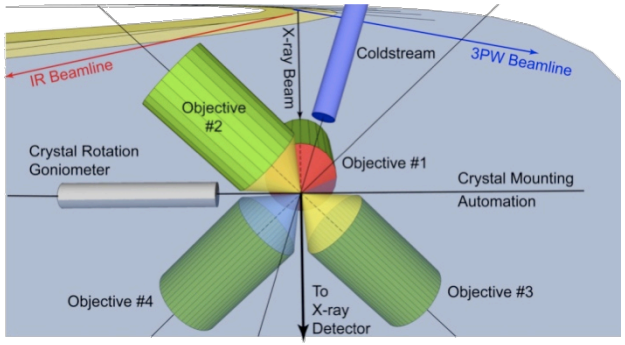
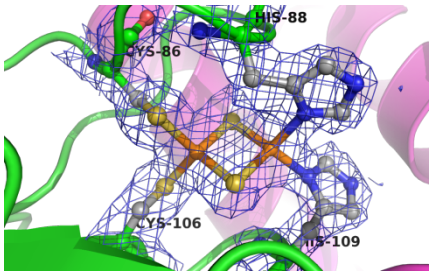
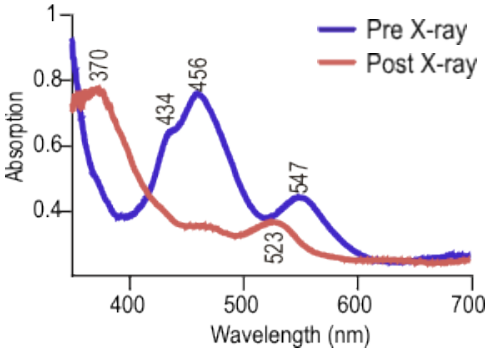
Correlated Spectroscopy and MX (SM3)

A unique facility for multi-disciplinary, nearly simultaneous studies of single crystals

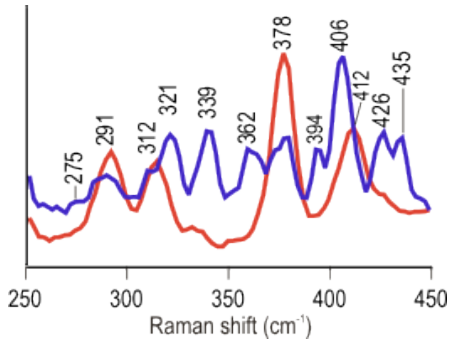
- Macromolecular crystallography
- Electronic absorption spectroscopy
- Fluorescence spectroscopy
- Raman spectroscopy
- FTIR spectroscopy
- XAS/XANES/EXAFS spectroscopy







Correlated studies conducted at X26-C of NSLS have demonstrated the reduction of the iron-sulfur Rieske center in Stachydrine demethlyase. The protein structure obtained with MX gives no information on this x-ray induced process. Comparison of the pre and post x-ray exposure absorption (top) and Raman (bottom) spectra, however, do provide clear evidence of this reduction. K. Daughtry, et al., in preparation .



Examples of Science Areas & Impact

Redox state: Define redox states of metalloproteins using structures and spectroscopy from the same sample

Mystery density: Raman spectroscopy helps assign electron density where ambiguities exist

Photochemistry: Initiate and follow reactions

Mechanisms: Trap and identify reaction intermediates

Beamline Capabilities

Techniques: macromolecular crystallography, spectroscopy on- and off-beamline (UV/vis, fluorescence, IR, Raman, XAS and EXAFS)

Source: three-pole wiggler

Energy Range: 5-20 keV

Flux: 10^{11} ph/s at 12 keV

U.S. DEPARTMENT OF ENERGY

Spokesperson: Allen M. Orville, Brookhaven National Laboratory

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