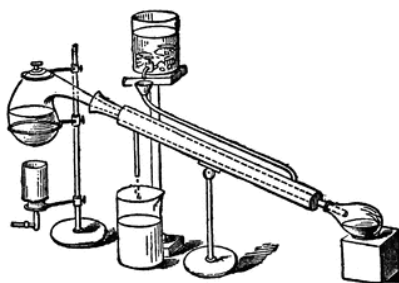




# ***SOUTHWEST RETORT***



**SIXTY-SEVENTH YEAR**

**APRIL 2015**

*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. 67(8) APRIL 2015**

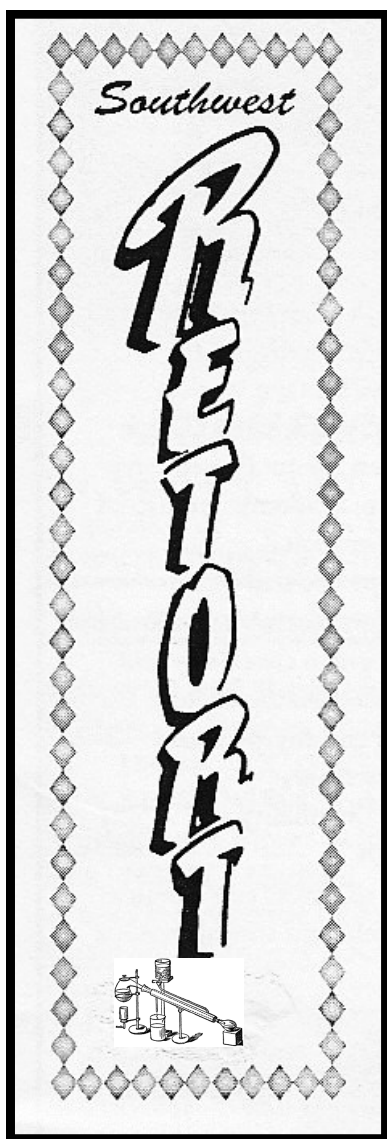
**Editorial and Business Offices:** *Contact the Editor for subscription and advertisement information.*

**Editor:** Connie Hendrickson, 802 South Jefferson, Irving, TX 75060; 972-786-4249; [retort@acsdfw.org](mailto:retort@acsdfw.org)

**Copy Editor:** Mike Vance, [vance2276@gmail.com](mailto:vance2276@gmail.com)

**Business Manager:** Danny Dunn, 6717 Lahontan, Fort Worth, TX 76132; 817-361-0943; [dannyldunn@sbcglobal.net](mailto:dannyldunn@sbcglobal.net)

*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 DFW Section*

General: [info@acsdfw.org](mailto:info@acsdfw.org)

Education: [new@acsdfw.org](mailto:new@acsdfw.org)

Elections:

[candidates@acsdfw.org](mailto:candidates@acsdfw.org)

Facebook: DFWACS

Twitter: acsdfw

## TABLE OF CONTENTS

Fifty Years Ago.....	6
Employment Clearing House.....	3

## ARTICLES and COLUMNS

Solar Electricity.....	7
And Another Thing.....	9
Interview with ACS President-Elect.....	13
FIVE QUESTIONS.....	24
Letter from the Editor.....	27

## NEWS SHORTS

Energy-generating cloth.....	10
Green tea and MRIs.....	15
Biodegradable?.....	26

## EVENTS and ANNOUNCEMENTS

Chromatography Symposium.....	17
FWLSC April Meeting.....	22
AROUND-THE-AREA.....	20
UTD Seminar Schedule.....	23

## DFW SECTION

Letter from the Chair.....	11
Student and Service awards.....	12
Doherty and Schulz nominations.....	16
Olympiad qualifiers.....	19

## INDEX OF ADVERTISERS

ANA-LAB.....	5
Huffman Laboratories.....	4
Veritas Testing.....	4
Vance Editing.....	4



## 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@acsdw.org](mailto:retort@acsdw.org). Deadlines are the 7<sup>th</sup> of each month.

### JENKEM TECHNOLOGY

The PEG and PEGylation Technology People

**Job Title:** Sales/Marketing Assistant

**Name of Company:** JenKem Technology USA Inc.

**Nature of Business:** Polyethylene Glycol (PEG) Polymers for Pharmaceutical and Biotech Applications

**Job ID:** JKUSA-20140801

**Job Type:** Full-time

**Salary Range:** Base salary \$25,000.00 to \$35,000.00; plus Sales Commission

**Location:** United States - Texas – Plano

**Additional notes:** Must be legally authorized to work in the United States. Local candidates preferred, no relocation benefits are provided for the position.

**Job Functions:** Sales and marketing for PEGylation products and services: provides quotations and information on product availability, and provides answers to technical questions to customers, by phone or email; processes orders, shipping, and payments; develops and maintains customer relationships; identifies and develops

new customers and new markets for PEGylation products and services; and performs other tasks as assigned by the manager.

**Job Requirements:** Bachelor's degree or higher (Chemistry/Biology/Biochemistry or similar background REQUIRED); Excellent interpersonal and communication skills; Excellent reading, speaking, and writing skills in business English; Good arithmetic skills and attention to details required; Proficiency in the use of Microsoft Word, Excel, PowerPoint, and Outlook required; English/Chinese bilingual preferred; Ability to work independently required.

**To Apply:**

Interested candidates should submit a cover letter including salary expectations, and an updated resume at email:

[hr@jenkemusa.com](mailto:hr@jenkemusa.com). Please do not call, we will contact only select candidates.

[hr@jenkemusa.com](mailto:hr@jenkemusa.com)

## SERVICES

### Elemental Analysis

**CHNOS Ash**

**ICP · AA · ICP/MS**

**TOC · TOX · BTU**

**Problem Solving**

# HUFFMAN

**LABORATORIES, INC.**

*Quality Analytical Services Since 1936*

Phone: (303) 278-4455

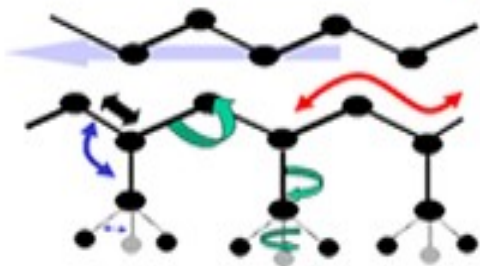
FAX: (303) 278-7012

chemistry@huffmanlabs.com

www.huffmanlabs.com



### Veritas Testing and Consulting LLC



Polymer and Materials Testing and Consulting  
Thermal and Infrared Analysis including  
DSC, TGA, TMA, DMA, etc.

