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Wide Angle and Small Angle X-ray Scattering for the structural characterization of fibers

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Over the years, there has been a growing interest in the development of nanofibrous structures with natural (collagen, silk fibroin, elastin, chitosan, alginate) and synthetic (polylactic acid - PLA, poly-lactic-co-glycolic acid - PLGA, polycaprolactone - PCL) polymers as fibrous structures. Thanks to tunable specific features linked to their nanostructure, the application of nanofibers in several fields has shown to be suitable for the solution of practical problems. Wide-Angle (WAXS) and Small-Angle (SAXS) X-ray Scattering are two techniques available at the MicroImaging Laboratory (XMI-Lab) of the Institute of Crystallography in Bari¹ equipped with by a table top high brilliance (synchrotron class) X-ray micro-source. Here, we report our work on natural polymeric fibers such as type I collagen^{2,3}, silk fibroin from *Bombix Mori*, cellulose⁴ but also on engineered fibers, such as peptide-based supramolecular architectures⁵.

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