The Welch Foundation

2025 ANNUAL REPORT



Advancing Chemistry, Improving Life

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Robert A. Welch



For

71 years

The Welch Foundation has upheld its commitment to advancing fundamental chemical research across Texas.

The Welch Foundation stands as a lasting testament to the foresight of oilman and philanthropist Robert A. Welch, who believed deeply in the power of chemistry to improve lives. The Foundation reflects his faith in the power of scientific discovery and his love for the state of Texas.

Robert Alonzo Welch was a self-made man who overcame the difficult circumstances of his childhood in South Carolina to achieve success through initiative, hard work, and discipline. Born in 1872, Welch was a determined person. He began working at just 12 years old, and at 14 he traveled to Houston to seek his fortune, which he found in oil and minerals.

While he never went on to higher education himself, Mr. Welch was capable, knowledgeable, and good friends with many well-educated peers. He lived most of his adult life in an era of incredible scientific progress and saw amazing discoveries grow out of research, particularly in chemistry. He recognized that scientific breakthroughs could make a better life for all.

Welch was a talented investor; when he wrote his will, he decided to dedicate his legacy to a sound and wise investment that would be repaid many times in valuable benefits to humankind. In recognition of the role they played in his business success, Welch left a generous portion of his estate to his employees and their families when he died in 1952. The remainder he dedicated to the creation of a foundation that would support fundamental chemical research in Texas: The Welch Foundation.

2025 Highlights

The Welch Foundation celebrated its 71st year in 2025. With assets of $927 million at fiscal year end, the Foundation has invested more than $1.1 billion since its inception to support fundamental chemical research in Texas.

In February, The Welch Foundation presented Haotian Wang of Rice University with the 2025 Norman Hackerman Award in Chemical Research *(see page 9)* for his pioneering contributions to carbon dioxide (CO_2) electrochemistry.

Dr. Wang has advanced efficient methods to capture and convert CO_2 into valuable fuels and chemicals through innovative catalyst design and reactor engineering. His research enables sustainable energy solutions by leveraging the catalyst-electrolyte interface to efficiently capture and convert CO_2 into high-value chemicals and fuels. Notably, his development of highly selective single-atom catalysts and scalable electrochemical systems enables cost-effective, industrially relevant production, bridging fundamental chemistry with practical solutions for sustainable energy, carbon capture, and green manufacturing.

Stuart L. Schreiber, Harvard University, and Peter G. Schultz, Scripps Research, were honored as co-recipients of the Robert A. Welch Award in Chemistry *(see page 6)* for their foundational contributions to the field of chemical biology during the annual Welch Award reception and dinner.

Dr. Schreiber innovated molecular glues and chemical inducers of proximity, which made it possible to understand and chemically modulate living systems, and he developed therapies based on this knowledge. Dr. Schultz pioneered technologies that enabled the addition of new letters to the alphabet of life and leveraged chemical diversity to discover novel therapeutics and materials. Together, they have significantly advanced our ability to use chemical tools to affect biological systems, thus improving disease treatments, health outcomes, and materials science.

The 68th Welch Conference on Chemical Research *(see page 12)* was held on October 27-28 at the Post Oak Hotel at Uptown Houston. Themed “New Horizons in Drug Discovery,” it featured breakthroughs in the chemistry of drug design and drug discovery for the benefit of human health. The conference was chaired by Welch Scientific Advisory Board member Kevan M. Shokat, who is currently a Howard Hughes Medical Institute







Haotian Wang is named 2025 Hackerman Award recipient. | Stuart Schreiber *(left)* and Peter Schultz share the Welch Award. | Scientific Advisory Board member Kevan Shokat welcomes attendees to the 68th annual Welch research conference.

Investigator, Professor in the Department of Cellular and Molecular Pharmacology at the University of California at San Francisco, and Professor in the Department of Chemistry at the University of California at Berkeley.

The third Welch eXperimental (WelchX) Collaboration Retreat *(page 25)* welcomed 18 mid-career tenured or tenure-track Texas researchers in June to ideate on the retreat's theme, "Chemical Research for Grand Challenges." Attendees participated in topically focused chemistry meetings while fostering lasting research connections across Texas. Seven project proposals designed during the retreat received a one-year, $100,000 pilot grant to launch their research collaborations:

- Yimo Han, Rice University, and Yuanyue Liu, The University of Texas at Austin, "Stabilizing Copper Electrocatalysts for CO_2 Conversion"
- Benjamin Janesko, Texas Christian University, and MD Masud Rana, Lamar University, "Cyber Twin Chemical Ensembles for Near-Infrared-Emitting Graphene Quantum Dot Therapeutics"
- Ivan Korendovych, Baylor University, and Dino Villagrán, The University of Texas at El Paso, "Selective Bio-Inspired Electrochemical Probes for PFAS Analysis and Degradation"
- Samantha Kristufek, Texas Tech University, and Kayla Green, Texas Christian University, "CIRCUIT: Critical Ion Recovery Using Conductive and Ultrafiltration Intelligent Technology"
- Indrajit Srivastava, Texas Tech University, and Ognjen Miljanić, University of Houston, "'Ping-Pong' Afterglow Luminescence in Self-Assembled Molecular Cubes"
- Andy Thomas, Texas A&M University, and Raúl Hernández Sánchez, Rice University, "Accelerating Magnetic Resonance Imaging Contrast Agent Discovery via Rapid Injection NMR: Improving the Detection of Lithium for Disease Diagnostics"
- Fang Xu, The University of Texas at San Antonio, and Hong Wang, University of North Texas, "Visualize Molecular Adsorption on Supported Ni-Porphyrin Model Catalysts via Substitute Effect"

The Welch Postdoctoral Fellows of the Life Sciences Research Foundation Grant Program provides three-year fellowships at $100,000 per year to recent Ph.D. graduates to develop their research careers in Texas. In 2025, the Foundation awarded two fellowships *(see page 17)*:

- Kate Baumler, Baylor University, "Crystal Growth of Ln2Fe4Sb5 Phases Toward the Study of Novel Quantum Properties"
- Teng Yuan, Rice University, "Unlocking New Chemistry of Nonheme Iron Enzymes for α-Amino Acids and γ-Lactones Synthesis"

The Equipment Grant Program provides supplemental funding to small and mid-size Texas colleges and universities receiving Departmental Research Grants *(see page 19)*. In 2025, the Foundation awarded 13 equipment grants.

The Foundation in 2025 also welcomed Glenn H. Fredrickson, Mitsubishi Distinguished Professor in Functional Materials and Chemical Engineering at the University of California, Santa Barbara, as the newest member of its Scientific Advisory Board.







Ognjen Miljanić and Dino Villagrán brainstorm at the WelchX retreat. | Howard Payne University's equipment grant helps expand students' research. | Glenn Fredrickson joins Welch's Scientific Advisory Board.

The Welch Foundation: Advancing Chemistry for a Better Tomorrow

Created through the foresight and generosity of Texas oilman Robert Alonzo Welch, The Welch Foundation has provided unwavering support for fundamental chemical research at Texas universities, colleges, and institutions since its founding in 1954.

The Welch Foundation's dedicated Board of Directors, Scientific Advisory Board, and Foundation staff continue to honor Mr. Welch's intent to advance chemistry within the state of Texas and to shape a legacy of fueling discoveries that improve lives everywhere. With more than $1.1 billion invested in research grants and programs over the years, the Foundation does more than fund science—it nurtures talent, enables innovation, and honors a commitment to the public good. Every grant and award reflects Mr. Welch's belief that basic research is a wise investment—one that continues to pay dividends in knowledge, opportunity, and progress for generations to come.

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As stewards of The Welch Foundation's mission and resources, the Board of Directors maintains the integrity and drive of the original Foundation trustees to support chemical research in Texas and continue building a robust community of scientists improving lives through research.

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The Scientific Advisory Board, comprised of nationally renowned scientists, provides expert counsel to the Board of Directors on scientific matters central to the Foundation's mission. Members rigorously evaluate research proposals, recommend award recipients, and guide key programs such as the annual Welch Conference, which brings together global leaders in chemistry.

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Behind every Welch Foundation program, award, and grant is a team of dedicated staff, led by President Adam Kuspa, who ensure the Foundation's work is carried out with excellence, efficiency, and purpose. With professionalism and care, they support the Foundation's mission to advance chemical research and uphold the legacy of its founder.

Welch Award: Advancing Chemistry to Transform Biomedical Discovery

Stuart L. Schreiber and Peter G. Schultz created powerful chemical tools that transform how scientists understand and manipulate living systems. They shaped the field of modern chemical biology, and they continue to innovate systems that translate chemical research discoveries into medical solutions.

"Professor Schreiber and Professor Schultz, each in their own independent work, have pioneered exciting innovations at the nexus of chemistry, biology, and medicine. They have founded successful companies and institutes to accelerate drug development. With their broad and deep contributions to scientific knowledge and to improving lives through novel therapeutics, both are towering figures in chemistry and stellar recipients of the Welch Award," said Fred Brazelton, chair and director of The Welch Foundation.

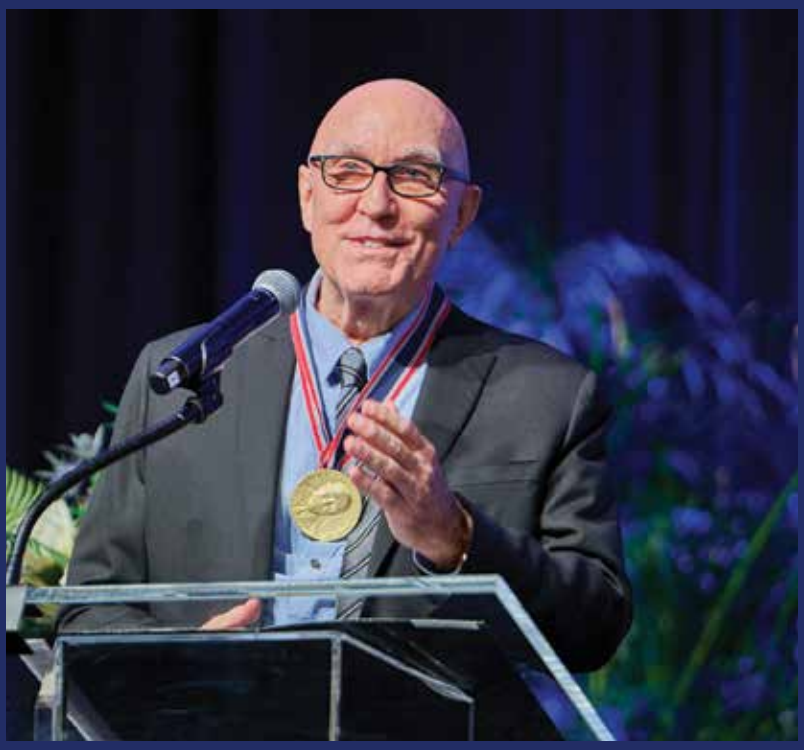
Although their discoveries differ in technique and focus, Drs. Schreiber and Schultz are aligned in mission and impact. Both contributed major molecular technologies that have become standard tools for probing and engineering biology, and both have translated fundamental chemical biology insights into practical platforms for discovering or designing therapeutic agents.

"These two Welch Awardees have pursued distinct yet complementary paths in their research," said Catherine J. Murphy, chair of The Welch Foundation Scientific Advisory Board. "We see their impact in our now much deeper understanding of how biological systems function and how we can influence those systems, leading to new drugs to treat disease and new materials that benefit society. Professor Schreiber and Professor Schultz have transformed biomedical research and inspired a whole generation of chemical biologists through their creativity, mentorship, and excellence in chemistry."

Dr. Schreiber, the Morris Loeb Research Professor at Harvard University, pioneered the use of small-molecule probes to reveal fundamental cellular signaling and gene regulatory pathways and the role they play in human disease. His early discoveries opened the door to controlling these pathways with precision when he demonstrated how small molecules can induce and mediate novel protein-protein interactions. His insights helped establish the field of chemical biology and sparked the development of modern therapeutic strategies for devastating diseases such as cystic fibrosis.

His research enabled the targeting of previously "undruggable" proteins and has contributed directly to the discovery of anti-malarial agents and compounds for cancer therapy. He continues to advance innovations based on molecular glues and chemical inducers of protein proximity, which have the potential to rewire cellular circuitry and prevent diseases like cancer that are influenced by gene activity.

"When Dr. Murphy called, the last thing on Earth I expected was the Welch Award. It was a complete surprise. For our field of chemistry, and my field of organic chemistry, it's probably the most special award out there. So, it was a moment of great joy," Dr. Schreiber said. "I got into science because of the joy it elicits and the deep feeling that I was doing the right, impactful thing



The

$500,000

Welch Award celebrates the outstanding achievements of scientists whose research has significantly improved lives.



Stuart Schreiber pioneered the use of small molecule probes as diagnostic tools. | SAB Chair Cathy Murphy salutes awardees.



Peter Schultz's groundbreaking work in chemical biology has led to new proteins, drugs, and materials.

to mitigate suffering and death from disease. It's great to have this recognition from The Welch Foundation, which is dedicated to advancing chemistry and improving life."

Dr. Schultz, president, CEO, L.S. "Sam" Skaggs Presidential Chair, and Professor of Chemistry at Scripps Research, first challenged the status quo by introducing one amino acid to the 20 traditional amino acids considered genetic building blocks of life. That initial expansion of the genetic code has since enabled site-specific incorporation of hundreds of unnatural amino acids into proteins across diverse organisms to create "synthetic" organisms with noncanonical amino acids. The ability to engineer these building blocks of life has fueled breakthroughs in biochemical tools and therapeutics with exquisite selectivity *in vitro* and *in vivo*.

Dr. Schultz also pioneered the development and application of large-scale "diversity-based" approaches to the discovery of novel proteins, drugs, and modern materials. He demonstrated how immune system diversity could be harnessed to evolve catalytic antibodies and, together with the 2019 Welch Award recipient Paul Alivisatos, showed that the base pairing interactions of DNA could be applied in materials science to guide the self-assembly of nanocrystals. The practical use of these new research directions have since become widespread. In recent work, Schultz and colleagues have advanced synthetic biology technologies that enable proteins to evolve continuously inside living cells, accelerating therapeutic protein engineering for cancer, neurodegeneration, and other diseases thousands of times faster than nature.

"The Welch Foundation is a really terrific asset, not only to the state of Texas, but to science. It was fun giving out Welch Awards when I was part of the Welch Scientific Advisory Board committee, and it's great receiving it," Dr. Schultz said. "It's an acknowledgment by the community that our science has had a significant impact on the scientific enterprise. The Welch Award also is a really nice recognition from the scientific community and from The Welch Foundation of the hard work and brainpower of my coworkers, postdocs, grad students, and collaborators over the years."

Dr. Schreiber earned his B.S. in Chemistry at the University of Virginia in 1977 and his Ph.D. at Harvard University in 1981 with Robert B. Woodward (recipient of the 1965 Nobel Prize in Chemistry) and Yoshito Kishi. His first faculty appointment was at Yale University; he returned to Harvard in 1988. Dr. Schreiber has trained over 150 outstanding individuals. He founded or co-founded Harvard Institute for Chemistry and Cell Biology (ICCB), the Broad Institute in 2004, and several companies, including Vertex Pharmaceuticals, one of the first biotech firms to use an explicit strategy of rational drug design, all with the goal of creating a community of chemists and biologists working together to advance science and improve human health.

He is a Howard Hughes Medical Institute Investigator Emeritus and member of the National Academy of Sciences, American Academy of Arts and Sciences, and National Academy of Medicine. His honors also include the Tetrahedron Prize for Creativity in Organic Chemistry (1997), ACS Arthur C. Cope Award (2014), Wolf Prize in Chemistry (2016), Nagoya Gold Medal Award of Organic Chemistry (2016), and Robert Koch Gold Medal (2024).

Dr. Schultz earned his B.S. in Chemistry from the California Institute of Technology in 1979 and also completed his Ph.D. there in 1984 under Peter Dervan (former chair and member of The Welch Foundation's Scientific Advisory Board, 2015-2024). Following postdoctoral work at the Massachusetts Institute of Technology with the 2010 Welch Award recipient Christopher Walsh, Dr. Schultz joined the faculty at UC Berkeley, with concurrent appointments at Lawrence Berkeley National Laboratory and the Howard Hughes Medical Institute. In 1999, he moved to Scripps Research. Dr. Schultz has founded or co-founded multiple institutes and companies focused on developing and applying innovative technologies to human health, including the Genomics Institute of the Novartis Research Foundation (GNF) and the Calibr-Skaggs Institute for Innovative Medicines, and mentored more than 300 students and postdocs into leadership roles in academia and industry.

He is a member of the National Academy of Sciences and National Academy of Medicine, and he served on The Welch Foundation's Scientific Advisory Board from 2003 to 2019. His recognitions include the Wolf Prize in Chemistry (1994), Paul Ehrlich and Ludwig Darmstaedter Award (2002), ACS Arthur C. Cope Award (2006), Science for the Future Ernest Solvay Prize (2013), Wieland Prize (2015), Tetrahedron Prize (2019), and Scheele Award (2023).

Hackerman Award: Spearheading Breakthroughs in Chemical Production

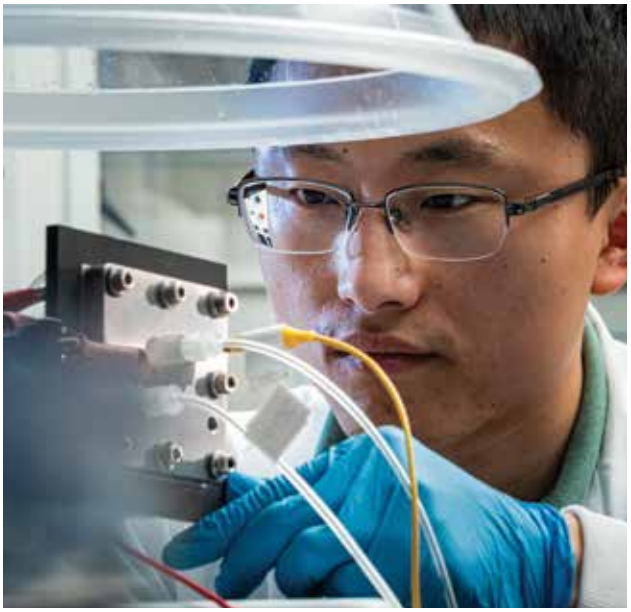
Industrial-scale chemical synthesis produces significant carbon emissions because it relies on fossil fuels. If it was possible instead to use renewable electricity and electrochemically convert carbon dioxide (CO_2) and other atmospheric molecules into fuels or chemicals, it would revolutionize chemical production while addressing climate change.

"I want to make today's centralized chemical factories that use oil and gas obsolete by replacing them with green and sustainable methods of chemical production," said Haotian Wang, associate professor in the Department of Chemical and Biomolecular Engineering at Rice University. "Electrochemistry will give us the tools to make chemicals using less energy, at a much lower cost, and significantly reduce the environmental impacts."