Suite 376-253  
2436 S Interstate 35 East  
Denton Texas 76205-4992

www.veritaslab.net  
info@veritaslab.net 940-367-1128



**EDITING  
AND  
PROOF-  
READING  
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:

[vance2276@gmail.com](mailto:vance2276@gmail.com)

408-786-7451



22 Ti 47.867	23 V 50.942												34 Se 78.96	35 Br 79.904
40 Zr 91.224	41 Nb 92.906												52 Te 127.60	53 I 126.90
72 Hf 178.49	73 Ta 180.95												84 Po (209)	85 At (210)
104 Rf (261)	105 Db (262)													
		<b>THE COMPLETE SERVICE LAB</b>												
		<i>Quality Analytical &amp; Environmental Services Since 1965</i>												
57 La 138.01	58 Ce 140.12	Pt 140.91	Nd 144.24	Pm (145)	Sm 150.36	Eu 151.96	Gd 157.25	Tb 158.93	Dy 162.50	Ho 164.03	Er 167.26	69 Tm 168.93	70 Yb 173.04	

**ANA-LAB CORPORATION**  
2600 Dudley Road • P. O. Box 9000  
Kilgore, Texas 75663-9000  
903-984-0551 • Fax: 903-984-5914  
www.ana-lab.com • Email: corp@ana-lab.com

*Ana-Lab Corporation is an employee-owned organization which provides superior, innovative and cost effective solutions for clients through exceptional science, processes and people. With a staff of experienced, professional and talented chemists and technicians supported by sophisticated laboratory testing equipment, Ana-Lab is the preferred environmental testing laboratory serving clients nationwide.*

### Regional Service Centers

Amarillo, TX  
Phone / Fax 806-355-3556  
Email: panhandlesales@ana-lab.com

Dallas, TX  
Phone / Fax 972-837-9412  
Email: northtexas@ana-lab.com

Austin, TX  
Phone / Fax 512-821-0045  
Email: centex@ana-lab.com

Brownsville, TX  
Phone / Fax 956-831-6437  
Email: rgvtex@ana-lab.com

Houston, TX  
Phone / Fax 281-333-9414  
Email: gulfcoastsales@ana-lab.com

Norman, OK  
Phone / Fax 405-590-2533  
Email: oklahoma@ana-lab.com

Shreveport, LA  
Phone / Fax 318-219-9300  
Email: arkla@ana-lab.com



T104704201

## FIFTY YEARS AGO IN THE SOUTHWEST RETORT

ACS tour speakers for April are Dr Rowland Pettit of UT-Austin and Dr. Hans B. Jonassen of Tulane. Dr. Pettit's topic will be "Olefin-Iron Carbonyl Complexes", while Dr. Jonassen's talks will come from the following three topics: "Metal Olefin Complexes," "Mossbauer Studies of Inorganic Complexes," and "Unusual Magnetic Moments in Copper (II) Complexes."

In the Central Texas ACS Section, Southwest Texas State College was host to the Mar. 10 section meeting with ACS tour speaker Dr. J. H. Simmons. University of Texas Vice-Chancellor Norman Hackerman made an ACS Midwest speaking tour, visiting local sections in Quincy, IL, Columbia, Kansas City, and Joplin, MO, Manhattan and Wichita, KS, and Ponca City and Shawnee, OK. His topics were "Fuel Cells" and "Molecular Structure and Corrosion Inhibition." Dr. W. A. Noyes, Jr. of the University of Texas was a tour speaker to the Northeastern ACS Section. He spoke at Brookline, MA, on "Recent Advances in Photochemistry." Dr. L F. Hatch visited Sun Oil in Philadelphia to take part in a special seminar on "The Chemistry of Refinery Processes." Dr. R. M. Roberts visited Shell Oil in Houston to talk on "Carbonium Ions" and on "New Friedel-Crafts Chemistry."

In the Dallas-Ft. Worth ACS Section, the new officers for the Dallas Society of Analytical Chemists were as follows" Chief Analyst, James C. Patton; Assistant Chief Analyst, Morton F. Mason; Recording Analyst, Herbert J. Belknap; Statistical Analyst, Robert M. Crawford.

At East Texas State College, Dr. S. L. Razniak has received a \$10,000 grant from the Welch Foundation to study "Synthesis and

Biochemical Properties of Alpha Amino Dithioacids."

Dr. Ralph Shriner of SMU spoke to the ACS student affiliate chapter at East Texas State College on "Reactions of Olefins with Iodine Monochloride" and to the chemists' seminar at the Dallas office of the FDA on "Cancer Chemotherapy."

North Texas State University was shocked by the sudden death of chemistry professor Burl E. Bryant. Dr. Bryant served in the Merchant Marine in World War II. He received his undergraduate degree from Hardin College in 1948, his M.S. degree from NTSU in 1950, and his Ph.D. from Penn State in 1952. Before coming to NTSU in 1962, he had taught at Penn State, Oklahoma, and Utah and had also worked at Dow Chemical Co. in Shreveport, LA.

In the South Plains ACS Section, Dr. F. O. Rice visited Texas Tech to lecture to the Sigma Xi chapter and to also give a seminar to the chemistry department. Dr. W. Wendland presented an invited paper at the First Toronto Symposium on Thermal Analysis.

At Baylor, Dr. Manfred B. Reinecke of TCU presented a seminar on "Synthesis of Alkaloid Heterocycles." Prof. John S. Belew of Baylor is scheduled to give a paper on "Activated Ozonides" at a symposium to be held at the University of Manchester, England.

Contributed by  
E. Thomas Strom



# Solar Electricity: Implications of a 25% Availability Factor

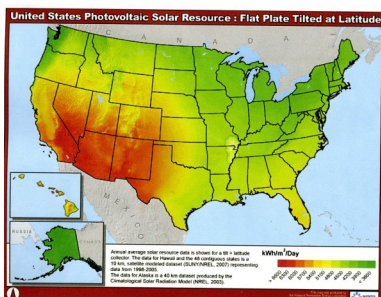
By

John E. Spessard, PE



The Availability Factor of an electric power plant is the percentage of the nameplate capacity that can be expected over a period of time. For a year, it is the number of kilowatt hours provided divided by the nameplate capacity in kilowatt hours times 8,760. The Federal Energy Information Administration (FIA) provides an Availability Factor of 25 % for solar electric plants. The FIA provides availability factors of 85% for coal powered plants and 90% for natural gas fired and nuclear plants. The coal, natural gas and nuclear plants can provide nameplate capacity day and night and any season. The factors are less than 100% because of scheduled and unscheduled shutdowns for maintenance and repairs.

We can look at a map of the United States that shows the average solar intensity for all areas of the country. For proper emphasis, the word average should be in neon letters a foot high. We can see that the greatest solar intensity is in the Desert Southwest and areas with minimum rain and clouds. Rain and clouds obscuring the sun

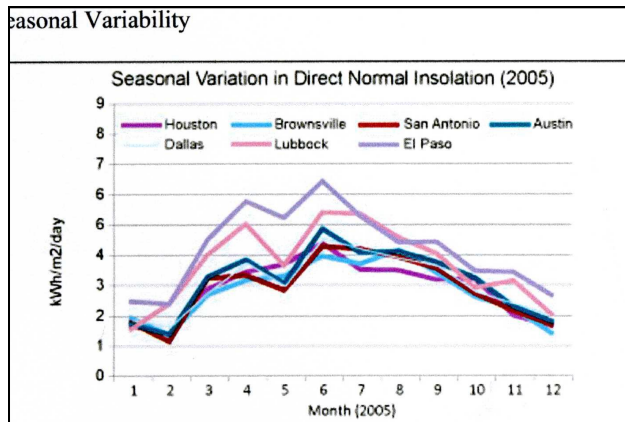


reduce the quantity of solar radiation. For example, Denver has more average solar radiation than either Honolulu or Miami, Florida even though it is definitely north of both cities.

