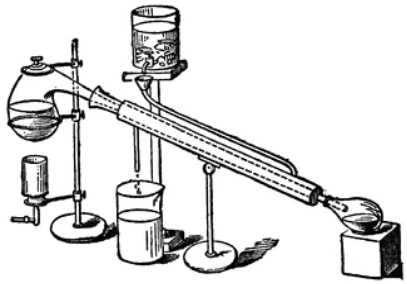
SOUTHWEST RETORT



SIXTY-NINTH YEAR **APRIL 2017**

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

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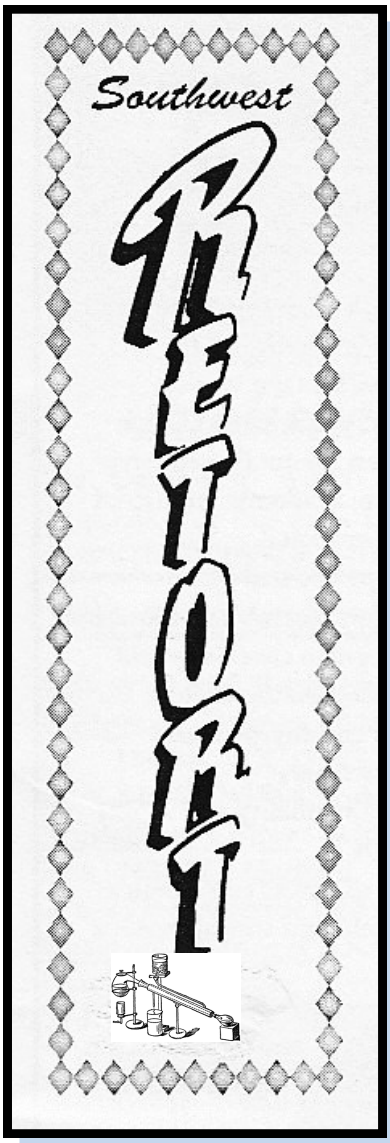

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EMPLOYMENT CLEARING HOUSE

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

POSITIONS AVAILABLE

Quality Manager, GMP Manufacturing
Location: Tianjin, China.
JenKem Technology Co. Ltd. has a current opening for a Quality Manager position for GMP manufacturing of polyethylene glycol polymers in Tianjin, China. The ideal candidate must have:
Excellent communication skills in English and Mandarin (Chinese)
Working knowledge of US GMP ICH Q7A Quality Management systems, preferably acquired in the pharmaceutical industry
Proven leadership skills in a quality management position
Advanced degree in Analytical Chemistry or related field.
Interested candidates should submit a cover letter including salary expectations; and an updated resume at email: hr@jenkemusa.com.

Project Manager, GMP Manufacturing
Location: Beijing or Tianjin
General Manager, GMP Manufacturing Plant
Location: Tianjin
Central point of contact internally and for customers. Maintains positive relationships with customers.
Daily responsibilities including leading customer conference calls, providing project updates, coordination of information flow, coordination of resources, resolution of issues between customer and JenKem Technology, writing project reports, and tracking project deliverables, scope, costs and schedules.
Provide leadership to facilitate problem solving and decision making. Recommend solutions for addressing project related problems.
Maintain direct involvement with other departments within JenKem Technology to help develop specifications, provide information required for analytical methods, contribute information for GMP related documentation such as investigations, batch records and reports and translate contract requirements for JenKem Technology departments.
Advanced degree in Chemistry, Chemical Engineering, or a scientific related field of study. Knowledge of organic, polymer and analytical chemistry.
Previous working knowledge of cGMP manufacturing in the US or Europe, preferably polymer-related or pharmaceutical manufacturing.
Outstanding demonstrated interpersonal skills in English and Mandarin (Chinese) a must (both written and oral)
Proven aptitude for project management tools. Proficiency using project management tools to oversee all elements of project lifecycle including scheduling/planning, meeting coordination, tracking of costs and deliverables, reporting to stakeholders, and risk mitigation. Project Management Certification a plus.
Computer and software skills including MS Office Suite programs, Internet, email systems required.
Proven multi-tasking skills able to handle multiple projects simultaneously within a GMP environment; ability to motivate teams, work within aggressive timelines collaboratively with cross-functional departments
Demonstrated ability to work as a strong contributor in a team environment on complex projects.
Required skills include strong communication, leadership, decision-making, organizational and analytical skills. A candidate must be able to maintain customer focus, handle difficult discussions, build consensus, work independently and prioritize multiple tasks and adjust quickly, as needed. The ideal candidate must be willing to pursue tasks that may be required for projects but are not clearly defined within this job description.
Detail-oriented, dependable, motivated, ability to work with minimal supervision.
Interested candidates should submit a cover letter including salary expectations; and an updated resume at email: hr@jenkemusa.com.

