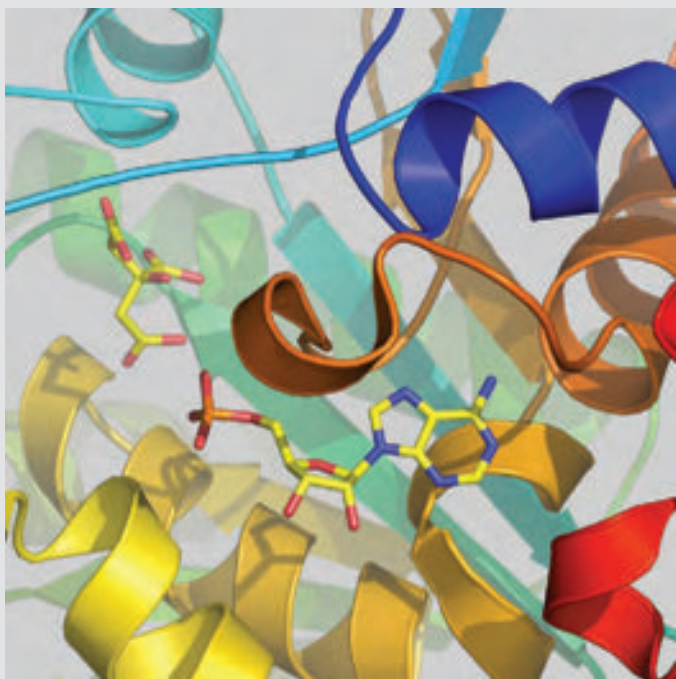


# Integrated Multidisciplinary Graduate Program



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**M**olecular  
**B**iophysics &  
**B**iochemistry

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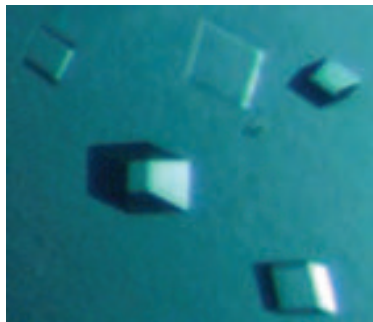


<http://mbb.uthscsa.edu>



# Molecular Biophysics and Biochemistry

The Molecular Biophysics and Biochemistry (MB&B) track focuses on the structure and function of cellular components broadly defined and provides advanced training for graduate students in the use of a broad spectrum of biophysical, biochemical, and molecular biological methods to study these cellular components.



Faculty members use a variety of quantitative and/or specialized approaches to answer fundamental questions about the relationship between form and function, an understanding that has important ramifications for the betterment of human health.



Students in the MB&B track acquire in depth training in these areas, preparing them for a successful career in academia or industry.



## MB&B Faculty

The faculty of the MB&B track encompass a broad range of expertise and interests, ranging from structural biology, to enzymology, to mechanisms of inter-cellular communication and metabolic disorders. A listing of the faculty and a brief description of their expertise/interests follows:

