TEXAS A&M UNIVERSITY

Artie McFerrin Department of Chemical Engineering

CHEMICAL ENGINEERING

2022

LEADERS IN ENGINEERING

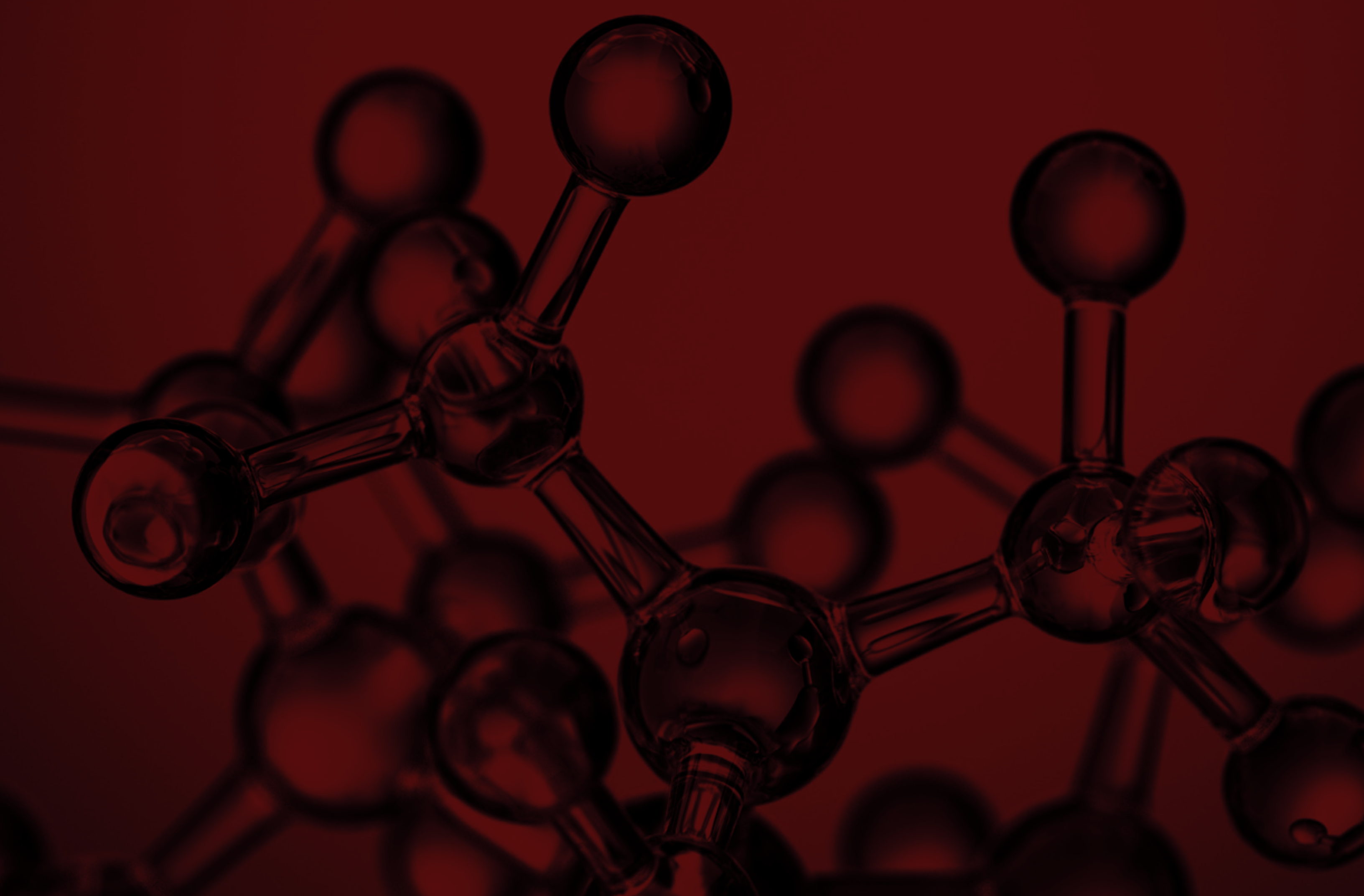
The Artie McFerrin Department of Chemical Engineering is one of 15 departments in the Texas A&M University College of Engineering. Among public institutions in the nation, our undergraduate program is ranked 10th and our graduate program is ranked 16th by U.S. News & World Report. Our faculty members are internationally recognized in varying research areas, including biomedicine and biomolecules, catalysis, complex fluids, environment and sustainability, reaction engineering, and process safety and controls.

