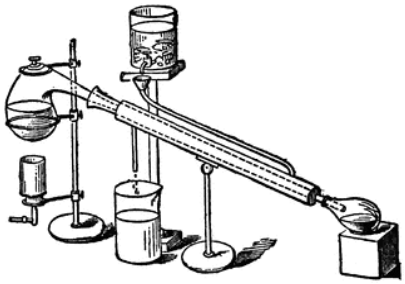
SOUTHWEST RETORT



SEVENTY-FIRST YEAR **NOVEMBER 2018**

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. 71(3) NOVEMBER 2018

Editorial and Business Offices: ***Contact the Editor for subscription and advertisement information.***
Editor: Connie Hendrickson: retort@acsdfw.org

Copy Editor: Mike Vance: vance2276@gmail.com

Business Manager: Martin Pomerantz: pomerantz@uta.edu

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.

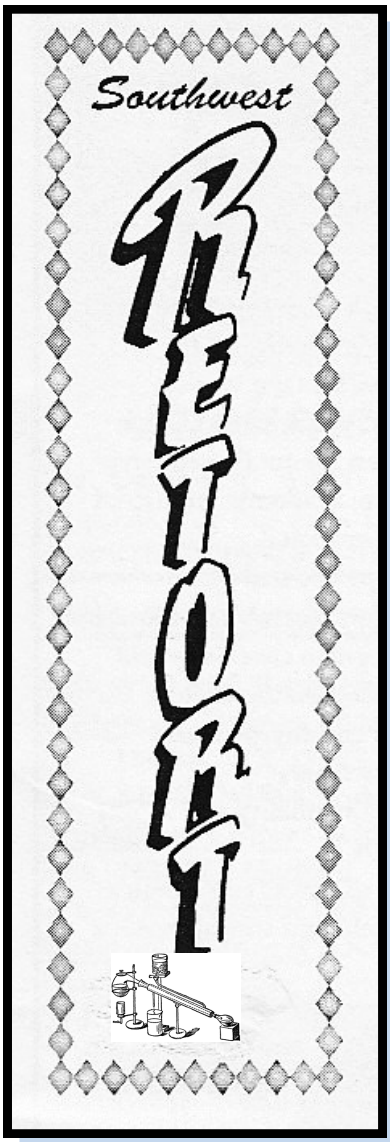


TABLE OF CONTENTS

Employment Clearing House
UTPB Position Available…….13
Fifty Years Ago…….....5

ARTICLES and COLUMNS

And Another Thing……....7
Around the Area……...…..….13
Letter from the Editor…..…..…….....17

NEWS SHORTS

Blue roses…….…….…….…..8
Wood sponge soaks oil from water…...….9
Dry-hopping beer making…….....11
Brain-eating amoebae treatment…...…...15
Moss as chemical sensors……...……16

ANNOUNCEMENTS and MEETINGS

FWLSC January meeting……..10
Call for Candidates……...……12, 14

INDEX OF ADVERTISERS

Huffman Laboratories……...….....3
Vance Editing…..…….…….....3
ANA-LAB……...…….…..4

Contact the DFW Section

General: info@acsdfw.org
Education: ncw@acsdfw.org
Elections: candidates@acsdfw.org
Facebook: DFWACS
Twitter: acsdfw

SERVICES and ANNOUNCEMENTS

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

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

408-786-7451

ANA-LAB CORP.®

THE COMPLETE SERVICE LAB

Quality Analytical & Environmental Services Since 1965

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 though 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: northtex@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

ACIL Seal of Excellence Program

BBB ACCREDITED BUSINESS

ACCREDITED

nelap T104704201

FIFTY YEARS AGO IN THE SOUTHWEST RETORT

An outstanding program is being put together for the ACS Southwest Regional Meeting to be held Dec. 4-6 in Austin. More than 300 papers will be presented in technical sessions plus symposia in eleven separate areas. The banquet speaker will be Sir Gilbert Peake, world famous science journalist.

New ACS Local Section! A new section to be called the Heart O' Texas section was authorized at the Atlantic City ACS meeting. The new section is being formed from the present Texas A&M-Baylor section and will be headquartered in Waco. The territory will comprise McLennan and Falls counties. The original section name will revert to Texas A&M Section, its original title.

