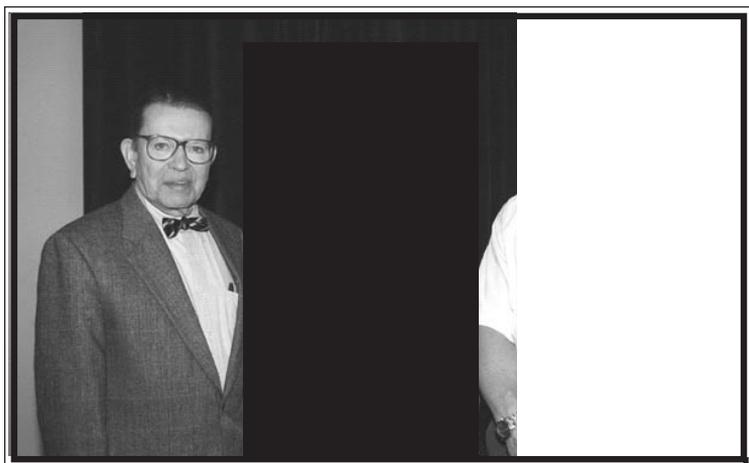


Chemical Bond

**Volume 54
Number 8
November 2003**

St. Louis Section, American Chemical Society



**Who won the distinguished 2003
Simon Scholar?**

See page 2 to find out.

Professor O'Brien Named 2003 Simon Scholar

Our very own Chair of the St. Louis section ...

Leah O'Brien, professor of Chemistry, is recipient of the 2003 Paul Simon Outstanding Scholar Award for her research in molecular spectroscopy and her efforts to involve students in that work. Her research explores the patterns of absorption and emission of radiation from diatomic, gas-phase molecules.



Former U.S. Sen. Paul Simon, SIUE Professor Leah O'Brien and Assistant Professor Rob Zachow of the SIU School of Dental Medicine

The Simon Scholar award is presented to an SIUE faculty member each year by the SIUE Graduate School to recognize the role of research and creative activities in excellence in teaching. The Award confirms the university's belief that an individual must be a good scholar to be a good teacher.

O'Brien has co-authored 12 publications with students about the research. She is shown in the photo flanked by former U.S. Sen. Paul Simon (left), for whom the award is named, and Rob Zachow, an assistant professor at the SIU School of Dental Medicine who won last year's award.

Chemical Bond

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Meeting & Seminars

Board of Directors

St. Louis Section–ACS Board of Directors meets on a Thursday of each month, at the Alumni Center, University of Missouri–St. Louis. The usual meeting day is the second Thursday of each month, but meetings and other events have caused a change in the October meeting to the third Thursday of the month. Meetings are open to all members, and all are encouraged to attend. Elected officers and chairs of major committees have the right to vote; others in attendance have voice but no vote. If you want to attend the dinner, please contact Leah O’Brien (lobrien@siue.edu or 618-650-3562) at least one week prior to the meeting date. The usual cost of dinner is \$15. Members wishing to become active in section activities are welcomed for their first dinner compliments of the section.

Date: Nov. 13
Social hour: 5:30 pm
Dinner: 6:30 pm
Business meeting: 7:15 pm
Future meeting: Dec. 11
(Continuity Dinner-see pg. 11)

St. Louis University

Seminars start at 3:30 pm in Room 204 Macelwane Hall, unless noted otherwise. Refreshments follow. For more information, contact Paul Jelliss, jellissp@slu.edu.

November 12
Prof. Christopher T. Culbertson
Dept. of Chemistry
Kansas State University

Synthetic Organic Chemistry (SOC) Discussion Group

The newly created Synthetic Organic Chemistry (SOC) discussion group for the Greater St. Louis Area will hold its second meeting on:

Wednesday, November 19
St. Louis University
Kelley Auditorium
(lower level lecture halls,
just next to Chem. Dept.)

and will feature one of its distinguished organizers:

Prof. Kevin Moeller
Washington University
*“Anodic Electrochemistry:
Developing New Umpolung
Reactions for the Synthesis of
Organic Molecules”*

Please convene for refreshments at 5:30 pm, general remarks and comments/suggestions from the participants will start at 6 pm, and the presentation will follow.

Parking will be available at the Olive Parking Garage, corner of Olive Blvd. and N. Compton Ave. The lower level lecture halls and Chem. Dept. are located just behind the soccer stadium. If you need directions, contact Olivier Nicaise at 977-2853 or nicaiseo@slu.edu.