hr@jenkemusa.com.

SERVICES and ANNOUNCEMENTS

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

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FIFTY YEARS AGO IN THE SOUTHWEST RETORT

The ACS April tour speaker is **Prof. Wesley W. Wendlandt** of the University of Houston. His talks will be from one of the following two lectures, "Reflectance Spectroscopy: A Neglected Spectroscopic Technique" or "Thermal Matrix Reactions of Coordination Compounds."

At the University of Texas, Welch Professor **Michael J. S. Dewar** reports the addition of the six following postdoctoral fellows to his group: **Dr. Colin Baird** from McGill University, **Dr. Franklin Davis** from Syracuse, **Dr. Josef Michl** from the University of Houston, **Dr. Thomas Squires** from the University of Florida, **Dr. Cliff Venier** from Oregon State, and **Dr. R. Sustmann** from Universitat Munchen. **Dr. Paul Schleyer** from Princeton visited UT to give a series of three seminars. **Dr. Alan H. Cowley** recently received a $45,000 Welch grant to study "The Structures and Chemical Behavior of Novel Non-Metal Compounds." He recently gave seminars at Ohio State and Texas A&M. **Dr. A. J. Bard** gave an invited paper in Tokyo at the meeting of CITCE.

In Dallas-Fort Worth, Texas Woman's University will offer three short, two-week courses over the summer designed for teachers and industrial personnel. The courses will be offered in: "Neutron Activation Analysis"; "Mass Spectrometry;" and "Gas-Liquid Chromatography"; At SMU **Dr. Bright A. Lowry** has joined the faculty. Welch grants have recently been awarded to faculty members **Dr. Edward Biehl** and **Dr. John Maguire**. **Dr. Ralph Shriner** has been appointed to the Sigma Xi National Lectureship Committee for 1967 and has also been named Vice-President Elect for Section C (Chemistry) of AAAS. **Dr. Charles T. Kenner** has been appointed Science Advisor to the Dallas District Laboratories of the Food and Drug Administration. At UT-Arlington **Dr. Milan Schara** from the Nuclear Institute of Ljubljana, Yugoslavia, has become a postdoctoral Fellow with Dean of Science **Dr. Peter Girardot**.

At Rice University **Dr. John L. Margrave** has been named Chemistry Department Chairman succeeding **Dr. E. S. Lewis**. At the University of Houston **Dr. G. G. Meisels** has received an NSF grant to study "Ion-Molecule Reactions." **Dr. Albert Zlatkis** was Chairman of the 4th International Symposium on Advances in Gas Chromatography held in New York April 3-6.

