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Development and evaluation of lipid-polymer hybrid systems for the treatment of benign prostate hyperplasia

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Benign Prostate Hyperplasia (BPH) is a progressive-proliferative disorder commonly observed in males over 50 years of age and the incidence is on the rise due to aging population. Common methods of clinical treatment for the disorder included drug therapy, sometime lasting for years and surgical approach including transurethral resection. An effective treatment strategy could focus on using new generation agents which functions on activating apoptosis mechanisms of prostate cells. From this perspective, we designed a series of lipid-polymer hybrid nanoparticulate drug carriers of a potent hexokinase-2 enzyme inhibitor-lonidamine-on the basis of design of experiment (DoE) approach. Oral application of lonidamine for the BPH treatment is limited due to the low water solubility, low bioavailability and the liver toxicity observed after the long-term treatment. These limitations could be solely overcome by designing and improving the nano-sized drug delivery systems of lonidamine. Within this context, a systematic screening study was employed to design the lipid-polymer hybrid nanoparticles of lonidamine and the in-vitro characteristics of the formulations were evaluated in terms of the major features of the carriers. After the selection of the optimized formulation based on the important outcomes of the design, *in-vivo* effectiveness of the system was evaluated on rats following BPH development. The optimized formulation was directly injected into the rat prostates that had been created BPH models and prostatic index was calculated to determine the level of regression in hyperplastic structure. As a result of this study, a significant progress has been achieved in treatment of BPH and a new alternative treatment method has been occurred with lonidamine loaded hybrid nanoparticles to increase the therapeutic efficiency of the drug.

Biography

Ceyda Tuba Sengel-Turk has obtained her PhD and Master's degree in Pharmaceutical technology from Ankara University, Faculty of Pharmacy in 2009 and 2003 respectively. In 2014 she obtained an Assistant Professor degree in the same department. Since 2002 she has been working, as an Assistant Professor at Ankara University. She is an author and co-author of 22 publications. Her H-index value is 6 since 2011.

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