Poster Presentation

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Characterizing proteins using SAXS on a multi-purpose laboratory X-ray diffractometer

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Small-angle X-ray scattering (SAXS) applied to protein solutions has become an accepted and rapidly growing structural biology technique [1]. Measurements can be done under native conditions, while varying concentration, pH, ionic strength or temperature. The data provide information about molecular weight, size, shape and stability of the biomolecules and ultimately allow for a low resolution molecular shape envelope reconstruction. The information is complementary to that obtained from XRD, NMR or cryo-EM. Although the setup for SAXS is easy in theory, it is in practice demanding with respect to the instrumentation and until recently it required dedicated, costly lab instruments or the usage of synchrotron beam lines, so the technique has not been readily available in the home laboratory.
We recently developed an economical solution that allows an easy configuring of a multi-purpose XRD platform (Empyrean with ScatterX78, PANalytical) for protein SAXS measurements. The Empyrean is widely used in labs for general material research and characterization. Here we will show how this general XRD platform can be configured for SAXS experiments and demonstrate the performance on a number of proteins.
[1] Trewhella, J. (2016). Curr. Opin. Struct. Biol., 40, 1- 7

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