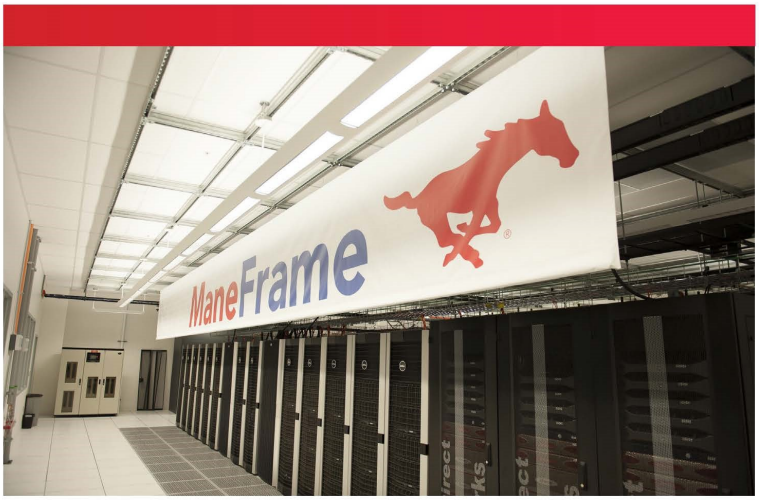
Dr. Henry Shine from Texas Tech recently gave a seminar on ESR Spectroscopy at New Mexico Highlands University. In the Ark-La-Tex ACS Section, Texarkana College dedicated its new chemistry building on Oct. 6.

Compiled by E. Thomas Strom

SMU

Department of Chemistry

smu.edu/chemistry



Introducing the Ph.D. in Theoretical and Computational Chemistry at SMU

Southern Methodist University in Dallas, Texas is proud to announce a brand-new Ph.D. degree program in Theoretical and Computational Chemistry (TCC). This is a direct bachelors-to-Ph.D. program, the first dedicated TCC doctoral program.

Each Ph.D. student receives a comprehensive stipend of $25,000 and a full tuition waiver, as well as susbtantial health insurance support and travel allowance to national conferences.

Outstanding candidates are also eligible for fellowships providing additional support beyond that stipend.

Course topics include molecular modeling and computer assisted drug design; training in QM/MM methods; Hartree-Fock Theory; Density Functional Theory; Electron Correlation Methods; Statistical Thermodynamics; and much more!

Want to learn more? Check out smu.edu/CATCO or contact dcremer@smu.edu or ekraka@smu.edu.

Why come to SMU?

- Experience a unique tailor-made educational program with discipline-specific curriculum and state-of-the-art courses
- Participate in a vivid research program stretching from software development and coding to simulation of homogeneous and enzyme catalysis, and everything in between.
- Acquire the necessary skills for a successful career in academia or industry
- Master computational tools to carry out world-class research in a high-performance computer environment
- Receive individual mentorship from a close community
- Utilize SMU's High Performance Computing Center ("ManeFrame")

From the ACS Press Room

Plant-made virus shells could deliver drugs directly to cancer cells

Structure-Based Engineering of a Recombinant Plant-Made Virus-Like Nanoparticle for Targeted Cargo Delivery
ACS Nano

Viruses are extremely efficient at targeting and delivering cargo to cells. In the journal *ACS Nano*, researchers report they have harnessed this well-honed ability — minus the part that makes us sick — to develop virus-like nanoparticles to deliver drugs straight to affected cells. In lab tests, they show that one such particle can be produced in plants and it ferries small molecules to cancer cells.

For this work, Frank Sainsbury and colleagues copied the core protein shell of the Bluetongue virus, a pathogen that affects ruminant animals. Previous research has shown that the capsid is stable, has a large cavity for small molecules or proteins to pack into, and is easy to produce with high purity. The researchers wanted to try making the virus-shell nanoparticles using plants. This is an increasingly popular approach to producing pharmaceuticals as it minimizes possible contamination by human pathogens, which plants don't carry. But first they needed to understand the structure of the shells.

Using single particle cryo-electron microscopy, the team showed for the first time that the recombinant shell nanoparticles produced by plants were different from the natural virus capsid. With the nanoparticles' detailed structure in hand, the researchers then genetically and chemically engineered them to their specifications, and loaded proteins and small molecules inside the shells. Lab testing showed that the plant-made virus particles, which naturally bind to receptors on cancer cells, were taken in by human breast cancer cells. The findings suggest the nanoparticles can potentially be used for the targeted delivery of drugs.

The authors acknowledge funding from the Australian Research Council, the U.K. Biotechnological and Biological Sciences Research Council and the John Innes Foundation.

