HYBRID NANOPARTICLES (HNP) PREPARATION BY PGSS® - A DERMATOLOGICAL FORMULATION FOR AN ANTIBACTERIAL COMPOUND

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Abstract

This work aimed the preparation (via supercritical fluid technology) of hybrid nanoparticles (HNP) loaded with Triclosan, for application in dermatological antimicrobial formulations.

Hybrid drug delivery systems are considered an attractive alternative to conventional systems since they allow taking advantage of distinct functional properties of the components and overcome limitations related with inefficient pharmacokinetic, and bioavailability.[1,2] The hybrid system selected comprises triacetyl-β-cyclodextrin for a sustained release of the active substance and two lipid carriers namely GMS and cutin, which favors a topical administration. Triclosan, one of the most common active ingredients in personal care products was used in this study as a model antibacterial compound.

Particles were produced by PGSS® (Particles from Gas Saturated Solutions) using different drug/cyclodextrin/lipid ratios and operating conditions in order to optimize the process. Loaded HPN produced by this method were analysed by Differential Scanning Calorimetry (DSC), Scanning Electronic Microscopy (SEM), Transmission Electron Microscopy (TEM), Laser Diffraction Spectrometry (LDS) and by HPLC UV/VIS with diode array. Furthermore, antimicrobial activity was tested in-vitro, against three different gram-positive bacteria (staphylococcus aureus, staphylococcus epidermis and corynebacterium xerosis) usually present in human skin flora and responsible for body odors.

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