

Small-Angle X-ray Scattering (SAXS): From Solutions to Imaging.

Small-angle X-ray scattering (SAXS) probes structures in the size-range of one to several hundred nanometers. Raster scanning a sample through a focused X-ray beam allows to record SAXS pattern spatially resolved. The information extracted from each scattering pattern can be used to construct images with different contrasts. Bragg peaks arising from characteristic distances in the sample, such as the repetition distance of myelin sheets in brain, provide a selective contrast for their density distribution. Besides density also orientation of ultrastructure can be retrieved from the SAXS pattern, for example the orientation of collagen fibrils in bone. The technique is mainly advantageous for hierarchical samples, since information about nanostructures can be obtained in macroscopic samples of several millimeter of even centimeters. The method can also be combined with computed tomography to study the inside of three-dimensional samples.

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