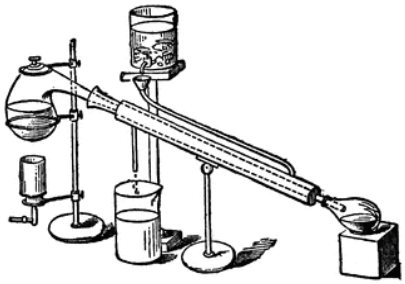
SOUTHWEST RETORT



SEVENTY-FIRST YEAR **APRIL 2019**

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(8) APRIL 2019

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

Copy and Layout Editor: Becky Escher: becky@beckyescher.com

Business Manager: Martha Gilchrist: Martha.Gilchrist@tccd.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

Fifty Years Ago…….....5

ARTICLES and COLUMNS

Around the Area……*will return next month*

Book Review: Chemistry Cartoons……..14

Letter from the Editor…..…..…….....15

NEWS SHORTS

Tissue lost to periodontal disease ……..7

Cryptosporidium parasite .....……..…..8

Parkinson's disease ……..…....,,...10

Solving a hairy forensic problem.,,...…...13

ANNOUNCEMENTS and MEETINGS

Call for nominations……...……...11

Student awards……...12

Meeting-in-Miniature 2019 at UNT …,,,...9

April meeting coming up……..14

INDEX OF ADVERTISERS

Huffman Laboratories…….....3

Vance Editing…..…….…….....3

Becky Escher Design…….….3

ANA-LAB……...…..……....4

FW Opera ……..…..……....6

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

be

BECKY ESCHER DESIGN
MARKETING. DESIGN &
BRAND DEVELOPMENT

BECKY@BECKYESCHER.COM
WWW.BECKYESCHER.COM

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

The ACS tour speakers for April are **Dr. Edward M. Eyring** from the University of Utah and **Dr. Harry P. Burchfield** from the Gulf South Research Institute in New Iberia, LA. Dr. Eyring will speak on one of three topics, "Application of Relaxation Techniques," "Hydrolysis & Polymerization of Aqueous Metal Perchlorates," and "Rapid Reactions of Acid-Base Indicators." Dr. Burchfield's topic is "Biochemical Effects of Pesticides."

UT-Arlington is hosting the second annual Meeting-in-Miniature co-sponsored by the Dallas-Ft.Worth Section of the American Chemical Society. It will be held on the UTA campus on April 25. Papers will be presented in two levels; undergraduate and graduate. An awards presentation banquet will be held at 6:30 p.m. **Dr. Tex Isbell** of Texas A&M will be the speaker at the banquet. At Texas Woman's University, **Chair Dr. Lyman R. Caswell** attended a meeting in Los Angeles to evaluate NSF undergraduate equipment proposals. TWU faculty members **Dr. Norman G. Foster** and **Dr. Murray G. Sturrock** were elected Fellows in the American Institute of Chemists. At TCU **Dr. Clifford Venier** and **Dr. Henry C. Kelly** recently received Welch grants. At. Mobil Field Research Laboratory **Dr. Norman Hackerman**, President of UT-Austin, addressed the Mobil branch of RESA on the topic "Universities-1969."**Drs. Donald E. Woessner** and **Brinkley S. Snowden** attended the 10th Experimental NMR Conference at Mellon Institute on Feb. 27-Mar.1. Dr. Woessner also presented a seminar before the Physics Department at NTSU. **Dr. James E. Cooper** was promoted to Research Associate. Dr. Cooper received his Ph.D. from Rice University working for Edward Lewis. His work at FRL resulted in the first published account of fatty acids isolated from ancient sediments.

Texas Tech University has received a $1,000,000 grant to fund a Welch Chair in the chemistry department. This appointment has been accepted by **Dr. Charles W. Shoppee**. He comes to Lubbock from the University of Sydney. His research interests are with the chemistry of natural products and mechanisms of substitution reactions.

In the Heart o' Texas ACS Section, at Baylor University **Welch Prof. Malcolm Dole** gave an invitational seminar at the National Bureau of Standards in Gaithersburg, MD. Recent seminars at Baylor were given by Dr. Preston W. Reeves of Texas Lutheran College and **Dr. Lewis Sams** of Texas Woman's University.

