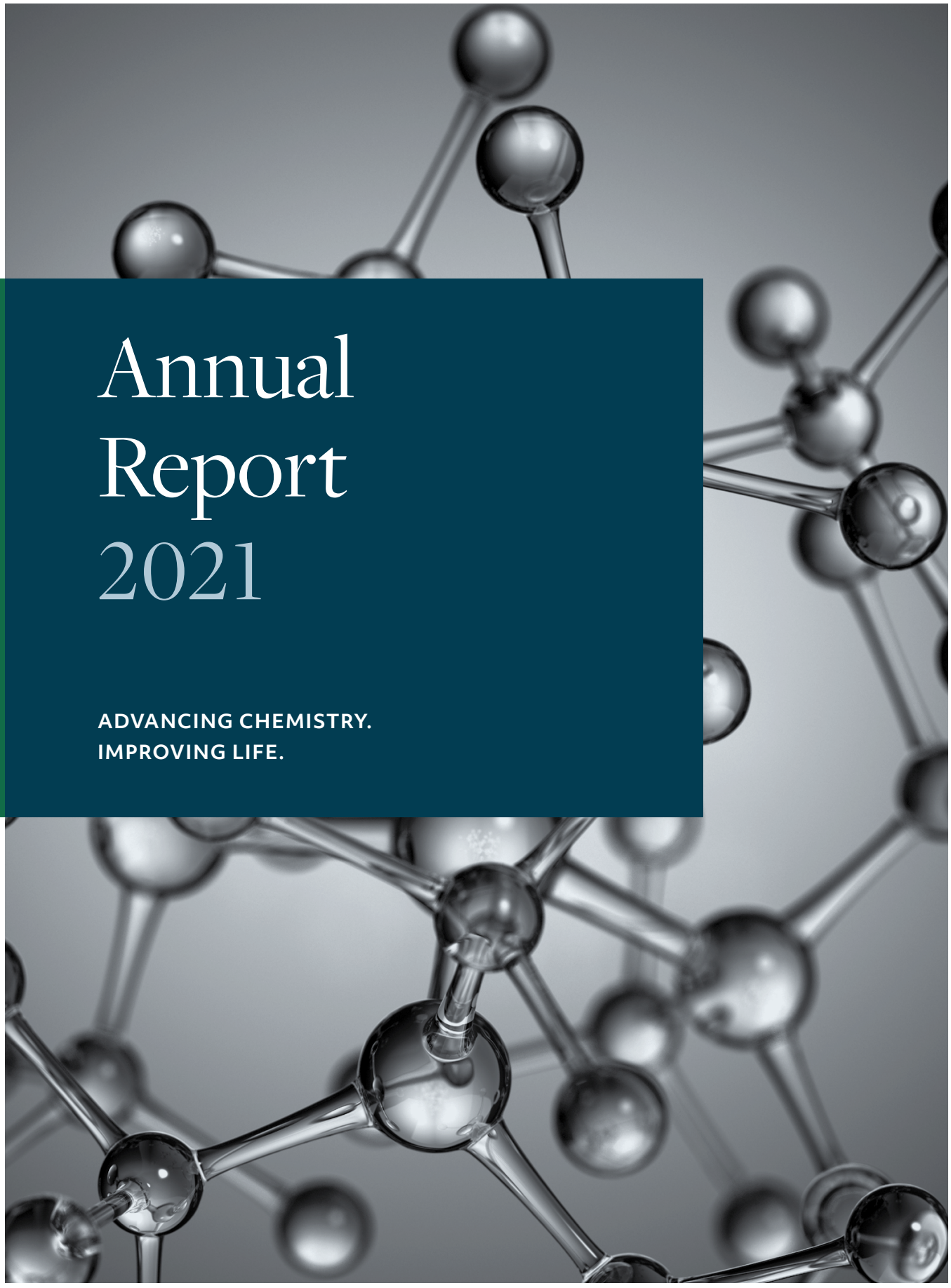


Annual Report 2021

ADVANCING CHEMISTRY.
IMPROVING LIFE.

Table of Contents

Robert A. Welch

For 67 years
The Welch Foundation has led the way in supporting basic chemical research.

The Welch Foundation is a legacy to the world from Robert Alonzo Welch, a self-made man with a strong sense of responsibility to humankind, an enthusiastic respect for chemistry and a deep love for the state of Texas.

Born in South Carolina to a prominent family that fell on hard economic times, Mr. Welch came to Houston as a youth and later made his fortune in oil and minerals. Over the course of his career and life, he became convinced of the importance of chemistry for the betterment of the world.

Scientists, geologists and petroleum engineers were among his close friends and associates as were the civic and business leaders of the day. From these associations and his own study, Mr. Welch determined that the pursuit of chemistry and chemical research held great potential for vast good and would continue to have a valuable impact on business, industry, global leadership and the human condition.

Mr. Welch gave serious thought to the disposition of his estate. His decisions reflected his belief in science and the role it would play in the future. In his will, Mr. Welch stated: "I have long been impressed with the great possibilities for the betterment of mankind that lay in the field of research in the domain of chemistry."

With his death in 1952, Mr. Welch left a generous portion of his estate to his employees and their families. The balance began what is now The Welch Foundation.

Message from the Chair

CARIN M. BARTH
Chair and Director

Dear Welch Friends,

If adversity breeds innovation, then 2021 was a banner year. As we reported in last year's annual report, Welch-supported researchers produced incredible work aimed at taming the pandemic. That work, along with other important investigations, continued in 2021. With the advent of COVID-19 vaccines, tracking and testing, and new treatments – many developed with chemistry at their core – we have better tools to help manage the coronavirus' impact.

The importance of our mission – advancing chemistry to improve life – became crystal clear, even to non-scientists, over the past two years. To achieve this vision, Welch continues its commitment to support the researchers who expand our understanding of the world and to educate the public and policymakers about the crucial role of fundamental research. Thanks to the guidance of conference chair Xiaowei Zhuang and the hard work of our staff, we were able to host a successful virtual research conference to build upon Welch's mission. And while we were unable to hold our Welch Award gala in person, we celebrated our Hackerman and Welch awardees, Ilya Finkelstein and Chi-Huey Wong, with smaller, socially distanced luncheons at their institutions.

Great organizations are only as good as their people, and Welch has benefited from some of the best. At the end of the year, our two longest-serving Scientific Advisory Board members, Peter Dervan and Joe Goldstein, retired. The decades-long service to and guidance of our Foundation by these two Board members is unparalleled: Peter Dervan spent 33 years helping oversee our research mission, including most recently as SAB chair, and Joe Goldstein also has been a board stalwart, sharing his insights and wisdom for 35 years. We thank them both for their devotion to the Foundation, and wish them well on their future endeavors.

Great organizations also reload, and in this spirit, I would like to welcome Cathy Murphy to her new role as chair of the advisory group. Cathy has been an exceptional team member, and we look forward to her continuing the tradition of the thoughtful scientific and intellectual leadership that underpins our mission. At the end of the year, I stepped down from my role as chair of the Board of Directors, but am honored to continue to support Welch's compelling work as a board member. Doug Foshee, who joined the board in 2017 and served most recently as vice chair, takes the reins and promises to bring fresh insights and enthusiasm to the role.

The roller coaster ride of the past two years underscores the critical importance of Welch's mission and highlights how chemistry is fundamental to the building blocks of a successful society. The dedication and innovation of Welch-supported scientists play a critical role in helping the world manage the pandemic. As we look to a brighter future, we are humbled by and grateful for your continued support.

2021 Highlights

At the end of fiscal year 2021, The Welch Foundation's endowment stood at $954 million, and the amount invested in chemistry totaled close to $1.1 billion in actual-dollar support over the Foundation's 67 years.

In February, The Welch Foundation named Ilya J. Finkelstein of The University of Texas at Austin as the 2021 "rising star" recipient of the Norman Hackerman Award in Chemical Research. His research has advanced our understanding of how cells repair DNA – critical to cancer treatment – as well as improved the efficacy and safety of gene-editing tools. Early in the pandemic, his lab switched gears allowing him to play an important role in producing the spike protein for vaccine research and development. He also aids efforts to track SARS-CoV-2 variants and COVID-19 community spread.

Chi-Huey Wong of Scripps Research was honored as the 2021 recipient of the Robert A. Welch Award in Chemistry for his work unraveling the many important functions of carbohydrates, one of the cell's four primary, yet little understood, molecules. He created a range of tools and techniques that simplified carbohydrate synthesis for study, learned many of the secrets of this important molecule and built upon this knowledge to help prevent and treat disease.

Postponed in 2020 for the first time since its inception in 1957, the Welch Conference on Chemical Research was held virtually in October 2021. Focusing on the latest advances in brain research, "Frontiers of Brain Science and Medicine," drew some 550 participants under the leadership of Scientific Advisory Board member and conference chair Xiaowei Zhuang of Harvard University.

The year also saw several changes on the Scientific Advisory Board. Two long-time board members, Peter B. Dervan, California Institute of Technology, and Joseph L. Goldstein, The University of Texas Southwestern Medical Center, retired at the end of 2021. Catherine J. Murphy, University of Illinois at Urbana-Champaign, SAB vice chair, replaces Dr. Dervan as SAB chair effective January 1, 2022. Two other SAB members stepped down from the board during 2021: Jennifer A. Doudna, University of California, Berkeley, and W. E. Moerner, Stanford University. Dr. Moerner is continuing his commitment to chair the 2022 Welch Conference on Chemical Research, "Molecules and Sculpted Light."

Joining the SAB was Kevan M. Shokat from the University of California, San Francisco, who began his service on January 1, 2021. Ann E. McDermott, Columbia University, was named to the SAB, effective January 1, 2022.

To honor Dr. Dervan's long service on the Scientific Advisory Board, including seven years as its chair, The Welch Foundation endowed The Peter B. Dervan Distinguished Lecture Series at The University of Texas at Austin Cockrell School of Engineering. The $500,000 gift creates a permanent endowment for support of the lecture series and an additional $25,000 supports the inaugural lecture. Xiaowei Zhuang, Harvard University and SAB member, is slated to give the inaugural lecture October 21, 2022.

Joining the Foundation staff in 2021 was Kristin Roden as assistant director of grant programs.

The Welch Foundation's investment in chemistry has totaled more than **$1 billion** in actual-dollar support since its inception.

The Welch Foundation: Fulfilling Our Founder's Vision

Created from an endowment by Texas oilman and philanthropist Robert Alonzo Welch, The Welch Foundation is one of the nation's largest private funding sources for fundamental chemical research at universities, colleges and other educational institutions in Texas. Since its founding in 1954, the Foundation has supported chemistry in Texas through close to $1.1 billion of research grants and other programs.

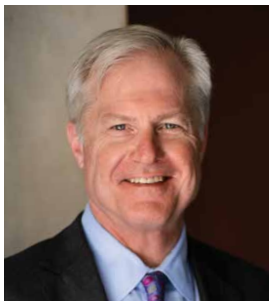
Following the dictates of Mr. Welch's will, the Foundation remains true to its mission of supporting fundamental scientific exploration that ultimately helps improve our world. The Foundation's endeavors are guided by a Board of Directors, Scientific Advisory Board and professional staff committed to building a robust scientific community in Texas that advances basic knowledge.

BOARD OF DIRECTORS

The Board of Directors serves as stewards of The Welch Foundation, overseeing its financial health, operational direction, and support for chemistry.

Welch Foundation Board of Directors and Officers

CARIN M. BARTH
Chair and Director



DOUGLAS L. FOSHEE
Vice Chair and Director

GINA A. LUNA
Treasurer and Director

FREDERICK W. BRAZELTON
Secretary and Director

WILLIAM F. MCKEON
Director

ADAM KUSPA
President

Scientific Advisory Board

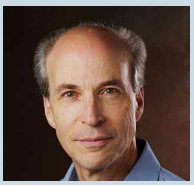
PETER B. DERVAN
SAB Chair
California Institute of Technology

CATHERINE J. MURPHY
SAB Vice Chair
University of Illinois at Urbana-Champaign

GEOFFREY W. COATES
Cornell University

JENNIFER A. DOUDNA
University of California, Berkeley

JOSEPH L. GOLDSTEIN
The University of Texas Southwestern Medical Center



ROGER D. KORNBERG
Stanford University School of Medicine

W. E. MOERNER
Stanford University

MELANIE S. SANFORD
University of Michigan

KEVAN M. SHOKAT
University of California, San Francisco

JAMES L. SKINNER
University of Wisconsin-Madison

XIAOWEI ZHUANG
Harvard University

The Scientific Advisory Board advises the Board of Directors on scientific issues related to the Foundation's mission. The board is composed of renowned leaders in chemistry and the related sciences who evaluate proposals for research grants, review and recommend finalists for the Welch and Hackerman Awards, and help oversee the other Foundation programs to promote chemistry in Texas. Each year, one member presides over the annual Conference on Chemical Research.

Foundation Staff

CARLA J. ATMAR
Director of Grant Programs

COLETTE BLEASDALE
Executive Assistant

CAROLYN KAHLICH
Senior Accountant

LOAN KIEU
Assistant Controller

JENNIFER MEADOWS
Administrative Assistant|Coordinator

RON PAGE
Chief Financial Officer

KRISTIN RODEN
Assistant Director of Grant Programs

SHERRY WHITE
Senior Accountant

Led by President Adam Kuspa, the staff oversees and implements the day-to-day operations of the Foundation.

Welch Award: Wong Revolutionizes the Field of Carbohydrate Chemistry

Chi-Huey Wong, Scripps Research, was named the 2021 Welch Award recipient for his groundbreaking work in carbohydrate chemistry.

The $500,000 Welch Award celebrates the outstanding achievements of scientists whose research has significantly improved lives.

Chi-Huey Wong, one of the most prolific and decorated scientists working today, revolutionized carbohydrate research. The Scripps Family Chair Professor at Scripps Research has developed a number of innovative and practical techniques, including automated "one-pot" synthesis for complex carbohydrates, now used globally. Many of the enzymatic catalysis methods he pioneered have also been adapted more broadly to other areas of organic synthesis. His prolific research program also has produced carbohydrate-based medicines for a wide-range of diseases.

Dr. Wong's interest in carbohydrates came from his goal of eradicating cancer. In the past few years, his long journey has started to pay off in clinical trials for vaccines that are looking promising for a variety of cancers. He also has been instrumental in the work to develop a universal flu vaccine, as well as HIV and COVID-19 vaccines.

His focus has been three-fold: develop tools and techniques to synthesize carbohydrates for research, explore the structures and functions of these little-understood molecules, and then

build on this knowledge to develop medicines to prevent and treat disease. Dr. Wong has made major strides in all of these endeavors.

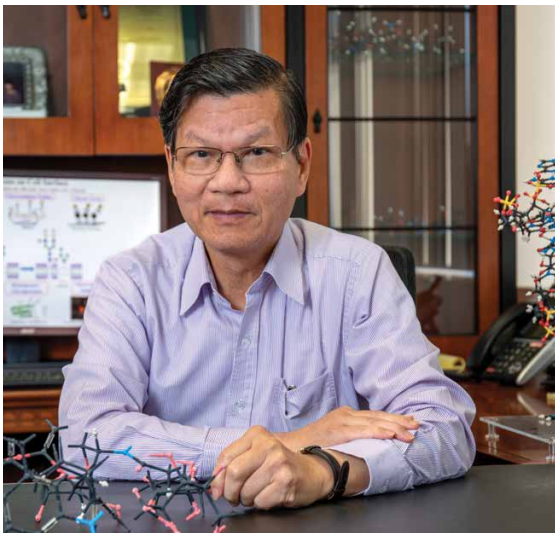
The 2021 Welch Award in Chemistry salutes his development of new methods for the synthesis of complex carbohydrates and glycoproteins and the elucidation of carbohydrate-mediated biological recognition associated with disease progression.