For his groundbreaking work in CO_2 electrochemistry, The Welch Foundation honored Dr. Wang with the 2025 Hackerman Award in Chemical Research. His research enables sustainable energy solutions by leveraging the catalyst-electrolyte interface to efficiently capture and convert CO_2 into high-value chemicals and fuels.

"Dr. Wang's use of electrochemistry to close the carbon cycle and develop renewable sources of industrial chemicals directly intersects with The Welch Foundation's mission of advancing chemistry while improving life," said Fred Brazelton, chair and director of The Welch Foundation. "We are proud to recognize his creativity and productivity by selecting him as this year's recipient of the Hackerman Award."

The Wang Group—also called the "CAT" Group, a reference to Dr. Wang's love of both cats and catalysis—studies fundamental reactions to develop novel nanomaterials and electrolyzers for energy and environmental applications, including energy storage, chemical and fuel generation, green synthesis, and water treatment.



Courtesy of Jeff Fitlow/Rice University.

Haotian Wang's work with CO_2 holds tremendous potential.

Dr. Wang's studies have laid a robust foundation for a broad range of practical applications, including electrochemical carbon capture, carbon conversion, and the electrosynthesis of clean fuels and chemicals.

His group was among the first to report how dispersed atoms of transition-metal catalysts show nearly 100 percent selectivity for CO_2 reduction, a significant improvement over bulk or nanosized catalysts. By dispersing metal catalysts as single atoms on substrates like carbon materials, Dr. Wang's group achieved electrochemical CO_2 conversion using less energy,

Named in honor of the long-time chair of Welch's Scientific Advisory Board, the

$100,000

Norman Hackerman Award in Chemical Research recognizes the accomplishments of chemical scientists in Texas who are early in their careers.





Haotian Wang's lab members celebrate with him as he accepts the Hackerman Award at a luncheon in February.



Welch's board members Fred Brazelton *(left)* and Carolyn Sabat and President Adam Kuspa congratulate Haotian Wang.

at a lower cost, and with fewer steps than conventional methods.

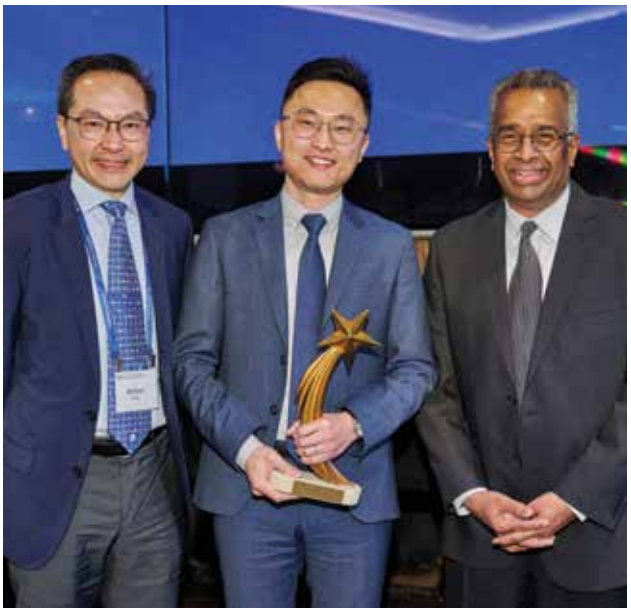
Dr. Wang also engineered a revolutionary porous solid-electrolyte reactor for continuous and direct CO_2 reduction into pure liquid fuels at industrially relevant reaction rates. The reactors could potentially reduce the electrochemical-synthesis costs by up to 80 percent by eliminating the now-necessary product purification steps.

He then demonstrated how the reactor could continuously capture carbon directly from the air (an approach called direct air capture), sparking dynamic research in CO_2 electrolysis and opening new opportunities to combat climate change. Dr. Wang also has pioneered use of the reactor to produce other key chemicals in a scalable, sustainable, and economical way. For example, he synthesized hydrogen peroxide in the reactor using only air, electricity, and water. In this process, too, the reactor was able to eliminate the energy-intensive, costly purification step required by conventional catalysis techniques.

"Dr. Wang's extensive body of work and rigorous pursuit of efficient electrochemical solutions to practical problems set him apart as a top innovator among early-career researchers," said Catherine J. Murphy, Scientific Advisory Board chair. "The Norman Hackerman Award recognizes rising stars in chemical research, and we look forward to watching Dr. Wang continue to shine brightly for many years to come."

Dr. Wang is committed to translating his research into practical applications. He co-founded a startup, Solidec, Inc., in 2023 to scale his innovations in low-carbon fuels, carbon-negative hydrogen, and carbon-neutral peroxide to commercial scale—proving the economic viability of a sustainable future. The company has been selected for the Chevron Technology Ventures' catalyst program, a Rice One Small Step grant, a U.S. Department of Energy Small Business Innovation Research grant, the first cohort of the Active Houston program, and as a finalist for the 2025 Houston Innovation Awards.

This pursuit of impact—designing fundamental research questions to solve practical problems—defines Dr. Wang's approach. Born in a small town in China, he earned his Bachelor of Science in Physics at the University of Science and Technology of China in 2011. He pursued his doctorate at Stanford University where he created novel catalysts and developed an electrochemical tuning technique for efficient catalysts inspired by lithium-ion battery studies. In 2016, he received a Rowland Fellowship to begin his independent career at Harvard University. In 2019, he joined the Rice faculty.



Rice's Michael Wong *(left)* and Ramesh Ramamoorthy congratulate Haotian Wang on receipt of the Hackerman Award.

"Dr. Wang has an exceptional ability to translate fundamental chemistry into marketable solutions and possible pathways to a product. Haotian is using the power of chemistry to prove CO_2 capture can work at scale," said Ramamoorthy Ramesh, Rice's executive vice president for research. "We are proud to have him at Rice. He's using chemical engineering to solve a big problem for humanity, everything that The Welch Foundation stands for."

Dr. Wang's research excellence is underscored by numerous accolades, including the 2024 inaugural Asian American Academy of Science and Engineering (AAASE) Rising Star Award, 2023 AIChE 35 Under 35, 2022 Hershel M. Rich Invention Award, 2021 Sloan Fellow, 2020 Packard Fellow, 2019 CIFAR Azrieli Global Scholar, and 2019 Forbes 30 Under 30. He has filed over 10 patents, published in *Nature, Science,* and several *Nature*-family journals, and has been designated a Highly Cited Researcher every year since 2018.

"The Welch Foundation has been instrumental to my mission to help tackle the world's environmental challenges and to educate the next generation to continue moving toward a low-carbon, greener future," Dr. Wang said. "We are blessed here in Texas to have their support of the fundamental science that drives innovation. I am honored to receive this prestigious award."

Welch Conference: Improving Life Through Chemical Advances in Healthcare

The Welch Foundation's 68th annual research conference, "New Horizons in Drug Discovery," explored recent advances in the development of new therapeutics. World-leading scientists shared their work across multiple areas of drug discovery research, with applications in the treatment of cancer, neurodegenerative diseases, infectious diseases, and genetic disorders. Held October 27-28 in Houston, the conference was offered both in-person and online.

Over the past century, the field of drug discovery has evolved from its origins in natural product chemistry into a highly interdisciplinary science. Advances in human genetics and a deeper understanding of the molecular bases of disease mechanisms have provided chemists with powerful tools to design new medicines. As a result, innovations in small molecules, nucleic acid–based therapies, and immune system engineering are enabling new approaches to treat a wide range of diseases.

"In the last decades, researchers have pinpointed the causative genes behind many diseases," said program chair Kevan M. Shokat, University of California, San Francisco, and member of the Foundation's Scientific Advisory Board. "Over two days, we brought together speakers working at the forefront of drug discovery who have come up with exciting new modalities to directly address and sometimes correct these diseases. Thank you to the distinguished speakers who shared their latest findings with us."

Pamela J. Bjorkman, California Institute of Technology, delivered the keynote address. She discussed next-generation vaccine design in her talk, "Towards a COVID-19 Vaccine to Protect Against SARS-CoV-2 Variants and Animal Sarbecoviruses Without Updating," highlighting her lab's mosaic nanoparticle approaches.

The 2025 Welch Award recipients, Stuart L. Schreiber and Peter G. Schultz, gave presentations on their latest research.

The conference was divided into four sessions over the two days. Kicking off the conference, Alex Johnson of Brandeis University led the "Drugs as Rescue Agents" session. The three presenters discussed the use of small molecules and nucleic acid–based therapies to restore or replace dysfunctional proteins, with a focus on genetic diseases and protein misfolding.

The "Living Therapeutics" session, led that afternoon by Emily C. Dykhuizen of Purdue University, featured two speakers who highlighted progress in treating cancer by reprogramming living cells of the immune system via smart-cell therapeutics and personalized RNA vaccines.

"Chemoproteomics & Drug Discovery" session leader Devin K. Schweppe of the University of Washington opened the second day. The three presenters showcased how innovations in mass spectrometry and covalent chemical library design are enabling the targeting of previously intractable proteins.

"Molecular Glues" was the final session of the conference. Led by Heeseon An of the Memorial Sloan Kettering Cancer Center, the two session speakers focused on the design of small molecules that induce proximity between proteins to modulate their function, an emerging paradigm inspired by natural products such as rapamycin, cyclosporin, and tacrolimus.



For

68 years

The Welch Foundation has hosted a research conference which draws leading scientists from around the world.



Poster submissions were displayed for in-person viewing at the conference. | Event chair Keven Shokat chats with attendee.



Keynote speaker Pamela Bjorkman shared her research on next-generation vaccine design.

Welch Conference Poster Session Debuts In-Person Format

For the first time, the poster session was displayed in-person as well as virtually on the conference event website, building on the success of previous virtual-only formats. The session drew 120 participants—twice as many as last year—across four categories: undergraduate, graduate, postdoctoral trainee, and laboratory head. Conference attendees had the opportunity to engage directly with the poster presenters in person and online to discuss their research.

Judges awarded prizes for first place (recognized with a monetary award of $2,500), second place ($1,000), and third place ($500) in each category based on effectiveness, coherence, scientific impact, and contribution of the author to the overall project. The awards went to:

UNDERGRADUATE STUDENTS

1. **Punarvash Mitta** (Rice University)—"Identifying TCR-T Target Epitopes via Integration of RNA-Seq Analysis and Mass-Spec Based Immunopeptidome in Sarcoma"
2. **Isabella Vasquez** (Texas Tech University)—"Second Window Surveillance: Albumin-Complexed Semiconducting Polymers for NIR-II Fluorescence Imaging of Pan-Ovarian Cancer"
3. **Alyssa Kornegay** (The University of Texas at San Antonio)—"Targeting TDP-43 Aggregation with Novel Small RNA Chaperones Using the FIT System"

GRADUATE STUDENTS

1. **Sachin Giri** (The University of Texas at Dallas)—"General Modular and Convergent Approach to Diversely Functionalized Allylic Systems"
2. **Muhammad Fiji** (University of Houston)—"Design Principles for the Synthesis of Self-Pillared ZSM-5 Zeolite Nanosheets"
3. **Linqi Cheng** (Rice University)—"Sequence Display-Enabled Machine Learning for Protein Evolution"

POSTDOCTORAL SCIENTISTS

1. **Teng Yuan** (Rice University)—"Biocatalytic Synthesis of N-Protected α-Amino Acids through 1,3-Nitrogen Migration by Nonheme Iron Enzymes"
2. **Sidhant Wagulde** (The University of Texas at Dallas)—"Nickel-Catalyzed Cross-Dehydrogenative Coupling of Aldehydes and Alkenes Toward Skipped Enones"
3. **Haoxin Li** (Scripps Research)—"A Covalent Molecular Clamp for TOE1 Illuminates Tunable Spliceosome Regulation"

LABORATORY HEADS

1. **Anju Sreelatha** (The University of Texas Southwestern Medical Center)—"A Repurposed AMP Binding Domain Reveals Protein AMPylation as a Regulator of Cellular Metabolism"
2. **Abdoulaye Djire** (Texas A&M University)—"Driving Selective Ammonia Catalysis via Sublattice-Nitrogen Chemistry of MNenes"
3. **Rafael Verduzco** (Rice University)—"Photoinitiated RAFT Copolymerization of α-Lipoic Acid and Acrylates for Degradable Polymers"



Pictured are poster contest winners *(from left)*: Teng Yuan, Haoxin Li, Linqi Cheng, Isabella Vasquez, and Alyssa Kornegay.

Welch Programs: Investing in Texas Researchers

Over its 70-plus year history, The Welch Foundation has invested in a range of initiatives across Texas to support its mission of advancing chemistry to improve life. Some of the programs highlighted in the following pages have been in place since the Foundation's early days; others are more recent, created to address new needs and leverage new opportunities.

Together, Welch programs offer support to scientists at all stages of their careers: exposing bright high school students to the joys of research, nurturing graduate students and postdoctoral fellows, and facilitating early, mid-career, and seasoned investigators. As the definition and reach of chemistry have expanded, so has Welch support, with newer programs designed to build the cross-connections and interdisciplinary explorations needed to tackle ever-more challenging questions. Viewed comprehensively, Welch funding is designed to ensure a solid foundation from which to continue growing the impact of Texas research.

The Welch-Hagler Fellows: Welcoming Renowned Chemists to Texas

The Welch-Hagler Fellows Program, now in its second year, brings internationally distinguished chemists to the Hagler Institute for Advanced Study at Texas A&M University for visiting appointments ranging from three to 12 months.

The Fellows engage in collaborative, high-impact research while at Texas A&M. Through this initiative, The Welch Foundation plays a role in recruiting quality faculty members and students to Texas.

"The Welch-Hagler Fellows Program is a perfect expression of our mission," said Fred Brazelton, chair and director of The Welch Foundation. "By bringing leading chemists to Texas A&M, we are strengthening Texas as a center of excellence in chemical research and also inspiring and training students."

In 2025-2026, the program supported three exceptional researchers. Joan B. Broderick of Montana State University is a leader in elucidating radical SAM enzyme mechanisms. Geoffrey W. Coates of Cornell University is widely recognized for pioneering advances in polymer chemistry, including more sustainable plastics. Tresa M. Pollock of the University of California, Santa Barbara, is renowned for developing high-strength alloys capable of withstanding extreme conditions.

Texas A&M also supports fellowships for graduate students working directly with the Welch-Hagler Fellows. This ensures that the program not only advances collaboration and discovery among established researchers but also cultivates the next generation of scientific leaders.

The Welch-Hagler Fellows Program was established in 2024 through a $10 million investment from The Welch Foundation, which was matched by a $5 million gift from Texas A&M alumnus Jon Hagler.

WSSP: Summer Scholars, Future Leaders

The Welch Summer Scholar Program (WSSP), founded in 1984, continues to cultivate the next generation of scientific leaders by providing exceptional high school students with a transformative introduction to research in chemistry. In 2025, the program reached new heights with a record 369 applications submitted from across Texas; 40 outstanding participants were selected.

71 years in, The Welch Foundation's

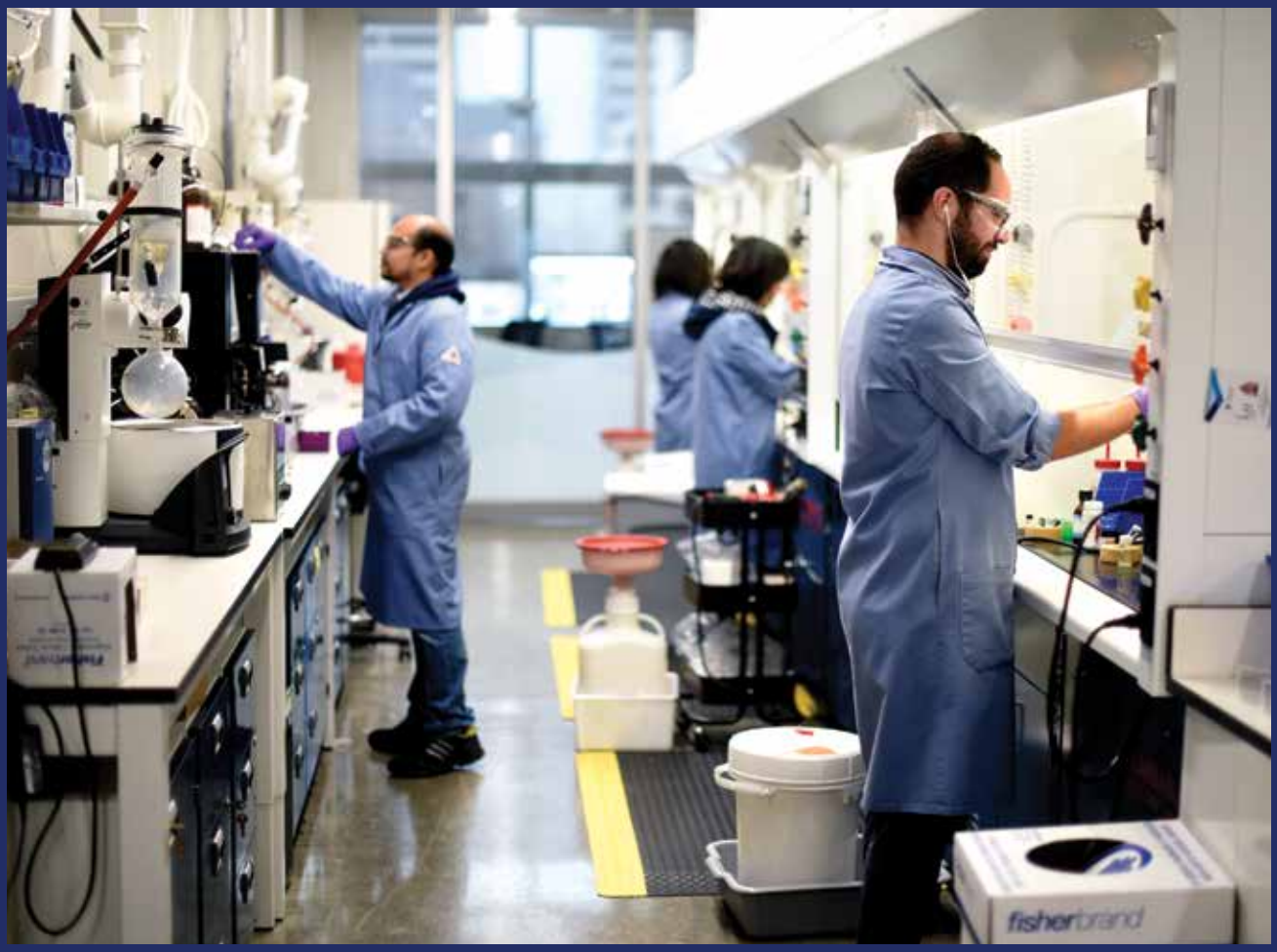
$1.1 billion+

in funding for chemistry research continues to spur innovative thinking with a range of programs.





Welch funding supports researchers ranging from high school students interested in chemistry to experienced scientists.



