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Collagen fibril's plastic damage: the rope and tube duality (I)

Sunday 10 June 2018 14:00 (30 minutes)

Collagen is the protein building block of most mammalian tissues such as tendon, arteries, skin and bone. In its triple helical form, collagen assembles into fibrils with tensile properties comparable to the strongest man-made polymer materials. Structural characterization of collagen fibrils using X-ray scattering and electron microscopy led to a picture where long triple helices form a paracrystalline array with a distorted hexagonal radial packing, a slightly lower density of molecules in the fibril centre, and some moderate molecular tilt at the fibril surface. Here I will present some recent single collagen fibril mechanical testing experiments that highlight both their rope-like and tube-like nature. I will also discuss how this rope-tube duality may be modulated by intermolecular crosslinks.

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