



Experiment title: Cambridge MRC Block Allocation Group
Crystal structure determination of the SMC head domain

Experiment number:
LS1669

Beamline:
BM14

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Shifts:
3

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Report:

SMC proteins (Structural Maintenance of Chromosomes) form a large family of conserved proteins that are ubiquitous in all three kingdoms of life. SMC proteins bind to DNA and perform essential tasks in chromatin condensation into chromosomes and sister chromosome separation. SMC's are very large proteins of about 1500 amino acids in each chain of a dimer with three globular domains. An antiparallel coiled-coil region puts the N-terminal and C-terminal domains together to form active head domains on both side of the approx. 1000Å long molecule.

Complete native dataset of the SMC head domain have been collected in space groups P3(n)12 and P2(1) to 3.0Å resolution. The trigonal crystals turned out to be hemihedrally twinned – unfortunately too late for the data collected on beamline BM14. The structure has recently been solved using SeMet MAD phasing on station ID29 and is currently being refined. The P21 crystal form contains 6 molecules per asymmetric unit and 30 sites could easily be located using the peak wavelength from station ID29 and SnB 2.1, although these crystals show very anisotropic diffraction, diffract only to 3.5Å resolution, and have a mosaic spread of 1.8°.