ABSTRACT

The current treatment of tissue injuries deal with numerous problems, such as limited healing capacity and immune response of the body. In many cases such obstacles does not allow a full regeneration of the injured tissues and the full resumption of its original features. Controlled delivery of growth factors has considerable importance for inducing wound healing for a wide range of defects. Biocompatible and biodegradable nanofibrous carriers prepared by electrospinning represent a universal platform for the delivery of a wide range of substances in regulated manner. The goal of this thesis is to create an overview and assessment of the nanofibrous systems for controlled drug release created by electrospinning with a focus on growth factors delivery. Nanofiber carrier offers a number of advantages, they are able to consistently deliver bioactive substance into the site of injury, maintain bioactivity of the substance and stimulate the adhesion, proliferation and differentiation of target cells. Compared to the classic methods of tissue engineering using tissue grafts with the risk of their immune rejection these funkcionalized biodegradable carriers offers the possibility to create cell-free carrier systems. The work is divided into 4 chapters concerning the methods of preparation of nanofibrous media, the regulation of their pharmacokinetic release profile and tissue engineering applications of nanofibers.

KEY WORDS: nanofiber scaffold, coaxial electrospinning, emulsion electrospinning, drug delivery, tissue engineering