In the ACS Central Texas Section, UT-Austin **Prof. James E. Boggs** has received a Welch grant to study microwave spectroscopy. **Dr. Allen J. Bard** and graduate student **Keith B. Prater** attended the Gordon Conference in Electrochemistry in January in Santa Barbara, CA. The recent Welch lecture at UT-Austin was given by **Dr. Howard E. Zimmerman** of the University of Wisconsin. His topic was "Recent Organic Photochemistry at Wisconsin."

compiled by
E. Thomas Strom

WORLD PREMIERE
COMPANIONSHIP
BY RACHEL J. PETERS
COMPOSER & LIBRETTIST
FOR TICKETS CALL 817-731-0726
OR VISIT WWW.FWOPERA.ORG
MAY 1, 3, 5
FORT WORTH BOTANIC GARDEN
FORT WORTH
OPERA
American Airlines
THE OFFICIAL AIRLINE OF FORT WORTH OPERA.
Texas Commission on the Arts
ARTS COUNCIL OF FORT WORTH
VISIT FORT WORTH
THE ANDREW W. MELLON FOUNDATION
TOWNEPLACE SUITES MARRIOTT
VIRGINIA HOBBS CHARITABLE TRUST, SIMMONS BANK, TRUSTEE
THE NATIONAL OPERA CENTER

From the ACS Press Room

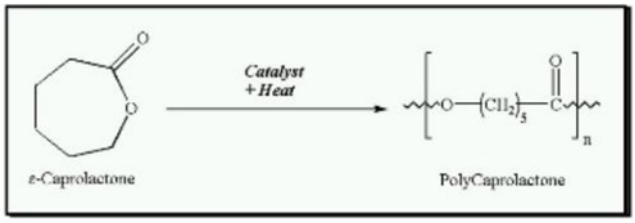
New technique could help regrow tissue lost to periodontal disease

"Hierarchically Patterned Polydopamine–Containing Membranes for Periodontal Tissue Engineering"

ACS Nano

According to the U.S. Centers for Disease Control and Prevention, about half of all Americans will have periodontal disease at some point in their lives. Characterized by inflamed gums and bone loss around teeth, the condition can cause bad breath, toothache, tender gums and, in severe cases, tooth loss. Now, in ACS Nano, researchers report development of a membrane that helps periodontal tissue regenerate when implanted into the gums of rats.

To regrow lost gum tissue and bone, scientists have tried implanting pieces of polymers that form a protected niche near the root of a tooth, recruiting nearby stem cells and helping them differentiate into new gum and bone cells. However, a second surgery is usually required to remove the polymeric membrane, which can get in the way of the healing process. Although researchers have developed biodegradable membranes, these materials don't tend to work as well for re-growing periodontal tissue. Alireza Moshaverinia, Paul Weiss and colleagues wanted to develop a membrane that would enhance periodontal tissue regeneration and then be absorbed by the body when healing was complete.



The researchers made nanofibrous membranes of poly (Ɛ-caprolactone), a biocompatible polymer already approved for medical applications. They then coated the membrane with polydopamine (PDA), a synthetic polymer that mimics the sticky protein that mussels use to attach to wet surfaces. In the lab, dental-derived stem cells adhered to the membrane and differentiated. The PDA coating also attracted calcium and phosphate ions, leading to early bone mineralization. When the researchers implanted the membranes into the gums of rats with periodontal defects, bone at the defect sites regenerated to normal levels within eight weeks. By this time, the membranes had degraded and were absorbed by the rats. Now, the researchers are working on adding other components to the membrane that aid healing and prevent infection.

The authors acknowledge funding from the National Institute of Dental and Craniofacial Research and the University of California, Los Angeles. for alleviating symptoms of depression and anxiety.