"The mission of The Welch Foundation is to improve the lives of others through the advancement of chemical research, and Dr. Wong has been working towards that goal for decades," said Carin M. Barth, chair and director, The Welch Foundation Board of Directors. "Not only has he made revolutionary advances in chemistry and biology, but his methodologies will facilitate new drug and vaccine developments for years to come."

Carbohydrates are one of the four major classes of molecules that make up cells, including nucleic acids, proteins and lipids. However, because they were hard to make in the lab in pure form, their functions were hard to study and, therefore, little understood. Dr. Wong pioneered the use of enzymes in organic synthesis, transforming the face of carbohydrate chemistry with this game-changing synthetic technology. He created a range of tools to simplify and streamline the synthesis, including his "one-pot" technique, now widely used.

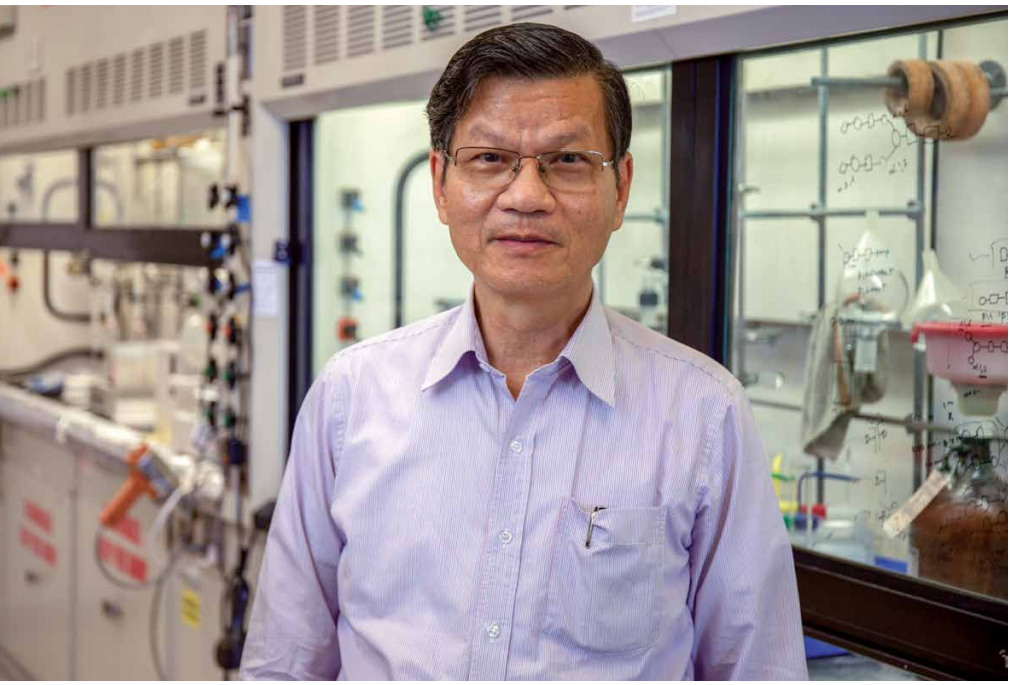
"Chi-Huey Wong is the most important figure in the development of carbohydrate synthesis using enzymatic catalysis," said Peter B. Dervan, the Foundation's Scientific Advisory Board chair. "Chi-Huey transformed the field of carbohydrate chemistry with innovative synthetic methods such as automated programmable assembly of oligosaccharides using computer-based guides to select the order of building blocks. This eliminated the problem of protecting group manipulation in traditional solution-phase synthesis and enabled biochemists to study the functional role of glycosylation of proteins and lipids in biology and medicine."

Dr. Wong also has explored the importance of carbohydrates in the active immunization and treatment of cancer and infectious disease. His work since the 1980s resulted in the development of scientific and technological tools including effective synthesis of complex polysaccharide antigens and glycoconjugates, suppression of autoimmune phenomena, homogenous antibodies, boosting the memory of the immune system and enhancing its cancer- and virus-killing abilities, and highly sensitive analytical methods. Recently, these tools and methods were instrumental in creating a vaccine that targets carbohydrates specific to the surface of cancer cells.



Chi-Huey Wong pioneered new techniques to synthesize carbohydrates for study to unlock their secrets.

Welch Chair Carin Barth and Dr. Wong with Welch President Adam Kuspa and SAB Chair Peter Dervan.



Chi-Huey Wong's group spans both chemical and biologic research in his continuing quest to leverage better knowledge of carbohydrates to prevent and treat disease.

"Without the fundamental understanding of science, it's difficult to do translational research and without translational research, it's difficult to see the impact of your fundamental research," said Dr. Wong. "Advances in applied science are always based on basic research, and we need to better communicate that connection to funding agencies and the public."

Dr. Wong's work has helped find answers to important questions, including the effects of protein folding, the impact of protein glycosylation on the immune response, identification of aberrant glycosylation in cancer and other diseases, and biological signaling associated with glycosylation. In addition to developing carbohydrate-based cancer vaccines, he has discovered new diagnostic methods using glycan arrays, pioneered the preparation of homogeneous glycoproteins with well-defined glycan structures as pharmaceuticals, and developed glycol-enzyme inhibitors for biomedical applications and as therapeutics. His research is leading to new treatment and prevention methods for maladies from cancer, diabetes and neurodegeneration to viruses including flu, HIV and SARS-CoV-2.

With degrees from National Taiwan University, Dr. Wong earned a Ph.D. at the Massachusetts Institute of Technology and completed postdoctoral studies at Harvard University. His first faculty appointment was at Texas A&M University, and he moved to Scripps Research in 1989. Dr. Wong completed a 10-year term as president of Academia Sinica in 2016, where he helped build the translational and biomedical capacity of the institute while continuing his own work. He has since held joint appointments there and at Scripps Research.

Dr. Wong received his award virtually at the Welch research conference in October 2021 just before delivering a lecture on his career accomplishments. His contributions were later celebrated at a small outdoor ceremony on the campus of Scripps Research.

Dr. Wong and his wife Yieng-lii have two children, Yuh-Shioh and Andrew.

Hackerman Award: 'Rising Star' Unravels How DNA Repairs Cells

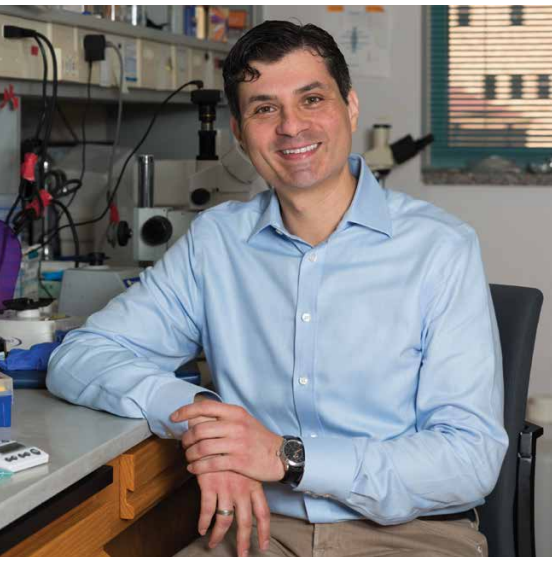
Ilya J. Finkelstein focuses his research on understanding the mechanisms of genome maintenance and CRISPR gene editing. The associate professor in the Department of Molecular Biosciences and the Institute for Cell and Molecular Biology at The University of Texas at Austin combines chemistry, biochemistry, biophysics and molecular biology in his work.

Dr. Finkelstein's lab has discovered and delineated the mechanisms of caretaker proteins that identify and repair DNA damage to preserve the genetic integrity of the cell. Since rapid-growing cancer cells are particularly dependent on DNA repair, this work suggests new targets for drugs to disrupt the repair process and slow tumor growth. His research also seeks to better understand the molecular underpinnings of CRISPR enzymes and how they can be used for precise genome engineering.

The 2021 Norman Hackerman Award in Chemical Research pays tribute to Dr. Finkelstein for his innovative methods to understand how cells repair their DNA and maintain integrity of genetic information.

Welch Chair Carin Barth presents Ilya Finkelstein with the Hackerman Award.

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.



The 2021 Hackerman Award recipient Ilya Finkelstein is working with the CRISPR-Cas molecule to make gene editing more precise. With the pandemic, he also has been instrumental in research related to the SARS-CoV-2's spike protein.

"Dr. Finkelstein made extraordinary accomplishments and is well deserving of this award," said Carin M. Barth, chair and director, The Welch Foundation Board of Directors.

"This honor is timely given his leadership and work surrounding the optimization and production of the spike protein, a critical component in some COVID-19 vaccine formulations."

Dr. Finkelstein has pioneered numerous innovative tools to understand how molecular machines edit and repair our genomes. His team has merged next-generation DNA sequencing with molecular biophysics to characterize and improve emerging gene-editing tools, known as RNA-guided CRISPR-Cas enzymes. This allows him to observe the intricate molecular choreography of proteins as they repair our genomes with the goal of improving the efficacy and safety of gene editing for medical applications.

Beyond his own research, some of these tools have been widely adopted by other researchers for broader studies of how proteins organize into molecular complexes and how these complexes coordinate their functions to carry out cellular activities.

"You can think of DNA as a track that supports all of life's activities. It's an information-rich track. It encodes all of the instructions for life, but it also is literally a road which allows proteins to package it, to read it, to write it, to copy it," Dr. Finkelstein said. "Our technologies allow us to observe individual proteins and make a molecular movie of a protein copying a DNA or a protein repairing a DNA and so on. Visualizing these proteins in action helps us understand the mechanisms at work."

When the pandemic took hold in early 2020, Dr. Finkelstein quickly reoriented much of his research, working in collaboration with other UT labs, including that of Robert A. Welch Chair in Chemistry holder Jason McLellan and Welch principal investigator Jennifer Maynard, to create spike proteins for use in vaccine development and antibody research.

Dr. Finkelstein is also on a team of UT faculty who have been working with clinicians in Houston to understand how COVID-19 is mutating, sequencing the virus to better understand community spread. They also have helped significantly increase the analytical capability to gain a clearer view into the prevalence of new variants.

"Dr. Finkelstein is a distinguished and impressive biophysicist," said

Peter B. Dervan, Foundation Scientific Advisory Board chair. "His creativity in the lab continues to move the field forward with cutting-edge research and discoveries related to DNA repair and CRISPR gene editing. Dr. Finkelstein's recent COVID-19 research also shines light on the importance of ongoing and proactive basic chemical research."

Dr. Finkelstein considers the students and postdocs he works with his most important achievement, calling himself a "force multiplier" for all the new knowledge they will unlock in the decades to come. Dr. Finkelstein's ability to nurture the next generations of scientists and imbue them with his own curiosity and passion for excellence will pay many dividends long into the future.

"It is truly an honor to join the extraordinary list of fellow scientists who have previously received the Hackerman Award," said Dr. Finkelstein. "This is such a momentous time for our lab and fellow UT researchers, and I look forward to continuing our efforts developing an even better understanding of the coronavirus as well as our focus on gene editing."

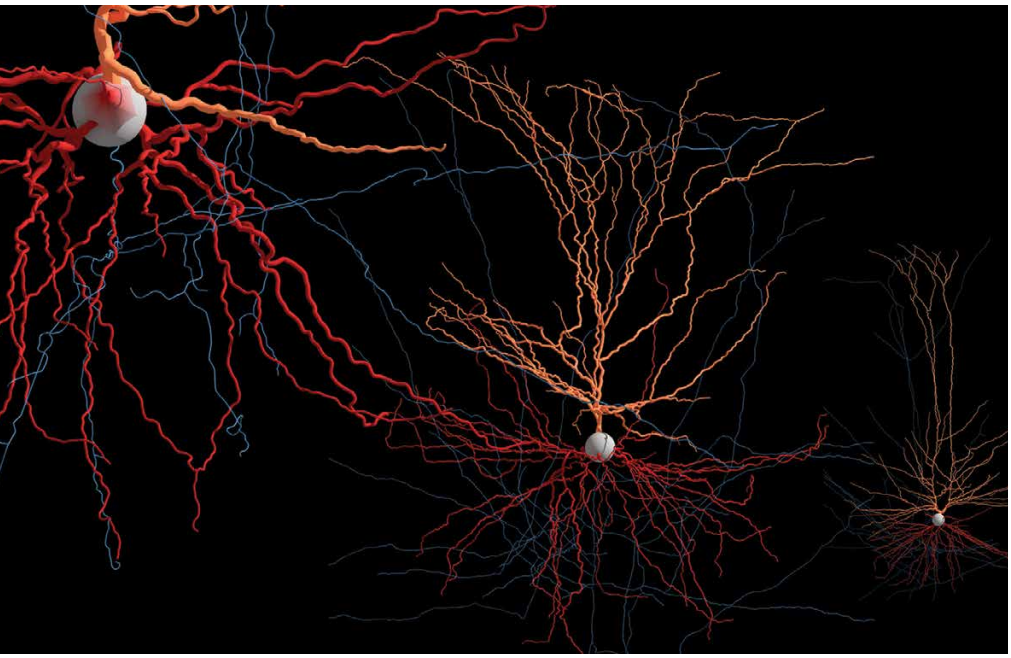
With bachelor's and graduate degrees in chemistry from the University of California, Berkeley, and Stanford University, respectively, Dr. Finkelstein moved into biophysics during his postdoctoral studies at Columbia University. He joined the UT Austin faculty in 2012.

He is married to Julie Glasser and has two young daughters, Zoya and Devri.

Named in honor of Welch's longtime chair of its 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.

Welch President Adam Kuspa (left) and Chair Carin Barth celebrate with Ilya Finkelstein on the UT Austin campus.

Conference on Chemical Research: Exploring New Developments in Brain Science



Reconstructed neurons from the human cortex.
Credit: Allen Institute for Brain Science.

For 64 years, The Welch Foundation has hosted a research conference which draws leading scientists from around the world.

The Welch Foundation, after postponing its research conference in 2020 due to the pandemic, held the meeting virtually in 2021. Some 550 attendees joined the live-streamed event exploring advances in brain research. The 64th conference, "Frontiers in Brain Science and Medicine," focused on the new technologies driving fresh insights into this still little-understood organ.

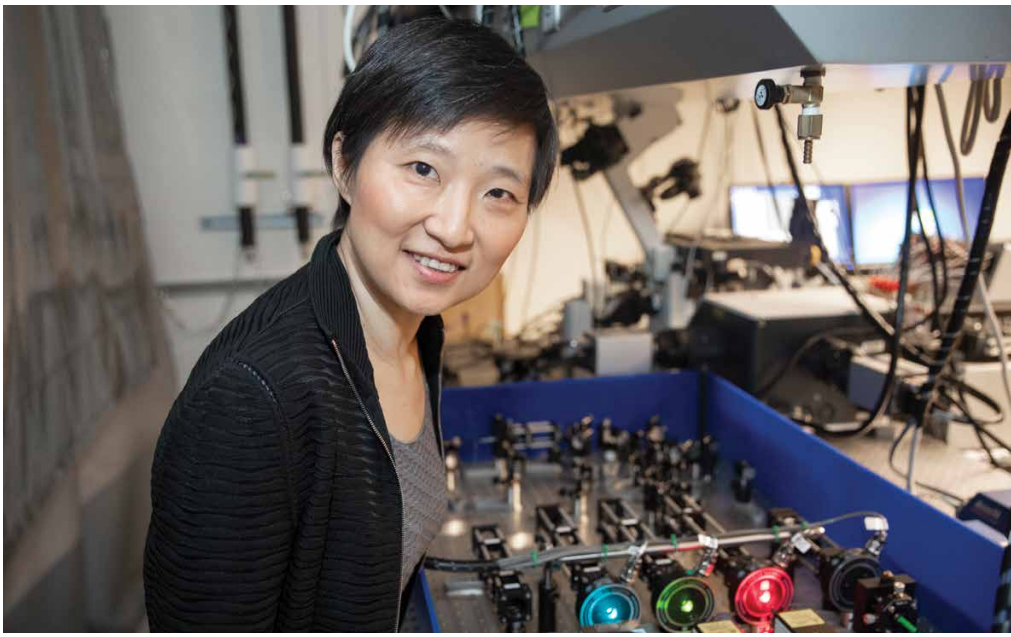
"The brain is our most complex and mysterious organ," said Xiaowei Zhuang, conference chair, Welch Scientific Advisory Board member, and the David B. Arnold Jr. Professor of Science and Howard Hughes Medical Institute Investigator, Harvard University. "Experts shared their latest work unraveling its secrets at the cellular and molecular levels and how these advances are accelerating our understanding of neuro diseases. While there is still a long way to go, the scientific community is making great strides toward a truly audacious goal: creating a detailed map of the brain's

molecular and cellular architecture. It's very exciting."

