

# NUMERICAL MODELING OF DIFFUSION IN POLY(LACTIC-CO-GLYCOLIC ACID) CONSISTED OF DRUG-LOADED EMULSION ELECTROSPUN NANOFIBERS

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## ABSTRACT

Achieving enhanced therapeutic effect using drug delivery systems has been goal of many authors in the past. Among these drug-delivery systems, electrospun nanofiber mats are promising as drug carriers which offer site-specific delivery of drugs to the target in human body and may be used for wound healing and cancer therapy[1-3]. Motivation for this work came from a need for efficient computational models for drug transport in complex polymer implants consisted of PLGA drug-loaded emulsion electrospun nanofibers. The authors have formulated a simple 1D radial finite element for drug release from drug loaded fibers, where 1D radial element is used to model diffusion in belonging fiber segment. Numerical model includes hydrophobicity effects at fibers surface into account. Polymer nanofibers also act as a barrier for particle transport, where surface interaction of polymer fibers are calculated using molecular dynamic simulations. For the purpose of experimental investigation, corresponding PLGA implant has been created at Faculty of Technology and Metallurgy. Numerical model serves as efficient tool for describing transport phenomena inside polymer fiber and surrounding porous media, and for the implant structure optimization.

## References

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