The Chemistry Section of the American Association for the Advancement of Science will meet in Dallas Dec. 26-31. The program will consist of ten lectures on selected topics of special interest. Chairs of the various symposia are William B. Smith from TCU, Jack K. Jeans from the University of Dallas, and Peter R. Girardot from UT-Arlington.

Tour speakers for November are Professor Keith E. Chave, Department of Oceanography at the University of Hawaii and Dr. L. B. Rogers of Purdue University. Their respective lecture titles are "Chemical Reactions and the Composition of Seawater" and "Computers in the Laboratory."

In the Dallas-Ft. Worth ACS Section, from TCU Dr. William H. Watson, while on sabbatical leave last summer, presented seminars at Cambridge, Oxford, Sheffield, East Anglia, Essex, Southampton, Imperial College, and Copenhagen. Dr. M. G. Reinecke presented a talk last summer at the Gordon Research Conference on "Chemistry of Heterocyclic Compound." Dr. William B. Smith was named a fellow in the American Institute of Chemists.

Norman E. Foster, recent chair of the DFW ACS section, has just retired from his 32 years with the Food and Drug Administration. He starts a new career teaching at the Southwestern State College of Pharmacy in Weatherford, OK.

At Mobil Field Research Lab, Drs.Peggy M. Dunlap, James C. Melrose, Herman C. Custard and E. Thomas Strom attended the fall meeting of ACS in Atlantic City, NJ. Dr. Strom also gave a recent seminar at Trinity University.

At the University of Arkansas, Dr. Arthur Fry recently attended the Carbanion Symposium at the University of Kentucky.
At Texas A&M Drs. Karl A. Gingerich, Bernard L Shapiro, Thor L. Smith, and Minoru Tsutsui have recently joined the faculty as professors of chemistry.

contributed by
E. Thomas Strom

ACS Local Section
Dallas-Fort Worth

Officers and Councilors

Chair 2018
Kirby Drake: kirby.drake@klemchuk.com

Chair-Elect 2018
Dr. Denise Merkle: dmerkle@sciconsult.com

Past Chair 2018
Dr. Katie Walker: erinkatewalker@gmail.com

Secretary (2018-2019)
Mandy Dark: mandydark@tsogiant.sorg
Treasurer (2017-2018)
Dr. Martin Pomerantz: pomerantz@uta.edu

EXECUTIVE COMMITTEE
Councilor (2018-2020)
Dr. Mary Anderson: meanders38111@yahoo.com

Councilor (2017-2019)
Dr. Linda Schultz: schultz@tarleton.edu

Councilor (2016-2018)
Dr. E. Thomas Strom: tomstrom@juno.com

Councilor (2016-2018)
Dr. Jason McAfee: jason.mcafee@gmail.com

Alternate Councilor (2018-2020)
Dr. Ed Donnay: donnay.edward@mcm.edu

Alternate Councilor (2017-2019)
Daniela Hutanu: daniela.hutanu@gmail.com

Alternate Councilor (2016-2018)
Dr.StephanieTaylor: stephaniem.taylor@utdallas.edu

Alternate Councilor (2016-2018)
Dr. John Mcilroy: john.mcilroy@gmail.com

#ACSDFW

We TWEET
and
we're on facebook
https://www.facebook.com/DFWACS/

Follow Us - so you don't miss a thing!

"TWITTER, TWEET, RETWEET and

the Twitter logo are trademarks of Twitter, Inc.

or its affiliates."

And Another Thing...

NoDaddy

By Denise L. Merkle, PhD

One of the bonuses inherent in contributing to a Newsletter such as the Southwest Retort is the freedom to observe the world and select topics that interest the writer, if not the Readers. It's inspirational to research and relate advancements in chemistry, innovative medical procedures, unexpected discoveries, and elegant experiments. The thrill of sharing information that might not be readily available to others is also significant, as is the enjoyment of polling colleagues about their reactions to various situations they might not normally encounter. Another positive aspect of columns like 'And Another Thing...' is the idea of And Another Thing, which, as is suspected by those who have seen a Saturday Night Live episode or two, is a corollary of, It's Always Somethin'.