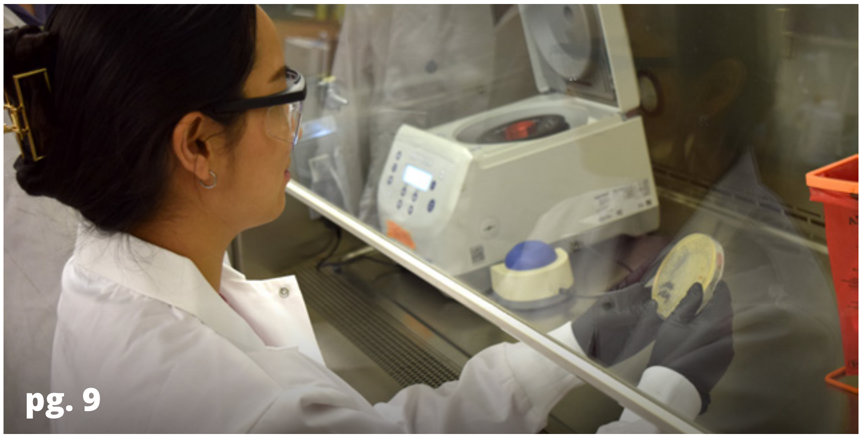
HIGH IMPACT

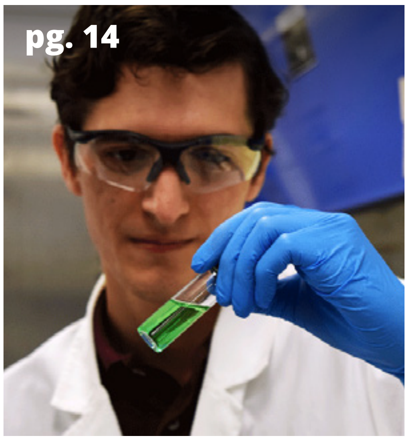
The department is engaged in a wide breadth of studies with the goal of utilizing chemical engineering to positively impact society. Research within the department has resulted in movements toward cleaner energy solutions, the creation of new and sustainable products, advancements in biomedicine and renewable energy resources.

STUDENTS

Students within the department receive a broad education in basic theory courses complemented by laboratory experiences. Students are provided opportunities to participate in research, helping them develop into independent engineers capable of tackling Earth's grand challenges.







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Letter from the

Department Head

Howdy from the Artie McFerrin Department of Chemical Engineering.

The chemical engineering profession provides an incredibly versatile skill set that is key to tackling the 21st century's most significant energy, health care, sustainability and manufacturing challenges. The chemical engineering department at Texas A&M is at the forefront of these advancements because of the efforts of our outstanding students, alumni and faculty.

Our department remains among the top nationally ranked chemical engineering programs in the United States due mainly to the caliber of research our faculty are conducting. Some of our recent research breakthroughs include discovering new ways to increase the shelf-life of COVID-19 vaccines, developing new processes that enable agricultural fertilizers to be produced less expensively, unlocking fundamental chemical mechanisms to make rechargeable batteries last longer and engineering E. Coli bacteria to manufacture drug compounds more efficiently.

None of these achievements would be possible without our students, who remain at the forefront of our department. With over 1,000 enrolled students, the department awarded nearly 300 degrees. That's why I'm thrilled that our department awarded a record-breaking 10 graduate fellowships that enable students to pursue cutting-edge research-based experiences. In addition, we have recently increased our graduate stipends, expanding the opportunities for our students.

None of these accomplishments would be possible without your support and engagement. Therefore, I invite you to read on as this issue of our magazine showcases some of the many exciting ways that Aggie chemical engineers are making a difference today in society through efforts aimed at improving the quality of life for everyone.

Dr. Victor M. Ugaz
Interim Department Head, Chemical Engineering
Director of Undergraduate Programs, Chemical Engineering
Chair, TAMU Master of Biotechnology Program
Carolyn S. & Tommie E. Lohman '59 Professor in Engineering Education

BY THE NUMBERS

RANKINGS

#10 Undergraduate Program Ranked No. 10 (Public) (*U.S. News & World Report, 2022*)

#16 Graduate Program Ranked No. 16 (Public) (*U.S. News & World Report, 2023*)

ENROLLMENT (FALL 2021)

1,058 Total

820 Bachelor's

105 Master's

133 Ph.D.

FACULTY

45 Total Faculty

5 Endowed Professorships

8 Chair Holders

6 Endowed Faculty Fellows

DEGREES AWARDED (AY 2020-21)

231 Bachelor's

29 Master's

28 Ph.D.

GRADUATE DEGREES

16 M.S. Chemical Engineering

6 MBIOT (Biotechnology)

7 M.S. Safety Engineering

28 Ph.D. Chemical Engineering

STUDYING CANCER-CAUSING BACTERIA USING THE POWER OF LIGHT

Helicobacter pylori (H. pylori) have colonized the stomachs of billions of people worldwide. Once an H. pylori infection occurs, it is challenging to eradicate. This is a significant biomedical problem as H. pylori can promote stomach ulcers and gastric cancers. How H. pylori navigate and colonize specific niches in the stomach remains largely unknown, but addressing this gap in fundamental knowledge is crucial for preventing infections moving forward.

Dr. Pushkar Lele recently received an R01 research grant from the National Institute of General Medical Sciences totaling over $1.3 million to investigate the mechanisms that enable H. pylori to navigate with the aid of motility appendages called the flagella. To do this work, his group will combine experimental techniques such as optical trapping and Förster resonance energy transfer (FRET) with computational modeling.

