Department of Biochemistry and Molecular Biophysics

The faculty of the Department of Biochemistry and Molecular Biophysics perform research in a broad spectrum of biomedically relevant areas, including DNA and RNA structure and enzymology; protein folding, misfolding and aggregation; cellular mechanics; membrane receptor-mediated signaling; and hemostasis, thrombosis and vascular biology. The department offers training opportunities at the crossroads of biochemistry, biophysics, systems biology, proteomics, computational science and pharmacological sciences.

The department's approaches to research focus on understanding the energetics, structure and mechanisms of biological processes. Investigators employ a variety of experimental methods (e.g., X-ray crystallography, nuclear magnetic resonance, mass spectrometry, optical spectroscopy, thermodynamics, rapid kinetics) in combination with computational approaches to unravel the molecular underpinnings of processes of relevance to health and disease. Novel single-molecule methods are providing new insight into the molecular details of enzyme mechanisms and macromolecule dynamics. The high-throughput screening of chemical libraries and the use of synthetic medicinal chemistry to develop small-molecule probes of biological systems provide new avenues for translational research and the development of experimental therapeutics.

The faculty in the department organize and teach basic science courses in the medical school curriculum. In the Arts & Sciences curriculum, the faculty teach courses in Nucleic Acids & Protein Biosynthesis (Biol 548), Chemistry and Physics of Biomolecules (Biol 5357), and Macromolecular Interactions (Biol 5312). The overarching theme of these courses is to understand the principles of the molecular interactions that underlie the biological process of health and disease. Students in the School of Medicine and the School of Arts & Sciences are eligible for these courses and may elect to pursue biomedical research under the direction of our faculty. A full listing of advanced course topics (https://biochem.wustl.edu/studentinfo/courses/) can be found on our website.

Website: http://biochem.wustl.edu