The Structural Biology Program

The Structural Biology Program at Brookhaven Lab's National Synchrotron Light Source II (NSLS-II) enables discovery-class research on fundamental biological questions. Researchers can use the program's world-class instruments to investigate the atomic building blocks of a wide range of biological samples using state-of-the-art x-ray scattering and diffraction techniques.

The program's scientific focus is to investigate the molecular structure and function of complex biomolecules using extremely small crystals and molecules in solution.

08/18 PST

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National Synchrotron Light Source II
A U.S. Department of Energy
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Beam time at NSLS-II is available at no charge to researchers and it is granted through a peer-review proposal process. Proprietary access is also available at a full cost-recovery rate.

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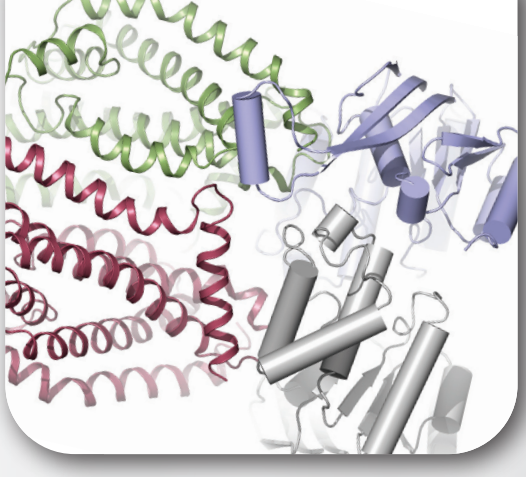
Structural Biology

at the National Synchrotron Light Source II

Investigating and understanding biology through molecular characterization and structure



Scientists Reveal Unexpected Structure For O-antigen Transporters

Scientists revealed an unexpected channel-forming structure for an O-antigen transporter, called Wzm-Wzt. This transporter protein is found in the cell membranes of highly abundant gram-negative bacteria, and transports polysaccharides through the outer cell membranes. Using advanced x-ray diffraction measurements, the scientists found that the transporter's channel-forming structure is unique and stands in contrast to classical mechanisms that are usually used by this kind of ABC transporter.

Reference: *Nature, 553, 361–365 (2018)*

Scientists Develop New Structure-Function Model for Protein Complex in Cellular Autophagy

Scientists unlocked the function and structure of a yeast protein complex called Snx4-Atg20, which is needed for autophagy—an essential cell function. Autophagy is a form of cell self-cleaning where a protein captures unused cellular material in vesicles and degrades the captured contents. In this study, scientists used small-angle x-ray scattering (SAXS) to map the shape of the complex and reported a detailed investigation of its structure and function.

Reference: *PNAS, E10112–E10121 (2017)*

beamlines

16-ID LiX

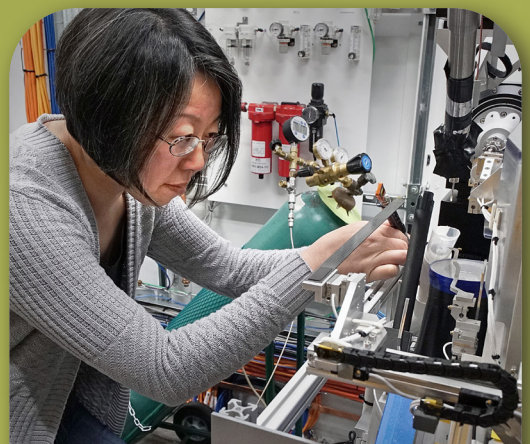
Life Science X-ray Scattering

The Life Science X-ray Scattering (LiX) beamline is specifically designed for life science applications beyond crystallography. Using x-ray scattering and imaging techniques, LiX's diverse user community studies complex proteins and macromolecules in solution. Researchers can choose from a broad range of x-ray-based techniques to investigate the properties of proteins and macromolecules *in vivo*.

17-BM XFP

Biological X-ray Footprinting and Spectroscopy

The Biological X-ray Footprinting and Spectroscopy (XFP) beamline is designed for studying the dynamics and structure of biological macromolecules in solution. XFP provides researchers with a versatile setup and intense broadband x-rays for investigating the interactions of biological macromolecules *in vivo*. The beamline is operated by the Case Western Reserve University Center for Synchrotron Biosciences.



17-ID-1 AMX

Highly Automated Macro-molecular Crystallography

The Highly Automated Macromolecular Crystallography (AMX) beamline is designed to meet the needs of bioscience researchers by revealing the structures and functions of protein complexes. AMX offers researchers a fast and efficient way to quickly discover the best crystals among available specimens and then to investigate them with high precision using state-of-the-art detector systems.

17-ID-2 FMX

Frontier Microfocusing Macro-molecular Crystallography

The Frontier Microfocusing Macromolecular Crystallography (FMX) beamline is optimized to solve bio-crystallographic challenges by offering researchers access to its unmatched micron-sized x-ray beam and high photon flux. Researchers can benefit from the fast sample exchange and temperature-controlled sample environment at FMX.

19-ID NYX

Biological Microdiffraction Facility

The Biological Microdiffraction Facility (NYX) beamline offers hard x-ray macromolecular crystallography with high energy resolution for the finer examination of proteins and complex biological molecules. The beamline is developed and operated by the New York Structural Biology Center.