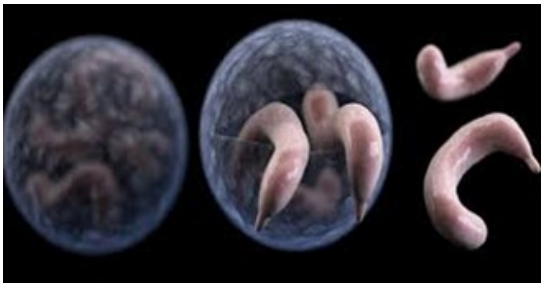
The authors acknowledge funding from the University of California, Davis, the National Institutes of Health and the National Science Foundation.

From the ACS Press Room

Cryptosporidium parasite detected in Minnesota groundwater

"Cryptosporidium Incidence and Surface Water Influence of Groundwater Supplying Public Water Systems in Minnesota, USA"

Environmental Science & Technology



When consumed in contaminated water, the microscopic parasite Cryptosporidium can cause symptoms of stomach cramps, diarrhea and fever. Now, researchers reporting in the ACS journal Environmental Science & Technology have detected evidence of the parasite in about 40 percent of surveyed wells in public water systems in Minnesota—even wells not influenced by surface water. The team emphasizes that they don't know whether the parasite levels are high enough to actually cause health concerns.

Most Cryptosporidium outbreaks associated with drinking water sources have been traced to surface waters such as lakes and rivers that become contaminated by sewage discharge or livestock runoff. In contrast, water from aquifers deep within the ground was not thought to be as vulnerable because the overlying soil and sediments can filter out Cryptosporidium oocysts. The U.S. Environmental Protection Agency requires that public water systems with a surface water source monitor and treat for Cryptosporidium contamination, whereas groundwater is exempt from these regulations unless known to be infiltrated by surface waters. Mark Borchardt and colleagues at the U.S. Department of Agriculture-Agricultural Research Service, U.S. Geological Survey and Minnesota Department of Health wondered if they could detect Cryptosporidium parasites in public water system wells with variable surface water influences.

Over a two-year period, the researchers collected water samples from 145 wells supplying public water systems across the state of Minnesota. They tested for Cryptosporidium DNA with a sensitive technique called quantitative polymerase chain reaction (qPCR). The team found that 40 percent of the wells tested positive for Cryptosporidium at least once, while 15 percent were positive more than once. The standard microscopic method also showed Cryptosporidium in some of the wells. The prevalence and levels of contamination were similar regardless of whether groundwater was influenced by surface water. These results suggest that soil may not completely prevent Cryptosporidium oocysts from reaching groundwater, and therefore, "monitoring and treatment measures should be considered for groundwater-supplied public water systems," the researchers say. The new findings also indicate that additional work is needed to better understand how the Cryptosporidium got into deep groundwater wells and to characterize potential health threats.

The authors acknowledge funding from the Minnesota Clean Water, Land and Legacy Amendment Fund.

ACS Local Section
Dallas-Fort Worth

52nd Annual Meeting-in-Miniature

Saturday, April 27, 2019

We invite and encourage graduate and undergraduate students to submit abstracts for 10-12 minute oral presentations, with an additional 3-5 minutes for questions. Submit your abstract using the link below.
The submission deadline is **April 5, 2019**, although earlier is better.

All presenters and attendees must register no later than **April 5, 2019**, although earlier is better.
Please note that there is NO fee to attend the meeting. Registration is required because lunch will be provided by the Department of Chemistry (at no cost to the attendees), so we need an accurate head-count.

Visit our website to submit your abstract and register for the DFW-ACS Meeting-in-Miniature
https://chemistry.unt.edu/meeting-in-miniature

DEPARTMENT OF CHEMISTRY
College of Science
UNT
EST. 1890

9:00-9:30AM	Check-in
9:30-11AM	Session 1
11:00-11:15AM	Morning break
11:15-12:45PM	Session 2
12:45-1:45PM	Lunch
1:45-3:15PM	Session 3
3:15-4:00PM	Entertainment (TBA)
4:00PM	Awards Ceremony

From the ACS Press Room

Sniffing Out Parkinson Disease

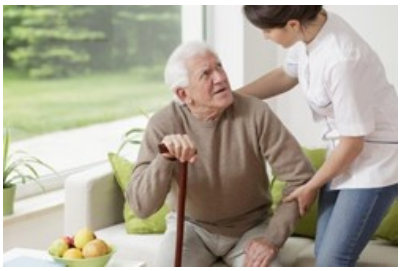
"Discovery of Volatile Biomarkers of Parkinson's Disease from Sebum"

ACS Central Science

Parkinson's disease is a neurodegenerative disorder that leads to progressive brain cell death and extensive loss of motor function. Despite much research being conducted on this disease, there are no definitive diagnostic tests currently available. Now, researchers report the identification of compounds that make up the signature odor of the disease with the help an individual who can detect Parkinson's through smell. They report their findings in ACS Central Science.

