

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.

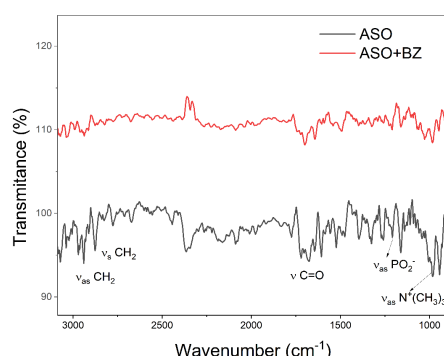


Fig.1 . FTIR spectra of liposomes in the absence (ASO) and in the presence of benznidazole (ASO+BZ).

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The banner features a dark teal background with a subtle pattern of molecular models and laboratory glassware. On the left, a molecular model with orange and white spheres is visible. On the right, another molecular model with red and white spheres is shown. The text is arranged in three columns. The first column contains the large number '31' in yellow, followed by 'ENCONTRO DE' in orange and 'QUÍMICA DA REGIÃO SUL' in white on a yellow rectangular background. The second column contains the theme 'A QUÍMICA COMO PROPULSORA DE NOVOS ECOSISTEMAS DE INOVAÇÃO' in white. The third column contains the dates and location '19 A 21 DE NOVOBRO Campus Toledo Unioeste' in white.

31 ENCONTRO DE
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