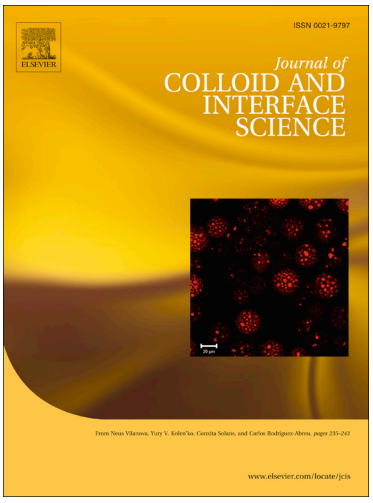

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Sealing hyaluronic acid microgels with oppositely-charged polypeptides: a simple strategy for packaging hydrophilic drugs with on-demand release

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ABSTRACT

A simple route to deliver on demand hydrosoluble molecules such as peptides, packaged in biocompatible and biodegradable microgels, is presented. Hyaluronic acid hydrogel particles with a controlled structure are prepared using a microfluidic approach. Their porosity and their rigidity can be tuned by changing the crosslinking density. These negatively-charged polyelectrolytes interact strongly with positively-charged linear peptides such as poly-L-lysine (PLL). Their interactions induce microgel deswelling and inhibit microgel enzymatic degradability by hyaluronidase. While small PLL penetrate the whole volume of the microgel, PLL larger than the mesh size of the network remain confined at its periphery. They make a complexed layer with reduced pore size, which insulates the microgel inner core from the