ABSTRACT BOOK ABSTRACTS



MEDICAL THERAPIES AND PHARMACOLOGY

VERSATILE MULTIFUNCTIONAL NANOFIBERS FOR PSORIATIC SKIN PROTECTION AND THERAPY

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Introduction: For people with psoriasis protection of skin from the consequences of excessive exposure to sunlight ultraviolet radiation needs an efficient protective system. Metal oxide nanoparticles, like titanium dioxide, have been applied to textiles to bestow ultraviolet protection capability to them. Another possibility is to embed these nanoparticles to nanofibers. Such a nanofibrous mats have been already used in medicine also for their antibacterial properties, as a scaffold for regenerating cells, or for controlled drug release.

Objective: Our goal is to develop versatile multifunctional textile with ultraviolet protective properties by incorporating titanium dioxide and magnetite nanoparticles into nanofibrous structures using electrospinning and to investigate its properties, evaluate heating properties of these nanofibers in an alternating magnetic field, and to use nanofibers for controlled release of methotrexate and hydrocortisone, drugs commonly used in topical therapy of psoriasis.

Materials and Methods: All samples were electrospun from polyvinyl alcohol. The surface morphology of nanofibers was studied by using scanning electron microscopy. The UV blocking abilities of electrospun mat has been evaluated using UV-VIS spectrophotometer. Nanofibers were heated using alternating magnetic field. Controlled drug release was quantified spectrophotometrically.

Results: Fabricated nanofibrous mat with embedded nanoparticles show high transparency in visible range with excellent UV-protective performance. We have demonstrated that the application of alternating magnetic field via the heating of magnetite nanoparticles, induced release of hydrocortisone as well as methotrexate in a controllable manner.

Conclusions: The aim of the present work was to introduce novel approach for more effective control of psoriasis. Our findings indicate that electrospinning imparted multiple functions to the resulting textiles and therefore such materials may find far-reaching applications in the dermatology.