Inside a bacterium, rapid signaling reactions constantly occur to control its movements. Measuring these reactions is the key to understanding H. pylori's navigational strategies. However, such measurements are incredibly difficult inside a bacterium considering its minuscule size — a couple of microns – and the speed at which it moves – almost 30 times its length per second.

Lele's group proposes to overcome the challenge by manipulating single bacterial cells through the power of light. Using what is known as an optical trap, the researchers will catch hold of single H. pylori cells and release them at distinct separations from their chemical targets to observe their navigational strategies. They will develop FRET assays to visualize signaling interactions in these cells.

"Bacteria rely on numerous signaling mechanisms to adapt their behavior to environmental conditions," said Lele. "The pathway we are interested in specifically helps them migrate from an unfavorable location to a favorable environment — a process known as chemotaxis. How do H. pylori sense and respond to environmental cues despite appearing to lack key enzymes in their arsenal? There has never been a more opportune time to tackle these important questions in collaboration with renowned research groups in the field."

The proposed work will build on the group's previous efforts funded by the Cancer Prevention and Research Institute of Texas. In a study published in eLife last year, researchers developed a novel method to quantify the effect of the environment by exploiting fluid drag on each bacterium. Their approach helped them characterize the properties of individual motors that operate the flagella.

"The manner in which H. pylori swim causes them to retrace their movements every other second, nullifying the progress they might have made in the preceding second. This complicates the understanding of chemotaxis," said Lele.

The group plans to tackle these questions by combining experiments with theory and computation.

"Their movements are erratic," said Lele. "Nonetheless, they can be computationally simulated with adequate inputs from experiments. Rigorous experimental tests of their mathematical models are expected to help unravel major mysteries and predict the probability of infections in the future."

The proposed research is timely as studies have shown an increased resistance in H. pylori to standard treatments. If the principles of navigation can be understood using these methods, there is potential to discover better ways to eradicate or treat H. pylori infections.

"As H. pylori continue to become resistant to antibiotics, such mechanistic studies on the different facets of host invasion and colonization will address critical medical needs," Lele said. "Chemotaxis strategies are well understood in only a few bacterial species, and successful execution of our projects will provide insights into the diverse strategies employed by pathogens to evade our immune systems."

FEATURED FACULTY

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Lutkenhaus awarded 2022 Edith and Peter O'Donnell Award in Engineering

Dr. Jodie L. Lutkenhaus is the recipient of the 2022 Edith and Peter O'Donnell Award in Engineering from The Academy of Medicine, Engineering and Science of Texas (TAMEST). She was chosen for her innovation and development of redox-active polymers for metal-free energy storage and smart coatings.

The Edith and Peter O'Donnell Awards annually recognize rising Texas researchers who are addressing the essential role that science and technology play in society and whose work meets the highest standards of exemplary professional performance, creativity and resourcefulness. Lutkenhaus is one of four Texas-based researchers receiving the TAMEST awards.

By developing new molecular-scale characterization methods, Lutkenhaus discovered fundamental connections among polymer dynamics, properties and performance. Specifically, using electrochemical quartz crystal microbalance with dissipation monitoring, she developed new ways to closely observe the response of polymers in some of the most challenging environments.

These types of discoveries have led to new designs for metal-free organic batteries that will address society's needs for materials that are earth-abundant and recyclable or degradable. Her concept of a 100% polymer battery, which would steer battery production away from cobalt and other precious metals, has the potential to charge and discharge much faster than traditional versions.

"Imagine a battery you never have to throw away, one that does not depend on precious metals to work and charges more efficiently than conventional methods," said nominator Dr. Mark A. Barteau. "This rapid charging technology could dramatically change the way batteries are developed and how things — like electric vehicles — are used today. We are just astounded at the ingenuity and innovation Dr. Lutkenhaus shows on a daily basis and are thankful to have her leadership here at Texas A&M mentoring the next generation of groundbreaking researchers."

FEATURED FACULTY

Dr. Jodie Lutkenhaus
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ENGINEERING E. COLI TO IMPROVE DRUG DEVELOPMENT

Whether you are taking a muscle relaxant or a heart medication, you are possibly using a medication that contains a synthetically produced benzoxazole. Although natural benzoxazoles show more significant promise in pharmaceuticals, their time to develop organically and inherent undesired properties impede their usage.

Dr. Xuejun Zhu, alongside graduate student Huanrong Ouyang, and two undergraduate students, Joshua Hong and Jeshua Malroy, are synthesizing natural benzoxazoles using E. coli in hopes of developing a more efficient, eco-friendly and cost-effective method of producing them for future drug development.

Their research was published in the American Chemical Society's journal ACS Synthetic Biology 2021.

Benzoxazole is a heterocyclic compound composed of carbon, hydrogen, oxygen and nitrogen. It can be produced synthetically but is also found in bioactive natural products like nataxazole, caboxamycin and calcimycin. Synthetically created benzoxazoles are found in synthetic pharmaceuticals ranging from chlorzoxazone (a muscle relaxant) to tafamidis (for treating heart disease).

