Production of Graphene Reinforced Polymeric Tissue Scaffolds for Neural Tissue Engineering

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Neurodegenerative diseases increase with aging populations in the world and have started to become a major social problem [1]. In recent years, developments in nanotechnology has led to new hope with desirable effects on biological structures. In the 21. Century, graphene is called as a miraculous material and its importance increasing due to the superior electrical characteristics for nerve tissue engineering near ability of promoting adhesion, proliferation, and differentiation of cell cultures. Particularly high electrical conductivity has a key role in the transmission of neural signal processing. Graphene's easily processable capacity provides forming of composite materials in different forms. While graphene presents high surface area / volume ratio with its two-dimensional (2D) structure; with the characteristics like biocompatibility, non-toxicity and being bioinert began to take place at the focus of tissue engineering [2,3].

In this study graphene was chosen as one of scaffold material to improve the biological properties of scaffold materials. Electrospinning from graphene reinforced poly ε-caprolactone (PCL) was used for polymeric scaffolds production and stem cells from different sources were cultivated on those scaffolds. Goal of this study, investigate how the addition of graphene into polycaprolactone (PCL) nanofibrous scaffolds effects stem cells on the way of neural differentiation following with viability, expression of phenotype and characteristic proteins.

References

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