

Abstract Submitted  
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**Probe diffusion in polymer solutions and hydrogels using fluorescence correlation spectroscopy** ARIEL MICHELMAN-RIBEIRO, NIH / Boston University, HACENE BOUKARI, NIH, FERENC HORKAY, NIH, RALPH NOSSAL, NIH — We apply fluorescence correlation spectroscopy (FCS) to measure the diffusion of small fluorescent probes (TAMRA,  $M_w = 430$  Da; dextran,  $M_w = 10$  kDa) in poly(vinyl alcohol) (PVA) solutions and hydrogels. PVA is a linear, neutral, biocompatible polymer, whose hydrogels have many biotechnology applications, such as drug-delivery devices and tissue scaffolds. The FCS measurements indicate that the probe diffusion decreases when the polymer solution is cross-linked. Further, the more the polymer chains are cross-linked, the slower the particles diffuse. These results suggest that the cross-link density, which is often ignored in the analysis of probe diffusion data in gels, must be taken into account. Remarkably, we find that the apparent diffusion time and the elastic modulus of the gels show a linear correlation.

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