HONORS AND AWARDS

- Dr. Yehia Mechref has been awarded the Texas Tech University President's Academic Achievement Award for 2019. This award is granted to TTU faculty who exhibit "excellence in achievement across the teaching-research-service missions of the university" as evidenced by "three years of faculty service, recognition by peers in one or more areas, evidence of productive scholarship, and demonstrated competence in the three areas". Dr. Mechref has also been awarded the Nancy J. Bell Graduate Faculty Excellence in Mentoring Award. The Graduate School at Texas Tech University has created this award to recognize those faculty mentors who have gone above and beyond in mentoring graduate students. This award was designed to allow graduate students and/or faculty to nominate Texas Tech University faculty mentors who they believe embody the spirit of a great mentor and have helped them on their educational journey.

- Dr. Michael Mayer, Associate Professor, was awarded the President's Excellence in Teaching Award at the 2019 Faculty Convocation. This award is bestowed upon faculty that have a demonstrated history of excellence in the classroom. The nominations are submitted by the Deans of the various colleges in a letter summarizing the excellent teaching activities of the faculty member. This award represents the highest teaching honor that is bestowed by Texas Tech University.

GRANT AWARDS

- Prof. Anthony Cozzolino has been awarded an NSF CAREER grant titled **"Pnictogen Bonding in Solution: Developing Tools for the Self-assembly of Inverted Bilayer Membranes, Heteromolecular Dyads and Supramolecular Catalysts"**. This award will be funded by the Macromolecular, Supramolecular and Nanochemistry (**MSN**) Program in the Division of Chemistry at $655,710 for 5 years.

- Prof. Yehia Mechref has received a 2nd NIH R01 Award entitled **"Quantitative Characterization of Glycopeptide Isomers"**. This new R01 award is funded at $1,214,360 total cost for 4 years. This is Prof. Mechref's 5th active NIH Grant.

- Prof. Michael Findlater has been notified that his Welch grant **"Base Metal Catalyzed Transformations"** is renewed for an additional 3 years at $195,000. This is his 2nd 3-year renewal.

- Prof. Bill Poirier has been notified that his Welch grant **"New Methodologies for Accurate Quantum Calculations of the Dynamics of Atomic Nuclei"** is renewed for an additional 3 years at $195,000. This is his 7th 3-year renewal.

AWARDS & RECOGNITION BANQUET, APRIL 30, 2019

Congratulations to all our award recipients! A special thank you to all our donors for making these possible!

Chemistry & Biochemistry Undergraduate Scholarship ..... Chan Hyuk Park
Craig Memorial Chemistry Dept. Endowed Scholarship ..... Melody L. Carey, Natalie M. Daniel, Andrea J. Lopez, Irin R. Luke
Gordon & Martha Bellah Endowed Scholarship ..... Jordan L. Chasteen, Cassidy R. Coker, Paula A. Garavito, Caedmon A. Seekins, Jesse A. Smith, Neeti Swami
H.E. Archer Endowed Scholarship ..... Julia E. Kuper, Brandon A. McCormick, Ariana R. Rowan
Hulda W. Marshall Chemistry Endowed Scholarship ..... Hermella T. Andarge, Michael T. Nagel, Jose L. Villeda
Jeanette & Joe Dennis Scholarship ..... Litzy K. Guevara, Kayla N. Henry, Brandon C. Richardson
Jerry L. Mills ACS Student Affiliate Scholarship ..... Merilyn Duarte
Jerry L. Mills Endowed Scholarship ..... Emmy G. Schniederjan
Mae and Doug Allee Endowed Scholarship ..... Febronia G. Khalil
Paul & Alta Cates Endowed Scholarship ..... Brendan C. Blacklock
Richard A. Bartsch Endowed Scholarship ..... Sarah G. Davis, Kaylee D. Morren, Sofia Isabela H. Salazar Miralles
Robert C. Goodwin Memorial Endowed Scholarship ..... Alexiss A. Dennett, Lilian M. Pham, Cheyanna R. Petty, Coltyn M. Wagnon
Chemistry Graduate Student Organization Scholarship ..... Xue Dong, Bhumika Jayee, Nanda Kumar Katakam, Elahe Masoumzadeh, Babak Tahmouresilerd
Ginny Shen Lin Endowed Scholarship *(*Shared Divisional Award)* ..... Reza Amani*, Collin G. Borcik, Bhumika Jayee*, Daniel Loya*, Yangxue Liu*, Chamila Manankandayalage, Jingfu Zhao
Richard Goodin Graduate Research Fellowship ..... Arpita Singh
Song Prize ..... Veronica J. Lyons
Doctoral Dissertation Completion Fellowship ..... Amandeep K. Brar, Babak Tahmouresilerd
Staff Appreciation Administrative Award ..... Dr. Robert D. Long
Staff Appreciation Technical Award ..... Dr. Daniel K. Unruh
Outstanding TA Awards in General Chemistry ..... Vanessa R. Charles, Sakshi Gautam
Outstanding TA Awards in Organic Chemistry ..... Shipra Garg, Adineh Rezaei
Outstanding TA Awards in Upper-Division Chemistry ..... Shiva Moaven

