

Structural Hierarchies in biological macromolecules.

Tim Wess Cardiff University

The emergent properties of many biological tissues collagen- cellulose – elastic assemblies- depend on the modulation of molecular properties and interface contacts over a range of lengthscales, SAXS is an optimal tool to define structural parameters at a variety of levels such as intermolecular distances, fibrillar size, interface properties and interfibrillar interference. The changes in these properties can also be observed in dynamic mechanical testing, and modulation by effects such as heat and chemical treatment. I will show how we have used SAXS on solid state ex planted samples of biomaterials to understand the interaction within intact tissues. We have also used solution SAXS to determine molecular shapes of molecular components of assemblies. Highlighted are studies go toward explaining 1) the molecular topology and structural hierarchies of collagen 2) the structural hierarchies of fibrillin a ubiquitous elastic protein of animals.