



# Chemical Bond

Volume 55  
Number 3  
March 2004

**St. Louis Section, American Chemical Society**

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Frank Cange  
High School Chemistry  
Teacher of the Year

***The Department of Chemistry at the University  
of Missouri–St. Louis  
announces***

**The Seventh Annual Robert W. Murray Lecture**



***Jacqueline K. Barton***

***Arthur and Marian Hanisch  
Memorial Professor of  
Chemistry at the California  
Institute of Technology.***

***will speak on:***

***DNA Charge Transport Chemistry  
and Biology***

**Monday, March 15, 2004**

Lecture at 4:00 pm in 102 Benton Hall.  
Reception 3:15 adjacent to the Lecture Theater.

**All are welcome!**

**The Robert W. Murray Lectureship** was inaugurated in 1998 as an endowed lecture series through the contributions of family, friends, former students, colleagues of Dr Murray and alumni. The Lectureship honors the distinguished research career and the many contributions to UM-St. Louis over more than 30 years by Professor Robert W. Murray, Curators' Professor Emeritus.



**The University of Missouri-St. Louis**

# Chemical Bond

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**Volume 55**

**No. 3**

**March, 2004**

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## In this issue . . .

- 4 **Meetings & Seminars**
  - 6 **Letters, Words & More: Mad Cow Disease**
  - 9 **Frank Cange: St. Louis High School  
Chemistry Teacher of the Year**
  - 9 **St. Louis Public Schools 21st Career Awareness Fair**
  - 10 **Recognition Night Reservation Form 2004**
  - 10 **Copyright: Who is the Owner and  
What is the Ownership Rights?**
  - 15 **Chemical Progress Week Schedule**
  - 15 **ACS Scholars Program for Underrepresented  
Students**
-

# Meeting & Seminars

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## Board of Directors

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St. Louis Section–ACS Board of Directors meets on the second Thursday of each month, at the Alumni Center, University of Missouri–St. Louis. 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 Bijan Khazai (bkhazai@sentortech.com or 314/497-8629) 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 for free, compliments of the section.

**Date:** March 11  
**Social hour:** 5:30 pm  
**Dinner:** 6:30 pm  
**Business meeting:** 7:15 pm  
**Future meetings:** April 8  
May 13

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## Washington University

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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](http://www.chemistry.wustl.edu/~seminars/seminars.html)

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## St. Louis NMR Discussion Group

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The St. Louis NMR Discussion Group will feature the following speaker at 4:00 pm in Room 458 Louderman Hall (Chemistry Dept.) at Washington University.

### March 30

Lewis Kay  
Univ. of Toronto  
Depts. of Biochemistry,  
Molecular Genetics, and  
Microbiology

The St. Louis NMR Discussion Group will also feature the following speaker at 4:00 pm in Room 241 Compton Hall (Physics Dept.) at Washington University.

### April 27

G. Allan Johnson  
Duke Medical Center  
Center for *in vivo* MR  
Microscopy

For more information contact:  
Mark Conradi 935-6292 or 935-6418.

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## **University of Missouri- St. Louis**

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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](http://www.umsl.edu/chemistry))

### **March 1**

Randall Halcomb  
Univ. of Colorado  
*Synthesis of Glycopeptides  
and Their Mimetics*

### **March 8**

Sheryl Tucker  
Univ. of MO-Columbia  
*Spectroscopic Characterization  
and Application of Dendritic  
Polymers as Selective Uptake  
Devices*

### **March 15**

#### **7th Annual Robert W.**

#### **Murray Lecture**

Jacqueline K. Barton  
Arthur and Marian Hanish  
Memorial Professor and  
Professor of Chemistry  
Calif. Institute of Technology  
*DNA Charge Transport  
Chemistry and Biology*

### **March 29**

Robert J. Linhardt  
Rensselaer Polytechnic Institute  
*Advances in the Synthesis of  
Acidic Oligosaccharides*

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## **St. Louis University**

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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](mailto:jellissp@slu.edu).

