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Title: Development and validation of a high-performance liquid chromatography assay for posaconazole nanoparticles

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The development and optimization of a poly (D, Llactide-co-glycolide) (PLGA) polymer encapsulating the weakly watery antifungal pharmaceutical posaconazole (PSZ) to develop a formulation for the treatment of fungal diseases. An emulsification procedure for oil / water (o / w) was used to make PLGA nanoparticles loaded with posaconazole. Different analytical approaches were used to characterize the optimal formulation of PLGA nanoparticles loaded with PSZ. The average particle size and size distribution, as well as the surface zeta potential, were determined using laser light scattering. The current study devised a high-performance liquid chromatographic (HPLC) method for determining PSZ in nanoparticles and drug release profiles. The inclusion of nanoparticle components had no effect on the outcomes of the analysis. With a relative standard deviation (RSD) of less than 3%, the method demonstrated appropriate precision. When a standard pharmaceutical was added to the mix, the accuracy was tested, and satisfactory recovery values were obtained for all the drug concentrations employed. The HPLC method established in this study had good precision and accuracy, as well as specificity and selectivity in the operating range. In vitro drug release was biphasic, with an early burst followed by a gradual and persistent release lasting up to 15 days. The analytical process is dependable and provides benefits in terms of speed and reagent cost. PSZ could be released for a long time using the newly designed optimal formulation nanoparticles. FAPDF, CNPq, FINATEC and CAPES supported this project.

Biography

Anderson de Jesus Gomes is a was born in Araguari, Minas Gerais, Brazil. He received the B.S. degree in Chemistry from the Federal University of Uberlândia (UFU), Uberlândia, Minas Gerais, Brazil, in 1995, and the MSc. and Ph.D. degrees in Chemistry from the University of São Paulo (USP) Ribeirão Preto, São Paulo, Brazil, in 1998 and 2003, respectively. In 2005 he held his first post-doctorate at UFU evaluating the cytotoxic and phototoxic action of psoralen derivatives on melanoma tumor cells when encapsulated in polymeric nanoparticles. Between 2006 and 2008 he held his second post-doctorate at USP performing the synthesis of ruthenium nitrosyl complexes for the controlled release of nitric oxide (NO) and in a later work he developed methods for the encapsulation of such complexes in several types of matrices evaluating its action on tumor cells. Between 2013 and 2014 he worked as a visiting professor in the Department of Biomedical Engineering at Columbia University in NY USA, producing delivery systems with theranostics characteristics for the evaluation of drug biodistribution in vivo. In 2008, he joined the University of Brasília, as an Assistant Professor, and in 2015 became an Associated Professor. His current research interests include production and optimization of drug delivery systems, production of theranostics systems, synthesis of bioinorganic molecules, and photodegradation of drugs and environmental waste.