And so, this November 2018 article, which has reached the editor after the deadline (many apologies, Dr. Hendrickson), is firmly entrenched in the dubious joys of Another Thing. This particular Another Thing is e-security. Those who use electronic communications of any kind are fully aware that recent security breaches have caused a rush to enhancements for anything - and everything- online. Not only is what seems like 50-factor authentication important in protecting our assets, we have TMing codes, e-mailing codes, selecting pictures of dogs, shop windows, or annoyed people, sending confirmation hardcopy letters about changes that were made to an account, and, my recent favorite, blocking all e-mails from a particular sender, even if the sender is replying to an e-mail sent from the blocking institution's servers.

We are safe, safe, safe. Or we would be, if company representatives didn't actually call out of the blue and say, 'Your account has a security problem. Give me your PIN'. Hmmm. I believe this company's idea of security and mine may vary. Also preventing unauthorized use of handy services like car insurance is the helpful, 'We can only send the code to the person on file', whose name is, of course, spelled wrong in the database and is, at the time of immediate need, on an 85 hour flight to China. Secure, too, is the carefully protected credit card account that requires 5 different proofs to allow legitimate purchases but can simultaneously be used to buy multiple tickets for unknown persons to travel on an obscure airline based in Nairobi.

How safe are we, I wonder? Will we ever know who hacks into our credit cards, mortgages, insurance companies' files, self-driving cars, and Robot Butlers? At what point will be able to, um, chat, with those who are flying all over other continents on tickets purchased on Discover cards that are not theirs? What will we say to those hackers when we meet them? I believe that's yet Another Thing.

From the ACS Press Room

Blue roses could be coming soon to a garden near you

Cloning and Expression of a Nonribosomal Peptide Synthetase to Generate Blue Rose

ACS Synthetic Biology

For centuries, gardeners have attempted to breed blue roses with no success. But now, thanks to modern biotechnology, the elusive blue rose may finally be attainable. Researchers have found a way to express pigment-producing enzymes from bacteria in the petals of a white rose, tinting the flowers blue. They report their results in ACS *Synthetic Biology.*

Although blue roses do not exist in nature, florists can produce blue-hued flowers by placing cut roses in dye. Also, in a painstaking 20-year effort, biotechnologists made a "blue rose" through a combination of genetic engineering and selective breeding. However, the rose is more mauve-colored than blue. Yihua Chen, Yan Zhang and colleagues wanted to develop a simple process that could produce a true-blue rose.

For this purpose, the researchers chose two bacterial enzymes that together can convert L-glutamine, a common constituent of rose petals, into the blue pigment indigoidine. The team engineered a strain of Agrobacterium tumefaciens that contains the two pigment-producing genes, which originate from a different species of bacteria. A. tumefaciens is often used in plant biotechnology because the bacteria readily inserts foreign DNA into plant genomes. When the researchers injected the engineered bacteria into a white rose petal, the bacteria transferred the pigment-producing genes to the rose genome, and a blue color spread from the injection site. Although the color is short-lived and spotty, the team states that the rose produced in this study is the world's first engineered blue rose. They say that the next step is to engineer roses that produce the two enzymes themselves, without the need for injections.

The authors acknowledge funding from the National Natural Science Foundation of China, the National Key Research and Development Program of China and the Foreign Young Talent Program.

Note from Wikipedia: A blue rose is a flower of the genus Rosa that presents blue-to-violet pigmentation instead of the more common red, white, or yellow. Blue roses are often portrayed in literature and art as symbols of love, prosperity, or immortality. However, because of genetic limitations, they do not exist in nature.

From the ACS Press Room

Wood sponge soaks up oil from water

Highly Compressible Wood Sponges with a Spring-like Lamellar Structure as Effective and Reusable Oil Absorbents

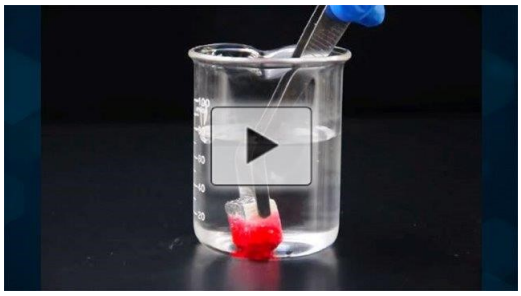
ACS Nano

Oil spills and industrial discharge can contaminate water with greasy substances. Although it's true that oil and water don't mix, separating and recovering each component can still be challenging. Now, researchers have created sponges made from wood that selectively absorb oil, and then can be squeezed out and used again. They report their results in ACS Nano. A video of the sponges in action is here.

