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Structural Biology at the ESRF: present and future

Tuesday, 12 November 2019 14:00 (30 minutes)

The ESRF's facilities for Structural Biology comprise 6 end-stations for macromolecular crystallography (MX) 1, one end-station for BioSAXS experiments 2 and one end-station based around a Titan Krios cryo-electron microscope 3. These are supplemented by a number of support laboratories including the iCOS facility for in crystallo optical spectroscopy 4 and a facility for the high pressure cryo-cooling and/or derivatisation of crystals of biological macromolecules 5. This talk will describe the instrumentation and experimental possibilities available on these end-stations, with a particular emphasis on automation, remote access and mail-in services.
The ESRF Extremely Brilliant Source (EBS) project (see http://www.esrf.fr/about/upgrade for details) will provide benefits for many areas of synchrotron-based science. This presentation will thus also look ahead to the evolution of the ESRF's facilities for Structural Biology post-2020, focusing on the possibilities for serial crystallography and time-resolved MX, which ESRF-EBS X-ray beams will facilitate.

1. Mueller-Dieckmann, C. et al. The status of the macromolecular crystallography beamlines at the European Synchrotron Radiation Facility. Eur. Phys. J. Plus 130: 70 (2015); doi /https//doi.org/10.1140/epjp/i2015-15070-0.
2. Pernot, P., et al. Upgraded ESRF BM29 beamline for SAXS on macromolecules in solution. J. Synchrotron Rad. 20, 660-664 (2017).
3. Kandiah, E. et al. CM01: a facility for cryo-electron microscopy at the European Synchrotron. Acta Cryst. D75, 528-535 (2019).
4. von Stetten, D. et al. In crystallo optical spectroscopy (icOS) as a complementary tool on the macromolecular crystallography beamlines of the ESRF. Acta Cryst. D71, 15-26 (2015).
5. Lafumat, B., et al. Gas-sensitive biological crystals processed in pressurized oxygen and krypton atmospheres: deciphering gas channels in proteins using a novel 'soak-and-freeze' methodology. J. Appl. Cryst. 49, 1478-1487 (2016).

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