

NE-CAT: Crystallography Beamlines for Challenging Structural Biology Research

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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: a 6 - 22 keV tunable energy beamline (24-IDC) and a 12.662 keV single energy beamline (24-ID-E). 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 pixel array detectors (Pilatus6M and Eiger16M) provide fast noiseless data collection and make possible it to resolve large unit cells. Both beamlines are equipped with custom-built ALS-style robotic sample automounters with dewars capable of holding 14 pucks. Our locally developed software suite RAPD provides data collection strategies, quasi-real time data integration, scaling and simple automated MR/SAD pipeline through a 384-core compute cluster. Towards improving the diffraction from low resolution crystals, NE-CAT has installed humidity controlled device, HC1 in the 24ID-E hutch. Users of the beamlines are supported 24/7 by experienced resident crystallographers. Funding for NECAT is provided through a P30 grant from the NIGMS and from the NE-CAT member institutions.