The conference was divided into four sessions over two days, featuring presentations from some of the top global researchers in brain science.

MOLECULAR ARCHITECTURE AND FUNCTION

Kicking off the conference, October 25, "Molecular Architecture and Function" was chaired by discussion leader Christy Landes, Rice University. The speakers shared research on the molecular systems critical to nerve cell function and the new technologies allowing researchers to explore these systems in ever-greater detail. Presenters were Thomas C. Südhof, Stanford University, "The Molecular Logic of Synapse Formation"; Steven Chu, Stanford, "Nanometer-Resolution Tracking of Axonal Transport by Dynein in Neurons"; and Pietro De Camilli, Yale University, "Intracellular Membrane Lipids Dynamics and Neurodegenerative Diseases."



Xiaowei Zhuang pulled together an exciting line-up of researchers in brain science.

CELL AND CIRCUIT ORGANIZATION

In the afternoon session, "Cell and Circuit Organization," the speakers examined new insights into the brain's cellular composition and organization, how cells interact in the neural circuits that control behavior and new technologies transforming the field. Discussion leader was Mirjana Maletic-Savatic, Baylor College of Medicine, and speakers were Hongkui Zeng, Allen Institute

Christy Landes, Rice University, led the first session.

Mirjana Maletic-Savatic, Baylor College of Medicine, guided discussion in the second.

Benjamin Arenkiel, Baylor College of Medicine, led the first discussion on day two.

Joe Goldstein wrapped up the conference with the final session.

for Brain Science, "Understanding Brain Cell Type Diversity"; Jeffrey R. Moffitt, Harvard Medical School, "Creating Molecular Atlases of Tissues by Imaging the Transcriptome"; and Catherine Dulac, Harvard, "Neurobiology of Social Behavior."

NEUROACTIVITY AND BEHAVIOR

The second day opened with "Neuroactivity and Behavior," led by Baylor College of Medicine's Benjamin R. Arenkiel. Three scientists described technological breakthroughs allowing the manipulation and recording of nerve cell activity with high precision as well as the new insights into the nervous system they have made possible. Presenters were Karl Deisseroth, Stanford, "Inner Workings of Channelrhodopsins and Brains"; Alice Ting, Stanford, "Optogenetic and Chemogenetic Technologies for Probing Molecular and Cellular Interactions"; and Adam Cohen, Harvard, "Optical Electrophysiology to Dissect Neural Circuits."

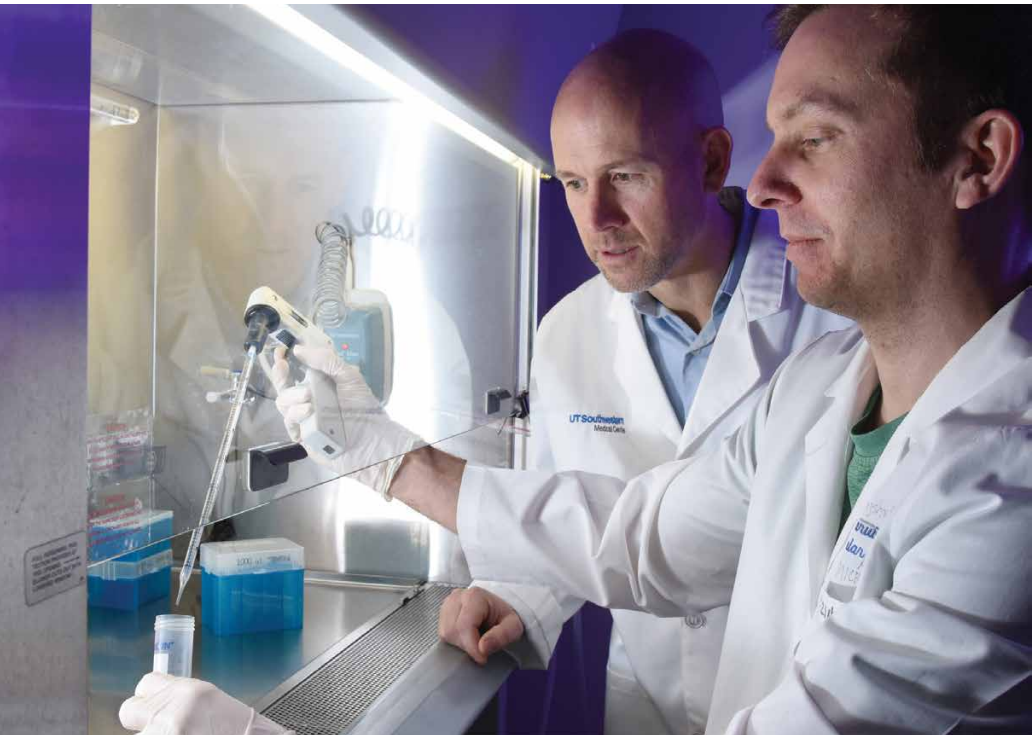
DISEASES AND MEDICINE

Wrapping up the conference, the final session focused on molecular and cellular dysfunctions and their relationship to neurological disorders and psychiatric diseases. Joseph L. Goldstein, The University of Texas at Southwestern Medical Center, guided the discussion of "Diseases and Medicine." Sharing their insights were Hugo J. Bellen, Baylor College of Medicine, "GlucosylCeramide in the Pathogenesis of Rare Lysosomal Disease and Parkinson's Disease"; Steven L. McKnight, UT Southwestern,"Tracing the Genetics of Neurological Disease to the Mutation-Engendered Addition of Single Hydrogen Bonds"; and Christopher A. Walsh, Harvard Medical School, "Somatic Mutation in Human Brain During Development and Neuropsychiatric Disease."

"Our brains are made up of more than 100 billion cells organized into a vast network of circuits that perform brain functions. Inside the cells are numerous molecules that themselves form interaction networks to support cellular functions," Dr. Zhuang said. "Building our fundamental understanding of how all this works will pay incredible dividends for human health."

With the pandemic forcing cancellation of the Welch Award gala once again, the Foundation instead honored the 2020 and 2021 recipients of the Welch Award in Chemistry during the conference. The 2020 recipient, Steven L. McKnight, UT Southwestern, was recognized midday Monday and Chi-Huey Wong, the 2021 awardee, on Tuesday. As traditionally done, Dr. Wong presented the 2021 Welch Award lecture on his current research, "Glycosylation Chemistry and Biology."

Programs: Spurring Research, Educational Initiatives



Welch Foundation research grants support hundreds of principal investigators across Texas, including this work in Neal Alto's lab at The University of Texas Southwestern Medical Center.

The Welch Foundation **supports basic research** in chemistry each year through a range of programs.

"Despite the continuing challenges of the pandemic, I have been impressed by the ongoing commitment of Texas' science community to finding creative ways to progress research and research mentoring," said Welch President Adam Kuspa. "2021 was a productive year for Welch in our continuing quest to finetune our operations to better fulfill our mission. One of the key changes we made was in revamping our grant review process to make it more equitable across the board. Effective March 2022, each proposal will be reviewed by two SAB members with expertise in that area of chemistry, and award and renewal based on their analysis. I am also pleased to report that starting in fiscal 2022, the grants will increase to $100,000 annually. There is so much good research and so many creative ideas flowing from Texas labs that we want our grants to keep pace with the ever-increasing cost of research so they can continue to support impactful projects."

THE WELCH INSTITUTE FOR ADVANCED MATERIALS

The Welch Foundation committed $100 million to Rice University last year, the largest grant in its history, establishing The Welch Institute for Advanced Materials. This sweeping strategic partnership will focus on advanced materials research.

Located on the Rice campus, the Institute is scheduled to occupy 50,000 square feet in the new Engineering and Science Building, now under construction on the engineering quad. It will combine fundamental chemistry and materials science with the latest in machine learning and artificial intelligence to accelerate the discovery, design and manufacture of the next generation of materials with applications to new energy systems, sustainable water, space systems, telecommunications, manufacturing, transportation, security and more.

During 2021, The Welch Institute continued work to develop a focused strategy, scientific team, facilities and equipment to drive the design of advanced materials, aiming for start-up in early 2023.

The Institute's goal is to attract top researchers from around the world to collaborate with Rice University's internationally renowned faculty and scientific resources, making the Institute a center of intellectual discovery, innovation and transformation in advanced materials.

The Institute is governed by an independent board of directors, led by Chair James T. Hackett, and is being advised by a scientific advisory board, chaired by Matthew V. Tirrell, dean of the Pritzker School of Molecular Engineering at the University of Chicago. The initial Institute SAB chair, Paul Alivisatos, stepped down upon being named president of the University of Chicago, and helped recruit Dr. Tirrell to the role.

Matthew Tirrell, University of Chicago, has been named chair of the Scientific Advisory Board of The Welch Institute for Advance Materials at Rice University.

"I am honored to head the SAB for this exciting new initiative," said Dr. Tirrell. "I look forward to working closely with Rice and Welch to recruit a world-class leadership team."

With his recommendation, the Institute board approved the addition of Sir Anthony Cheetham, University of California, Santa Barbara, and Kristin Persson, University of California, Berkeley, to the SAB in 2021. The Institute also appointed Albert Chao, Charles (Chip) Blankenship and Andrew Karsner to its Board of Directors.

RESEARCH GRANTS

The research grant program is the oldest initiative of The Welch Foundation. First launched in 1954, the program provides support for fundamental research in chemistry by full-time faculty members at Texas colleges and universities. The Foundation has provided funds to hundreds of laboratories around the state, fostering nascent projects that can have difficulty qualifying for federal grants. This year, $18.3 million supported 367 three-year research grants, including 39 new proposals and 55 renewal projects, at 25 Texas institutions. From its inception, the Foundation has contributed close to $1.1 billion to chemical research, the majority of which went to research grants.

Currently, each research grant provides a maximum of $80,000 annually for three years and may be renewed based on the proposal submitted by

the principal investigator. This year the Welch Board approved an increase in support to $100,000 per year, beginning in 2022.

A list of principal investigators receiving Welch Foundation grants during its 2021 fiscal year, September 1, 2020, to August 31, 2021, begins on page 26. The listing includes researchers' institutions and the titles of their research projects. The work of two of these principal investigators is highlighted starting on page 30.

DEPARTMENTAL RESEARCH GRANTS

Small- and medium-size colleges and universities often struggle to find the resources to provide student research opportunities despite the institutions' important role in science education. To help meet this need, The Welch Foundation launched a program in 1984 to provide funding to many of these schools with the goal of strengthening their chemistry programs.

Welch departmental grants allow the schools to offer research opportunities to students, support faculty work and enhance chemistry programs. The departments typically use Welch funding to provide scholarships or other monetary support to undergraduates and graduate students, purchase laboratory supplies and equipment, and underwrite student travel to scientific conferences.

Over the years, the Foundation has been informed of how the research experience helps to support and promote a sense of discovery and passion for scientific inquiry – enthusiasm and excitement difficult to create through book learning alone. For many students at these institutions, it is their first opportunity to conduct research themselves. Many students later go on to seek advanced degrees and careers in science and medicine.

Descriptions of how two colleges in Welch's departmental grant program, University of Houston-Clear Lake and The University of Texas of the Permian Basin, have leveraged those funds to enhance their educational missions can be found in the foundation grants section starting on page 18.

WELCH SUMMER SCHOLAR PROGRAM

Unfortunately, the pandemic once again caused the canceling of the 2021 Welch Summer Scholar Program in which high school students spend six weeks on a college campus and gain hands-on experience working with faculty on their research projects.

Instead, program director Lauren Webb, The University of Texas at Austin, organized an online lecture series featuring 10 speakers from around the state.

"We chose presenters with talent for explaining difficult concepts in chemistry to younger students who lack a technical academic background – something not always easy to do!" Dr. Webb, professor of chemistry, noted. "The seminars proved hugely successful despite having to scramble to pull the program together quickly when COVID started peaking again."

Attendance averaged 75 people per session, with a total of 195 unique participants.

"While we targeted WSSP's core age group of older high school students, we were excited to find that several high school science teachers also participated," she said. "The online lectures also allowed us to expand our outreach to more students than we can accommodate in the normal summer scholar program."

Based the program's success, WSSP plans to continue hosting a lecture series each year along with the on-campus summer scholar experience.

WELCH CHAIRS

The Welch Foundation endows 48 chairs at 21 Texas universities. This support is designed to recruit and retain talented chemical researchers and teachers to Texas universities as well as strengthen the quality of higher education programs across the state. The Foundation provides ongoing research funding for chairholders, helping support graduate and postdoctoral students working with the professors.

In 2021, three scientists were named to Welch chairs: John G. Ekerdt, The University of Texas at Austin, Norbert Dittrich-Welch Chair in Chemical Engineering (see page 20); Oleg Larionov, The University of Texas at San Antonio, Welch Chair in Chemistry; and Yi Lu, The University of Texas at Austin, The Richard J. V. Johnson-Welch Regents Chair in Chemistry.

Foundation Grants: Welch Funding Supports New Scientific Advances Across Texas

ANTON DUBROVSKIY
Departmental Grant
University of Houston-Clear Lake

Anton Dubrovskiy says he has been fascinated by chemistry since middle school. He attended a chemistry high school and college in his hometown of Moscow before coming to the U.S. in 2007 for graduate studies. At Iowa State University, he discovered a strong passion for teaching.

He joined the University of Houston-Clear Lake in 2014 as it expanded from an upper-level institution to a comprehensive four-year university, and today he runs the chemistry program of 10 faculty members, including two with joint appointments in biology and environmental science.

Dr. Dubrovskiy's goal: to make a difference and inspire in students a love of chemistry. He has found exposing students to research early is vital.

"I want to inspire students for science. I want them to feel valued and get them interested and started in research as early as possible as it takes time to learn the basics and get them off the ground. Today's students are our future," Dr. Dubrovskiy said.

UHCL chemistry majors are required to do research and can select their research project from multiple areas of chemistry: organic, inorganic, computational, environmental, analytical and biochemistry.

The undergraduate research projects are designed so they can be completed within a semester or two. For example, Dr. Dubrovskiy's research focuses on designing organic methodologies to convert readily available materials, such as natural amino acids or simple aromatic amides, into more complex, medically relevant N-containing heterocycles, using at most a couple of chemical steps.

Anton Dubrovskiy seeks to inspire students through research at the University of Houston-Clear Lake.

"We want the students to have a sense of ownership over their research projects," Dr. Dubrovskiy explained. "That really excites them about continuing a career in science. It is sad that many of our students come with very limited chemistry background from high school. As such, the more opportunities we can provide for them to do research earlier at UHCL, the better."

