders and cleanup workers are showing the health effects of exposure to dust containing many toxic substances.

Risk assessment requires an understanding of the fate and transport of toxins in the environment. Is the toxin soluble in water? Does it tend to accumulate in sediment or certain types of soil and how long does it persist?

Professor Vanhouten routinely incorporates toxicology case studies into his classroom. As an example he cited the University of Michigan study on dioxin exposure in the Tittabawassee River area. If you live on dioxin-contaminated soil or consume the products of animals in that area, you have higher levels of dioxin in your blood. A 20 mile stretch of the river is contaminated. Dredging the sediment could make things worse. Still, questions of actual risk to health persist. Chloroacne is the only scientifically proven effect of dioxin. A recent Michigan State study found that reproductive success of fowl such as herons, and great horned owls was unaffected by dioxin in the environment. Overall, Professor Vanhouten provided a fascinating and entertaining glimpse into the world of toxicology.

-Submitted by Tom O'Connor, Schoolcraft College

ATTENTION ALL Introductory Biology Teachers!!



For an upcoming session at the Spring 2008 Conference I am looking for simple, engaging activities used in lecture for introductory biology students. They can be group work, modeling or extra credit assignments that reinforce and clarify the subject material. It can be as simple as the “muddiest point” or finding a biology cartoon for extra credit. I’m sure everyone has some creative, easy, ideas to liven up, show relevance or emphasize a biology concept.

PLEASE HELP! No idea is too simple or goofy. Please call or email the ideas to Lynnda Skidmore (skid823more@hotmail.com or 248-594-4438). I may contact you for more information. Do it today, before you forget. Thank you for your suggestions and contributions!

An Ancient Medicine (Enjoy in Moderation)

Every year, the average American adult drinks the equivalent of 38 six-packs of beer, a dozen bottles of wine and two quarts of distilled spirits like gin, rum, single malt Scotch, or vodka that aspires to single malt status through the addition of flavors normally associated with yogurt or bubble bath. We are by no means the most bibulous people: according to the World Health Organization, 39 other nations outdrink us, a list topped by Luxembourg, where residents manage to ingest roughly 284 bottles of beer and 88 bottles of wine annually, no doubt to salve the indignation of explaining that their country isn't part of Belgium. Yet even though we Americans drink less than some others, we can hold our own, especially now that the peak ethanol season is under way. Liquor sales in December, according to hospitality trade groups, are usually a good 50 percent higher than in other months, and that's hardly a surprise. December is a time of multicreedal spirituality and festivities, and alcohol has been a fixture of celebration and religious ritual since humans first learned to play and pray. December is also cold, dark and miserable, a meteorological migraine begging for home remediation, and alcohol is perhaps humanity's oldest medicine.

Moreover, December is a time for family, and a taste for alcohol, it seems, is all in the family, the extended phylogenetic family of primates and other animals that make fruit a centerpiece of their diet. Nothing broadcasts the presence of ripe, digestible fruit as effectively as the aroma of fermentation. We're frugivores at our core. "As far back as we can look, humans have had a love affair with fermented beverages" said Patrick McGovern, an archaeological chemist at the U- Pennsylvania. "And it's not just humans. From fruit flies to elephants, if you give them a source of alcohol and sugar, they love."

Humans may have an added reason to be drawn to alcohol. Throughout antiquity, available water was likely to be polluted with cholera and other dangerous microbes, and the tavern may well have been the safest watering hole in town. Not only is alcohol a mild antiseptic, but the process of brewing alcoholic beverages often requires that the liquid be boiled or subjected to similarly sterilizing treatments. "It's possible that people who drank fermented beverages tended to live longer and reproduce more" than did their teetotaling peers, Dr. McGovern said, "which may partly explain why people have a proclivity to drink alcohol." Dr. McGovern and other archaeologists have unearthed extensive evidence of the antiquity and ubiquity of alcoholic beverages. One of the oldest known recipes, inscribed on a Sumerian clay tablet that dates back nearly 4,000 years, is for beer. Chemical traces inside 9,000-year-old pottery from northern China indicate that the citizens of Jiahu made a wine from rice, grapes, hawthorn and honey, a varietal recently brought back to life by the intrepid palates at Dogfish Head brewery in Delaware. Last month, researchers reported evidence that the earliest known chocolate drink, made from the cacao plant in Honduras 1,400 years ago, was probably a fermented beverage, with an alcohol content similar to beer, a discovery that brings to mind the classic Onion T-shirt: "I'm like a chocoholic but for booze." Researchers caution, however, that if we humans are congenitally inclined to drink, we are designed to do so only in moderation. We are not Syrian hamsters, the popular pet rodents that also are a favorite of alcohol researchers. "They'll drink alcohol whenever offered the option," said Howard B. Moss, associate director at the National Institute on Alcohol Abuse and Alcoholism. "You give them a bottle of water and a bottle of alcohol, they'll always choose the alcohol over the water." This avidity has been related to the hamster's natural habits. The animals gather fruit all summer and save it for later by burying it underground, where the fruit ferments. "That's how the hamsters find their cache of last summer's goodies when it's the middle of winter. They've developed a preference for the taste and smell of fruit that's turned." They've also developed the necessary equipment to metabolize high doses of alcohol. "A hamster's liver is five times the size of a human liver in comparison to the other abdominal organs," Dr. Moss said.

