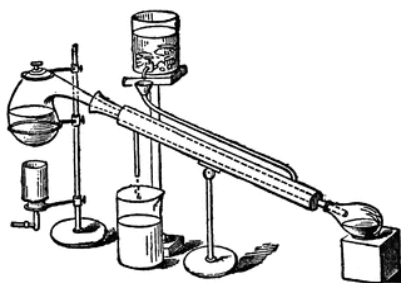




# ***SOUTHWEST RETORT***



**SIXTY-SIXTH YEAR**

**JANUARY 2014**

*Published for the advancement of  
Chemists, Chemical Engineers  
and Chemistry in this area*

published by

The Dallas-Fort Worth Section, with the cooperation of five other local sections of the American Chemical Society in the Southwest Region.

**Vol. 66(5) JANUARY 2014**

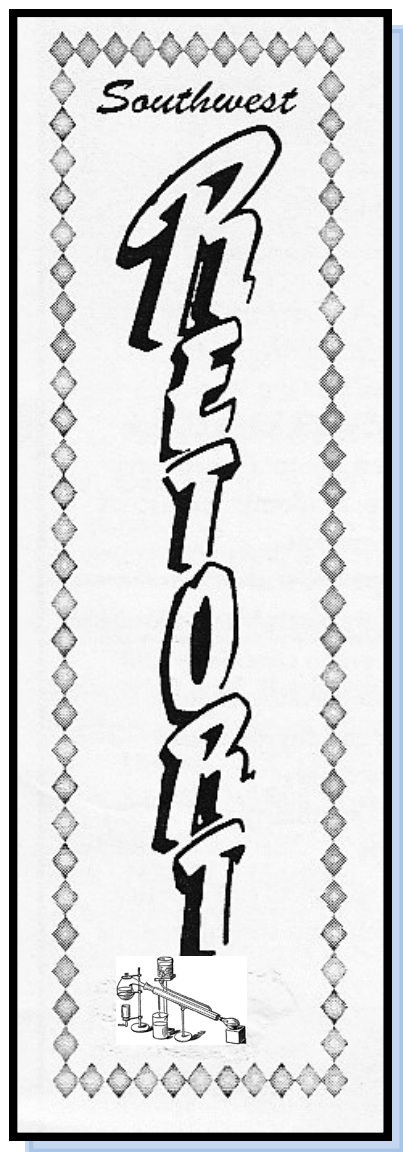
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*The Southwest Retort is published monthly, September through May, by the Dallas-Ft. Worth Section of the American Chemical Society, Inc., for the ACS Sections of the Southwest Region. Contact the Editor for subscription and advertisement information.*



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# EMPLOYMENT CLEARING HOUSE



Job applicants should send name, email, and phone, along with type of position and geographical area desired; employers may contact job applicants directly. If you have an opening, send your listing, including contact info for your company, to [retort@acsdfw.org](mailto:retort@acsdfw.org). Deadlines are the 7<sup>th</sup> of each month.



## EDITING AND PROOFREADING SERVICES

Need someone to proof or edit your next paper, grant, or presentation? Let an experienced proofreader and PhD chemist do it for you! I have a strong grasp of English grammar and scientific writing and can condense text without losing the underlying meaning. Competitive rates! Contact Mike Vance:

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## FIFTY YEARS AGO IN THE SOUTHWEST RETORT

The ACS Southwest Regional Award address in Houston last month by **Dr. Jacob Sacks** of the University of Arkansas dealt with "Science Education in Latin America." His talk was printed in the January 1964 issue of the magazine. Some of the main themes include that science education was mainly involved in preparing students for professional or engineering programs rather than for the science itself and that students tended to come mainly from the wealthy classes. The situation was steadily improving, but support by both the Rockefeller and Kellogg Foundations is still crucial in maintaining momentum.

At Rice University **Dr. Edward S. Lewis** has been named Chairman of the chemistry department. He succeeds **Dr. Richard B. Turner**. Dr. Lewis joined the Rice faculty in 1948. A native of Berkeley, CA, he received his B.S. degree from California in 1940 and his M.A. and Ph.D. degrees from Harvard in 1947. He was a National Research Council Postdoctoral Fellow at UCLA in 1947-48. He recently received a PRF grant for "Plar-Gas Reactions."

At Texas A&M, **Dr. J. M. Prescott** of the biochemistry department received a \$45,000 Welch Grant renewal to study "Chemistry and Metabolism of Proteins and Amino Acids." Faculty members attending the ACS regional meeting in Houston were **Drs. Frederick Duke, B. J. Zwolinski, A. Danti, F. Sichio, E. A. Meyers, A. F. Isbell, H. Rakoff, A. Merijanlian, and R. A. Zingaro**. **Mr. R. Copeland** and **J. O. Page** presented papers. Those attending the Welch Conference in November were **Drs. Duke, Zwolinski, Danti, Myers, C. K. Hancock, D. C. Conway, R. M. Hedges, and J. Jones**. As of last Oct. 7, the Chemical Ther-

modynamic Properties Center is partially supported through the new NBS Standard Reference Data Program to accelerate work on thermodynamic and spectroscopic properties of substances of interest to the chemical industry through the MCA Research Project.

The second regular ACS meeting of the Texas A&M-Baylor Section was held in Waco in the new McLean Science Building. The lecturer was **Professor John Oro** of the University of Houston, who spoke on "Prebiological Organic Chemistry." On Nov. 14, Nobel Laureate **Willard F. Libby** of UCLA give two lectures. The first lecture dealt with the Franck-Condon Principle, while the second lecture was on carbon-14 dating. **Professor John Belew** participated in a Varian NMR Workshop held in Palo Alto the week of Nov. 11.