Ancient physicians used scent as a diagnostic tool, and although olfactory tests are not common in modern medicine, diseases such as diabetes are often associated with a particular smell. However, there has been little evidence to tie scent to neurodegenerative disorders. Enter Joy Milne, a "Super Smeller" who can distinguish the unique odor of Parkinson's, which she can detect in subjects' sebum before clinical symptoms appear. This waxy, lipid-based biofluid moisturizes and protects the skin, particularly on the forehead and upper back. Excessive production of the substance is a known symptom of Parkinson's disease. So, Perdita Barran and colleagues wanted to determine what chemicals make up the scent in sebum that Milne is picking up on in Parkinson's patients so that they can eventually develop a diagnostic test for the disease.

The researchers collected sebum samples using gauze to swab the upper backs of more than 60 subjects, both with and without Parkinson's. The volatile scent compounds of sebum that could be contributing to a disease-associated smell were extracted and analyzed with mass spectrometry. The data revealed the presence of hippuric acid, eicosane and octadecanal, which indicate the altered levels of neurotransmitters found in Parkinson's patients, along with several other biomarkers for the disease. Milne confirmed the signature musk of Parkinson's when presented with laboratory-prepared samples containing these compounds in a controlled olfactory environment. While the researchers acknowledge the limited scope of this study, they say it opens the door to the development of a non-invasive screening test for Parkinson's, potentially leading to earlier detection.



The authors acknowledge funding from the Michael J. Fox Foundation and Parkinson's UK.

DFW Section

Nominations are invited for awards: Doherty, Schulz, and Chem Ambassador

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

The Schulz Award is given to high school chemistry teachers, who, like the late Dr. Werner Schulz, bring that something extra to the teaching of chemistry. The nominee and/or nominator need not be ACS members. Nominees should show excellence in chemistry teaching as demonstrated by testimonials from students and fellow teachers, results in student competitions, and diligence in updating and expanding scientific/teaching credentials. lectures at a fall meeting of the section.

The Chemistry Ambassador Award is newly instituted by the DFW Section to recognize an outstanding Section member who has made a significant impact via promoting chemistry to the community. The 2019 Chemistry Ambassador of the Year award is based on peer or self-nominations to the selection committee. Submissions should be one page in length and address the community outreach activities either through teaching, service, or working with legislators to affect public policy. Submissions will be evaluated on the impact made, which may include but not limited to how many people were reached, impact on individual people in the community, and exemplary commitment to the promotion of chemistry in the community.

Remember, a continuous flow of nominations is needed to maintain the quality of awards. Each nomination should contain completed nomination form, cover letter highlighting the nominee's accomplishments, and a copy of the CV. One seconding letter may accompany nominations. The nomination package should be sent by email as a single pdf file to Sean O'Brien at **sobrien@ti.com**. Nominations remain active for five years but should be updated annually.

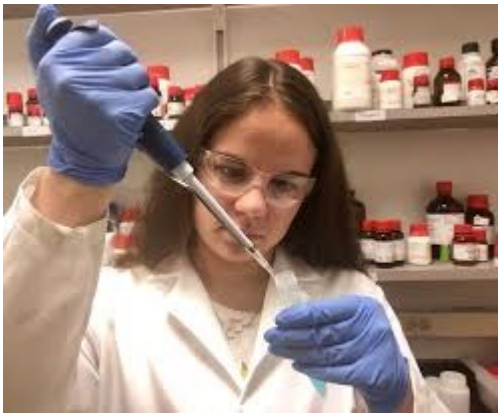
Complete information and nomination forms are available at https://dfw.sites.acs.org/awards.htm Deadline May 15

Outstanding Undergraduate Student Awards

The Dallas-Fort Worth local section is accepting nominations for Outstanding Undergraduate Student Awards. Each chemistry department at a 4 year degree granting institution in the Dallas-Fort Worth local section is allowed to nominate one student for this honor per calendar year. In years where an April Awards banquet is held, students will be recognized at that banquet. The award will include a $100 prize per student.

https://dfw.sites.acs.org/awards.htm

Student Requirements: (updated in 2015)



1) The student must be an undergraduate chemistry ot biochemistry major enrolled in an ACS approved curriculum or its equivalent.

