

Title: New biocompatible chitosan-based self-healing hydrogels for bio-applications

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Abstract

Interpenetrating polymer network (IPN) hydrogels are regarded as most promising materials due to the improved properties gained through the method of preparation. In this context, new semi-IPN structures based on poly(N,N-dimethylaminoethyl methacrylate) (PDMAEMA) and maleoyl-chitosan (MAC) were prepared by interpenetrating the crosslinked PDMAEMA chains between the water-soluble chitosan network. MAC is a chitosan derivative of great interest due to the excellent solubility in water, biocompatibility while being rich in reactive functional groups (-NH_2, -OH and -COOH). As a scaffolding material, the modified biopolymer has many drawbacks especially low mechanical integrity and uncontrollable biodegradation, limiting its utilization in various biomedical applications. Therefore, the aim of this investigation was to increase the stability of chitosan derivative structure by extending its practical applicability in the form of new hydrogel systems with self-healing capacity and native tissue-mimicking architecture which can sustain the cell-matrix interactions without losing their structural integrity. The characterization by spectroscopic, morphological, structural and rheological analyses demonstrated the formation of a highly porous network, which possesses controlled drug delivery and self-healing capacity, pH/thermo-responsiveness and biocompatibility for various bio-applications.

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Biography

Dr. Alina Gabriela Rusu has completed her PhD in Chemistry by "Gheorghe Asachi" Technical University in 2016 and in the present is working on her postdoctoral project at "Petru Poni" Institute of Macromolecular Chemistry. She has been involved in 2 research projects as research assistant, gaining experience in the field of preparation and characterization of nanoparticulate systems, and has published more than 14 papers in reputed journals.

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