

Área: ORG**Effects of cypermethrin in liposomes parameters: an approach to prevent Chagas disease**

Rhenan Freitas Ferreira Colman (IC)^{1*}, Laura Antônio Santos (IC)¹, Sandy Moreira Rodrigues (IC)¹, Sandra Cruz dos Santos (PQ)², Vânia Rodrigues de Lima (PQ)¹

rhenancolman@gmail.com

¹Escola de Química e Alimentos, Universidade Federal do Rio Grande (FURG).² Universidade Federal de Pelotas (UFPel)

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Highlights

Encapsulation of cypermethrin into liposomes reduces its toxicity and increases its insecticidal action. Molecular interactions between cholesterol-based liposomes and cypermethrin were investigated.

Abstract

Chagas disease, caused by *Trypanosoma cruzi*, remains a major public health problem in Latin America. The triatomine vector control relies on insecticides, such as cypermethrin (CP), which are related to environmental toxicity and low selectivity. A strategy to prolong insecticidal activity and reduce its toxicity is the drug encapsulation into liposomes, as well as the knowledge of their molecular interactions. In this study, CP was incorporated into soybean lecithin (ASO) liposomes, pure or containing cholesterol (CHL). The systems were analyzed by Differential Scanning Calorimetry (DSC) and Nuclear Magnetic Resonance (NMR). DSC data showed that CP did not significantly change the phase transition temperature (T_m) but increased the ASO liposomes stability (as observed by enthalpy variations results). The CHL ordered the apolar region of ASO liposomes, while the association CP+CHL promoted a fluidest ASO liposome. NMR results indicated that CP increased the ASO choline rotation motion, whereas CHL ordered this region. However, the association CP+CHL ordered the ASO choline region 10 times more than CHL. The CP in cholesterol-based liposomes Thus, encapsulation of CP in cholesterol-based liposomes disordered the lipid apolar region and ordered the polar one. This may affect the controlled release of CP, and reduce its adverse effects, which make these liposomes promising to the Chagas disease control.

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