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Controlled release of steroids utilizing drug-eluting endotracheal tube**Aiman Abu Ammar^{1,2} Maayan Gruber^{3,4} and Eyal Zussman²**¹Azrieli College of Engineering Jerusalem, Israel²Technion – Israel Institute of Technology, Israel³Galilee Medical Center, Israel⁴Bar-Ilan University, Israel

Intubation-related morbidity is a common complication that usually involves the larynx and trachea, leading to local irritation, inflammation, and edema. Such complication is secondary to airway mucosal damage due to the use of an endo-tracheal tube (ETT), which produces local pressure and a pressure-like ulcer. The common clinical approach to manage airway mucosal damage is systemic administration of steroids hours to days prior to extubation, however, such treatment is inadequate, and some patients will need to undergo tracheostomy. Herein, steroid-eluting ETT for local treatment was developed for the purpose of improving drug efficiency and avoiding systemic steroid related side effects. Electrospinning technique was utilized to coat ETTs and produce a microscale layer of poly (lactic-co-glycolic acid) (PLGA) nanofibers loaded with Mometasone Furoate (MF). The novel delivery system was fully characterized, by means of drug loading, morphology, and mechanical stability of fiber mats. Moreover, in vitro release study demonstrated controlled release of MF over 14 days. The MF-coated ETTs exhibited superior therapeutic response compared to blank ETTs using an in vivo rat model, in terms of reduced laryngeal mucosal thickness and submucosal laryngeal edema. Taken together, steroid-loaded ETT is a novel approach allows for local drug delivery in a controlled manner, for improved treatment of intubation-related morbidity.

Biography

Aiman Abu Ammar is a Faculty Member in the Department of Pharmaceutical Engineering at Azrieli College of Engineering, Israel. He has completed his Pharmacy studies, MSc in Medicinal Chemistry, and PhD in Pharmaceutical Sciences at The Hebrew University of Jerusalem. He has joined Nanoengineering Group at Technion, as Senior Scientist. He is a licensed Pharmacist and has research experience in nano-drug delivery systems for the treatment of solid tumors and performs multi-disciplinary research with a focus on development of localized drug delivery systems using nanotechnology. He is a Co-inventor of 1 patent in this field.

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