

# Graduate Research Day 2013

## Florida Atlantic University

**Charles E. Schmidt College of Science**

### **DNA Fingerprinting of Human Oral Microbiome: A first step towards development of early diagnosis of oral diseases**

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Recent advances in the study of the human microbiome have revealed the enormous role of bacteria that inhabit the human body. About 700 species are estimated to occur in the oral cavity and some play a key role in the development of oral diseases. The study seeks to evaluate the potential of predicting oral health status by the molecular fingerprints of oral microbiome using 16S rDNA polymorphisms.

Metagenomic and Cultured community DNA obtained from 10 healthy individuals and 5 smokers were obtained from Dr Esiobu's lab. The bacterial 16S rDNA were amplified using universal primers 1492R and 27F. The amplified PCR products were subjected to RFLP using restriction enzymes HaeIII, Alu I, Sau3AI, Bam H1 and the banding patterns will be analyzed using Gel Compare software .

RFLP technique, with restriction enzyme HaeIII, Sau 3AI and AluI showed marked contrast in the fingerprint pattern of direct and plate washed isolates and produced some ubiquitous DNA bands among healthy and smoker subjects. Hae III produced a DNA bands that was uniquely present in two of the smoker samples which warrants further investigation as potential biomarkers for early diagnostics. There seems to be a steady and universal community of bacteria in all the samples tested and specific polymorphisms unique to smokers were apparent; suggesting a stable shift in bacterial community. Detection of bacterial community changes associated with the early stages of less severe to severe oral diseases would allow diagnosis and prompt treatment.