Title: Recent progress in polymeric ultrafine fibrous scaffolds for enabling cell infiltration in tissue engineering

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Abastact: The structural features of polymer-based tissue engineering scaffolds engineered to support cell adhesion, proliferation, and differentiation have been consistently and assiduously studied over the past few decades. It is now well known that scaffolds composed of polymers with ultrafine fibrous morphologies produced via electrospinning and integrated porosity, can positively influence cell response. The primary objective of most studies in tissue engineering scaffold development is to create a scaffold that emulates the native in vivo-like environment of extracellular matrices (ECMs). Achieving an even distribution of cells throughout the scaffold is critical for exactly mimicking the native extracellular matrix environment. However, inadequate cell infiltration towards the center of the scaffolds has been a common issue in many studies. Only a limited subset of researchers has successfully identified the structural features of scaffolds that facilitate cell penetration and has consequently introduced innovative scaffolds. This study aims to identify the critical structural features of polymeric scaffolds that facilitate cell infiltration and presents novel ultrafine fibrous scaffolds engineered to enhance uniform cellular penetration.

Keywords: extracellular matrix, electrospinning, phase separation, nanofiber, microfiber, pore size

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