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Fluorometholone loaded nanospheres PLGA for the treatment of ocular disorders

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Fluorometholone (FMT) is a drug that is used in ophthalmology for inflammatory and allergic processes. However, commercials formulations have low residence time in the corneal area, obtaining no-effective therapeutic levels. The purpose of this study was to developed poly(lactic-co-glycolic-acid) (PLGA)-Nanospheres (NSs) loaded with FMT in order to increase the ocular bioavailability of FMT. The NSs were prepared by the solvent displacement method using poloxamer 188 as surfactant and acetone as organic solvent. To optimize and to investigate the correlation between independent variables (such as the pH of aqueous phase, concentrations of poloxamer 188 and of the FMT) and the dependent variables (average particle size (Zav), polydispersity index (PI), zeta potential (ZP) and Encapsulation Efficiency (EE)) previously a factorial design was applied. At the same time, the Zav of NSs was checked by Transmission Electronic Microscopy (TEM). X-ray diffraction, infrared spectroscopy and differential scanning calorimetry were applied to evaluate interaction drug-polymer. Following this, the biopharmaceutical behavior (release *in vitro*) and the ex vivo ocular permeation of optimized formulation was studied using Franz cells. The interaction studies showed that there is no link formation between the drug and the other components of the nanostructured system. Also, the optimized formulation selected by factorial design showed a good stability which it was measured by Turbiscan®. The NSs evidenced a slow and prolonged profile release and a better bioavailability than commercial formulations. According to the above described, this developed nanostructured system of prolonged release could be used for the treatment of inflammatory and allergic ophthalmic disorders.

Biography

Roberto González Pizarro has completed his studies at University of Valparaiso (Chile) with a thesis on validation of the process of fabrication of tablets in a pharmaceutical laboratory. After his studies, he started to work at the National Agency of Medicines in Chile for 2 years as Inspector of validation of the pharmaceutical processes. Subsequently, he completed his Post-graduate course on Research, Development and Control of Drugs at Barcelona. Currently, he is doing his PhD at University of Barcelona. His PhD project is about the development and characterization of nanostructured systems.

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