Over the years, scientists have developed numerous techniques to clean up oily water, from gravity separation to burning to bioremediation. But many of these methods suffer from limitations, such as low efficiency, secondary pollution and high cost. More recently, researchers have explored 3D porous materials, such as aerogels or sponges, based on various building blocks including synthetic polymers, silica or cellulose nanofibers. However, these are often difficult to fabricate, lack mechanical robustness or are made from nonrenewable, nondegradable materials. Xiaoqing Wang and colleagues wanted to develop a sponge made from wood — a renewable resource — that would absorb oil and tolerate repeated squeezing without structural failure.

The team made the wood sponge by treating natural balsa wood with chemicals that removed lignin and hemicellulose, leaving behind a cellulose skeleton. They then modified this highly porous structure with a hydrophobic coating that attracted oil, but not water. When placed in a mixture of water and silicone oil, the wood sponge removed all of the red-dyed oil, leaving clean water behind. Depending on the oil tested, the sponge absorbed 16¬ to 41 times its own weight, which is comparable to or better than many other reported absorbents. In addition, the sponge could endure at least 10 cycles of absorption and squeezing. The researchers incorporated the wood sponge into an oil-collecting device in the lab that continuously separated oils from the water surface.

The authors acknowledge funding from the National Key Research and Development Program of China and the National Natural Science Foundation of China.



https://youtu.be/3JqiSrMflN4

Stay Tuned!

FWLSC's
Next Formal Program
is planned for
January 2019
'So, You Want to Be a Consultant?'

Next Social Event
Holiday Drop-In
5p - 9p Thurs, Dec. 13th
@ 1723 5th Ave 76110
more details soon
rsvp to info@fwlsc.org

Fort Worth Life Sciences Coalition

From the ACS Press Room

'Hoppy' beer without exploding bottles and too much alcohol

Evidence of Dextrin Hydrolyzing Enzymes in Cascade Hops (Humulus lupulus)

Journal of Agricultural and Food Chemistry

The forgotten art of "dry-hopping" beer to enhance flavor is back in vogue. But this practice sometimes has undesirable side effects, such as an unexpectedly high alcohol content and high pressures that could cause beer bottles to break. Now, research published in ACS' *Journal of Agricultural and Food Chemistry* explains the biochemical basis of these unintended consequences, which could help brewers create "hoppy" beverages without the quality-control and safety issues.

During beer production, grain is mashed and steeped in hot water to convert starch into sugars. The liquid extract is then boiled with hop flowers to impart bitter flavor and a pleasant aroma and to limit bacterial contamination. Yeast is then added to ferment the sugars into alcohol. In dry-hopping, hops are added during or after the fermentation stage, meaning the resulting beer is less bitter. Although hops were previously thought to be inert ingredients, recent evidence suggests they contain biologically active compounds that restart the fermentation process and alter the final composition of beer. Thomas Shellhammer and Kaylyn Kirkpatrick wanted to identify the source of these changes.

The researchers dry-hopped a commercial beer and showed this boosted its carbon dioxide (CO2) and alcohol content, while lowering its carbohydrate content. They found that the activity of starch-degrading enzymes associated with hops — including amyloglucosidase, α-amylase, β-amylase and dextrinase — altered the composition of carbohydrates in the beer, shifting the balance to more fermentable sugars and thus increasing the alcohol content. The scientists also found that the amount of hops used, the duration and temperature of the process, and whether yeast was present affected the results. They say that brewers could use their findings to better control beer quality and safety when producing this trendy beverage.

The research was supported by the U.S. Department of Agriculture's National Institute of Food and Agriculture.

The ACS DFW Local Section Needs You!

Interested in becoming more involved in the Local Section?

Becoming involved in leadership is just the way to do so!

We are looking for nominees for Chair-Elect (3-year term), Treasurer (2-year term), Councilor (3-year term), and Alternate Councilor (3-year term). Terms for newly elected officers will begin on January 1, 2019.

Descriptions of each position and duties may be found at

http://dfw.sites.acs.org/officerduties.htm.

To run for office, please submit a 1/3-page biography, single-space typed to Amanda Dark, the Secretary of the DFW Section at **mailto:amanda.m.dark@gmail.com**.

Deadline to run is November 1, 2018.

Questions about positions? Contact Chair Kirby Drake at **mailto:kirby.drake@klemchuk.com**.

