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Effects of Implant Separator Structure on Drug Delivery to the Posterior Eye.[1] SEYEDALIREZA ABOOTORABI, Indiana University-Purdue University Indianapolis, ABHI TRIPATHI, LILIAN DAVILA, University of California, Merced, HUIDAN YU, Indiana University-Purdue University, Indianapolis — The prevalence of visual impairment and blindness attracts attentions to develop new types of implant for drug delivery that can reduce drug administration doses and regulate drug release rates. We use Comsol Multiphysics to simulate drug transport from a hydrogel implant behind the sclera layer to the posterior eye. The focus is on the time evolutions of the drug concentration in the sclera, choroid, and retina layers respectively. The computational domain and dimensions are from a prior study (Kavousanakis *et al*. 2014). The governing equations are coupled between incompressible Darcy's law for flow and diffusion-advection for concentration. Drug delivery from the hydrogel implant directly agrees with open data. A new polymeric implant, containing several compartments defined by porous separators, is then introduced between the hydrogel and sclera to regulate the drug delivery rate. It is found that the peak concentration appears at approximately the same time but with much larger magnitude with no separator vs. with zero blockage separator. When the blockage widths in the separator is increased, the peak concentration appears in later time and smaller value. Such a new implant seems to be a plausible alternative to the drug delivery implants available to date in the market.

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