The Texas State Energy Conservation Office published a Texas Renewable Energy Assessment in 2008. Chapter 3 treated solar energy. The treatment showed variations in available solar energy on an annual, hourly, daily and seasonable basis for several Texas cities. The cities were: El Paso, Midland, Lubbock, San Angelo, Abilene, San Antonio, Austin, Brownsville, Corpus Christi, Waco, Dallas, Houston, Lufkin and Port Arthur. Measurements were made for both direct sunlight where the solar cells tracked the sun and also horizontal (flat) placement. The trend was lower available solar energy proceeding from west to east with El Paso being the highest and eastern cities being the lowest. For direct placement, Dallas had about 2/3 of the available solar energy of El Paso. For Port Arthur it was about 55% of that of El Paso. For horizontal plates, that used both direct and diffuse sunlight, Dallas and Lufkin were about 80% that of El Paso. El Paso and other West Texas cities did better when the solar panels tracked the sun. For



East Texas cities, there was little benefit is tracking panels over flat panels.

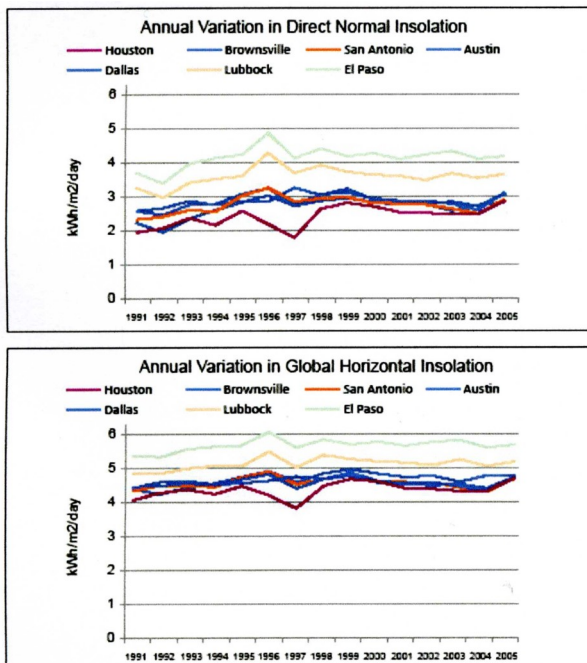


The study provided hourly, seasonal and annual variation data for El Paso, Lubbock, Brownsville, San Antonio, Austin, Dallas and Houston. At night, there is no solar energy. On clear days, the available solar energy peaks at about 1 pm. The heaviest demand for electricity is in late afternoon so some form of energy storage would be most useful. However when clouds cover the sun, available energy can drop by as much as half in a few minutes. This is acceptable if energy backup is available but solar

energy could not be a base line “Must have” energy source.

There are seasonal variations in available solar energy. This is because of both longer days and more intense sunlight in summer than in winter. The winter minimum is about 40% of the summer maximum. The best months for solar energy are April and June. There is significant month to month variation. There are also annual variations as measured between 1990 and 2006. The range is about 20%.

The Texas data clearly demonstrates that solar energy is far too variable on both a long term and short term basis to serve as a base line, must have energy source. Solar energy can provide intermittent electricity, particularly if either there is storage capacity or the demand is a fraction of the available supply.



Presently, all solar electricity generated goes onto the electric grid. This is not an issue as long as solar electricity is a small percentage of the solar electricity generated. But as solar electricity generation grows, either the electric grid must expand or convention electric generation must cut back. Who would pay for a grid expansion is an open issue. At present home solar panels can put electricity onto the grid and be paid retail for it. This contributes nothing to covering a utility’s overhead or maintenance and upkeep of the electric grid. This cost is passed on to the customers who buy conventionally generated electricity.



## ...And Another Thing...

by Denise L. Merkle, PhD

2015. The year I Join the Club. No, I don't mean AARP—shame on you for thinking it. I mean MOCC, the *My Offspring is in College Club*. In the course of life there are other organizations one can join, but few require jumping through hoops as high or as fiery as MOCC. It might even be called hazing, for parents as well as their students, but the students experience the most grueling preparation. Grades, extracurricular activities, standardized test scores, community service, awards, talents, teacher recommendations—whatever it takes, we now expect near-perfection from our teens—and we're exhausting our high schoolers to present them to colleges as the best-prepared students in the history of the world (or they should be). Whether all this incredible activity results in students with supreme knowledge and excellent life skills, I cannot know. It's likely I'll find out in 6 months or so, but right now, the knowledge eludes me. And another thing—There are not as many institutions of higher learning as one might think. One report, based on the analysis of data from 2011, indicated that the USA has >7,000 colleges and universities, including 2-year schools<sup>1</sup>. Univsearch.com<sup>2</sup> lists numbers of schools by territory and state. I didn't add them up, but I noticed that American Samoa has 1 university, and Texas more than 500. Do we need more? or fewer? or is the number just right? When I looked at the US News and World Report's<sup>3</sup> 2014-2015 rankings of the top liberal arts schools, I wasn't struck so much by how many colleges were represented, or even

which topped the list, but by tuition and fees. *Wowee*. For a mere \$40,000 per year, for four years, we can educate our young people and teach them the benefit of an education—as we're saddling them with debt higher than many people pay for houses. What are we actually doing here? And why?

Joining MOCC is a requirement for me. My Offspring's chosen career requires higher education. Not trade school, not a 2-year school, but a 4-year degree and probably a Masters on top of it. More than \$160,000 to ensure that one student, albeit a student who is very important to me, emerges from an institution of higher learning with an education sufficient to go forth into the workplace and contribute to society, while qualifying for a graduate program, of course! Education as the one thing no one can take away, is crucial to life. When one has lost worldly goods, wealth, health, family, even religion, education will remain - and prevail.

Is there a solution to the exorbitant cost of higher education? Probably. Can I solve the problem? No. I'm just going to join MOCC and hope the Offspring's residential suite contains a really nice cappucino machine.

<sup>1</sup><https://nces.ed.gov/fastfacts/display.asp?id=84>

<sup>2</sup><http://www.univsearch.com/state.php>

<sup>3</sup><http://colleges.usnews.rankingsandreviews.com/best-colleges/rankings/national-liberal-arts-colleges/page+2>

## From the ACS Press Room

# Energy-generating cloth could replace batteries in wearable devices

### Nanopatterned Textile-Based Wearable Triboelectric Nanogenerator

*ACS Nano*

From light-up shoes to smart watches, wearable electronics are gaining traction among consumers, but these gadgets' versatility is still held back by the stiff, short-lived batteries that are required. These limitations, however, could soon be overcome. In the journal *ACS Nano*, scientists report the first durable, flexible cloth that harnesses human motion to generate energy. It can also self-charge batteries or supercapacitors without an external power source and make new commercial and medical applications possible.

