

## Chemically Modified Electrospun Chitosan Membranes as Implantable Devices for Controlled Drug Delivery

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### Abstract :

The study aims to investigate a new chemically (fatty acid) modified electrospun chitosan membranes (ESCM) for the local and controlled delivery of simvastatin, as an alternative to BMP-2 for stimulating bone formation. The modified membranes were characterized using scanning electron microscopy, attenuated total reflectance Fourier transform infrared spectroscopy, and examined the loading and release profiles of simvastatin from the modified ESCM. Further, the release and effect of simvastatin from ESCM on osteoblastic cells in in-vitro was assessed. Results showed that as the fatty acid chain length increased from two to six methylene groups, the hydrophobicity of the membranes increased. The long-chain ESCM released  $40 \pm 1.5\%$  for extended periods of up to 90 days of simvastatin in comparison to short-chain fatty acid modified. Cell studies showed that SMV from 100 to 400 ng/ml range possessed osteogenic potential in a dose-dependent manner. We anticipate performing and evaluating bone formation in rodent calvarial defects to assess the clinical efficacy of the developed ESCM.

### Biography:

Mallesh Kurakula is currently a Research Scientist working on an NIH project at the Biomedical Engineering department at the University of Memphis, TN, USA, and also a Consultant for Triad Life Sciences®, TN, industry for innovative projects. His area of expertise includes advanced drug delivery, medical devices, and gene delivery. He is from a multidisciplinary background having a Ph.D. in Chemistry (2015), Masters in Pharmaceutics (2011), and Bachelor in Pharmacy (2009). Earlier he worked on “Fabrication and Evaluation of Polymeric Nanoscaffolds as Implantable Medical Device in Spinal Cord Injuries” as a postdoctoral researcher at the University of Bologna, Italy (2016-18) and on “Use of Lipid Nanoparticles for Effective Delivery of siRNA against Chikungunya Virus” as a research associate at CSIR-Indian Institute of chemical technology (IICT), India (2018-19). To date, he has published research (22), reviews papers (07), book chapters (06) in high-impact factor ISI indexed journals. He has even disseminated research in international arenas conducted across the United States, Europe & Middle East. Based on his international recognition in the area of expertise, he is serving as an Editorial board member, Review Editor, Guest Editor for book / special issues, and a peer reviewer in reputed journals, from different publishers such as Elsevier, Springer, MDPI, Frontiers, Bentham sciences. He has been a faculty judge panel member for research projects and abstract reviewer for OrDD session, Controlled release society (CRS) 2020, annual meeting at Vegas (July 2020).

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