

# Temporal mathematical modeling of nasal microbiota dynamics with viral pathogens

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## Abstract

Microorganisms in nature form diverse communities that dynamically change in structure and function in response to environmental variations. For example, the oral microbiota is one of the first known microbial ecosystems, and currently the study of the naso-pharyngeal microbiota is having great relevance. Microbiome research has transformed our understanding of microbes and human health. Recent work shows evidence of a relationship between the microbial ecosystem and various immune / inflammatory human processes.

In this work, a mathematical model based on multispecies Lotka-Volterra systems is presented to describe the dynamics of the naso-pharyngeal microbiome under the presence of a pathogen. Applications of the proposed model to real cases of great current interest are shown using experimental data.

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