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## **Synthetic Organic Chemistry (SOC) Discussion Group**

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The Synthetic Organic Chemistry (SOC) discussion group will hold its first Spring 2004 meeting on:

### **Wednesday, March 24**

St. Louis University  
Lee Lecture Hall 1 (LH1)  
(lower level lecture halls,  
just next to Chem. Dept.)

and will be also very pleased to host the following speaker on that evening:

### **Prof. John-Stephen Taylor**

Washington University  
*Problems and Progress in  
Developing Nucleic Acid  
Triggered Prodrug Activation  
for Patient-Specific  
Chemotherapy*

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. If you need directions, contact Olivier Nicaise.

If you are interested in participating please contact one of the organizers listed below:

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

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

## Mad Cow Disease - Cause for Madness?

by Jack Bornmann

The brain of a mad-cow shows spongiform encephalopathy (big words describing the sponge-like formation in the pathologic brain of the sick cow). It is not a sponge with openings filled with water or air, but openings filled with debris called plaque. This plaque is an insulator preventing the electrochemical messages from flowing within the brain.

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## Letters & Words More

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Spongiform encephalopathy appears in other animals such as sheep, deer, elk, and humans. (Scientists have also caused it to develop in some unfortunate laboratory mice.) In sheep it is called "scrapies" because the infected sheep would stagger into a fence and scrape itself until the wool came off. In deer and elk the disease is called "chronic wasting disease". In humans the disease is called "variant-Creutzfeldt-Jakob disease" because of its similarity to the Creutzfeldt-Jakob disease which has been known for many years, long before the

appearance of mad-cow disease.

Apparently the disease is caused by a prion (pronounced *pree-on*), which is a variant form of a naturally occurring protein on the surface of nerve cells in the brain. The natural protein has a helical shape. The abnormal prion has the same amino acids as the normal protein, but is folded like the pleats of a partially opened accordion. For proteins, the shape is critical for biological activity and altering the shape can destroy its activity. It appears that the prion can cause naturally occurring helical proteins to change their shape to match the prion, which then convert more natural proteins in to prion mimics. Thus, causing a cascade effect.

Infectious diseases can be caused by bacteria, which are cells containing proteins, DNA, RNA, ribosomes and mitochondria. Or, a disease can be caused by viruses, which are simply DNA (or RNA) with a protein coating. Prions, however, are only proteins, which have no DNA or RNA. Prions are not alive and, therefore, cannot be killed. To stop a prion you must destroy it. The question, then, is "How can you destroy a prion (protein) without destroying the other proteins that make up the body and are necessary

*Continued on page 13*

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*The Department of Chemistry at Washington University  
is pleased to announce this special presentation*

## **2004 Bayer Distinguished Lectures**

***Professor Roeland J. M. Nolte***

*University of Nijmegen  
The Netherlands*



***March 25, 2004***

*Laboratory Sciences Building*

**“Mastering Molecular Matter:  
Nanosized Architectures from  
Molecular and Macromolecular  
Building Blocks”**

4:00 p.m. – Lecture in Room 300

5:30 p.m. – Reception in the  
Rettner Gallery

***March 26, 2004***

*McMillen Chemistry Laboratory*

**“Bio-inspired Supramolecular and  
Macromolecular Catalytic  
Systems”**

11:00 a.m. – Lecture in Room 311

*For reservations, please call by March 19, 2004*

*(314) 935-4108*

*or e-mail [Christine@wuchem.wustl.edu](mailto:Christine@wuchem.wustl.edu)*

 **Washington**  
University in St. Louis

## CAREER CORNER...

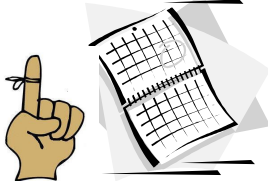
The National Employment Clearinghouse for the Anaheim meeting is now open for registration (submit your resume and search job listings) Go to:

[www.chemistry.org/careers](http://www.chemistry.org/careers) and click on "At the National Meeting" for all the details and to view the list of career workshops that will be presented at that meeting. If there is a particular topic you would like to discuss at the April career workshop, please let us know! Contact Lisa Balbes.com or 314/966-5298.

