Electrospun Nano-and Microfibres for Biomedical Applications Conference

COST MP1206

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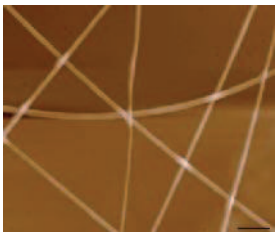
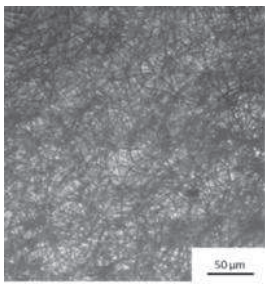
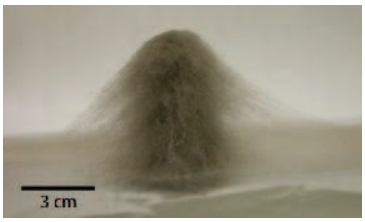
BOOK OF ABSTRACTS







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ELECTROSPINNING
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Electrospun micro and nanofibers applied for animal models in urology and wound dressing. Potential applications in cancer treatment.

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We used the principles of electrospinning to produce materials for applications in regenerative medicine of urinary bladder wall, ureter, wound dressing and potential applications in cancer therapy. Our research is based on biodegradable polymers produced by ring-opening polymerization. Scaffolds of poly(L-lactide-co-caprolactone) (PLCL) gradually degrade leaving no artificial material behind to be replaced by natural extracellular collagen matrix. We formed flat membranes of micro- and nanofibers to carry out regeneration of urinary bladder wall as animal model of cancer treatment. Grafts were tested for biocompatibility and aimed for guided cell growth, yet we were unsuccessful in mechanical compliance of nanomaterial and reconstructed tissue. We tested tubular scaffolds made of nanofibers aimed for ureter tissue engineering. We found stem cells seeding unnecessary. The results of nanomaterial implantation on animal model were better than for collagen matrices. Animal model was also tested for use of nanofibers of human serum albumin as wound dressing. The native structure of the protein was retained to maintain its anti-adhesive properties, despite poor mechanical characteristics. Nanomaterial caused no inflammation and was resorbed during 16 days. Last application of presented materials was targeted drug delivery system made of PLCL nanofibers. Release of anticancer drug complexed with nanoparticles is to be triggered by tumor cells. Such nanomaterial is potential drug delivery system.

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