UNDERGRADUATE OUTSTANDING PERFORMANCE AWARDS

Analytical Chemistry ..... Ameer S. Ahmed, Benjamin P. Greif, Ethan G. Johnson,Maria J. Bajayo Lugo, Abdul Rashid K. Nur, Reese K. Oliver, Adan N. Tijerina, Yiwei Wang, Garrett S. Welch
Biochemistry ..... Stephan B. Azatian, Nikke L. Tweet
Inorganic Chemistry ..... Ashley G. Smith
Organic Chemistry ..... Shr Chun Chen, Benjamin P. Greif, Dylan B. McBee, Sean C. McNeme, Floyd A. Pirtle, Neel P. Roy
Physical Chemistry ..... Kirsten R. Nettles, Truman J. Thompson
2018 ACS POLYED Undergraduate Achievement Award ..... Benjamin P. Greif
2019 ACS Undergraduate Award in Organic Chemistry ..... Henry J. Trubenstein
Outstanding Graduating Senior Award ..... Stephan B. Azatian

Texas Tech University
Department of Chemistry & Biochemistry
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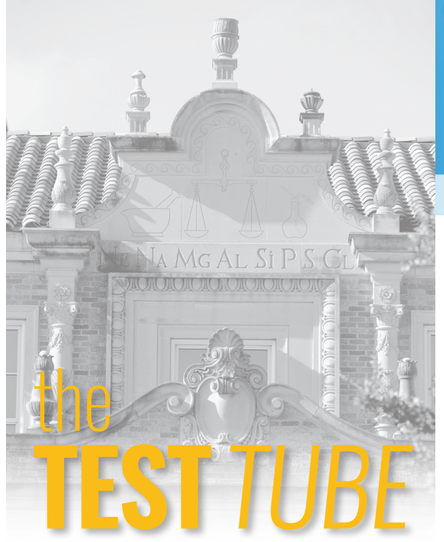

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OUR VISION

The Department of Chemistry and Biochemistry will strive to be recognized locally, nationally, and internationally for the quality of the education of the undergraduate and graduate students; vibrant, synergistic, and inventive interdisciplinary and multidisciplinary research programs; and impactful community engagements.

the **TEST** *TUBE*
CO-EDITORS:
Dr. Robert D. Long
Dr. Daniel K. Unruh

THE NEWSLETTER OF THE DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY

the **TEST** *TUBE*
Vol. 26 No. 1 • 2019

HORN PROFESSOR W. DAVID NES RECEIVES THE SCHROEPFER AWARD

By Tony Salama, Dean's Office

It's early 1983, and two men are at a workbench in a government lab on the West Coast. They've been hard at their research six weeks straight, intent on providing clear evidence of a particular chemical pathway in a particular plant, and now they're there. They've done it.