Dallas-Fort Worth Section of the American Chemical Society

50th Annual Meeting-in-Miniature

Saturday, April 29

All graduate and undergraduate students are invited to submit abstracts for a 10-12 minute oral presentation, allowing 3-5 minutes for questions. Email your ACS-style abstract to b.janesko@tcu.edu with the subject line "Meeting in Miniature Abstract Submission" by Friday, March 31.

REQUIRED ABSTRACT DETAILS:

- Title of presentation
- Underline presenting author and put * next to advisor
- List department and university
- Division (analytical, biochemistry, inorganic, organic, physical etc.)
- Email address of presenting author
- Category (undergraduate or graduate)
- Paragraph to include motivation, methods, results, conclusions (no more than 200 words)

Program Details

Department of Chemistry & Biochemistry
Texas Christian University

8 - 8:30	Check-in
8:30 - 10	1st Session presentations
10 - 10:15	Morning break
10:15 - 11:45	2nd Session Presenations
11: 45 - 1: 15	Lunch
1:15 - 3:30	3rd Session presentations
3:30 - 4:30	Tours and Reception
4:30	Awards Ceremony

Multiple awards will be given to top presentations for each session.
Registration is free. Register here: http://ow.ly/opp430863rx

TCU COLLEGE OF SCIENCE & ENGINEERING

And Another Thing...

By Denise Merkle, PhD

It's well-known that those who join organizations to pursue their interests and who then take on responsibilities for governance in the organizations very often wind up with no time to actually pursue those interests. And so it's been for me. As a board member for a local community garden, my photosynthetic activities have morphed into the nurturing of electronic communications and planting the seeds of volunteerism. Computer cultivation at its finest. Glancing over a garden plot and noticing that something in it is leafy and green is not the same thing as actually gardening, as I very recently found. To my chagrin, what appeared to be robust, if bolted, broccoli was really a substrate for scale insects[1] and squash bugs (actually, I think they were stinkbugs,[2] but ... Eeek!). Not a good situation - a board member of the garden aiding and abetting a pest farm. My healthy plants - weren't. What to do? What to do? Given that the garden is all-organic aka No Synthetic Pesticides Allowed, the best way to prevent infestation is vigilance. Daily vigilance and removal of pests is best, but a weekly assessment is crucial. Daily. Weekly. Right. So. Next Best. What's next best? Selecting the least environmentally toxic, naturally derived pesticide and making sure the devilish little insects have met it personally is the next line of defense - and therein is the issue. Wherever healthy soil and ecofriendly methods exist, so too exist beneficial insects. Closer inspection of my bug buffet revealed that the area was also teeming with ladybugs and ladybug larvae - obviously the pests were the equivalent of neon signs at the all-you-can-eat restaurant. Butterflies flitted around the plot, and birds hovered nearby, waiting for the stunned gardener to move away and let them back at the insect-laden feast.

Even green insecticides kill indiscriminately. Drenches for squash bugs or fire ants are also deadly for ladybugs and earthworms. Research Science rules the world, but Ecosystems rule the garden. Perturbation of one part of the ecosystem has both positive and negative effects on the interrelationships of the system,[3] and the Law of Unintended Consequences constantly affects us all - even ladybugs. Manual de-bugging ensued. Removing the plants and physically squashing the squash bugs was onerous and not at all pleasant, but the specificity of the insect removal process allowed many a beneficial bug to live to consume another aphid. Whether or not the beneficials will recover from the physical removal of their food source, I cannot know. It is easier to predict my chances of surviving other gardeners' attentions after the stinkbug farm was shut down: *Much* higher than before the pests were sent to the big bolted broccoli in the sky.

What is the point of all this, you may ask? The point is, Assess, Think,

And Another Thing *cont.*

Think, Act! Without careful observation, there's no possibility of understanding. And without understanding, appropriate action is impossible. If I hadn't really looked (albeit belatedly) at the infested plot, I'd have treated the pests with an eco-friendly but widespread product - and the destruction of the beneficial insects might never have been recognized...stealth collateral damage, but no less catastrophic for being unnoticed. If I hadn't learned, years ago, that ladybug larvae[4] look like little dragons, future generations of ladybugs in my community garden plot would not have the remotest chance at existence. As it was, Going Really Green required work (and was pretty oogie, to tell the truth), but the overall benefit should be worth the effort - and the time. Assess, Think, Think, Act - and keep an eye on your broccoli.