However, natural benzoxazoles are rarely used because of the time it takes to organically produce the compounds and their unwanted properties, such as high toxicity, low potency and poor solubility. There is limited research on natural benzoxazoles, but they contain many qualities that show potential for future use in cancer, antiparasitic and antimicrobial treatments. For example, some natural benzoxazoles show promising cytotoxic activity that fights against various tumor cell lines.

"Currently, natural methods for producing the compound benzoxazole occur very slowly, sometimes taking a week or longer," said Zhu. "The natural compounds can also cause excess levels of toxicity or other undesired properties that restrict its applications."

Desiring to extract and combat certain qualities of natural benzoxazoles, the researchers turned to the microbe, E. coli — a bacterium found in the environment and within human and animal intestines.

"Compared to other microbes, E. coli grows very quickly," said Ouyang. "Modern researchers have conducted numerous studies on E. coli, and it is easier for us to manipulate genetically for productivity improvement, especially for large-scale production."

The researchers modified an E. coli with a few essential genes for making the natural benzoxazoles. By coupling the engineered E. coli with precursor-directed biosynthesis, a pathway is developed to produce natural benzoxazoles at a faster rate.

"From our study, we found we could produce three different types of benzoxazoles simultaneously," said Zhu. "Each type could have different biological activities such as antimicrobial, antiparasitic and anticancer."

By tailoring variables, such as using different precursors, the researchers can further expand the structural diversity of benzoxazoles with the hope to reverse some of the natural benzoxazoles' inherent issues to improve solubility and potency while lowering toxicity levels.

With a sustainable way to develop natural benzoxazoles, they could potentially be used in various medications with more benefits than synthetically produced benzoxazoles. The researchers hope this is a step toward a straightforward and cost-effective method of generating novel benzoxazole analogs through protein engineering and combinatorial biosynthesis.

This work is supported by the Texas A&M Engineering Experiment Station and chemical engineering department start-up funds.

FEATURED FACULTY

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USING **QUANTUM METHODS** TO PREDICT NEXT-GEN LITHIUM-METAL BATTERY REACTIVITY

Dr. Perla Balbuena is using quantum chemical methods to track specific reactions that occur on the surfaces inside lithium-metal (Li-metal) batteries. Understanding Li-metal battery reactions and predicting products will enhance usability by decreasing their reactivity.

This research was recently published in the American Chemical Society's ACS Applied Materials & Interfaces journal and was co-authored by graduate student Dacheng Kuai from the Department of Chemistry at Texas A&M.

When Li-metal batteries are manufactured, a thin film forms on the anode, commonly referred to as solid-electrolyte interphase (SEI). This film is made of multiple components and produced by electrolyte decomposition. The chemical makeup of the SEI is critical for ensuring peak performance from the battery and extending its lifespan. Through experimental efforts, theoretical predictions can reveal the details in this phenomenon at the atomistic and electronic levels.

In this study, the researchers targeted a polymer that develops due to electrolyte reactions on the battery's internal surfaces. Pinpointing this specific polymer reaction is challenging but necessary to optimize the SEI. The researchers simulated the interface at the atomistic level and solved accurate quantum chemical equations to map a time evolution of the polymer formation reaction.

"What differentiates this research is starting from the microscopic-level description and letting the system evolve according to its electronic redistribution upon chemical reaction," Balbuena said. "There are many experimental techniques that can follow and monitor the reactions, but they're challenging. We isolate the part of the system that is responsible for important chemical events. We follow that specific group of molecules and analyze the reactions spontaneously occurring at the surface of electrodes."

The researchers found that the species polymerizing in the SEI could be beneficial for Li-metal batteries because they can aid in controlling the level of reactivity of the battery materials. These findings illustrate the use of computational tools that can contribute to creating batteries that are more friendly to the environment, have longer lifespans and are cheaper to produce.

