

Poster Presentation

MS22.P26

EMBL beamlines for macromolecular crystallography at PETRA III

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Since 2012, EMBL Hamburg operates two new beamlines for macromolecular crystallography - P13 and P14 - at PETRA III at DESY (Hamburg, Germany). We exploit the high brilliance and the wide energy range offered by PETRA III to offer a wide range of conditions to fit the experimental conditions to the challenges posed by the samples. P13 provides high photon flux down to 4 keV. With a helium cone and a kappa goniostat, this allows optimized data collection for SAD phasing. Using adaptive mirrors, the focus size (H x V) can be adjusted between 30 x 20 μm^2 and 150 x 100 μm^2 to match the size of the sample. A MARVIN sample changer is in operation for rapid loading and unloading of samples. P14 offers a high photon flux ($>10^{12}$ ph/sec at 12 keV into 5 x 5 μm^2). The beamsize can be varied between 1 x 1.5 mm² (unfocused) and 5 x 5 μm^2 (fully focused) in less than a minute by moving the KB mirrors in and out of the beam. For small crystals, an MD3 vertical diffractometer with a sphere of confusion smaller than 100 nm offers excellent conditions. Both beamlines are equipped with PILATUS 6M-F detectors for shutter-less data collection and dedicated data processing computers. The beamlines are embedded into the 'Integrated Facility for Structural Biology' offering facilities for sample preparation and characterization, a laboratory specifically equipped for the preparation of heavy atom derivatives, and downstream facilities for data evaluation. We will report about the status of the beamlines and describe typical experimental situations (small crystals, large unit cells, serial crystallography, low-energy phasing, small molecules and others).

Keywords: synchrotron, micro crystallography, serial crystallography