

**Polymer nanofibers
produced by electrospinning
applied in regenerative medicine**

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Gliwice, 2015

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Polymeric nanofibers find use in a broad range of applications in various areas such as nano reinforcement and nanofluidics, medicine and pharmacy, tissue engineering etc. Nanofibers or microfibers produced by either of the techniques are used in tissue restoration, compact organs, construction of biocompatible prostheses, cosmetics, face masks, bone substitutes, artificial blood vessels, and valves; and drug delivery applications [3]. Scaffold materials produced from nanofibers offer a very large surface area that supports cell growth [2]. Polymers such as Polyglycolide (PGA), Polylactic Acid (PLA) In this work, biodegradable polymer nanofiber mats were produced by electrospinning polycaprolactone (PCL). The PCL, and PCL/ Hydroxyapatite (HA) scaffolds were characterized using Scanning [Show full abstract] Electron Microscope (SEM), Differential Scanning Calorimeter (DSC), and Fourier Transform Infrared Spectroscopy (FTIR). The application of tissue engineered constructs is an approach in regenerative therapies to support regeneration of damaged muscular tissue. Therefore the development of highly aligned electrospun scaffolds based on polycaprolactone (PCL) and collagen enables a versatile development towards tailor made applications. In this research, nanofibers are produced by fabricated electrospinning device in which pulsed system used in our work is distinct with other normal systems. This research is done by means of two steps.

Frenot A, Chronakis IS (2003) Polymer nanofibers assembled by electrospinning. *Curr. Opin.* Yang Y, Leong KW (2010) Nanoscale surfacing for regenerative medicine. *Wiley Interdisciplinary Rev: Nanomed Nanobiotechnol* 2: 478-495. Jayaraman K, Kotaki M, Zhang Y, Mo X, Ramakrishna S (2004) Recent advances in polymer nanofibers. Rogina A (2014) Electrospinning process: Versatile preparation method for biodegradable and natural polymers and biocomposite systems applied in tissue engineering and drug delivery. *Appl Surf Sci* 296: 221-230.