This conversation actually happened in the garden last year:

Gardener, gesturing to a ladybug larva: Have you seen Juvenile Ladybugs?

Friend of a Gardener, who was photographing his buddy: Are they a band?

Gardener, startled: Uh. No. They're *insects*.

1) https://www.planetnatural.com/pest-problem-solver/houseplant-pests/scale-control/

2) https://www.planetnatural.com/pest-problem-solver/garden-pests/stink-bugs/

3) http://www.nature.com/scitable/knowledge/library/trophic-cascades-across-diverse-plant-ecosystems-80060347 (trophic cascades)

4) http://www.ladybuglady.com/ladybugweb9.htm

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SATURDAY • MAY 20, 2017
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From the ACS Press Room

Nanoparticle fertilizer could contribute to new 'green revolution'

Urea-Hydroxyapatite Nanohybrids for Slow Release of Nitrogen
ACS Nano

The "Green Revolution" of the '60s and '70s has been credited with helping to feed billions around the world, with fertilizers being one of the key drivers spurring the agricultural boom. But in developing countries, the cost of fertilizer remains relatively high and can limit food production. Now researchers report in the journal *ACS Nano* a simple way to make a benign, more efficient fertilizer that could contribute to a second food revolution.

Farmers often use urea, a rich source of nitrogen, as fertilizer. Its flaw, however, is that it breaks down quickly in wet soil and forms ammonia. The ammonia is washed away, creating a major environmental issue as it leads to eutrophication of water ways and ultimately enters the atmosphere as nitrogen dioxide, the main greenhouse gas associated with agriculture. This fast decomposition also limits the amount of nitrogen that can get absorbed by crop roots and requires farmers to apply more fertilizer to boost production. However, in low-income regions where populations continue to grow and the food supply is unstable, the cost of fertilizer can hinder additional applications and cripple crop yields.

Nilwala Kottegoda, Veranja Karunaratne, Gehan Amaratunga and colleagues wanted to find a way to slow the breakdown of urea and make one application of fertilizer last longer.

To do this, the researchers developed a simple and scalable method for coating hydroxyapatite (HA) nanoparticles with urea molecules. HA is a mineral found in human and animal tissues and is considered to be environmentally friendly. In water, the hybridization of the HA nanoparticles and urea slowly released nitrogen, 12 times slower than urea by itself. Initial field tests on rice farms showed that the HA-urea nanohybrid lowered the need for fertilizer by one-half. The researchers say their development could help contribute to a new green revolution to help feed the world's continuously growing population and also improve the environmental sustainability of agriculture.

The authors acknowledge funding from Hayleys Agriculture Holdings Limited and Nagarjuna Fertilizers and Chemicals Limited.

Call for Volunteers: Summer Experience in Antibiotic Discovery and Development (SEADD)

What is SEADD?

An advanced summer program covering the broad range of careers and experimental techniques involved in pharmaceutical development from lead compound discovery to FDA approval and commercialization. As part of the first ever Summer Experience in Antibiotic Discovery and Development (SEADD) led by The Shoulders of Giants, twenty high school girls will delve into sixty hours of hands-on curriculum with a focus on the chemistry, biochemistry, molecular biology, and microbiology involved in discovering new antibiotics.

Presented by

THE SHOULDERS OF GIANTS

Sponsored by

girl scouts of northeast texas

What do we need?

We are looking for two types of volunteers, **teaching assistants** and **speakers**. Teaching assistants are students of any level or professionals with experience in organic synthesis, computational chemistry, bacterial cell culture, PCR, or gel electrophoresis. Teaching assistants can volunteer for the duration of the program or on a part-time basis in morning (9am - 12pm) or afternoon (1pm - 4pm) shifts. Speakers are experienced industry professionals or professors who feel like they could give an hour long talk on *any* topic in drug discovery or development, including but not limited to, high throughput screening, natural product synthesis, rational drug design, SAR, clinical testing, drug formulation, and process chemistry.

