

GI-MS46-03 | EMBL BEAMLINES FOR MACROMOLECULAR CRYSTALLOGRAPHY AT PETRA

III

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EMBL-Hamburg operates two MX beamlines, P13 and P14, at PETRA III (DESY, Hamburg).

On P13, combining X-rays in the 4-6 keV energy range with beam sizes down to 15 μm diameter while maintaining high photon flux allows to perform full anomalous data collections in less than 5 minutes. S-SAD phasing is achieved routinely. Diffraction measurements at low energies on P13 do not require any special preparation of the sample, i.e. a crystal attached to a standard SPINE-pin can be automatically mounted onto the goniostat.

P14 can be run in two modes, one providing a collimated homogeneous beam that can be shaped to any size between 10 and 200 μm , the second mode producing micro-focus conditions with a beam size on the 5 μm scale. The collimated beam can be used to illuminate large (50-200 μm) and small crystals homogeneously and/or to resolve diffraction from large (>1000 Å) unit cells. The micro-focus beam can be used conveniently for serial data collections both on cryogenically cooled crystalline suspensions and *in situ* on crystals as grown in CrystalDirect™ crystallization plates. *In situ* structure determinations have been successfully performed from crystals in crystallization drops, in lipidic cubic phase, or as grown in living cells.

In 2018, a second endstation 'T-REXX' has been added to P14 providing an environment optimized for pump-probe time-resolved experiments.

The beamlines are part of the Integrated Facility for Structural Biology that offers access to services such as characterization of samples prior to crystallization, HT-crystallization, and crystal harvesting with a CrystalDirect™ Harvester.