CMC AND PVA HYDROGEL CONTAINING PAPAIN NANOPARTICLES FOR DRUG DELIVERY

Reference	Presenter	Authors (Institution)	Abstract
01-034	Caroline Santos Alves de Lima	Lima, C.S. (Instituto de Pesquisas Energéticas e Nucleares - Universidade de São Paulo); Varca, G.H. (Instituto de Pesquisas Energéticas e Nucleares); Oliveira, J.R. (Instituto de Pesquisas Energéticas e Nucleares); Nogueira, K.M. (Instituto de Pesquisas Energéticas Nucleares / Universidade de São Paulo); Santos, F.A. (INSTITUTO DE PESQUISA NUCLEAR); Ribeiro, A.H. (Instituto de Pesquisas Energéticas e Nucleares - Universidade de São Paulo); Lugao, A.B. (IPEN); Freitas, L.F.(Instituto de Pesquisas Energéticas e Nucleares); Rogero, S.O. (IPEN/CNEN-SP);	Four hydrogel formulations of Carboxymethylcellulose (CMC) and Poly (vinyl alcohol) (PVA) were prepared with native papain (AP and BP) and papain nanoparticles (AN and BN) for drug delivery. The formulations were evaluated for their preliminary stability, protein distribution in the matrix and cytotoxicity. Three methods for sterilization purposes were compared: irradiation by 60Co source, electron-beam and UV light. The preliminary stability test confirmed that the system was stable since there was no precipitation or alteration of the organoleptic properties of the samples in the evaluated period. The distribution of proteins in the hydrogel was very homogeneous in all the formulations. Quantification of the enzymatic activity of papain after contact with the gel showed that native papain maintained its activity high (86% and 93% for AP and BP gels, respectively), whereas there was a considerable drop in the activity of the papain nanoparticles to 60.54% and 69.44% for AP and BP gels, respectively. Such loss of activity is attributed to processing and/or process steps. The cell viability assay showed that the polymer matrix shows no cytotoxicity, corroborating with the literature, since the material is biocompatible. Thus, it is possible to affirm that the developed system presents potential for biomedical application, either as a vehicle of papain itself or for the transport of other drugs through complexation with papain nanoparticles. However, the need for further studies of stability, controlled release capacity and biocompatibility is required.

<< Back