Who are we?

The Shoulders of Giants (TSoG), a 501(c)(3), provides a 4,000 sq. ft. science and engineering teaching lab in northeast Dallas for passionate individuals, faculty, staff, and volunteers to innovate in the world of education. TSoG offers a year-round high school mentorship program which provides rigorous, supplementary courses in science in engineering. TSoG also presents outreach events throughout the year, bringing TSoG programming to students outside of our facility and across the metroplex.

Program held at Camp Whispering Cedars
6010 Whispering Cedars Drive, Dallas, TX 75236

This is a two day a week, five-week program that will be held Tuesdays and Thursdays between June 13th to July 20th, with no programs held during the week of July 4th. Class day schedule is 9am – 4pm with an hour break for lunch.

For more information on SEADD, as well as other STEM outreach volunteer opportunities with TSoG, please contact Mandy Dark at The Shoulders of Giants
682-552-0649 or email mandydark@tsogiants.org

Around the Area

University of Arkansas

University Honors Faculty Inventors

The University of Arkansas and Chancellor Joe Steinmetz honored 14 faculty inventors Tuesday, Feb. 28, at the fifth-annual Inventor Appreciation Banquet. The event, held at the Innovation Center at the Arkansas Research and Technology Park and hosted by Technology Ventures — the U of A's technology licensing office — recognized the work of U of A inventors who received issued patents or filed invention disclosures in the past 12 months.

Five of the 14 faculty getting recognition were from the Department of Chemistry and Biochemistry! Our own **Suresh Kumar, Susanne Striegler, Jingyi Chen, Feng Wang**, and **Ryan Tian** all filed patent disclosures. The only other department with this many honorees was our cousins in Chemical Engineering.

In his remarks, Chancellor Steinmetz said, "Some of our greatest ambassadors — as a university, as a state, and as a country — are scientists … who have no greater agenda than to share what they know and be of service. There is no shortage of examples of our faculty contributing to the greater welfare of Arkansas, not just to meet the requirements of their faculty appointment or our overarching land-grant responsibilities, but out of a genuine desire to use their knowledge to improve the condition of humankind in whatever way they can."

Faculty News

On the Go

Chen, J.; Crane, C.C.; Zong, G.; Shi, W. Catalytically-Active Plasmonic Copper Nanostructures. 2017 MRS Spring Meeting, Phoenix, AZ; poster (April 17-21).

Cameron, C.C.; Wang, F.; Chen, J. Enhancing the Stability and Localized Plasmon Resonance of Cu Nanostructures with Thin Silica Shells 2017 MRS Spring Meeting, Phoenix, AZ; oral (April 17-21).

Chen, J.; Jenkins, S.V.; Meeker, D.; Smeltzer, M.S. Engineering Gold Nanoconstructs for Photoactivatable Controlled Release of Antibiotics, 2017 MRS Spring Meeting, Phoenix, AZ; poster (April 17-21).

Chen, J. Introduction of galvanic replacement reactions at the nanoscale to undergraduate students: Synthesis of hollow metal nanostructures, 2017 ACS Spring Meeting, San Francisco, CA (April 2-6, invited talk).

Chen, J. Seeded growth of catalytically active copper-based nanostructures, 2017 ACS Spring Meeting, San Francisco, CA (April 2-6, invited talk).

O. Matsushita, K. Uchida, H. Sekiguchi, T. Mima, K. Gotoh, Y. Yamamo-

Around the Area

to, K. Yokota, M. Takaso, **Ryan Bauer, Joshua Sakon**. Structural analysis of a matrix anchor in bacterial collagenase to develop an osteogenic therapeutic. The 90th Annual Meeting of Japanese Society for Bacteriology, Sendai International Center, Sendai, Japan, March 19-21, 2017.