UHCL boasts about 500 biology and 60 chemistry undergraduates and 15 chemistry graduate students. Under Dr. Dubrovskiy's leadership, the chemistry program is working to broaden research engagement opportunities for the students, and Welch funding is an important component. However, faculty teaching loads can pose a challenge for professors interested in mentoring more research students.

He explained that a very significant portion of Welch funding now goes to supporting students, unlike in the past when it was primarily used for supplies and equipment. The department holds an awards ceremony at the close of each semester to celebrate students' research achievements, with the best-performing awarded tuition scholarships.

Dr. Dubrovskiy said he has gleaned ideas on prioritizing student scholarships from other Welch-supported programs at the annual Welch research conference.

"Despite all the challenges of the pandemic, we were able to keep some research going. Tough times, but it is getting better! I am so pleased that a number of our very recent graduates are now pursuing Ph.D.s in the chemistry field or found jobs in the chemical industry," he added. "It is gratifying that we are making a difference."

At Baylor College of Medicine, Livia Schiavinato Eberlin's team has developed technology that allows surgeons to precisely differentiate cancerous and normal tissue during surgery.

LIVIA SCHIAVINATO EBERLIN

Principal Investigator
Baylor College of Medicine

"Welch funding lets us look deeper at the chemistry. It can really open our eyes to new possibilities," said Livia Schiavinato Eberlin, associate professor in the department of surgery at Baylor College of Medicine.

Dr. Eberlin is building on her work in fundamental chemistry to leverage ambient ionization mass spectrometry and large data analysis techniques to better inform clinical decisions.

As an undergraduate in her native Brazil, Dr. Eberlin was exposed to ambient ionization mass spectrometry in the very early stages of its development and she "fell in love" with its possibilities. Ambient mass spectrometry streamlines analysis as it requires much less effort and time to prepare samples, which is a complicated process in traditional mass spec, particularly for biological samples.

She went on to complete a Ph.D. in analytical chemistry at Purdue University and a postdoctoral fellowship at Stanford University in statistical analysis of large data sets. She leverages her background to sort through extensive molecular data sets that she collects using mass spectrometry to pinpoint interesting aspects for further exploration and to inform diagnosis and treatment for patients.

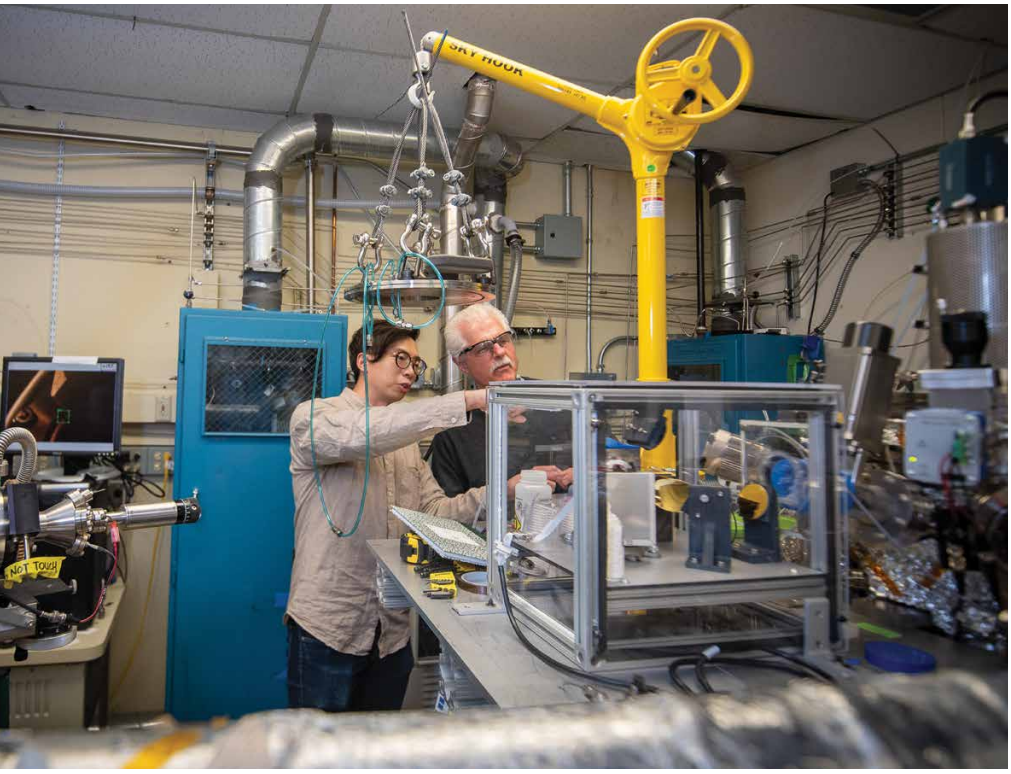
Dr. Eberlin started her independent career at UT Austin where a

Welch grant provided early research support. After five years, she moved to Baylor College of Medicine to be closer to her medical community collaborators in the surgery department. This makes sense, she explained, as the connection between her chemical research and surgery is human tissue. "The pieces of flesh surgeons deal with are the most incredible bottles of molecules you can imagine," she said.

Her ultimate goal is to apply chemical methodologies to healthcare. Her research team has been working on creating a user-friendly platform from which clinicians can quickly access comprehensive and detailed molecular information to make decisions. What is the disease? Are there subtypes to consider? What is the best treatment? This type of highly sensitive chemical analysis currently is not available in a clinical setting where doctors often make decisions based on what they can see.

For example, her research group has been testing a handheld mass spectrometry-based device they have created, named MasSpec Pen technology, in a variety of cancer surgeries. It helps surgeons precisely distinguish between regions of cancer and normal tissues *in vivo*, thus improving patient outcomes.

"I am so grateful for Welch support," Dr. Eberlin said. "It has allowed my lab to focus on the fundamental aspects of chemical analysis. Ambient mass spec is still a relatively new field, and our research is helping us understand the chemical properties of tissues. Welch lets us take a step back on the analytical approach and understand the more fundamental chemical underpinnings so we can optimize our methods for disease diagnosis based on that deeper understanding of the chemical processes involved."



John Ekerdt's UT Austin lab explores metal and oxide thin films and hetero-structures to develop more precise and less destructive methods to etch metals and semiconductors at low temperatures.

JOHN G. EKERDT

Norbert Dittrich-Welch Chair in Chemical Engineering
The University of Texas at Austin

John Ekerdt studies materials to enable next-generation technology with potential applications in electronic materials, energy and sensors. His group focuses on surface and materials chemistry as it relates to the growth and properties of ultrathin metal and metal oxide films for optical and electronic applications. Their goal is to understand and describe nucleation and growth of films and nanostructures, site-specific reactions to control/inhibit growth and structure-property relationships.

Dr. Ekerdt and his colleagues explore metal and oxide thin films and hetero-structures – alone and integrated with semiconductors. His work is highly interdisciplinary, requiring collaborations with faculty in chemical, electrical and mechanical engineering, and physics as well as researchers in industry.

His lab is elucidating the properties of oxide perovskite crystals atop

semiconductors and learning how to manipulate them, enabling optical interconnections to speed information transfer between chips. Since current speeds are limited using copper, such a breakthrough would speed up computing power while minimizing energy use.

Dr. Ekerdt also studies perovskite films to understand the chemical reactions responsible for atomic layer deposition growth and the interfacial reactions responsible for forcing the films to grow in a crystalline form. This work explores the monolithic integration of functional oxides with silicon to allow for silicon photonics heterostructures integrated on the same platform as the digital circuits.

One key research focus is area selective atomic layer deposition where the Ekerdt group is exploring how to reduce the chemical reactivity of surfaces using organic blocking layers that either self-assemble or are lithographically patterned, the robustness of the blocking layer and how the blocking layer fails. His team employs a variety of tools as *in situ* real-time probes to understand reactions and control a film's composition and structure as it evolves. They aim to develop more precise and less destructive methods of etching metals and semiconductors at low temperatures.

The associate dean of research in the Cockrell School of Engineering has had a long and productive career at UT Austin, holding numerous administrative positions in addition to his research and teaching roles. In 2021, Dr. Ekerdt was named to the new Norbert Dittrich-Welch Chair in Chemical Engineering, created to honor the former long-time Welch Foundation president.

"It is an honor to hold a chair named for Norbert," Dr. Ekerdt said. "I knew him for many years as he guided The Welch Foundation's support for research in the state. Welch has been such a driving force in helping build the caliber of our department and research across UT Austin and Texas. I have held Welch research grants for 12 years, and this has allowed us to be more nimble and take risks in our research. Welch has been indispensable in expanding our work into exciting new areas."

MILKA MONTES

Departmental Grant
The University of Texas of the Permian Basin

At The University of Texas of the Permian Basin, the chemistry department uses research as a tool for problem-based learning that complements course work, and vice versa.

"This is a key part of our mission," said Milka Montes, department chair. "Many of our students come in leery of research as something that is 'required' or potentially scary, but the experience totally changes their perspective and opens the door to new interests."

Students are required to take a minimum of two course credits in research, but most elect to do more

Milka Montes, UT Permian Basin, leverages Welch funding to support hands-on student research.

once they have the initial experience. Students can either continue with the same faculty member or gain exposure to another research area. The university offers biochemistry, environmental, and pre-pharmacy tracks with its Bachelor of Science in Chemistry as well as a chemical engineering degree.

Significant faculty attrition followed by the pandemic were tough on the department, Dr. Montes said. With classes back in person and four tenure-track faculty and two lecturers now on board, 19 undergraduates participated in research projects in 2021. The department averages approximately 50 chemistry majors.

"Students learn experimental design, conduct hands-on research and gain computation research experience," Dr. Montes said. UT Permian Basin benefits from access to mega computers through the UT System.

In 2021, projects ranged from exploring nanoparticles' impact on bacterial biofilms to conducting various types of chemical synthesis, including producing inhibitors to treat gout.

Others developed biomimetic catalysts to create energy-rich molecules or spectroscopically determined the structure and function of organometallic compounds with quantum mechanical computational methods. Three students worked with a faculty member who aims to synthesize molecules to release carbon oxide at a controllable rate for therapeutic use. A number of the projects resulted in published papers.

Over the years, Welch support has helped literally hundreds of students, many of whom have gone on to graduate school or to work in the local petrochemical industry.

"Welch funding provides monetary support to students conducting research. It also helps with travel to research conferences, equipment and supplies," Dr. Montes said. "It makes such a difference in the experience we can offer students – and something our faculty find invaluable in supporting their research and making other grant dollars go further."

DAVID POWERS

Principal Investigator
Texas A&M University

Associate Professor David Powers has long been fascinated by reaction mechanisms – how to move from A to B in a chemical reaction. His research program combines synthetic organic and inorganic chemistry to develop, understand and apply novel chemical transformations for sustainable synthesis. By developing new tools to control reactions, his group is streamlining the synthesis of functional molecules while reducing the associated waste streams.

The Powers group has two major research foci: characterizing the reactive species that are responsible for bond-forming and -breaking in catalysis as well as developing new methods to generate and apply those reactive species in synthetically important contexts.

Because reactive intermediates have fleeting lifetimes, it can be difficult to study them. Often, efforts to stabilize these reactive intermediates to enable characterization – by X-ray crystallography, for example – can affect the very properties a researcher is hoping to analyze. Dr. Powers' team is working to create a new approach using photochemistry inside a crystal to generate transient intermediates under conditions in which they can be observed and characterized. These studies provide insights into how to design new catalysts to control the structure and reactivity of the reactive intermediates at the heart of synthetic reactions.

To utilize reactive intermediates in new, efficient synthetic methods, Dr. Powers has been developing sustainable metal-free synthetic approaches. Using strong oxidants generated by oxygen from the air or electricity that can be sourced from solar power, these methods promise to increase the sustainability of fine-chemical synthesis.

He leverages his expertise in catalysis, synthesis and reaction mechanisms to explore the fundamental chemistry involved in electrochemical oxidation of main-group compounds. Dr. Powers

David Powers' aim is to streamline the synthesis of functional molecules while reducing the associated waste streams.

hopes developing a deep understanding of the mechanisms will help pinpoint strategies to enable broadly applicable electrocatalytic and aerobic processes.

"Welch is one of the only mechanisms where preliminary data isn't necessary to secure funding, and that is incredibly helpful," Dr. Powers said. "Welch supports a lot of work in my lab as we work to develop new and more sustainable tools to make chemicals."

Dr. Powers joined Texas A&M in 2015 after graduate school at Harvard University and a postdoctoral fellowship at Harvard and Massachusetts Institute of Technology. Welch funding helped him get his lab up and running. Today he leads a group of 20-plus researchers, including undergraduates, graduate students, and postdocs. He has been recognized with both research and teaching awards.

"Texas A&M has an awesome legacy in synthetic and inorganic chemistry, with great resources and great people," he said. "Thanks to Welch, Texas is a very friendly place for fundamental science."

MICHAEL P. SHEETZ

Welch Distinguished Chair in Chemistry
The University of Texas Medical Branch

Mike Sheetz is studying the detailed molecular mechanisms involved in a variety of cellular phenomena from cancer metastasis to aging and muscle function. This includes understanding the mechanical aspects of certain cells that allows them to sense their environment and then adapt to it.

"Biodiversity depends on this ability – how mechanics control reproductivity to create a proper form – but we don't know much about it," he said.

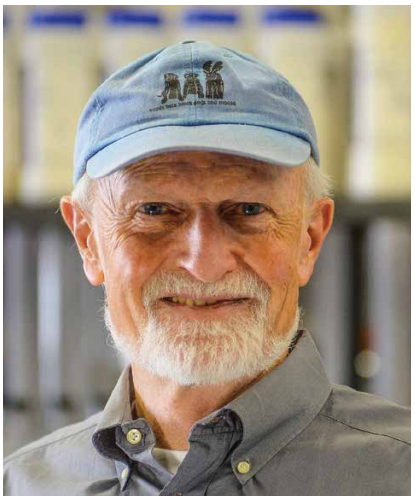
Dr. Sheetz joined UTMB in 2019 from the Mechanobiology Institute in Singapore, following stints at Columbia and Duke Universities.

Research has shown that mechanical stresses will kill cancer cells while normal cells thrive in the same conditions. His group is trying to exploit this reaction by using ultrasound. He hopes to use ultrasound to mimic the stress on cells caused by exercise – a reaction known to be beneficial in fighting many types of cancer.

Dr. Sheetz has detailed the pathway and created a working model. He has shown the approach works *in vitro* and it has seen limited success in mice. He now is trying to expand the process and make it more reliable. The next step would be to bring it to clinical trial.

"We're having fun. It's nice to have these new challenges. It's why we do science – invigorating and hopefully helpful down the road," Dr. Sheetz said.

Dr. Sheetz's major emphasis is on bringing the implications of mechanical effects on cells to the translational stage and ultimately useful treatments. Treating people mechanically – as opposed to using drugs – could significantly reduce negative side effects. He hopes that mechanics may eventually



Mike Sheetz focuses on the mechanical processes cells use to adapt to their environment.

prove effective in fighting cancer and other maladies.

The professor and his team also are interested in how mechanics affect aging. Exercise is known to reverse many effects of getting older, and he believes ultrasound will prove effective in reversing aging.

"I am excited about the research's potential," he said. "We are still at the fundamental science level, but the results have profound implications for patient care.

"While I have CPRIT dollars too – for which I am very grateful, Welch funding was vital in helping me hit the ground running when I arrived at UTMB and to develop our research program full speed, even in the face of COVID," Dr. Sheetz said. "Welch support also allows us to move quickly into new areas such as aging – speeding up the process of getting the equipment and other resources we need to tackle new challenges."