Behind the hamster dance is the ancient chemical legerdemain of fermentation, which by its most general definition means extracting energy from sugar without using oxygen. There are many ways to do this: our muscle cells ferment when operating anaerobically. The fermentation that yields ethanol, the type of alcohol we drink, is the work of yeast cells, which will latch onto any suitable sugar source and start feasting. As they break down the sugary chains, the yeast enzymes generate two key byproducts: carbon dioxide, which can be used to puff up bread dough, and ethanol. Alcohol, then, is nothing more than fungal scat. Ah, but how that scat can sing. An alcohol molecule consists of a knob of hydrogen and oxygen linked to a carbon-based stalk, and that telltale knob, that hydroxyl group, allows the molecule to mix easily with water. "The hydroxyl group makes alcohol go to any cell in the body that has water," said Samir Zakhari, director of the division of metabolism and health effects at the alcohol institute, "which means alcohol goes to every tissue in the body." The brain is particularly well lubricated, and alcohol happily mingles therein. It stimulates the secretion of dopamine, the neurochemical associated with the brain's reward system. It stifles the brain's excitatory circuits and excites the brain's dampening circuits. It alters the membranes of neurons and the trafficking of important ions like calcium and sodium across neuronal borders. It stimulates like cocaine and it depresses like valium.

It makes the shy voluble, the graceful clumsy and the operator of a motorized vehicle very dangerous. As always, the dose makes the poison, so as you savor the season, take it one small sip at a time.

-By NATALIE ANGIER, The New York Times, Published: December 11, 2007 (submitted by Pete Clason)

On a related note: **A Toast to Green Beer and Wine**

You may have already considered serving locally produced organic foods to your holiday guests, but what about the beer and wine? Significant amounts of water and fossil fuels are used to grow conventional grapes, barley, and hops, and to transport the finished products to market, but a growing number of beer and wine makers have made a commitment to produce beverages with the same (or better) quality as conventional products and with less environmental impact.

Organic: Organic beer and wine is regulated by the U.S. Department of Agriculture. For a product to be labeled "organic," 95 percent of the ingredients (other than water and yeast) must be grown without the use of synthetic fertilizers or pesticides and must not be genetically engineered. In addition, wines labeled "organic" cannot contain any added sulfites (a preservative that can aggravate asthma). Products labeled "made with organic ingredients" must contain at least 70 percent organic ingredients and may contain a small amount of added sulfites.

Biodynamic: A small but growing number of wine makers are growing grapes using methods inspired by the philosophy of biodynamics, which holds that plants, animals, soil, air, and celestial influences work in harmony to create self-sustaining farms. Many of these sustainable farming practices (such as avoidance of synthetic fertilizers and pesticides) are required for organic certification, but also include crop rotation and composting. Wines labeled "biodynamic" have met certification standards set by the nonprofit Demeter Association, which has trademarked the term.

Locally Produced: Purchasing beer and wine made by local producers minimizes fossil fuel use associated with shipping. And some breweries offer local customers the option of buying beer in refillable 64-ounce glass bottles called growlers, which reduces the environmental impact associated with packaging. Local wine options might be limited depending on where you live, so when buying a wine made outside your region of the country, consider the distance it has had to travel in order to reach you. The American Association of Wine Economists (see the related links) provides a comparison of the global warming emissions associated with transporting wines from various countries to several major U.S. cities.