Cutting-edge scientific research pushes the boundaries of chemical knowledge in hundreds of laboratories across Texas.

"In 2025, the Welch Summer Scholar Program was again a resounding success," said Lauren Webb, WSSP director and Joseph & Jeanne Lagowski Professor in Chemistry at The University of Texas at Austin. "The WSSP is a unique and unparalleled opportunity for students to begin to gain the skills, knowledge, and experience necessary to become the next generation of scientists and leaders."

Over the course of five weeks, scholars—affectionately known as "Welchies"—lived and worked at one of six Texas universities, where they conducted independent research under the guidance of faculty and graduate student mentors.

Through hands-on investigation, students applied foundational classroom knowledge to explore original research questions. Along the way, they developed critical skills in laboratory safety, collaboration, and scientific communication. On the final day of the program, each participant presented their research via a scientific poster and oral presentation, mirroring the professional conference experience.

Since its founding in 1984, WSSP has introduced nearly 3,000 Texas high school students to chemical research. Students consistently describe WSSP as a transformative experience.

One 2025 participant shared that, "Being part of Welch truly changed the trajectory of my life. The experience, the community, and the opportunities it opened for me played a major role in my growth as a student and as a young researcher."

Postdoctoral Fellows: Bringing Young Talent to Texas

The Welch Postdoctoral Fellows of the Life Sciences Research Foundation Grant Program provides three-year fellowships to recent Ph.D. graduates from outside of Texas who are choosing to begin their chemical research careers within world-class Texas laboratories. Competition for the fellowships is fierce, and only the top two percent of applicants are accepted.

The grants support groundbreaking research across a range of fields including:

KATE BAUMLER, BAYLOR UNIVERSITY

By understanding where magnetism comes from and how electrons interact in solids, researchers can design better materials for future technologies, from advanced computing components to powerful medical instrument parts. To kick off that innovation pipeline, Welch Postdoctoral Fellow Kate Baumler spends her days in the lab growing single crystals of new materials with layered atomic structures that may exhibit unusual magnetic and physical properties.

"When we apply a magnetic field to the crystal, what happens? Usually, it doesn't align and stick nicely like a fridge magnet. It does weird things because it has frustrated magnetism. The spins compete and get stuck in complex configurations. That gives us some unexpected properties that are hard to predict, which is part of why we do it," Dr. Baumler explained.

Working in the research group of Julia Chan, Professor of Chemistry & Biochemistry and Fenn Family Chair in Materials Science at Baylor University, Dr. Baumler produces large crystals that can be oriented, measured, and studied with precision, allowing her to observe how electrons and atomic spins interact. Some contain square-net arrangements of atoms combined with magnetic elements such as cerium and iron, which give rise to novel behaviors. Her goal is to uncover emergent properties, which are characteristics that arise from interactions within a complex system that cannot be predicted from the individual components alone.

Progress depends on strategy, patience, and curiosity.

"We put these elemental precursors in a furnace at around 1,000 degrees and wait several days before we open it up to see our results. It's really fun," she said. "But we can't watch the reaction as it's happening. So, I have to be strategic: How do I change a variable and see what happens? How can I push it to a limit before it all falls apart and starts making something else? Why does it make something else? I really like to think about what the atoms are up to."

Dr. Baumler's path to crystallography began with early research experiences synthesizing nanoparticles as an undergraduate at Iowa State University. Later, while in graduate school at Pennsylvania State University, she manipulated known compounds with desirable features



Kate Baumler studies crystals to learn how materials behave.

into new compounds that cannot be synthesized directly. Frustration with the tools available to study those systems led her to single crystals. With single crystals, their large size (sometimes you can even hold them, turn them around, and look at them in your hand), long-range order of the atoms, and heavier elements offer clearer insight into how materials behave.

"Most materials are discovered by accident. Try as we might to make things on purpose, we never know for certain what will come out," she explained. "So, what makes chemists important in this space is trying to understand why things form a certain way and what happens if we can control, for example, very high-temperature reactions."

Dr. Baumler is deeply committed to mentoring students and communicating the excitement of discovery. She hopes to build a career that combines research with teaching, showing students that chemistry is fun and exciting.

"I like teaching through research," she said. "I am really excited about research and sharing that with other people. It's really fun to bring in students and show them that as much as materials chemistry can be really high level and complicated, the day to day is really understandable."

For her, every reaction still carries the possibility of surprise.

"The Welch Fellowship gives me security; that's the biggest thing. But it also lets me look into topics I'm really interested in, which helps me when I'm thinking about new ideas for my own research someday," Dr. Baumler said.

Support from the Foundation allows her to explore future directions, such as combining human intuition and serendipity with machine learning to identify promising materials chemistry no one has thought of yet.

She added, "It's the theme of everything I think about: How can we try to control and harness serendipity?"

ZIYI ZHANG, THE UNIVERSITY OF TEXAS AT AUSTIN

"It's just like cooking," insists Ziyi Zhang, an avid home chef and Welch Postdoctoral Fellow at The University of Texas at Austin, as he explains that synthesizing nanoparticles is the "easy" part of his project.

Dr. Zhang is designing organic ligands that link nanoparticles together with reversible bonds into "superstructures." By controlling, or tuning, the linking chemistry of these structures, he is engineering these bonds to be reversible in response to external stimuli, such as temperature, electric fields, or chemical environment, resulting in different functions and properties.

Tunable nanocrystal structures could enable advances in energy storage, optical materials, and adaptive electronics. For example, temperature-sensitive structures could function as "smart fuses" in batteries, temporarily disconnecting at high temperatures to reduce overheating risks and reconnecting when conditions normalize. Similarly, other nanoparticle assemblies could lead to optical coatings or devices in which light absorption changes on demand, like smart windows that dynamically regulate heat and light transmission.

"We are engineering bonds that reversibly form and break under controlled conditions. The final goal of this project is to show the tunability of this versatile system. But now we are in the very early steps of trying to explore those parts one by one," Dr. Zhang said.

The project involves two main steps. First, Dr. Zhang synthesizes inorganic nanoparticles that serve as the structural backbone. Then, the particles are functionalized with organic ligands, terpyridines, that allow them to connect through reversible metal coordination chemistry, forming higher-order three-dimensional networks.

His work is co-advised by Eric Anslyn, Welch Regents Chair in Chemistry and Distinguished Teaching Professor

at UT Austin, and Delia Milliron, Anthony C. Lembke Department Chair of Chemical Engineering and James and Judith Street Professor of Chemical Engineering at the University of Michigan.

A key scientific challenge lies in controlling the reversibility of the assembled structure. Because the linking kinetics depend on bond energies, the assembly responds sensitively to applied external stimuli, such as temperature gradients across the material. Dr. Zhang is exploring strategies to address this, including using multiple metal ions with different bonding strengths to create stepwise structural changes instead of simultaneous transitions.

"I am very grateful to The Welch Foundation for its support," he said. "The three-year term of the grant allows me to pursue longer-term scientific questions, develop an independent research direction, and plan ahead for expensive budget items. Also, I really enjoy the Welch Conference. It's a great opportunity for us young researchers to get together and express our crazy ideas."

Beyond the research itself, Dr. Zhang values mentoring undergraduate students and introducing them to hands-on laboratory work. Early exposure to real research, he believes, helps students understand how scientific discovery actually happens.

That's how it happened for him: "When I was an undergrad, I joined a lab and did my first synthesis on my second day. The second day, because the first day was training. That impressed me a lot because I was really making the nanoparticle just as easy as cooking. For me, I think chemistry is the same as cooking. I love cooking."

Looking ahead, Dr. Zhang hopes to continue a career focused on fundamental research and studying how chemical design at the smallest scales can lead to new classes of functional materials. For him, the uncertainty of fundamental science is part of its appeal: unlike engineering problems with predefined goals, exploratory research requires discovering the path forward step by step. That challenge, he says, is what makes the work exciting.

"In fundamental science, you only have a beginning point," Dr. Zhang explained. "You never know the final goal you can achieve. It's just in your mind, where you can imagine a goal. That's my driving force to keep me in this fundamental research field. You are trying to find your own path. That's very interesting."



Ziyi Zhang is developing tunable nanocrystal structures for use in energy storage, optical materials, and electronics.

Departmental Grants: Empowering Institutions, Expanding Opportunities

The Welch Departmental Grant Program helps position small- and mid-size Texas colleges and universities for long-term excellence in chemical research by promoting financial stability, funding scholarships and travel to industry conferences, and providing faculty with the resources needed to create hands-on laboratory experiences for undergraduate students. In 2025, Welch awarded departmental grants to 44 institutions, supporting research led by 246 faculty mentors and engaging more than 535 students.

To build additional capacity and enhance competitiveness with larger schools, Welch's Equipment Grant Program (now in its third year) provides support for laboratory equipment at Texas colleges and universities that are currently receiving funding under the Departmental Grant Program. In 2025, the Foundation awarded $975,000 in new equipment grants to 13 institutions. Those institutions in turn committed more than $390,000 in additional cost-sharing funds.

Together, these investments generate a powerful ripple effect across the research landscape in Texas. Discover how Welch departmental and equipment grants are helping two universities broaden research opportunities and amplify impact for Texas students.

HOWARD PAYNE UNIVERSITY

Howard Payne University (HPU), a Christ-centered liberal arts institution in Brownwood, Texas, is known for its close-knit academic community and strong emphasis on mentoring and personal connection. The Welch Foundation departmental grant aligns seamlessly with that mission, providing HPU students access to high-impact research experiences typically associated with much larger universities, especially through the university's annual Summer Research Symposium.

"The reason I started the symposium was that a lot of students were coming into the lab for the first time, and they were so scared to break something and make mistakes," said Associate Professor Dennis Gibson, the director for HPU's Center of Faculty and Student Research and one of the Welch grant's three faculty leaders.



Howard Payne students learn research methodologies in a summer symposium providing hands-on experience.

"My goal is to catch them early as freshmen or sophomores and get them into the lab over the summer," he explained. "They learn that failure is part of the process and to work through problems; they become resilient and benefit from that experience throughout their academic careers."

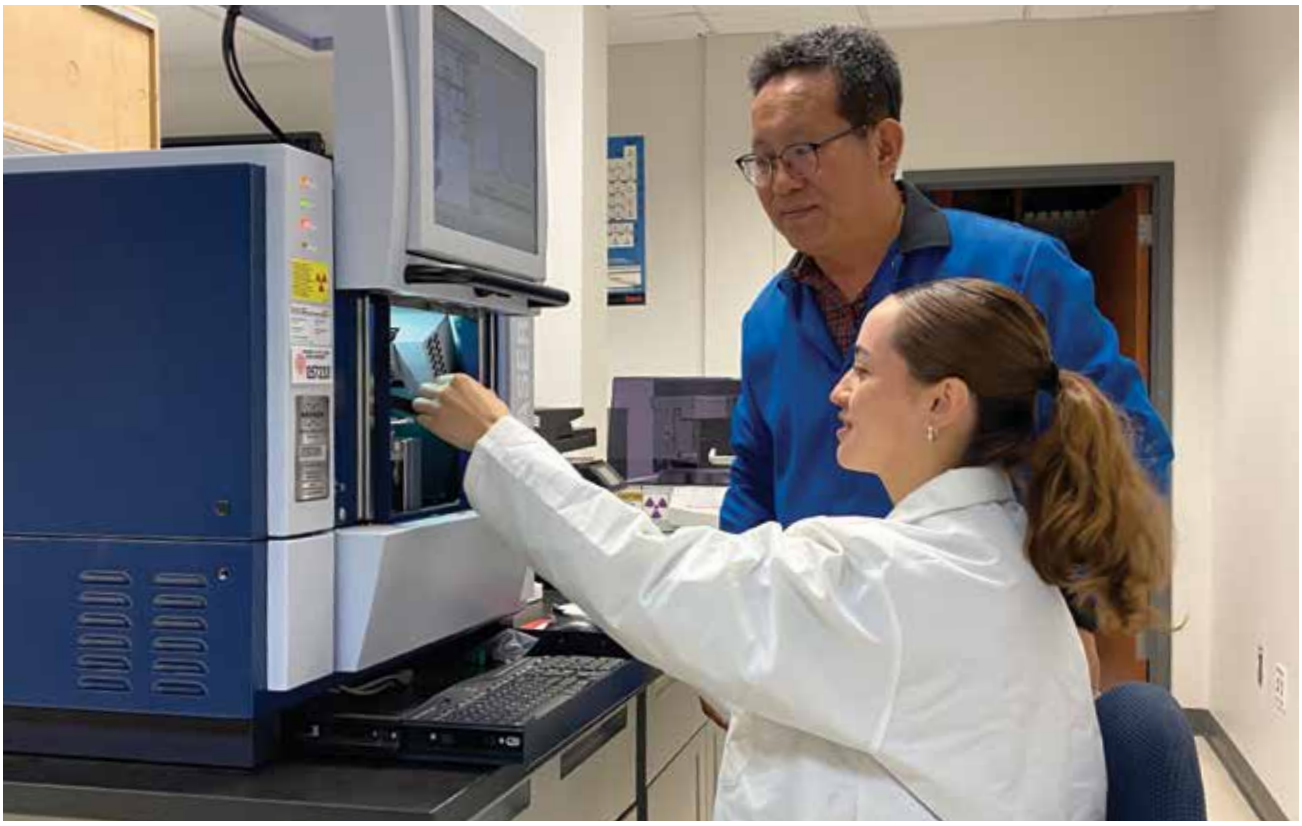
The four-week Summer Research Symposium centers on current, real-world problems in science, technology, engineering, and mathematics (STEM) and emphasizes student independence. Early in the program, faculty provide close, one-on-one guidance in lab safety, techniques, and instrumentation. As the weeks progress, the mentors step back. By the end of the summer, participants are largely self-sufficient: planning experiments, troubleshooting problems, and presenting their findings.

"This is the first time we've really been able to pay a large group of students to stay on campus and do research," said Dr. Gibson.

Last summer, during HPU's 4th Summer Research Symposium, seven undergraduates participated, four of whom received stipends funded by the Welch departmental grant to remain on campus and immerse themselves in full-time laboratory work. Seven local high school students also worked alongside the undergraduates. By funding lab materials, travel, and supplies in addition to the stipends, the Welch grant supports capacity building for the entire chemical research program.

Three major research thrusts are currently being supported by the Welch grant. The first focuses on identifying a cost-effective manner to measure the presence of microplastics. Traditional staining compounds used in microplastic analysis are expensive and require specialized suppliers. HPU students have discovered that crude extracts from some common plants can effectively stain microplastics and allow imaging under a fluorescent microscope. Because these materials are inexpensive and readily available at grocery stores, their approach could dramatically reduce barriers for researchers studying plastic pollution.

"When you're a small university, you have to think outside of the box to get an answer with the resources at your disposal. But by doing that, you think of a different technique that may not have been used historically to do analysis. Now you have developed a new, more accessible technique for your research project, and also for others as well," Dr. Gibson said.



Hong Young Chang introduces Sul Ross students to research methods and scientific inquiry with funding support from Welch.

The second project addresses a critical health issue related to eye drops used by individuals with Sjögren's syndrome, an autoimmune condition that limits tear and saliva production. Preservatives can cause harm with long-term use, but preservative-free eye drops are vulnerable to contamination by dangerous bacteria. Students are investigating whether naturally occurring compounds, such as free fatty acids, could inhibit bacterial growth in these eyedrops.

A third project has developed a recyclable, green chemistry method to extract a biopolymer that is commonly used in cosmetics, healthcare products, and a variety of medical applications. While details are limited due to ongoing patent considerations, this Welch-supported research emphasizes environmentally friendly methods for the biopolymer extraction, using non-harsh chemicals that can be recycled after the extraction is complete.

A major goal is setting up the students for future success. The students who participate in HPU's chemistry program and Summer Research Symposium usually are interested in continuing into pre-professional programs, like medical or pharmacy school, after graduation.

"At HPU, we have that small university, student-centered focus. I really enjoy being able to offer individuals specialized, very close to one-on-one training. Those experiences are very beneficial in getting students to the next step," said Dr. Gibson. "We are grateful that The Welch Foundation is helping us offer more opportunities for our students to succeed."

SUL ROSS STATE UNIVERSITY

At Sul Ross State University (SRSU), Associate Professor Hong Young Chang is building a research-driven learning environment. Supported by The Welch Foundation, he is providing students with hands-on experience in advanced chemistry, which will open pathways to graduate school, professional careers, and scientific discovery.

Located in the mountains above Alpine, Texas, a gateway to Big Bend National Park, the "Frontier University of Texas" is known for its small class sizes, close faculty-student relationships, and a 468-acre working ranch that serves its animal science programs. The university's chemistry program reflects these strengths, with a hands-on, mentorship-centered approach.

"Our chemistry program has one goal: to teach chemistry well," said Dr. Chang. "Especially for those students interested in agricultural, environmental, forensic, geological, health, or veterinary sciences, it is very important to teach research methods. They must learn how to access research and how to think like a scientist to succeed in their academic and professional careers."

A solid-state chemist by training, Dr. Chang completed his Ph.D. at the University of Houston, where his graduate studies were supported by The Welch Foundation. After completing postdoctoral work at Washington State University, he returned to Texas, he says, because of its thriving educational and research environment and strong commitment to science education.

Dr. Chang is currently the only chemistry professor in the SRSU program, with a recent hire in forensic science adding complementary expertise. Due to his loaded teaching schedule, he must reserve advanced research for the summer program. Despite limited personnel, he remains committed to expanding research opportunities for SRSU students.

"I'm grateful to The Welch Foundation for allowing undergraduate students to broaden their perspective on chemistry through their participation in the summer research program," Dr. Chang said. "Sul Ross State University is a relatively small university, but the students are very high quality and have a strong desire to study science."

Over the past five years, 13 undergraduate students supported by The Welch Foundation grant have participated in summer research. During the program, students learn how to design reactions, synthesize new compounds, analyze crystal structures, and measure the physical and optical properties of new transition metal oxide materials known as polyoxometalates (POMs). These complex materials can form asymmetric crystal structures that exhibit fascinating physical properties.

Dr. Chang emphasizes the importance of understanding how atomic-level structure influences material behavior. "I'm focusing on the relationship between structure and physical properties," he explained. "Students can see how chemistry connects to real physical phenomena."

The Welch Foundation has been instrumental in making this research possible. A supplemental equipment grant supported the purchase of a spectrometer for UV-visible reflectance and a thermal analyzer for simultaneous Differential Scanning Calorimetry (DSC) and Thermogravimetric Analysis (TGA), giving students access to tools typically found only at larger research institutions. The departmental grant also provides student stipends, allowing undergraduates to devote time to research without sacrificing financial stability.

The impact is substantial. Students gain experience in scientific communication, data analysis, and problem-solving—skills that translate directly into graduate study and professional careers. Research supported by Welch funding already has resulted in three peer-reviewed publications, with two more in preparation.

Looking ahead, SRSU hopes to hire additional chemistry faculty and further grow its teaching and research capacity. With support from The Welch Foundation, SRSU's chemistry program is demonstrating that high-impact research and close mentorship can thrive and create new opportunities for Texas students at small institutions.

