MS01-P08 | DEVELOPMENT OF SERIAL MILLISECOND CRYSTALLOGRAPHY AT BIOMAX BEAMLINE

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With the advent of X-ray free electron laser sources (XFELs), serial crystallography - a new method of data collection where thousands of crystals are delivered to the beam and exposed in random orientation at room temperature - was developed. During last years, serial crystallography was successfully implemented at synchrotron radiation sources (*serial synchrotron crystallography-SSX*) using a variety of sample presentation procedures. Due to the increased pulse length (around 100 ps) and reduced brilliance of synchrotron sources as compared to XFELs, SSX does not allow performing time-resolved experiments on ultra-fast time scales (fs-ps), nor to collect data from macromolecular nano-crystals. Nevertheless, SSX is well adapted to perform room temperature experiments on micro-crystals and to study events occurring on the ms-s timescale. Reduced costs, flexibility of the set-up and increased beamtime availability makes synchrotrons very attractive instruments to perform SSX experiments.

This work describes an implementation of different sample delivery approaches to perform room temperature serial crystallography at BioMAX beamline of recently inauguarated MAXIV facility. One of them is high viscosity injector-based serial millisecond crystallography, similar to the experiments with injectors originally developed at XFELs, where a continuous stream containing micro-crystals is injected into the microbeam. An alternative solid support approach is based on raster scanning micro-crystals deposited on silicon nitride membranes or capton based Xtal tools with very low background. Also, future perspectives for the dedicated serial crystallography beamline MicroMAX providing a very small but parallel and intense X-ray beam, will be discussed.