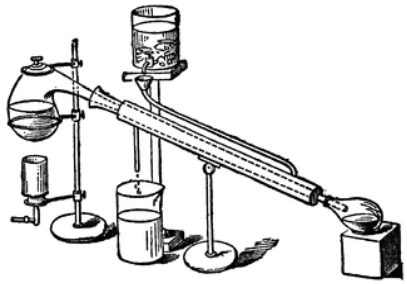
SOUTHWEST RETORT



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and Chemistry in this area

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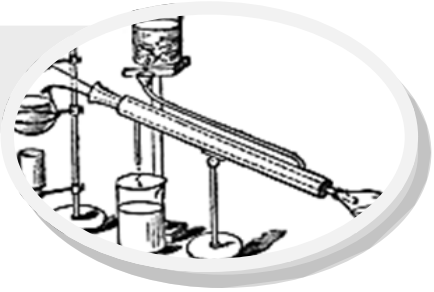

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EMPLOYMENT CLEARING HOUSE

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. Deadlines are the 7th 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-20150501

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. Please do not call, we will contact only select candidates.

hr@jenkemusa.com.

SERVICES and ANNOUNCEMENTS

FIFTY YEARS AGO IN THE SOUTHWEST RETORT

This year's ACS Regional Meeting will be hosted by the Central New Mexico Section. It will be held in Albuquerque, NM, Nov. 30-Dec. 2. The General Chair will be **Dr. Robert A. Penneman** of the Los Alamos Scientific Laboratory. There will be a plenary lecture given by **Dr. Glenn T. Seaborg**, Chairman of the US Atomic Energy Commission. Special symposia will be held on Cryochemistry, High Temperature Chemistry, Chemistry of Complex Fluorides and Molten Salts, Biochemistry, New Approaches to Teaching Undergraduate Chemistry, and Physical Chemistry of Water Desalination.

Students of Northwestern State College at Natchitoches, LA, majoring in chemistry, physics, and geology are back in remodeled and improved Fournet Hall after a year in makeshift quarters following the damage to the building's interior from a fire. In some respects, the fire was a blessing, as the redesign allowed for more efficient use of space. Also, it became possible to air condition the entire building.

One of the most distinguished men in polymer chemistry visited Texas Eastman recently, **Professor Herman Mark,** often called the father of modern polymer chemistry and the Dean Emeritus of the Brooklyn Polytechnic Polymer Institute. On Mar. 9 a milestone was reached when the first shipment of acetaldehyde was made from the newest Texas Eastman plant in Longview.

In the Dallas-Ft. Worth ACS Section, **Dr. William L. Mecay** of Texas Woman's University gave three talks at Winona State College in Winona, Minnesota. **Dr. Lyman R. Caswell** recently received a $16,000 grant from the US Army Medical Research and Development Command to study "Heterocyclic Amadines."

In the South Plains ACS Section, **Dr. William L. Herndon** recently accepted a position as Assistant Professor at Texas Tech University. **Professor Michael Szwarc** of the State University College of Forestry at Syracuse University recently gave a seminar April 15 at Texas Tech on "Reactivities of Ions and Ion-Pairs in Aprotic Solvents."

At Baylor **Drs. A. J. Pinkus** and **T. J. Bond** recently attended the ACS National Meeting in Pittsburgh. Those attending the Hydrocarbon Symposium in Houston April 13-14 were **John S. Belew, Virgil Tweedie,** and Pinkus. **Dr. Charles G. Overberger** of the Polytechnic Institute of Brooklyn presented a Welch lecture on April 18 on "Polymers with Catalytic Activity."

Dr. John A. Thoma has joined the faculty of the University of Arkansas as Associate Professor. He comes to Arkansas from the faculty at Indiana University.

Published Irreproducible Scientific Research

By

John E. Spessard, PE

In this paper, published irreproducible scientific research is defined as it has been published in a peer-reviewed journal and competent scientists have been unable to reproduce the results. Deliberate fraud and/or misconduct are not considered.

1. Is Irreproducible Scientific Research an Issue?

It is an issue in the fields of biomedical and psychological research. It is much less of an issue in the physical sciences such as chemistry and physics. Lest physical scientists get overly complacent, between 1926 and 1931, several unsubstantiated claims of having discovered a new element include element 61(Illenium), element 85 (Alabamaine) and element 87(Virginiaum). In more recent times, the International Union of Pure and Applied Chemistry resolved conflicting claims of the discoveries of new super heavy elements.