Jingyi Chen is organizing the symposium ED14: Molecular and Colloidal Plasmonics: Synthesis and Applications, at the 2017 MRS Spring Meeting, April 17-21, 2017 in Phoenix, AZ.

The 61st Biophysical Society Annual Meeting took place February 11-15 in New Orleans, LA. The following 5 posters were presented: **Fahmida Afrose, Denise V. Greathouse, Roger E. Koeppe, II**. Influence of paired histidine residues on transmembrane helix orientation and dynamics.

Kelsey Knobbe, Venkatesan Rajagopalan, Ashley N. Martfeld, Denise V. Greathouse, Roger E. Koeppe, II. Solid-state NMR investigations of transmembrane helix interactions.

Karli A. Lipinski, Ashley N. Martfeld, Denise V. Greathouse, Roger E. Koeppe, II. Response of GWALP23 transmembrane peptides to incorporation of specific pairs of buried charged arginine residues.

Matthew J. McKay, Ashley N. Martfeld, Anna A. De Angelis, Stanley J. Opella, Denise V. Greathouse, Roger E. Koeppe, II. Interfacial tryptophan residues govern transmembrane helix dynamics.

Amanda Paz Herrera, **Fahmida Afrose, Denise V. Greathouse, Roger E. Koeppe, II**. Detection of helix fraying in transmembrane helices with interfacial histidine residues.

Publications

Qinglei Gan and **Chenguang Fan**. Increasing the Fidelity of Non- canonical Amino Acid Incorporation in Cell-Free Protein Synthesis. *Biochimica et Biophysica Acta*. doi: 10.1016/ j.bbagen.2016.12.002.

Cameron, C.C.; Wang, F.; Li, J.; Tao, J.; Zhu, Y.; **Chen, J.** Synthesis of Copper-Silica Core-Shell Nanostructures with Sharp and Stable Localized Surface Plasmon Resonance, *J. Phys. Chem. C* 2017, accepted.

Choudhury, D.; Lackner, J.; Fleming, R.A.; Goss, J.; **Chen, J.**; Zou, M. Diamond-like Coating with Zirconium-containing Interlayers for Orthopedic Implants, *J. Mech. Behav. Biomed. Mater.* 2017, 68, 51-61.

US Patent Issued Feb 28, 2017- Delivery of Therapeutic Agents by a Collagen Binding Protein. Patent number: US 9,579,273. Inventors are T. Ponnapakkam, L. Philominathan, R. Katikaneni, T.

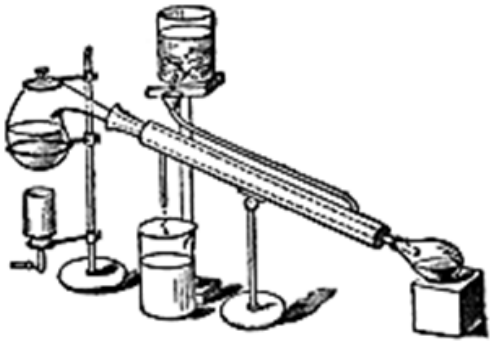
Around the Area

Koide, O. Matsushita, R. Gensure, N. Nishi, and **J. Sakon**.

Two Provisional Patents were filed: Collagen-Binding Agent Compositions and Methods of using Same. Assigned number 62/457,410. Filed Feb 10, 2017. Inventors are **R. Bauer, K. Janowska,** K. Tanaka, R. Roeser, O. Matsushita, and K. Uchida. The second one is: Cleavage Resistant Photoluminescent Proteins and Applications Thereof. Coinventors are David S. McNabb, Bob Beitle, Jr., **Joshua Sakon**, Rudra Palash Mukherjee, and **Suresh Thallapuranam**. Filed March 2, 2017.

UT-Arlington

The Department of Chemistry & Biochemistry recently received *two* teaching honors! The President's Award for Excellence in Teaching for Tenured Faculty this year was given to **Dr. Frank Foss**, while the President's Award for Excellence in Teaching for Untenured Faculty was given to **Dr. Junha Jeon**.