Statements of Financial Position

AS OF AUGUST 31, 2021 AND 2020

	2021	2020
ASSETS		
CASH AND CASH EQUIVALENTS	$ 33,870,414	$ 16,596,249
INVESTMENTS	917,710,334	730,818,871
RECEIVABLES:		
Investment transactions	1,060,363	772,809
Interest and dividends	39,217	46,734
Other	898,084	594,560
Total receivables	1,997,664	1,414,103
OTHER ASSETS	1,105,386	1,578,935
TOTAL ASSETS	$ 954,683,798	$ 750,408,158
LIABILITIES AND NET ASSETS		
LIABILITIES:		
Unpaid grants	$ 103,553,441	$ 111,269,748
Current and deferred federal excise tax payable	4,654,404	1,813,784
Accounts payable and other	255,997	227,569
Total liabilities	108,463,842	113,311,101
NET ASSETS	846,219,956	637,097,057
TOTAL LIABILITIES AND NET ASSETS	$ 954,683,798	$ 750,408,158

Statements of Activities

AS OF AUGUST 31, 2021 AND 2020

	2021	2020
REVENUES, INCOME, AND GAINS (LOSSES):		
Interest and dividends	$ 3,868,937	$ 3,170,731
Oil and gas royalties and other	3,384,446	2,233,323
Net realized gains on sales of investments	54,143,024	34,026,148
Unrealized appreciation of investments	182,202,713	43,334,312
Unrealized (depreciation) appreciation of other assets	(16,739)	17,958
Investment management expenses	(3,526,151)	(3,421,203)
Federal excise tax provision	(539,176)	(334,443)
Total revenues, income, and gains	239,517,054	79,026,826
EXPENSES:		
Grants approved, net	23,115,404	119,729,246
Grants administration	3,141,221	3,342,084
General and administrative	1,296,910	1,541,200
Total expenses	27,553,535	124,612,530
DEFERRED FEDERAL EXCISE TAX PROVISION ON UNREALIZED CAPITAL GAINS	(2,840,620)	(314,511)
CHANGE IN NET ASSETS	209,122,899	(45,900,215)
NET ASSETS, beginning of year	637,097,057	682,997,272
NET ASSETS, end of year	$ 846,219,956	$ 637,097,057

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

Principal Investigators

The Welch Foundation supported 367 active research grants at 25 institutions in 2021.

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Girish S. Agarwal	*Texas A&M University*	Correlated Super-Resolution and Supersensitive Total Internal Reflection Fluorescence Microscopy with Structured Classical and Quantum Illumination.
Michalis Agathocleous	*The University of Texas Southwestern Medical Center*	The *In Vivo* Requirement and Cell Type Specificity of the Citric Acid Cycle
Esra Akbay	*The University of Texas Southwestern Medical Center*	Targeting Arginase Enzyme Activity to Restore Arginine for T Cell Function in the Tumor Microenvironment
Hal S. Alper	*The University of Texas at Austin*	Biochemical Evaluation of Furan-Fatty Acid Biosynthesis and Production
Neal M. Alto	*The University of Texas Southwestern Medical Center*	Post-Translational Modification of Host Enzymes by Bacterial Effector Proteins
Oliviero Andreussi	*University of North Texas*	Modeling Solvation-Driven Rare-Events: From Drug Design to Protein Folding
Mauricio Antunes	*University of North Texas*	Establishing the Biochemical Determinants of microRNA Long-Distance Mobility in Plants
Xiao-chen Bai	*The University of Texas Southwestern Medical Center*	Structural Insights into the Activation Mechanisms of pH-Sensitive Insulin Receptor-Related Receptor (IRR)
Carlos R. Baiz	*The University of Texas at Austin*	Studies in Biophysical Chemistry: Applications of Ultrafast Infrared Spectroscopy
Kenneth J. Balkus, Jr.	*The University of Texas at Dallas*	Zeolite Encapsulated Metal Complexes
Zachary T. Ball	*Rice University*	New Strategies for Catalytic Bond Formations
Laura A. Banaszynski	*The University of Texas Southwestern Medical Center*	Chromatin-Based Mechanisms of Gene Activation
Sarbajit Banerjee	*Texas A&M University*	Developing Design Rules and a Synthetic Toolbox for Accessing Metastable Solids
Jiming Bao	*University of Houston*	Correlating Photocatalytic and Photoelectrochemical Activity of Cobalt Oxides with Dynamics of Photo-Excited Electrons and Holes
David P. Barondeau	*Texas A&M University*	Elucidating Control Mechanisms for the Synthesis of Sulfur-Containing Biomolecules
Jeffrey E. Barrick	*The University of Texas at Austin*	Chemical Specificity of DNA Uptake by Naturally Competent Bacteria
Bonnie Bartel	*Rice University*	Novel Peroxisomal Processes in Plants
Brian Belardi	*The University of Texas at Austin*	Probing Collagen Glycosylation: Synthesis, Self-Assembly, and Detection
Doran I.G. Bennett	*Southern Methodist University*	Mesoscale Quantum Dynamics in New Semiconductor Materials

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Matthew R. Bennett	*Rice University*	The Role of Protein/DNA Interactions in the Kinetics of Biochemical Networks
David E. Bergbreiter	*Texas A&M University*	Multiphase Multicomponent Systems for Synthesis and Catalysis
Ricardo A. Bernal	*The University of Texas at El Paso*	High Resolution Cryo-EM Reconstructions of the Heat Shock Protein 60 and its Conformational Intermediates
Eric R. Bittner	*University of Houston*	Many-body Excitation Dynamics in Molecular Solids
Paul Blount	*The University of Texas Southwestern Medical Center*	Determining Protein-Lipid and Protein-Protein Interactions for a Channel Involved in Mechanosensing
Joan F. Brennecke	*The University of Texas at Austin*	Ion Dissociation in Ionic Liquids and Its Impact on Physical Properties and Phase Behavior
Robert Brenner	*The University of Texas Health Science Center at San Antonio*	Shedding Light on Endoplasmic and Sarcoplasmic Reticulum Voltage Changes During Calcium Signaling
Jakoah Brgoch	*University of Houston*	Synthesis of Gold Compounds with Unusual Oxidation States and Metalloaromaticity
Jennifer S. Brodbelt	*The University of Texas at Austin*	Characterization of Ion Conformations by Ultraviolet Photodissociation
Maurice Brookhart	*University of Houston*	Pd(II)- and Ni(II)-Catalyzed Olefin Polymerizations and Copolymerizations
Shawn C. Burgess	*The University of Texas Southwestern Medical Center*	Dysregulation of Intermediary Metabolism During Disease
Can Cenik	*The University of Texas at Austin*	Transcriptome-Wide Measurement of Translation Using a Novel On-Chip Isotachophoresis Approach
Maria Chahrour	*The University of Texas Southwestern Medical Center*	Decoding Social Communication Networks through Forward Genetics
Julia Chan	*The University of Texas at Dallas*	Unravelling the Growth of Quantum Materials
Walter G. Chapman	*Rice University*	Structure and Properties of Complex Fluids in the Bulk and Interfacial Regions
James Chappell	*Rice University*	Activating Total Synthesis of Natural Products in Diverse Bacterial Species
Banglin Chen	*The University of Texas at San Antonio*	Porous Mixed-Metal-Organic Frameworks for Recognition of Small Gas Molecules
Tai-Yen Chen	*University of Houston*	Interplay of Redox Status and Cu Homeostasis in Live Neurons at the Single-Molecule Level
Zheng Chen	*The University of Texas Health Science Center at Houston*	Identification of Endogenous ROR Ligands as Modulators of Aging Clock and Physiology
Zhijian J. Chen	*The University of Texas Southwestern Medical Center*	Regulation of Innate Immunity by Liquid-Liquid Phase Separation
Kwan Cheng	*Trinity University*	Understanding Molecular Mechanisms of Amyloid Diseases from Multiscale Simulations of Early Aggregation of Disordered Protein on Lipid Nanodomains
Jae-Hyun Cho	*Texas A&M University*	Biophysical Bases of Evading Host Innate Immune Responses by Pandemic and Seasonal Influenza Viruses
Yuh Min Chook	*The University of Texas Southwestern Medical Center*	Mechanisms of Importin 8-Mediated Nuclear Import
Melanie H. Cobb	*The University of Texas Southwestern Medical Center*	Regulatory and Catalytic Properties of MAP Kinase Cascades

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Jeffery L. Coffer	*Texas Christian University*	Well-Defined Silicon Nanotubes for Targeted Loading, Release, and Therapeutically-Relevant Activity
James J. Collins III	*The University of Texas Southwestern Medical Center*	Regulation of Parasite Reproduction by a Non-Ribosomal Peptide
Robert J. Comito	*University of Houston*	Main Group Catalysts for Advanced and Sustainable Polymers
Maralice Conacci-Sorrell	*The University of Texas Southwestern Medical Center*	Novel Roles of the Tryptophan Catabolite Kynurenine in Signal Transduction
Jacinta C. Conrad	*University of Houston*	Dynamics in Deeply Supercooled Nanoparticle Liquids with Attractive or Anisotropic Interactions
Lydia M. Contreras	*The University of Texas at Austin*	*In vivo* Structural Characterization of Catalytic and Regulatory RNAs
Christina B. Cooley	*Trinity University*	Fluorogenic Reversible Addition-Fragmentation Chain-Transfer Polymerization for Biomolecular Detection
David R. Corey	*The University of Texas Southwestern Medical Center*	Recognition of Cellular Nucleic Acids by Synthetic Oligomers
Luis G. Cuello	*Texas Tech University Health Sciences Center*	Crystallographic and Functional Studies on the Novel Role of Water Molecules in K+ Channel C-Type Inactivation Gating
Thomas R. Cundary & Mary E. Anderson	*University of North Texas*	Hydridic Activation of Methane
Sheena D'Arcy	*The University of Texas at Dallas*	A Novel HDX Workflow to Study Histone Dynamics in Multi-nucleosome Systems
Jenee D. Cyran	*Baylor University*	Elucidating Sunlight Driven Chemical Processes at Aqueous Interfaces
Pengcheng Dai	*Rice University*	Transport, Magnetic, and Neutron Scattering Studies of Quantum Materials
Kevin N. Dalby	*The University of Texas at Austin*	Inhibiting a Mechanosensor for Cancer Therapy
Weiwei Dang	*Baylor College of Medicine*	Regulation of Telomere Function Through Lysine Methylation in Telomere Shelterin Complex
Gaudenz Danuser	*The University of Texas Southwestern Medical Center*	Probing Oncogenic Functions of Vimentin Filaments by Small Molecule Screens
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*	Paradigms for Redox-Active Ligands in Bi- and Polymetallic Complexes
Bryan W. Davies	*The University of Texas at Austin*	Defining the Physicochemical Space of Antimicrobial Nanobodies
Jef K. De Brabander	*The University of Texas Southwestern Medical Center*	Synthesis and Chemical Biology of Bioactive Small Molecules
Nicole J. De Nisco	*The University of Texas at Dallas*	Glycosaminoglycan Utilization and Metabolism by the Microbiota of the Urogenital Tract
H. V. Rasika Dias	*The University of Texas at Arlington*	Metal Complexes of Highly Fluorinated Ligands
Loi H. Do	*University of Houston*	Molecular Engineering of the Second Coordination Sphere for Controlled Olefin Polymerization Catalysis

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Sheel Dodani	*The University of Texas at Dallas*	Harnessing the Plasticity of Anion-Binding Proteins to Engineer Genetically Encoded Fluorescent Indicators and Integrators
Ivan D'Orso	*The University of Texas Southwestern Medical Center*	Cooperative Assembly of HIV Transcription Elongation Complexes
Konstantin Doubrovinski	*The University of Texas Southwestern Medical Center*	Molecular Basis of Tissue Material Properties in the Early Drosophila Embryo
Peter Douglas	*The University of Texas Southwestern Medical Center*	Intracellular Lipid Surveillance via Nuclear Hormone Receptor Sequestration by RAB GTPase Geranylgeranylation
Michael C. Downer	*The University of Texas at Austin*	Femtosecond Optical Probes of Nano-Interface Chemistry
Michael P. Doyle	*The University of Texas at San Antonio*	Challenging Selective Chemical Reactions of Diazo Compounds
Kim R. Dunbar	*Texas A&M University*	Engendering Strong Magnetic Coupling and Anisotropy in Transition Metal and Lanthanide Metal Complexes
Ron Elber	*The University of Texas at Austin*	Rafts and Biological Membranes
Andrew D. Ellington	*The University of Texas at Austin*	A Neural Network for Polymerase Engineering
Donglei L. Fan	*The University of Texas at Austin*	Innovative Mechanism for the Synthesis of 3-D Nanosuperstructures by Electrochemical Reactions
Lei Fang	*Texas A&M University*	Centripetal Aza-Circulene and Aza-Helicenes
Walter L. Fast	*The University of Texas at Austin*	Chemical Probes of Biological Catalysts
Shervin Fatehi	*The University of Texas Rio Grande Valley*	Stochastic Methods for Highly Accurate Quantum Chemistry Extended to Nonadiabatic Molecular Dynamics
Michael Findlater	*Texas Tech University*	Base-Metal Catalyzed Transformations
Ilya J. Finkelstein	*The University of Texas at Austin*	Massively Parallel Peptide Interaction Mapping on a Repurposed Next-Generation DNA Sequencer
Skye Fortier	*The University of Texas at El Paso*	New Vistas in Early Actinide Chemistry
Frank W. Foss, Jr.	*The University of Texas at Arlington*	Ion Binding, Mobility, and Single Molecule Fluorescence Sensing at Molecularly Designed Gas-Solid Interfaces
Matthew S. Foster	*Rice University*	Quantum Criticality and Coherence in Topological and Strongly Correlated Matter: Random Curvature and (Artificial) 2D Quantum Gravity
Doug E. Frantz	*The University of Texas at San Antonio*	New Catalytic Methods Towards the Synthesis of Allenes
Kendra K. Frederick	*The University of Texas Southwestern Medical Center*	*In vivo* Structural Biology for Protein-Folding Diseases
Benny D. Freeman	*The University of Texas at Austin*	Synthesis and Characterization of Water and Ion Transport in Novel Ion Exchange Membrane Polymers
Jonathan R. Friedman	*The University of Texas Southwestern Medical Center*	Mechanisms of Mitochondrial Inner Membrane Organization
François P. Gabbaï	*Texas A&M University*	Tuning the Electrophilic Properties of Group 10 Metal Complexes Using Non-Innocent Antimony Z-Ligands
Matthieu G. Gagnon	*The University of Texas Medical Branch*	Structural Studies of the Chemical Interactions During Non-Canonical Reading of the Genetic Code
Elyssia S. Gallagher	*Baylor University*	Examining the Effects of Metal Ions on Carbohydrate Structure During In-Electrospray H/D Exchange: A Fundamental Study

