

## عنوان مقاله:

Patterning the surface roughness of a nano fibrous scaffold for transdermal drug release

## محل انتشار:

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## خلاصه مقاله:

The main objective of this paper was to manipulate the Nano Fibrous Scaffold "NFS" surface roughness to achieve a new transdermal drug release profile. To assess the intrinsic mechanical properties of Nylon 6 or polycaprolactam, such as its proper resiliency, it was considered as the matrix. Cetirizine was used as a drug model and was loaded (1% w/v) to polymer solution (3% w/v) before spinning. Two polymeric meshes with different orifices in size and geometry were used to induce roughness on the surface of two collecting NFS during the electrospinning process. They were placed in line of conventional electrospinning, here after called "Mesh Electrospinning" and hereby, two roughened NFS were fabricated: Pentagonal templated nanofibrous scaffold (PeTNFS) and tetragonal nanofibrous scaffold (TeTNFS) beside ordinary NFS (ONFS). The kinetic of drug release was compared with known models and the release of cetirizine from these new drug delivery systems was done by UV-VIS spectroscopy and its in-vitro release profile was measured using Franz cell diffusion system. Release profiles from NFS were compared with a commercially available drug delivery system. To assess the simulation of NFS effect on the skin, NFS was placed on layer of dialysis film, and after three hours, the morphology was investigated using SEM. PeTNFS sample showed the greatest trend of drug release and it was about 20% more than un-roughened NFS. The best fit for drug release kinetic of NFS and TeTNFS samples were Higuchi model but it obeyed first order model for PeTNFS sample. The obtained NFS showed high potential for transdermal drug release.

## کلمات کلیدی:

Drug release, Franz cell diffusion, In-vitro, Mesh electrospinning, Transdermal

