Graduate Training in Chemistry

Application is free online:
www.utsouthwestern.edu/chemistry

Summer Undergraduate Research Fellowships:
www.utsouthwestern.edu/SURF
UT Southwestern includes a graduate school of over 700 students. Additionally, UTSW features one of the premier medical schools in the country, and a school of allied health.

The division of basic sciences at UT Southwestern includes over 250 faculty members and 8 training programs, including the chemistry training track.

Excellence in Research
- Four Nobel laureates
- 18 members of the prestigious National Academy of Sciences
- More than 3,500 research projects annually
- More than $400 million in research funding
- Leaders in a new era of scientific discovery in the 21st century

Welcome to UT Southwestern

Chemistry Training Track

The interface between chemistry and biology continues to be a rewarding and dynamic area of research. The Chemistry Training Track at UT Southwestern was founded on this vision and is designed to prepare students to address emerging research opportunities at the crossroads of modern chemistry and discovery biology.

Research projects focus on topics at the forefronts of synthetic and mechanistic chemistry, chemical biology, and biochemistry. The program is committed to providing an educational experience that is challenging, broad based, and rigorous.
Ph.D Training in Chemistry

Training is provided through coursework, scientific presentations, and independent research. These opportunities train students to think critically, present their research, and master the field of organic chemistry.

Courses
17 Total credit hours
High Faculty/student ratio ensures individualized training.

Fall, First Year
Advanced Problems in Reaction Mechanisms
Chemical Structure & Reactivity
Chemical Synthesis

Spring, First Year
Advanced Synthesis and Catalysis
Advanced Problems in Reaction Mechanisms
Small Molecule Structure & Elucidation
Medicinal Chemistry

Chemistry graduate students can also elect to take any of the other 56 courses offered by the Division of Basic Science.

David Corey, PhD
Professor
Ph.D. University of California, Berkeley 1990
Website: www4.utsouthwestern.edu/coreylab/
David.corey@utsouthwestern.edu

The Corey lab is interested in studying chemically modified nucleic acids and nucleic acid mimics designed to modulate gene expression.
- Oligonucleotides
- RNA
- Peptide nucleic acids

Jef K. De Brabander, PhD
Professor
Ph.D. University of Ghent, 1993
Website: http://www4.utsouthwestern.edu/jdebralab/
ej.debander@utsouthwestern.edu

Research in De Brabander laboratory focuses on the synthesis of designed and naturally occurring substances. The De Brabander group develops methodology for the construction of functionality found in complex natural products. His group has integrated molecular pharmacology and biochemical studies to understand and create biologically active small molecules.
- Synthesis
- Natural Products
- Mode-of-Action

J. R. Falck, PhD
Welch Professor
Ph.D. Colorado State University 1974
Website: http://www4.utsouthwestern.edu/falcklab/index.html
j.falck@utsouthwestern.edu

The main theme of research in the Falck group is the application of synthetic and bioorganic chemistry to problems of biochemical and medicinal relevance.
- Total synthesis
- Antibiotics
- Medicinal chemistry
- Isolation of natural products

László Kürti, PhD
Assistant Professor
Ph.D. University of Pennsylvania 2006
Website: http://kurtilabs.com
Laszlo.kurti@utsouthwestern.edu

The Kürt group focuses on the development of new methods for the enantioselective assembly of highly functionalized molecules.
We are interested in applying our reactions to the preparation of complex bioactive natural products and their derivatives. We will work with our colleagues to identify molecules that have the potential to become drugs for a variety of major as well as neglected diseases.
- Asymmetric catalysis
- Total synthesis
- Heterocyclic chemistry
- Medicinal chemistry

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Ph.D. University of California, San Diego, 1996
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Research in the Li laboratory aims to develop photonic probes to enable biological discovery. The biological focus of our study is on the regulation of insulin secretion in pancreatic beta cells and on the regulation and therapeutic application of small non-coding RNAs including microRNAs.
- Probe development
- Insulin secretion and diabetes
- Fluorescence and molecular imaging
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Richard Auchus, MD, PhD
Professor
MD, Ph.D. Washington University 1988
Richard.auchus@utsouthwestern.edu

The Auchus group is interested in understanding the mechanisms of steroid-metabolizing enzymes. To this end, the lab uses chemical probes, kinetic experiments, and structural biology.

