



Experiment title: Structural studies of copper containing amine oxidase, four-way DNA (Holliday) junctions and plasmid replication initiator proteins.

Experiment number:
LS431 ,432,433

Beamline:

ID09

Date of experiment:

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Date of report:

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Shifts:

6

Local contact(s):

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Report:

The initial trip to collect data for these projects, using a Mar image plate as the detector, in February was unsuccessful due to problems with a beamline shutter.

For the second session the station CCD was mounted on the beamline. Using this we collected data sets for *E.coli* Amine Oxidase, two of the RepAl heavy atom derivatives and a derivative of a DNA junction Endonuclease complex crystal. We found that data collection was slower than expected due to problems with the cryo-cooler, our long exposure time required many oscillations which caused a time lag and variable crystal quality after transportation.

Correcting the data, which was carried out for us by a beamline scientist, proved difficult and only approximate. The different crystals required different crystal to detector distances and detector positions for optimum data collection. We were advised that standard correction and calibration files were available but when correction was carried out it was found that our positions did not correspond exactly to those in the calibration files.

Subsequent data processing has also been unsatisfactory. We have attempted processing for the data with the most accurate image corrections and the strongest diffraction. Due to the size of the CCD and the length of the unit cell, small oscillation angles were used which resulted in very few fully recorded reflections on each image or larger oscillations where

many reflections were rejected due to overlap. The partial reflections could not be summed over images as the background intensity on each image varied although the data collection time remained constant. A further problem was experienced with the spindle which did not perform the full oscillation for each image.

As a result of the problems outlined above we did not collect as much data as we expected and we have not been able to process satisfactorily that which we did collect. We did, however, learn more about how our various crystals diffract in the ESRF undulator beam. In particular, we showed that the RepAl crystals show good diffraction to at least 2.5\AA , a considerable improvement over the 3.3\AA maximum we observed at Daresbury SRS Station 9.6.