Sang-Woo Kim and colleagues point out that the potential of wearable electronics extends far beyond the flashy and convenient. Small, lightweight devices could play life-changing roles as robotic skin or in other biomedical applications. But to maximize their utility, such electronics need an ultra-flexible, long-lasting energy source that is seamlessly incorporated into the device's design. For a possible solution, Kim's team turned to the emerging technology of "triboelectric nanogenerators," or TNGs, which harvest energy from everyday motion.

The researchers created a novel TNG fabric out of a silvery textile coated with nanorods and a silicon-based organic materi-

al. When they stacked four pieces of the cloth together and pushed down on the material, it captured the energy generated from the pressure. The material immediately pumped out that energy, which was used to power light-emitting diodes, a liquid crystal display and a vehicle's keyless entry remote. The cloth worked for more than 12,000 cycles.

The authors acknowledge funding from the National Research Foundation of Korea.



A new kind of material can harness energy from human movement and use it to light up a small LCD display. Credit: American Chemical Society

## ACS DFW Local Section



Dear Colleagues,  
As the semester reaches an end, our local section is quite busy before our summer break.

On April 6th, we honored a select group of outstanding undergraduate students as well as our 2014 50 and 60 year service award members at the Saltgrass Steakhouse in Lewisville. My most sincere congratulations to all of our award winners! I am appreciative to those members in our section that have paved the way to make our section so great, and I look forward to the leadership and encouragement that the youngest chemists in our section can provide. Without such dedication and hard work, our local section would not be what it is today.

On Saturday, April 25th, the University of Arlington will host our 48th annual Meeting in Miniature. Please consider attending this full day symposium and listening to the great work being done by undergraduate and graduate students in the DFW area. The hosting university is also in need of some volunteers to serve as judges during the symposium. If you are interested, please contact Dr. Rasi-ka Dias (dias@uta.edu). For more in-

formation about the symposium, please find it located here at this link: <http://www.uta.edu/chemistry/seminars/dfw-ac-s-mim-2015.php>.

Our last meeting of the semester will be held on Monday, May 11th at the Hard Rock Café in Dallas. Dr. Bill Carroll will deliver a lecture entitled, "Statistics and the Shirelles: How Physical Sciences Thinking Informs Popular Music Analytics." A RSVP link will be delivered to your inboxes very soon.

I want to personally thank you all for the support this semester. I am truly looking forward to our last events this semester and I am excited to see you all at the upcoming meetings.

As always, if you have any questions, please feel free to email me (shana.marie.santos@gmail.com).

All my best,  
Shana Marie Santos



## **AWARDS**

### **2015 OUTSTANDING STUDENT AWARDS**

**Philip Friedman**

Austin College

**Aaron French**

The University of Dallas

**Calvin Mikler**

The University of North Texas

**Allison Conway**

The University of Texas at Arlington

**Amanda Dugan**

Abilene Christian University

**Tung Le**

Texas Christian University

**Anish Patel**

Southern Methodist University

### **2014 50-YEAR SERVICE AWARDS**

**Mr. Richard Dexheimer**

**Mr. Michael Imhoff**

**Dr. William Witmer**

### **2014 60-YEAR SERVICE AWARDS**

**Mr. Thomas Higgins, Jr.**

**Dr. Henry Kelly**

**Mr. Robert Maguire**

**Dr. Edward Sward, Jr.**



# INTERVIEW WITH ACS PRESIDENT-ELECT DONNA J. NELSON

**Interviewer, E. Thomas Strom**

This is the 12th time I have had the privilege of interviewing the ACS President-Elect in The Southwest Retort. These individuals have all been very sharp and articulate. They have been the type of individual a member wants to represent the Society to the public. They all have a platform of objectives they want to accomplish to improve the lot of the ACS member. One should not expect an ACS President to cause a huge change in the Society's direction, but a number of incremental changes can eventually have a positive impact. I have the upmost respect for these individuals who give up huge chunks of time to serve us and our Society. As an example, our current ACS President-Elect Dr. Donna Nelson gave me one full hour on Mar. 20 taken from her busy schedule.

Like her predecessor, Dr. Donna Nelson was elected as a petition candidate. Unlike the usual ACS presidential candidate, Dr. Nelson had some name recognition from outside the chemical community, as a scientific advisor for the popular TV show "Breaking Bad." Dr. Nelson is a native of Oklahoma. Both her father and grandfather were the town physicians for Eufaula, OK. In view of the centennial this month on the first use of poison gas in warfare, it

is of interest that her grandfather was gassed in World War I. Dr. Nelson said that her grandfather suffered all the rest of his life from being gassed. Because of this interest in chemical warfare, Dr. Nelson attended portions of the ACS History of Chemistry symposium on "Modern Chemical Warfare: History, Chemistry, Toxicology, Morality" and briefly spoke to those attending.



With both her father and grandfather as physicians, you would think that Dr. Nelson would follow them into the medical field, and she had been planning to do just that. She started out at the University of Oklahoma as a chemistry major with the idea of going to medical school after graduation. A conversation with her father changed her mind. When he

learned she wanted to be a doctor, he said, "You don't want to be a doctor. You're around sick people all the time, and that is depressing. You think everyone is a hypochondriac. You catch every single cold they bring in. If you're the town family doctor, you feel guilty going out of town for a vacation. You shouldn't be a doctor. You should go into a profession in which you are around smart, interesting people all day long, not sick people. You need to be in a profession in which you learn

things the rest of your life.” She thought about his arguments, and then she decided she wanted to be a professor. The thing that attracted her to the academic life was the autonomy. You can select your projects and have a lot of freedom. She has never been unhappy with that decision.

To become an academician, you need to work with people of high status, and Dr. Nelson did just that. She received her Ph.D. from UT-Austin working with Michael Dewar and then she did a post-doc with H. C. Brown at Purdue. Her project with Dewar involved the reactions of atomic carbon with ketones. The carbon takes out the oxygen as carbon monoxide, leaving behind carbenes. Butenes are the eventual product. She also studied the process with MNDO calculations. Many people have told her that Dewar was the one true genius they have ever met. He thought outside the box and made everything seem so simple. She tells the story of a post-doc presenting results in a group meeting, showing the trend for a group of compounds. Dewar then gave an explanation for the trend. Then the post-doc jumped up and said that he had made a horrible mistake in the series. He rewrote the series, and now it showed the exact opposite trend. Dewar was not chagrined, and he said, “This is even more interesting!” He then gave a different, equally plausible explanation. By contrast, Brown was very systematic in his approach, but he was certainly successful as well. Dr. Nelson believes that she was fortunate to have seen these two different approaches, both of which have merit depending on the circumstances.

