Fabrication of 3-dimesional physically enhanced electrospun scaffolds

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Electrospinning is a unique technology that can produce non-woven fibrous products. Ordinary electrospun 2-dimensional sheet-like scaffold structure is used in various tissue engineering area requires biomimetic support for tissue regeneration. But conventional 2-dimensional inflexible scaffolds have a structural limitation which is not suitable for mimicking extracellular matrix (ECM). Thus, there has been a lot of tries to make 3-dimesional electrospun scaffolds. In our previous study, 3-dimensional 'clay-like' scaffolds were fabricated by core-shell electrospinning. Polystyrene (PS) and poly(ε-caprolactone) (PCL) were used in this method and the structure which consists of pure PCL fiber was obtained by selective leaching. Existing fluffy system is deficient in mechanical strength and cell attachment so it is necessary to complement these characteristics. In this study, dopamine polymerization is used to create physically enhanced fluffy scaffold. The fibrous scaffold structure is held to polymerized dopamine and becomes reinforced constitution. To fabricate mechanically enhanced 3-dimensional electrospun scaffolds will promote to variety of soft tissue engineering applications.