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LIPOSOMES LOADED WITH PHOTOPROTECTIVES BIOPOLYMER AND FLAVONOID: MOLECULAR INTERACTION STUDIES

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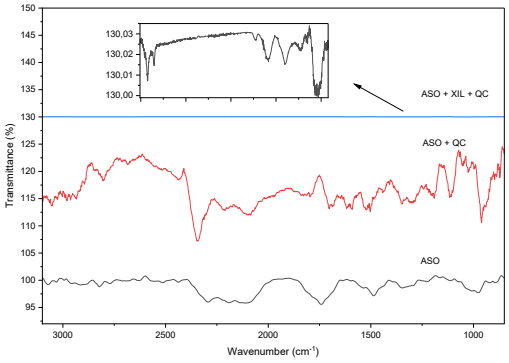
Highlights

This work reports the spectroscopical characterization of liposomes containing xylan and quercetin. It can contribute to the development of efficient and sustainable photoprotective systems.

Abstract

The use of photoprotectors constitutes one of the main strategies for preventing skin cancer, which requires the development of effective, stable and sustainable formulations[1]. In this context, liposomal formulations are promising due to their high biocompatibility and reduced toxicity. They may be prepared by the vesicle hydration method. Briefly, soybean asolectin was co-solubilized with chloroform. After the solvent evaporation, tricin buffer was added and liposomes were formed after mechanical agitation[2,3]. In this work, interactions of asolectin liposomes (ASO) containing the biopolymer xylan (XIL) and the flavonoid quercetin (QC), both photoprotective agents, were investigated by Fourier transform infrared (FTIR) and nuclear magnetic resonance (NMR). FTIR spectra were obtained in Horizontal Attenuated Total Reflectance (HATR) mode, and one-dimensional (1D) NMR of ^{13}C and ^{1}H spectra were obtained in the liquid state. FTIR data (Fig. 1) demonstrated that the insertion of XIL and QC promoted an increase in the ASO methylene stretching wavenumber of 31 cm^{-1}, increasing the *trans-gauche* isomerization of this group. This data indicates a disturbing effect in the liposome hydrophobic region[4]. ^{1}H NMR results have shown that xylan increased the lipid choline T_1 by 470.4 ms, which is related to a restriction of its rotational freedom[5]. The xylan insertion in the liposomes enhanced the organizational stability in the ASO choline region.

Fig.1 - FTIR spectra of pure asolectin (ASO) liposomes and ASO liposomes containing xylan (XIL) and quercetin (QC).



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