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Encapsulation of agonist PPAR-γ in polymeric nanoparticles to treat ocular inflammatory processes

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Peroxisome Proliferator-Activated Receptor Gamma (PPAR-γ) is a member of the nuclear receptor superfamily of ligand-dependent transcription factors. PPAR has been shown in numerous studies to affect the expression of pro-inflammatory cytokines. Pioglitazone (PGZ), a PPAR-γ agonist used to treat type-2 diabetes, has been reported to have responses in different inflammatory processes. The purpose of this study was the association of PGZ to poly(D,L-lactide-co-glycolide) poly(ethylene glycol) (PLGA-PEG) nanoparticles (NPs), for the treatment of ocular inflammatory disorders. NPs of PGZ were prepared by solvent displacement technique. Previously, a factorial design was carried out to determine the influence of independents variables studied. Physicochemical characterization, biopharmaceutical behavior and interaction drug-polymer studies were done. To evaluate ocular tolerance of the developed formulation, HET CAM and DRAIZE test were performed. In order to analyze the effectiveness of these systems, *in vivo* studies were executed in rabbits (male/n=6 per group), before and after induction of ocular inflammation by Sodium Arachidonate (SA). Results obtained demonstrated an adequate size of NPs for ocular administration with a sustainable releasing profile. The interaction studies of NPs-PGZ showed that within the formulation the drug remains linked to the polymer. Regarding effectiveness, it was found that these systems decrease the level of inflammation in rabbit eyes with an optimum ocular tolerance. In conclusion, PGZ-NPs showed to be suitable systems to possible treatment of inflammatory ocular diseases.

Biography

Marcelle Silva de Abreu is currently a PhD student at the University of Barcelona, Faculty of Pharmacy and Food Sciences. She has a Master's degree in Research, Development and Control of the Drugs. Her research is centered in the field of nanoscience and nanotechnology in the area of nanostructured drug delivery systems.

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