Research Grants: Exploring New Science

Welch research grants are the most wide-reaching of the Foundation's programs, funding 314 principal investigators at 21 institutions with $31.7 million in 2025. This includes 85 new grants awarded to principal investigators at 16 institutions.

Each award provides $100,000 annually for three years to support early-stage research. Awards are made based on proposals submitted by Texas-based scientists and reviewed by the Foundation's Scientific Advisory Board. Welch plans to increase the annual amount to $117,000 next year.

The grants help early career scientists launch their research programs while providing stable and flexible funding for more established academics to explore new—and often unconventional—ideas. When those ideas show promise, Welch support makes it possible to develop the data needed to secure additional funding.

JODIE LUTKENHAUS, TEXAS A&M UNIVERSITY

Jodie Lutkenhaus, professor of Chemical Engineering at Texas A&M University, pursues diverse research interests spanning redox-active polymers, energy storage, polyelectrolytes, nanocomposites, and thin films and coatings, with a focus on developing redox-active polymers for energy storage and smart coatings. Her Welch Foundation funding supports her work with polymer batteries.

"Our goal is to develop organic, metal-free batteries from abundant materials that are easily recyclable," she explained.

Dr. Lutkenhaus studies polymers that are electrochemically active with fast charge transfer during redox events. This property makes these polymers excellent candidates for materials used in fast-charging portable electronic devices.

While potentially intriguing, creating efficient polymer batteries must overcome the challenge that they are typically poor at storing and exchanging electrons.

"Redox polymers are electrochemically active and can store charge, but they aren't as efficient at it as traditional metal-based batteries," she said. "Our group is digging into how charge is stored and transferred in these materials to understand how to address the rate-limiting issues of using soft organic materials."

Her research uses electrochemical quartz crystal microbalance with dissipation (E-QCMD) techniques to detect nanogram-level changes in mass in real time. This allows her team to track ions moving in and out of the polymers, a process difficult to observe by other means.

"The answers have been surprising," she said. "We've learned that these ions carry solvents as they move in and out. We are encouraged because this information helps explain the rate-limiting steps within redox-active polymers and gives us a new tool in designing the next generation."

Working with colleague and Welch Chair Karen Wooley, the two demonstrated that glutamic acid could be used to make batteries—the first fully biodegradable protein battery, in 2019. More recently, one of Dr. Lutkenhaus' foci has been on air batteries.

"Air is free," she noted. Her team is experimenting with reducing oxygen with air on one side of the battery and using electrochemistry on the other to provide high-density storage.

They also aim to develop batteries that can function in extremely low-temperature environments, such as the Arctic, as soft materials can move more easily when cold. If successful, flexible polymer batteries could have biomedical applications as well.

A Texas native growing up in the Dallas-Fort Worth area, Dr. Lutkenhaus studied chemical engineering at The University of Texas at Austin before earning a Ph.D. at Massachusetts Institute of Technology and completed



Courtesy of Texas A&M Engineering.

Jodie Lutkenhaus develops redox-active polymers for use in energy storage and smart coatings applications.



Courtesy of UTEP Marketing and Communications/J.R. Hernandez.

Dino Villagrán inspires his team to delve into electrochemistry research and to address energy and environmental issues.

postdoctoral training at University of Massachusetts Amherst. In 2010, she moved from Yale University to Texas A&M.

"Coming back to Texas let me plant roots and give back to my home state," she said. "Here, Welch Foundation grants provide the type of continuous funding that lets me explore new directions and develop interesting new approaches."

Among her many hats, she serves as Associate Dean for Research, Texas A&M College of Engineering and Associate Agency Director, Texas A&M Engineering Experiment Station.

DINO VILLAGRÁN,
THE UNIVERSITY OF TEXAS AT EL PASO

Dino Villagrán combines a drive to better understand the basics of electrochemistry with research focused on applying those insights to real-world energy and environmental issues. He is exploring the rational design of molecular systems and well-defined inorganic architectures to investigate electron transfer (ET) and electrocatalysis for the activation of small molecules of energy and environmental concern.

His lab spans physical, inorganic, and computational chemistry, using multiple-bonded bimetallic systems and organic macrocycle architectures to study multi-electron redox chemistry and delineate electron transfer reactions through covalent or hydrogen-bond pathways.

"Many of the most fundamental aspects of small molecule activation and the way we manipulate chemical bonds through redox processes are still not well understood," Dr. Villagrán, professor at The University of Texas at El Paso (UTEP), explained. "I have an incredibly diverse lab, trying to bridge the gap from basic electron transfer, quantum chemistry, and how electrons move to how we can apply those concepts to clean energy production and removing pollutants from water."

His group focuses on physical measurements and computational and theoretical studies. Using advanced synthetic techniques, they create novel inorganic, transition-metal compounds designed to activate small molecules and then study their electrochemical and magnetic properties. The goal is to synthetically manipulate the compounds' structure and bonding to tailor them to perform attractive multielectron redox chemistry.

For example, Dr. Villagrán is working to better understand the mechanisms of the electrocatalysis of water, both to produce clean hydrogen energy from water—"relatively simple on paper but complicated in real life," he notes—and to clean polluted water.

His aim is to create the means to detect, absorb, and destroy pollutants such as nitrates, found in fertilizers, and per- and polyfluoroalkyl substances (PFAS), human-made "forever" chemicals that are precursors to Teflon and used in firefighting. Stable and water-resistant, the very qualities that make PFAS useful also mean nature hasn't yet found a way to break them down. Dr. Villagrán believes that a better understanding of their basic chemistry allows a rational design approach. His team experiments with oxidizing small molecules by adding and removing electrons and using these electrochemical strategies to create sensors that can detect pollutants in water and then absorb and destroy them.

Growing up on the border, Dr. Villagrán studied chemistry at UTEP. After pursuing a Ph.D. at Texas A&M University with Welch Award recipient Al Cotton and postdoctoral work at the Massachusetts Institute of Technology with Dan Nocera (now at Harvard), he returned to teach at UTEP 14 years ago.

Dr. Villagrán says he finds it incredibly fulfilling to work with a student body composed of many first-generation, non-traditional, and Hispanic students like himself.

"I have been privileged to work with so many fantastic and brilliant students," he said. "The Welch Foundation has been transformative, allowing me to pursue truly fundamental research while addressing important environmental challenges."

Welch eXperimental (WelchX) Collaboration Retreat & Pilot Grants: Seeding New Cross-Connections

Now in its third year, the Welch eXperimental program has proven popular with researchers and effective in creating new connections among scientists in diverse disciplines and different institutions.

The 2025 collaboration retreat was held in Houston June 16-19, welcoming 18 early-to-mid career, tenure or tenure-track academics from 12 institutions. This year's theme was "Chemical Research for Grand Challenges."

Over three days, participants brainstormed creative, innovative, and collaborative ideas to address the most challenging and unexplored issues in climate science, including smart chemistry, clean energy, materials production and use, minerals processing, and clean water. Researchers paired off with colleagues in teams of two to create cutting edge cross-disciplinary research proposals to address these grand challenges.

Following the retreat, the Foundation awarded WelchX pilot grants to seven teams, representing 14 researchers from 12 institutions, including the two below. The pilot grants provide $100,000 for one year to allow them to test their concepts and build out a basis to secure additional funding to further advance the research.

BENJAMIN JANESKO,
TEXAS CHRISTIAN UNIVERSITY &
MD MASUD RANA, LAMAR UNIVERSITY

Researchers from Texas Christian University (TCU) and Lamar University are combining two computational approaches to tackle a challenge at the interface of medicine and materials science: the chemistry behind near-infrared emission in biocompatible graphene quantum dots (GQD).

Their project was inspired by the work of Anton Naumov, a physicist at TCU, who has been developing graphene quantum dots that chemically absorb and emit near-infrared light. Skin and bones are transparent in this light, giving these devices many possible applications in detecting and treating disease. However, it is unclear exactly how and why the dots behave as they do.

"Stable and bright near-infrared fluorescence is a special property, and there are still important questions about why these graphene quantum dots can do it," said Dr. Janesko, TCU professor and chemistry department chair. "It can be very challenging to make sense of the chemistry of these relatively large and disordered structures."

The project integrates AI-driven uncertainty quantification in "cyber twins," leveraging Masud Rana's research, with Dr. Janesko's atomistic simulation of chemical structure-property relationships. It uses computer simulations to help predict the chemical details of how and why these nanomaterials emit near-infrared light.

"The goal is to give our experimental colleagues a place to start in tuning the properties of their quantum dots," Dr. Janesko said.

His team began by searching the literature to identify graphene-type structures previously made by other researchers capable of absorbing and emitting near-infrared light. They found 17 chemical structures for Dr. Rana's group to use as a basis for their work.

The Lamar team designed a three-step process with AI machine learning to develop ensembles of chemically realistic GQD chromophore structures (the part of a molecule that absorbs and reflects specific light wavelengths). These structures are predicted to reproduce the size, composition, infrared absorption, and near-infrared absorption and emission of real graphene quantum dot samples.

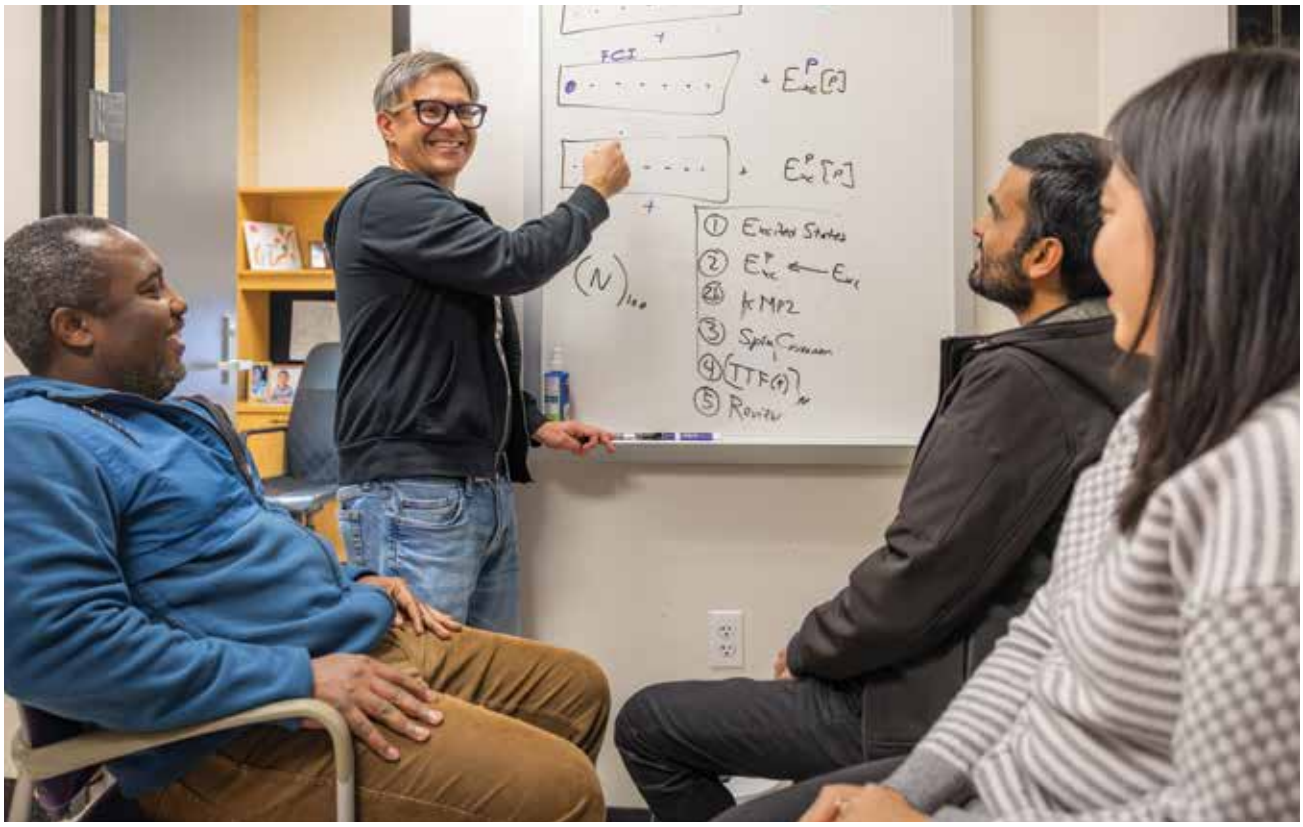
"We are very close to our goal of creating 10,000 structurally diverse and chemically reasonable candidate structures, and hopefully even more by the end of the pilot project," said Dr. Rana, Lamar University assistant professor of computer science.

"We have been working closely together with weekly team calls and periodic virtual meetings. We are starting to develop hypotheses as to why these systems perform as they do," Dr. Janesko added. "Once we wrap up this work, we plan to share our AI-driven simulations wth Dr. Naumov and work with his team to design experiments to test our hypotheses. Ultimately, we hope to help design new ways to turn these quantum dots into clinically useful tools."

The approach also can have broader applications, Dr. Rana reported. For example, he is using AI machine learning to analyze other systems, with another of his team hoping to improve methods for biomedical applications such as diagnosing lung cancer. A potential joint future project between the two WelchX researchers will involve graphene quantum dots' use in energy applications such as batteries.

"The WelchX experience was so special," said Dr. Rana. "Dr. Benjamin and I started comparing notes early on at the WelchX retreat as we are both in computation, although in very different disciplines. Together, we are able to expand the impact of our work."

"WelchX is catalyzing new kinds of interdisciplinary research across Texas," Dr. Janesko said. "Our research program here at TCU was built with Welch support.



Ben Janesko's lab at TCU is working closely with the AI expertise of Masud Rana and his Lamar team to understand the near-infrared emissions of biocompatible graphene quantum dots for applications in medical imaging.

Welch continues to help these programs grow by catalyzing cross-disciplinary and cross-institutional collaborations."

OGNJEN MILJANIĆ, UNIVERSITY OF HOUSTON &
INDRAJIT SRIVASTAVA, TEXAS TECH UNIVERSITY

Connecting at the WelchX retreat, Ognjen Miljanić and Indrajit Srivastava are combining their very diverse research expertise to create a new category of imaging tools that could be a "game changer" for medical imaging.

In their individual work, Dr. Miljanić, Moores Professor of Chemistry at University of Houston, is leveraging supramolecular and synthetic chemistry to design unique, self-assembled molecular "cages." Dr. Srivastava, an assistant professor at Texas Tech University, is an expert in bioimaging and nanoengineering who specializes in the development of novel polymer-based imaging probes.

In their WelchX research, they are integrating their individual expertise to develop what they call a "ping pong imaging probe." The goal is to create a brighter, more focused, and longer-lasting self-sustaining light that ultimately could improve surgical outcomes.

Current fluorescent-based probes face two major challenges: they require constant external light excitation to remain visible, and this continuous illumination creates significant background "noise," known as autofluorescence, as healthy tissues also reflect the light source, obscuring the target.

"He [Dr. Miljanić] had these very cool molecules, and I brought the nanoengineering and bioimaging expertise needed to translate them into a biological environment," Dr. Srivastava said.

"With Welch support, we are demonstrating proof of concept of a reversible reaction between singlet oxygen and molecular cages," Dr. Miljanić said. "By stabilizing this process within a nanoengineered polymer-protein matrix, we will be creating an afterglow that could provide the sensitivity needed for deep-tissue applications."

Dr. Srivastava is an expert in afterglow imaging, a technique that functions more like a battery than a mirror. Instead of reflecting light instantly, these probes soak up energy and "leak" it out slowly over time. This allows the target to glow in the dark long after the external light is turned off, providing a high-contrast map of the body with zero background interference.

The team is developing what they call a "ping-pong" probe, which combines two specialized components.



Ognjen Miljanić *(middle)* is working to create new imaging tools by combining the self-assembled molecular cages he designs with the work of his WelchX partner.

Dr. Miljanić's team has synthesized unique, cube-shaped molecular cages that act as a "trap" for oxygen molecules. When these cubes capture oxygen, they store light energy. As the oxygen "ping-pongs" inside the walls of the cube, it is continually reactivated, creating a sustained, steady glow.

Because these molecular cubes do not naturally dissolve in the body, Dr. Srivastava's lab uses nanoengineering to wrap them in a protective "shell" made of specialized polymers and proteins such as bovine serum albumin. This process, known as nanoprecipitation, makes the probes safe and effective for medical use.

This protective shell does more than just transport the cubes; it amplifies them. Dr. Srivastava has previously demonstrated that this specific protein wrap can make an afterglow five times brighter. By applying this engineering to the new molecular cubes, the team aims to reach a benchmark Dr. Srivastava previously set: a glow that lasts for 20 minutes. This long-lasting "battery life" would give surgeons a clear, stable view during complex procedures.

While challenges lie ahead, such as identifying the best compounds to preserve the cube's structure in water, the results to date have been very promising. The collaborators plan to investigate other geometries beyond the current cube to see how changing the internal space affects how fast they trap oxygen and how long the afterglow lasts.



Texas Tech's Indrajit Srivastava *(left)* brings his lab's expertise in bioimaging and nanoengineering to the WelchX project.

"The true blessing of Welch support is funding studies for crazy ideas and enabling results from explorations based on real scientific curiosity," Dr Miljanić said. "The WelchX program is a very welcome new way of looking at scientific collaboration in Texas. It is creating productive collaborations at completely unexpected intersections of research areas, and I am excited to see what will come of this."

Dr. Srivastava agreed, "The two of us would never have connected in any other way: different disciplines, different institutions, different stages in our careers. The WelchX program is a catalyst for combining my work in bioimaging with new molecular architectures to create exciting new science for Texas."

Welch Endowed Chairs: Keeping Talent in Texas

Welch has endowed 53 chairs at 20 institutions in the state, providing support for faculty positions to be held by outstanding, active research scientists who will advance basic scientific research in chemistry and allied sciences in Texas.

With the goal of providing a tool for universities to attract and retain top talent, Welch endowed chairs are only awarded to Texas educational institutions that have a Ph.D. program in chemistry. Generally, the institution is required to match the endowment funds dollar for dollar.

In 2025, Pernilla Wittung-Stafshede was named to The Charles W. Duncan, Jr.-Welch Chair in Chemistry when she joined Rice University.

These chairs were occupied by outstanding scientists who deepen and enhance the quality of chemical research in Texas with their teaching, research, and mentorship, including the two profiled below.

JANNETTE DUFOUR, DISTINGUISHED UNIVERSITY CHAIR, TEXAS TECH UNIVERSITY HEALTH SCIENCE CENTER

Jannette Dufour's research explores the role of Sertoli cells, found in testes, in regulating the immune response that protects developing sperm. The goal is to better understand the biochemistry mechanism to improve their protection capabilities and extend this ability to other tissues.

