

In-vitro evaluation of Vorinostat-loaded microspheres for cancer therapy

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Microparticulate delivery systems incorporating anticancer agents have emerged as a potential strategy for targeting drugs to tumor cells. Our research focused on the development of oral capsules containing albumin-based biodegradable microspheres encapsulated with vorinostat. Microspheres were prepared by the microencapsulation method. Bovine serum albumin (BSA) was dissolved in purified water and crosslinked for 24 hours using glutaraldehyde. Sodium bisulfite was added to the crosslinked polymeric matrix prior to adding the desired quantity of vorinostat, and then the dispersion was spray-dried. Prepared microspheres were characterized for their physicochemical properties, including size, surface morphology, and Zeta potential. Data indicated that microspheres were approximately 2- μ m in size, with Zeta potential measurements of -30 mV. Raman spectroscopy was used to evaluate the chemical integrity of the encapsulated drug in the biodegradable microsphere drug formulations. Additionally, thermal stability of the drug in the polymeric matrix was analyzed using differential scanning calorimetry (DSC). The results showed that the drug-encapsulated in the microspheres were stable. Dissolution studies of drug-loaded microspheres and capsules containing drug-loaded microspheres were carried out over a period of 48 hours, as per the USP guidelines. The collected samples from different time points were measured using a UV-visible spectrophotometer. The release studies showed an initial burst release of vorinostat, followed by an extended-release profile. Additionally, drug-loaded microspheres demonstrated a similar profile with capsules containing drug-loaded microspheres. Thus, the microsphere capsules were shown to be a promising strategy for the extended-release of vorinostat for oral cancer therapy.

Biography

Duc P Do is an Assistant Professor of Pharmaceutical Sciences at Chicago State University College of Pharmacy (CSU-COP). Prior to joining CSU-COP, Dr. Do was Assistant Professor of Pharmaceutical Sciences at LECOM, School of Pharmacy. He received his B.S. from the University of Georgia and his Ph.D. in Pharmaceutical Sciences from Mercer University. His research interests are in the areas of drug delivery systems and microencapsulation technology. Dr. Do has published in these areas and has presented at national conferences. He is member of several scientific editorial boards and has served as a reviewer for several scientific journals.

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