She joined the faculty of the University of Oklahoma as the first tenure track woman faculty member, and things were difficult at first. The Chair at the time had been in that position for many years, and he did not get along with her. With a change of Chair, matters improved. Her groundbreaking research involves functionalizing single walled carbon nanotubes, but she has also carried out research in science education. Just a few of the honors received include the ACS Henry Hill Award in 2013, the ACS Oklahoma Chemist Award in 2012, the E. Ann Nalley Regional Award for Volunteer Services in 2011, and the Stanley C. Israel Regional Award for Advancing Diversity in the Chemical Sciences in 2011.

I started our conversation by inquiring about the job situation, which I felt to be a most important issue. Dr. Nelson felt that the jobs problems facing chemists have many fingers and go into many areas. The main problem is the mismatch between the areas that many chemists are trained in and the job openings, which are in other areas. Other factors worsening the situation are jobs moving overseas and downsizing of domestic businesses. Then we have the public’s lack of appreciation for science and scientists, which results in fewer students going into science. I interjected at this point that fewer people going into science would eventually correct the mismatch. She pointed out that the science workforce needs to have a significant portion of US citizens, so that the science enterprise is not wholly dependent on foreign students. She stated that she is creating a task force to look into all aspects of this

problem. The task force, she hopes, will identify areas that promise jobs in the future. The members have just been chosen, so she hopes they will start working immediately. As an example of the desire of many ACS members for quick action, she tells of an e-mail she received. "It was announced on Nov. 17th that you had won. Now it is Dec. 1. What have you done so far about jobs?"

Dr. Nelson is concerned about the lack of appreciation among the general public about the benefits of science---the improvement of their lives and their standard of living. Scientific disputes in the media contribute to this problem, as such disputes are not usually settled by the scientific method but by who can yell the loudest. The non-scientists may be alarmed by what they are reading. She feels that all scientists should make a point of talking to their non-scientist friends to tell them what we scientists do. We should talk at places such as Lions Clubs, Rotary Clubs, Chambers of Commerce, PTAs, etc. Of course, Hollywood and TV can present distorted views of scientists as well. She came on as science advisor to "Breaking Bad" one year after the series had started, too late to have any impact on the direction of the show. However, she was pleased when later in the series the hero/villain said "Without us (chemists), you have nothing!" People do not realize how science touches their lives every day. She went on to point out that we have a responsibility to the government as well as to the public. The ACS Charter, signed by President Roosevelt on Aug. 25, 1937, stipulates that ACS, whenever called upon, is to assist

the War or Navy Departments in all areas connected with the national defense.

I raised the touchy issue of whether we are training too many chemists. Dr. Nelson agreed that reducing the number of chemistry students would improve the employment situation, but so would the alternative of increasing the number of jobs. Her feeling is that we should NOT try to cut back on the number of students going into science. She wants to explore other solutions. She also cited what has been called "The Great Crew Change." Presumably the retirement of the baby boom generation will result in a great number of job vacancies, which will have to be filled. Thus, she thinks that now is not the time to cut back the numbers of scientists.

I appreciated Dr. Nelson's candor and her generosity in fitting me into her hectic schedule. I also reflected that most of my recent interviews of ACS Presidents-Elect have dealt with jobs. This is a proper emphasis, as we all want the state of chemistry to flourish. Perhaps great progress will be made in Dr. Nelson's term; perhaps not. However, the efforts of these bright people will surely improve matters somewhat. Dr. Nelson will definitely be a worthy person to represent chemistry to the public at large. We all wish her well.



# *DFW SECTION OF THE ACS*

## *Call for Nominations*

### *Doherty and Schulz Awards*

Nominations are invited for 2015 Wilfred T. Doherty and Werner Schulz awards. Nomination forms and additional information are available online at <http://dfw.sites.acs.org/localsectionawards.htm>. This year's chair is Dr. Rasika Dias at UT Arlington (817-272-3171). Nominations are due by April 15, 2015. Each nomination should contain completed nomination form, cover letter highlighting the nominee's accomplishments, and a copy of the CV. One seconding letter may accompany nominations. The nomination package should be sent by email as a single pdf file to Rasika Dias at [utachem2015@yahoo.com](mailto:utachem2015@yahoo.com). Nominations remain active for five years but should be updated annually.

The Doherty Award is given for excellence in chemical research or chemistry teaching, meritorious service to ACS, establishment of a new chemical industry, solution of pollution problems, and advances in curative or preventive chemotherapy. Nominees may come from industry, academia, government, or small business. The nominee should be a resident member in the area served by the DFW Section, and the work should have been done here. The award is \$1500 and an engraved plaque. A photo of the Doherty Award winner will be displayed permanently in the Gallery of Doherty Award winners, Berkner Hall, UT-Dallas.

The Schulz Award is given to high school chemistry teachers, who, like the late Dr. Werner Schulz, bring that something extra to the teaching of chemistry. The nominee and/or nominator need not be ACS members. Nominees should show excellence in chemistry teaching as demonstrated by testimonials from students and fellow teachers, results in student competitions, and diligence in updating and expanding scientific/teaching credentials. A photo of the Schulz Award winner will be displayed for one year at the Perot Museum of Nature and Science in Dallas, and then displayed permanently in the Gallery of Schulz Award winners, Science Bldg., Tarleton State University. A traveling plaque stays at the winner's high school for the year of the award. Winners will normally receive their awards and give their lectures at a fall meeting of the section.

Remember, a continuous flow of nominations is needed to maintain the quality of awards.





# 38th International Symposium on Capillary Chromatography & 12th GCxGC Symposium

May 16 - 21, 2015 Ft. Worth, Texas

[www.rivaintexas.com](http://www.rivaintexas.com)

ISCC is the premier meeting for pressure and electrodriven microcolumn separations and related techniques. GC x GC brings together world leaders in the application of comprehensive multidimensional gas chromatography. The combination of these meetings provides a rich forum for fundamentals and applications of widely used analytical techniques. Information about student travel grants and a complete list of awards are available on the website. These conferences, held bi-annually in Riva del Garda, Italy, move to Ft. Worth, Texas for 2015. Plenary lecturers include George Whitesides from Harvard University and Sandy Dasgupta from The University of Texas at Arlington. Some general themes include:

Petroleum, Energy, and Resource Development  
Pharmaceutical, Forensic, and Process Analysis  
Ionic Liquids in Chemical Analysis  
Contaminants in Food and the Environment  
Biomarker Discovery and Protein Analysis  
Novel Stationary Phase Chemistry  
Atmospheric and Air Analysis

Software and Data Analysis  
Integrated Sample Preparation  
Lab-On-A-Chip and Microfluidics  
Fundamentals and Theory  
Novel Detection Techniques  
Multidimensional Separations  
Miniaturized and Portable Systems

## Abstract submission and registration now welcome!

Invited Presenters Include:

