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Diffusion of molecular probes and proteins in hydrogels RICCARDO RACCIS, ROBERT ROSKAMP, ANNETTE BRUNSEN, BERNHARD MENGES, Max Planck Institute for Polymer Research, ULRICH JONAS, Max Planck Institute for Polymer Research; F.O.R.T.H. Institute of Electronic Structure and Laser Technology, WOLFGANG KNOLL, Austrian Research Centers, GEORGE FYTAS, Max Planck Institute for Polymer Research; F.O.R.T.H. Institute of Electronic Structure and Laser Technology — We employ fluorescence correlation spectroscopy to study the diffusion of molecular probes (Cy5) and dye-tagged proteins (Cy5-AntiMouse, hydrodynamic radius 10nm and Alexa488-Streptavidin, 4nm) in surface-attached poly-N-isopropylacrylamide (PNIPAAm) and dextran based hydrogel layers. The diffusion process depends on the crosslinking density and the presence of electrostatic and steric interactions. The protein penetration into the hydrogel layer occurs close to the isoelectric point but the local probe concentration and diffusion rate diminish with increasing penetration depth. Mesh size characterization of the hydrogels is inferred from the diffusivity and the concentration profile of fluorescent probes with different size, with the molecular free dye diffusing deeper into the gel.

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