At the University of Arkansas the speaker for the Jan. 14th ACS meeting will be **Dr. John K. Stille** of the University of Iowa. His talk is titled "New Polymerization Reactions." The Feb. 11 speaker will be **Dr. Gordon Lindblom** of the Jersey Production Research Co. in Tulsa. His topic will be "Introduction to Microbial Chemical Transformations." The speaker at the December meeting was **Dr. Ralph Adams** of the University of Kansas, whose topic was "Electron Spin Resonance Studies of Electrode Reactions." Faculty members attending the ACS Regional Meeting in Houston were **Drs. Edward S. Amis, A. W. Cordes, Nirmal Shastri, and award winner Jacob Sacks**.

Contributed by  
E. Thomas Strom





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T104704201

# **Project Management and the Affordable Care Act**

by  
**John E. Spessard, PhD, PE**



An essential requirement for the successful implementation of a project is good project management. Project management is the successful implementation of a project such that the project is completed on schedule, within budget and meets the project's objectives. The attempted enrollment of the Affordable Care Act (ACT) is a good example of failed project management.

Successful project management starts with a definition and understanding of the project's objectives. Next comes defining the project's requirements in human assets, money and materials. Then there is the project schedule. To schedule the project requires understanding the necessary steps. For each step, there must be a definition of the time needed to complete the step and the necessary human and material resources (aka money).

From kinetics, chemists are familiar with the concept of the slowest or rate determining reaction. The same concept applies to projects. As a simple example, a process has three steps, A, B and C. The three steps require the same amount of time to complete and require the same amount of resources. But Step B can't start until Step A is completed. Step C can start at any time. The rate determining step or Critical Path is the Step A Step B sequence. So you start Step A, and after Step A is complete, you start Steps B and C. Please note that you do not need to have the resources for Step C on hand until Step B is completed. This helps

the project budget.

Each step needs to have several points or milestones where progress can be measured. The project schedule sets times at which each milestone is to be completed. If a milestone appears to be behind schedule or over budget, this is a problem. The causes must be understood and addressed immediately. The milestones provide early warnings of potential problems and allow timely intervention. The official line on the ACT as of September 1, 2013 was that it would be ready to run on the scheduled October 1, 2013 starting date. There appeared to be genuine surprise on October 1st that there was a problem. This is unsatisfactory Project Management.

An essential ingredient to successful project management is the Project Manager. For the ACT, the Project Manager would have needed to have coordinated the efforts of computer programmers, software developers, systems engineers and the people operating the system. The Project Manager would have to have been aware of all deviations from schedules and budgets in every area. The Project Manager would have needed the authority and resources to make all modifications necessary to have kept the ACT on schedule and on budget. Did the ACT have a Project Manager? If so, Congress has yet to discover him/her. I have heard the deafening silence concerning the existence of a Project Manager. A Project

Manager for so complex an undertaking as the affordable Care Act is a very demanding and necessary feature.

The Manhattan Project is a good example of high quality project management. J. Robert Oppenheimer was a magnificent Project Manager. He was so important to the project that his pre-World War II leftist leanings were overlooked. In my opinion this was necessary. He was a good enough scientist to have the respect of the scientists working on the project. He was able to coordinate with General Groves who handled the engineering, military and political issues. That Groves and Oppenheim were able to work together was a tribute to both men. The Germans and the Japanese had unsuccessful nuclear projects.

Author's note: I can't understand why the enrollment phase of the ACT lacked a Project Manager. I wonder if the implementation phases are similarly blessed.



## SCIENCE FAIR JUDGES NEEDED

We would like to extend an invitation to participate as a chemistry judge at the 2014 Beal Bank Dallas Regional Science and Engineering Fair. Held annually since 1957, this competition produces some of the best middle and high school research projects in the world, hosting around 1,000 students and 400 judges. Please join us and help support students in our region! Breakfast, lunch, and a small memento of the fair will be provided for all judges. Further details and online registration can be found on the Judge page of [drsef.org](http://drsef.org).

What: Beal Bank Dallas Regional Science & Engineering Fair

When: 8:00 am - 1:00 pm approx.,  
Saturday, February 15, 2014

Where: Fair Park, Dallas

Contact: [scifair@physics.smu.edu](mailto:scifair@physics.smu.edu)

Website [drsef.org](http://drsef.org)





# Welcome To ASMD@D

*The Somewhat Different Conference*

<http://smu.edu/austinsymposium/>

The **25<sup>th</sup> Austin Symposium on Molecular Structure and Dynamics at Dallas (ASMD@D)**, will take place at the Double Tree Hotel, Campbell Center, Dallas, from **March 1-4, 2014**. The conference will be held in memoriam of Professor James E. Boggs, who organized the first 23 Austin Symposia in the time from 1966 to 2010 before the conference moved to Dallas. The ASMD@D 2014 will be organized in the spirit of previous symposia:

Listen and discuss

Meet international experts

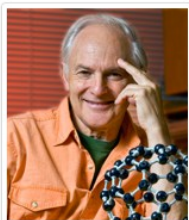
No parallel sessions

A place where important interdisciplinary work can start

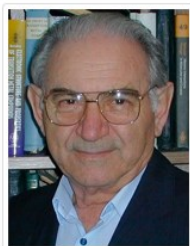
A place where new positions can be found

## Featured speakers

Sir Harold Kroto



Professor Issac Bersuker



Professor Louis Echegoyen



Professor Anne McCoy



Professor Martin Quack



Professor Martin Suhm



For the list of confirmed speakers, check the website.  
We hope to see you in March.



Professor Dieter Cremer      Professor Elfi Kraka  
Chairs of the Organizing Committee of ASMD@D  
Department of Chemistry, SMU, Dallas, Texas

Click on the logo to  
access the web site.



# ...And another thing...

By Denise L. Merkle

## Resolution

Welcome to 2014. The future. The 'life is what you make it,' 'you only live once,' and 'it's now or never' next year of our existence. Welcome to whatever you want, need—*resolve*—to do with the 365 days between Happy New Year 2014 and Auld Lang Syne. How will you use this precious time?

