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Probing convection and diffusion in macromolecular gels ENRICA DE ROSA, Universit degli studi di Napoli 'Federico II' - DIMP, PAOLO ANTONIO NETTI, Universit degli studi di Napoli 'Federico II' - DIMP — Transport of molecules within three-dimensional biological tissue occurs by both diffusion and convection. While diffusion is relatively well studied in the literature, there is a paucity of data on convection parameters, even if is the most effective transport mechanism for large molecules. Pressure-driven flow through complex macromolecular gels can provide different probe velocity depending on the diffusant molecule and matrix interaction and so far no specific measurements have been performed. Furthermore the complexity or heterogeneity of the system may cause differences with the position in the convection properties of the sample. In this study both diffusion coefficient and velocity of several fluorescent probes in macromolecular gels have been measured with a high spatial resolution ($100\mu\text{m}$). The macromolecular velocity has been evaluated by adopting the video-FRAP technique, through an algorithm to separate the fluorescence recovery due to the brownian motion and that due to a bulk convection. Combination of the two transport process is very relevant in tissue engineering and drug delivery application.

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