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Dr. Perla Balbuena

Professor, Chemical Engineering; GPSA Professor; Mike O'Connor Chair I

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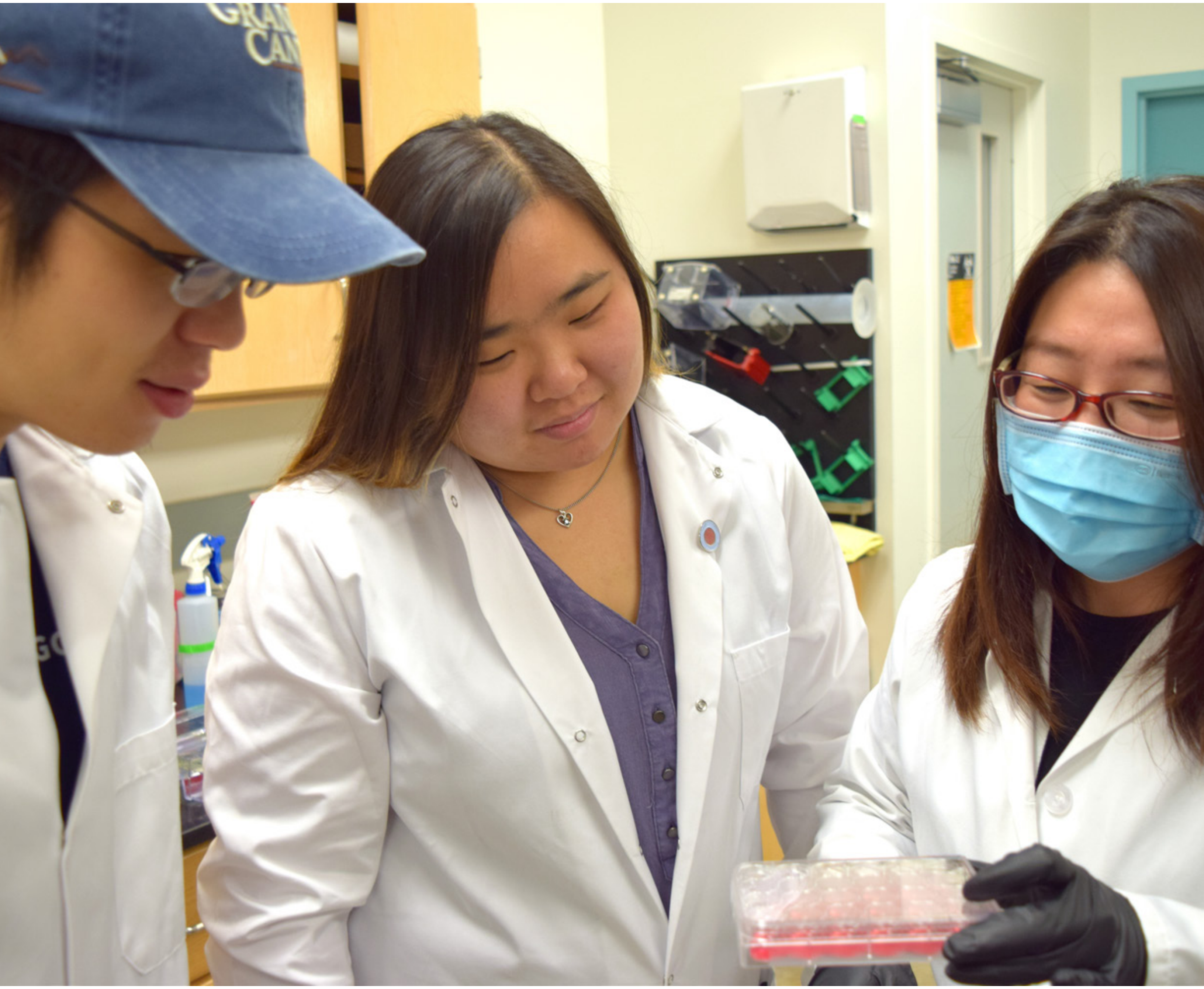
Improving thermal stability of COVID-19 vaccines



Messenger ribonucleic acid (mRNA) vaccines have become more popular as they can help prevent viral infections ranging from Zika to COVID-19, but their thermal stability remains a drawback. To store and transport mRNA vaccines requires ultracold freezers and cold-chain assurance, making it costly and challenging to provide vaccines to rural and developing communities.

The National Institutes of Health (NIH) awarded Dr. Qing Sun $1.8 million through the Stephen I. Katz Early Stage Investigator Research Project Grant. Using deep learning, Sun aims to develop mRNA vaccines that are thermally stable and relax the stringent conditions needed for mRNA vaccine preparation, storage and distribution.

"It is important in the future to improve the thermal stability of mRNA vaccines so that if there are other infectious diseases, we can respond quickly and distribute vaccines more efficiently," said Sun. "Using this grant, we will focus on using artificial intelligence to develop a system for thermally stable mRNA vaccine development."

Messenger RNA vaccines function by triggering an immune response within the body, protecting us from infection when exposed to pathogens. With the onset of the pandemic, the importance of vaccinations has grown. Being able to transport vaccines at cheaper cost without the need for extremely cold temperatures is critical for fighting against COVID-19 and other infections such as rabies and influenza.

To help with this issue, Sun proposed using a deep-learning platform that has shown success in natural language processing to nucleic acid feature prediction tasks. This interpretable, end-to-end model can predict mRNA vaccine secondary structures directly from sequence information. The model has been shown to reduce mRNA degradation in a solution and mammalian cells after transfection.

With the ability to screen over thousands of mRNA vaccine sequences through the deep-learning platform, she can predict mRNA sequences that are more stable when exposed to higher temperatures. She plans to validate the model performance by producing the predicted top-performance mRNA vaccine sequences and testing their stability and efficacy in her lab.

In the future, Sun hopes her production process can serve as a framework for other mRNA vaccine processing for rapid response to pandemics outside of COVID-19.

"By improving the thermal stability of the COVID-19 mRNA vaccines, we could redesign all other mRNA vaccines for the better," she said. "I hope to see our deep-learning method applied to predict RNA secondary structure, stabilities and to study biological functions of RNA molecules including noncoding RNA, riboswitch and therapeutic RNAs. The method can potentially play critical roles in cellular and viral machinery to inspire novel antibacterial, antitumor and antiviral functions."