I resolve to re-do my company's office. Recycle journals (especially those now available electronically, sad though that is). Discard old posters (chromatography column technology has advanced in the past decades, after all). Donate old electronics (including the brand-new phone that was purchased to improve telephonic communication and only succeeded in pithing me with its unbearably high ring tone). Excavate out from under the strata generated by 17 years in business. Obliterate the soul-oppressing ugly blue paint. **Redecorate the office.** Really. This is my 2014 resolution for my professional life. And so it has been for the 16 years this office has been SCI's home. What is wrong with this picture? Perhaps nothing.

Contemplation of my ubiquitous resolution prompted a survey of 59 colleagues. 37% of those contacted graciously used their valuable time to answer the question, 'What are your personal and professional resolutions for 2014?'

The responses were fascinating and inspirational. 8% made no resolutions, with more than one participant explaining that short term goals were made and met throughout the year, and another saying that dodging the guilt of aspirations unmet is a perfect reason to avoid resolutions. Of those who

sent resolutions, 5% specified professional only—and many of those were: Write! Write up data (all but one academic said this; the outlier was 'attend more faculty meetings'), Blog, establish a website for a business (which involves writing content, as we all know), and continue to write for the Retort (not my resolution—mine is to re-do SCI's office. Yes. This will happen in 2014. Really. It will.). Other professional goals include: identify and retain more clients or customers, bill more hours ('after working them' was implied), follow customer interactions more efficiently, focus on business without sacrificing personal life, stay current with paperwork, dress for success, be more organized, and interact more assertively with colleagues (this isn't me, either, you may be relieved to note). One participant set 'Be more reliable' as a goal for professional and personal life.

The most popular personal resolution was Read! Read for relaxation, spiritual growth, and personal edification. A respondent who is nearing retirement expressed the overall resolution of figuring out what's next, and one who will become a parent in 2014 resolved to figure out how to be a good one (One year is not enough. I foresee similar goals in 2015, 2016, 2017...). Those who wrote back want to Improve Relationships (including tolerating in-laws), Erase Debt, Sing Higher, De-clutter, Achieve Balance, and Be Happy.

In 2014, we all plan to live balanced, rewarding, and organized lives, full of good relationships, attainable goals—and happiness. Divesting of insipid office wall color,

*continued on page 22*

## First plant-based ‘microswimmers’ could propel drugs to the right location

### Bioinspired Helical Microswimmers Based on Vascular Plants *Nano Letters*

In the quest to shrink motors so they can maneuver in tiny spaces, like inside and between human cells, scientists have taken inspiration from millions of years of plant evolution and incorporated, for the first time, corkscrew structures from plants into a new kind of helical “microswimmer.”

The low-cost development, which appears in ACS’

journal *Nano Letters*, could be used on a large scale in targeted drug delivery and other applications. Joseph Wang and colleagues point out that nanomotors have tremendous potential in diverse applications from delivering drugs to precise locations in the body to making biosensors. To realize this potential, scientists have recently taken inspiration from microorganisms that have tiny, hair-like structures that they whip around to propel themselves. But copying these nature-engineered nanomotors requires advanced instruments and costly processing techniques that make them a challenge to produce on a large

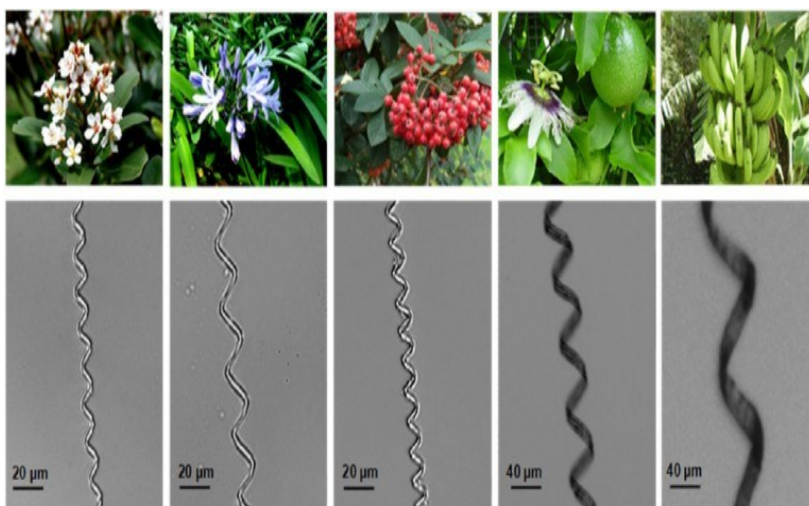
scale. To address these issues of practicality, Wang’s group also drew inspiration from nature, but turned to plants instead.

They isolated spiral microstructures packed by the million in small pieces of a plant’s stem.

The scientists coated these tiny coils that are about the width of a fine cotton fiber with thin layers of titanium and magnetic nickel. The plant material makes these microswimmers biodegradable and

less likely to be rejected by the human body. The magnetic layer allows scientists to control the motors’ movement. When the scientists placed the coated spirals in water or human blood serum and applied a magnetic field, the nanomotors efficiently spun their way through the liquids. The scientists conclude that the microswimmers show great promise for future biomedical uses.

The authors acknowledge funding from the Defense Threat Reduction Agency-Joint Science and Technology Office for Chemical and Biological Defense.



