

Title: Understanding the characteristics of canine saliva to improve their oral health

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Structured Abstract:

Background: While the human salivary composition has generated an extraordinary amount of information, there is a tremendous gap in knowledge of animal salivary composition, especially when companion animal oral dental health is considered, for example dogs. It is essential to bridge this gap to understand the organic and inorganic salivary canine composition to further develop diagnostic and therapeutic strategies based on the use of dog's saliva. Though dental caries (dental decay) is almost absent in dogs, gingivitis and periodontitis (gum diseases) constitutes the most common diseases that affect more than 80% of adult dog's oral cavity. Although it is well known that the above-mentioned gum diseases result from the immunoinflammatory responses induced by dental biofilm accumulation and dental calculus formation on the teeth, the potential relationship of the presence of absences of specific salivary proteins with the development of these diseases in dogs are scarce.

Hypothesis: Absence of dental caries of dogs and presence of dental calculus might be related to their salivary organic and inorganic composition. There will be a significant difference between the organic and inorganic composition between dogs and other mammalian species.

Objective: We aim to comprehensively determine the inorganic composition and the proteome, peptidome, and phosphoproteome of the saliva dogs. More specifically, the application will be addressing three novel areas of investigation in veterinary field that have clear translational potential.

Aim 1: Determination of inorganic composition, pH, and buffer capacity in dog saliva.

Aim 2: Identification and characterization of the proteome and peptidome in dog saliva.

Aim 3: Identification and characterization of the phosphoproteome and its phosphorylated sites in dog saliva.

Research Plan: Sample selection, collection, and processing of canine saliva: Twenty dogs (*Canis lupus familiaris*) from the London Police Canine Unit will be participating in this study. A total 10 female and 10 male healthy adult dogs (>then 18-month old) will be recruited. Saliva will be collected by using a specific saliva collection device for animals, MicrooSAL absorbent pad. The samples will be analysis according to our aims.

Impact on Dog Health: This is a pioneering scientific exploration aimed towards a comprehensive characterization of the dog saliva. Also, we believe that the overall outcomes of such studies would lead to significant improvement in the field of veterinary sciences by providing essential background to further develop diagnostic and therapeutic agents based on the use of dog's saliva. Also, the data collected would have an impact on other clinical applications of other species, such as human (dental calculus formation and inhibition).