If you are interested in participating, and would like to make suggestions regarding the organization and some additional activities of the SOC discussion group, or at best would like

to make a presentation at a future meeting, please contact one of the organizers listed below:

Prof. Olivier Nicaise
St. Louis University
(314) 977-2853
nicaiseo@slu.edu

Prof. Kevin Moeller
Washington University
(314) 935-4270
moeller@wuchem.wustl.edu

Washington University

Seminars are in McMillen 311 at 4 pm unless otherwise noted. Coffee is available 20 minutes prior to the talk, and refreshments follow. For information, contact:

Amy Walker
walker@wuchem.wustl.edu
An up-to-date list of seminars is available at:
www.chemistry.wustl.edu/~seminars/seminars.html

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University of Missouri- St. Louis

Seminars are held on Mondays at 4:00 pm in Room 451 Benton Hall unless otherwise specified. Refreshments 15 minutes prior to seminar time. (www.umsl.edu/chemistry)

November 3
Carolyn R. Bertozzi
Univ. of California, Berkeley
Chemical Glycobiology

November 10
Jay A. Switzer
Univ. of Missouri, Rolla
Epitaxial Electrodeposition of Metal Oxide Nanostructures

November 17
Nancy C. Horton
Univ. of Arizona, Tucson
Sequence of Selectivity and Degeneracy in a DNA Binding Enzyme

*Friday, November 21
1:00 pm
Herbert Schumann
Technical Univ. of Berlin
Metallocene Complexes of the Lanthanides and Their Use as Polymerization Catalysts

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Your Children Are What You Eat

by Jack Bornmann

Two months of sex is not enough. I am rested and back for more.

The first stage after fertilization is the simple replication of the fertilized egg. The mass of two to over a hundred identical cells is called the zygote. It is the first stage on the way to create a complicated mass of differentiated cells called a baby.

Letters & Words More

The second stage of development is the creation of these differentiated cells. In this stage, a hollow ball of zygotic cells forms a double layer where the inner cells are slightly different from the outer cells. This process of creating new kinds of cells is called differentiation.

Differentiation is an interesting and intriguing process for the people who ask "How?" That is science talk and not Native American talk. The lump of differentiated cells is called the embryo.

Hundreds of years ago people thought that the embryo had the shape of a teeny, tiny human being, which simply had to grow larger to make the baby ready to be born. We now know that the embryo starts out as a clump of cells that go through a number of weird changes. For example, slits form on the right and left side of the embryo in the region where the head will later appear. These slits look like and are referred to as *gill slits*. They do disappear though. Another odd feature is a

long tail that appears as though the embryo is going to become a reptile. But the tail shortens as the body grows into it. The embryo also develops *buds* that grow into the legs and arms.

When the embryo can be recognized as human, it is called a fetus. In the fetal stage more differentiation occurs to bring more complete organ formation. The nucleus of the fertilized egg contains the instructions for forming all of the different parts of a baby. The blueprint, of course, is contained in the chromosomes, i.e. the deoxyribonucleic acid (DNA). Do the cells differentiate by losing parts of the DNA? Does a differentiated cell from the stomach contain less DNA than the original fertilized egg? Or does it contain more DNA? These questions intrigued scientists a hundred years ago when they did not know about DNA but they did know about chromosomes. A biologist took some cells from the stomach of a frog and stimulated it to begin replicating. It turned into a tadpole. In other words the specialized stomach cell contained all of the chromosomes needed to make a baby frog. Somehow some of the chromosomes were turned off during differentiation.

DNA cannot cross the membrane surrounding the nucleus of a cell. Outside the nucleus there is an object called the mitochondria which manufactures proteins according to instructions on the DNA. If the DNA is trapped within the nucleus, how does its information get to the mitochondria? The RNA (ribonucleic acid) which can cross the nuclear membrane does it. The RNA assembles on a portion of the DNA, i.e. a gene, and then carries the code to the mitochondria. A protein attaching itself to the bases of the DNA and

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Invention: How do I know I have invented something?

Sadiq Shah

Office of Technology Transfer
Western Illinois University

Most of us involved in research activity are focused on solving or understanding a challenging and interesting problem. In general, you may not think about or expect a commercial use for your research. Yet, it is possible that in the course of your research you may have discovered a new tool, method, chemical or biological sample that may have use in an area outside your field of research. Such inventions can be protected for a limited term (20 years) by **patents**. A patent may be obtained for any method, machine, manufactured article, compound, or new use for existing matter; it may include genes and gene products, or an improvement to an existing invention. For an invention to qualify for patent grant, according to the laws, it must meet the three fundamental requirements. The invention must be **new, non-obvious, and useful**. The owner is given the right to stop others from making, using, and selling the patented claims. More importantly the owner does not necessarily have these rights either, until he/she has met the requirements of other federal agencies as they apply to a given invention.

Stay tuned for more on these topics and associated ownership rights in the future Chemical Bond issues.



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Bond Briefs

St. Louis Section

Wins 2

ChemLuminary Awards

We are pleased to announce that the St. Louis Section won the following ChemLuminary Awards at the National ACS Meeting:

- Outstanding Local Section - Large Category
- Outstanding Kids & Chemistry Program Award

The ChemLuminary Awards ceremony was held on Tuesday, September 9, 2003 at New York's Hotel Pennsylvania. in the Penntop Ballroom.

