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Antibacterial and antibiofilm activity of salts derived from N-cinnamyl imidazole with different chain lengths against *Streptococcus mutans*

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In recent years, scientific knowledge about the multiple properties of ionic liquids (IL), such as their toxicity, recyclability, low vapor pressure, high chemical and thermal stability, among others, thus increasing and applying these in various experimental investigations and industrial uses. In this investigation, two specific properties of IL derived from N-cinnamyl imidazolium were explored; antibacterial activity and antibiofilm activity. The process of synthesis of IL derived from cinnamic acids was based at a molecular level on a core of an imidazole group, which was initially synthesized with the formation of different amides between the cinnamic acid and carbonyldiimidazole until the corresponding N-cinnamyl imidazolium was obtained. Subsequently, the quaternization reaction of the different N-cinnamyl imidazoles was carried out with alkyl halides (methyl, hexyl, octyl and decyl); the corresponding IL and their precursors were characterized by different spectroscopic and spectrophotometric techniques. The purpose of this investigation was to empirically evidence the bactericidal and/or bacteriostatic activity of this group of IL by means of agar diffusion techniques, minimum inhibitory concentration (MIC) determination, as well as antibiofilm activity according to microtitration techniques and optical density. The antibacterial and antibiofilm activity were evaluated in a bacterial strain of *Streptococcus mutans* ATCC 700610 / UA 159, in order to promote the use of IL as a possible and efficient antimicrobial, capable of neutralizing the virulent effects of a potentially pathogenic bacteria that act in the oral cavity, promoting the cariogenesis or giving more complicated cases of bacteremia or endocarditis in human beings.

Biography

Luis Guzman has worked in the area of natural products, especially in the Research and Development of Bioactive Products. He is a Professor at the Faculty of Health at the University of Talca, Chile and External Consultant of Fraunhofer Chile Research in the area of Nanomedicine.

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