

James & Esther King Biomedical Research Program

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*2011 Program
New Investigator Research
(3-year project)*

Project Title: Molecular Identification of Subgingival Bacteria Associated with Progression of Periodontitis in Smokers

Project Summary: Periodontal disease (or gum disease) is a common problem facing smokers. It is a chronic bacterial infection that affects the gums and bone supporting the teeth. The infection begins when bacteria in the dental plaque spread and grow under the gum line. As infection progresses, gums become inflamed and detached from the teeth. If left untreated, the infection can destroy the bones, leading to tooth loss. It is well known that smoking causes more rapid progression and more severe disease, and that response rates to therapy are lower in smokers. Although bacteria associated with periodontal disease are known to be more common in smokers, there are no tests that can screen these high-risk patients for periodontal disease or treatment response. Our long-term goal is to be able to screen and predict disease before symptoms develop. We hypothesize that smoking enhances the survival of periodontitis-associated bacteria in periodontal pockets. To test this hypothesis, we will use the latest genomic technology to prospectively compare oral bacteria in current smokers to non-smokers, thereby determining the effect of smoking on these bacteria. We will then further investigate this relationship as it relates to periodontal disease and treatment outcome. Once it is known which bacteria predict disease and treatment outcome, screening tests can be developed and clinicians will be able to diagnose and treat on the basis of bacterial compositions before the onset of symptoms.