Please join me in congratulating the many hard-working members of our section who have contributed in so many ways.

Your Section Needs You!

Exciting volunteer opportunities are available for the 2004 season. There are many events that need people to help out, especially the Kids & Chemistry Program, the annual St. Louis area science fairs and career fairs and the Chemical Bond. Rewards include personal satisfaction, gratitude of your colleges, and networking opportunities galore. To volunteer please contact Leah O'Brien at lobrien@siue.edu.

We hope to hear from you!

FREE Science Seminar Series

A free science seminar series is being sponsored by the St. Louis Zoo and the Academy of Science of St. Louis. Seminars will be held in The Living World (North side of the zoo) and free parking is available in the North lot. The seminars are held on Wednesday evenings from 7:30 - 9:30 pm. All teachers, adults, and secondary students are invited to attend. For more information call 1-314-768-5466 or 1-314-533-8083. The seminars are as follows:

November 19

Susan Mackinnon, M.D.
Professor of Surgery
Washington University

Bridging the Gap: Advances in Nerve Regeneration and Transplantation

January 21

Elizabeth A. Kellogg, Ph.D.
Professor of Botanical Studies and Molecular Systematics
Dept. of Biology, UM-St. Louis
Greens to Genes: DNA Evidence and Plant Evolution

February 18

Timothy M. Kusky, Ph.D.
Assistant Professor
Earth and Atmospheric Science
St. Louis University
Plate Tectonics on the Early Earth: How a record got preserved in northern China

March 24

Alan R. Templeton, Ph.D.
Professor, Dept. of Biology
Washington University
The Evolution of Modern Humans: What Genes Really Tell Us

Nominate a Colleague for the St. Louis Award

The St. Louis Award, sponsored by the Monsanto Company, is presented to an individual who had made outstanding contributions to the profession of chemistry and demonstrated potential to further the advancement of the chemical profession. The award, consisting of a \$1,500 honorarium and a plaque, is presented at the St. Louis Award Banquet, the final event of Chemical Progress Week in April.

Please help the Awards Committee identify outstanding chemists in the St. Louis Section by submitting your nominations to the St. Louis Award Chair. The nominations should include a nominating letter, two or more seconding letters from individuals who have had a close professional affiliation with the nominee, a brief biography, a description of the nominee's accomplishments, and a list of publications and patents.

At the time of the nomination, the nominee must not have previously received the Midwest Award or any national ACS-sponsored award. The nominee must be a member or affiliate of the St. Louis Section of the ACS. The deadline for nomination packets to be received is December 10, 2003. Please send nominations and inquire to:

Dr. Joseph Ackerman
St. Louis Award Chariman
Department of Chemistry
Campus Box 1134
Washington University
1 Brookings Drive
St. Louis, MO 63130-4899
Phone: 1-314-935-6593
FAX: 1-314-935-4481
ackerman@wuchem.wustl.edu

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Continued from page 6
blocking any RNA from reading its message might turn off the gene. There may be a special DNA code at the beginning of a gene that says, in essence, "Start here." It is like the capital letter at the beginning of this sentence that says, "This is a new thought."

There is a new field in biology and medicine called "epigenetics." Whereas genetics deals with the genes, chromosomes, and DNA, epigenetics deals with factors that turn genes on or off. These factors can go to work in utero, i.e. during embryonic or fetal development in the uterus. Recently some biologists at Duke University took mice that had identical genetic material and fed some of the mothers with a supplemented diet during pregnancies. The mice born to mothers receiving the diet supplement had brown coats. The mice born to mothers receiving

the standard diet had yellow coats characteristic of these carefully inbred mice (clones by controlled sexual reproduction) to give both groups exactly the same genes. To paraphrase the old saying we must now say, "You are what your mother ate!"

Epigenetics is new and there is a tremendous amount of information to be learned about foods that turn on or turn off genes in the baby during pregnancy. This lack of knowledge and the consequent uncertainty could be a terrible burden for a mother-to-be. We humans have successfully reproduced ourselves for millions of years without epigenetics. But for those mothers-to-be, until we know more just keep doing what your trusty urges tells you to do.

For more information see Sharon Begley's column Science Journal on page B1 of the August 15, 2003 issue of the Wall Street Journal.

Don't forget to plan to attend the Continuity Dinner

Thursday, December 11, 2003
at Chris' Dining
5980 Southwest Blvd.
(314) 645-2088

The December board meeting is the Continuity Dinner. This fancier than average board meeting celebrates the year's achievements and the passing of the gavel to a new slate of section officers. The Henry Godt Memorial Lecture (recapping the past year, speaker always a surprise) is a highlight.

The evening will begin with a social hour and open bar (beer, wine, and soft drinks) at 5:30 pm. Dinner will be served at 6:30, and the business meeting will begin at 7:15. Cost is \$20 per person (payable at the meeting).

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