Sun is the principal investigator on the project. She will conduct the research in her lab on the Texas A&M campus, with support from a team of graduate students, postdoctoral researchers and lab technicians. The Stephen I. Katz Early Stage Investigator Research Project Grant is an R01 grant that funds creative early-stage investigators' research ventures in which no preliminary data is needed.

FEATURED FACULTY

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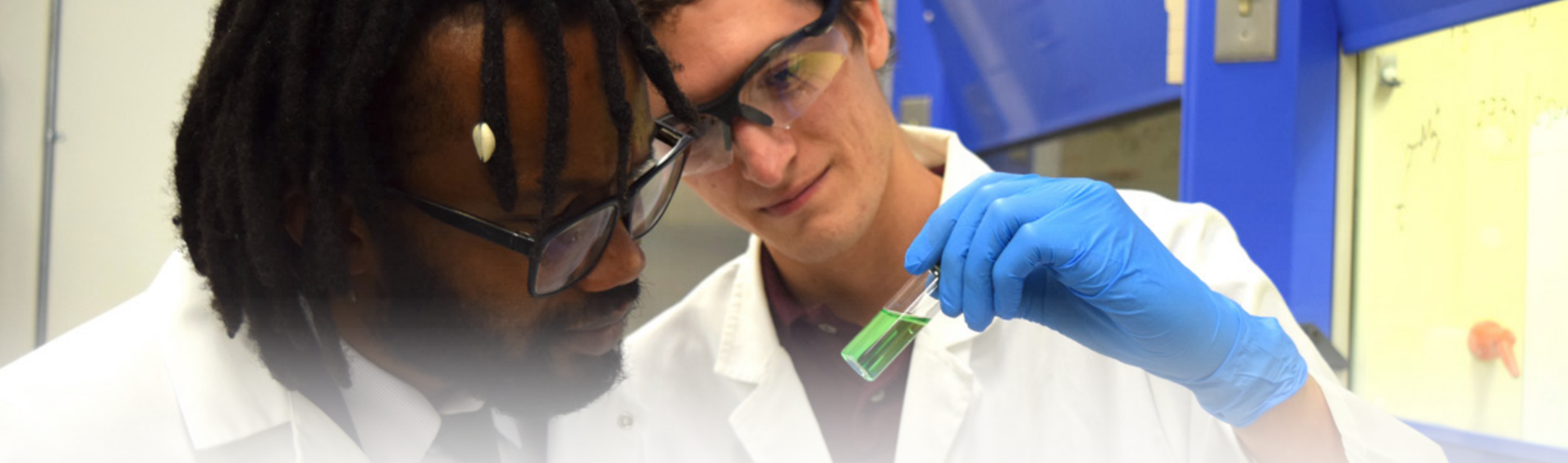

PRODUCING AMMONIA THROUGH ELECTROCHEMICAL PROCESSES

Ammonia is commonly used in fertilizer because it has the highest nitrogen content of commercial fertilizers, making it essential for crop production. However, two carbon dioxide molecules are made for every molecule of ammonia produced, contributing to excess carbon dioxide in the atmosphere.

A team from the Artie McFerrin Department of Chemical Engineering consisting of Dr. Abdoulaye Djire, assistant professor, and graduate student Denis Johnson, has furthered a method to produce ammonia through electrochemical processes, helping to reduce carbon emissions. This research aims to replace the Haber-Bosch thermochemical process with an electrochemical process that is more sustainable and safer for the environment.

The researchers recently published their findings in Nature Scientific Reports.

Since the early 1900s, the Haber-Bosch process has been used to produce ammonia. This process works by reacting atmospheric nitrogen with hydrogen gas. A downside of the Haber-Bosch process is that it requires high pressure and high temperature, leaving a large energy footprint. The method also requires hydrogen feedstock, which is derived from nonrenewable resources. It is not sustainable and has negative implications on the environment, expediting the need for new and environmentally friendly processes.

The researchers have proposed using the electrochemical nitrogen reduction reaction (NRR) to produce ammonia from atmospheric nitrogen and water. The benefits of using an electrochemical method include using water to provide protons and the ability to produce ammonia at ambient temperature and pressure. This process would potentially require lower amounts of energy and would be less costly and more environmentally friendly than the Haber-Bosch process.

The NRR works by using an electrocatalyst. For this process to succeed, nitrogen must bond to the surface and break apart to produce ammonia. In this study, the researchers used MXene, a titanium nitride, as the electrocatalyst. What differentiates this catalyst from others is that nitrogen is already in its structure, allowing for more efficient ammonia formulation.

"It's easier for ammonia to form because the protons can attach to the nitrogen in the structure, form the ammonia and then the ammonia will leave out of the structure," said Johnson. "A hole is made in the structure that can pull the nitrogen gas in and separate the triple bond."

The researchers found that using titanium nitride induces a Mars-van Krevelen mechanism, a popular mechanism for hydrocarbon oxidation. This mechanism follows a lower energy pathway that would allow for higher ammonia production rates and selectivity because of the nitrogen from the titanium nitride catalyst.