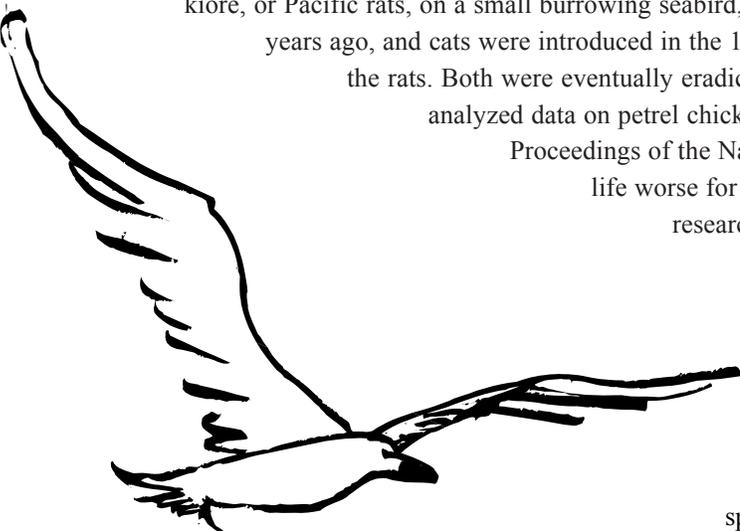
-From UCS Greentips e-newsletter,

Dec 14, 2007 (see newsletter for related links)

General Biology:

When Removing One Predator Harms the Prey

The predator-prey relationship is simple, right? If a predator is around, that is bad for the prey, and if the predator is removed, that is good for the prey. Ecological theory, however, suggests that isn't always the case, particularly if there is more than one predator species around and they share the same prey. In that case, elimination of the top predator may allow the midlevel predator to thrive, and a result may actually be worse for the prey. Matt J. Rayner of the University of Auckland and colleagues found such a case on Little Barrier Island, a wildlife sanctuary in New Zealand. They studied the impact of two predators, feral cats and kiore, or Pacific rats, on a small burrowing seabird, Cook's petrel. Kiore were introduced to the island hundreds of years ago, and cats were introduced in the 1870s. Both preyed on the petrels, with the cats also preying on the rats. Both were eventually eradicated, the cats in 1980, the rats in 2004. The researchers analyzed data on petrel chick survivability from 1972 to 2007. As they report in *The Proceedings of the National Academy of Sciences*, removing the cats actually made life worse for the petrels, since that left more kiore to prey on them. The researchers also found that the effect of the rats on petrels was worse at higher elevations than at lower ones. They suggest that at higher, colder elevations less variety of foods was available to the rats. Only when the rats were eliminated did petrel breeding success increase, to a level above that when both predators were around. The researchers say the findings reinforce the idea that an understanding of an entire ecosystem is crucial to proper management of introduced species.



-By HENRY FOUNTAIN, The New York Times, 12-11- 2007

Unveiling The Immune System

By: Patrick Truszkowski; Delta College, Michigan. patricktruszkowski@delta.edu

Starring: The Lymphocytes and the Antigen-presenting cell.

Special guest star: Pathogenic microorganism.

Purpose: *Unveiling the Immune System* is an activity that brings the immune system to the level of the human. The phenomena of the Specific (Acquired) Immune System requires the student to use abstract / higher level learning. Abstract learning, though, requires prior concrete learning of the concept. This activity will use concrete learning to grasp the concepts and ideas of specific-immunity cells and pathogens, before engaging into abstract learning. *Unveiling the Immune System* will use hands-on participation from the students as they become introduced to new concepts while observing the instructor (director) throughout this lesson. This approach will use inquiry, cooperative interaction, and hands-on manipulation to stimulate student interest and successfully gain vital concepts.



Materials: Thirty eight 8"x11" poster-boards, hole puncher, thick string, permanent marker, different colored Legos, four 3" x 3" x 1" wood blocks, seven colored-pictures of immune cells & pathogens, seven paint stirrers, glue, and eight 3" x 3" pictures of the Y-shaped antibody.

Set-up: Label each poster-board, in large print, the following (see picture): five with "Pathogen", five with "Helper T-cell", eight with "B-cell", eight with "Cytotoxic T-cell", and four with "Memory cell". At the top of each, punch out two holes near the corners. Insert a thick string through the holes and make the string long enough to wear around the students neck, and then tie the string to make a loop. Make one more with the following: "Macrophage" and/or "Antigen-presenting Cell". With the seven

poster-boards left, glue a picture onto each with the following (see picture): macrophage, helper T-cell, B-cell, Cytotoxic T-cell, memory lymphocyte, bacteria, and virus. Glue a paint stirrer on the back of each sign. Glue two 3" x 3" pictures of an antibody onto each side of the wood blocks.

