

FLUOCINOLONE ACETONIDE LOADED BIODEGRADABLE POLYMER BASED NANOPARTICLES FOR MANAGEMENT OF DIABETIC MACULAR EDEMA

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Abstract:

Diabetic macular edema (DME) is a prevalent complication of diabetic retinopathy and a leading cause of preventable vision loss. Its pathology involves the breakdown of retinal barriers, leading to hypoxia, and macular edema. Pro-inflammatory cytokines, alongside altered expression of neurotrophic factors and increased VEGF and HIF-1 α expression, exacerbating vascular dysfunction and endothelial injury. Conventional treatments, involving repeated intravitreal injections, pose risks like infections, haemorrhage, and retinal detachment.

The study explores the use of biodegradable polymer nanoparticles to deliver fluocinolone acetonide to retinal pigment epithelium and retinal microglia, aiming to manage DME. The project involves screening the prepared nanoparticles for cellular uptake and evaluating their efficacy in regulating pro-inflammatory cytokines, angiogenic, and neurotrophic factors in retinal pigment epithelial and microglial cells.

This work aims to address the gap in understanding the interrelationships between pro-inflammatory cytokines, angiogenic factors, and neurotrophic factors in DME pathology and treatment. The outcomes hold the potential for a therapeutic approach leveraging biodegradable nanoparticles for drug delivery to mitigate DME.