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## Development of extended-release capsules containing biodegradable microspheres

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Extended-release delivery of BCS class II and III compounds is desirable in order to decrease dosing frequency and potential adverse effects. Maintaining an extended-release profile of the drug is ideal to minimize fluctuations in plasma concentration. The main objective of this research was to investigate the feasibility of a novel polymeric microparticulate (microsphere) drug delivery system that will effectively provide extended-release characteristics in the body via an orally administered capsule. Using acetaminophen and ibuprofen as model drugs, this drug delivery system should be able to provide enhanced efficacy, absorption, and bioavailability. The biodegradable polymeric matrix was formulated using bovine serum albumin (BSA) with glutaraldehyde as the crosslinker. The drug was then encapsulated into the polymeric matrix and spray-dried into microspheres. Once prepared, the drug-loaded microsphere powder was placed into hard gelatin capsules. The physicochemical properties of the microspheres were then characterized. In addition, FTIR and Raman spectroscopy were utilized to examine the chemical stability of the encapsulated drug. Dissolution studies were conducted to examine the release profile of the drug in solution. Microspheres were found to be less than 2 microns in size and exhibit a uniform size distribution. Zeta potential measurements were shown to be -20 mV to -10 mV, which indicated that the microparticles were stable. Additionally, our dissolution data showed a constant release of the drug from the microsphere and capsule formulations for upwards of 36 hours.

### 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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