Procedure: A transition from Non-specific (Innate) Immunity to Specific (Acquired) Immunity occurs as you put on the "macrophage" sign. Every student also has a sign around their neck. Some students at one end of the classroom are the pathogens and one of them is holding a stack of different colored Legos while another is holding a picture of bacteria. The middle of the classroom has Helper T-cells, each with a different color Lego. To the left are B-cells & some Memory cells and to the right are Cytotoxic T-cells & some Memory cells. Every group is holding up a picture of their respective immune cells. Give one B-cell the four antibody-blocks. The pathogens enter the room, looking 'bad. You, the macrophage, approach them and recognize the antigens, the Legos. You proceed to dismantle the stack of Legos. You begin to leave to ask the Lymphocytes for help. You specifically keep one of the colored Legos in your hand (your 'receptor'). You leave the infected area and enter a lymph node, which is the classroom (I walk out of the classroom and re-enter). As I walk around the classroom acting like I'm flowing through a maze, I am trying to get a Helper T-cell to recognize my Lego. One Helper T-cell recognizes my Lego color and grabs the Lego from my hand. The Helper T-cell then chooses a B-cell to respond to the antigen and proliferate. Clonal Selection is discussed. The B-cell throws the antibody-blocks in the vicinity of the pathogens to imitate antibodies. The Memory Cells are now discussed. The procedure will be done again, but this time the pathogens are viruses and a Helper T-cell chooses a Cytotoxic T-cell. This 'killer T-cell moves to the pathogens to imitate direct host cell (virus infected) cell-death.

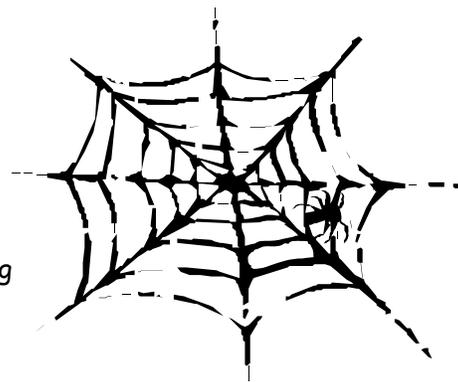
Afterwards, I pick a student to be the macrophage, and then the whole procedure is performed again, but without instructor guidance. Once my students have the concrete knowledge mastered, abstract thinking occurs as I explain the Specific Immunity during lecture.

Feedback & Outcome: I have used this method for high-school and college level students with very high success. Years later students tell me they remember acting like a T-cell or B-cell or pathogen and remember how the specific immunity works. Many learning styles were enhanced: cooperative learning, collaborative learning, inquiry, long-term memory, and they had fun while learning biology.



Websites:

- 1- <http://www.rareforms.com/seedsaver.htm> from Harry Benson
- 2- www.lsa.umich.edu/umbs for University of Michigan Biological Station mini-courses.
- 3- At NABT in Atlanta , Friday, Nov. 30, 2007. Francis Collins, Director of Human Genome Project, had just spoken about evaluating an individuals personal genome for SNPs ("snips"). SNPs are common, minor variations among the DNA coding sequence in all of us. This song is about the dilemma of interpreting the data results from a genome evaluation! Sing Along!! <http://www.youtube.com/watch?v=I14ncHnHNp4> (submitted by Sam Rhine)