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Don Gammon	*The University of Texas Southwestern Medical Center*	Biochemical Characterization of an Evolutionarily-Conserved Host Antiviral Complex Using Viral Antagonists
Venkat Ganesan	*The University of Texas at Austin*	Fundamental Studies of Self-Assembly in Mixtures of Organic and Inorganic Molecules
Xue Gao	*Rice University*	Mechanistic Study of the Stereochemically Controlled Biosynthesis of Fungal Natural Products
Yang Gao	*Rice University*	Investigating the Catalytic Mechanisms of Mg^{2+}-Dependent Enzymes with Time-Resolved Crystallography
Isaac Garcia-Bosch	*Southern Methodist University*	C-H Bond Functionalization Promoted by Cu Complexes Bearing Tridentate Redox-Active Ligands with Tunable H-Bonds
Jeremiah J. Gassensmith	*The University of Texas at Dallas*	Detection of Trace ROS Metabolites with Unnatural RNAs
Haibo Ge	*Texas Tech University*	Catalytic Functionalization of Unsaturated Hydrocarbons
Feliciano Giustino	*The University of Texas at Austin*	Designer Perovskites for Light Harvesting and Light Emission
John A. Gladysz	*Texas A&M University*	Werner Complexes as "Organocatalysts"
Margaret E. Glasner	*Texas A&M University*	Role of Underground Metabolism in the Evolution of New Metabolic Pathways
Vishal M. Gohil	*Texas A&M University*	Phospholipid-Protein Interactions in Mitochondrial Bioenergetics
Elizabeth J. Goldsmith	*The University of Texas Southwestern Medical Center*	Abiotic Stress Modulation of ASK1 Activity by Autophosphorylation
John B. Goodenough	*The University of Texas at Austin*	Influence of Counter Cation in Mixed-Metal Oxides
Kayla Green	*Texas Christian University*	Building Better Molecules to Target Oxidative Stress
Nick V. Grishin	*The University of Texas Southwestern Medical Center*	Chemistry of Speciation
Qing Gu	*The University of Texas at Dallas*	Super-Resolution Chemical Imaging Microscopy with Perovskite Gain-Assisted Hyperbolic Metamaterials
Anna-Karin Gustavsson	*Rice University*	Binding Dynamics and Nanoscale Architecture of CaMKII-Actin Network Reorganization at the Single-Molecule Level
Naomi J. Halas	*Rice University*	Synthesis, Photophysical and Photocatalytic Properties of Complex Nanoparticles
P. Shiv Halasyamani	*University of Houston*	New Multiferroic Mixed-Metal Fluorides: Synthesis, Crystal Growth, and Characterization
Michael B. Hall	*Texas A&M University*	Computational Chemistry on Transition Metal Systems
Yimo Han	*Rice University*	Investigation of the Structural Dynamics of Voltage-Responsive Membrane Proteins
Jeffrey D. Hartgerink	*Rice University*	Synthesis of Nanostructured Organic Materials via Self-Assembly
Eva Harth	*University of Houston*	Advanced Nanostructured Plastics and Networks by Engaging Multiple Polymerization Pathways
Kaden Hazzard	*Rice University*	Ultracold Molecules for Synthetic Chemistry, Chemical Kinetics, and New Phases of Matter
Adam Heller	*The University of Texas at Austin*	Titanium Dioxide Crystals in the Type 2 Diabetic Pancreas and in the Diseased Brain

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Graeme Henkelman	*The University of Texas at Austin*	Design of Materials for Energy Conversion and Storage
W. Mike Henne	*The University of Texas Southwestern Medical Center*	Mechanisms of LD Sterol Organization and LD-Lysosome Inter-Organelle Trafficking
Ryan E. Hibbs	*The University of Texas Southwestern Medical Center*	Structural Principles of Inhibitory Neurotransmitter Receptor Modulation
Lea Hildebrandt Ruiz	*The University of Texas at Austin*	Effects of Chlorine Atoms on Tropospheric Oxidation Chemistry
Christian B. Hilty	*Texas A&M University*	Mechanisms of Graphene Based Single Site Catalysts Determined by Hyperpolarized NMR
Lora V. Hooper	*The University of Texas Southwestern Medical Center*	Biochemical Studies of Small Proline-Rich Proteins, A New Class of Endogenous Antibiotics
Gerta Hoxhaj	*The University of Texas Southwestern Medical Center*	Regulation of NADP+ Biosynthesis by Oxidative Stress And Its Role In Tumorigenesis
Bo Hu	*The University of Texas Health Science Center at Houston*	High-Resolution Structure Determination of Molecular Machines *in situ* by Cryo Electron Tomography
Todd W. Hudnall	*Texas State University*	Diborylcarbenes: A Decades Old Search for Unprecedented Electrophilic Carbenes
Randall G. Hulet	*Rice University*	Quantum Effects in Soliton Molecules
Kami L. Hull	*The University of Texas at Austin*	Development of Stereoselective Three Component Carboamination Reactions
Simon M. Humphrey	*The University of Texas at Austin*	New Directions in Coordination Polymer Chemistry: Materials Based on Heavier p-Block Donors for Enhanced Magnetism and Catalysis
Kristin Hutchins	*Texas Tech University*	Mechanochemistry as a Green Synthetic and Crystallization Tool for Drug Development
Gyeong S. Hwang	*The University of Texas at Austin*	First-Principles Investigation of the Structure, Chemistry and Function of Carbon-Based Nanomaterials
Oleg A. Igoshin	*Rice University*	Speed-Accuracy-Dissipation Trade-Offs in Non-Equilibrium Biochemical Information Processing
Tatyana I. Igumenova	*Texas A&M University*	Sequestration Without Isomerization: A Novel Mode of AGC Kinase Regulation by Pin1
Andrea Isella	*Rice University*	Investigating the Origin of the Chemistry of Planets
Dmitri N. Ivanov	*The University of Texas Health Science Center at San Antonio*	Deciphering the Role of dNTP Metabolism in Antiviral Immunity, DNA Repair and Cell Cycle Control
Brent L. Iverson	*The University of Texas at Austin*	Dynamic Supramolecular Solids
Khuloud Jaqaman	*The University of Texas Southwestern Medical Center*	*In situ* Measurement of Inter-Receptor Interaction Kinetics on the Cell Surface
Makkuni Jayaram	*The University of Texas at Austin*	Chemical and Mechanistic Characterization of Complex Active Sites for Phosphoryl Transfer in Nucleic Acids
Jenna Jewell	*The University of Texas Southwestern Medical Center*	Deciphering the Glutamine Signaling Pathway to mTORC1
Jean X. Jiang	*The University of Texas Health Science Center at San Antonio*	Modulating Hemichannel Activities Using Targeting Antibodies
Jin Jiang	*The University of Texas Southwestern Medical Center*	A Non-Canonical Role of Hippo Signaling in Cancer
Ning Jiang	*The University of Texas at Austin*	A High-Throughput Single-Cell Method to Link Antigen Specificity to T Cell Receptor Sequences

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Youxing Jiang	*The University of Texas Southwestern Medical Center*	Structural and Functional Studies of Organellar Cation Channels
Lukasz A. Joachimiak	*The University of Texas Southwestern Medical Center*	Role of Local Structure in Modulating Assembly of Intrinsically Disordered Proteins
Kenneth A. Johnson	*The University of Texas at Austin*	Dynamics of Structural Changes Governing DNA and RNA Replication
Keith P. Johnston	*The University of Texas at Austin*	Controlled Assembly of Inorganic and Organic Nanoparticle Clusters
Matthew Jones	*Rice University*	Dimensionally- and Toplogically-Constrained Nanoparticle Assembly
Richard A. Jones	*The University of Texas at Austin*	Molecular Precursors for New Functional Materials
Karl M. Kadish	*University of Houston*	Electrochemistry and Spectroelectrochemistry of Compounds with Multiple Redox Centers
Adrian T. Keatinge-Clay	*The University of Texas at Austin*	Engineering the Macrolactin Polyketide Assembly Line
Ben Keitz	*The University of Texas at Austin*	Peptide Directed Synthesis of Metal-Organic Frameworks
Nayun Kim	*The University of Texas Health Science Center at Houston*	Locus-Specific Quantitation of Uracil Associated with Unscheduled DNA Synthesis
Steven A. Kliewer	*The University of Texas Southwestern Medical Center*	Regulation of the Type 2 Diabetes Drug Target PPARγ by Sumoylation
Jennifer J. Kohler	*The University of Texas Southwestern Medical Center*	Discovering the Glycoconjugate Receptors of Pertussis Toxin
Michael Kolodrubetz	*The University of Texas at Dallas*	Computational Path Integral Approaches to Non-Equilibrium Quantum Systems
Anatoly B. Kolomeisky	*Rice University*	Theoretical Understanding of the Mechanisms of Chemical Processes on Heterogeneous Catalysts
Junichiro Kono	*Rice University*	Optical, Infrared and Terahertz Spectroscopy of Low-Dimensional Materials
Genevieve Konopka	*The University of Texas Southwestern Medical Center*	Chemical Regulation of Human Brain Cell Type Specification
Anna Konovalova	*The University of Texas Health Science Center at Houston*	Mechanism of Signal Transduction Across the Bacterial Cell Envelope
Brian A. Korgel	*The University of Texas at Austin*	NIR II Light-Emitting Nanocrystal Quantum Dots
László Kürti	*Rice University*	New Paradigms in Heterocyclic Chemistry
Jaan Laane	*Texas A&M University*	Molecular Structures and Vibrational Potential Energy Surfaces in Ground and Excited Electronic States
Helen C. Lai	*The University of Texas Southwestern Medical Center*	Molecular Interactions of the Prdm12 Transcription Factor Implicated in Painlessness
Keji Lai	*The University of Texas at Austin*	Imaging Chemical Processes in 2D Materials Under Controlled Environment
Alan M. Lambowitz	*The University of Texas at Austin*	Bacterial Reverse Transcriptases: Characterization and Biotechnological Applications
Christy F. Landes	*Rice University*	Orientational Effects on Protein Dynamics at Chromatographic Supports from a Single Analyte Perspective

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Oleg V. Larionov	*The University of Texas at San Antonio*	New Catalytic Strategies for Efficient and Selective Functionalizations
Michael Latham	*Texas Tech University*	Uncovering Allosteric Coupling in a DNA Damage Repair Complex with Methyl-Based NMR Spectroscopy
T. Randall Lee	*University of Houston*	Functionalized Xanthates, Dithiocarboxylates, and Dithiocarbamates for Coating Surfaces and Nanoparticles
Guigen Li	*Texas Tech University*	Multi-Layer 3D Chirality and its Asymmetric Catalytic Assembly
Wenbo Li	*The University of Texas Health Science Center at Houston*	Elucidating the Role of m6A Methylation on Enhancer RNAs
Xiaochun Li	*The University of Texas Southwestern Medical Center*	Structure and Function of Sterol-Sensing Domains in Membrane Proteins
Xiaoqin (Elaine) Li	*The University of Texas at Austin*	Charge and Energy Transfer Dynamics in Layered Photocatalysts
David S. Libich	*The University of Texas Health Science Center at San Antonio*	The Structural Biology of EWSR1 and EWS-FLI1 in Biomolecular Condensates
Erez Lieberman	*Baylor College of Medicine*	Identifying and Controlling New Factors that Facilitate Chromatin Loop Formation
Milo M. Lin	*The University of Texas Southwestern Medical Center*	Accelerating Thermodynamic Sampling to Predict the Toxic Oligomer Structure of Abeta42 in Alzheimer's Disease
Paul A. Lindahl	*Texas A&M University*	Low-Molecular-Mass Zinc, Copper, and Heme Trafficking-Complexes in Biological Cells
Brian M. Lindley	*Baylor University*	The Development of Diborylamide Ligand Platforms for Electrochemical CO_2 Reduction
Stephan Link	*Rice University*	A Single Particle Approach to Plasmon Photochemistry
Alexander R. Lippert	*Southern Methodist University*	Single Molecule Localization Lithography
Glen Liszczak	*The University of Texas Southwestern Medical Center*	Regulation and Function of DNA Damage-Induced Chromatin ADP-Ribosylation
Hung-wen Liu	*The University of Texas at Austin*	Mechanistic Studies of Novel Enzymes
Wenshe Liu	*Texas A&M University*	The Identification and Characterization of SARS-CoV-2 Main Protease Inhibitors with Novel Chemical Entities
Xin Liu	*The University of Texas Southwestern Medical Center*	Chromatin Targeting of Polycomb Repressive Complexes
Yi Liu	*The University of Texas Southwestern Medical Center*	A Code Within the Code: Codon Usage Regulates Co-Translational Protein Folding
Yuanyue Liu	*The University of Texas at Austin*	First-Principles Simulations of Atomic-level Kinetics of Electrocatalysis at Solid-Water Interface
Jun Lou	*Rice University*	Synthesis, Characterization and Applications of Ultrathin Crystals
Carl J. Lovely	*The University of Texas at Arlington*	New Methods for the Total Synthesis of Aminoimidazole-Containing Marine Alkaloids
George Lu	*Rice University*	Chaperone-Assisted Assembly of Gas-Filled Protein Nanostructures
Vassiliy Lubchenko	*University of Houston*	Bonding and Structural Degeneracy in Incommensurate Phases and Quasicrystals

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Lloyd L. Lumata	*The University of Texas at Dallas*	Non-Invasive and Ultrasensitive Detection of Altered Biochemistry in Brain Cancer Using Hyperpolarized 13C Magnetic Resonance
Weibo Luo	*The University of Texas Southwestern Medical Center*	Novel Role of Ubiquitination in Hypoxia-Inducible Factor 1 Transcriptional Activity
Xuelian Luo	*The University of Texas Southwestern Medical Center*	Chemical Inhibition of the Hippo TEAD-YAP Transcription Factors for Cancer Therapy
Jodie Lutkenhaus	*Texas A&M University*	*In situ* Redox Observations of Conjugated Polymers for Organic Electrochemical Transistors
Peter Ly	*The University of Texas Southwestern Medical Center*	Mutagenic Chromosomal Rearrangements from Diverse DNA Repair Pathways
Nathaniel A. Lynd	*The University of Texas at Austin*	Functional Epoxide Photopolymerization: Fundamentals and Materials Synthesis
Jianpeng Ma	*Baylor College of Medicine*	Exploring the Chemical Forces Stabilizing Human Polycomb Repressive Complex 2
Allan H. MacDonald	*The University of Texas at Austin*	Spintronics in Two-Dimensional Magnetic Materials
Ram Madabhushi	*The University of Texas Southwestern Medical Center*	Elaborating the Roles of DNA Breaks in Stimulus-Dependent Gene Transcription in Neurons
Corina Maeder	*Trinity University*	Implication of an Uncharacterized Protein Auto-Cleavage in Spliceosome Assembly Regulation
Dmitrii E. Makarov	*The University of Texas at Austin*	New Methods for Predicting the Kinetics of Complex Molecular Rearrangements
David J. Mangelsdorf	*The University of Texas Southwestern Medical Center*	Targeting the DAF-12 Signaling Pathway in Parasitic Nematodes
Filippo Mangolini	*The University of Texas at Austin*	Encapsulation of Lubricious Ionic Liquids within Polymer Nanoshells
Arumugam Manthiram	*The University of Texas at Austin*	Synthesis and Properties of Transition Metal Oxides with Unusual Valence States
Amanda B. Marciel	*Rice University*	Synthesis of Polyampholytes via Protein Engineering to Decode Complex Solution Behavior
Edward M. Marcotte	*The University of Texas at Austin*	A Mass-Spectrometry-Based Reference Map of Core Plant Protein Complexes
Caleb D. Martin	*Baylor University*	Heavy Element-Boron Systems: From Unusual Bonding to New Synthetic Tools
Stephen F. Martin	*The University of Texas at Austin*	Synthesis of Biologically Relevant Molecules
Elisabeth D. Martinez	*The University of Texas Southwestern Medical Center*	Development of Epigenetic Inhibitors to Prevent Acquired Drug-Resistance in Malaria
Andreas Matouschek	*The University of Texas at Austin*	Structure and Function of a Nano-Scale Biological Machine
Devin Matthews	*Southern Methodist University*	Understanding X-Ray and Raman Signatures of Disordered Systems
Jeremy A. May	*University of Houston*	Novel Synthetic Methods in Organic Chemistry Derived from Highly Reactive Intermediates
Jennifer A. Maynard	*The University of Texas at Austin*	Control of Protein Folding Quality: Portable Sequence Determinants of Antibody Stability