The March 24, 2016 issue of *Nature* published a commentary: "Challenges in Irreproducible Research." This study provided an estimate of a $28 billion per year cost of irreproducible biological research. Francis S. Collins, Director and Lawrence A. Tabak, Principal Deputy Director of the US National Institute of Health published in the January 30, 2014 issue of *Nature* "NIH Plans to Enhance Reproducibility." The August 28, 2015 issue of *Science* published a study "Estimating the Irreproducibility of Psychological Science." Efforts to replicate the findings of one hundred articles which had been published in three peer-reviewed psychology journals found that 97% of the original papers provided significant results while 36% of the replications provided significant results.

2. What are the Causes of Irreproducible Research?

Reasons are procedural and psychological. Considering the procedural issues, biomedical research has a much lower ratio of signal to noise than do physical science research. Thus biomedical research is more susceptible to reproducibility issues such as variables that the investigators are unaware of and hence are uncontrolled. An example could be subtle differences in tested animal strains and environment. Statistical flaws include experimental design, data analysis and interpretation and misapplication of statistics. The results of clinical trials are much more reproducible. There are hundreds if not thousands of subjects and the scientists do not know who is receiving the medication and

who is receiving the placebo. Thus, there is much more data and the data is not subject to experimental bias. Lest the physical scientists get too complacent, remember polywater.

Then there are the psychological issues. People tend to see what they want to see. (Consider me a Charter Member of the Club.) To the industrial scientist, the objective is to achieve potentially important commercial research. For the academic scientist, the objective is publication in a prestigious peer-reviewed journal. This is also a survival issue. In industry, a project lacking potential economic benefits will be terminated and possibly also will be the involved scientists. In academia, important results are necessary to achieve funding and continued employment. This research must be published quickly to both satisfy the sources of funding and to prevent being "scooped" by another research group. The rewards and incentives for successfully reproducing others' research and to double check findings are minimal and do not justify the necessary effort. It is a hard world out there and I have the greatest respect for the survivors.

3. What are the Costs of Irreproducible Research?

The Scientist Magazine published an estimate of $28 billion as the annual cost of irreproducible research. This finding was republished in *Nature News and Comment*. There was no published methodology for obtaining this estimate and this estimate has been held to be excessive. Nevertheless, no one denies that there is a substantial cost.

One cost is that research efforts and funding are diverted to false efforts. If clinical trials are a false step, considering there are hundreds, if not thousands, of human volunteers receiving double blind administrations of a therapy and the record keeping and statistical treatment, this estimate becomes more credible. As an example, Prinz and colleagues published an analysis from their experience in drug development at Bayer Healthcare. Bayer scientists attempted to experimentally validate published research on potential new drug targets. The Bayer scientists reproduced only 21% of the published results. The title of their report was: "Believe it or Not: How Much can we Rely on Published Data on Potential New Drug Targets?" NIH certainly believes there is a problem. Some of this academic research was funded by pharmaceutical firms and governmental agencies.

The fact that Bayer felt that published research had to be verified is troubling (at least to me). This was research that had potential applications for new drug discoveries. The fact is that Bayer had to kiss almost four frogs to find one prince impacts the cost of prescriptions that you and I need.

4. Is There a Remedy?

I am unsure there is one. The only possible remedies would have to come from the funding sources where these sources put heavier weight on reproducibility in future funding. The funding sources would need to fund reproducibility investigations. Whether or not this is feasible, I don't know. There could be

some interesting exchanges between the original group and a party unsuccessfully attempting to reproduce the results.

Referees who evaluate research proposals and submitted publications now identify themselves. It has been suggested that making referees anonymous would improve matters. This would make referees more likely to provide better evaluations because the scientist being evaluated could not retaliate when this scientist is evaluating the referee's proposals and publications. I do not think so.

The scientific community working in a particular field is small and established researchers know who is active in the field. Even if the referee were anonymous, the scientist being evaluated could make a very good guess as to the referee's identity. Or the referee providing a favorable review could reveal his/her identity off the record with an expectation of reciprocation.