That's when Thomas Bach knew he was watching a rising star in David Nes. Bach's memory isn't just of the scientific breakthrough but the humor of the scene itself.

"A funny remembrance worth mentioning is our sitting side-by-side in darkness at the bench, with green lamps on our heads, to work up etiolated wheat seedlings for incorporation and other experiments, as plants don't 'see' green light," said Bach, now professor emeritus at the University of Strasbourg, France.

W. David Nes, a Paul Whitfield Horn Distinguished Professor of Chemistry & Biochemistry at Texas Tech University, stands ready to receive the 2019 Schroepfer Medal from the American Oil Chemists' Society (AOCS) for his contributions to the field of steroid and sterol chemical research.

The award is named in honor of the late Dr. George J. Schroepfer, Jr., a Rice University department chair in biochemistry whose pioneering studies in cholesterol and oxysterol biosynthesis contributed to understanding the role of cholesterol in heart disease.

Horn Prof. W. David Nes

"This prestigious award is like the Nobel Prize in the field of steroid or sterol biochemistry," said Henry T. Nguyen, formerly a Paul Whitfield Horn Professor in the Department of Plant and Soil Science at Texas Tech and currently Curators' Distinguished Professor of Plant Sciences at the University of Missouri. To read more about Dr. W. David Nes' academic journey on the way to the Schroepfer Award please follow the link ***https://today.ttu.edu/posts/2019/03/Stories/nes-schroepfer-medal.***

TEXAS TECH UNIVERSITY
Department *of* Chemistry & Biochemistry

INSIDE THIS ISSUE

TRANSITIONING TO A BETTER FUTURE

In our last newsletter we talked about all the exciting renovations and instrument upgrades that were taking place in the department. While these projects always seems to take longer than initially thought, the transformations are happening and are going to be well worth the wait. However, for all the changes currently going on in the building, there are still stories like the following. This past winter, we had the joy of welcoming some of our alumni back to campus and showing them the current renovations within the building. During the tour, however, one alumni in particular (Dr. Dan Peckenpaugh, BS '75) was able to find his original research desk where he sat conversing with the late Dr. Jerry Mills about his research project as an undergraduate back in the mid ' 70s.

But stories like this one are what motivates us to move forward and keep pushing. As the finishing touches are being put on the remodeled laboratories for two of our General Chemistry labs, the original large lecture hall (room 107), and installation of new instruments and equipment in teaching labs, the process continues with the gutting and remodeling of the next classroom and two of the Organic Teaching labs.

Along with the changes happening in our building, there are other avenues of research space opening up to the faculty of our department as well. By the end of this summer, the Experimental Sciences Building II will be completed and will be housing faculty from various disciplines across campus, including Chemistry and Biochemistry. This space intends to help facilitate collaborative research programs and that will eventually lead to the establishment of national research centers on campus.

However, research space is nothing without the brilliant minds to fill it. As we have continued to increase our enrollment of both undergraduate and graduate students within the department we must be careful not to diminish the experiences our students share with the faculty. To this end, we are seeking to expand the number of tenure-track faculty from 28 to 35 in the coming years, resulting in student to faculty ratios that are in line with peer institutions, but also allowing the department to establish complementary research programs.

There is a strong sense within the department that many of the changes and improvements over the next couple of years are going to be the foundation for success within the department. Not only our current students and faculty, but for the future generations of students and faculty to come. ■

L-R Dr. Krempner with Dr. Dan Peckenpaugh

CHEMISTRY RESEARCHER TARGETING WAYS TO REMOVE CONTAMINANTS FROM WATER

by Glenys Young, Office of Communications & Marketing

The wonders of modern medicine are many. It has given millions of people the ability to live longer, healthier lives just by taking a few little pills each day. But of those few little pills each day, a trace amount leaves the body with each trip to the bathroom, not to mention the leftover medications that get flushed down the toilet or washed down the sink drain. All those trace amounts from each person, each day, can add up to a lot over time.