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
David G. McFadden	*The University of Texas Southwestern Medical Center*	Mechanism of Action of Neuroendocrine-Selective Cancer Toxins
Gabriele Meloni	*The University of Texas at Dallas*	Assembly, Selectivity, Structure, Metalloaromaticity and Reactivity in Protein Metal-Thiolate Clusters
Joshua T. Mendell	*The University of Texas Southwestern Medical Center*	The Regulation and Composition of NORAD-PUMILIO Bodies
Quentin Michaudel	*Texas A&M University*	C-C Cross Couplings Enabled by SuFEx Click Chemistry
Ognjen Š. Miljanić	*University of Houston*	Supramolecular and Dynamic Covalent Chemistry of Carbon Dioxide
Delia J. Milliron	*The University of Texas at Austin*	Plasmonic Transparent Conducting Oxide Nanocrystals: Dopant Chemistry and Heterogeneity
Ping Mu	*The University of Texas Southwestern Medical Center*	Small Molecule Inhibitors Targeting Lineage Plasticity and Neuroendocrine Differentiation in Advanced Prostate Cancer
Charles B. Mullins	*The University of Texas at Austin*	Nano-Structured Materials for Chemistry
Siegfried M. Musser	*Texas A&M University Health Science Center*	Physicochemical Properties of FUS Droplets: *In vitro* Models of Liquid-Like Membrane-Less Compartments in Cells
Douglas Natelson	*Rice University*	Single- and Few-Molecule Vibrational Spectroscopy and Energy Flow
Andriy Nevidomskyy	*Rice University*	Exotic Phases of Matter in Quantum Spin Ice and Other Frustrated Magnets
Kyriacos C. Nicolaou	*Rice University*	Total Synthesis of Bioactive Natural and Designed Molecules
Deepak Nijhawan	*The University of Texas Southwestern Medical Center*	Using Forward Genetics to Understand Mechanism of Action for Anticancer Toxins
Michael Nippe	*Texas A&M University*	Tuning Molecular Electrocatalysts via Secondary Coordination Sphere Modifications
Peter J.A. Nordlander	*Rice University*	Plasmon Enhanced Chemistry
Adam D. Norris	*Southern Methodist University*	New Chemosensory Isoform of a Canonical Mechanosensory Protein
Kathryn A. O'Donnell	*The University of Texas Southwestern Medical Center*	Dissecting Novel Mechanisms of Translational Control in Lung Cancer
Mohammad A. Omary	*University of North Texas*	Dawn Rise Upon New Chemical Bonds Amidst Ground- and Excited-State Bonding Assortments in Luminescent Molecules/Excitons/Polarons
José Onuchic	*Rice University*	Investigating Chromatin Dynamics and Function on Evolution, Genetic Disorders, and Cancer
Robert C. Orchard II	*The University of Texas Southwestern Medical Center*	Defining the Molecular Mechanisms of Viral Inhibition by TRIM Restriction Factors
Kim Orth	*The University of Texas Southwestern Medical Center*	Bile Salts as Agonist/Antagonist for Vibrio Receptor VtrA/C
Oleg V. Ozerov	*Texas A&M University*	Catalytic Synthesis and Utilization of Arylgermanes
Zachariah A. Page	*The University of Texas at Austin*	Photochemistry as a Tool to Generate Complex Soft Matter
Jeremy C. Palmer	*University of Houston*	Dynamic Heterogeneity, Crystallization, and Polyamorphism in Supercooled Tetrahedral Liquids

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Sapun H. Parekh	*The University of Texas at Austin*	Imaging *in situ* Lipid Droplet Chemical Heterogeneity in Macrophage Inflammation with Vibrational Microscopy
Jae Mo Park	*The University of Texas Southwestern Medical Center*	Development of Hyperpolarized Probes for Imaging Neurotransmitter Synthesis
Matthew Parker	*The University of Texas Southwestern Medical Center*	The Role of Sequence Composition in Disordered Domain Phase Separation
Matteo Pasquali	*Rice University*	Physical Chemistry of Nanorods and Nanoplates
Margaret A. Phillips	*The University of Texas Southwestern Medical Center*	Purine Salvage Pathways as Potential Drug Targets in Trypanosomatid Parasites
Lionel W. Poirier	*Texas Tech University*	New Methodologies for Accurate Quantum Calculations of the Dynamics of Atomic Nuclei
David C. Powers	*Texas A&M University*	Synthesis of, and Small-Molecule Activation with, Open-Metal-Site Molecular Clusters
Jai Prakash	*Texas A&M University-Corpus Christi*	Bio-Inspired Multinuclear Manganese Complexes as Water Oxidation Catalysts for Hydrogen Production
B. V. Venkataram Prasad	*Baylor College of Medicine*	X-ray Crystallographic Studies on Viruses and Viral Proteins
Han Pu	*Rice University*	Machine Learning in Quantum Physics and Quantum Chemistry
Tian Qin	*The University of Texas Southwestern Medical Center*	Leveraging the Reactivity of Sulfur in Reaction Development
Emily L. Que	*The University of Texas at Austin*	Extraction and Retention of Metal Ions in Perfluorinated Solvents
Arun Radhakrishnan	*The University of Texas Southwestern Medical Center*	Molecular Mechanisms of Cholesterol Sensors in Human Cells
Frank M. Raushel	*Texas A&M University*	Elucidation of Enzyme Reaction Mechanisms
Joseph M. Ready	*The University of Texas Southwestern Medical Center*	New Directions in Asymmetric Synthesis
Michael Reese	*The University of Texas Southwestern Medical Center*	How are Substrates Recognized in Parasite Kinases Lacking a Canonical Walker Motif?
Linda E. Reichl	*The University of Texas at Austin*	Quasibound States and Decay Processes in Nanometer Scale Quantum Systems and Fluids
Joaquin Resasco	*The University of Texas at Austin*	Understanding and Controlling Structural Dynamics in Electrocatalysis
Peter M. Rentzepis	*Texas A&M University*	Ultrafast Time and Space Structural Dynamics in Solids. Efficient, Remote Detection and Inactivation of Pathogens
Luke M. Rice	*The University of Texas Southwestern Medical Center*	Biochemical and Structural Analysis of TOG Domains in Microtubule Regulation
Michael G. Richmond	*University of North Texas*	Synthesis and Reactivity Studies of Polynuclear Clusters
Jeffrey D. Rimer	*University of Houston*	Physicochemical Factors Governing Molecular Modification of Pathological Crystallization
Jose Rizo-Rey	*The University of Texas Southwestern Medical Center*	NMR Methods to Study Membrane Proteins in Lipid Bilayers
Sean T. Roberts	*The University of Texas at Austin*	Designing Supramolecular Assemblies for Photon Splitting
Jacob T. Robinson	*Rice University*	Molecular Mechanisms for Magnetically Sensitive Ion Channels

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Debora F. Rodrigues	*University of Houston*	Plant-Based Antibiotic Nanocarriers Investigation in the Simultaneous Reduction of Pathogen Mutation Rates and Intestinal Infections in Humans
Liela Romero	*Baylor University*	New Strategies in Asymmetric Synthesis: Routes to Multifunctional Chiral Organic Building Blocks
Daniel Romo	*Baylor University*	Novel Strategies for β-Lactone Synthesis and Annulation to Impact Basic Cell Biology
Michael J. Rose	*The University of Texas at Austin*	Earth Abundant Elements for Energy Related Energy Conversions
Michael K. Rosen	*The University of Texas Southwestern Medical Center*	2D Phase Separated Protein Polymers: Interactions with Actin Filaments
Daniel M. Rosenbaum	*The University of Texas Southwestern Medical Center*	Capturing the Active Conformations of CNS GPCRs with Nanobodies
Tomce Runcevski	*Southern Methodist University*	Exploring the Organic Mineralogy of Titan, Saturn's Moon
Rick Russell	*The University of Texas at Austin*	Quantitative Tests of Modularity in a Helicase Protein that Resolves Misfolded RNAs
Livia Schiavinato Eberlin	*The University of Texas at Austin*	Understanding and Optimizing Molecular Extraction and Ionization Mechanisms in Solvent Based Ambient Ionization Mass Spectrometry
John W. Schoggins	*The University of Texas Southwestern Medical Center*	Biochemical Characterization of a Novel Antiviral RNA Binding Protein
Hans A. Schuessler	*Texas A&M University*	Optical Studies of Atomic and Molecular Systems with Femtosecond, XUV and IR Laser Radiation
Marlan O. Scully	*Texas A&M University*	Experimental and Theoretical Research into Quantum Chemistry and Quantum Optics
Jonathan T. Sczepanski	*Texas A&M University*	Synthesis and Applications of DNA-Encoded Libraries of Mirror-Image RNA
Joachim Seemann	*The University of Texas Southwestern Medical Center*	Biochemical and Structural Analysis of Golgi-Based Spindle Assembly Activities
Irina I. Serysheva	*The University of Texas Health Science Center at Houston*	Cryo-EM Analysis of Ion Channels in a Lipid Membrane
Libo Shan	*Texas A&M University*	Biochemical and Regulatory Constraints of Immune Sensors
Bryan F. Shaw	*Baylor University*	The Dark Side of "Wild Type" Cu, Zn SOD1 in Motor Neuron Disease: Metal Snatcher or Prion Template?
Jason B. Shear	*The University of Texas at Austin*	Development of Micro-3D-Printed Optical Fiber Probes for Remote Characterization of Complex Bio-Environments
Matthew Sheldon	*Texas A&M University*	Nanophotonic Platforms for Polaritonic Chemistry
Benjamin D. Sherman	*Texas Christian University*	Monolithic Tandem Photoelectrodes for Solar Driven Organic Conversions or Water Oxidation Coupled to Hydrogen Formation
Chih-Kang Shih	*The University of Texas at Austin*	Controlling Interlayer Electronic Interactions in Transition Metal Dichalcognide Hetero-Bilayers
Michael Shiloh	*The University of Texas Southwestern Medical Center*	Activation of Airway Nociceptive Neurons by Mycobacterial Phenolic Glycolipid

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Qimiao Si	*Rice University*	Theoretical Studies of Electronic Correlations and Dynamics in Carbon-Based and Related Low Dimensional Systems
Matthew H. Sieber	*The University of Texas Southwestern Medical Center*	Examination of the Mitochondrial Mechanisms that Drive Quiescence and the Re-Initiation of Growth
Daniel Singleton	*Texas A&M University*	Localized Vibrational Promotion of Organic Reactions in Solution
Myles W. Smith	*The University of Texas Southwestern Medical Center*	Enantioselective Diketone Desymmetrization for the Synthesis of Chiral Heterocycles
Alexei V. Sokolov	*Texas A&M University*	Ultrafast Coherent Molecular Spectroscopy with Spatially and Temporally Shaped Electromagnetic Fields
Dong Hee Son	*Texas A&M University*	Mn-Doped Cesium Lead Halide Perovskites as the New Magnetically-Doped Quantum Dots
Anju Sreelatha	*The University of Texas Southwestern Medical Center*	AMPulation of Manganese Superoxide Dismutase by Selenoprotein O
Francois St-Pierre	*Baylor College of Medicine*	Developing an Expanded Color Palette of Fluorescent Voltage Sensors with Optimized Photochemistry
Jeanne C. Stachowiak	*The University of Texas at Austin*	Protein Liquid Droplets as Dynamic Supramolecular Catalysts for *in situ* Self-Assembly in Cells
Mihaela C. Stefan	*The University of Texas at Dallas*	Functionalized Polycaprolactones for Delivery of Anticancer Drugs
Allison Stelling	*The University of Texas at Dallas*	Development and Application of IR-Based Methods for Detecting A-T Hoogsteen Base Pairs in the Nucleosome
Lu Sun	*The University of Texas Southwestern Medical Center*	Molecular Mechanisms Underlying Autophagy-Dependent Myelination
Ruhma Syeda	*The University of Texas Southwestern Medical Center*	Probing the Mechanism of SWELL Response to Osmotic Stress and Ionic Strength
Jerzy O. Szablowski	*Rice University*	Engineering a New Class of Site-Specific Therapeutics for Brain Disorders
Daniel P. Tabor	*Texas A&M University*	Mapping the Structure and Formation of Aerosols Through Theoretical Spectroscopy and Multiscale Simulation
Jeffrey J. Tabor	*Rice University*	Next-Generation Antibiotics: High Throughput Discovery of Inhibitors of Pathogenic Bacterial Two-Component Systems
Vincent S. Tagliabracci	*The University of Texas Southwestern Medical Center*	Novel Protein Kinases and Pseudokinases
Uttam K. Tambar	*The University of Texas Southwestern Medical Center*	Stereoselective Transformations of Alkynes
Yizhi Jane Tao	*Rice University*	Mechanisms of Genome Packaging and Replication by a Filamentous dsRNA Virus
David Taylor	*The University of Texas at Austin*	Chemical Insights into Substrate Cleavage by CRISPR-Cascade
Thomas S. Teets	*University of Houston*	Blue-Phosphorescent Platinum Complexes Supported by Strong sigma-Donor Carbenes
Jonathan R. Terman	*The University of Texas Southwestern Medical Center*	Chemistry and Enzymology of MICAL Family Oxidoreductases
Andy Thomas	*Texas A&M University*	Exploring New Avenues for Organolithium Reagents

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
ChinSen Ting	*University of Houston*	Superconductivity in Doped Fe(Se,Te) and Other Correlated Electron Materials
Frank K. Tittel	*Rice University*	Investigation of Quartz Enhanced Spectroscopy (QEPAS) to Trace Gas Detection via Autonomous Networked Drones
Zachary J. Tonzetich	*The University of Texas at San Antonio*	Earth-Abundant Transition Metal Catalysts Supported by Pincer Ligands
Erdal Toprak	*The University of Texas Southwestern Medical Center*	Beta-Lactamase-Traps: A Novel Class of Molecules that Select Against Antibiotic-Resistant Bacteria Carrying Beta-Lactamase Genes
James M. Tour	*Rice University*	Molecular Machines Open Cell Membranes and Kill Cancer Cells with Visible Light
Eszter Trufan	*University of Houston-Downtown*	Synthesis and Characterization of New Ball-Type Phthalocyanines
Thomas M. Truskett	*The University of Texas at Austin*	Liquids Near Interfaces: Single-Molecule and Collective Dynamics
Francis T.F. Tsai	*Baylor College of Medicine*	Structural and Mechanistic Studies of NTP-Dependent Stress Proteins
Kuang-Lei Tsai	*The University of Texas Health Science Center at Houston*	Biochemical and Structural Analysis of the Transcription Mediator Subunit Med13
Benjamin P. Tu	*The University of Texas Southwestern Medical Center*	Translational Adaptations to Sulfur Starvation
Emanuel Tutuc	*The University of Texas at Austin*	Correlated Electrons in Controlled Moire Patterns of Two-Dimensional Materials
Adam R. Urbach	*Trinity University*	Supramolecular Studies of Intrinsically Disordered Polypeptides
Rafael Verduzco	*Rice University*	Charge Transport in Conjugated Ladderphanes and Network-Stabilized Conjugated Polymers
Dino Villagran	*The University of Texas at El Paso*	Molecularly Inspired Metal-Free Water Splitting Electrocatalysts
Eric J. Wagner	*The University of Texas Medical Branch*	Biochemical and Structural Investigation of Integrator
Fei Wang	*The University of Texas Southwestern Medical Center*	Mechanistic Dissection of a Novel Meiotic Exit Regulation by Autophagy
Haotian Wang	*Rice University*	Isolated Transition Metal Single Atomic Sites for Selective CO_2 Reduction
Huiliang Wang	*The University of Texas at Austin*	Developing Non-Viral, Covalently-Assembled DNA Delivery Strategy for Optogenetics
Meng C. Wang	*Baylor College of Medicine*	Chemical Imaging of Glutathione Spatiotemporal Dynamics During Aging
Qinghua Wang	*Baylor College of Medicine*	Chemical Mechanisms of Human Adaptation of Influenza Virus
Weiwei Wang	*The University of Texas Southwestern Medical Center*	Molecular Mechanism and Functional Significance of the Mammalian Heteromeric Glycine Receptor and its Interaction with Scaffolding Protein Gephyrin
Yuhong Wang	*University of Houston*	The Kinetics and Conformational Changes During the Peptidyl Transferase Reaction in Single Ribosomes

PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Zhao Wang	*Baylor College of Medicine*	Determining Chemical Interactions Mediating Biological Complex Formation by Cryo-EM
Aryeh Warmflash	*Rice University*	Embryonic Patterning as a Reaction-Diffusion System
Coran Watanabe	*Texas A&M University*	Streptomyces sahachiroi: A Rich Treasure Trove of Unique Biosynthetic Reactions
Benjamin P. Weaver	*The University of Texas Southwestern Medical Center*	Regulation of Non-Canonical Caspase Functions by Distinct Protein Complexes
Lauren J. Webb	*The University of Texas at Austin*	Electrostatic Fields in Chemically Diverse Lipid Bilayer Membranes
Geoff Wehmeyer	*Rice University*	Probing Anharmonic Atomic Bonding Using Thermal Phonon Mean Free Path Spectroscopy
R. Bruce Weisman	*Rice University*	Optical Properties and Processes of Carbon Nanotubes
Alexander H. Weiss	*The University of Texas at Arlington*	New Method for the Chemical Characterization of the Internal Surfaces of Porous Materials
Julian West	*Rice University*	New Fluorination Reactions Using Earth Abundant Elements
Kenneth D. Westover	*The University of Texas Southwestern Medical Center*	Covalent Targeting of SRC Kinase
Dawn Wetzel	*The University of Texas Southwestern Medical Center*	Defining the Mechanism of a Novel Antiparasitic Small Molecule that Facilitates Tubulin Polymerization
Angelique Whitehurst	*The University of Texas Southwestern Medical Center*	Molecular Mechanisms of a Novel Anti-Cancer Target, Testis Specific Serine Kinase 6
Sebastian E. Winter	*The University of Texas Southwestern Medical Center*	Chemical Biology of Salmonella-Host Interactions
Jeffrey B. Woodruff	*The University of Texas Southwestern Medical Center*	Molecular Rules Determining Centrosome Composition
Jun Wu	*The University of Texas Southwestern Medical Center*	Dissecting the Novel Function of Tasor in Regulating Mouse Pluripotent Stem Cells
Han Xiao	*Rice University*	Precision Protein Modification using Proximity-Induced Chemistry
Chong Xie	*The University of Texas at Austin*	Probing the *in vivo* Chemistry in the Behaving Brain
Boris I. Yakobson	*Rice University*	Science of Nearly-1D Materials: From Nanotubes to Nanowires
Xin Yan	*Texas A&M University*	Nitrogen Transfer to Unactivated C=C Bonds in Lipids for Their Positional and Stereo Isomer Identification at Nanomolar Scale
Ding-Shyue Yang	*University of Houston*	Ultrafast Electron Crystallography and Femtosecond Spectroscopy of Structural Transformation Dynamics in Transition Metal Systems
Jin Ye	*The University of Texas Southwestern Medical Center*	Chemical Reactions Controlling Ferroptosis
Hsin-Chih Yeh	*The University of Texas at Austin*	NanoCluster Beacons for Highly Specific DNA Methylation Detection
Ming Yi	*Rice University*	Tuning Complex Quantum Phases One Parameter at a Time

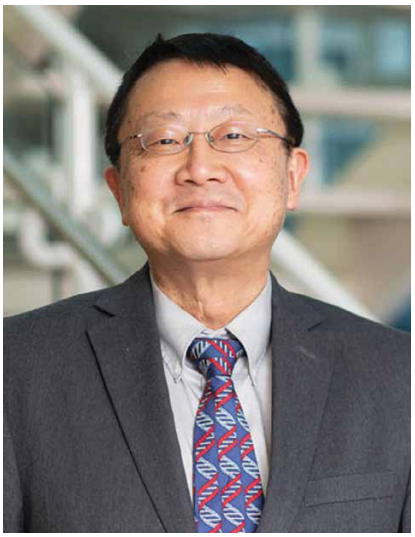
PRINCIPAL INVESTIGATOR	INSTITUTION	TITLE OF RESEARCH
Seung-hee Yoo	*The University of Texas Health Science Center at Houston*	A FAD-Driven Biochemical Oscillation Governing CRYPTOCHROME Turnover
Damian Young	*Baylor College of Medicine*	Stapled Peptide DNA-Encoded Libraries
Guihua Yu	*The University of Texas at Austin*	Probing the Charge Storage Mechanisms of Molecularly-Assembled Two-Dimensional Inorganic Solids
Yonghao Yu	*The University of Texas Southwestern Medical Center*	Cell Death Switch Mediated by the Cross-Talk Between Protein ADP-Ribosylation and Caspase Signaling
Anvar A. Zakhidov	*The University of Texas at Dallas*	Photochemistry of Nanoimprinted Hybrid Perovskites for Photovoltaics
Melissa L. Zastrow	*University of Houston*	Cofactor-Based Fluorescent Proteins as Platforms for New Zinc Ion Sensors
Chun-Li Zhang	*The University of Texas Southwestern Medical Center*	Chemical Regulation of Human Motor Neurons
Junjie Zhang	*Texas A&M University*	Functions of Unique Structures in Mycobacterium Tuberculosis Translation
Renyi Zhang	*Texas A&M University*	Chemical Kinetics and Mechanism of Hydrocarbon Oxidation Reactions
Xiuren Zhang	*Texas A&M University*	Biochemical Basis of SWI/SNF ATPase in Remodeling RNA Complexes
Xuewu Zhang	*The University of Texas Southwestern Medical Center*	Structural and Functional Analyses of the BCCIPβ/RPL23 Complex
Yan Jessie Zhang	*The University of Texas at Austin*	Visualization of the Incorporation of Molecular Oxygen in Endoperoxide Bond Formation Using Time-Resolved X-ray Crystallography
John C.-G. Zhao	*The University of Texas at San Antonio*	Expeditious Modification of Organocatalyst Structures for Improved Stereoselectivities
Alexey M. Zheltikov	*Texas A&M University*	Multimodal Chemically Selective Optical Imaging and Fiber-Optic Thermometry
Jie Zheng	*The University of Texas at Dallas*	Unravelling Charge Selectivity in the Glomerular Filtration of Ultrasmall Engineered Nanoparticles at the Chemical Level
Yubin Zhou	*Texas A&M University Health Science Center*	Chemical Biology Toolkit for Remote Control of 3D Genome Architecture

Endowed Chairs

The Welch Foundation endows 48 chairs at 21 institutions.

INSTITUTION	CHAIRHOLDER AND CHAIR NAME
Baylor College of Medicine	Theodore G. Wensel, Welch Chair in Chemistry
Baylor College of Medicine	Thomas Westbrook, Welch Chair in Chemistry
*Baylor College of Medicine**	The R. P. Doherty, Jr.-Welch Chair in Science
Baylor University	John L. Wood, Welch Chair in Chemistry
Rice University	Stephan Link, The Charles W. Duncan, Jr.-Welch Chair in Chemistry
Rice University	Gustavo E. Scuseria, Welch Chair in Chemistry
Rice University	Peter Wolynes, The D. R. Bullard-Welch Chair in Science
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**	Welch Chair in Chemistry
Texas Tech University Health Sciences Center	Vadivel Ganapathy, Welch Chair in Biochemistry
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
The University of Texas at Arlington	Daniel W. Armstrong, Welch Distinguished University Chair in Chemistry
The University of Texas at Austin	Eric V. Anslyn, Welch Regents Chair in Chemistry
The University of Texas at Austin	Richard M. Crooks, Welch Chair in Chemistry (Materials Chemistry)
The University of Texas at Austin	John Ekerdt, Norbert G. Dittrich-Welch Chair in Chemical Engineering
The University of Texas at Austin	Michael J. Krische, 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

**Chair not filled*



Vladimir Gevorgyan | Jason McLellan | Patrick Sung

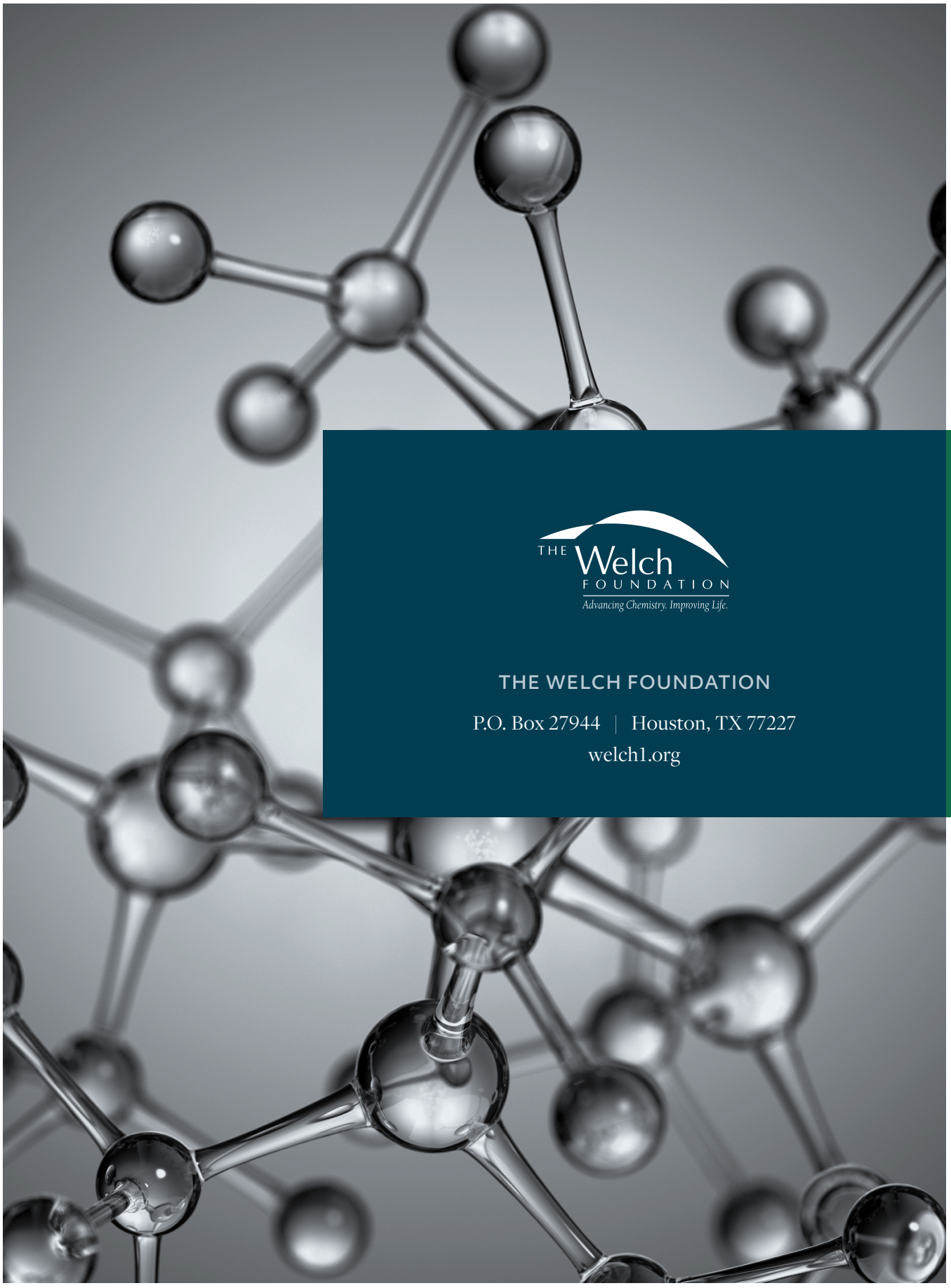
INSTITUTION	CHAIRHOLDER AND CHAIR NAME
The University of Texas at Austin	Devarajan Thirumalai, The Marvin K. Collie-Welch Regents Chair in Chemistry
*The University of Texas at Austin**	The Jack S. Josey-Welch Chair in Science
*The University of Texas at Austin**	The Norman Hackerman-Welch Regents Chair in Chemistry
The University of Texas at Dallas	Ray H. Baughman, Welch Chair in Chemistry
The University of Texas at Dallas	Vladimir Gevorgyan, Welch Chair in Chemistry
The University of Texas at El Paso	Luis Echegoyen, Welch Chair in Chemistry
The University of Texas at San Antonio	Oleg 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 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 Health Science Center at San Antonio	Charles P. France, Welch Distinguished University Chair in Chemistry
The University of Texas Health Science Center at San Antonio	Patrick M. Sung, Welch Distinguished University Chair in Chemistry
The University of Texas M. D. Anderson Cancer Center	Andrew Futreal, Welch Chair in Chemistry
The University of Texas M. D. Anderson Cancer Center	John A. Tainer, 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

Departmental Grants

The Welch Foundation funds 43 institutions, 226 faculty and 376 trainees.

INSTITUTION	PARTICIPATING FACULTY	CHEMICAL RESEARCH TRAINEES
Abilene Christian University (Abilene)	6	10
Angelo State University (San Angelo)	7	10
Austin College (Sherman)	5	1
East Texas Baptist University (Marshall)*	—	—
Hardin-Simmons University (Abilene)	0	0
Houston Baptist University (Houston)	3	7
Huston-Tillotson University (Austin)	3	3
Jarvis Christian College (Hawkins)	2	3
Lamar University (Beaumont)	11	23
LeTourneau University (Longview)	3	9
Lubbock Christian University (Lubbock)	4	9
McMurry University (Abilene)	2	7
Midwestern State University (Wichita Falls)	5	15
Our Lady of the Lake University (San Antonio)	2	0
Prairie View A&M University (Prairie View)	5	3
St. Edward's University (Austin)	4	8
St. Mary's University (San Antonio)	2	3
Sam Houston State University (Huntsville)	12	13
Schreiner University (Kerrville)	3	0
Southwestern University (Georgetown)	6	11
Stephen F. Austin State University (Nacogdoches)	12	14
Sul Ross State University (Alpine)*	—	—
Tarleton State University (Stephenville)	6	3
Texas A&M International University (Laredo)*	—	—
Texas A&M University-Commerce (Commerce)	6	17
Texas A&M University-Corpus Christi (Corpus Christi)	10	11
Texas A&M University-Kingsville (Kingsville)	12	22
Texas A&M University-Texarkana (Texarkana)*	—	—
Texas Lutheran University (Seguin)	5	0
Texas Wesleyan University (Fort Worth)	3	12
Texas Woman's University (Denton)	8	29
Trinity University (San Antonio)	9	10
University of Dallas (Irving)	3	11
University of Houston-Clear Lake (Houston)	4	12
University of Houston-Downtown (Houston)	9	17
University of Mary Hardin-Baylor (Belton)	3	9
University of St. Thomas (Houston)	4	11
University of the Incarnate Word (San Antonio)	0	0
The University of Texas at Tyler (Tyler)	13	24
The University of Texas of the Permian Basin (Odessa)	7	19
The University of Texas Rio Grande Valley (Edinburg)	18	6
Wayland Baptist University (Plainview)	3	7
West Texas A&M University (Canyon)	6	7

**Grants effective June 1, 2021*



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