An Interview with ACS President-Elect Allison A. Campbell

Interviewer E. Thomas Strom

ACS President -Elect **Allison Campbell**

Lucky thirteen! This is the thirteenth time I have interviewed the ACS President-Elect during the first year of the three-year rotation. Former ACS President Bill Carroll has told me that he finds it very interesting to learn what these articulate, sharp people want to accomplish in their three-year term, *before reality sets in*! Bill's comment highlights what we all know instinctively. In the three years they serve, they can't drastically change the public's negative perceptions of chemistry, significantly increase the number of jobs in chemistry, or greatly stimulate government support of research. However, they can make incremental improvements in all these areas, and over time incremental improvements lumped together become large improvements.

As you readers should know, the ACS presidency alternates between a president from industry/government and a president from academia. Dr. Allison A. Campbell is in the first group, as she is from DOE's Pacific Northwest National Laboratory (PNNL). I am very grateful to Dr. Campbell for taking time from her busy schedule to give me a morning interview in San Diego on Mar. 13.

Last year when I interviewed current ACS President Dr. Donna Nelson, I asked about jobs. Donna had created a "Task Force on the Employment of Chemists." Dr. Campbell is a current member of that Task Force. How can the chemistry job market stay at a decent level when industry mergers result in downsizing, as in the current DuPont/Dow merger? To my inquiry about jobs, Allison responded that there were two aspects---downsizing and the pipe line. ACS can't do much about business decisions which result in downsizing, but ACS can help in the transition necessary for those chemists who have lost their jobs. ACS has a very good suite of helpful programs in areas such as resume writing, interviewing skills, and networking. She did note that the unemployment rate for chemists had improved markedly from the low point in 2009, but the unemployment rate for recent graduates is still alarmingly high. She felt that ACS should develop programs focused on students who are new to the job market. Allison thought that a necessary focus was on turning around the declining support of the government for research and development. If that were to turn around, new government support could drive the economy and

the related jobs in a positive direction. As a Director in a DOE user facility for the past ten years, that is where her strengths lie. She believes that her efforts in three areas, science advocacy in government, science literacy, and globalization, will have a synergistic effect on jobs. She certainly intends to carry the recommendations of the Task Force forward during her year as President.

So far as the pipe line, at present she thinks there is no need for adjustment. She did mention that at the graduate level the perception was that the only two paths were employment in industry or in academia. Allison says that if students do not go one of those two ways, they are not "failing their degree." There are a lot of non-traditional jobs that are highly important and greatly valued.

So far as science advocacy, it makes sense to build upon previous ACS efforts in this area. She wants to take advantage of National Chemistry Week in some way. She is thinking of a "Chemistry on the Hill" day, in which there are events which focus on the effect that chemistry and chemists have had on our economy and on the quality of life in our country. This would draw the line and the thread for our stakeholders on the hill that their investments in applied and basic research are having a substantial effect on our economy. She wants to engage young members in this process, since they are the future of the Society. Allison has been a member of an "Energy Caucus" that helps educate Congress on energy matters, and ACS is establishing a "Chemistry Caucus" to work in the same way.

Science literacy is linked with science advocacy. Allison cited an American Physical Society survey of a few years ago. The public was asked whether the government should invest in research and development. The answer was unequivocally yes. A later question asked if the need should arise for cuts in government spending, what area should be cut first. The answer was research and development! Allison's take on that is that people realize the importance of research and development, but they don't see how it impacts their everyday life. Therefore, we need to educate the public on just how important chemistry and chemists are to their quality of life. People have all sorts of things in their home that are innovations of chemists and chemistry, but they have no idea that this is so. Allison thinks it would be useful for the ACS Leadership Institute to have a module on "Communicating with the Public." This module then could be taken to regional meetings to show younger chemists how to communicate with the public.

Allison feels that diversity makes the Society stronger, and she means not just diversity of gender and ethnicity, but of background and culture also. Chemistry is transcending borders and disciplines. Membership is something that everyone needs to keep their eye on. ACS needs to continue to provide

value to their members. The obvious avenues are through publications and meetings, but ACS has made progress in providing their members the "soft skills" needed for their members to be competitive in the work place. Allison got into the ACS as a student member and stayed. Some members leave after just a couple of years. They don't seem to realize that participation in the Society is a key feature of being a chemist. Allison feels that many members don't realize the importance of the local section in developing leadership skills and in networking.