This wouldn't be a problem if water treatment plants were able to effectively remove all those medications before putting the water back into nature, where fish swim in it, plants use it to grow, animals drink it and people consume both the water itself and many of the plants and animals that used it before. If treatment plants could just get all that medication out, there would be no need to worry about the effects it may be having on the entire ecosystem.

Of course, that's not the case – yet. The most widely used filtration methods can only remove some medications, and some only partially. But Texas Tech University assistant professor Kristin Hutchins is working to change that.

Hutchins and her team are working to design materials that can remove various contaminants from wastewater, including heavy metals and pharmaceutical compounds. One research project was recently highlighted in a special issue of Crystal Growth & Design, where Dr. Hutchins was highlighted as an emerging investigator.

"We looked at one drug, specifically bezafibrate," she said. "People commonly take it for high cholesterol. It's been found in wastewater in low concentrations, but still there, so it's one of our targets. "One of our strategies is to look at the structure of this drug molecule and think about how we can make a material to capture it, and then we design that material."

Hutchins first tried bonding bezafibrate with different molecules to see which molecule would bond strongest, effectively capturing the drug. One molecule, 4-dimethylaminopyridine (DMAP), bonded with the bezafibrate more than 18 times better than other molecules tried.

Focusing her attention to just that molecule, she grew crystals from a DMAP-bezafibrate mixture. Then, using a special piece of equipment – a single crystal X-ray diffractometer – she could visualize the results and examine how well the DMAP bonded with the bezafibrate in the solid state.

"It's my favorite technique, because it generates a visual representation," she said. "You can really see it.

"We also did experiments in a liquid phase, because, ultimately, we want to capture the drug in water. We wanted to see if we see similar behavior in the solid and in the liquid phases, and we did. That one molecule just worked so much better than any of the rest." To read more about Dr. Hutchins exciting research endeavors please follow the link ***https://today.ttu.edu/posts/2019/04/Stories/kristin-hutchins***. ■

THE BENEFITS OF UNDERGRADUATE RESEARCH

by Prof. Dominic Casadonte

Undergraduate research in the Department of Chemistry and Biochemistry at Texas Tech provides a variety of benefits, both for the student as well as the faculty member. Within the department of Chemistry and Biochemistry, undergraduate research is a significant component of the educational experience of our majors. This semester alone, we have more than 65 students conducting novel research projects throughout the department. Personally, I have been very fortunate to have had excellent undergraduates in my lab over the years as I have mentored 71 different undergraduate students. These students have gone on to continue their education in graduate school or medical school, started careers as industrial chemists, become teachers, or even had careers in areas outside of chemistry (e.g., chemical engineering, marine biology, etc).

Presentations, posters, papers, and scholarships are the currency by which we measure the success of undergraduate students in the lab. This spring we had 26 undergrads present posters at Texas Tech's annual Undergraduate Research Conference. On top of the experience of presenting their work, many of these students will also have their work incorporated into peer-reviewed journal articles or presented at professional meetings. For some of my students, these publications and presentation become the basis for scholarships. The Barry Goldwater Scholarship is often viewed as "the most prestigious scholarship in the natural sciences, mathematics, and engineering in America" (from the Goldwater website). Six undergraduate researchers in my lab have become Goldwater Scholars and two other student have been named as Goldwater Honorable Mentions.

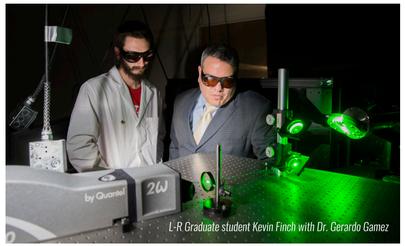
However, research is an expensive endeavor and without the financial support of multiple agencies, most of the research conducted and accolades received wouldn't be possible. Along with support from department of Chemistry and Biochemistry, TTU has also supported undergraduate researcher through the Honors College, TrUE, CISER, and Pi2. Outside of the University, students have been supported by the national funding agencies of NIH, NSF, DOE, the Welch Foundation, Petroleum Research Fund, and the State of Texas Advanced Research Program for summer salaries.

