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Advances in Three-Dimensional Nanofibrous Macrostructures *via* Electrospinning

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Abstract: Compared with other nanofiber fabrication processes, electrospinning is versatile and superior in production and construction of ordered or more complex nanofibrous assemblies. Besides traditional two-dimensional (2D) nanofibrous structures, electrospinning is powerful in fabrication of three-dimensional (3D) fibrous macrostructures, especially for tissue engineering applications. This article summarizes and reviews recent advances in various promising and cutting-edge electrospinning techniques, including multilayering electrospinning, post-processing after electrospinning, liquid-assisted collection, template-assisted collection, porogen-added electrospinning, and self-assembly. And their formation mechanisms, features, and the challenges of electrospinning have also been discussed. Furthermore, these 3D nanofibrous macrostructures have been demonstrated to have potential applications in tissue engineering, energy harvesting and storage, and filtration.

Keywords Electrospinning; 3D nanofibrous macrostructures; Tissue engineering; Energy harvesting and storage; Filtration

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