I asked Allison about her choice of chemistry as a career. She felt that her parents had a great influence on that. She grew up in Portland, OR. Her mother was a biology major who worked in a cancer lab. Her father was a chemistry major who became a pediatric surgeon. When she went to Gettysburg College, she thought she wanted to eventually go to medical school; but chemistry appeared to come naturally for her. By the time she graduated, she decided she didn't want to go to medical school, but the job market was bad at that time. Therefore, she decided to go to graduate school at SUNY-Buffalo. She worked with George Nancollas studying biomineralization and the interactions of proteins with minerals at the molecular level. She received her Ph.D. in physical chemistry in 1991. She wanted to get back to the West Coast, so she did a post-doc at PNNL. She fell in love with the national laboratory and has stayed there ever since. She is currently Associate Laboratory Director for the Earth and Biological Sciences Directorate.

When she was younger, Allison participated in equestrian events. They involved three-day events in which the first day you do dressage, the second day cross-country riding, which included jumping over the jumps that are there, and the third day doing jumps in a stadium. She represented the US in the 1987 Junior World Championships, and she was a contender for the US Olympic equestrian team in 1988. She was working toward the Olympics as a senior in college, when her horse became critically ill and had to be put down. She then decided to put all her energy into school. She switched to bicycling as a hobby. However, one of her best friends has been to five Olympics, so she can experience equestrian events vicariously through her. She feels that being an equestrian competitor having to care for her horse taught her a lot of skills, which are still useful.

It appears that Allison's experience in leading a scientific user facility at PNNL and her past interactions with government officials will be very helpful to her efforts in science advocacy. Like all the past ACS presidents I have met, she is articulate and bright and exactly the sort of person one would want to represent ACS to the public.

I hope that all of us members will do our part to help her carry out these worthy initiatives.

From the ACS Press Room

The art — and science — behind treasured Japanese porcelain

Controlling the Color of Lead-Free Red Overglaze Enamels and a Process for Preparing High-Quality Red Paints
ACS Applied Materials & Interfaces

Porcelain connoisseurs have prized the traditional Japanese-style ceramics called akae, typically known for Kakiemon-style ware, for centuries. Its paintings feature a vivid red color against a milky white background. Artisans have passed on their techniques to produce this type of porcelain for generations, but these methods are poorly documented. Now scientists report in the journal *ACS Applied Materials & Interfaces* a practical method for preparing red paints for high-quality akae.

Since the early 17th century, master potters have honed their techniques for creating akae ceramics by trial and error, and then passed on their methods to their apprentices. The quality of the resulting porcelain varies, however. In a search for a more reliable way to make superior akae, a few studies have probed the underlying structure that makes the best red ceramics. But they didn't clarify the essential coloring mechanism. Hideki Hashimoto and colleagues wanted to gain a deeper understanding of what makes the most distinctive akae.

The researchers experimented with different methods for making red coloring

Scientists have come up with a simple way to produce the high-quality red color in prized Japanese porcelain.
Credit: American Chemical Society

with hematite and a lead-free glass frit, a ground material used to make glazes and glass. They found that the sizes of hematite particles and of the frit powder played an important role in color quality. Based on their results, the researchers developed a simple process for preparing red paints for creating exceptional akae. It involves mixing hematite, frit powder and a solvent three times with a mortar and pestle, instruments commonly used by porcelain artisans. Because the method is simple, the researchers say today's potters could easily adopt it.

The authors acknowledge funding from Japan's Ministry of Education, Culture, Sports, Science and Technology and the Kazuchika Okura Memorial Foundation.