Around-the-Area

UTA

Dr. **Saiful Chowdhury** has been promoted to Associate Professor with tenure. Dr. Chowdhury joined the Arlington faculty in 2012 after receiving a Ph.D. in analytical chemistry from Washington State University. His research involves the use of mass spectrometry in proteome investigations.

Welch Professor Armstrong Honored.
Dr. **Daniel W. Armstrong** was recently presented with the Dow WesTEC 2018 Award for Distinguished External Leadership in Science and Technology. Dr. Armstrong received the award on Oct. 18 at Dow's annual Western Canada Operations Technical Excellence Conference in Fort Saskatchewan, Alberta, Canada. This award was created in 2010 and recognizes an individual outside of Dow that the company feels best exemplifies the traits and values associated with its culture. This honor was given in recognition of Armstrong's unwavering commitment to advance various aspects of science, education and research.

Succesful Shale Conference at UTA.
The second "Responsible Shale Energy Extraction Conference" was held at UT-Arlington Oct. 12-13. Conference Co-Chair **Kevin Schug** noted that 180 guests registered for the event, which included poster displays, keynote talks, and panel discussions. The next conference is tentatively scheduled for Mar. 2020.

Positions in Chemistry

UT–Permian Basin

UTPB is accepting applications for the following positions:

Assistant Professor Physical Chemistry, Tenure Track

Assistant Professor Organic Chemistry, Tenure Track

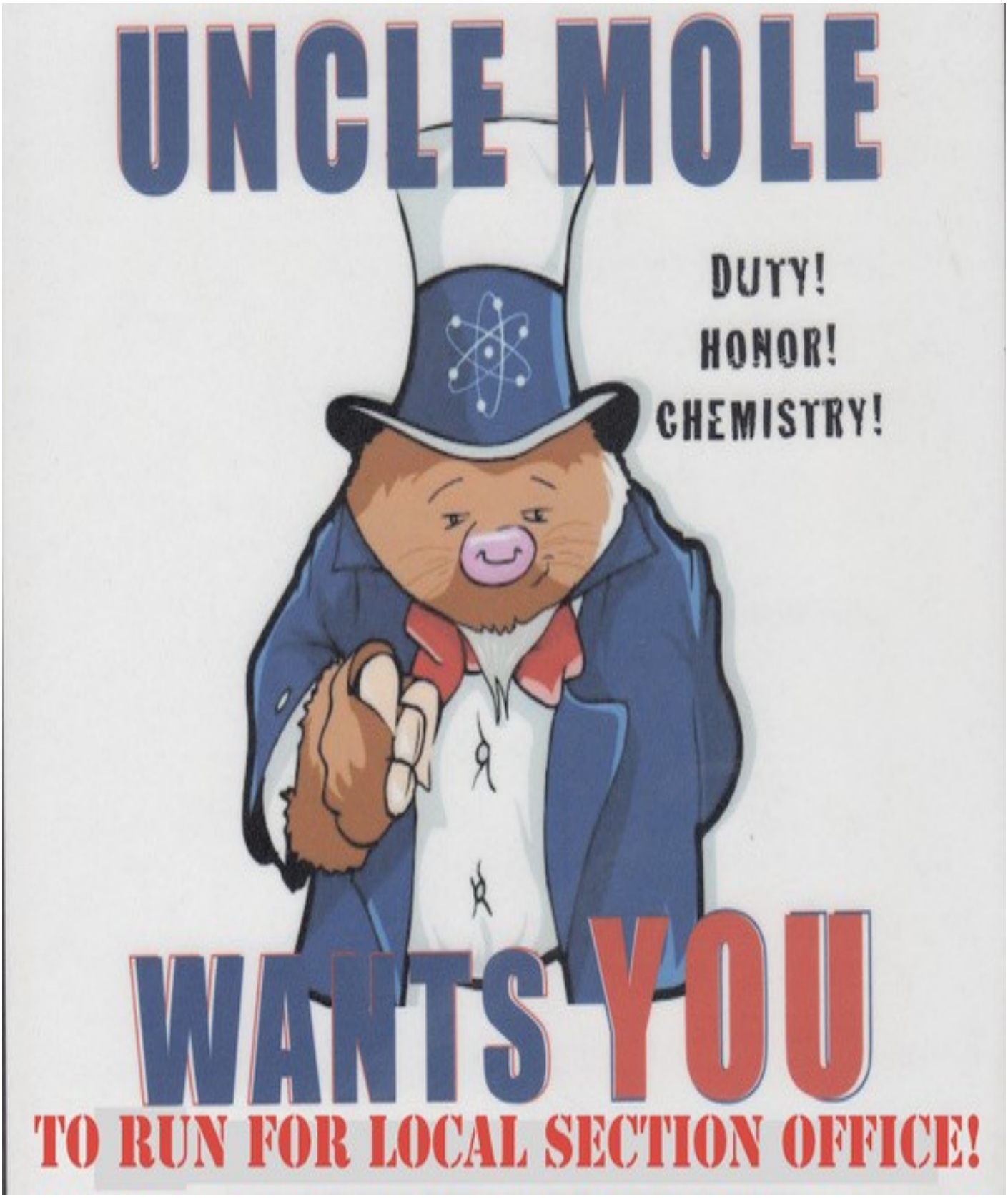
Lecturer, General Chemistry

Requirements and duties are listed in the UTPB faculty job site:

https://www.utpb.edu/services/business-affairs/human-resources/careers/faculty/College%20of%20Arts%20and%20Sciences/index

Applications materials should be directed to: Dr. Milka Montes, Chair of the Physical Sciences Dept.: **montes_m@utpb.edu**.

Candidates should send a letter of application, curriculum vitae— especially including relative teaching experience, very brief information on research interests, and names and contact information for three references.


UNCLE MOLE
DUTY!
HONOR!
CHEMISTRY!
WANTS YOU
TO RUN FOR LOCAL SECTION OFFICE!

From the ACS Press Room

Brain-eating amoebae halted by silver nanoparticles

