

High throughput biological solution SAXS instrumentation for the home lab

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Low volume samples, high throughput capabilities and easily reconfigurable instrument parameters for biological small angle x-ray scattering have previously been reserved for measurements at state-of-the-art synchrotron beamlines.

With the introduction of the presented new dedicated solution SAXS instrument, Xenocs is not only moving the sample handling technology previously only seen at synchrotrons into the home lab, but also providing it and the instrument itself with a level of automation that empower users at any skill level to obtain the best data for their particular sample without compromise.

The high throughput nature of the instrument and the ability to automatically mix sample components shortly before measurements facilitates the study of biomolecular kinetics that was previously not possible in an automated fashion on a lab source SAXS instrument. This level of automation allows for automatic screening in time resolved studies in the minutes to hours scale, and greatly increases productivity.

The instrument has been developed to be a truly easy to use workhorse for samples in solution. By integrating computer vision technology, sample volumes down to 5 uL are possible and the in-line UV/VIS absorption measurements facilitate concentration estimation on the exposed sample. Automated sample loading, sample cell cleaning and drying is done with a high precision pipetting robot that also ensures gentle transport from the 2x96 well tray sample containers to the sample cell.

No compromise is made on data quality as the detector is fully in vacuum, ensuring the lowest possible background. Furthermore, using a motorized detector stage and motorized scatterless slits, the sample to detector distance and flux can be automatically optimized to fit a large variety of protein complex sizes. Data reduction and analysis can also be automated and done using the open source software RAW that also includes integration and compatibility with the advanced software suite ATSAS from the EMBL.

This new and unique instrument is the latest offering to the quickly growing biological SAXS community and lowers the complexity for researchers that want an easy to use yet powerful SAXS system for their lab.

Keywords: [SAXS](#), [protein solution](#), [protein structure](#)