## SPONSOR A STUDENT AWARD!

Please consider sponsoring a student award. In the last several years the St. Louis Section has offered subscriptions to ChemMatters to each of the 30 high school students at a cost of \$12/student. We also pay Student Affiliate ACS dues for each of the 8 College Award winners at a cost of \$19/student. If you are willing to sponsor an award, please send a check by April 9, made out to "St. Louis Section ACS" and mail to our treasurer: Bruce Ritts, 803 Lilac Ave., St. Louis, MO 63119. Donors will be recognized in the Awards Night program on April 19.

## DATES



## TO REMEMBER

**March 13** - Recognition Night  
Glen Echo Country Club

**April 18** - Women Chemist's Luncheon (speaker: Kristin Bowmen-James)

**April 19** - Awards Night  
Kemoll's Restaurant

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# Frank Cange

## High School Chemistry Teacher of the Year

Frank Cange received the 2004 St. Louis Section ACS High School Chemistry Teaching Award. He is an exemplary educator, providing direction for his students, expecting excellence in their work, and encouraging participation in area science competitions and events. Frank has been especially active in providing opportunities

for his students to be competitive in Advanced Placement Testing, the Battle of the Burets, the Chemistry Olympiad tests, and similar contests. A strong advocate of AP exams in the region, Frank has attended workshops on the exams and been a grader for the national exams. His commitment to encouraging students to achieve this level is unparalleled.

Frank attends many workshops and classes to keep in pace with new technologies. He has presented at various meetings, and equally important, encouraged colleagues to attend and become active in sharing ideas. He has been a regular participant in both the metro area Chemistry and Physics teachers groups. His efforts to increase attendance at these functions have continued year after year.

Frank brings to the classroom a solid understanding of his discipline, an interest in the application and integration of the discipline into the real world of his teenage students, and an understanding that all students are unique and important. With experience in both Illinois and Missouri schools and in both public and private institutions, Frank has worked with a diversity of student needs and expectations. Currently teaching at Trinity Catholic High School in St. Louis, he teaches regular, honors, and college level chemistry and regular and college level physics. Frank has built programs that work for these different levels.

Frank has his bachelors and masters degrees from Southern Illinois University Edwardsville as well as many additional credits for his participation in special programs and workshops. This is his 25<sup>th</sup> year of teaching at the high school level. He also teaches part-time at Southwestern Illinois College and has an online Advanced Placement Chemistry Course.

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### **St. Louis Public Schools 21<sup>st</sup> Career Awareness Fair**

Volunteers still needed for the St. Louis Public Schools Career Awareness Fair to be held at the America's Center - Hall 3, Tuesday-Wednesday, May 4 and 5, 2004 from 8 AM to 2 PM. Come join in and invest in a world-class workforce by sharing your career as a chemist with 8th grade students. For more information or to volunteer, please contact Greg Wall, ph: 800-325-5832 ext. 3139 or e-mail: gwall@sial.com. Hope to see you at the Fair!

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# Copyrights: Who is the Owner and What are the Ownership Rights?

**Sadiq Shah**

Office of Technology Transfer  
Western Illinois University

The copyright laws protect any original works of authorship. These works can be literary, dramatic, choreographic, musical, pictorial, graphical, sculptural, sound recording, and computer software. The law gives the original author or the employer if it is completed under work-for-hire category the exclusive rights for 1) reproduction, 2) distribution, 3) public performance, 4) public display, and 5) modifications of the work. The owners can exercise any of these rights or a combination of these on their own. They may license any combination or all of them to another party, or permit another party in writing to exercise any without monetary compensation. There are some limited exclusions to these rights that will be covered in the future. As users of copyright protected materials we must avoid infringing these rights because this can result in significant penalties. In general the copyright laws are much more complex than what is discussed here. As creators of our own works and users of other protected works we must develop a clear understanding in various situations.

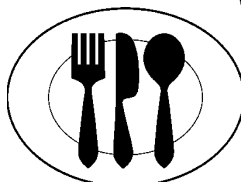
*Stay tuned for more on these topics and associated ownership rights in future Chemical Bond issues.*

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## Recognition Night

New 50-year members honored, presentation of the Distinguished Service Award, Past Chair recognition and address.  
Come for an enjoyable evening. Spouses welcome!

