

## **Polymeric Electrospun Fibrous Mats Enriched With Insulin and Insulin Loaded Ethosomes for the Treatment of Diabetic Foot Ulcer**

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This study is meant to design a novel system for the treatment of diabetic ulcer. The prepared system took advantages of insulin as a localized gold standard healing therapeutic. The main aim of the presented work is to design an effective topical dual mechanistic treatment for diabetic foot ulcer through designing and preparing insulin-ethosomes-loaded electrospun fibrous mats as a sustained and efficient platform of therapy. The biodegradable electrospun mat would serve as an ideal matrix for the handling and administration of the designed system. The designed system is composed of flexible ethosomal vesicles loaded with insulin for local treatment of foot ulcer. The prepared system offered controlled rate and profile of insulin releases through duals mechanism; first; the system benefited from the excellent reported flexibility of ethosomal vesicles to pass deep along skin layers allowing gradual drug release in all affected layers and second, the fibrous mat served as an efficient and accurate mode of applying the drug carrier system and providing a new generation of the wound dressing materials which was able to alleviate much of the painful repetitive procedures of frequent changes of dressing materials. The designed system was tested in vivo on experimental animals after inducing skin wounds.

### **Recent Publications:**

1. Gina S. El-Feky, Samar S. Sharaf, Amira El Shafei, Aisha A. Hegazy. Using chitosan nanoparticles as drug carriers for the development of a silver sulfadiazine wound dressing. *Carbohydrate Polymers*. 2017; 158: 11-19.
2. Gina S. El-Feky, Sally T. El-Banna, G.S. El-Bahy, E.M. Abdelrazek, Mustafa Kamal. Alginate coated chitosan nanogel for the controlled topical delivery of Silver sulfadiazine. *Carbohydrate Polymers*. 2017; 177: 194-202.
3. Gina S. El-Feky, Rania Farouk Abdulmaguid, Gamal M. Zayed, Rabab Kamel. Mucosal co-delivery of ketorolac and lidocaine using polymeric wafers for dental application. *Drug Delivery*. 2018; 25:1, 35-42.
4. Gina S. El-Feky, Gamal M. Zayed, Yaseen A. M. M. ElShaier, Fahd M. Alsharif. Chitosan-gelatin hydrogel crosslinked with oxidized sucrose for the ocular delivery of timolol maleate. *Journal of Pharmaceutical Sciences*. 2018; <https://doi.org/10.1016/j.xphs.2018.08.015>.
5. Gina S. El-Feky, Mona M. El-Naa, Azza A. Mahmoud. Flexible Nano-sized Lipid Vesicles for the Transdermal Delivery of Colchicine; In Vitro and In Vivo Investigation. *Journal of Drug Delivery Science and Technology*. Volume 49, February 2019, Pages 24-34.