She draws upon her experience studying Sertoli cells' role in sperm development as a graduate student at Washington State University as well as later work on islet transplantation as a postdoctoral fellow with the Islet Transplantation Group in the Surgical Medical Research Institute, Department of Surgery at the University of Alberta, Edmonton, Canada. Now Distinguished University Professor and Chair at Texas Tech University Health Science Center (TTUHSC), Dr. Dufour brings this expertise to her research aimed at using Sertoli cells for cell-based gene therapy and leveraging their protective mechanism to improve the survival of islets, pancreatic cells that produce insulin and other hormones, when transplanted as a treatment for Type I diabetes.

"Our goal is to better understand how Sertoli cells regulate the immune response to enhance and target it," she said. "We have successfully found prolonged survival of islets when co-transplanted with these cells. Now we are learning how to improve the outcomes and expand this approach to other types of transplants, including xenotransplants between species, which would expand the availability of organs for life-saving treatments."

In other work, Dr. Dufour is exploring the flip side of the Sertoli cells' protective mechanism. Decreasing the body's immune response to prevent an autoimmune attack on sperm cells could potentially allow pathogens to survive.



Working with Sertoli cells, Janette Dufour seeks to understand their protective role in regulating the immune response and extend it to other tissues.

"How the immune system functions in male reproductive organs is different from other areas of the body," she said. "Studies have shown that Ebola- and Zika-infected male patients, for example, can sexually transmit the disease months after the patient has recovered and cleared the virus from the bloodstream because the virus can persist in the male reproductive tract. However, it doesn't appear that the pathogens survive in this reservoir indefinitely, most seem to disappear by six to 12 months."

A recent collaborative project is examining this process in virus-infected testes to uncover new pathways of immune regulation to allow for both protection of sperm and clearance of pathogens.

Dr. Dufour is Co-Director for Center of Excellence in Obesity and Cardiometabolic Research and Chair in the Department of Cell Biology and Biochemistry, School of Medicine and Graduate School of Biomedical Sciences at TTUHSC.

"We draw upon an amazing cross-section of expertise within the Texas Tech University System to fuel collaboration across disciplines and allow us to tackle fascinating questions," she said. "I am so excited to get to do work that I love and to take part in the vibrant research community here in Texas."

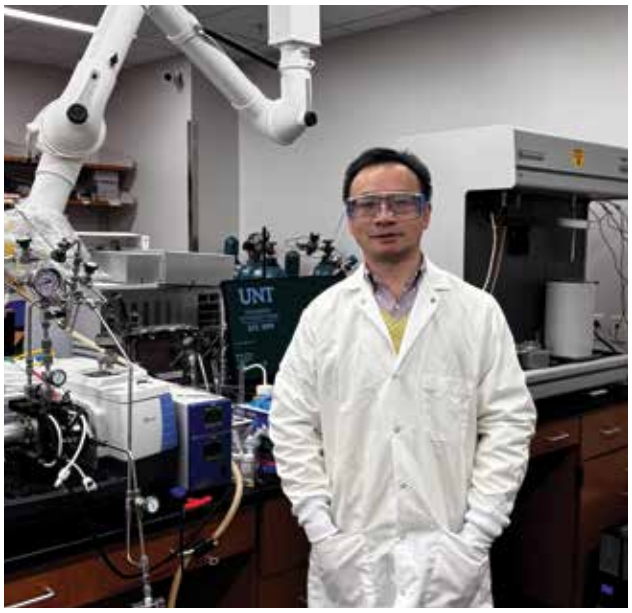
SHENGQIAN MA, WELCH CHAIR IN CHEMISTRY, UNIVERSITY OF NORTH TEXAS

"Welch support is so vital," said Shengqian Ma, University Distinguished Research Professor and Welch Chair in Chemistry. "It gives me the freedom to explore new ideas, with some of that early research growing into federally funded projects on the critical materials which are so important to this country."

His synthetic inorganic and organic materials research group focuses on task-specific design and functionalization of advanced porous materials. A key goal is to engineer the nanospace of advanced porous materials such as metal-organic frameworks (MOF), covalent organic frameworks (COF) and porous organic polymers (POP) for energy, biological, and environmental applications.

"The space within nanoporous materials provides virtually unlimited room for imagination, allowing designed incorporation of different functionalities for numerous potential applications," he explained.

Dr. Ma's current Welch-funded research is exploring how to extract lithium and rare earth metals from water,



Shengqian Ma is working with advanced porous materials to create energy, biological, and environmental applications.

including geothermal sources, brine lakes, seawater, and produced water, a byproduct of oil and gas operations.

"At concentrations of parts per million, it has not been practical previously to harvest these metals," he noted. "But our approach is aimed at changing that." He points to a pending federal grant proposal to recover lithium from produced water.

Such task-specific COF/POP-based "nano-traps" also can be used to treat water by removing a range of pollutants, including heavy metals, oil, and micro-pollutants.

In related research, his team is developing methods to recover and recycle critical materials such as platinum, palladium, and rhodium from catalyst waste and gallium manufacturing streams.

Some other current projects are employing MOFs/COFs/POPs as precursors for the synthesis of microporous carbon materials and nanostructured oxide materials for applications in fuel cells, energy storage, and electrocatalysis, including converting carbon dioxide captured from the atmosphere into fuels.

While much of his work is focused on inorganic applications, Dr. Ma also is using Welch support to explore applications for nonporous materials in the biomedical and biophysical spaces. For example, his team is using COFs to gain a better understanding of the biophysical conditions of protein translocation across cell membranes. His team also is employing MOFs as a new platform to understand the behaviors of enzymes/proteins in confined/crowded environments.

"As far as I know, we are probably the only group doing this," Dr. Ma said. Based on early results, his team has two NIH proposals pending to expand the research.

"Welch lets us explore creative, innovative, and unprecedented ideas and build the preliminary results that let us obtain more funding. I call this 'frontier' research, and it has been very productive," he said.

After undergraduate work at Jilin University in China, Dr. Ma earned a Ph.D. at Miami University in Ohio in 2008. He completed a two-year Director's Postdoctoral Fellowship at Argonne National Laboratory before starting his faculty career at University of South Florida. He was promoted to full professor in 2018 and joined the University of North Texas in 2020 as the Welch Chair in Chemistry.

Catalysts for Discovery: Powering Chemical Breakthroughs in Texas

The Catalyst for Discovery Program provides large, multi-year grants to collaborative research teams in Texas that are addressing significant scientific challenges for the benefit of humankind. Each year, Texas institutions with strong chemical research programs are invited to submit proposals for five-year projects in all subfields of chemistry, as well as related areas such as biochemistry, chemical biology, chemical engineering, materials science, and nanoscience. Grants of up to $5 million each are awarded to a maximum of two highly meritorious proposals annually. This level of support is calibrated to give investigators the flexibility and resources to pursue ambitious ideas with minimal administrative burden.

Through this initiative, the Foundation seeks to stimulate innovative partnerships, strengthen the research landscape in Texas, and encourage major discoveries that expand the frontiers of chemical science. In 2025, The Welch Foundation supported 28 investigators at four institutions through six ongoing Catalyst grants.

JEFFREY D. RIMER, UNIVERSITY OF HOUSTON

When Jeffrey D. Rimer, Abraham E. Dukler Professor of Chemical Engineering at the University of Houston, was introduced to The Welch Foundation's Catalyst for Discovery Grant Program, he immediately recognized that it was a "perfect fit" to expand his collaborative work on unconventional crystal formation into areas where

fundamental chemistry could drive major real-world impact, particularly in pharmaceutical manufacturing, but also in biology and industrial catalysis.

With the Catalyst grant, the Welch Center for Advanced Bioactive Materials Crystallization was born. The center's most fundamental mission is to improve scientific understanding of how crystals form.

Polymorphism is the concept that a single compound can crystallize into multiple structures with dramatically different properties, and it poses a major challenge for drug development.

"Some pharmaceutical ingredients can crystallize five, 10, or more different polymorphs. Controlling crystal structure is critical because one specific polymorph may be very effective for a particular drug treatment, while other polymorphs may be significantly less impactful. You need to understand how these crystals form to make a desired product," explained Dr. Rimer. "Our thought process was that this is a perfect application for thinking about how to control nucleation."

By targeting the earliest stages of crystal nucleation—the stage wherein an initial clustering (nucleus) will develop into a crystal form—the center aims to develop predictive models and insight into how to control these systems so that specific crystal forms can be reliably produced.

The center is focusing primarily on "nonclassical" pathways of nucleation and crystal growth, complex processes that depart from traditional crystallization models and remain poorly understood. Understanding these nonclassical systems has emerged in the crystallization community as the next frontier.

"It's kind of ironic that we call these nonclassical because the more examples we see, it looks like the nonclassical pathways might actually be the more conventional or at least the more frequently encountered route. We might have to revisit what we call classical and nonclassical," said Dr. Rimer.

Another defining feature of the center's research is its exploration of non-conventional strategies to control crystallization.

These include the use of molecular modifiers to influence nucleation, the design of nanoparticles with structured interfaces to direct crystal formation, and the creation of charged polymer coacervates that serve as confined environments for controlled crystallization.



UH's Jeff Rimer *(front row, right)* is leading a team of multidisciplinary scientists to better understand unconventional crystal formation and unlock its potential benefits for drug development, biology, and industrial catalysis.

Complementing these experimental efforts is a strong emphasis on integrating theory, computation, and simulation to move beyond trial-and-error approaches and toward robust predictive models. This is where Professor Rimer's collaborators, Peter G. Vekilov, Alamgir Karim, T. Randall Lee, Jeremy C. Palmer, Gül Zerze, and Francisco Robles, come in to solve this problem from all angles.

"The support from The Welch Foundation has been critical in bringing our people together. We are using most of the funding to support multi-PI (principal investigator) teams and dedicated student researchers. The Catalyst grant has broken down the common barriers associated with personnel resource sharing," Dr. Rimer said.

This collaborative strength has also laid the foundation for long-term impact beyond the grant period, including the development of an industry-facing consortium, with strong interest from pharmaceutical partners.

"We want to be able to show The Welch Foundation the impact of its investment. And the team of investigators we have been able to put together, thanks to the Welch Catalyst grant, played a big role when we had our first Industrial Advisory Board for the center," Dr. Rimer said. "They described our collaboration as invigorating. It made a big impact in convincing them that what we offer would benefit their companies."

With a future plan to establish a consortium, the center seeks to translate fundamental chemical insight into practical strategies for controlling crystallization across medicine, biology, and industry—demonstrating the unique and enduring value of Welch support.

"All of us feel very fortunate for The Welch Foundation," Dr. Rimer added. "It really gives researchers in Texas such an advantage. To find funding elsewhere, we would have had to alter our goals to fit within a certain box. Because Welch is focused on fundamental chemistry, it gives us a lot of latitude to pull together creative, cross-cutting ideas. The Welch Catalyst grant has allowed us to design the type of interdisciplinary center that we long envisioned."

DAMIAN W. YOUNG,
BAYLOR COLLEGE OF MEDICINE

Finding a new drug often begins with a simple question: Can we discover a molecule that binds to and changes the behavior of a disease-causing protein? For decades, answering that question has required testing compounds one at a time. In the most advanced pharmaceutical laboratories, scientists may screen one to five million molecules during a research campaign.

With support from a Welch Catalyst grant, Damian Young, director of the Center for Drug Discovery and Professor of Biochemistry and Molecular Pharmacology and Pathology & Immunology, and his co-investigators Martin M. Matzuk, Zhi Tan, and Mingxing Teng at Baylor College of Medicine are developing DNA-encoded chemical libraries (DELs) that allow researchers to screen billions of compounds together in a single test tube.

Typically in drug discovery, researchers identify a protein of interest that they think is involved in a disease. Their goal is to find a molecule that may modulate that protein's function. There are many ways to screen for these molecules, but DELs are unique in scale and efficiency.

In most screening technologies, every individual compound must be "spatially arrayed," which means each compound is identified and tested separately in its own test tube. With DELs, in contrast, each compound is tagged with a unique DNA "barcode," and billions of tagged compounds are put into one mixture in one test tube.

Researchers introduce the protein of interest into the billion-compound mixture, using the protein as bait to fish out the molecules that bind to it. By sequencing the DNA tags attached to the molecules that bound to the protein, scientists can rapidly identify which compounds were successful. Thus, instead of running millions of individual tests, the process becomes a single, powerful selection experiment.

"We screen all those molecules in one test tube, instead of one billion test tubes," said Dr. Young. "The efficiency of this approach allows us to explore chemical space at a scale that just isn't possible with traditional screening. And the more chemical possibilities we can sample, the greater our chances of finding the magic bullet in one experiment."

While DEL technology holds enormous promise, it presents major chemical challenges, especially since, historically, it has been utilized primarily by secretive pharmaceutical companies.

"There was a lot of innovation that needed to occur in terms of the chemistry and how we build these billion-compound mixtures. The technology, at least



Damian Young's team is developing DNA-encoded libraries that allow researchers to efficiently screen for drug candidates.

in the literature, had not progressed very far, since we are one of the first organizations to utilize it in an open, academic environment," said Dr. Young. "What we're doing now really gives it a new life that will hopefully be implemented in companies and beyond."

One major challenge is that all the reactions must be performed in water to keep the DNA tags stable and readable. Yet water can interfere with the progression of many chemical reactions. At the same time, the reactions must not damage the DNA tags or scientists will never be able to identify a successful hit.

To address this, Dr. Young's team is pioneering what they call "DNA-preserving reactions." These newly developed chemical strategies are designed to protect the DNA tag while still allowing the creation of diverse, complex molecules.

This technical advance has broad implications.

If the DNA identifier is damaged during the construction of a library, promising molecules may be missed entirely. By improving DNA integrity during reactions, the team believes they can reveal binding compounds that earlier methods failed to detect.

"We have to think creatively in terms of how we're going to get a reaction to occur in a solvent that's really highly reactive and that has all that DNA. It really pushes us to rethink fundamental chemistry in new ways," said Dr. Young.

Dr. Young's team is working to use DELs not just to find initial hits, but also to optimize them by building focused follow-up libraries and iteratively selecting for better binders. The project also integrates machine learning to predict promising candidates and guide future library design.

"I am really grateful to The Welch Foundation for recognizing the power of this technology and also valuing that it requires a new type of chemistry. There is a real need for fundamental research that helps researchers succeed in their own respective domains," he says. "We are innovating these DNA-encoded libraries and DNA-preserving reactions, and then others can access these tools to target cancer, cardiovascular disease, neurological disorders, and whatever else they're working on. We're having fun with it, and I'm grateful that it continues to evolve as new ideas emerge."

Statements of Financial Position

AS OF AUGUST 31, 2025 AND 2024

	2025	2024
ASSETS		
CASH AND CASH EQUIVALENTS	$ 21,111,831	$ 484,672
INVESTMENTS	900,904,732	887,201,857
RECEIVABLES		
Investment transactions	667,151	214,865
Interest and dividends	1,799	87,425
Other	115,678	256,639
Total receivables	784,628	558,929
OTHER ASSETS		
Asset held for sale	981,000	—
Right of use assets	1,304,771	1,808,237
Other assets	2,571,086	1,970,067
Total other assets	4,856,857	3,778,304
TOTAL ASSETS	$ 927,658,048	$ 892,023,762
LIABILITIES AND NET ASSETS		
LIABILITIES		
Unpaid grants	$ 30,634,907	$ 37,996,829
Current and deferred federal tax payable	3,196,407	3,499,817
Operating lease liability	1,527,380	2,048,374
Accounts payable and other	382,971	620,679
Total liabilities	35,741,665	44,165,699
NET ASSETS	891,916,383	847,858,063
TOTAL LIABILITIES AND NET ASSETS	$ 927,658,048	$ 892,023,762

Statements of Activities

AS OF AUGUST 31, 2025 AND 2024

	2025	2024
REVENUES, INCOME, AND GAINS (LOSSES)		
Interest and dividends	$ 9,998,909	$ 9,010,230
Oil and gas royalties and other	2,918,253	4,969,093
Net realized gains on sales of investments	39,795,028	22,870,042
Unrealized appreciation (depreciation) of investments	32,890,627	58,395,437
Unrealized appreciation (depreciation) of other assets	(977)	949
Investment management expenses	(3,128,304)	(2,991,050)
Federal income and excise tax provision	(1,183,355)	(431,335)
Total revenues, income, and gains	81,290,201	91,823,366
EXPENSES		
Grants approved, net	32,018,657	54,596,035
Grants administration	3,173,060	3,138,142
General and administrative	2,185,376	2,457,234
Total expenses	37,377,093	60,191,411
DEFERRED FEDERAL EXCISE TAX PROVISION ON UNREALIZED CAPITAL GAINS	145,212	(846,013)
CHANGE IN NET ASSETS	44,058,320	30,785,942
NET ASSETS, beginning of year	847,858,063	817,072,121
NET ASSETS, end of year	$ 891,916,383	$ 847,858,063

For the Foundation's complete audited financial statements, please visit www.welch1.org.

Research Grants

The Welch Foundation supported 314 active research grants at 21 institutions in 2025.