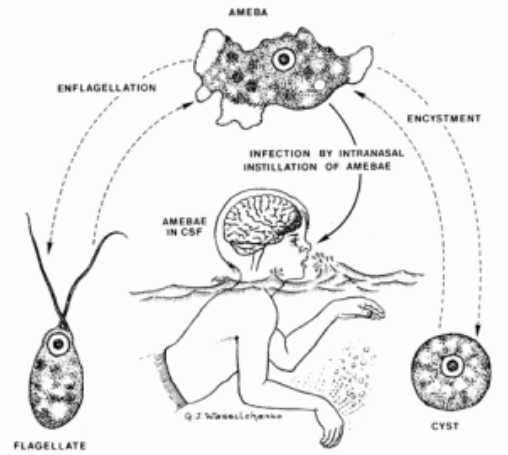
Clinically-Approved Drugs Against CNS Diseases as Potential Therapeutic Agents to Target Brain-Eating Amoebae
ACS Chemical Neuroscience

Halloween is just around the corner, and some people will celebrate by watching scary movies about brain-eating zombies. But even more frightening are real-life parasites that feed on the human brain, and they can be harder to kill than their horror-movie counterparts. Now, researchers have developed silver nanoparticles coated with anti-seizure drugs that can kill brain-eating amoebae while sparing human cells. The researchers report their results in ACS *Chemical Neuroscience.*

Although infections with brain-eating amoebae (*Naegleria fowleri*) are rare, they are almost always deadly. Most cases result from inhaling warm, dirty water in ponds, hot springs or unchlorinated swimming pools. Another species, Acanthamoeba castellanii, can cause blindness by entering the eyes through dirty contact lenses. Common treatments include antimicrobial drugs, but they often cause severe side effects because of the high doses required for them to enter the brain. Ayaz Anwar and colleagues wondered if three anti-seizure drugs — diazepam, phenobarbitone and phenytoin — could kill amoebae, alone or in combination with silver nanoparticles. The drugs are already approved by the U.S. Food and Drug Administration and are known to cross the blood-brain barrier. The researchers reasoned that they might be more effective when attached to silver nanoparticles, which can improve the delivery of some drugs and also have their own antimicrobial effects.

The team chemically attached the drugs to silver nanoparticles and examined their ability to kill amoebae. They found that each of the three drugs alone could kill N. fowleri and A. castellanii, but they worked much better when bound to silver nanoparticles. The drug-nanoparticle combos protected human cells from the microbes, increasing their survival rate compared with untreated infected human cells. The researchers propose that these repurposed drugs, aided by the nanoparticles, might kill amoebae by binding to protein receptors or ion channels on the single-celled organism's membrane.

