

Área: ORG

Molecular Interactions of Benznidazole with Liposomes: a Strategy for the Chagas Disease Therapy

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Highlights

Spectroscopical characterization of liposomes containing benznidazole was performed in order to increase the stability and reduce the adverse effects of the drug in Chagas disease therapy.

Resumo/Abstract

Chagas disease, caused by the protozoan *Trypanosoma cruzi*, represents a major public health problem in Latin America (DNDi, 2024). Benznidazole (BZ), the primary drug used in Brazil, is effective during the acute phase but shows limited efficacy in the chronic phase of Chagas disease. Due to its hydrophobicity and limited bioavailability, BZ encapsulation into liposomes is a potential strategy to reduce its systemic toxicity (Agrawal, Baliga, & Londhe, 2025). In this study, interactions of BZ with lecithin-based liposomes were evaluated by Fourier-transform infrared spectroscopy (FTIR), ultraviolet-visible spectroscopy (UV-Vis), and Differential Scanning Calorimetry (DSC). FTIR (Fig 1) and DSC results demonstrated that BZ interacts preferentially with the lipid polar and interface regions reducing the local fluidity and hydration of the carbonyl (C=O) and choline (N+(CH₃)₃) groups, without penetrating deeply into the hydrophobic core. UV-Vis assays have shown that BZ increase liposomes turbidity. The knowledge related to the molecular interactions between BZ and the liposomes contributes to the development of new therapeutic formulations against Chagas disease.

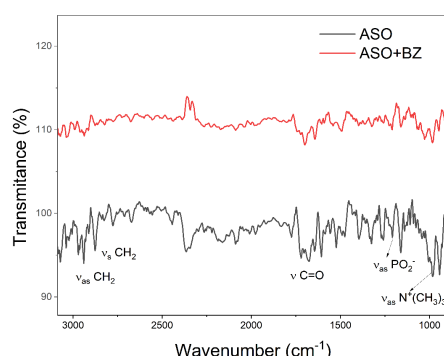


Fig.1 . FTIR spectra of liposomes in the absence (ASO) and in the presence of benznidazole (ASO+BZ).

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