

MSc Showcase Abstract

New Drugs for Bad Bugs

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As of 2013, the US Centers for Disease Control and Prevention has documented antibiotic resistance as a severe threat to the human population. The search for alternative drugs to curb the epidemic has been extensive, with natural products at the forefront of drug discovery and development. Numerous organisms, including plants, animals, bacteria and fungi, produce antimicrobial peptides (AMPs) to defend against invading pathogens. Indolicidin (indol) is one such AMP that displays multiple mechanisms of attack against pathogens, making it difficult for organisms to develop a resistance. The shortcoming of indol is that it's too hemolytic for therapeutic use. To overcome this problem my research focuses on a novel indol derivative, called indol45, which is less hemolytic with an increased antimicrobial potential. Lipopolysaccharide (LPS) is indol45's suspected receptor for entry into the bacterial cell. My research concentrates on determining a binding constant (K_b) between indol45 and LPS. The higher the K_b the stronger the interaction between the ligand and receptor, in this case indol45 and LPS. The goal of this research is to provide insight into the mechanism of action of indol45, in hopes that with further research, AMPs could be used as a possible solution to the antibiotic resistance epidemic.