Jared Anderson	Harold McNair
Sandy Dasgupta	Luigi Mondello
John Dimandja	Milos Novotny
Frank Dorman	Michael Ramsey
Tadeusz Gorecki	Eric Reiner
James Harynuk	Kevin Schug
Emily Hilder	John Seeley
Steven Jacobson	Nick Snow
Robert Kennedy	Frantisek Svec
Milton Lee	Rob Synovec
Phillip Marriott	Ralf Zimmerman

Symposium Chair  
Daniel W. Armstrong  
[www.isccgcxgc2015.com](http://www.isccgcxgc2015.com)



## From the ACS Press Room

### How green tea could help improve MRIs

#### Enhanced In Vitro and In Vivo Cellular Imaging with Green Tea Coated Water-Soluble Iron Oxide Nanocrystals

*ACS Applied Materials & Interfaces*

Green tea's popularity has grown quickly in recent years. Its fans can drink it, enjoy its flavor in their ice cream and slather it on their skin with lotions infused with it. Now, the tea

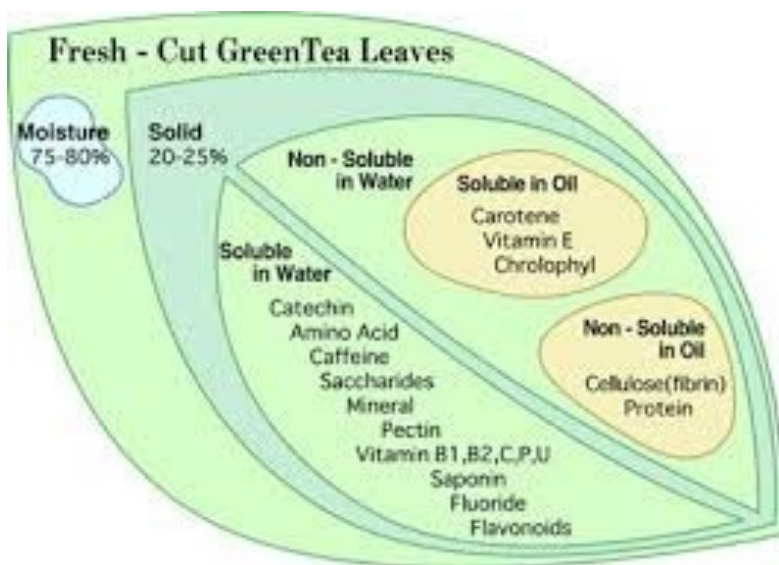


could have a new, unexpected role — to improve the image quality of MRIs. Scientists report in the journal *ACS Applied Materials & Interfaces* that they successfully used compounds from green tea to help image cancer tumors in mice.

Sanjay Mathur and colleagues note that recent research has revealed the potential usefulness of nanoparticles — iron oxide in particular — to make biomedical imaging better. But the nanoparticles have their disadvantages. They tend to cluster together easily and need help getting to their destinations in the body. To address these issues, researchers have recently tried attaching natural nutrients to the nanoparticles. Mathur's team wanted to see if compounds from green tea, which research suggests has anticancer and anti-inflammatory properties, could play this role.

Using a simple, one-step process, the researchers coated iron-oxide nanoparticles with green-tea compounds called catechins and administered them to mice with cancer. MRIs demonstrated that the novel imaging agents gathered in tumor cells and showed a strong contrast from surrounding non-tumor cells. The researchers conclude that the catechin-coated nanoparticles are promising candidates for use in MRIs and related applications.

The authors acknowledge funding from the University of Cologne and the EU Project Nanommune.



# NATIONAL CHEMISTRY OLYMPIAD EXAM QUALIFIERS

The National NCO Exam will be administered on Saturday, April 18, 2015, and is being graciously hosted by the Department of Chemistry and Biochemistry at the University of Texas at Arlington. The NCO Coordinators for Dallas-Fort Worth are Dr. Kathleen Holley, M. B. Lamar High School, Arlington, and Dr. Brad Pierce, University of Texas at Arlington.

## ***QUALIFYING STUDENTS***

### ***STUDENT***

Justin Yan  
Robert Luo  
Paul Ryu  
Tim O'Meara  
Hasan Ashqeen  
Lillian Zha  
Joseph Dean  
Elizabeth Zhou  
Ishan Paranjape  
Shicheng Rao  
Devesh Singh  
Druv Patel  
Anthony Zhang

### ***HIGH SCHOOL***

Colleyville Heritage  
Highland Park  
R. L. Paschal  
St. Mark's School  
Grapevine  
TAMS  
TAMS  
Hockaday School  
Plano West Senior  
TAG Magnet, Dallas ISD  
Trinity Valley School  
Plano West Senior  
Frisco Independence

### ***TEACHER***

Sonya Loughran  
Wenzen Chuang  
Davin Haley  
Jon Valasek  
John Modica  
Dr. Martin Schwartz  
Dr. William Acree  
Dr. Beverly Lawson  
Megan Mobley  
Xavier Almaguer  
Paul Price  
Neil Milburn  
Dennis Cook





# Around the Area

## TAMU System

Two DFW Section members were honored by the Texas A&M University System as Regents Professors – the highest academic rank within the System – on February 11, 2015. They were Dr. **Ben Jang** of Texas A&M University – Commerce and Dr. **Linda Schultz** of Tarleton.

## University of Arkansas

### On the Go

The following research was presented at the Biophysical Society Annual Meeting in Baltimore, Maryland, February 2015. Abstracts published in *Biophysical Journal* 108 (2015). Abstract number follows each citation.

Denise V. Greathouse, J.J. Kinnun, J.A. Williams, D. Marquardt, J.B. Klauda, R.E. Koeppe, II, J. Katsaras, T.A. Harroun, S.R. Wassall. Disorderly polyunsaturated fatty acids and orderly cholesterol. Just how do they get along in a membrane? 412a.

Amanda Lowe, D.V. Greathouse. Characterization of membrane interactions of antimicrobial lactoferricin peptides with central residue substitutions, 554a.

Ashley N. Martfeld, D.V. Greathouse, R.E. Koeppe. Response of gwalp transmembrane peptides to incorporation of buried histidine residues, 553a.

Armin Mortazavi, V. Rajagopalan, D.V. Greathouse, R.E. Koeppe. Detection of helix fraying in designed transmembrane al-

pha helices, 554a.

Venkatesan Rajagopalan, D.V. Greathouse, R.E. Koeppe. Ionization-dependent behavior of transmembrane helices that incorporate glu or tyr residues, 554a.

Radda Rusinova, R.E. Koeppe, II, O.S. Andersen. A general mechanism for off-target effects: Studies with amiodarone and other antiarrhythmics, 498a.

Vasupradha Suresh Kumar, A.N. Martfeld, D.V. Greathouse, R.E. Koeppe. Influence of a potentially destabilizing central tryptophan on transmembrane helix domains, 553a.

Jordana K. Thibado, A.N. Martfeld, D.V. Greathouse, R.E. Koeppe. Influence of cholesterol on single arginine-containing transmembrane helical peptides, 553a.