**Date:** March 13 6:00 pm  
**Location:** Glen Echo Country Club  
3401 Lucas & Hunt Road  
St. Louis, MO 63121  
**Cost of dinner:** \$20.00 per person  
**Reservations:**  
Samir El-Antably  
P.O. Box 50168  
St. Louis, MO 63105  
(314) 664-5522



**\* make checks payable to: St. Louis Section - ACS**  
*Please make your reservation by March 10.*

## Science Fair Call for Judges

Science Fair season is just around the corner, and so is another opportunity for you to encourage an understanding of good science by participating as a Science Fair judge. Members of the ACS St. Louis Section are needed as judges to evaluate chemistry projects for special awards at regional science fairs in the greater St. Louis area. Secondary-level winners receive prizes from the section (science books and more), while all elementary-level participants with chemistry-related projects receive ribbons. Everyone (kids and judges) wins in other ways as well.

This year, the judging times are as follows:

### **St. Charles-Lincoln County Regional Science Fair**

Monday, March 8th, 6:00 PM at St. Charles Community College

### **Illinois Junior Academy of Science Region 12 Science Fair**

Saturday, March 20th, 9:30 AM at SIU-Edwardsville

### **Greater St. Louis Science Fair**

Friday, April 16th, 6:00 PM at Greensfelder Pavilion at Queeny Park

**Interested in judging? Please contact David Haselbauer:**

phone: (314) 918-1062

email: [djhase@swbell.net](mailto:djhase@swbell.net)



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The SIUE Department of Chemistry and the  
Chemistry Club announce the  
28<sup>th</sup> Annual William J. Probst Memorial Lecture

# Dr. Bassam Z. Shakhashiri

William T. Evjue Distinguished Chair for the  
Wisconsin Idea & Professor of Chemistry  
University of Wisconsin – Madison



## “Science is Fun”

Thursday, April 15,  
2004

7:00 pm Meridian Ballroom  
Morris University Center

Spectacular demonstrations will be used to show how science can be communicated to all segments of our society. Students, faculty, and all members of the community are invited. Come learn about combustion, exploding balloons, floating soap bubbles, polymers, and other spectacular scientific phenomena. You will sit at the edge of your seat and will see science in action.

### Additional Probst Lecture Events Include:

#### “The Joy of Learning and Exortations for Good Teaching”

Bassam Z. Shakhashiri  
Wednesday, April 14, 2004  
4 p.m., Science Building 3114

#### Student Research Symposium

Thursday, April 15, 2004  
2 p.m. Meridian Ballroom,  
Morris University Center

Funded in Part By: The College of Arts and Sciences, The Graduate  
School, The Department of Chemistry, and Student Activities Fees

For further information contact the SIUE Department of Chemistry  
at (618) 650-2042

*Continued from page 6*

for life?”

As I mentioned earlier, when humans get spongiform encephalopathy (mad-cow disease) the disease is called variant-Creutzfeldt-Jakob disease (vCJD). It is rare, but fatal. In other words, your chance of getting the disease is very, very low but once you have it there is a 100% chance that you will die from it.

There are three forms of the standard Creutzfeldt-Jakob disease. The most common form of this rare disease is sporadic-CJD, accounting for about 85% of the CJD cases. In this form of CJD the gene that directs the synthesis of a protein undergoes a mutation. As a result of the mutation, the gene directs the synthesis of a different form of the protein, which then causes CJD.

The next most common form of CJD is genetic-CJD, which affects 10 to 15% of the cases of the disease. It is passed genetically from one generation to the next.

The least common form of the disease is iatrogenic-CJD. (Iatrogenic means that it has been caused by a physician, in this case a surgeon.) It

occurs when an infected individual transfers the disease to a healthy individual. Known cases have involved organ or tissue transplantation or the injection of tainted human growth hormone. Tissue from the brains of mad-cows and brain tissue from humans with vCJD can cause the disease to form in injected mice. However, when brain tissue from a human infected with ordinary CJD is injected into a mouse, the mouse does not develop the illness. Thus, we can conclude that mad-cow disease and its human form (variant Creutzfeldt-Jakob disease) is **not** the same as ordinary CJD.

