

Nano-formulations for Sustained Intraocular Drug Delivery

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Technology description

Diseases of the front of the eye such as glaucoma, ocular inflammations (e.g. conjunctivitis), post-cataract surgery inflammation, dry eye and choroidal neovascularization are leading causes of visual impairment and ocular discomfort. In order to manage these diseases patients are currently prescribed to take several topical eye drops per day and for many weeks or months and in some instances throughout their life. The need for frequent administration of eye drops is due to the unique structure of the eye and presence of multiple physiological barriers of the eye, These barriers only allow less than 5% of total drug administered, therefore, frequent eye drops are necessary. However, frequent administration of medication causes significant ocular toxicity, limited therapeutic efficacy, excessive waste of costly drugs, poor patients compliance and poor adherence to therapy.

To overcome these issues, we intend to develop and evaluate a novel long-acting drug delivery system. The method uses biodegradable, "nanoformulations" (polymeric nanoparticles) laden with drug molecules that can maintain steady levels of drug over a period of a week to three months following single administration. The active nano particles are targeted to treat a range of front of the eye diseases (e.g. glaucoma) which will address a substantial void in ocular therapeutics and provide significant benefits over current therapies.

Application area

This novel technology will offer greatly enhanced clinical benefits to patients and the healthcare industries, as well as reducing treatment costs. Additionally, this technology could also be applied in other sustained release applications in humans (e.g. vaccine delivery, coating medical devices), in veterinary and in cosmeceutical applications thereby increasing its commercial value.

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