

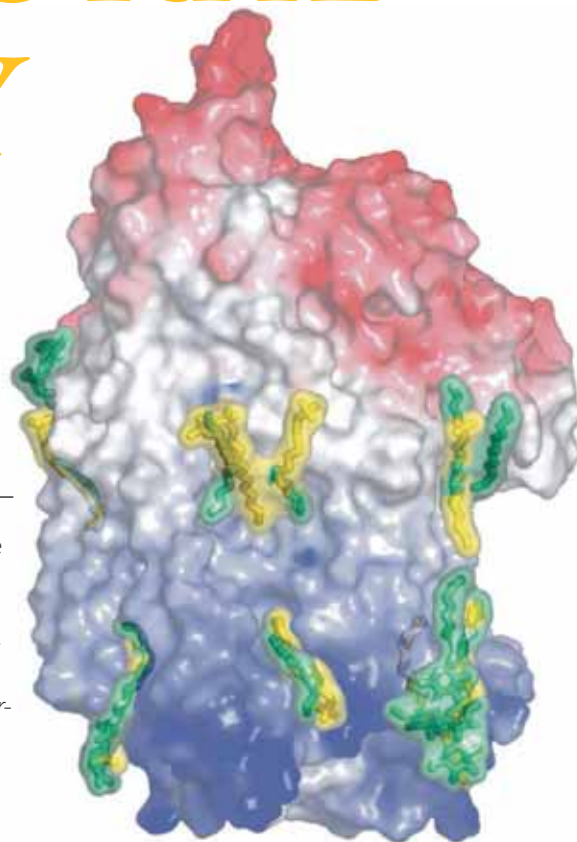
MICHIGAN CENTER FOR

STRUCTURAL BIOLOGY

The Michigan Center for Structural Biology is led by Michigan State University, with consortia at the Universities of Michigan, Wayne State and the Van Andel Research Institute, as well as the Advanced Photon Source at Argonne National Labs in Argonne, IL. The Center is designed to provide state-of-the-art instrumentation to Michigan researchers in the area of macromolecular structure/function determination. Its aim is to create a collaborative, synergistic research environment among the universities and with industry, to promote major advances in understanding of structure and catalytic mechanism, and to foster commercial application of this knowledge, especially in the areas of nutrition, aging, drug discovery and disease mechanisms/treatment.



The membrane protein cytochrome c oxidase, the key enzyme for energy production in aerobic organisms; the structure was determined at the APS Synchrotron facility.



SERVICES, RESOURCES & EQUIPMENT

X-ray Crystallography (all sites)

- A sector at the APS Synchrotron LS-CAT is serving Michigan researchers for structure determination at the highest level of resolution.
- Facilities are available at all the sites for analysis of protein and nucleic acid crystals.

Nuclear Magnetic Resonance (NMR) Spectroscopy (UM, MSU, WSU)

- A 900MHz NMR at Michigan State is available and offers the highest power available for structural and dynamic measurements of proteins.

- A 700 MHz NMR is available at WSU, especially equipped for DNA/RNA structure analysis.

- A 600 MHz NMR with cyroprobes is available at UM.

Electron Paramagnetic Resonance Spectroscopy (EPR) (MSU)

- A 95GHz/ 9 GHz (pulse cw) EPR spectrometer is available. This top-of-the-line instrument is a powerful tool for analysis of the mechanism of metalloproteins.

Single Molecule Spectroscopy (UM)

- The laboratory dedicated to single molecule laser spectroscopy is fully operational, allowing unprecedented time resolved measurements of motional characteristics of individual molecules.

MCSB

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Laser Laboratory (MSU)

- A femtosecond laser system with new Raman and photon-echo capabilities has been installed that is capable of analyzing the most ambitious problems in biochemistry and biophysics such as enzyme catalysis and protein folding.

Protein Production and Tailoring

(MSU, UM)

- The Membrane Protein Over-expression Facility at MSU has personnel, equipment and expertise to aid investigators in producing and purifying membrane proteins.
- The Protein Expression Laboratory in Engineering at MSU, with a 10 liter and a 150 liter fermentor and personnel, is available to aid investigators in large scale expression of proteins.
- A facility for protein tailoring and labeling at UM provides personnel and expertise for aiding researchers in making different forms of a protein that are suitable for crystallization and NMR analysis.

The Macromolecular Structure, Synthesis and Sequencing Facility (MSU)

- Services including amino acid analysis, oligonucleotide synthesis and DNA sequencing, protein purification via FPLC and HPLC chromatography, N-terminal and C-terminal automated peptide sequencing. These services are available at competitive prices and with expert assistance.

ACCESS

Qualified investigators trained to use the instruments may make arrangements for access, or may pursue specific projects on a collaborative basis. Sample preparation will usually be done in their own labs. There is a fee for equipment usage. Contracts can be arranged for production of proteins, modification of proteins, and DNA primers, DNA sequencing.



The Biomolecular NMR Facility at Michigan State University houses the 900 MHz NMR instrument in a new building with access to researchers across the State.

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