**Dr. Martin Adamo, Biochemistry**  
IGF-1 biosynthesis and signaling

**Dr. Ricardo Aguiar, Medicine**  
Molecular pathogenesis of hematological malignancies

**Dr. Reto Asmis, Biochemistry & Clin. Lab. Sci.**  
Thiol antioxidants in cardiovascular disease

**Dr. Robert Brenner, Physiology**  
Calcium-activated potassium channels

**Dr. Borries Demeler, Biochemistry**  
Hydrodynamic modeling of biological macromolecules

**Dr. Paul F. Fitzpatrick, Biochemistry**  
Catalytic and regulatory mechanisms of enzymes

**Dr. Franco Folli, Pharmacology**  
Regulation of protein expression in diabetes mellitus

**Dr. Maria Gaczynska, Molecular Medicine**  
Proteasomal function in cellular homeostasis and disease

**Dr. Stephen C. Hardies, Biochemistry**  
Genome mapping and evolution of phage genomes

**Dr. P. John Hart, Biochemistry**  
Protein crystallography, SOD in Lou Gehrig's Disease

**Dr. Andrew Hinck, Biochemistry**  
NMR Spectroscopy, TGF- $\beta$  signal transduction

**Dr. Dmitri Ivanov, Biochemistry**  
NMR Spectroscopy, Mechanisms of retroviral restriction

**Dr. Jean X. Jiang, Biochemistry**  
Gap junction mediated intercellular communication

**Dr. Chongwoo A. Kim, Biochemistry**  
Structure-function of polycomb group proteins

**Dr. Eileen Lafer, Biochemistry**  
Vesicular transport and synaptic vesicle recycling

**Dr. John C. Lee, Biochemistry**  
Regulation of gene expression by BMPs

**Dr. Feng Liu, Pharmacology**  
Receptor tyrosine kinase signal transduction

**Dr. Richard Ludueña, Biochemistry**  
Biochemistry of microtubules and tubulin isoforms

**Dr. Bettie Sue Siler Masters, Biochemistry**  
Structure-function of FAD- and NAD-containing enzymes

**Dr. Lee McAlister-Henn, Biochemistry**  
Structure-function of isocitrate dehydrogenase

**Dr. Nicolas Musi, Medicine**  
Molecular mechanisms of insulin action

**Dr. Leslie Myatt, ObGyn**  
Placental physiology

**Dr. Bruce J. Nicholson, Biochemistry**  
Structure-function of gap junction intercellular channels

**Dr. Shane Rea, Physiology**  
*C. elegans* as a model for aging

**Dr. Neal C. Robinson, Biochemistry**  
Mitochondrial electron transport complexes

**Dr. Phil Serwer, Biochemistry**  
Bacteriophage assembly and evolution

**Dr. Mark Shapiro, Physiology**  
Physiology and regulation of ion channels

**Dr. Yuzuru Shiio, Biochemistry**  
Proteomic analysis of proteins important in cancer

**Dr. Rui J. Sousa, Biochemistry**  
Structures and mechanisms of nucleic acid polymerases

**Dr. Bjorn Steffensen, Periodontics**  
Matrix metalloproteinases and their interactions with the ECM

**Dr. James Stockand, Physiology**  
Regulation of ENaC and aldosterone signaling

**Dr. Susan Weintraub, Biochemistry**  
Applications of mass spectrometry to biochemical systems

**Dr. David Weiss, Physiology**  
Mechanisms of GABA receptor regulation

## Research Infrastructure

The Molecular Biophysics and Biochemistry track supports state-of-the-art instrumentation for structural analysis of biological macromolecules (X-ray crystallography, NMR spectroscopy, CD spectroscopy), biological mass spectrometry, hydrodynamic analysis



(analytical ultracentrifugation and light scattering), macromolecular interactions (surface plasmon resonance and isothermal titration calorimetry), and protein stability (differential scanning calorimetry). The track also maintains multiple computing clusters for data analysis and computational modeling. Nearly all of the instrumentation resides in core facilities supported by Ph.D level staff who assist and train users.

## Locale

The University of Texas Health Science Center is located on the north side of San Antonio, a historic and culturally diverse city with a



population of more than 1.3 million. Cultural and recreational opportunities abound, including the historic downtown with the Alamo and San Antonio riverwalk. The nearby Texas hill country offers beautiful scenery, as well as hiking, kayaking, and cycling.

## Additional Program and Application Information

The Ph.D. track in Molecular Biophysics and Biochemistry is a component of the Integrated Multidisciplinary Graduate Program at the Graduate School of Biomedical Sciences at the University of Texas Health Science Center at San Antonio. It is one of nine tracks, each defining a specific sets of training requirements for the Ph.D. degree. Students apply to and are accepted by the Integrated Program. During their first semester, they take a unified course in the Fundamentals of Biomedical Science while doing short research projects in laboratories of several faculty chosen from any of the nine tracks. They then choose a supervising professor and a corresponding track with which to complete their training.

Additional information about the Molecular Biophysics and Biochemistry track may be found here:

<http://mbb.uthscsa.edu>

or by contacting the track leader,  
Andrew Hinck, PhD:

[hinck@uthscsa.edu](mailto:hinck@uthscsa.edu)

Applications are accepted through the Integrated Multidisciplinary Graduate Program of the Graduate School of Biomedical Sciences:

<http://gsbs.uthscsa.edu>



7703 Floyd Curl Drive  
San Antonio, TX 78229