

NANORHEOLOGY OF HYALURONAN SOLUTIONS

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Abstract

Fluorescence correlation spectroscopy (FCS) represents one of the most sensitive fluorescence techniques due to single molecule detection. Microrheology serves as a tool to study viscoelastic properties of microenvironment of observed particles. Particle tracking (or video) microrheology has its limitations especially due to the size of the particles. FCS is able to observe single molecules or particles and FCS autocorrelation function can be transferred to mean square displacement (MSD) of the particle. We used 30 nm fluorescently labelled particles to observe the movement of the particles in hyaluronan solutions with different molecular weight and different concentrations. Newtonian fluids were used to check the accuracy of measurements. Calculated MSD corresponded to theoretical values so the FCS method and 30 nm particles could be used to determine viscoelastic properties of non-newtonian fluids. We determined MSD as a function of time in greater extent of time when compared to dynamic light scattering (DLS) method or particle tracking microrheology.

Keywords: Nanorheology, microrheology, fluorescence correlation spectroscopy

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