**Spiral microstructures from xylem of Indian Hawthorn, African Lily, Cotoneaster, Passion Fruit and Wild Banana**

# *DFW Section Meetings*

## **JANUARY 2014**

### **Meet DFW's New Young Investigators**

**Learn about exciting research in the DFW Section**

**Saturday, January 25, 2014, 8:30 A.M. to 2:00 P.M.**

**Room 114, W. A. Baker Chemistry Research Building (CRB),  
Arlington, TX**

**Updates, a complete program, details on registration, and directions will be posted at**

**<https://www.uta.edu/chemistry/seminars/dfw-ac-s-meeting>**

#### **SYMPOSIUM SPEAKERS (9:00 to Noon)**

**Kayla Green (TCU)**

**Nicolay Tsarevsky (SMU)**

**Benjamin Janesko (TCU)**

**Brian Zoltowski (SMU)**

**Junha Jeon (UTA)**

**Gomika Udugamasooriya (UTSW)**

**Kayunta Johnson-Winters (UTA)**

#### **Schedule:**

**Coffee and Welcome: 8:30 A.M. to 9:00 A.M.**

**Speakers: 9:00 A.M. to 12:00 P.M. (includes coffee break)**

**Lunch and Postdoctoral Posters: 12:00 P.M. to 2 P.M.**

**Pizza Lunch will be provided**

**For questions or concerns, please contact Chair Katie Walker at [walker@austincollege.edu](mailto:walker@austincollege.edu) or (903) 813-3159.**



# **FEBRUARY 26, 2014**

**The DFW Local Section presents:**

## **Why are Women Underrepresented in Science? Evidence For and Against 5 Common Hypotheses**

by Dr. Karla McCain  
Associate Professor of Chemistry & Director of Accreditation  
Austin College



This talk will explore the evidence for and against five common explanations for women's underrepresentation in science. The issues raised in these hypotheses range from the epistemology of the scientific method to possible differences in mathematical abilities between the genders to the difficulty in combining careers in science with family. Evidence from a variety of disciplinary perspectives will be presented to explain facts that seem contradictory on the surface. For example, women publish fewer papers in scientific journals, but are more cited by other authors. Women scientists report consistently that they have observed sexism and discrimination during their career, but never been the target of it themselves. One study has shown that a woman's resume needs to show twice the productivity as that of a man to be rated as having equal competence. Maria Goeppert Mayer did not receive tenure until after she won the Nobel Prize in physics. This material is taken from a course Dr. McCain developed and has taught in a variety of formats.

Karla McCain earned her BA in chemistry from Ohio Wesleyan University in 1998 and her Ph.D. in physical/analytical chemistry from the University of Utah in 2003. She was been a member of the faculty at Austin College in Sherman, TX since then and is currently an Associate Professor of Chemistry and Director for Accreditation and Assessment. Her research interests are in the area of applying spectroscopy to solve problems and understand structure in interfacial systems including dye-sensitized solar cells and organogels.

Meeting Date: Wednesday, February 26

Meeting Schedule: 6:30pm Social, 7pm Dinner & Announcements, 8pm Lecture

Location: Abuelo's (East Plano), 3420 North Central Exp., Plano, TX 75074

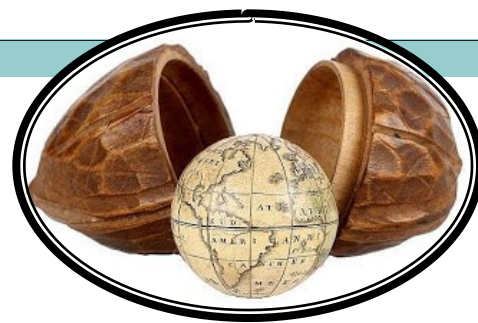
**RSVP Deadline: Friday, February 21** RSVP Link: <http://bit.ly/1iDyX5R>

Ticket Price: \$20 per person (online price), \$22 per person (at the door price)

Menu: Buffet with Chile con Queso, Guacamole salad, Beef & Chicken Fajitas, beverage

Payment by credit card will be available online in advance, but only cash or check will be accepted at the door. For questions or concerns, please contact Chair Katie Walker at [kawalker@austincollege.edu](mailto:kawalker@austincollege.edu) or (903) 813-3159.

## DFW ACS Climate Science Project UPDATE IN A NUTSHELL



**Bob Landolt**, Program Director, will be attending **National Council for Science and the Environment (NCSE) Climate Conference in January:**  
<http://www.buildingclimatesolutions.org/>

### Key people consulted for programming for 2014:

**Amina El-Ashmawy**, director of the upcoming Two Year College Chemistry Consortium (2YC3) program at Collin College in McKinney (<http://iws.collin.edu/2yc3/index.html>)

**Robert Brecha**, Climate Change and Sustainability Chautauqua Presenter at the U. of Dayton (<http://campus.udayton.edu/~physics/gkm/chau/DAY13-20.htm>)

**Jerry A. Bell**, chair of the Working Group on Climate Science for the ACS, responsible for the Climate Science Toolkit (<http://www.youtube.com/watch?v=8jvtpzuESWk>)

**Drew Jones**, designer of simulation-based learning environments and Co-Director of Climate Interactive (<http://vimeo.com/30081681>)

**Kirby Drake**, General Chair of the 2014 Southwest Regional (SWRM) ACS Meeting in Fort Worth

### 2014 activities for our project include:

**February 6:** Presentation with **Terah Coffman** for the Dallas Community College Faculty Conference Day

**March 14:** Presentation at the Collin College 2YC3 Conference (**Jerry Bell** is also preparing a March 15 workshop for this conference)

**April 9:** Presentation at Texas Wesleyan's Sustainability-themed University College Day

**Spring/Summer-**Daylong Climate Science Symposium for regional Community College Faculty, date and Keynote Speaker selection in progress

**November 19-22:** Presentation invited for the ACS Fort Worth SWRM

### Sources of Climate Change: Pessimism and Optimism

For a referenced, admittedly worst-case scenario about climate change (use of at least one reference is incorrect): <http://www.commondreams.org/view/2013/12/17-5>

The optimistic view on what would work to mitigate climate effects:

[http://www.youtube.com/watch?v=CTS9RY1z\\_i8&feature=player\\_embedded](http://www.youtube.com/watch?v=CTS9RY1z_i8&feature=player_embedded)