To consider the chances of contracting vCJD we must look to Britain, which has had the most occurrences of the disease. In Britain 143 people have died from vCJD, the human form of mad-cow disease and these people are dying at a rate of 20 per year, not a large number for a death rate. In 2001 in Britain there were 140,000 deaths due to cancer, 2,000 deaths due to vehicular accidents, and 185 deaths due to accidental drowning. My advice is: *eat your meat and give up swimming and driving.*

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## Marcus Award Competition Slated at SLU

The 2004 Leopold Marcus Award competition will be held Wednesday, April 14 at 4:00 p.m. in Lee Hall (Lecture Hall 1) on the campus of SLU.

The Leopold Marcus Award was established by the late Jack and Gertrude Marcus in memory of his father. It is administered by the Department of Chemistry at Saint Louis University and the St. Louis Section of the American Chemical Society. The competition consists of presentations based on the undergraduate research projects of senior chemistry majors at Saint Louis University. The candidates, chosen by the faculty, will be making fifteen-minute presentations.

The winner of the award is determined by vote of the professional chemists in the audience. All ACS members are invited to attend. Refreshments will be available after the competition. For further information, contact Bruce Kowert at (314) 977-2837 or kowertba@slu.edu.

*Pick up*

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*Mass-Vac ad*

*from p. 7 of Dec. 2003*

# Chemical Progress Week: April 19-24, 2004

## Schedule of Events

### Monday, April 19, **Awards Night**

Kemoll's Restaurant - \$20/person, 5:30 pm social hour,  
6:30 pm dinner, 7:30 pm Program

contact: Bijan Khazai (314) 497-8629 bkhazai@sentortech.com

### Tuesday, April 20, **ADACIOM Luncheon**

contact: Bijan Khazai (314) 497-8629 bkhazai@sentortech.com

### Friday, April 23, **Chemistry Career Day**

9:00 am to 12:00 pm - Benton Hall, UM-SL

contact: Jim O'Brien or Keith Stine at (314) 516-5311

### Friday, April 23, **St. Louis Award Symposium**

1:00 - 5:00 pm, Cori Auditorium, McDonnell Science Bldg., WashU

contact: George Gokel (314) 362-9297 or ggokel@molecool.wustl.edu

### Saturday, April 24, **St. Louis Award Banquet**

Kemoll's Restaurant - \$30/person, 6:00 pm cocktails, 7:00 pm Banquet,  
8:00 pm Program; Reservations to Samir El Antably, P.O. Box 50168,  
Clayton, MO 63105. Questions call (314) 664-5522

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## Underrepresented Students: Take advantage of the ACS Scholars Program

The American Chemical Society sponsors scholarship programs for qualified applicants who want to enter the fields of chemistry, biochemistry, or chemical engineering, and students seeking a two-year degree in chemical technology. The programs are designed to encourage African-American, Hispanic, and American Indian students to pursue undergraduate college degrees in the chemical sciences and chemical technology. The goal of these scholarships is to aid in building an awareness of the value and the rewards associated with careers in science and to assist students in acquiring the skills and credentials needed for success in these areas.

The scholarships are awarded on the basis of merit and financial need to high school seniors planning a science preparatory program of study, and college students who are currently freshmen, sophomores, or juniors who are committed to the study of chemistry, biochemistry, chemical engineering or other chemically related fields such as environmental science, materials science, or toxicology. Students interested in two-year chemical technology programs and careers in these fields are also eligible.

For more information contact Kathy Fleming at [k\\_fleming@acs.org](mailto:k_fleming@acs.org) or (202)872-6132. If you are a faculty or school administrator, please contact Robin Wainwright at 1-800-227-5558, ext. 6222 or send an e-mail to [r\\_wainwright@acs.org](mailto:r_wainwright@acs.org) to request informational posters for your department.

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