The authors acknowledge funding from Sunway University in Malaysia.



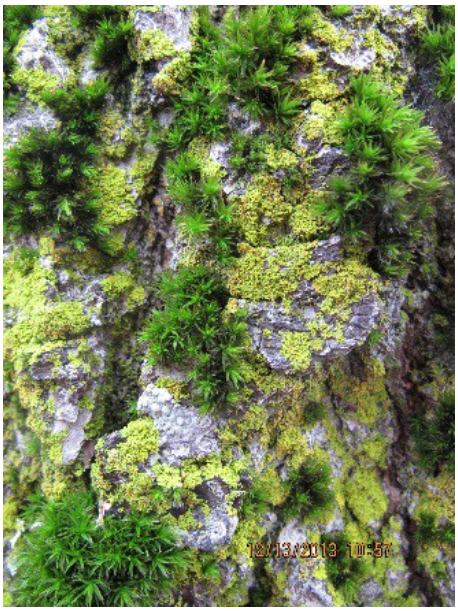
From the ACS Press Room

Moss rapidly detects, tracks air pollutants in real time

Chemical Sensing in Real-time with Plants Using a Webcam

Analytical Chemistry

Moss, one of the world's oldest plants, is surprisingly in tune with the atmosphere around it. Now in a study appearing in ACS' journal *Analytical Chemistry*, scientists report that they have found a simple and inexpensive way to detect air pollutants, specifically sulfur dioxide, in real time based on subtle changes in moss leaves. The discovery could rapidly alert authorities to potentially dangerous alterations in air quality using a sustainable, natural plant sensor.



Plants have evolved the ability to sense light, touch, gravity and chemicals in the air and soil, allowing them to adapt and survive in changing environments. Thus, plants have been used in studies to assess the long-term damage caused by accumulated air pollution worldwide. However, this type of study requires skilled personnel and expensive instrumentation. Xingcai Qin, Nongjian Tao and colleagues wanted to develop an easier way to use moss, a particularly good indicator of sulfur dioxide pollution, as a rapid, real-time sensor.

The researchers gathered wild moss and exposed it to various concentrations of sulfur dioxide in a chamber. Using a highly sensitive, inexpensive webcam, the research team found that moss leaves exposed to sulfur dioxide slightly shrank or curled and changed color from green to yellow. Some of these changes, analyzed with an imaging algorithm, began within 10 seconds of exposure to the pollutant. However, once the sulfur dioxide was removed from the chamber, the moss leaves gradually recovered. This result suggests that the plant, unlike traditional colorimetric sensors, can regenerate its chemical sensing capacity. The researchers conclude that combining remote webcams or drones with moss or other plant-based sensors could lead to cheaper, faster and more precise monitoring of the air for sulfur dioxide and other pollutants over vast regions.

The authors acknowledge funding from the National Natural Science Foundation of China and the Natural Science Foundation of Jiangsu Province.

From the editor

If you go swimming in untreated or dirty water, you probably know not to snort any water up your nose. The brain-eating amoebae *Naegleria fowleri* enters via the nasal mucosa, travels to the brain, and causes brain swelling and inflammation and is usually fatal. However, within the last two years *N. fowleri* has been found in two ***drinking water systems*** in Louisiana, in both the northern and southern parts of the state: Terrebonne Parish [better known as Tee-bown], south of New Orleans, and Ouachita Parish, near Monroe. It's safe to drink but the Louisiana Department of Health advises residents to "avoid letting water go up their nose during showers, prohibit children from being unsupervised while playing with hoses and sprinklers, and to not submerge their head in the bathtub". And this is treated water, not wild water or dirty swimming pools.

https://www.newsweek.com/amoeba-brain-eating-louisiana-water-drink-swim-nose-cdc-977453

https://abcnews.go.com/Health/brain-eating-amoeba-found-louisiana-water-systems/story?id=48372045

On a more cheerful note, how about blue roses? As a small child, every January I sat on my grandfather's or my uncle's lap looking at the new seed and plant catalogs, looking for—you guessed it—blue roses. Every year we ordered rose busheswith blue or black flowers (supposedly). Alas, we never got a good one...as Wikipedia says, blue roses do not occur in nature. Maybe now….

Best regards,
Connie