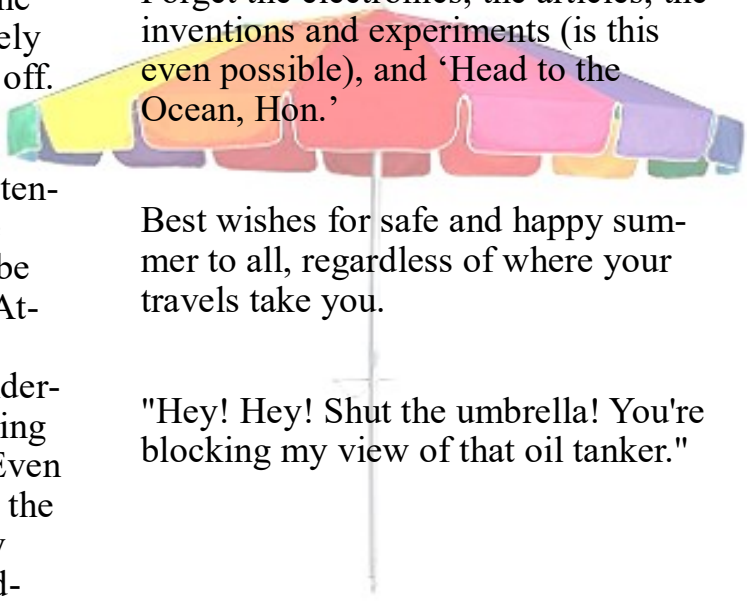
...And Another Thing…

by Denise L. Merkle, PhD

Embark on a drive from the DFW Metroplex and, if traffic doesn't get you, six hours later Surfside Beach will appear in your windshield. Cross the bridge over the intracoastal waterway, and there, between the Gulf of Mexico and you, is a sleepy little seaside town, with a real beach. Keep driving east (or is it actually south?) and experience sand, sunbathers, the occasional waves, and cottages looking out over the expanse of the Gulf - and framing the oil tankers as they head through the inlet to deliver their cargo to the refineries. As a chemist, and an extremely safety conscious chemist at that, I sit on Surfside Beach and worry about an exothermic catastrophe's effect on tourism - and my skin. As someone who never feels comfortable more than 3 hours from sand and surf, I do not care that the glow in the night sky is not a lovely moon, but gas overpressure burn off.

The gulf is fine, even with the potential energy lurking just across the marshes, but the Atlantic should be everybody's favorite ocean. The Atlantic, though a wild and moon-controlled expanse of aquatic wilderness, has never seemed as menacing as the ironically named Pacific. Even when it devours a ship or pounds the coast with hurricanes, it's still my ocean. Surely, anyone from a mid-Atlantic state, especially one that is home to Balmer, has vivid memories of the Summertime Theme: 'Headed to the ocean, Hon.' Even if one isn't a Hon, Headed to the Beach is the only way to enjoy the summer. Or the winter. Fall? Spring? Same. Head to the Ocean.

What is the point of all this, you may ask? Perhaps it's that the summertime haunts of childhood are adulthood's lures. Perhaps the sand one meets as a baby becomes the destination of choice, many years after sand-eating days have passed. Mountain streams call people who grew up fly fishing, the sun and the sand call me. Beach towels, sunblock (healthier living through chemistry), dive boats, and coolers of sandwiches and lemonade. Forget the electronics, the articles, the inventions and experiments (is this even possible), and 'Head to the Ocean, Hon.'



Best wishes for safe and happy summer to all, regardless of where your travels take you.

"Hey! Hey! Shut the umbrella! You're blocking my view of that oil tanker."

Around the Area

UT-Arlington

Drs. Alejandro Bugarin and **Robin Macaluso** have received $10,000 REP grants that run from June 1, 2016 to Aug. 31, 2017. Dr. Bugarin has recently returned from giving seminars at three Mexican universities.

Dr. Kevin Schug, Shimadzu Distinguished Professor of Analytical Chemistry, has recently been named as a Fellow of the UT System Academy of Distinguished Teachers.

The San Diego ACS Symposium on "The Posthumous Nobel Prize in Chemistry. Correcting the Errors and Oversights of the Nobel Prize Committee" organized by **Dr. E. Thomas Strom** was the subject of a two and one page feature in the April 11, 2016, issue of *Chemical and Engineering News*. This symposium will be the subject of an ACS Symposium Book with Dr. Strom and **Dr. Vera Mainz** of the University of Illinois the co-editors.

Science Dean **Dr. Morteza Khaledi** and graduate student **Nathaniel Weisner** have developed a new green system for organic synthesis using 80-90% water with fluoro alcohol.

Award winners from chemistry in the recent ACES (Annual Celebration of Excellence by Students) presentations were graduate students **Jonathan Thacker, Emmanuel Varona Torres,** and **Evelyn Wang** and undergraduate student **Jamie Schenk.** Graduate student **Atreyi Dasmahapatra** and undergraduate student **Caitlynn Reeves** received honorable mentions. **Jessica McCammon** has been selected as a McNair Summer Scholar.

UTD

The Department of Chemistry and Biochemistry congratulates Associate Professor **Mihaela Stefan** (Semiconducting Block Copolymers Capable of Actuated Changes of Opto-Electronic Properties) and Professor **Ken Balkus, Jr.** (Zeolite Encapsulated Metal Complexes) for being awarded with Research Grants by the Robert A. Welch Foundation.

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From the ACS Press Room

Recyclable, sugar-derived foam — a renewable alternative?

