

“Development of an In Vitro Model of Oral Biofilm Formation”

University of Kentucky Faculty Research Support Program

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Abstract:

With the increasing development of antimicrobial resistance to traditional antibiotics, new targets are needed to combat infections that cause human disease. While oral infections are rarely life threatening, they do have a significant impact on quality of life, economics, and systemic health. The use of systemic antibiotics for the management of oral infections, especially in cases of the biofilm-associated diseases, dental caries and periodontal disease, has not received considerable support because of the implications for the emergence of antibiotic resistance in medically important pathogens. In contrast, the use of topical chemotherapeutic agents, where the emergence of resistance is not of paramount concern, has typically been well received. However, the development of such agents is lagging behind the potential applications. The development of new oral chemotherapeutic agents therefore represents an opportunity to link basic science research with commercial endeavors that could ultimately impact the oral health of the general population. One potential limitation of the oral application of these agents is their ability to kill microorganisms growing in the biofilm environment. Therefore, it is important to assess the efficacy of any newly proposed therapeutic compounds against the target bacteria grown in biofilms. The purpose of this proposal is to establish in our laboratory an in vitro model of oral bacterial biofilm formation. Once established, this model will allow for the assessment of antimicrobial peptides as effective agents in killing the oral biofilm cells.