2) The student must be at least a junior with the equivalent of 8 hours of advanced (junior/senior level) chemistry coursework completed (or <4 hours completed and currently enrolled in remaining).

3) Student must have a minimum GPA of 3.0 on a 4.0 scale.

4) The student must be a member of a Chemistry Club, a student member of the ACS, or have presented a paper at a scientific meeting.

To nominate a student, fill out this ***online nomination form*** before Monday May 6. (**https://goo.gl/forms/HUyAuBCbCtu81ux63**)

Please also send an email to **sobrien@ti.com** to confirm the nomination.

From the ACS Press Room

Solving a hairy forensic problem

Hair Analysis: Contamination versus Incorporation from the Circulatory System — Investigations on Single Hair Samples Using Time-of-Flight Secondary Ion Mass Spectrometry and Matrix-Assisted Laser Desorption/Ionization Mass Spectrometry

Analytical Chemistry

For decades, forensic scientists have tested strands of hair to reveal drug use or poisoning. But in recent years, reports have questioned the technique — in particular, its ability to distinguish between the intake of a substance and external contamination of the hair. Now, researchers have reported a new method that appears to do just that in the ACS journal Analytical Chemistry.

When a person ingests a drug or medication, the substance travels through the bloodstream to the roots of their hair, where it becomes incorporated. Because hair grows at a rate of about 0.4 inches per month, researchers can estimate when a drug was taken by analyzing different segments of a strand cut horizontally from root to tip. However, with current methods, it can be difficult to tell whether a person actually ingested a substance or simply handled the drug and transferred it to their hair. Thomas Kraemer, Markus Baumgartner and colleagues wanted to develop a method that could distinguish between contamination and actual incorporation of drugs from the circulatory system.

The researchers analyzed single hairs from volunteers who had taken the sleeping medication zolpidem many times or only once. They found that by splitting the hair lengthwise to expose the entire inner compartment, they greatly increased the sensitivity of zolpidem detection by mass spectrometry compared to current approaches, allowing them to distinguish between ingestion and contamination. The team then developed and assessed a washing protocol that removed most of the contaminating zolpidem from hairs that were soaked in the drug or contaminated with sweat or body oils. Importantly, the washing method preserved drug that was tightly bound inside the hair, the majority of which had been deposited by the circulatory system upon ingestion.

The authors acknowledge funding from the University of Zurich.

Dallas-Fort Worth Section
Of the American Chemical Society

Next local section meeting is in the works!

Stay tuned; details will be posted on the website and emails sent.

ACS
Chemistry for Life®
AMERICAN CHEMICAL SOCIETY

Sidney Harris, the cartoonist of science fame, now has a book out with an all-chemistry collection of his cartoons. His first collection of a single science, the book is available from Amazon. What can we say in a review?—it's hilarious!

Ed. Note: this is my favorite. It has been on my refrigerator for many years.

Copyright credit:ScienceCartoonsPlus.com

From the editor

Important stuff:

Registration for the Meeting-in-Miniature at UNT is closed, but you can still attend, as registration was for lunch head-count.

On page 13 is one of the most important announcements of the year for the Retort. The DFW Section Student Awards. Nominations for the Doherty, Schulz, and Chem Ambassador awards don't close until May 15.

Really important stuff:

Sidney Harris, cartoonist of science, has a book out just on chemistry foibles (page 14). The Southwest Retort received a copy of the book from his agent this month, and the editor spent an hour reading it and laughing her head off. The Louis Pasteur cartoon that I included is my favorite and has been on my refrigerator for many years!

Best regards,
Connie