Girls Make History by Sweeping Top Honors at a Science Contest

Girls won top honors for the first time in the Siemens Competition in Math, Science and Technology, one of the nations most coveted student science awards, which were announced yesterday at New York University. Janelle Schlossberger and Amanda Marinoff, both 17 and seniors at Plainview-Old Bethpage John F. Kennedy High School on Long Island, split the first prize a \$100,000 scholarship in the team category for creating a molecule that helps block the reproduction of drug-resistant tuberculosis bacteria. Isha Himani Jain, 16, a senior at Freedom High School in Bethlehem, Pa., placed first in the individual category for her studies of bone growth in zebra fish, whose tail fins grow in spurts, similar to the way childrens bones do. She will get a \$100,000 scholarship. The three girls victories is "wonderful news, but I cant honestly say its shocking," said Nancy Hopkins, a biologist at the Massachusetts Institute of Technology. Dr. Hopkins helped start a national discussion about girls and science two years ago when she walked out of a talk by Harvard Universitys president, Lawrence H. Summers, after he suggested that innate differences between men and women might be one reason that fewer women than men succeed in math and science careers. Dr. Summers apologized during the ensuing furor; he announced his resignation as Harvards president 13 months later. "Why do people think girls cant do science?" Dr. Hopkins said yesterday. "Where did this crazy idea ever come from?" James Whaley, president of the Siemens Foundation, which oversees the competition for Siemens AG, a global electronics and engineering company, said the competition results send a great message to young women. Alicia Darnell, 17, a senior at Pelham Memorial High School in Pelham, N.Y., won second place and a \$50,000 scholarship in the individual category for research that identified genetic defects that could play a role in the development of Lou Gehrigs disease. The Siemens competition was first held in 1998 and is distinct from the Westinghouse Science Talent Search, which was founded in 1941 and is now known as the Intel Science Talent Search. Many high school students enter both. This year, more than 1,600 students nationwide entered the Siemens competition. After several rounds of judging, 20 finalists were chosen to present their projects at N.Y.U. and to vie for scholarships ranging from \$10,000 to \$100,000. Eleven of the finalists were girls. It was the first year that girls outnumbered boys in the final round. Most of the finalists attend public school. On Sunday, the students gave 12-minute presentations of their projects, filled with explanations about Herceptin resistance (when breast cancer patients with HER2-positive tumors do not respond to the drug Herceptin) and FtsZ inhibitors (experiments on a specific protein that could lead to a new treatment for drug-resistant tuberculosis). One of the most popular was by three home-schooled girls from Pennsylvania and New Jersey — Caroline Lang, 16; Rebecca Ehrhardt, 15; and Naomi Collipp, 16 who used a Power Point presentation to demonstrate their "Burgercam" monitoring system. It is designed to determine when *E. coli* bacteria in hamburgers have been safely eliminated by measuring the shrinkage of each patty when fully cooked. Several hundreds of hamburgers later, the girls took home fifth place and \$20,000 in scholarship money. Caroline, Rebecca and Naomi, called "the Hamburger Girls," said they had been friends since they were toddlers and had stayed in touch through a group for home-schooled children. "They were concerned it wasnt sophisticated enough, but they wanted to try," said Rebeccas mother, Alicia Butcher Ehrhardt, a plasma physicist. Three-quarters of the finalists have a parent who is a scientist. The Siemens Foundation arranged some sightseeing for the finalists, an outing to "The Lion King", bowling at Chelsea Piers and a group picture on the JumboTron in Times Square. "It was the most fun Ive ever had. The kid next to me was cracking math jokes," said Alexander C. Huang, 17, a senior at Plano Senior High School in Plano, Tex., who earned a \$10,000 scholarship for research on combating jet lag. "Theyre even a little bit nerdier than me." -By AMANDA MILLNER-FAIRBANKS, The New York Times, 12/4/07

Algae Emerges as a Potential Fuel Source

ST. PAUL, Dec. 1 (AP) The 16 big flasks of bubbling bright green liquids in Roger Ruans laboratory at the University of Minnesota are part of a new boom in renewable energy research. Driven by renewed investment as oil prices push \$100 a barrel, Dr. Ruan and scores of scientists around the world are racing to turn algae into a commercially viable energy source. Some algae is as much as 50 percent oil that can be converted into biodiesel or jet fuel. The biggest challenge is cutting the cost of production, which by one Defense Department estimate is running more than \$20 a gallon. "If you can get algae oils down below \$2 a gallon, then you'll be where you need to be," said Jennifer Holmgren, director of the renewable fuels unit of UOP, an energy subsidiary of Honeywell International. "And there's a lot of people who think you can." Researchers are trying to figure out how to grow enough of the right strains of algae and how to extract the oil most efficiently. Over the past two years they have received more money from governments, the Pentagon, big oil companies, utilities and venture capital firms. The federal government halted its main algae research program nearly a decade ago, but technology has advanced and oil prices have climbed since then, and an Energy Department laboratory announced in late October that it was partnering with Chevron, the second-largest American oil company, in the hunt for better strains of algae. "It's not backyard inventors at this point at all," said George Douglas, a spokesman for the National Renewable Energy Laboratory, an arm of the Energy Department. "It's folks with experience to move it forward." A New Zealand company demonstrated a Range Rover powered by an algae biodiesel blend last year, but experts say algae will not be commercially viable for many years. Dr. Ruan said demonstration plants could be built within a few years. Converting algae oil into biodiesel uses the same process that turns vegetable oils into biodiesel. But the cost of producing algae oil is hard to pin down because nobody is running the process start to finish other than in a laboratory, Mr. Douglas said. If the price of production can be reduced, the advantages of algae include the fact that it grows much faster and in less space than conventional energy crops. An acre of corn can produce about 20 gallons of oil per year, Dr. Ruan said, compared with a possible 15,000 gallons of oil per acre of algae. An algae farm could be located almost anywhere. It would not require converting cropland from food production to energy production. It could use sea water and could consume pollutants from sewage and power plants. The Pentagon's research arm, the Defense Advanced Research Projects Agency, is financing research into producing jet fuel from plants, including algae. The agency is already working with the Honeywell subsidiary, General Electric and the University of North Dakota. In November, it requested additional research proposals. -The New York Times 12/2/07

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