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Girish Agarwal	*Texas A&M University*	Correlated Supersensitive Absorption, Fluorescence and, Polarization Microscopy With Quantum Illumination
Erez Aiden	*Baylor College of Medicine*	Determining the Mechanistic Basis of Chromatin Looping
Caroline Ajo-Franklin	*Rice University*	Elucidating the Chemical Principles That Underlie Multiscale Assembly of Living Materials
Alessandro Alabastri	*Rice University*	Understanding the Role of Structured Light in Controlling Transition Rates and Selectivity During Photoelectron-Driven Catalysis Using Optical Metasurfaces
Alison Altman	*Texas A&M University*	Chemistry at Small Energy Scales: Controlling Magnetic Interactions in f-Elements Through Inverted Ligand Field Environments
Neal Alto	*The University of Texas Southwestern Medical Center*	Post-Translational Modification of Host Enzymes by Bacterial Effector Proteins
Xiaochen Bai	*The University of Texas Southwestern Medical Center*	Developing Insulin-Alternative Molecule for Effective Treatment of Diabetes
Carlos R. Baiz	*The University of Texas at Austin*	Polaritonic Solvents to Control Chemical Reactions
Lane A. Baker	*Texas A&M University*	Quantifying Single-Entity Electrocatalysts
Aaron Baker	*The University of Texas at Austin*	Integrating ToF-SIMS and Atomic Force Microscopy for Chemical and Mechanical Mapping of the Glycocalyx
Matthew Baker	*The University of Texas Health Science Center at Houston*	Structural Characterization of Chimeric Antigen Receptors and Their Interactions With Tumor Associated Antigens
Edoardo Baldini	*The University of Texas at Austin*	Coherent Chiral Inversion in Hybrid Organic-Inorganic Materials
Zachary T. Ball	*Rice University*	New Strategies for Catalytic Bond Formation
Laura A. Banaszynski	*The University of Texas Southwestern Medical Center*	Characterizing the Role of Novel H3.3 Interacting Proteins in Enhancer Activation
Sarbajit Banerjee	*Texas A&M University*	Anion Intercalation as a Means of Dynamically Reconfiguring Electronic Structure in Metastable Solids
David P. Barondeau	*Texas A&M University*	Mechanism of [4Fe-4S] Cluster Cofactor Biosynthesis
Brian Belardi	*The University of Texas at Austin*	Towards a Synthetic Cell: *In Situ* Reconstruction of Membrane Proteins
Eric R. Bittner	*University of Houston*	Quantum Entanglement and Many-Body Dynamics in Low-Dimensional Molecular Assemblies
Joshua D. Bocarsly	*University of Houston*	Discovery and Control of Quantum Materials Using Electrochemical Intercalation

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Steven Boeynaems	*Baylor College of Medicine*	Dissecting the Biochemistry of Innate Immune Activation
Jakoah Brgoch	*University of Houston*	Activating Nobel Metal Charge Transfer Toward Unusual Oxidation States
Jennifer S. Brodbelt	*The University of Texas at Austin*	Structural Heterogeneity of Proteins in the Gas Phase
Maurice S. Brookhart	*University of Houston*	Pd(II)- and Ni(II)-Catalyzed Olefin Polymerizations and Copolymerizations
Kevin Burgess	*Texas A&M University*	New Approaches to Peptide Helix and Loop Mimicry for Impeding Protein-Protein Interactions
Michael Buszczak	*The University of Texas Southwestern Medical Center*	Developing Ribosome Biogenesis Inhibitors for the Treatment of Disease
Cassandra E. Callmann	*The University of Texas at Austin*	Uncovering Molecular Design Principles in Heavy Metal-Binding Glycopolymers
Pieremanuele Canepa	*University of Houston*	Exploring Links Between Vibrational and Configurational Entropies in Complex Oxides via First-Principles and Machine Learning
Xinyun (Sherry) Cao	*The University of Texas Southwestern Medical Center*	Uncovering Novel Mechanisms of Bacterial Transcription and Regulation
Brad Carrow	*University of Houston*	Modular Catalytic Approach to Telechelic Polymers and Improved Plastics Recycling
Can Cenik	*The University of Texas at Austin*	Transcriptome-Wide Measurement of Translation Using a Novel On-Chip Isotachophoresis Approach
Elif Cenik	*The University of Texas at Austin*	Beyond Ribosome Biogenesis: Role of RNA Polymerase I in Germline Chromosome Condensation
Julia Y. Chan	*Baylor University*	Topology, Magnetism, and Electron Correlations in a Hybrid Kagome Lattice
James Chappell	*Rice University*	Recording Intracellular Chemicals Across Microbial Consortia Using Programmable Allosteric Ribozymes
James R. Chelikowsky	*The University of Texas at Austin*	New Computational Methods for Molecular Fingerprinting of Complex Hydrocarbon Mixtures
Songtao Chen	*Rice University*	Fluorescence and Spin Properties of Quantum Defects in Silicon
Tai-Yen Chen	*University of Houston*	Mapping Membrane Viscosity at Single-Molecule Scale
Zhijian J. Chen	*The University of Texas Southwestern Medical Center*	Regulation and Function of STING-Induced Autophagy
Jae-Hyun Cho	*Texas A&M University*	Deep Mechanistic Understanding of How SARS-CoV-2 Evades Host Innate Immune Responses
Yuh Min Chook	*The University of Texas Southwestern Medical Center*	Karyopherin-Mediated Nuclear Import of Ribosomal Proteins
Melanie H. Cobb	*The University of Texas Southwestern Medical Center*	Regulatory and Catalytic Properties of MAP Kinase Cascades
James J. Collins	*The University of Texas Southwestern Medical Center*	Regulation of Parasite Reproduction by a Non-Ribosomal Peptide
Robert J. Comito	*University of Houston*	Complex Amine Synthesis by Catalytic Imine Photochemistry

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Maralice Conacci-Sorrell	*The University of Texas Southwestern Medical Center*	Elucidating the Molecular Functions of the Tryptophan Metabolite Indole-3-Pyruvate
Qian Cong	*The University of Texas Southwestern Medical Center*	Identification of New Regulatory Proteins for Enzymes in Human Pathogens
Jacinta C. Conrad	*University of Houston*	Non-Equilibrium Dynamics of Soft Nanoparticle Glasses
Lydia M. Contreras	*The University of Texas at Austin*	Expanding *In Vivo* Structural Characterization Tools to Map Complex Molecular Features and Cellular Networks That Support RNA Function
David R. Corey	*The University of Texas Southwestern Medical Center*	Identifying RNA-DNA Regulatory Switches and Controlling Their Formation With Small Molecules
Thomas R. Cundari, Francis D'Souza, & Jeffry A. Kelber	*University of North Texas*	Collaborative Research: Sustainable Ammonia Production from Nitrogen via Electrochemical and Photochemical Methods
Pengcheng Dai	*Rice University*	Transport, Magnetic, and Neutron Scattering Studies of Quantum Materials
Kevin N. Dalby	*The University of Texas at Austin*	Leveraging Entropy for Enhanced Covalent Targeting at a Kinase Protein Binding Site
Donald J. Darensbourg	*Texas A&M University*	Reactivity Studies of Metal Catalyzed Production of Polycarbonates from Novel Oxiranes and Carbon Dioxide
Marcetta Y. Darensbourg	*Texas A&M University*	Biomimetic Tripeptide Motifs in Control of Polymetallic Topologies and NO Reactivity
Bryan W. Davies	*The University of Texas at Austin*	Discovering Protein Chemistry That Can Thread Through Bacterial Pores
Jef K. De Brabander	*The University of Texas Southwestern Medical Center*	Synthesis and Chemical Biology of Bioactive Small Molecules
Marcos H. de Moraes	*Rice University*	Functional Characterization of Bacterial Deaminase Toxins and Their Use as Genome Editing Tools
Connor Delaney	*The University of Texas at Dallas*	Metal Insertion into Strained Heterocycles: New Frontiers in C–C Bond Activation
Daniel J. Dickinson	*The University of Texas at Austin*	Integrative Fluorescence and Mass Imaging of Cellular Protein Complexes
Abdoulaye Djire	*Texas A&M University*	Resolving Lattice Nitrogen Reactivity Misconception in Transition Metal Compounds
Sheel C. Dodani	*The University of Texas at Dallas*	Discovery and Evolution of Chemoenzymatic Editors for Organofluorine Compounds
Kyle P. Eagen	*Baylor College of Medicine*	Elucidating the Mechanism and Dynamics of Chromatin Contacts Mediated by a Molecular Bridge
Andrew D. Ellington	*The University of Texas at Austin*	Machine Learning for Improving Protein Chemistry
Lei Fang	*Texas A&M University*	Synthesis, Coordination Chemistry, and Catalysis of Fully Fused Polypyridine Ligands
Maria Falzone	*The University of Texas at San Antonio*	Membrane-Mediated Phospholipase Regulation
Furqan Fazal	*Baylor College of Medicine*	Leveraging RNA Proximity Labeling to Reveal the Principles of Subcellular RNA Localization to Mitochondria

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Josephine C. Ferreon	*Baylor College of Medicine*	Disordered Protein Condensates as Novel Nanomaterials
Ilya J. Finkelstein	*The University of Texas at Austin*	On-Demand Cellular Oligonucleotide Synthesis for Precision Genome Engineering
Glenna Foight	*Baylor College of Medicine*	Signaling-Responsive Control of Transcription Factors With Designed Protein Inhibitors
Skye Fortier	*The University of Texas at El Paso*	Facile Methods for the Synthesis of Uranium-Carbon Multiple Bonds
Matthew S. Foster	*Rice University*	Fractal Mechanisms of Coherent Dynamics in Complex Quantum Materials
Alison R. Fout	*Texas A&M University*	Catalyst Design for Frontal Hydrosilylation
Kendra K. Frederick	*The University of Texas Southwestern Medical Center*	Determination of the Toxicity-Associated Conformation Ensemble of α-Synunclein Inside Cells
Benny D. Freeman	*The University of Texas at Austin*	Fundamental Experimental and Modelling Study of Ion and Water Transport in Polymeric Double Network Ion Exchange Membranes
Masaya Fujita	*University of Houston*	Understanding the Functional Roles of Multiple Kinases Controlling a Complex Network of Chemical Processes
François P. Gabbaï	*Texas A&M University*	Bismuth(III) Lewis Acids for the Transport of Chloride Anions Across Biological Membrane Mimics
Matthieu G. Gagnon	*The University of Texas Medical Branch at Galveston*	Chemical and Structural Features in tRNA and mRNA for Accurate Reading of the Genetic Code
Venkat Ganesan	*The University of Texas at Austin*	Fundamental Studies of Self-Assembly in Mixtures of Organic and Inorganic Molecules
Yang Gao	*Rice University*	Investigating the Catalytic Mechanisms of Mg^{2+}-Dependent Enzymes With Time-Resolved Crystallography
Jeremiah J. Gassensmith	*The University of Texas at Dallas*	Remote Control Over Protein-Viral Nanoparticle Dynamics in Complex Environments
Joseph A. Gauthier	*Texas Tech University*	Biomimetic Conversion of Carbon Dioxide to Value Added Fuels and Chemical
Haibo Ge	*Texas Tech University*	Palladium-Catalyzed Enantioselective Isomerization of Alkenes
Feliciano Giustino	*The University of Texas at Austin*	Mechanisms of Light Absorption and Emission in Perovskites
John A. Gladysz	*Texas A&M University*	New Polyyne-Based Allotropes of Carbon
Vishal M. Gohil	*Texas A&M University*	Phospholipid-Protein Interactions in Mitochondrial Bioenergetics
Elizabeth J. Goldsmith	*The University of Texas Southwestern Medical Center*	Isoform Specific Osmotic Activation and Chloride Inhibition of WNKs
Jenifer Gómez-Pastora	*Texas Tech University*	Magnetic Field Assisted Electrochemical Transformation of CO_2 Into Value-Added Products
Kayla N. Green	*Texas Christian University*	Disguising Small Molecules to Improve Therapeutic Strategies to Target Oxidative Stress
Nick V. Grishin	*The University of Texas Southwestern Medical Center*	Leveraging Large-Scale Sequence and Structure Data for Enzyme Discovery

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Joshua Gruber	*The University of Texas Southwestern Medical Center*	Exploiting Synthetic Lethality of Histone Chaperones for Cancer Therapy
Zygmunt Gryczynski	*Texas Christian University*	Forbidden Singlet-to-Triplet Excitation and Room Temperature Phosphorescence as a Novel Tool to Study Large Proteins Dynamics
Yogesh K. Gupta	*The University of Texas at San Antonio*	Covalent Nucleic Acid Modifications in DNA Repair and Innate Immune Response
Osvaldo Gutierrez	*Texas A&M University*	Unraveling the Mechanistic Complexity of Multicomponent Nickel-Catalyzed Dicarbofunctionalization of Unactivated Alkenes
Jason H. Hafner	*Rice University*	Fingerprint Raman-Active Vibrations for Membrane and Peptide Structure
Naomi J. Halas	*Rice University*	Hybrid Nanoparticle Complexes for Enhancing Light-Based Chemical Properties and Reactivities
P. Shiv Halasyamani	*University of Houston*	Crystal Growth of Functional Inorganic Materials
Yimo Han	*Rice University*	Understanding Neuron Signaling at Molecular Level Using Cryo-Electron Microscopy
Rasika M. Harshey	*The University of Texas at Austin*	Bacterial Molecular Motors as Anti-Phage Defense Systems
Jeffrey D. Hartgerink	*Rice University*	A Combined Computational–Synthetic Approach to Nanostructured Assemblies
Eva M. Harth	*University of Houston*	Governing Function and Reactivity of Nickel Complexes in Cross Coupling and Polyolefin Polymerizations
Graeme Henkelman	*The University of Texas at Austin*	Design of Materials for Energy Conversion and Storage
Raúl Hernández Sánchez	*Rice University*	Carbon Dioxide Reduction Facilitated by C-H Anion Recognition Catalysts
Lea Hildebrandt Ruiz	*The University of Texas at Austin*	Impacts of Multi-Phase Chlorine Free Radical Chemistry on Indoor and Outdoor Air
Isaac Hilton & Michael Diehl	*Rice University*	Dynamic Molecular Probes for *In Situ*, Locus-Specific Histone Profiling
Christian B. Hilty	*Texas A&M University*	Activity and Mechanisms in Micro-and Mesoporous Catalysts by Para-Hydrogen Enhanced NMR
Meagan Hinze	*Sam Houston State University*	Biocatalysis Methodologies for Oxidative Chiral Resolutions
Gary C. Hon	*The University of Texas Southwestern Medical Center*	Mechanisms of Enhancer Cooperativity in Gene Expression Regulation
Lora V. Hooper	*The University of Texas Southwestern Medical Center*	Microbiota-Directed Remodeling of Intestinal Plasma Membranes
Gerta Hoxhaj	*The University of Texas Southwestern Medical Center*	Deciphering the Regulatory Mechanisms of NAD Kinase in Metastasis
Kaiwen Hsiao	*Texas A&M University*	Photo-Switchable Nano-Resolution Fast Additive Manufacturing With Controlled Living Radical Polymerization
Ku-Lung Hsu	*The University of Texas at Austin*	Chemoselective Protein Reactions via Sulfonyl-Azole Chemistry
Shengxi Huang	*Rice University*	Unveiling the Charge Interaction Between Molecules and Topological Surface States

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Todd W. Hudnall	*Baylor University*	Exploring the Photochemistry of π-Acidic Singlet Carbenes
Kami L. Hull	*The University of Texas at Austin*	Development of Stereoselective Substitution Reactions
Simon M. Humphrey	*The University of Texas at Austin*	Chiral Phosphine Metal-Organic Frameworks: A New Paradigm in Scalable Solid-State Chiral Catalysts
Oleg A. Igoshin	*Rice University*	Non-Equilibrium Mechanisms Controlling the Selectivity of Biochemical Information Processing
Tatyana Igumenova	*Texas A&M University*	Structure and Mechanism of a Novel Target for Next Generation Anti-Fungal Drugs
Dmitri N. Ivanov	*The University of Texas at San Antonio*	Protein Ubiquitylation in Antiviral Immunity and Cancer
Junji Iwahara	*The University of Texas Medical Branch at Galveston*	Biomolecular Electrostatics by NMR Spectroscopy
Michael I. Jacobs	*Texas State University*	Elucidating the Origins of Accelerated Biochemistry in Levitated Microdroplets
Benjamin G. Janesko	*Texas Christian University*	Virtual Screening Beyond the Rule of Five: Open Computational Workflows Integrating Metadynamics, Model Solvent, and Broadly Accurate Density Functional Theory
Junha Jeon	*The University of Texas at Arlington*	Aryne Formation Through Single-Electron Transfer Coupled With Hydrogen Atom Transfer: Carbon–Heteroatom-Forming Cross-Coupling Reactions
Jenna L. Jewell	*The University of Texas Southwestern Medical Center*	Phosphorylation and Inhibition of mTORC1 by PKA
Jean X. Jiang	*The University of Texas at San Antonio*	Extracellular Amino Acid Residues and Motifs Regulating Hemichannel Opening and Closing
Ziwen Jiang	*The University of Texas at Dallas*	Targeted Control of Organelle Dynamics Using Modularly Designed Macromolecules
Jin Jiang	*The University of Texas Southwestern Medical Center*	Biochemical Investigation of a Pseudokinase Implicated in Neurological Diseases
Youxing Jiang	*The University of Texas Southwestern Medical Center*	Structural Mechanisms of Gating and Selectivity of Lysosomal Cation Channels
Kayunta L. Johnson-Winters	*The University of Texas at Arlington*	Kinetic Characterization of Promiscuous F420-Dependent Sugar-6-Phosphate Dehydrogenases
Chad W. Johnston	*Baylor College of Medicine*	A High-Throughput Model for Polyketide Synthase (PKS) Interrogation and Engineering
Matthew R. Jones	*Rice University*	Quantifying Chemical Thermodynamics and Kinetics at the Ligand-Nanocrystal Interface
Alamgir Karim	*University of Houston*	Understanding Stabilization and Molecular Transport of RNA and Charged Polymer Across Membraneless Coacervate Droplets
Zunlong Ke	*The University of Texas at Austin*	Integrate Click Chemistry and Cryo-CLEM to Visualize Virus-Host Interactions
Adrian T. Keatinge-Clay	*The University of Texas at Austin*	Structural Elucidation and Total Biosynthesis of Neaumycin B
Ben K. Keitz	*The University of Texas at Austin*	Evolving Synthetic Reactions Through Extracellular Electron Transfer
Oleg Klykov	*The University of Texas at San Antonio*	Structural Basis for Chemical Signaling in the Brain

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Daniel L. Kober	*The University of Texas Southwestern Medical Center*	Characterizing Lipid-Regulated Ubiquitination
Jennifer Kohler	*The University of Texas Southwestern Medical Center*	Metabolic Incorporation of Photocrosslinking Galnac for Glycoconjugate Interaction Discovery
Anatoly B. Kolomeisky	*Rice University*	Theoretical Understanding of Dynamic Catalysis Phenomena
Junichiro Kono	*Rice University*	Optical, Infrared, and Terahertz Spectroscopy of Low-Dimensional Materials
Anna Konovalova	*The University of Texas Health Science Center at Houston*	Mechanism of Signal Transduction Across the Bacterial Cell Envelope
Ivan Korendovych	*Baylor University*	Development of Catalytically-Amplified Biosensors for Metal Ions
Brian A. Korgel	*The University of Texas at Austin*	Nanocrystal Quantum Dots With Infrared Optical Response
László Kürti	*Rice University*	Transformative and Pioneering Reagents, Next-Generation Strategies and Tactics for the Rapid Construction of Highly Functionalized Cyclic Molecules
Arthur Laganowsky	*Texas A&M University*	Molecular Assemblies of Oncogenic RAS Mutants With SOS and BRAF
Keji Lai	*The University of Texas at Austin*	Nanoscale Electrical Probing of Chemical Reactions in Layered Materials
Alan M. Lambowitz	*The University of Texas at Austin*	Bacterial Reverse Transcriptases
Laura A. Lavery	*Rice University*	Determining the Mechanism of Altered Chemical Catalysis of DNA Methylation in Mammalian Brain Development
T. Randall Lee	*University of Houston*	2D Nanolayered Structures Based on N-Heterocyclic Carbene-Functionalized Transition Metal Dichalcogenides for Nanodevice Fabrication
Hongjie Li	*Baylor College of Medicine*	Integrative Multi-Omics to Study Aging- and Alzheimer's Disease-Caused Chemosensory Decline
Nan Li	*The University of Texas Southwestern Medical Center*	Axon-Terminal-Specific and Action-Potential Dependent Functional MRI Reporters
Pingwei Li	*Texas A&M University*	The Structural Basis of Lipopolysaccharide Sensing by the Caspase-4 Inflammasome
Wenbo Li	*The University of Texas Health Science Center at Houston*	Nascent RNA Chemistry and Structure in Transcriptional Control and Chromatin Organization
Xiuling Li	*The University of Texas at Austin*	Understanding the Spin Defects in Van der Waals Sheets and Quantum-Photonic Integration on a Curved Surface
Xiaochun Li	*The University of Texas Southwestern Medical Center*	Mechanisms of Cholesterol Biosynthesis and Trafficking: From Sterol-Sensing Domain to Phosphatidylserine Synthase
Ruibin Liang	*Texas Tech University*	Multiscale Simulation of Molecular Photoswitches in Biological Systems
Jung-Fu Lin	*The University of Texas at Austin*	Fixation of Single-Bonded Nitrogen Compounds
Paul A. Lindahl	*Texas A&M University*	Copper Trafficking and Regulation in Eukaryotic Cells

