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Development of triamcionolone based lipid nanocapsules as platforms for ocular drug delivery

Submitted by Laurent Lemaire on Thu, 01/21/2016 - 11:24

Titre	Development of triamcionolone based lipid nanocapsules as platforms for ocular drug delivery
Type de publication	Communication
Type	Communication avec actes dans un congrès
Année	2015
Langue	Anglais
Date du colloque	03-07/05/2015
Titre du colloque	Annual Meeting of the Association-for-Research-in-Vision-and-Ophthalmology (ARVO)
Titre des actes ou de la revue	Investigative Ophtalmology & Visual Science
Numéro	56
Volume	7
Pagination	4152
Auteur	Formica, Maria Lina [1], Ullio Gamboa, Gabriela Veroniva [2], Benoît, Jean-Pierre [3], Allemandi, Daniel [4], Luna Pinto, José D [5], Palma, Santiago Daniel [6]
Pays	Etats-Unis
Editeur	Association for Research in Vision and Ophthalmology
Ville	Denver
ISBN	1552-5783

Résumé en anglais	Purpose Triamcinolone acetonide (TAA) is considered a first-line drug by itself or as a combined treatment of several intraocular diseases such as macular edema, retinal vein thrombosis, uveitis and age-related macular degeneration. The development of TAA dosage forms is limited due to its poor solubility in water and physiologically acceptable solvents. Lipid nanocapsules (LNCs) are biocompatible systems that allow loading both hydrophobic and hydrophilic drugs. LNCs present a versatile composition and application suitable for different routes of administration. The aim of this work was to develop and characterize a novel lipid LNCs formulation containing TAA as drug delivery system. Methods LNCs were prepared in triplicate using an optimized phase inversion-based method described by Heurtault et al., 2002. Due to the poor solubility of TAA in the oily phase of the original formulation, two co-surfactants (captex® 500p -Glyceryl triacetate and oleic acid) in three proportions (20, 30 and 50%) were tested. The average particle size (APS), polydispersity index (PI), zeta potential (ZP) and entrapment efficacy (EE) were measured. Results Acceptable results were obtained with a 20% of both co-surfactants. LNCs with captex® 500p leads to about (40±1) nm size nanoparticles with a narrow size distribution (PI less than 0.2), a negative ZP (-1.2±0.7) mV and EE (85.8±0.8) % while LNCs with oleic acid showed an APS of (35.9± 0.6) nm and a PI below 0.1 with a negative ZP (-3.6±0.6) mV and EE (87±2) %. Moreover, both systems were stable for two months. Conclusions LNCs allow encapsulation of TAA and their properties remain constant over long periods of time. Thus, LNCs are promising systems than may be a potential strategy to improve efficacy and decrease side effects of this drug so used in the treatment of intraocular diseases.
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