SIMPLE PRODUCTION OF NANOBALLS OR NANOFIBERS MADE OF BIOCOMPATIBLE DERIVATIVES OF HYALURONIC ACID

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Abstract

Hyaluronic acid (HA) is a hydrophilic polysaccharide made of repeating units of N-acetyl-D-glucosamine and D-glucuronic acid and is very often used in medical applications. The use of this polysaccharide in such devices takes advantages of its well established biocompatibility and safety properties. However, unmodified HA is highly water soluble and clears rapidly from physiological environments prior to the critical wound healing process. Chemically modified HA will provide prolonged in vivo residence time and enhanced the biomaterial properties. Thus, novel derivatives of HA will be presented. These new derivatives were processed by electrospinning to prepare nanofibers or nanoballs. These derivatives carry reactive groups that can be cross-linked thereafter insoluble nanofibrous materials can be obtained. The preparation of various nanostructures depends on macromolecular interaction between HA and a second polymeric component used on the formulation. Using this technology, nanofibers or nanoballs of different diameter size averages could be obtained. Screening of different derivatives of chemically modified hyaluronic acid has been prepared in order to establish a correlation between degree of chemical modification and characteristics of the macromolecular structure. The properties of these nanofibrous materials are currently under investigation in order to find the best application of the materials made thereof.

Keywords: Biopolymers, hyaluronic acid, chemical modification

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