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Glen Liszczak	*The University of Texas Southwestern Medical Center*	Chemoenzymatic Tools to Study Site-Specific Protein ADP-Ribosylation
Aimin Liu	*The University of Texas at San Antonio*	Iron-Dependent Peptide Cyclization: Mechanistic Divergence in C–C/C–O Bond Forming Reactions
Hung-wen Liu	*The University of Texas at Austin*	Mechanistic Studies of Novel Enzymes
Wenshe Liu	*Texas A&M University*	The Exploration of Genetically Encoded Noncanonical Amino Acids for the Cyclization of Phage-Displayed Peptides
Yuanyue Liu	*The University of Texas at Austin*	Realistic Atomistic Simulations of Electrocatalysis at Solid-Water Interface
Jun Lou	*Rice University*	Unveiling Mechanisms of Strain Engineering in Enhancing 2D Electrocatalyst Performances via On-Chip *Operando* Characterizations
George J. Lu	*Rice University*	Molecular Mechanism of Gas Vesicle Assembly
Lloyd L. Lumata	*The University of Texas at Dallas*	Hyperpolarized Magnetic Resonance Tracking of the Altered Biochemistry in Non-Alcoholic Fatty Liver Disease
Jodie L. Lutkenhaus	*Texas A&M University*	Unraveling Mixed Ion and Electron Transport in n-Type Conjugated Polymers
Peter Ly	*The University of Texas Southwestern Medical Center*	Mutagenic Chromosomal Rearrangements from Diverse DNA Repair Pathways
Nathaniel Lynd	*The University of Texas at Austin*	Design of Biohybrid Macromolecular Non-Colligative Ice Disruptors
Shang Ma	*The University of Texas Southwestern Medical Center*	Targeting Mechanotransduction Pathway for Human Disease
Allan H. MacDonald	*The University of Texas at Austin*	Spintronics in Magnetic Topological Insulators
Dmitrii E. Makarov	*The University of Texas at Austin*	Topics in the Kinetics of Complex Molecular Rearrangements
David J. Mangelsdorf	*The University of Texas Southwestern Medical Center*	Characterizing the Host Sensory Pathway That Governs Parasitic Nematode Infections
Filippo Mangolini	*The University of Texas at Austin*	Temporal Evolution of the Interfacial Nanostructure of Deep Eutectic Solvents
Arumugam Manthiram	*The University of Texas at Austin*	Synthesis and Properties of Transition Metal Oxides With Unusual Valence States
Edward M. Marcotte	*The University of Texas at Austin*	Mass Spectrometry-Based Determination of Protein Assemblies in the Brain
Kevin G. Mark	*The University of Texas Southwestern Medical Center*	The Biochemical Basis of Translational Control by Ubiquitin and Its Significance in Neurodegenerative Disease
Angel A. Martí-Arbona	*Rice University*	Dawn of Photoactive Metal Complex Surfactants: Synthesis, Properties, and Applications
Caleb D. Martin	*Baylor University*	Annihilating Perfluoroalkyl Substances With Aluminum Lewis Superacids
Andreas T. Matouschek	*The University of Texas at Austin*	Structure and Function of a Nano-Scale Biological Machine
Despoina Mavridou	*The University of Texas at Austin*	The Biochemistry of Novel Mobile Colistin Resistance Enzymes

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Jennifer A. Maynard	*The University of Texas at Austin*	Determinants of Antibody Folding, Stability, and Activity
Gabriele Meloni	*The University of Texas at Dallas*	Assembly, Plasticity, and Reactivity of "Exotic" Homo-/Hetero-Metallic Protein Metal-Thiolate Clusters
Joshua T. Mendell	*The University of Texas Southwestern Medical Center*	Regulation of Pyrimidine Metabolism by NORAD-Pumilio Bodies
Quentin Michaudel	*Texas A&M University*	Exploring New Macromolecular Space for the Design of Selective Antibacterial Cationic Polymers
Ognjen Miljanić	*University of Houston*	Putting Water to Work: Methane Capture in Stabilized Water Clusters
Prashant Mishra	*The University of Texas Southwestern Medical Center*	Mapping Thermodynamic Efficiencies in Biomolecular Machines
David Mitlin	*The University of Texas at Austin*	Fundamental Understanding and Modification of Sodium-Based Solid-State Electrolytes
Jeetain Mittal	*Texas A&M University*	Unraveling Sequence-Encoded Dynamics and Rheology Using Molecular Simulations: From Polymers to Disordered Proteins
Emilia Morosan	*Rice University*	Accelerated Discovery of Correlated Topological Materials Using Chemical Bonding Design
Yunsun Nam	*The University of Texas Southwestern Medical Center*	Biochemical Probing of Substrate Specificity in RNA Methylation
Douglas Natelson	*Rice University*	Chemistry and Chirality With Electrically and Optically Driven Plasmon-Based Hot Carriers
Robert W. Newberry	*The University of Texas at Austin*	Fundamental Chemical Determinants of Protein Beta-Strand Structure and Stability
Kyriacos C. Nicolaou	*Rice University*	Total Synthesis of Bioactive Natural and Designed Molecules
Peter J. A. Nordlander	*Rice University*	Plasmon Enhanced Chemistry
Yuuki Obata	*The University of Texas Southwestern Medical Center*	Deciphering Gut Chemosensory Circuits
José N. Onuchic	*Rice University*	Complex Structural Organization Governing the Function of Genome and Large Protein Assemblies
Kim Orth	*The University of Texas Southwestern Medical Center*	Co-Component Receptors: The GPCR Equivalent for Bacteria
Oleg V. Ozerov	*Texas A&M University*	Early-Metal Hydrogenation of Arenes: Potential New Approach to Chiral Phosphines
Guido Pagano	*Rice University*	Trapped-Ion Simulation of Electron Transfer in Molecules
Zachariah A. Page	*The University of Texas at Austin*	Localized Heating to Expand the Chemical Diversity of Photocurable Resins
Jeremy C. Palmer	*University of Houston*	Glass Polyamorphism in Tetrahedral Substances: Toward Discovery of New Amorphous States
Sapun H. Parekh	*The University of Texas at Austin*	Lipid Droplets as Flexible Substrates for Disordered Protein Self-Assembly and Fibrillation
Matteo Pasquali	*Rice University*	Physical Chemistry of Nanotube and Graphene Fluids
Emily Pentzer	*Texas A&M University*	Rigid Rod Polymers via Group Transfer Polymerization

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
George N. Phillips, Jr. & Anastasios Kyrillidis	*Rice University*	Machine Learning Solutions to the Crystallographic Phase Problem
Margaret A. Phillips	*The University of Texas Southwestern Medical Center*	Identification and Characterization of Plasmodium Proteasome Inhibitors
David C. Powers	*Texas A&M University*	Organometallic Platforms for Pnictogen-Transfer Catalysis
Han Pu	*Rice University*	Simulating Many-Body Systems for Quantum Physics and Chemistry
Xiaofeng Qi	*The University of Texas Southwestern Medical Center*	Structural and Functional Studies of the Bile Acid Transporter OST-α/ß for Drug Development
Tian Qin	*The University of Texas Southwestern Medical Center*	Uncanonical Functionalization of Bicyclic Heterocycles
Emily L. Que	*The University of Texas at Austin*	Dual Nanoparticle Conjugate Magnetic Resonance Imaging Agents: Design Principles and Applications
Doran I.G.B. Raccah	*The University of Texas at Austin*	Mesoscale Consequence of Quantum Dynamics in Molecular Materials
Arun Radhakrishnan	*The University of Texas Southwestern Medical Center*	Molecular Mechanisms of Cholesterol Sensors in Human Cells
Abelardo Ramirez-Hernandez	*The University of Texas at San Antonio*	Molecular Bottlebrushes at Liquid-Liquid Interfaces: Surface Rheology and Structure
Rebecca J. Rapf	*Trinity University*	The Role of the Interface: Systematic Studies of Reactivity in Complex Aqueous Environments
Joseph M. Ready	*The University of Texas Southwestern Medical Center*	Multi-Component Couplings Involving Alkenyl Boronates
Michael L. Reese	*The University of Texas Southwestern Medical Center*	Interrogating the Function of a Parasite-Specific Ubiquitin-Like System
Tiffany A. Reese	*The University of Texas Southwestern Medical Center*	Investigation of the Membrane Disruption Capacity of a Viral Death-Inducing Protein
Hang Ren	*The University of Texas at Austin*	Single-Entity Electrocatalysis at Structurally Well-Defined Nanoparticles
Pengyu Ren	*The University of Texas at Austin*	Molecular Mechanism of Dopamine Transporter from Atomistic Simulations Using Advanced Electrostatics
Hans Renata	*Rice University*	Chemoenzymatic Approaches to Multisubstituted Piperidines via Divergent Enzymatic C–H Hydroxylations
Joaquin Resasco	*The University of Texas at Austin*	Unifying Concepts in Thermochemical and Electrochemical Catalysis
Joshua Riback	*Baylor College of Medicine*	Resolving the Physicochemical Rules Coordinating Ribosome Biogenesis in the Nucleolus
Jeffrey D. Rimer	*University of Houston*	Unique Role of Tautomers as Molecular Modifiers of Crystallization
Jose RizoRey	*The University of Texas Southwestern Medical Center*	NMR and Cryo-EM Methods to Study Protein Complexes on Lipid Bilayers
Megan L. Robertson	*University of Houston*	Sustainable Block Polymer Properties and Self-Assembly Modulated by Ionic Interactions
Liela A. Romero	*Baylor University*	New Chemical Reactions Enabled by Oxophilic Transition Metal Catalysts
Filippo Romiti	*The University of Texas at Dallas*	Novel Strategies for the Total Synthesis of Complex Bioactive Natural Products

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Daniel Romo	*Baylor University*	Novel Strategies for Beta-Lactone Synthesis and Annulation to Impact Basic Cell Biology
Michael J. Rose	*The University of Texas at Austin*	Elucidating Design Principles for Semiconductor | Molecule Electronic Coupling
Michael K. Rosen	*The University of Texas Southwestern Medical Center*	Size-Scaling of Biomolecular Condensate Activity
Daniel M. Rosenbaum	*The University of Texas Southwestern Medical Center*	High-Resolution Cryo-EM of Membrane-Embedded Drugs Binding to GPCRs
Tomče Runčevski	*Southern Methodist University*	Exploring the Organic Mineralogy of Titan, Saturn's Moon
David H. Russell	*Texas A&M University*	Native Mass Spectrometry and Thermodynamics Studies of Protein-Ligand and Protein-Protein Interactions
Benjamin R. Sabari	*The University of Texas Southwestern Medical Center*	Transcriptional Condensates During Cell State Transitions
Lorena Saelices Gomez	*The University of Texas Southwestern Medical Center*	Cryo-Electron Microscopy Study of the Conformational Switch of Monomeric Tau That Drives Its Amyloid Aggregation
Amaresh Sahu	*The University of Texas at Austin*	Theory of Electric-Field-Induced Phase Transitions and Rafts in Lipid Membranes
Devleena Samanta	*The University of Texas at Austin*	Chemical Sensing in Living Cells via Target-Responsive, Activatable, Cell-Permeable Enzyme Reporters (TRACERs)
David Sanders	*The University of Texas Southwestern Medical Center*	Biochemical Interrogation of a Phosphorylation-Regulated Electrostatic Switch
Gabriel Sanoja	*The University of Texas at Austin*	Leveraging Non-Covalent Bonds and Mechano-chemistry to Advance the Manufacturing of Soft and Tough 3-D Materials
Livia Schiavinato Eberlin	*Baylor College of Medicine*	Understanding Metabolic Flux in *In Vivo* Tissues With Solvent-Based Ambient Ionization Mass Spectrometry
David Schilter	*Texas State University*	Molecular Size and Electronic Structure as Descriptors of Hemilability
John W. Schoggins	*The University of Texas Southwestern Medical Center*	Structural Determinants Underlying a Virus-Host Evolutionary Conflict
Marlan O. Scully	*Texas A&M University*	Quantum Coherence and Entanglement in Chemical, Physical, and Biological Sciences
Irina I. Serysheva	*The University of Texas Health Science Center at Houston*	Decoding the Role of Lipids in Ion Channel Structure Using Advanced Cryo-EM Techniques
Bryan F. Shaw	*Baylor University*	The Cysteine-Sulfinate "Gas Pedal" and Asparagyl-Carboxy "Brake" in ALS-Linked SOD1 Heterodimerization
Jason Shearer	*Trinity University*	Leveraging Ligand Noninnocence in Cobalt-Based Electrocatalytic Oxidations
James Shee	*Rice University*	Demystifying Strong Correlation in Chemistry—What It Is, Where to Find It, and Algorithms To Quantitatively Describe It
Chih-Kang Shih	*The University of Texas at Austin*	Moiré Quasicrystals—A New Frontier for 2D Electronic Materials

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Michael Shiloh	*The University of Texas Southwestern Medical Center*	Structure Activity Relationship and Functional Analysis of Mycobacterial Phenolic Glycolipid in Airway Neuron Activation
Qimiao Si	*Rice University*	Theoretical Studies of Electronic Dynamics and Many-Body Effects in Carbon-Based Nanostructures and Related Low Dimensional Systems
Donald Siegel	*The University of Texas at Austin*	Chemical Pathways for the Efficient Storage of Thermal Energy
Daniel J. Siegwart	*The University of Texas Southwestern Medical Center*	Determining the Mechanisms Underlying the Trans-Endothelial Migration of mRNA SORT Lipid Nanoparticles (LNPs)
Myles W. Smith	*The University of Texas Southwestern Medical Center*	Accessing Complexity via Dearomatization of Nitrogen Heteroarenes
Alexei V. Sokolov	*Texas A&M University*	Vibrational Micro-Spectroscopy Enhanced by Molecular Coherence and Plasmonic Nanoantennas
Anju Sreelatha	*The University of Texas Southwestern Medical Center*	Defining the Eukaryotic AMPylome
Jeanne Stachowiak	*The University of Texas at Austin*	Chemical Coupling of Protein Condensates for Triggering Uptake of Cell-Surface Receptors
François St-Pierre	*Baylor College of Medicine*	Orange-Emitting Fluorescent Voltage Indicators for Two-Photon Multiplexed Imaging
Xuewu Sui	*Texas A&M University*	The Mechanism of Membrane-Embedded Catalysis for Bioenergy Storage
Daniel P. Tabor	*Texas A&M University*	Accelerating the Prediction and Analysis of Vibrational and Electronic Spectroscopy
Vincent S. Tagliabracci	*The University of Texas Southwestern Medical Center*	Engineered Bacterial Ubiquitin Ligase for Small Molecule Target Identification
Uttam K. Tambar	*The University of Texas Southwestern Medical Center*	Stereoselective Functionalization of Alkenes With Chalcogen-Based Oxidants
Yizhi Jane Tao	*Rice University*	Structural Mechanisms of Innate Immunity Suppression by Influenza Viruses
David W. Taylor	*The University of Texas at Austin*	DNA Recognition and Unwinding by Cas9 Variants
Thomas S. Teets	*University of Houston*	Luminescent Organometallic Complexes Prepared by (3+2) Cycloaddition Reactions of Coordinated Isocyanides
Andy A. Thomas	*Texas A&M University*	Exploring New Strategies to Access Remote Synthetic Landscapes
Ross Thyer	*Rice University*	Investigating the Function and Assembly of Synthetic Selenolate-Coordinated Iron-Sulfur Clusters
Stefano Tiziani	*The University of Texas at Austin*	Exploring the Chirality of Enantiomeric Metabolites to Identify New Cancer Metabolic Vulnerabilities
Erdal Toprak	*The University of Texas Southwestern Medical Center*	Development of a Platelet-Based Electrochemical Assay for Pancreatic Cancer Diagnosis
James M. Tour	*Rice University*	Molecular Machines Activate Cellular Calcium Signaling Pathways Through Mechanical Action
Thomas M. Truskett	*The University of Texas at Austin*	Statistical Mechanics of Dynamic Covalent Networks
Francis T.F. Tsai	*Baylor College of Medicine*	Decoding NACHT Proteins: 3D Structure and Mechanisms in Phage Defense

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Benjamin P. Tu	*The University of Texas Southwestern Medical Center*	Elucidating the Role of a Metabolically Regulated Phosphatase in Cellular Signaling and Growth Control
Emanuel Tutuc	*The University of Texas at Austin*	Correlated Electrons in Moiré Materials
Adam R. Urbach	*Trinity University*	Functionalized Synthetic Receptors for Site-Specific Labeling of Polypeptides
Syed M. Usama	*The University of Texas at San Antonio*	Subtyping Triple Negative Beast Cancer by Multispectral Raman Imaging
Peter G. Vekilov	*University of Houston*	Microscopic Perspective of Amyloid-β Fibrillization
Rafael Verduzco	*Rice University*	Molecular Recognition in Three Dimensional Covalent Organic Frameworks
Dino Villagrán	*The University of Texas at El Paso*	Molecular Based Electrocatalysts for Environmental Remediation
Julea Vlassakis	*Rice University*	Probing Fusion Oncoprotein Glycosylation, Solubility, and Interactions With Single-Cell Resolution
Andrew Wand	*Texas A&M University*	Greatly Enhancing Fragment-Based Drug Discovery by Teaching Artificial Intelligence Weak-Binding Thermodynamics
Boyuan Wang	*The University of Texas Southwestern Medical Center*	Mapping Allosteric Regulations by Intermediate Metabolites Using Chemical Proteomics
Haotian Wang	*Rice University*	Understanding the Interfacial Chemistry of Electrochemical CO_2 Reduction Reactions
Huiliang Wang	*The University of Texas at Austin*	Two-Stage Condensation Approach of DNA Plasmids for Enhanced Gene Delivery in Sono-Optogenetics
Wennie Wang	*The University of Texas at Austin*	*Ab Initio* Elucidation of Structural Heterogeneities in MoS_2 for Photocatalysis
Jinfan Wang	*The University of Texas Southwestern Medical Center*	Optical Control of Translation With an Engineered Protein Inspired by SARS-CoV-2
Weiwei Wang	*The University of Texas Southwestern Medical Center*	Structural Mechanism and Drug Interactions of Human Heteromeric Serotonin Receptor 5-HT_{3AB}
Zhao Wang	*Baylor College of Medicine*	Determining Chemical Interactions Mediating Membrane Complex Formation by Cryo-EM
Benjamin Weaver	*The University of Texas Southwestern Medical Center*	Decoding FASN-Mediated Metabolic Signals in Cellular Stress Resolution
Lauren J. Webb	*The University of Texas at Austin*	Electrostatic Field-Based Mechanisms of Function in Chemically Complex Lipid Membranes
Julian G. West	*Rice University*	New Fluorination Reactions Using Earth Abundant Elements
Kenneth D. Westover	*The University of Texas Southwestern Medical Center*	Development of JNK2 Selective Inhibitors for Cancer
Dawn M. Wetzel	*The University of Texas Southwestern Medical Center*	Mechanism of an Anti-Trypanosomal Microtubule-Stabilizing Molecule
Christian P. Whitman	*The University of Texas at Austin*	Enzymes of the Tomaymycin Biosynthetic Pathway
Jun Wu	*The University of Texas Southwestern Medical Center*	Modulating Cell-Cell Adhesion Through Membrane-Anchored Nanobody-Antigen Interactions

