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Drug Eluting Electrospun Nanofibrous Scaffolds for Controlled Drug Delivery and Tissue Regeneration

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Electrospun nanofibers are distinguished by the unique properties they possess. These include high surface area & aspect ratio, high porosity volume, and consequently high encapsulation efficiency. Moreover, their features in terms of structural, morphological, compositional and physicochemical properties could be manipulated and controlled their fabrication procedures. Interestingly, electrospun nanofibers could be fabricated using biodegradable and biocompatible FDA approved polymeric based materials that could be formulated easily through electrospinning, a facile, cost-effective and eco-friendly technique. Additionally, the electrospun have good capability for modifications according to the targeted application. Therefore, nanofibers have proven their efficiency as promising nanobiomaterials in various biomedical applications such as drug delivery, tissue engineering, wound healing, bio-sensing, etc. Furthermore, swellability of nanofibers could be tailored to control the release of incorporated drugs, growth factors, etc. Hence, nanofibers have widely attracted the attention of many researchers be used as implantable controlled release drug eluting system in drug delivery and regenerative medicine. The drug loaded nanofibrous matrices can be inserted at

the targeted site to deliver the incorporated cargos locally at specific times. This minimizes the risk of adverse effects of absorbed drugs into the systemic circulation. Finally, the nanofibers are bio-degraded and eliminated safely out of the human body without the need of any surgical removal operation. This is attributed to the biodegradable properties of the materials used in the fabrication process of the nanofibers.

Speaker Biography

Isra H. Ali has completed her PhD in Nanoscience on 2020 from Zewail City of Science and Technology, a research-based institute in Egypt founded by the former Nobel Laureate professor Ahmed Zewail. She got her MSc in Nanotechnology from the American University in Cairo on 2014. She joined Faculty of Pharmacy, University of Sadat City just after her PhD graduation. She is also a postdoc at Biomedical Polymer Nanocomposites, Hydrogels, and Tissue Engineering Group, Chemistry department, The American University in Cairo. She contributed and co-authored more than 10 research articles, review articles and book chapters focusing on developing smart nanobiomaterials for drug delivery and tissue engineering. She also has participated in filing two UK patents emerging from her PhD thesis. She has presented her work in several international and national conference and competitions, where she got first place. She has an h-index 6 with more than 80 citations.

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