In vitro Evaluation of Cytotoxicity and Genotoxicity of an Ionic Liquid with Antifungal Activity

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The present study aimed to evaluate the cytotoxicity and the genotoxicity of the 1-methyl-3-hexadecylimidazole (C16MImCl) ionic liquid, which demonstrated antifungal activity in previous studies, with a MIC of 0,014 µg/mL for Candida albicans. The reason for the development of the research is due to the frequency of systemic fungal infections and the restricted number of antifungals, which makes the study of new drugs essential. Studies show that several of the ionic liquids have higher activity and lower toxicity than the antifungal agents currently on the market. However, it is with a toxicological concern that this work studies cellular and genetic alterations in the cell line V79, when exposed to the compound. The following tests were performed: reduction of the MTT salt, incorporation of Neutral Red dye, Trypan Blue dye absorption, and the Comet assay. Statistical analysis was performed by the one-way ANOVA method, followed by Duncan's post-test. In the MTT and Neutral Red assay, the IC50 value was 4.9 µg/mL and 5 µg/mL, respectively. In the Trypan Blue assay an increase in cell viability was observed at the lowest concentrations and a decrease in it at the highest concentrations. Microscopic analysis of the Comet assay was performed, and the cells demonstrated undamaged nuclei, categorizing zero damage. From the results obtained, it was found that the compound C16MImCl presents cytotoxicity to the V79 cells in the highest concentrations tested; however, it does not cause genetic damage to the cell line, which makes it a strong candidate for antifungal.

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