## DFW Section

### VOLUNTEERS NEEDED!

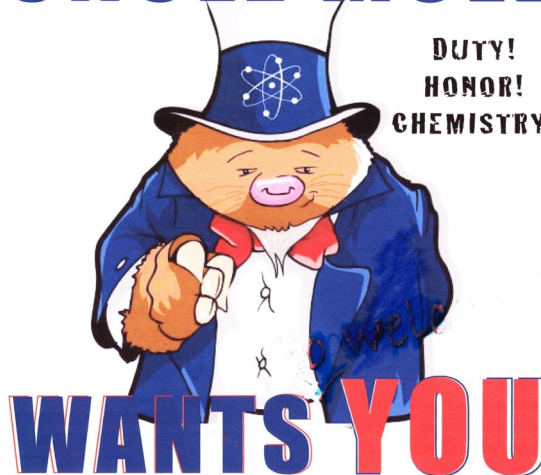
The 247<sup>th</sup> National ACS Meeting will be here in Dallas on March 16-20, 2014. Volunteers are needed for the Local Section Hospitality Booth, to help National with meeting logistics, and to help with the outreach event on Saturday, March 15. Help us show off our local section and DFW to chemists from across the nation! If you are interested, please fill out a **volunteer form** so we can contact you with further details:

<http://bit.ly/1m22B4F>

Kirby Drake is planning the 70<sup>th</sup> Southwest Regional Meeting to be held in Fort Worth in 2014. Please email Kirby ([kirby.drake@kk-llp.com](mailto:kirby.drake@kk-llp.com)) if you are interested in serving as the **sponsorship/exhibitors chair**, **undergrad programming chair**, or a **symposium chair**.

# UNCLE MOLE

DUTY!  
HONOR!  
CHEMISTRY!



To volunteer for the 2014 Southwest Regional ACS Meeting! SWRM 2014 will be held at the Fort Worth Renaissance Worthington Hotel, November 19-22, 2014. If anyone would like to suggest a topic or organize a symposium, please contact Kirby Drake [kirby.drake@kk-llp.com](mailto:kirby.drake@kk-llp.com)

or Danny Dunn  
[dannyldunn@sbcglobal.net](mailto:dannyldunn@sbcglobal.net)



# Around the Area

## University of Arkansas

### Presentations

**Feng Wang** gave an invited talk, *Exploring No Man's Land with Simulations at Coupled Cluster Quality*, with coauthors Yaping Li, Jicun Li, Feng Wang, at the ACS Northwest Regional Meeting, Baylor University, Waco, Texas, Nov. 17-20, 2013.

**Ryan Bauer** presented a poster, *Understanding the collagenolysis mechanism by M9 collagenases from Clostridium histolyticum and Grimontia hollisae*, at the 2013 SE Regional IDEa Conference. Co-authors were Keisuke Tanaka, Rohana Liyanage, Jackson O. Lay, Jr., Rakehiko Mima, Osamu Matsushita, and Joshua Sakon.

**Charles Wilkins** presented a seminar December 6, 2013 at Valparaiso University. Its title was *Ionization in Vacuum (MAIV) for High Resolution Fourier Transform Ion Cyclotron Resonance*.

**Julie Stenken** gave a talk entitled *Microdialysis Sampling of Cytokine Cell Signaling Proteins in Neuroscience and Wound Healing Applications*, November 15-17, 2013, at the SE Regional IDEa meeting, Little Rock.

**Nan Zheng** gave an invited talk at the 69th ACS Southwest Regional Meeting, Waco, TX, Nov. 18, 2013, entitled *New Synthetic Adventures of Amine Radical Cations by Visible Light Photocatalysis*.

### Publications

*Raman spectroscopy of carbon nanohoops*: Hang Chen, Matthew R. Golder, Feng Wang, Rames Jasti, Anna K. Swan, **Carbon**, **67**, 203-213, 2014.

*Microdialysis sampling techniques applied to studies of the foreign body reaction*: CR Sides, JA Stenken, **Eur. J. Pharm. Sci.** 2013 Nov 21. doi:pii: S0928-0987(13)00440-5. 10.1016/j.ejps.2013.11.002.

*Comparison of microdialysis sampling perfusion fluid components on the foreign body reaction in rat subcutaneous tissue*: GD Keeler, JM Durdik, JA Stenken. **Eur. J. Pharm. Sci.** 2013 Nov 15. doi:pii: S0928-0987(13)00443-0. 10.1016/j.ejps.2013.11.005.

*Pharmacokinetics in rats of long-acting human parathyroid hormone-collagen binding domain (PTH-CBD) peptide construct*: R Stratford, C Vu, J Sakon, R Katikaneni, R Gensure, T Ponnappakkam. **Journal of Pharmaceutical Sciences**. Accepted.

### Achievements

For the one-year anniversary of the release of the organic chemistry app **Tap OChem**, a free version has just been released: **Tap OChem Lite**. Developed by Neil Allison and Joseph Allison, these apps have been downloaded by faculty and students from over 20 countries, including USA, China, Japan, India, UK, Sweden, Germany, Mexico, Brazil, Singapore, and Nigeria. The Apple app store listing can be found at the following URL:

<https://itunes.apple.com/us/app/tap-ochem-lite/id763895340?mt=8>

Tap OChem Lite  
开发商: Tap OChem, LLC  
打开 iTunes 以购买和下载 App。



View in iTunes

*Around-the-Area cont.*

## DFW Section at the Perot Museum

The Perot Museum of Nature and Science invited the local section to participate in Discovery Day on January 11. Discovery Day is a day at the museum where families discover the fun of science together. They try out real experiments, design and build new creations, and see dynamic performances with guest scientists, educators and artists. Discovery Day runs from 10 AM-4 PM, and we average about 4,000 – 6,000 in attendance throughout the day. The January 11th Discovery Day theme was *States of Matter*. The museum had experiments and demonstrations throughout the museum focusing on polymers and states of matter.