Many of our students that major in Chemistry and Biochemistry who have done undergraduate work in the department have gone on to satisfying and productive careers in STEM fields and medicine. The skills they learn in research laboratories compliment what they can learn in the classroom, enhancing the educational experience for the student. They also get to see the benefits of the knowledge that they produce, both in publications and in their ability to go on to further education or employment. We encourage all of our majors to participate in undergraduate research and continue to thank those who support these activities. To read more about the projects students have worked on in Prof. Casadonte's lab check out the full article at ***https://www.depts.ttu.edu/chemistry/Newsletters/UndergraduateResearch.pdf*** ■

PROFESSOR HIGHLIGHT

For Prof. Gerardo Gamez, 2019 has already been exciting and rewarding year. Along with receiving the 2019 College of Arts & Science Research Award this spring, he also received tenure and promotion to the rank of Associate Professor in Chemistry and Biochemistry. The following is a brief synopsis of the research activities and awards Dr. Gamez has received while at Texas Tech University.

Dr. Gerardo Gamez obtained his B.Sc., summa cum laude, and M.S. in Chemistry at the University of Texas at El Paso with Prof. Gardea-Torresdey. He obtained his PhD in Analytical Chemistry at Indiana University-Bloomington with Prof. Hieftje. He performed postdoctoral work at the Swiss Federal Institute of Technology (ETH), Zurich, with Prof. Zenobi and later became a Scientist at the Swiss Federal Laboratories for Materials Science and Technology (EMPA), Thun. In 2013, he joined the faculty at Texas Tech University's Department of Chemistry and Biochemistry as an Assistant Professor. His research group focuses on instrumentation and method development of high-throughput and imaging chemical analysis techniques. His laboratory's work on glow discharge optical emission spectroscopy (GDOES) represents a paradigm shift where novel access to laterally resolved data has allowed the development of three-dimensional surface elemental mapping at analysis speeds several orders of magnitude faster compared with typical techniques. Also, his laboratory's work on ambient desorption/ionization mass spectrometry plasma sources has yielded new insights into exhaled breath analysis, as well as improved chemical imaging capabilities through laser assisted desorption. In addition, his group develops laser scattering plasma diagnostic techniques to permit a better understanding of the underlying mechanisms of laboratory plasma systems used for chemical analysis. His current NSF funded projects include development of compressed sensing and geometric-super resolution strategies for hyperspectral imaging via atomic optical emission spectroscopy.



L-R Graduate student Kevin Finch with Dr. Gerardo Gamez

Dr. Gamez has co-authored 60 publications, presented more than 30 invited lectures, including keynote lectures at the International Glow Discharge Spectroscopy Symposium and the Asia-Pacific Winter Conference on Plasma Spectrochemistry. He also received the inaugural Richard Payling award for outstanding research in glow discharge spectroscopy, and the inaugural Royal Society of Chemistry-Journal of Analytical Atomic Spectrometry Emerging Investigator Lectureship award. Also, he has served as the president for the Indiana Section of the Society for Applied Spectroscopy; coordinator for the GLADNET European Commission FP6-program research training network; co-organizer of the 1st International Glow Discharge Spectroscopy Symposium 2010 (France); Atomic Spectroscopy section chair of the SciX international conference; and as Advisory Board member for the RSC Journal of Analytical Atomic Spectrometry. ■

THE COINAGE METALS **DONATION PAGE**

As with any remodeling project, funds are a necessary part of the equation and it is not always possible to do everything at once. While we have been extremely appreciative of previously received monies for small projects from the University, we are looking towards the future and what would be possible with more of our proposed projects finished and being fully utilized by our undergraduates, graduate, faculty, and staff. As we continue to strive for student excellence and research recognition, your support is always appreciated and will be used to the fullest.

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For an extended list, please see our website: *www.depts.ttu.edu/chemistry/departmental/donation.php*

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