

MS08-2-5 Efficient sample delivery for serial protein crystallography with low background
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Abstract

Serial crystallography experiments require a continuous delivery of microcrystals to the X-ray beam. An ideal sample delivery should have several features: First, owing to the small crystal size, a high signal to noise ratio (SNR) is vital for successful experiments. Second, high hit-rates are desirable that minimize both necessary beamtime and sample consumption. Last but not least, the setup should be robust and easy to use, but flexibly adaptable to experimental different designs. In cooperation with Suna Precision, we have developed a sample environment designed to fulfil these criteria. Here, a slurry of microcrystals in mother liquor is transported onto an ultrathin porous polymer foil, across an interaction-point and into the X-ray beam.

With this new tapedrive version, liquid scattering is reduced and SNR optimized by blotting away excess mother liquor and if applicable for TR-SX ligand buffer before the quasi-naked crystals are illuminated. The tapedrive setup will be installed at the new ESRF ID29 beamline in Grenoble. It allows time-resolved observation of conformational changes in crystallized proteins using different triggers like light-activation, pH jump or chemical mixing via diffusion. This contribution offers solutions and advice against the frequent problem of crystal settling and highlights ongoing experiments on preferential crystal orientation.

References

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