Representing the DFW Local Section were members of the Mean Green Chemistry Demo Team (from the University of North Texas), including **Diana Mason**, **Robyn Ford** (the 2013 Schulz award recipient), and **Jo King** from Amarillo (former chair of the Panhandle Plains Local Section and high school chemistry teacher). The DFW Local Section will be back at the museum on Saturday, March 15th to perform hands on experiments in collaboration with the National ACS Committee on Community Activities, demonstrating great science and fun to kick off the National ACS Meeting in Dallas! If you are interested in participating, please fill out the [volunteer form](#).

## UTA

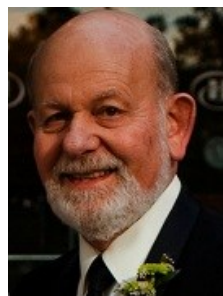
Dr. **E. Thomas Strom** has received a grant from ACS President Tom Barton to support the HIST symposium on "Fifty Years of the James Flack Norris Award:

The Foundations of Physical Organic Chemistry" to be held at the Dallas ACS meeting next March. In addition, the President has designated the symposium as a 'president recommends' event.



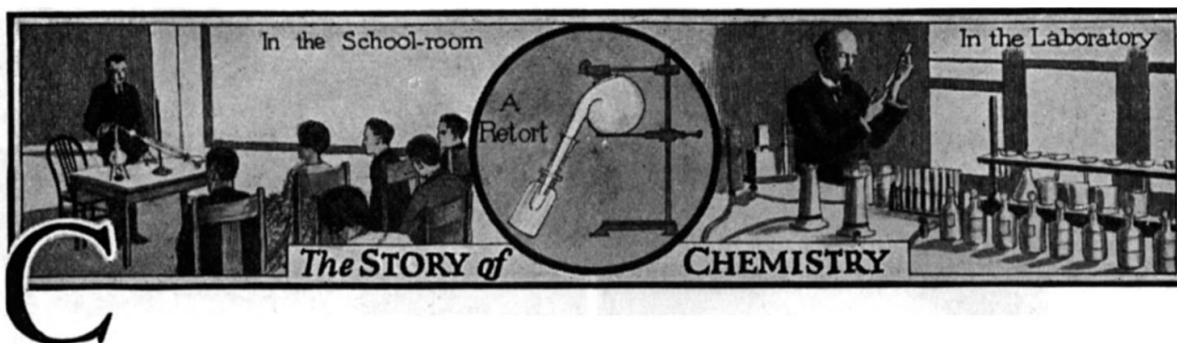
This means that the event will be included in all the presidential advertising in C&EN (both preliminary and technical), registration insert, and the onsite booklet program.

Professor Emeritus **Martin Pomerantz** has accepted a part-time position in the Chem-



istry Division of the National Science Foundation. It involves essentially the same duties as a Program Officer, but his actual title will be 'Expert.' His duties, which involve sending for ad hoc reviews of proposals,

running panels and evaluating those proposals, will be carried out remotely from his UTA office.



## PACKAGING INSULIN INTO A PILL-FRIENDLY FORM FOR DIABETES TREATMENT

### Improved Stability and Antidiabetic Potential of Insulin Containing Folic Acid Functionalized Polymer Stabilized Multi-layered Liposomes Following Oral Administration

#### *Biomacromolecules*

Since insulin's crucial discovery nearly a century ago, countless diabetes patients have had to inject themselves with the life-saving medicine. Now scientists are reporting a new development toward a long-sought insulin pill that could save millions the pain of daily shots. Published in *Biomacromolecules*, the advance could someday not only eliminate the "ouch" factor, but also get needle-wary — and weary — patients to take their medicine when they should.

Sanyog Jain and colleagues explain that patients with diabetes sometimes skip doses or stop taking their insulin because the injections can be painful. But doing so puts their health in danger. An estimated 347 million people globally (about 26 million in the U.S.) are living with diabetes. In the U.S., more than a quarter of these patients are taking some kind of insulin therapy. For years, researchers have sought a way to transform delivery of this therapy from a

shot to a pill, but it has been a challenge. The body's digestive enzymes that are so good at breaking down food also break down insulin before it can get to work. In addition, insulin doesn't get easily absorbed through the gut into the bloodstream. To overcome these hurdles, Jain's team combined two approaches to shield insulin from the digestive enzymes and then get it into the blood.



They packaged insulin in tiny sacs made of lipids, or fats, called liposomes, which are already used in some treatments. Then, they wrapped the liposomes in layers of protective molecules called polyelectrolytes. To help these "layersomes" get absorbed

into the bloodstream, they attached folic acid, a kind of vitamin B that has been shown to help transport liposomes across the intestinal wall into the blood. In rats, the delivery system lowered blood glucose levels almost as much as injected insulin, though the effects of the layersomes lasted longer than that of injected insulin.

The authors acknowledge funding from the Department of Science & Technology (India) and the Council of Scientific and Industrial Research, New Delhi.



## SCIENTISTS UNEARTH SECRETS OF PÉRIGORD TRUFFLES, THE CULINARY ‘BLACK DIAMOND’

### Unlocking the Puzzling Biology of the Black Périgord Truffle *Tuber melanosporum*

*Journal of Proteome Research*

Just in time for the holidays, when cooks in France and elsewhere will be slipping bits of the coveted black Périgord truffle under their turkeys’ skin for a luxurious flavor, scientists are revealing the secrets that give the culinary world’s “black diamond” its unique, pungent aroma. Their study, which could lead to better ways to determine the freshness and authenticity of the pricey delicacy, appears in ACS’ *Journal of Proteome Research*.