Without modifications to the materials, the researchers reached a selectivity of 20%, which is the ratio of the desired product formed compared to the undesired product formed. Their method could potentially reach a higher selectivity percentage with modifications, forging a new pathway to ammonia production through electrochemical processes.

FEATURED FACULTY

Dr. Abdoulaye Djire

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Hasan named **division director** for *American Institute of Chemical Engineers*

Dr. Faruque Hasan was recently elected as a director of the American Institute of Chemical Engineers (AIChE), Computing and Systems Technology (CAST) Division for 2022-24.

"The members of the division executive committees are seen as future leaders of society and the community," said Hasan. "It is an honor to serve my professional community, and this is a step toward more meaningful engagement that goes beyond this role."

AIChE is the largest professional organization for chemical engineers with over 60,000 members worldwide and several divisions. The CAST division focuses on a variety of activities involving computing and chemical engineering, systematic decision-making and process systems engineering ranging from process design, operations, intensification, optimization and control using techniques from applied mathematics.

The director position is voted on by AIChE members. As the director, Hasan will serve the CAST community through varying avenues such as the AIChE annual conference and poster sessions.

"The meetings include researchers, students and professionals, and they are a great platform to exchange ideas," he said. "They showcase the power of servicing a community. Being a part of the planning of these events is one of the many reasons I am excited to be named director."

Additionally, Hasan is a recent recipient of the CAST Outstanding Young Researcher Award and hopes to use his research findings and role as CAST director to make strides toward a greener future.

Hasan hopes that by assuming a director role, he can further the efforts to solve some of Earth's grand challenges that align with his research areas, such as reducing greenhouse gas emissions, developing sustainable energy resources and furthering carbon capture methods.

"What we have been doing and what we can do as a committee is share our knowledge so that upcoming researchers will have the tools and training necessary to solve these problems," he said.

FEATURED FACULTY

Dr. Faruque Hasan
Associate Professor, Chemical Engineering
Kim Tompkins McDivitt '88 and Phillip McDivitt '87 Faculty Fellow
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Our acclaimed faculty are continuously pushing the boundaries of science and technology. They are engaged in a wide breadth of studies ranging from highly applied research in the areas of biomass utilization, process safety and hydrocarbon processing to fundamental research in nanotechnology, life sciences and molecular simulation. The goal the department's research is to positively impact society and continue to advance the field of science and technology.

To view our faculty directory, scan the QR code.
tx.ag/CHENFacultyDirectory





Department awards **10** graduate fellowships

The department named 10 students the recipients of various graduate fellowships, the most awarded in department history.

"These fellowships recognize the accomplishments and success of our students," said Dr. Arul Jayaraman, chemical engineering department head and professor. "I hope it will encourage them to excel further in their academic careers."

Among these students, Kathy Rhee is the recipient of the Brunner-Barnes Fellowship and Shuhao Liu is the recipient of the Phillips 66 Technical Fellowship.

"Receiving this fellowship showcases the amount of work that I have done throughout my Ph.D.," said Rhee. "It's recognition that I have worked hard for, and I am very honored to receive this prestigious fellowship."

Rhee didn’t know what she wanted to pursue for her doctorate degree when she decided to attend Texas A&M. After hearing a lecture during her first year from Dr. Pushkar Lele, associate professor in the chemical engineering department, she became fascinated with bacterial systems.

"My area of focus is bacterial motility," said Rhee. "The cells are able to swim around using appendages known as flagella that are attached to their bodies. I am particularly interested in the quantification of flagellar rotational speed and its transfer of energy.”

Liu chose Texas A&M due to the College of Engineering’s outstanding reputation. After completing his master's degree in materials science and engineering, he transferred to chemical engineering for the doctoral program. His advisor, Dr. Mustafa Akbulut, is an associate professor in the chemical engineering department.

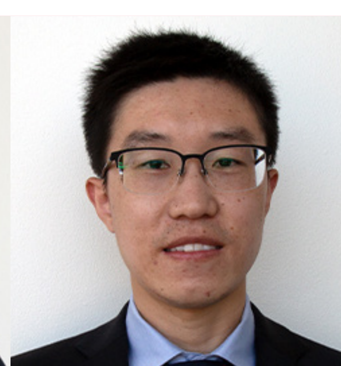
"I first decided to join Texas A&M because the school has a strong background and various resources across many engineering fields," he said. "Dr. Akbulut has been a very kind and helpful advisor who created a path for me to achieve my research goals."

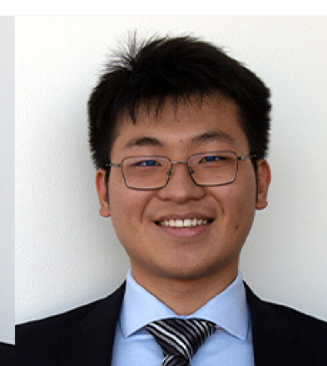
Liu's research focus encompasses many fields. He received his fellowship for extensive work in complex dynamic fluids related to oil production and the energy field.

"Receiving this opportunity is amazing to me," said Liu. "I've worked for more than four years to gather achievements in my area. I think it is confirmation of my several years of work."