Chemically Recyclable Biobased Polyurethanes
ACS Macro Letters

Polyurethanes in products from cushy sofas to stretchy spandex have made sitting, sleeping and walking more comfortable. But once they have served their purpose, most of the non-degradable materials pile up in landfills. Now scientists report in the journal *ACS Macro Letters* a potential way to reduce future waste: a chemically recyclable foam made using a new sugar-derived material.

Cushion foam and other products made from polyurethanes could get a "green" makeover.

Credit: ULTRA F/Digital Vision/Thinkstock

Polyurethanes are highly versatile materials. In addition to furniture and clothing, manufactures use them in electronics, cars, floors and medical devices. But the materials come from petroleum, and efforts to recycle them are limited. To tackle the huge amount of waste this creates, scientists are pursuing more sustainable options. Marc A. Hillmyer and colleagues developed an efficient method to make a sugar-derived rubbery polyester compound called poly(β-methyl-δ-valerolactone), or PMVL, that can be used in new chemically-recyclable polyurethanes.

Using this new polymer, the researchers made flexible polyurethane foams that were comparable in performance to commercial analogs. To test whether the foams could be recycled, the team first added a catalyst, then heated the materials to a high temperature. Through this process, the researchers recovered up to 97 percent of the starting β-methyl-δ-valerolactone (MVL) monomer in high purity. The researchers then used what they recovered to remake PMVL with essentially identical properties.

The authors acknowledge funding from the National Science Foundation-supported Center for Sustainable Polymers and the University of Minnesota Graduate School.

Ed Biehl Receives SMU Faculty Career Achievement Award


Ed Biehl, award recipient

"Professor Biehl's noteworthy contributions to teaching, scholarship and service are numerous throughout his career at SMU," said Provost Steven C. Currall, Vice President for Academic Affairs. "His leadership, mentoring and research have provided the essential foundation for SMU's Chemistry Department today, and its current success is in no small part due to his skill and management. Dr. Biehl has provided inspiration for other academic departments at SMU and we are grateful for his exemplary leadership."

Biehl was honored at a reception on Thursday, April 28.

The annual SMU Faculty Career Achievement Award, established in 2015, recognizes remarkable contributions across the scope of a career by a current tenured SMU faculty member.

Biehl joined the SMU Department of Chemistry in 1962 and was among the first to establish an active research program. He became Chair in 1981 and remained at that post for what might be an unprecedented 27 years.

In the past 50 years, Biehl has taught many chemistry classes, including first-year chemistry, organic chemistry, chemistry for non-majors, advanced organic chemistry, qualitative organic analysis, organic mechanisms and environmental chemistry.

His active, innovative research program in synthetic organic chemistry has resulted in contributions of more than 275 publications in international scientific journals. He has received more than nine patents.

Biehl's work in the areas of benzyne chemistry and microwave synthesis has earned him an international reputation for his expertise.

His research group was the first to carry out a successful benzyne-click reaction using microwave heating and to synthesize a nitrobenzyne intermediate.

Selection of the Faculty Achievement Award is done by a committee appointed annually by the Provost, consisting of the Director of the Center for Teaching Excellence, the Dean of Graduate Studies, a current or former Faculty Senate President, one Ford Fellowship recipient, and one Altshuler Teaching Fellowship recipient.

In 2015, James K. Hopkins, professor emeritus of history, was the inaugural recipient of the award.

From the ACS Press Room

Creating a reduced-fat chocolate that melts in your mouth

Isothermal Crystallization Behavior of Cocoa Butter at 17°C and 20°C With and Without Limonene
Journal of Agricultural and Food Chemistry

Chocolate is divinely delicious, mouth-wateringly smooth and unfortunately full of fat. But reducing the fat content of the confection makes it harder and less likely to melt in your mouth. That's why scientists are investigating additives that could reinstate chocolate's delightful properties in these lower-fat treats. Now, researchers report in ACS' *Journal of Agricultural and Food Chemistry* an analysis that sheds light on how adding limonene could improve lower-fat versions' texture and ability to melt.

Flavor and sweetness make strong contributions to the pleasant experience of eating chocolate, but so do look and feel. Reducing the fat in chocolate, however, often ruins its texture and viscosity. Previous research has shown that adding limonene – a compound found in lemons and oranges – results in a smoother, softer chocolate that melts more easily than typical reduced-fat chocolates. Annelien Rigolle and colleagues at KU Leuven in Belgium sought to investigate exactly how limonene impacts chocolate production. They focused on one part of this process: the crystallization of one of its main ingredients, cocoa butter, which undergoes several important transformations at different times and temperatures.