Mark Baker, Shoba Ranganathan and colleagues note that the harvest of the Périgord truffle, a fungus that grows underground around the roots of oak and hazelnut trees in winter, has plummeted recently due to climate change, the loss of arable land and the cultivation of lower-quality truffles. Paired with an increase in demand from “foodies” seeking exotic flavors, prices for this truffle have skyrocketed to more than \$900 per pound. Though long celebrated in the kitchen, only recently has the black Périgord



**Truffle Hunting**  
**Charles Henry Cook (1830-1906)**



truffle garnered scientific attention. In 2010, European scientists published the full genome of the Périgord, but this raw blueprint remained largely unmined. In their report, Baker and Ranganathan’s team go beyond the genetic code to identify and describe the truffle’s proteins for a better understanding of the culinary delight.

By marrying techniques in bioinformatics and proteomics, they combed databases to unearth what proteins make the black Périgord truffle, which they obtained from the Marshalls’ Terra Preta truffière in Braidwood, New South Wales, unique. They found that more than 2,500 proteins out of the truffle’s nearly 13,000 were similar to existing proteins in other fungi, and they identified nine proteins that contribute to the cherished aroma. “This study has resulted in the functional characterization of novel proteins to increase our biological understanding of this organism and uncovered biomarkers of authenticity, freshness and perfume maturation,” the scientists state.

The authors acknowledge funding from the ARC, Macquarie University and Terra Preta Truffles.

## DFW Officers' Section

### *Letter from the Chair-Elect*

Greetings colleagues,



I would like to extend my appreciation for being elected Chair-Elect of the DFW local section of ACS. I am fairly new to the area, but I am truly looking forward to the year ahead of us. I am very excited

to serve our section and to help promote the great chemistry being performed in the DFW area. I look forward to meeting many more members during our outstanding programs yet to come in 2014!

All the best,

Shana Santos

### *Letter from the Chair*



Welcome back and Happy New Year! 2014 brings a lot of excitement and chemist activity to the DFW area!

We kick off the year with the DFW Young Investigator's Meeting on Saturday, January 25, at UT Arlington. The meeting will include research presentations from young faculty in the local section, postdoc poster presentations, and lunch! Check out the speaker list at <http://www.uta.edu/chemistry/seminars/dfw-ac meeting.php>.

On Wednesday, February 26th, join me at

Abuelo's in east Plano as we learn about "Why are Women Underrepresented in Science? Evidence For and Against 5 Common Hypotheses" with Dr. Karla McCain of Austin College. Make sure you RSVP online by Friday, February 21st. RSVP: <http://bit.ly/1iDyX5R>

The 25<sup>th</sup> Austin Symposium on Molecular Structure and Dynamics will be in Dallas on March 1-4. This year the symposium is being organized by the Computational and Theoretical Chemistry Group at SMU. Check out the schedule and list of speakers here: <http://smu.edu/austinsymposium/index.html>.

**VOLUNTEERS NEEDED!** The 247<sup>th</sup> National Meeting will be here in Dallas on March 16-20. Volunteers are needed for the Local Section Hospitality Booth, to help National with meeting logistics, and to help with the outreach event on Saturday, March 15th. Help us show off our local section and DFW to chemists from across the nation! If you are interested, please fill out a volunteer form so we can contact you with further details. Volunteer form: <http://bit.ly/1m22B4F>

I'd also like to highlight the activities being undertaken with the DFW ACS Climate Science project, which includes a presentation to the Dallas Community College Faculty conference in February, a presentation and workshop for the Collin College Two-Year College Chemistry Consortium in March, and a presentation at Texas Wesleyan's sustainability-themed University College Day in April. Thanks to Bob Landolt for coordinating these efforts.

**cont. on page 22**

## SILKWORMS SPIN COLORED SILKS WHILE ON A ‘GREEN’ DYED-LEAF DIET

### **Uptake of Azo Dyes into Silk Glands for Production of Colored Silk Cocoons Using a Green Feeding Approach** *ACS Sustainable Chemistry & Engineering*

For some 5,000 years, cultivated silkworms have been spinning luxurious white silk fibers destined for use in the finest clothing. But current dyeing practices produce wastewater that contains potentially harmful toxins, so scientists are turning to a new, “greener” dyeing method in which they coax already-colored fibers from the caterpillars by feeding them dyed leaves. Their findings are published in the journal *ACS Sustainable Chemistry & Engineering*.

Anuya Nisal, Kanika Trivedy and colleagues point out that dyeing textile fabrics is one of today’s most polluting industries. The process requires huge quantities of water for bleaching, washing and rinsing, and it results in a stream of harmful wastewater that needs to be treated effectively before release into the environment. To make the industry greener and more environmentally friendly, researchers have been developing less toxic methods, including feeding dyed leaves to silkworms so they spin colored — rather than white — cocoons. But so far, this technique has only been tested with one type of dye, which is too pricey for large-scale production. Thus, the team

turned to azo dyes, which are inexpensive and account for more than half of the textile dyes used today.



They dipped or sprayed mulberry leaves, the silkworm’s food of choice, with azo dyes to see which ones, when consumed, would transfer to the silk. Of the seven dyes they tested,

three were incorporated into the caterpillars’ silk, and none seemed to affect the worms’ growth. The scientists noticed that certain dye traits, such as the ability to dissolve in water, affected how well the dye worked. “These insights are extremely important in development of novel dye molecules that can be successfully used in this green method of producing colored silk fabrics,” they conclude.

The authors cite funding from the CSIR-National Chemical Laboratory, Pune, and the Central Sericultural Research and Training Institute, Mysore.

Editor’s note: Other articles and comments on dye-fed silkworms

***Intrinsically Colored and Luminescent Silk***

***Cutting water consumption in the silk industry***

***<http://www.popsoci.com/article/science/scientists-color-silk-feeding-silkworms-fabric-dyes>***



## FIVE QUESTIONS FOR...

The first '5 Questions' participant of 2014 is Kirby Drake, Partner in Klemchuk Kubasta, LLP in Dallas. Klemchuk Kubasta LLP is an IP boutique law firm offering a full array of intellectual property-related services, including litigation and enforcement of all forms of intellectual property as well as registration and licensing of patent, trademark, trade dress, and copyright.

