

**MS08-2-1 Optimization of capillary-based serial synchrotron crystallography sample delivery for soluble proteins
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Abstract

Serial Synchrotron Crystallography (SSX) is an emerging data-collection approach in which diffraction data are collected from multiple protein microcrystals. Some of the most common sample delivery setups for SSX include LCP extruder, GDVN, and fixed target^{1,2}.

The Neutze group developed a flow cell system called Serial-X³ for LCP membrane protein crystal samples at synchrotrons (Figure 1). The system has been tested and its proof of principle confirmed with data collected at BioMAX (paper in manuscript, Figure 2). This project is taking the setup on the next level of use by showing it can be used for non-LCP crystals.

The idea was to test non-LCP crystals if they can be modified to mock-up LCP samples and to test all samples with different viscous matrices to show flexibility of the set-up. Hemoglobin, lysozyme and Rubisco crystals were used for the study. Based on literature search, monoolein, vacuum grease, HEC and Vaseline® have been chosen as viscous matrices for the study since those are the most common carrier media⁴.

The first step was to test how crystals mix with the matrices, what the consistency of the LCP samples are (since for the set-up it needs to be a certain density to go and not clog the system) and how long the crystals can survive in the mixture. After establishing the test protocol it was used on all crystal and matrix pairings. The next step was data collection at BioMAX, where flow rate, exposure time, transmission and number of images per spot were needed to be tested. Initial data processing shows the system can be used for non-LCP samples and achieving good resolution of 1.8 to 2Å.

References

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