

A review on current trends and future prospectives of electrospun biopolymeric nanofibers for biomedical applications

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ABSTRACT

Electrospinning (ES) is considered the most advanced and robust method to make nanoscale materials named nanofibers (NFs) using various polymers. However, due to the hazardous and toxic nature of petroleum based polymers, the trend has shifted toward biopolymers. Conventional techniques to fabricate NFs are nonreproducible, require tedious procedures, and most incorporate toxicity to the final product. ES gained tremendous momentum as it is a crucial solution to the drawbacks of conventional methods. In recent years much prepondering research and review work has been done on ES applications. However, the present paper does not cliché the routine reporting format by review papers in recent years. Instead, it highlights the ignored significant parameters especially solvent related in current research responsible for underutilizing ES and new innovative ES methods. The current review signifies ES's crucial necessity for biomedical applications compared to conventional methods with similar biocomposites. A systematic review of the literature was done to correlate those parameters with the present work to find the gap in the existing literature. The present review is significant in providing a helpful tool to improve further the properties of the NFs biocomposites by ES methods. Significant missing correlations were identified, which, if considered in the future, can drastically improve the future of ES applications.

KEYWORDS

Biopolymers; Electrospinning; Nanofibers; Nanocomposites; Smart polymers

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