The researchers examined crystallization at 63 °F and 68 °F using differential scanning calorimetry and X-ray diffraction to examine cocoa butter profiles when limonene was added. Surprisingly, they found that adding the compound accelerated cocoa butter crystallization at 63 °F, but inhibited cocoa butter crystallization at 68 °F. Varied concentrations of limonene also affected the crystallization steps of the cocoa butter differently, so they could ultimately affect the texture of chocolate. The study suggests that carefully choosing the amount of limonene and the temperature at which chocolate is processed could lead to a smoother, more luxurious reduced-fat chocolate.

The researchers acknowledge funding from the Fund for Scientific Research-Flanders, Belgium.

FIVE QUESTIONS FOR…

Hope Shimabuku, Regional Director of the Texas Regional office of USPTO

Our 5Q Lite interviewee for this ultimate issue of the 2015-2016 school year is Hope Shimabuku, J.D., Regional Director of the Texas Regional Office of the United States Patent and Trademark Office (USPTO, opened Fall 2015). Ms. Shimabuku holds a B.S. in Mechanical Engineering from the University of Texas at Austin and is a 2005 *cum laude* graduate of Southern Methodist University's Dedman School of Law.

"The USPTO is the federal agency responsible for granting U.S. patents and registering trademarks, and I am responsible for leading the Texas regional office and carrying out the strategic direction of the Under Secretary of Commerce for Intellectual Property and Director of the USPTO."

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

I cannot remember a time when I was not interested in some aspect of science. I grew up by NASA – Johnson Space Center, and a lot of my friends' parents were scientists, computer scientists, engineers, or astronauts working for NASA or NASA contractors or suppliers. My dad was a mechanical engineer working in the oil and gas industry; and my mom (pre-kids) was a computer programmer working for NASA. The influence of science was always around me. So, the question was never when I realized I wanted to be a scientist, but always what kind of scientist did I want to become. I ultimately graduated from the University of Texas at Austin with an undergraduate degree in Mechanical Engineering.

2. What one aspect of your career do you most enjoy? And which component of your career do you most dislike?

Having the opportunity to meet and work with all the wonderful, talented, innovative, and intelligent people, students, and teachers at work, in the schools/universities, and in the business community – each motivated to move the ball forward in the innovation ecosystem.

Like many working moms and spouses, I struggle with balancing the demands of my career and being a good mom and wife. It is important for me to spend quality time in each role, and when I am in that role, I need to dedicate my full attention and time to it.

3. In addition to your stellar career in patent law, you focus significant energy on promoting diversity. Is there a particular action you feel would make diversification more rapid? If so, what do you suggest everyone do?

Significant change will take time, but I think that each person can make a small

impact every day by bringing in others who are different from themselves – whether it is inviting a co-worker to have lunch or coffee with you, including an individual in a discussion or project which they otherwise would not have the opportunity to be a part of, working on cultural events celebrating diversity, or mentoring (formally or informally) another diverse individual, we can all make a difference in increasing the value and awareness of diversity.

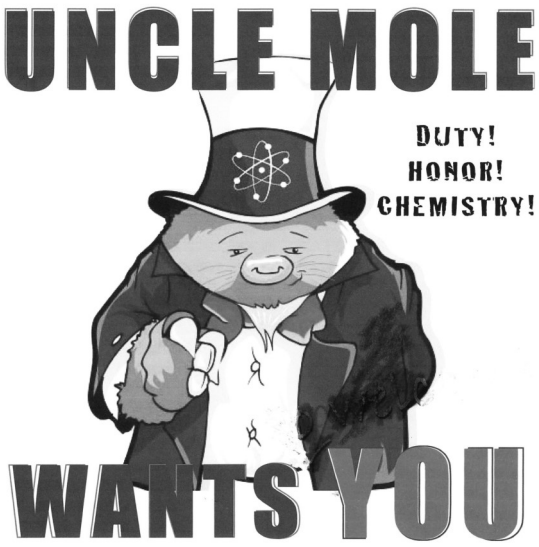
4. As Director of the newly opened Texas Regional United States Patent and Trademark Office (USPTO), what is your vision for the office?

