

Principal Investigator/Program Director (Last, First, Middle): Gordan, Valeria V.

DESCRIPTION: See instructions. State the application's broad, long-term objectives and specific aims, making reference to the health relatedness of the project (i.e., relevance to the **mission of the agency**). Describe concisely the research design and methods for achieving these goals. Describe the rationale and techniques you will use to pursue these goals.

In addition, in two or three sentences, describe in plain, lay language the relevance of this research to **public health**. If the application is funded, this description, as is, will become public information. Therefore, do not include proprietary/confidential information. **DO NOT EXCEED THE SPACE PROVIDED.**

Caries continues to be a prevalent disease with high incidence among all age groups. Ammonia production from the hydrolysis of arginine and urea by enzymes of oral bacteria moderates plaque acidification and may inhibit dental caries, as suggested by in vitro studies and indirect clinical observations. The objective of this study is to examine the relationship of arginine deiminase (ADS) and urease activities with dental caries at the clinical level. We hypothesize that ADS and urease activities in plaque and/or saliva of caries free subjects is significantly higher than in caries active subjects. ADS and urease activities will be measured in dental plaque and saliva samples from caries free subjects and subjects with at least 4 teeth with active caries. Specific Aim (SA) 1 will determine the magnitude and the direction of the association between plaque and saliva ADS and urease activity levels with dental caries in human subjects. SA 2 will examine the relationship between ADS and urease activity levels with the numbers of selected major acid-producing and alkali-producing bacterial species in the dental plaque. SA 1 will be met through a case-control study and SA 2 will be met using a sub-sample of the subjects (10 with the highest, 10 with the lowest, and 10 with medium plaque ADS and urease levels). If the results of the present study support an association between ADS and/or urease activity levels with dental caries in adults, the knowledge obtained from this study will be applied to the design of a prospective cohort study at the end of the grant period, which will determine whether this association is a cause-and-effect one. If ADS and urease activity levels are shown to be predictive of caries risk in adults either alone, or in combination with other risk factors, then we will explore possible applications of this relationship into the development of novel approaches for early identification of adults at risk to develop caries and for caries prevention.

Public Health Impact:

The proposed study presents virtually no risks to the human subjects, still, it can potentially contribute to the development of novel methods for caries risk assessment and prevention. Additionally, the research community may have a better understanding of unknown factors affecting caries risk.

PERFORMANCE SITE(S) (organization, city, state)

Dental Clinics at the University of Florida College of Dentistry, Gainesville, FL
Periodontal Disease Research Center at the University of Florida College of Dentistry, Gainesville, FL
Oral Biology laboratory at the University of Florida College of Dentistry, Gainesville, FL