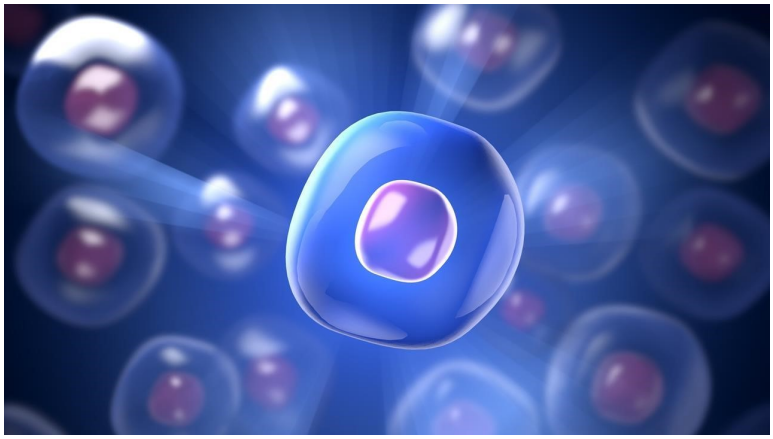
Send your seminar schedules for the semester or the year to the Southwest RETORT!

retort@acsdfw.org

From the ACS Press Room

Passing the chemical Turing test: Making artificial and real cells talk

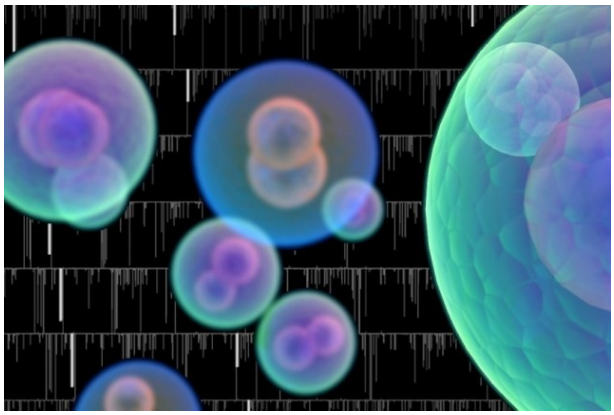
Two-Way Chemical Communication between Artificial and Natural Cells
ACS Central Science



The classic Turing test evaluates a machine's ability to mimic human behavior and intelligence. To pass, a computer must fool the tester into thinking it is human—typically through the use of questions and answers. But single-celled organisms can't communicate with words. So this week in *ACS Central Science*, researchers demonstrate that certain artificial cells can pass a basic laboratory Turing test by "talking" chemically with living bacterial cells.

Sheref S. Mansy and colleagues proposed that artificial life would need to have the ability to interact seamlessly with real cells, and this could be evaluated in much the same way as a computer's artificial intelligence is assessed. To demonstrate their concept, the researchers constructed nano-scale lipid vessels capable of "listening" to chemicals that bacteria give off. The artificial cells showed that they "heard" the natural cells by turning on genes that made them glow. These artificial cells could communicate with a variety of bacterial species, including *V. fischeri*, *E. coli* and *P. aeruginosa*. The authors note that more work must be done, however, because only one of these species engaged in a full cycle of listening and speaking in which the artificial cells sensed the molecules coming from the bacteria, and the bacteria could perceive the chemical signal sent in return.

The authors acknowledge funding from the Simons Foundation, the Armenise-Harvard Foundation, the National Science Foundation and the Province of Trento.



From the editor

We are fast approaching the end of our RETORT season, since we run on an academic year. April is still a busy month, though; we have the Meeting-in-Miniature on April 29, and we should have some news from the Olympiad committee soon.

My favorite press release this month is the talking cells—nanoscale lipid vesicles which "listen" to bacterial cells "talking." The vesicles detect the chemical signals emitted by the bacterial cells. The chemical nature of communication has always fascinated me. When teaching, I have often asked classes to name one thing that is not chemical in nature. Memory is a molecule; nerve transmission (and all that it implies) is a molecule...and so on. I always say that the only non-chemical thing I can think of is ***time***—and if that is a construct, then nothing is non-chemical.