My vision is for the Texas Regional Office to be the beacon of innovation for the region – serving, promoting, and amplifying innovative programs and outreach activities that are beneficial to the community, increasing awareness for the need and value of intellectual property, and breaking down the barriers and improving the overall quality of the patent and trademark system for which our office is responsible.

5. The ubiquitous 5th Question must be: Who is your science hero? And why?

Sally Ride - She was the first American female in space, and one of my dreams is to travel to space and gaze upon the Earth.

Thank you, Ms. Shimabuku, for sharing your insights with Retort readers! We wish you great success in the Texas Regional Office of the USPTO.



to send your articles, news items, and opinion pieces to the Southwest RETORT!

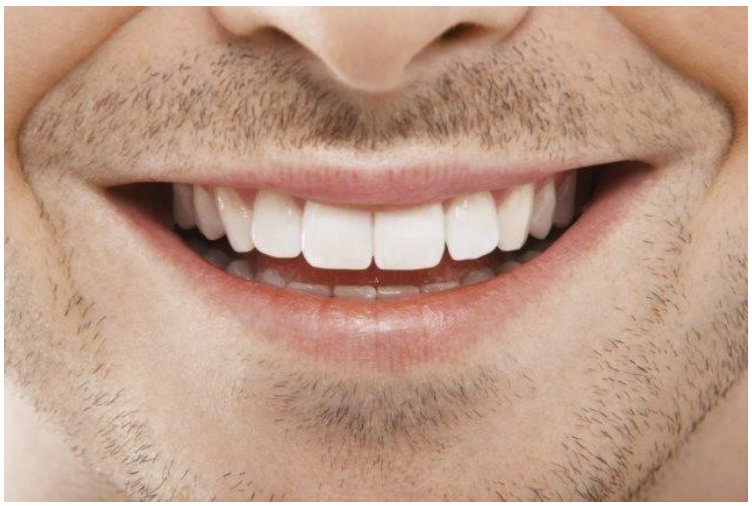
To volunteer to be interviewed for 5Q Lite, e-mail to retort@acsdfw.org or dmerkle@sciconsult.com.

From the ACS Press Room

Searching for signs of disease in spit

The Individual Human Metabolic Phenotype Analyzed by 1H-NMR of Saliva Samples
Journal of Proteome Research

Testing for health conditions usually involves needles, X-rays and other invasive or uncomfortable measures. To make diagnostics less burdensome for patients, scientists are developing alternatives, looking for disease markers in urine — and even spit. Now a study, appearing in ACS' *Journal of Proteome Research*, demonstrates for the first time that individuals may have saliva "fingerprints." The finding suggests that identifying changes in these baseline fingerprints could someday be a reliable way to detect disease.



Diagnosing diseases could get simpler using patients' unique spit "signatures."

Credit: IPGGutenbergUKLtd/iStock/Thinkstock

In the search for non-invasive and less stress-inducing ways to detect disease, much effort has focused on urine testing. Individuals' urine samples have specific metabolic signatures that can become altered when a person develops a health problem. But compounds in urine can also vary depending on factors such as diet and environment. Saliva has similar potential as an easy-to-access fluid that changes in response to health conditions, but could be less affected by diet and the environment. Paola Turano, Kurt Zatloukal and colleagues wanted to investigate how reliable this route might be.

The researchers sampled saliva and urine from 23 healthy volunteers multiple times a day over 10 days. The molecular signatures of saliva and urine were distinct and consistent for each participant. But profiles from spit samples changed less due to dietary variations than those from urine. Although longer-term research would be needed, this initial work on saliva fingerprints suggests that they could be useful in searching for signs of disease, say the researchers.

The authors acknowledge support from Ente Cassa di Risparmio di Firenze, the Christian Doppler Laboratory for Biospecimen and Biobanking Technologies and the Fondazione Veronesi.

From the editor

This month we have featured Tom Strom's thirteenth interview with an ACS president-elect; thank you, Tom, for that continuing insight into the mechanics of the ACS. Congratulations to Ed Biehl on his career achievement award from SMU.

My two favorite articles this month are the use of saliva as a diagnostic fluid and —what else? — reduced fat chocolate. Using spit (or urine) means ***no needles***; I hope that research in this area is on-going and active.

Reduced fat chocolate...well, that speaks for itself.

Well, it's the end of the sixty-eighth year of the Southwest Retort.; the call for articles and news will go out about September 1. Go get yourself some reduced fat chocolate and have a good summer.