Antimicrobial Properties of Skin Secretions from Salamanders

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The growing bacterial resistance to antibiotics is a concern of global proportion. It is imperative that novel compounds with antimicrobial properties be identified for therapeutic applications. A promising source of novel antimicrobial agents lies in the skin secretions of salamanders, which contain hundreds of compounds with diverse functions. Specifically, it is known that these skin secretions protect salamanders from infectious pathogens. The goal of this study was to determine if salamander peptides inhibit the growth of bacteria which cause human diseases and develop antibiotic resistance, including A. baumannii, E. aerogenes, S. marcescens, and others that negatively affect human health. Skin secretions were collected from three different species of salamanders (A. tridactylum, A. maculatum, C. alleganiensis) and growth inhibition assays conducted to determine the antimicrobial activity of the skin secretion from each species. The growth inhibition assays demonstrated that salamander species vary in their ability to inhibit bacterial growth. Skin secretions from A. tridactylum inhibited the growth of several pathogens tested while skin secretions from A. maculatum and C. alleganiensis were not inhibitory. Future work will include identification of the secretory compounds (specifically from A. tridactylum) responsible for the antibacterial properties and their mechanisms of action, which may guide structural optimization for enhanced pharmacological and therapeutic properties.

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