Ms. Drake also actively promotes science and science knowledge via work in numerous non-ACS organizations and previous service to ACS as Treasurer of the ACS DFW local section, Business Manager of the Southwest Retort, and PR co-chair of SWRM 2004.



Most importantly for the Southwest Region and the hosting ACS DFW local section, Ms. Drake is General Chair of the 2014 Southwest Regional Meeting, which will be held in Fort Worth's Worthington Hotel from November 19-November 22: <http://www.swrm.org/swrm2014>

**1) *How old were you when you realized you wanted to be a scientist?*** I always liked science, but I believe it was when I was about 15 years old and I found myself asking my parents to attend a summer science camp at North Carolina State University. Thankfully, my parents let me attend, and I had a fantastic time experiencing science with other students, fueling my interest going forward.

**2) *What aspect of your career do you enjoy the most?*** Although I no longer “do”

much science myself on a day-to-day basis, what I enjoy most is interacting with scientists every day in my job. Whether it is working with inventors to prepare and prosecute patent applications, working with experts to analyze patents in litigation, or more recently, becoming part of The Shoulders of Giants, a wonderful non-profit dedicated to providing opportunities for science enthusiasts to teach children about science as well as to conduct their own scientific analysis ([www.sciencegiants.org](http://www.sciencegiants.org)), I thrive on being connected and involved in science, and my job allows me to do that.

**3) *Since 2010, you've been the Chair of SWRM 2014. What are your goals for the meeting?*** My greatest goal is to make this a meeting that meets the needs of the widest range of scientists and science enthusiasts possible. I know that there are many people out there who are interested in science and could benefit from attending SWRM but feel intimidated in thinking that many presentations may be over their heads. Also, I know that there are many people interested in starting businesses or learning about new areas of science but don't know where to get that information. Accordingly, in addition to providing high-quality presentations on new developments in chemistry (organic, inorganic, computation, etc.), my goal is to provide presentations/workshops related to business, education and legal issues that can be of benefit to the bench chemists, educators as well as business people—because we are all ACS members.

**4) *What can ACS members do to help make the meeting the best SWRM yet?***



First of all, attending the meeting is key. We want to have high attendance, and since the meeting will be held in Fort Worth, it should be accessible to most in our region. Also, encourage your business or university to participate, whether through sponsoring, exhibiting, participating in the graduate school fair, submitting an abstract, presenting a paper or poster, or even just attending.

Finally, we can always use more assistance in organizing the meeting. No contribution is too small. Please contact me if you are willing to get involved. The next few months will be critical to the success of SWRM 2014. ( [kirby.drake@kk-llp.com](mailto:kirby.drake@kk-llp.com))

#### 5) *Who is your Science Hero? and*



*why?* While there are many people that I could identify, my science hero is Dr. **James F. Bonk**, former chemistry professor at Duke University. His name became so synonymous with general chemistry that the

class came to be called “Bonkistry.” He was a true teacher in every sense of the word; he was passionate about teaching and would constantly update/adjust his teaching style to reach the largest number of students possible, even those just trying to fill a requirement through taking his course. Although I only had him for general chemistry, he continued to be an excellent advisor and mentor throughout my time in the chemistry program at Duke.

*Thank you, Ms. Drake, for participating in '5Q'!*

***Interesting Scientists Wanted! To volunteer to be interviewed for 5 Questions, contact [retort@acsdfw.org](mailto:retort@acsdfw.org).***

#### *cont. from page 9: And another thing*

ugly ceiling fans and a lot of the accumulations generated by an active career in science may be necessary for this—or, the more I think about it, perhaps not.

Happy New Year. Best wishes for the most wonderful possible 2014. May your happiness be focused outward, to the world and the good we must do in it.

- Many, many thanks to the survey participants! Plans to cite respondents were changed after many request anonymity, and it became obvious that it was safer to protect everyone's identity than to inadvertently rip off the masks.

#### *cont. from page 19: Letter from the chair*

Our Meeting-in-Miniature will take place at Texas Wesleyan University in April, so stay tuned for details about dates and abstract submissions. Also, keep an eye out for a Planning for Success meeting in May to discuss ways to revise our local section bylaws and practices to make us even more awesome at serving and supporting chemists in the local area. I look forward to hearing your thoughts!

Finally, I'd like to extend a hearty “thanks for all your hard work” to our outgoing past chair Aaron Fletcher, and a welcome to our new Chair-Elect Shana Santos. Good luck in the New Year!

Katie Walker, 2014 Chair



# From the editor

When we started the eRetort in 2011, I used press reports from the ACS web site to add some variety to the magazine. I first began googling the topics in order to find clip art to insert for texture, but have ended up finding really interesting addenda to these short releases. For example, this month I found that the BBC reports that *alien invading truffles are supplanting the Périgord black truffle*:

<http://news.bbc.co.uk/2/hi/science/nature/7405004.stm>. Woo hoo! Are alien invaders harvesting the truffles with space pigs?!



Meetings: We have several coming up (not to mention the March ACS meeting here in Dallas). The DFW Section meeting in January is our second annual **Young Investigators Conference**; it will take place at UTA on **January 25th**. The 25th Austin Symposium on Molecular Structure and Dynamics at Dallas (ASMD@D) is scheduled for March.



One of the most important announcements in this issue—maybe the most important—is the need for judges for the Dallas Regional Science & Engineering Fair, on February 15th in Fair Park in Dallas. All too many local school science fairs have suffered under cutbacks. Support all your local science fairs and consider volunteering for this one.

*Best regards,  
Connie*