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Chuan Xiao	*The University of Texas at El Paso*	Decipher the Biochemistry Folding and Assembly Mysteries of the Most Common Protein Motif Used by Viruses
Han Xiao	*Rice University*	Traceless Protein Labeling Using Proximity-Induced Chemistry
Yonglong Xie	*Rice University*	Crafting New Materials Through Stacking Engineering of Atomic Sheets
Shiqing Xu	*Texas A&M University*	Fundamental Studies on Electrochemical Palladium-Catalyzed Directed C-H Functionalization With Nucleophiles
Xin Yan	*Texas A&M University*	Aziridination-Enabled Lipid Modification for Cis- and Trans-Isomer Identification
Hao Yan	*University of North Texas*	Catching the Transient: Stabilization and Characterization of Reaction Intermediates in the $[Cu_2O_2]^{2+}$ System by High-Pressure Mechanochemistry
Ding-Shyue Yang	*University of Houston*	Direct Visualization of Photoinduced Dynamics of Surfaces and Functional Materials
Ming Yi	*Rice University*	Correlated Topology on Geometrically Frustrated Lattices
Seung-hee Yoo	*The University of Texas Health Science Center at Houston*	Regulatory Role of the Cryptochrome-Fad Axis in Mitochondrial Bioenergetic Oscillation
Guihua Yu	*The University of Texas at Austin*	Probing the Electrocatalytic Properties and Mechanisms of Molecularly-Assembled Two-Dimensional Inorganic Solids
Melissa L. Zastrow	*University of Houston*	Uncovering Metal Homeostasis Mechanisms of Lactobacillaceae Bacteria in the Gut Microbiota
Xing Zeng	*The University of Texas Southwestern Medical Center*	Enzymology and Physiological Significance of the Uncharacterized Cytochrome P450 Protein CYP2B10
Gul H. Zerze	*University of Houston*	Resolving Dynamics of Biomolecular Condensates via Multiscale Simulations
Fan Zhang	*The University of Texas at Dallas*	Intelligent Infrared Polarimetry: Revolutionizing Next-Generation Medical Sensing
Xuewu Zhang	*The University of Texas Southwestern Medical Center*	Structure and Regulatory Mechanism of the Death-Associated Protein Kinase 1
Jie Zheng	*The University of Texas at Dallas*	Neurotransmitter-Like Nanoparticles
Yubin Zhou	*Texas A&M University Health Science Center*	Synthetic Biology Tools for Optogenetic Control of Endogenous Proteins and Designer Cells
Yue Zhou	*The University of Texas at Dallas*	Fundamental Understanding of Interface Evolution and Mass Transfer in Li-Metal Batteries by Theory-Guided Experimental Studies
Hanyu Zhu	*Rice University*	Synthesizing and Probing Chiral Interactions in Atomically Thin Lattices
Xuejun Zhu	*Texas A&M University*	Elucidating Gut Bacterial Enzymes for the Reductive Metabolism of Small Molecules
Brian Zoltowski	*Southern Methodist University*	Chemical Foundations of Magnetosensing in Butterfly Migration

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INSTITUTION	CHAIRHOLDER AND CHAIR NAME
Baylor College of Medicine	Theodore G. Wensel, Welch Chair in Chemistry
Baylor College of Medicine	Thomas F. Westbrook, Welch Chair in Chemistry
Baylor College of Medicine	Damian W. Young, The Robert A. Welch Chair in Science
*Baylor College of Medicine**	The R. P. Doherty, Jr.-Welch Chair in Science
Baylor University	John L. Wood, Welch Chair in Chemistry
Rice University	Lane W. Martin, Welch Chair in Materials Science 1
Rice University	Gustavo E. Scuseria, Welch Chair in Chemistry
Rice University	Pernilla Wittung-Stafshede, The Charles W. Duncan, Jr.-Welch Chair in Chemistry
Rice University	Peter G. Wolynes, The D. R. Bullard-Welch Chair in Science
*Rice University**	Welch Chair in Materials Science 2
*Rice University**	Welch Chair in Materials Science 3
Texas A&M University	Tadhg P. Begley, Welch Chair in Chemistry
Texas A&M University	James C. Sacchettini, The Roger J. Wolfe-Welch Chair in Science
Texas A&M University	Karen L. Wooley, The W. T. Doherty-Welch Chair in Chemistry
Texas A&M University	Hongcai Joe Zhou, Welch Chair in Chemistry
Texas A&M University Health Science Center	Vytas A. Bankaitis, The E. L. Wehner-Welch Chair in Chemistry
Texas A&M University Health Science Center	Thomas A. Kent, Welch Chair in Chemistry
Texas A&M University Health Science Center	Roderic I. Pettigrew, Welch Chair in Chemistry
Texas Christian University	Eric E. Simanek, Welch Chair in Chemistry
Texas Tech University	Yehia S. Mechref, Welch Chair in Chemistry
Texas Tech University Health Sciences Center	Jannette M. Dufour, Welch Chair in Biochemistry
The University of Texas at Arlington	Daniel W. Armstrong, Welch Distinguished University Chair in Chemistry
The University of Texas at Austin	David Allen, Norbert Dittrich-Welch Chair in Chemical Engineering
The University of Texas at Austin	Eric V. Anslyn, Welch Regents Chair in Chemistry
The University of Texas at Austin	Michael J. Krische, Welch Chair in Science
The University of Texas at Austin	Xiaoqin Li, The Jack S. Josey-Welch Chair in Science
The University of Texas at Austin	Yi Lu, The Richard J.V. Johnson-Welch Regents Chair in Chemistry
The University of Texas at Austin	Jason S. McLellan, Welch Chair in Chemistry
The University of Texas at Austin	Jonathan L. Sessler, The R. P. Doherty, Jr.-Welch Regents Chair in Chemistry
The University of Texas at Austin	Devarajan Thirumalai, The Marvin K. Collie-Welch Regents Chair in Chemistry
*The University of Texas at Austin**	The Norman Hackerman-Welch Regents Chair in Chemistry



Shengqian Ma



Jason McClellan



Pernilla Wittung-Stafshede

Courtesy of Gustavo Raskosky/Rice University.

INSTITUTION	CHAIRHOLDER AND CHAIR NAME
*The University of Texas at Austin**	Welch Chair in Chemistry (Materials Chemistry)
The University of Texas at Dallas	Ray H. Baughman, Welch Chair in Chemistry
The University of Texas at Dallas	Rudi Fasan, The Robert A. Welch Chair in Chemistry
The University of Texas at Dallas	Vladimir Gevorgyan, Welch Chair in Chemistry
*The University of Texas at El Paso**	Welch Chair in Chemistry
The University of Texas at San Antonio	Oleg V. Larionov, Welch Chair in Chemistry
The University of Texas at San Antonio	Kirk S. Schanze, Welch Distinguished University Chair in Chemistry
The University of Texas at San Antonio	Charles P. France, Welch Distinguished University Chair in Chemistry
The University of Texas at San Antonio	Patrick M. Sung, Welch Distinguished University Chair in Chemistry
The University of Texas Health Science Center at Houston	Zhiqiang An, Welch Distinguished University Chair in Chemistry
The University of Texas Health Science Center at Houston	John L. Spudich, Welch Chair in Chemistry
The University of Texas MD Anderson Cancer Center	John A. Tainer, Welch Chair in Chemistry
The University of Texas MD Anderson Cancer Center	David J. Tweardy, Welch Chair in Chemistry
The University of Texas Medical Branch	B. Montgomery Pettitt, Welch Distinguished University Chair in Chemistry
The University of Texas Medical Branch	Michael P. Sheetz, Welch Distinguished University Chair in Chemistry
The University of Texas Southwestern Medical Center	J. Russell Falck, Welch Chair in Chemistry
The University of Texas Southwestern Medical Center	Eric N. Olson, Welch Chair in Science
University of Houston	Olafs Daugulis, Welch Chair in Chemistry
University of Houston	Jan-Åke Gustafsson, Welch Chair in Chemistry
University of Houston	Allan J. Jacobson, Welch Chair in Science
University of North Texas	Shengqian Ma, Welch Chair in Chemistry
University of North Texas Health Science Center	Laszlo Prokai, Welch Chair in Biochemistry

**Chair not filled*

Departmental Research Grants

The Welch Foundation funds 44 institutions, 246 faculty, and 535 trainees.

INSTITUTION	PARTICIPATING FACULTY	CHEMICAL RESEARCH TRAINEES
Abilene Christian University (Abilene)	8	12
Angelo State University (San Angelo)	7	19
Austin College (Sherman)	6	8
East Texas A&M University (Commerce)	6	9
East Texas Baptist University (Marshall)	2	6
Hardin-Simmons University (Abilene)	2	4
Houston Christian University (Houston)	2	15
Howard Payne University (Brownwood)	3	4
Huston-Tillotson University (Austin)	1	5
Jarvis Christian College (Hawkins)	3	4
Lamar University (Beaumont)	12	26
LeTourneau University (Longview)	4	11
Lubbock Christian University (Lubbock)	4	9
McMurry University (Abilene)	3	5
Midwestern State University (Wichita Falls)	5	16
Our Lady of the Lake University (San Antonio)	3	1
Prairie View A&M University (Prairie View)	7	10
St. Edward's University (Austin)	3	12
St. Mary's University (San Antonio)	6	9
Sam Houston State University (Huntsville)	12	18
Schreiner University (Kerrville)	3	4
Southwestern University (Georgetown)	4	6
Stephen F. Austin State University (Nacogdoches)	12	38
Sul Ross State University (Alpine)	1	5
Tarleton State University (Stephenville)	6	11
Texas A&M International University (Laredo)	9	9
Texas A&M University-Corpus Christi (Corpus Christi)	8	17
Texas A&M University-Kingsville (Kingsville)	10	30
Texas A&M University-Texarkana (Texarkana)	1	4
Texas Lutheran University (Seguin)	4	10

INSTITUTION	PARTICIPATING FACULTY	CHEMICAL RESEARCH TRAINEES
Texas Wesleyan University (Fort Worth)	3	9
Texas Woman's University (Denton)	8	40
The University of Texas at Tyler (Tyler)	8	29
The University of Texas of the Permian Basin (Odessa)	4	5
The University of Texas Rio Grande Valley (Edinburg)	15	6
Trinity University (San Antonio)	9	17
University of Dallas (Irving)	3	10
University of Houston-Clear Lake (Houston)	6	12
University of Houston-Downtown (Houston)	14	26
University of Mary Hardin-Baylor (Belton)	2	8
University of St. Thomas (Houston)	6	16
University of the Incarnate Word (San Antonio)	3	11
Wayland Baptist University (Plainview)	2	3
West Texas A&M University (Canyon)	6	6
Total	246	535

Postdoctoral Fellows Grants

The Welch Foundation funds 5 investigators at 5 institutions.

POSTDOCTORAL FELLOW	INSTITUTION	TITLE OF RESEARCH
Kate Baumler	*Baylor University*	Crystal Growth of Ln2Fe4Sb5 Phases Toward the Study of Novel Quantum Properties
Brad Ganoe	*Rice University*	Spin Projection for Strong Correlation: A Quantum Monte Carlo Approach
Kayla Goforth	*Texas A&M University*	Shedding Light on the Mechanisms Underlying Animal Magnetoreception
Heidi Pak	*The University of Texas Southwestern Medical Center*	Role of Feeding Entrainment in Mediating Health and Lifespan
Ziyi Zhang	*The University of Texas at Austin*	Tunable Dynamic Covalent Bonding for Programmable Assembly of Colloidal Nanocrystal Gels

Departmental Equipment Grants

The Foundation's $2 million+ in grants to 28 institutions spurred $685,281 in cost sharing.

INSTITUTION	WELCH AMOUNT	COST SHARE
Austin College (Sherman)	$ 75,000	$ 30,348
East Texas A&M University (Commerce)	$ 75,000	$ 4,830
East Texas Baptist University (Mashall)	$ 75,000	$ 1,525
Houston Christian University (Houston)	$ 75,000	$ 50,991
Howard Payne University (Brownwood)	$ 75,000	$ 1,500
Huston-Tillotson University (Austin)	$ 75,000	$ 12,448
Lamar University (Beaumont)	$ 75,000	$ 46,993
LeTourneau University (Longview)	$ 75,000	$ —
Sam Houston State University (Huntsville)	$ 75,000	$ 45,000
Schreiner University (Kerrville)	$ 75,000	$ 37,500
Southwestern University (Georgetown)	$ 75,000	$ 16,413
St. Edward's University (Austin)	$ 75,000	$ 12,859
Stephen F. Austin State University (Nacogdoches)	$ 75,000	$ 85,134
Sul Ross State University (Alpine)	$ 75,000	$ 2,346
Texas A&M International University (Laredo)	$ 75,000	$ 74,448
Texas A&M University–Corpus Christi (Corpus Christi)	$ 75,000	$ —
Texas A&M University–Kingsville (Kingsville)	$ 75,000	$ —
Texas A&M University–Texarkana (Texarkana)	$ 75,000	$ —
Texas Lutheran University (Seguin)	$ 75,000	$ 6,483
Texas Woman's University (Denton)	$ 75,000	$ —
The University of Texas Rio Grande Valley (Edinburg)	$ 75,000	$ 74,999
Trinity University (San Antonio)	$ 75,000	$ 42,903
University of Dallas (Irving)	$ 75,000	$ 22,429
University of Houston–Downtown (Houston)	$ 75,000	$ 35,006
University of Mary Hardin-Baylor (Belton)	$ 75,000	$ —
University of St. Thomas (Houston)	$ 75,000	$ 76,486
University of the Incarnate Word (San Antonio)	$ 75,000	$ 25,182
West Texas A&M University (Canyon)	$ 75,000	$ —
Total	$ 2,100,000	$ 685,281

Catalyst for Discovery Program Grants

The Welch Foundation funds 28 investigators at 4 institutions.

PROGRAM DIRECTOR	CO-INVESTIGATORS	INSTITUTION	TITLE OF RESEARCH
Yi Lu	Thomas R. Cundari Andrew D. Ellington Kami L. Hull Michael J. Rose	*The University of Texas at Austin*	Artificial Dinitrogen Transferases: Leveraging Bio-Inspired Nitrogen Fixation to Directly Transfer N_2 into Organic Molecules
Deepak Nijhawan	Jef K. De Brabander Tian Qin Joseph M. Ready	*The University of Texas Southwestern Medical Center*	A Platform for the Rapid Discovery of Novel Small Molecules for Chemical Biology
Jeffrey D. Rimer	Alamgir Karim T. Randall Lee Jeremy C. Palmer Peter G. Vekilov	*University of Houston*	Welch Center for Advanced Bioactive Materials Crystallization
Megan L. Robertson	Brad Carrow Olafs Daugulis Alamgir Karim Ramanan Krishnamoorti	*University of Houston*	Enabling Polyolefin Circularity via Chemical Functionalization, Compatibilization, and Upcycling
Michael K. Rosen	Qian Cong Matthew W. Parker Benjamin R. Sabari Jeffrey B. Woodruff	*The University of Texas Southwestern Medical Center*	Biochemical Specificity and Function of Biomolecular Condensates
Damian W. Young	Martin M. Matzuk Zhi Tan Mingxing Teng	*Baylor College of Medicine*	Innovation in DNA-Encoded Chemistry Technology to Enable More Effective Ligand Discovery

Welch eXperimental (WelchX) Collaboration Pilot Grants

The Welch Foundation funds 26 investigators at 15 institutions.

PRINCIPAL INVESTIGATORS	INSTITUTIONS	TITLE OF RESEARCH
Ilya J. Finkelstein Zhao Wang	*The University of Texas at Austin* *Baylor College of Medicine*	Mapping Sub-Cellular Genotype-Phenotype Relationships with Correlated Spatial Sequencing and Electron Cryo-Tomography
Yimo Han Yuanyue Liu	*Rice University* *The University of Texas at Austin*	Stabilizing Copper Electrocatalysts for CO_2 Conversion
Benjamin Janesko MD Masud Rana	*Texas Christian University* *Lamar University*	Cyber Twin Chemical Ensembles for Near-Infrared-Emitting Graphene Quantum Dot Therapeutics
Anna Konovalova Tian Qin	*The University of Texas Health Science Center at Houston* *The University of Texas Southwestern Medical Center*	Cost-Effective Tool for Bacterial Reverse Vaccinology
Ivan Korendovych Dino Villagrán	*Baylor University* *The University of Texas at El Paso*	Selective Bio-Inspired Electrochemical Probes for PFAS Analysis and Degradation
Samantha Kristufek Kayla Green	*Texas Tech University* *Texas Christian University*	CIRCUIT: Critical Ion Recovery using Conductive and Ultrafiltration Intelligent Technology
Stanton F. McHardy Jonathan T. Sczepanski	*The University of Texas at San Antonio* *Texas A&M University*	Development Of PROTACs with Programable Oligonucleotide-Based Linkers
Indrajit Srivastava Ognjen Miljanić	*Texas Tech University* *University of Houston*	'Ping-Pong' Afterglow Luminescence in Self-Assembled Molecular Cubes
Andy Thomas Raúl Hernández Sánchez	*Texas A&M University* *Rice University*	Accelerating Magnetic Resonance Imaging Contrast Agent Discovery via Rapid Injection NMR: Improving the Detection of Lithium for Disease Diagnostics
Joshua Tropp Benjamin K. Keitz Melissa L. Zastrow	*Texas Tech University* *The University of Texas at Austin* *University of Houston*	Unraveling the Role of Iron in the Gut Microbiome using Iron-Selective Organic Electrochemical Transistors
Lauren J. Webb Sheena D'Arcy Hao Yan	*The University of Texas at Austin* *The University of Texas at Dallas* *University of North Texas*	Molecular Mechanisms of Life in the Deep Sea: Understanding Protein-Lipid Structures and Dynamics at High Pressure
Fang Xu Hong Wang	*The University of Texas at San Antonio* *University of North Texas*	Visualize Molecular Adsorption on Supported Ni-Porphyrin Model Catalysts via Substitute Effect



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