Biochemistry and Molecular Biology

Saint Louis University is a Catholic, Jesuit institution that values academic excellence, life-changing research, compassionate health care, and a strong commitment to faith and service.

Founded in 1818, the University fosters the intellectual and character development of nearly 14,000 students on two campuses in St. Louis, Missouri, and Madrid, Spain. Building on a legacy of nearly 200 years, Saint Louis University continues to move forward with an unwavering commitment to a higher purpose, a greater good.

OVERVIEW

The department of biochemistry and molecular biology is a member of the graduate program in biomedical sciences at Saint Louis University’s School of Medicine. Each year, 10-15 highly qualified candidates with bachelor’s degrees are accepted into this multidisciplinary Ph.D. program. To assist students in deciding which area of biomedical research is right for them, the program provides students with opportunities for exploring research in as many as five diverse disciplines during the first year of graduate training.

Approximately 70 faculty members in the programs of biochemistry and molecular biology, molecular microbiology and immunology, pharmacological and physiological sciences, pathology and the Institute for Molecular Virology provide an almost unlimited variety of research project choices for students. In recognition that successful graduates need a broad background in biomedical science and flexible skills, the first year also includes interdisciplinary lecture courses, small-group discussions and participation in a colloquium series where contemporary developments in the biomedical sciences are presented and discussed. Informed by their experiences in this first year, students then select a Ph.D. mentor in a specific program, such as biochemistry and molecular biology, and continue with their Ph.D. training in that specific program.

For entry with a bachelor’s degree, application is made to the graduate program in biomedical sciences at Saint Louis University’s School of Medicine.

Screening of applicants begins in the December preceding the academic year of enrollment. During the months of February, March and April, highly qualified candidates are invited, at our expense, to come to St. Louis for interviews and to acquaint themselves with the area, the University and the graduate program in biomedical sciences. Offers of admission into the program are generally made shortly after the interviews are complete. Acceptance of the offer of admission into the program by the applicant is expected no later than April 15. Late applications are considered on a space available basis. The first academic year generally begins in the third week of August.

The department also offers an M.D./Ph.D. program. Application is competitive and a limited number of positions are available. The program offers financial support in the form of full tuition remission for both the M.D. and the Ph.D. Trainees typically complete the first two years of medical school before undertaking the Ph.D. portion of their training. After completion of the Ph.D. dissertation, trainees return to complete the final years of medical school.

APPLICATION REQUIREMENTS

• Transcript(s)
• Three letters of recommendation
• GRE G scores (GRE S optional)
• Résumé
• Professional goal statement
• Interview (desired)

ADMISSION CRITERIA

The prospective graduate student must have completed an undergraduate degree with a major in chemistry, biology or a related field with outstanding scholastic achievement. While not required for admission, physical chemistry is strongly recommended, as is a strong background in mathematics.
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FACULTY

Youhna Ayala, Ph.D.: Functional and structural characterization of RNA binding proteins in the context of cellular metabolism, gene expression and human disease, in particular, neurodegenerative disorders

Ángel Baldán, Ph.D.: Studies on sterol homeostasis and the molecular mechanisms involved in the conversion of macrophages to foam cells

Yie-Hwa Chang, Ph.D.: Understanding how two distinct eukaryotic methionine aminopeptidases (MetAPs) function in the amino terminal processing of eukaryotic proteins and its role in angiogenesis

Yoonsang Cho, Ph.D.: Structural and chemical biology of ligands and receptors in inflammation and cancer

Carmine Coscia, Ph.D.: Opioid receptors and the effects of opioids on brain development

Enrico Di Cera, M.D.: Structure and function of trypsin-like proteases, such as thrombin, and the molecular determinants of substrate specificity and allosteric regulation

Dale Dorsett, Ph.D.: Chromosome structure control of gene expression during development using Drosophila molecular genetics and elucidation of the molecular mechanisms of Cornelia de Lange syndrome

Joel Eissenberg, Ph.D.: Mechanisms of gene activation and gene silencing as well as aspects of transcriptional regulation using Drosophila as a model system

David A. Ford, Ph.D.: Biochemical mechanisms responsible for the pathophysiological sequelae of cardiovascular diseases, including ischemic heart disease and atherosclerosis

Susana Gonzalo, Ph.D.: Nuclear architecture, chromatin structure and genomic instability in aging and cancer

Tomasz Heyduk, Ph.D.: Mechanisms of transcription regulation and development of novel sensors for biomolecule detection and imaging

Jung San Huang, Ph.D.: Novel trans-Golgi network signal transduction and autocrine transformation by the v-sis/c-sis oncogene and the role of the transforming growth factor β (TGF-β) type V in the biological functions of TGF-β

Claudette Klein, Ph.D.: Development of Zinc as a new chemotherapeutic option for the treatment of cancer

Sergey Korolev, Ph.D.: Structure-functional studies of DNA recombination, replication and repair proteins

Alireza Rezaie, Ph.D.: Understanding the mechanism by which coagulation proteases interact with their target cofactors, substrates and inhibitors, and how heparin enhances the inhibitory function of antithrombin in the regulation of the proteolytic activities of these proteases

James Shoemaker, M.D., Ph.D.: Screening children for inborn errors of metabolism using gas chromatography-mass spectrometry and evaluation of special nutritional needs in children with Down’s syndrome

Dorota Skowyra, Ph.D.: Studies on the role, function and regulation of the ubiquitin-proteasome system in health and disease

William S. Sly, M.D.: Experimental approaches to the treatment of murine β-glucuronidase deficiency mucopolysaccharidosis (Sly syndrome) and biochemical and molecular genetics studies of human carbonic anhydrase deficiencies

Alessandro Vindigni, Ph.D.: Studies on DNA repair and genome stability, including the structure, function and regulation of RecQ helicases

Mee-Ngan Yap, Ph.D.: Mechanism of translational regulation and the molecular responses of ribosome tunnel to different antibiotics and nascent polypeptides