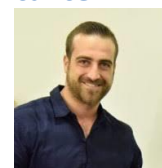


Hybrid polymeric-liposomal matrix as a local delivery system for oral cancer



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Abstract:

Oral cancer is the sixth most prevalent cancer worldwide. Specifically, squamous cell carcinoma (SCC) accounts for over 90% of all head and neck cancers, and the overall survival rates are only 40–50%. Over the past decade incidences of oral cancers have risen by 35%, with limited treatment modalities. Administering anti-cancer agents in close proximity to the cancerous lesion has proven clinically effective when dealing with head and neck tumors. To date, no drug delivery system for the controlled administration of anti-cancer agents to the oral cavity exists in the clinic. Herein we propose a new type of hybrid system, composed of bio-adhesive polymeric matrixes (alginate) that harbor drug-loaded lipid nanoparticles. The polymeric matrix is engineered to adhere to the oral mucosa for the duration of the drug release, and the nanoparticles (liposomes) are designed to penetrate the tissue and release different therapeutic agents (chemotherapy/ proteins).

Our system successfully reduced tumor size by more than 50%. Additionally, we demonstrate the liposomes' potential to act as theranostic agents by encapsulating the contrast agent, Gadolinium. This dual potential of the fabricated liposomes paves the way for therapeutic as well as diagnostic modalities for early detection and treatment of oral cancer.

Biography

Mohammed received his B.Sc in Pharmaceutical Engineering from Azrieli – College of Engineering, Jerusalem, Israel (2014), and his MSc in Medicinal Chemistry from the Hebrew University, Jerusalem, Israel (2017). He is co-author of two

papers from his MSc studies. His doctoral research is multi-disciplinary, at the interface of nanotechnology, engineering and medicine. Specifically, Mohammed is devoting his efforts towards developing a new approach for treating metastatic Oral Cancer with nanotechnology.

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