Each of the recipients will conduct extensive research, receive guidance from faculty experts and be exposed to new and exciting experiences.







Outstanding senior engineer awards

Vivie Tran and Gabriel Zolton are recipients of the Craig C. Brown Outstanding Senior Engineer Award for their exemplary achievements in and outside the classroom. It is the most prestigious honor that can be bestowed upon a graduating senior.

Zolton is the son of two former students but made his final decision to attend Texas A&M when he explored the various research opportunities available through the chemical engineering department. He has partaken in many research ventures during his time as a student. However, his interests lie beyond one subject, as he will also be receiving a bachelor's degree in English.

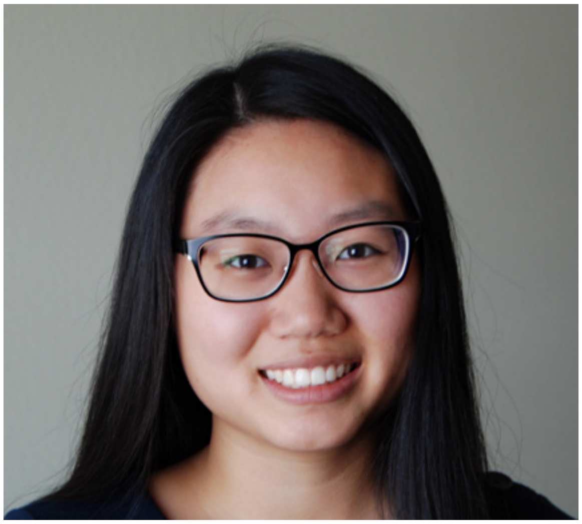
"Completing an undergraduate creative research thesis as part of the Undergraduate Research Scholars Program and the Aggie Creative Collective is one of my greatest accomplishments," said Zolton. "In the future, I plan to finish a novel that I worked on alongside my thesis."

Like Zolton, Tran thrives academically, as they each hold a perfect grade point average. She is finishing her chemical engineering degree a semester early after getting a jumpstart on coursework through an early college program. Tran was first drawn to Texas A&M by the Aggie core values. She decided to pursue chemical engineering after hearing the variety of career opportunities the degree provides.

"There is a wide range of industries that I could specialize in, from chemical production to pharmaceuticals," she said. "I can envision myself in a role that allows me to do something different every day, but the possibilities are endless."

Tran works an on-campus job and holds a leadership role in Engineering Honors, which keeps her involved with various events. She has conducted research in both the biology and chemical engineering departments. In addition to this award, in fall 2020, she was awarded the Sophomore Gathright Dean's Excellence Award, recognizing the top students in the College of Engineering. She is also the recipient of various honors such as the President's Endowed Scholar, BP Scholar, Axalta Bright Futures Scholar, Transocean Scholar, Houston Livestock Show and Rodeo Scholar, and the Texas Society of Professional Engineers Scholarship and CHI St. Joseph's Auxiliary Scholarship.

"I have been lucky to have made relationships with my professors and peers who have made an impact on my time here at Texas A&M," said Tran. "I feel very honored to be the recipient of the outstanding senior award. A hard work ethic was instilled in me at a young age as I grew up seeing my parents work tirelessly to provide for our three-generation household. It means so much to me to make my parents proud."



THE **IMPACT** OF SCHOLARSHIPS

Students in the chemical engineering department benefit greatly from the generous contributions of our donors. This year, many donors have chosen to give to the department, helping students achieve an Aggie education.

Kathryn and Thomas "T.A." Smith '66 have established two more scholarships, in addition to several that have been established for many years. Distributions from these endowments will be used to provide one or more scholarships to full-time students in good standing pursuing an undergraduate degree in the Artie McFerrin Department of Chemical Engineering, the College of Engineering and the Corps of Cadets at Texas A&M.

"We hope the recipients will remember the help and recognition from this scholarship and become future donors to A&M," Thomas said.

Thomas graduated from Texas A&M in 1966 with his degree in chemical engineering and was a member of Squadron 12 in the Corps of Cadets. He and Kathryn have three sons, two of whom are Texas A&M graduates. They also have two grandsons who are Aggie graduates and two who are currently enrolled at Texas A&M.

Dotty and Dr. Joseph McAdams have established the Mrs. Dotty and Dr. Joseph McAdams Endowed Chemical Engineering Scholarship. Distributions from this endowment will be used to provide one or more scholarships to full-time students in good standing pursuing an undergraduate degree in chemical engineering from Texas A&M.

McAdams has been involved with the Artie McFerrin Department of Chemical Engineering's advisory council for 20 years. During this time, he developed relationships with the faculty within the department, as well as the department head, Dr. Arul Jayaraman. The dedication he witnessed encouraged him to give back to the department.

"I was impressed by the commitment of the department to undergraduate students," McAdams said. "I hope my gift will ease the cost burden students face while in school at Texas A&M."

Photo courtesy of Queen Friday Photography

TEXAS A&M UNIVERSITY
Artie McFerrin Department of Chemical Engineering