

Imaging and Osmotic Characterization of Aggrecan Assemblies on Mica Surface, comparison against DNA.

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Aggrecan is a negatively charged bottlebrush-shaped proteoglycan in the extracellular matrix, with unique polyelectrolyte properties. Aggrecan-hyaluronic acid aggregates are responsible for the compressive resilience of articular cartilage. Unlike linear polyelectrolytes such as DNA, aggrecan is insensitive to the presence of multivalent counterions (e.g., calcium ions) and self-assembles into micro-gels in near-physiological salt solutions. These features are preserved by aggrecan adsorbed on mica surfaces. To probe both the nature of aggrecan assemblies in solution and their surface interactions, we image the aggrecan assemblies adsorbed on mica surface using Atomic Force Microscopy. The effect of counterion valence on the hydration-dehydration properties of the aggrecan assemblies will be discussed.