- Steroid hormones
- Enzyme mechanisms
- Kinetic isotope effects

Chuo Chen, PhD
Associate Professor
Ph.D. Harvard University 2001
Website: www4.utsouthwestern.edu/chuochen/
Chuo.chen@utsouthwestern.edu

The goals of our research program are to develop new strategies and methods to facilitate the chemical synthesis of small molecules, and to use these small molecules to help advance our understanding of cancer biology. We are focusing on (1) the target-oriented synthesis of structurally unique and biologically significant natural products, and (2) the function-oriented synthesis of small-molecule inhibitors of the Hedgehog (Hh) and Wnt signal transduction pathways.

- Total synthesis of natural products
- Hedgehog and Wnt signaling pathways
Seminars in Chemistry

Students benefit from frequent interactions with multiple faculty members through several mechanisms.

Student Seminars in Chemistry
Students present seminars on their own research and on a literature topic annually.

Chemistry Noon Seminar Series
The chemistry training track hosts a unique seminar series featuring visiting expert speakers from industry and academia.

Dissertation Committee
Students meet regularly with their dissertation committee to discuss their progression toward completing their Ph.D.

Qualifying Exam
Students prepare and present an independent research proposal in their 2nd year.
UT Southwestern and Dallas/Ft. Worth

UT Southwestern is located a few minutes from the modern urban center of Dallas, a vibrant and diverse city that has something for everyone. Dallas is the third largest city in Texas and the ninth largest city in the US. The Dallas/Fort Worth Metroplex is home to over 5 million residents. Many apartment complexes are available within walking and cycling distance of the campus.

Dallas is known for its barbecue, authentic Mexican, and Tex-Mex cuisine. But the city is also home to a diverse array of cuisine from around the world.

If you can not find what you’re looking for in Dallas, the city of Fort Worth is a quick drive from the campus. As the seventeenth largest city in the US, Fort Worth is one of the cultural and social centers of Texas. For more information, go to:
www.visitdallas.com

Sports and Entertainment
Dallas is home to professional teams in all the major sports, including:

- Dallas Cowboys (Football)
- Dallas Mavericks (Basketball)
- Texas Rangers (Baseball)
- Dallas Stars (Hockey)
- FC Dallas (Soccer)
Life at

UT Southwestern

Financial Assistance
All students are supported by fellowships throughout their training:
• $28,000 (2010) stipend
• Tuition Waiver
• Health insurance

Dallas enjoys a healthy economic climate and low cost of living in comparison to other major cities in the US:

Teaching Opportunities
Students are not required to teach labs or courses during their training. Rather, they focus on research from their first days on campus. Special opportunities for teaching may be available for students who are interested.

Data source: ACCRA www.costofliving.org
UT Southwestern is equipped with state of the art instrumentation for chemical research. Shared instrumentation includes:

- Autosampling 400 MHz NMR
- 500 MHz NMR
- Tandem HPLC/600 MHz NMR
- 800 MHz NMR
- UV/Vis, IR, Fluorescence spectrometers
- High-pressure hydrogenation equipment
- Small molecule X-ray diffractor

Individual labs are equipped with:

- Gas chromatographs
- Tandem gas chromatograph/mass spectrometer
- Tandem HPLC/mass spectrometers
- Microwave reactors
- Gloveboxes
- Solvent purification systems
- Automated chromatography

The University supports several labs to aid chemical research:

- X-ray crystallography facility
- High-throughput screening facility
- Pharmacology facility
- Medicinal chemistry facility
Recent Collaborative Projects Involving UT Southwestern Chemists

Identification of small molecules that regulate the hedgehog signaling pathway, a pathway important in cancer and development


Discovery of an anticancer agent operating through a novel mechanism

*Science* **2004**, *305*, 1471-1474

Discovery of a small molecule to treat neurodegenerative diseases


Biological studies on a potent anticancer natural product


Discovery of a potent antibiotic operating through a novel mechanism

*Science* **2008**, *321*, 1078-1080
Research Opportunities

As a chemist at UT Southwestern, you will address problems at the forefront of chemistry and biomedical sciences. UT Southwestern combines a focus on individual excellence with opportunities to engage in interdisciplinary research.

Research in Chemistry
Research groups focus on problems of fundamental importance to the chemical community:
- Asymmetric catalysis
- Isolation of natural products
- Medicinal chemistry
- Organometallics
- Synthesis of natural products
- Synthetic methodology

Interdisciplinary Research Opportunities
UT Southwestern fosters collaborative, interdisciplinary science. Students have exciting opportunities to work with researchers ranging from clinicians to basic scientists on topics at the forefront of biomedical research.

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Equivalent Stipend Levels

Average Monthly Rent

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