Sarah E. Whitlock, R.E. Koeppe II, D.V. Greathouse. Comparing peptide-lipid interactions and antimicrobial activities of peptides with similar “core” lengths but variable arginine and tryptophan residues, 554a.

**Feng Wang** gave an invited talk, *Water from the liquid-vapor critical point to the putative liquid-liquid critical point according to the first principles*, at the 9th International Conference on Computational Physics, Singapore, January 7-11, 2015.

**T.K.S. Kumar** attended the Annual Editorial Board meeting of the *Journal of Biological Chemistry* in Boston, MA, March 27-28, 2015.



## Publications

Jenkins, S.V., Chen, S., Chen, J.

*Gold-Copper Alloyed Nanorods for Metal-catalyzed Organic Reactions: Implication of Surface Ligands on Nanoparticle-based Heterogeneous Catalysis*. Tetrahedron Lett. 2015, accepted.

Jenkins, S.V., Gohman, T.D., Miller, E.K., Chen, J. *Synthesis of Hollow Gold-Silver Alloyed Nanoparticles: A "Galvanic Replacement" Experiment for Chemistry and Engineering Students*, J. Chem. Ed. 2015, accepted.

Hang Chen, Matthew Golder, Feng Wang, Stephen Doorn, Ramesh Jasti, Sergei Tretiak, Anna Swan. *Raman-active modes of even-numbered cycloparaphenylenes: Comparisons between experiments and DFT calculations with group theory arguments*. J. Phys. Chem. C, 119, 2879 (2015).

Hongyi Hu, Zhonghua Ma, and Feng Wang. *On the transferability of three water models developed by adaptive force matching*. Annual Reports of Computational Chemistry, Vol. 10 (2014).

Fruchtl M, Sakon J, Beitle R. *Expression of a collagen-binding domain fusion protein: Effect of amino acid supplementation, inducer type, and culture conditions*. Biotechnol Prog. 2015 Jan 13 (full text online)

Bauer, R., Janowska, K. Taylor, K. Jordan, B, Gann, S. Janowski, T., Latimer, E.C., Matsushita, O., Sakon, J. *Structures of three polycystic kidney disease-like domains from Clostridium histolyticum colla-*

*genases ColG and ColH*. Acta Cryst. D71, 565-577 (2015).

Bunnell, K., Lau, C.S., Lay, J.O., Gidden, J., Carrier, D.J. *Production and Fractionation of Xylose Oligomers from Switchgrass Hemicelluloses using Centrifugal Partition Chromatography*. Journal of Liquid Chromatography & Related Technologies, 38(7) 801-809 (2015).

Eric C. Peterson, Michael D. Hambuchen, Rachel L. Tawney, Melinda G. Gunnell, James L. Cowell, Jackson O. Lay, Jr., Bruce E. Blough, F. Ivy Carroll, & S. Michael Owens. *Simple Radiometric Method for Accurately Quantitating Epitope Densities of Hapten-Protein Conjugates with Sulfhydryl Linkages*. Bioconjugate Chem., 25(12) 2112-2115 (2014).

## UT Arlington

UT-Arlington. At the Annual Celebration of Excellence by Students (ACES) Conference, Yusheng "Sam" Sung, a sophomore chemistry major, took the top undergraduate oral presentation prize, and Evelyn Wang, a chemistry graduate student, took the top graduate oral presentation prize. Both are from the group led by Dr. Kevin Schug.

Dr. E. Thomas Strom attended the Denver ACS National Meeting, where he represented DFW in the ACS Council Meeting.

## NMR INSTRUMENT TIME NEEDED

The University of North Texas Health Science Center in Fort Worth is looking to purchase instrument time on mid-to-higher field NMR spectrometers (300-600 MHz) in the Dallas-Fort Worth area. With the new UNT System College of Pharmacy coming online and the recent arrival of faculty in pharmaceutical sciences and medicinal chemistry, we have a sudden need for NMR capabilities. In addition, we are developing new diagnostics based on low-field benchtop NMR relaxometry and spectroscopy, and are seeking to validate those approaches at higher field. If your institution has excess NMR capacity and is looking for customers, please contact David P. Cistola, M.D., Ph.D., Vice President for Research & Innovation, UNT Health Science Center, Fort Worth. Email at [david.cistola@unthsc.edu](mailto:david.cistola@unthsc.edu) or call 817-735-2055.



**FWLSC's Spring  
Event in Support  
of**

**SfN's Brain  
Awareness Week**

**Thursday, April 23<sup>rd</sup> 2015**

**7:30p – 10:30p**

**@ A5A 1628 5th Ave 76104**

**Interesting Talks by Local Scientists**

**Benjamin R. Miller, PhD**

*Assistant Professor of Biology*

School of Natural and Social Sciences

Texas Wesleyan University

**C. Munro Cullum, PhD, ABPP**

**"Traumatic Brain Injury and Cognitive  
Function Later in Life"**

UT Southwestern Medical Center

[http://profiles.utsouthwestern.edu/  
profile/11587/c-munro-cullum.html](http://profiles.utsouthwestern.edu/profile/11587/c-munro-cullum.html)

**Denise C. Park, PhD**

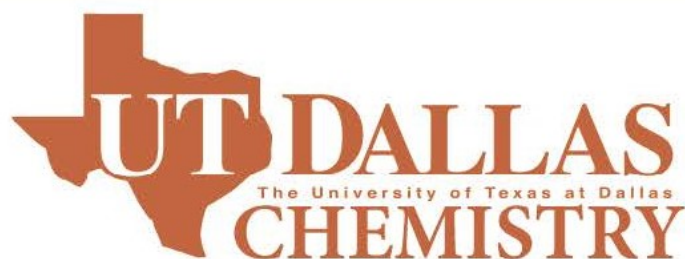
Center for Vital Longevity, UT Dallas

[http://agingmind.utdallas.edu/people/  
view/denise-park#sthash.eyJZglqFc.dpuf](http://agingmind.utdallas.edu/people/view/denise-park#sthash.eyJZglqFc.dpuf)

**To Register - & for more information  
about the expert speakers, visit:**

[http://www.eventbrite.com/e/fwlscs-  
spring-2015-event-thursday-april-23-  
tickets-15565380472?aff=eac2](http://www.eventbrite.com/e/fwlscs-spring-2015-event-thursday-april-23-tickets-15565380472?aff=eac2)

**We Appreciate our Sponsors, Including  
Sustaining Sponsors: FTI & SCI**



Date	Speaker	School
January 23	Dr Eduard Chekmenev	Vanderbilt University
January 30	Dr Donovan Haines	Sam Houston State University
February 6	Dr Wei Zhang	University of Colorado
February 13	Dr Ivan Aprahamian	Dartmouth
February 20	Dr Susan Kauzlarich	University of California Davis
February 27	Dr Wei Chen	University of Central Oklahoma
March 6	Dr Jose Gutierrez-Gonzales	University of Texas Pan American
March 13	Dr Richard Willson	University of Houston
March 27	Dr Saiful Chowdhury	University of Texas Arlington
April 6	Dr Ali Trabolsi	New York University Abu Dhabi
April 10	Dr. Warren Chan	University of Toronto
April 17	Dr Gang-Yu	University of California Davis
April 24	Dr Nathaniel Rosi	University of Pittsburgh
May 1	Dr Jennifer Irvin	Texas State University

800 West Campbell Rd. Richardson, TX Contact: [gassensmith@utdallas.edu](mailto:gassensmith@utdallas.edu)

## ***FIVE QUESTIONS FOR...***

Our April interviewee is **Benjamin Miller, Ph.D.**, Assistant Professor of Biology at Texas Wesleyan University. Dr. Miller researches astrocytes and their regulation of neuronal communication for behavioral



output in the central nervous system, which has implications for numerous neurodegenerative diseases.

