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New Hydrogels Based on Methacrylated Collagen and Hyaluronic Acid for Soft Tissue Engineering

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Polymeric hydrogels are soft and hydrophilic materials of great interest for the engineering of soft tissues, as mimicking structures of the extracellular matrix; because of their 3D architecture and biological properties constitute an adequate environment for cells function. Biopolymers like collagen and hyaluronic acid have a good biological response but the mechanical characteristics make necessary the crosslinking of the networks in order to build resistant and easily workable structures. The paper presents preparation of new hydrogels based on methacrylated collagen and methacrylated hyaluronic acid/ hyaluronic acid as natural-based networks with controlled morphology and biointeractivity. FTIR spectra confirmed the proposed structure and the scanning electron microscopy data indicated a porous morphology dependent of the ratio between polymers. The prepared hydrogels are highly swellable, bioadhesive and degradable by enzymes. In vitro cytotoxicity tests revealed a very good material response in contact with cells (fibroblasts).