NE-CAT Crystallography Beamlines for Challenging Structural Biology Research

The NorthEastern Collaborative Access Team (NE-CAT) focuses on the design and operation of synchrotron X-ray beamlines for the solution of technically challenging structural biology problems and provides an important resource for the national and international research community. Currently NE-CAT operates two undulator beamlines: 24ID-C fully tunable in the energy range from 6 to 21keV (~2.1 to 0.5A) and 24ID-E fixed energy at 12662eV (optimized for Se SAD experiments).

Both beamlines are equipped with state-of-the-art instrumentation. MD2 microdiffractometers installed at both beamlines provide very clean beams down to 5 microns in diameter and are capable of visualizing micron-sized crystals. Large area detectors (including Pilatus-6MF), not only provide the best diffraction data, but also make possible to resolve large unit cells. Both beamlines are equipped with ALS style automatic sample mounters. Towards improving the diffraction from low resolution crystals, NE-CAT has installed humidity controlled device, HC1 in the 24ID-E hutch. Locally developed software suite RAPD provides data collection strategies, quasi-real time data integration and scaling and simple automated MR/SAD pipeline through 384 core computing cluster. Users of the beamlines are supported by experienced resident crystallographers.

To meet the needs of technically challenging crystallographic projects, cutting-edge hardware and software ideas are implemented. A summary of beamline capabilities, technology, scientific highlights, future developments and details of availability will be presented.

The NE-CAT facility is open to the whole crystallography community via APS General User Program. Detailed descriptions of the beamlines can be found at NE-CAT website http://necat.chem.cornell.edu.

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