### **1. How old were you when you realized you wanted to be a scientist?**

I never had a point in my life where I “decided” to be a scientist. I think it honestly happened as soon as I had cognition. As a child, adults were always frustrated with my behavior because I always asked “WHY?” and went against the grain. I always questioned authority, rules, and conventional human endeavors. For me, life has always been about breaking the boundaries of traditional ways of thinking, which is why science intrigues me. Science is the essence of searching for truth. Only through critical thinking and empirical evidence can we step closer to understanding reality. I don’t mock or scorn tradition and customs, but at some

point, humans need to understand reality. For me, science is the gatekeeper to reality. As a father of four wonderful children, I always ensure that my kids ask “why?” Similarly, I want my students to ask “why?” To ask why is the essence of science.

### **2. What aspects of your career do you most enjoy?**

I’m in a lucky position in my career. I primarily teach human anatomy and physiology, and also work with talented undergraduates to explore how astrocytes (the non-neuronal cells of the central nervous system) regulate neuronal communication and behavior. I honestly love almost all aspects of my science career. Educating students about science, however, is the aspect of my profession that is most enjoyable and meaningful; it inundates my entire thought process. Although I may not be the most talented scientist, I at least try to touch all my students with the “bug” of scientific reasoning.

Many educators explain that if “I only reach that one person, then I’ve done my job”. That statement is null and void to me, because I try to reach all my students, and instill in them an understanding of science, which then becomes a new way of thinking that students can apply to their lives.

### **3. What advice do you have for students who wish to focus on a career in science?**

Look, any career one wishes to obtain



should stem from the passion that one has for that particular career. Don't seek science because it's sexy. If you are a scientist, then choose that profession. The great thing about the sciences is that the profession is extremely diverse. The best advice that I could give is to find a job or internship in science as soon as possible and figure out if you enjoy science. Importantly, students should not be fearful of making mistakes. The beauty about science is that we don't know so many fundamental aspects about the universe. Ultimately, the goal of students interested in science is that they should have the passion to find the puzzle pieces of the universe.

**4. In addition to research and teaching, you work to increase awareness of Brain-focused Science. Please explain the importance of the Society for Neuroscience's "Brain Awareness Week", and ways in which the Metroplex can get involved with SfN and Brain Awareness Week.**

"Cogito ergo sum"; "I think, therefore, I am" (Rene Descartes) sums up why I'm interested in the brain. It's hypothesized that the brain is the last frontier in science. We know more about the physics of our universe than we know about the mechanisms of brain function. It is extremely important to get people excited about the brain, particularly brain health. Humans can live without limbs and can use a mechanical heart, but it is the brain that makes us human. Brain Awareness means informing others that what makes us unique is the 5-pound mush of tissue that lies in our skull. Treating the brain as a sacred organ and keeping it healthy are the keys to having a productive and meaningful life.

My goal is to continue promoting Brain Awareness in the Metroplex. The success of this endeavor ultimately will come from the help of other passionate scientists interested in promoting this event. I'm always entertaining new ideas to advance the awareness of Brain Health!

**5. The ubiquitous 5th Question must be:**



**Who is your Science Hero? And why?**

My science hero is Bill Nye the Science Guy. His drive is dissemination of science to the public, which is the most worthy goal of any scientist. He is the epitome of a great science educator. His work is accessible to the science literate and illiterate alike.

Thank you, Dr. Miller, for participating in 5 Questions!

**Correction: Contact info for Dr. Susan Carson, March 2015 5Q interviewee, was omitted from the column. Reach Dr. Carson via [susan@smartleadershipcoaching.com](mailto:susan@smartleadershipcoaching.com)**



## **Many plastics labeled ‘biodegradable’ don’t break down as expected**

### **Evaluation of Biodegradation— Promoting Additives for Plastics**

#### *Environmental Science & Technology*

Plastic products advertised as biodegradable have recently emerged, but they sound almost too good to be true. Scientists have now found out that, at least for now, consumers have good reason to doubt these claims. In a new study appearing in the ACS journal *Environmental Science & Technology*, plastics designed to degrade didn’t break down any faster than their more conventional counterparts.

Susan Selke, Rafael Auras and colleagues note that to deal with our plastic waste problem, many countries and local governments have adopted laws, such as single-use bag bans, to deal with increasing amounts of trash. Most plastics end up in landfills, where they sit for decades or longer without breaking down. More recently, some manufacturers now make plastics with additives that are supposed to make the products biodegradable. But the effectiveness of this approach has been unclear. Selke and Auras’s team wanted to see if the additives were working under typical disposal conditions.

The researchers evaluated plastics containing five different compounds designed to encourage breakdown. They found no

evidence that the additives enhanced biodegradability in compost or under simulated landfill conditions, or when buried in soil for three years. They say their findings have wide-ranging implications for consumers, the environment and the companies that make these products.

The authors acknowledge funding from the Center for Packaging Innovation and Sustainability at Michigan State.

#### *A few more links to the subject:*

<http://science.kqed.org/quest/2014/06/12/biodegradable-plastics-too-good-to-be-true/>

<http://www.sustainableplastics.org/spotlight/biodegradable-plastics-true-or-false-good-or-bad>

<http://www.motherearthnews.com/nature-and-environment/biodegradable-plastics-zmaz10jjzraw.aspx>

<http://www.motherjones.com/environment/2009/05/do-biodegradable-plastics-really-work>

## *From the editor*

I was particularly interested this month in the ACS Press Room article on catechins from green tea. Any mention of green tea always reminds me of the story *Green Tea* by the great ghost story writer Joseph Sheridan le Fanu, which describes an interesting side effect of excessive green tea ingestion and catechins: hallucinations, both auditory and visual. Walking around the Google, I find that green tea has a huge following among the galenical crowd. No real evidence exists that drinking green tea per se causes such things BUT green tea concentrate has been known to elicit harmful side effects. Leaving you to search for yourself, I'm not even going to put any links because there were so many and so many opinions.

I think this is a great example of the good/bad sides of natural extracts and herbal treatments. Yes, plants and natural medicines can be helpful, but other chemicals exist in plants which may not be efficacious and may be even harmful. And yes, they're all chemicals.

*Best regards,  
Connie*

PS: here's the link to the story: <http://www.readbookonline.net/readOnline/38943/> .  
Careful: it might put you off green tea for life.