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# Profiling Oral Microbiota to Elucidate Gut-Brain axis alteration in Autism Spectrum Disorder

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**Background:** Autism Spectrum Disorder (ASD) is a complex neurodevelopmental condition characterised by deficits in social communication, restricted interests, and repetitive behaviours. Despite the increasing global prevalence of ASD, its underlying mechanisms remain poorly understood, and no definitive biological markers have been identified. Diagnosis primarily relies on behavioural assessments, often leading to delayed intervention. While extensive research has been conducted on the gut microbiota's role in ASD, there is a significant lack of microbiota data, particularly within the Indian population.

Objective: This study aims to explore the potential contribution of oral microbiota to ASD through its impact on the gut-brain axis, a growing area of interest in ASD research. By profiling microbial differences in oral samples from individuals with ASD and neurotypical controls, the study seeks to identify microbial signatures that could serve as early, non-invasive diagnostic markers.

**Methods:** A systematic literature review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, identifying key bacterial species potentially associated with ASD. These species were evaluated and ranked based on their relevance, data quality, and prevalence across studies. To further validate these findings, saliva samples from ASD individuals and neurotypical controls (n=30) are being collected. These samples will also support future gene expression studies, aiming to confirm observed microbial differences in line with the literature.

**Results:** Analysis revealed 20 bacterial species significantly more abundant in individuals diagnosed with ASD. The most prominent genera included Clostridium, Bacteroides fragilis, and Prevotella, underscoring the diversity of microbial communities associated with ASD. The findings reinforce the hypothesis that these species may influence neurodevelopment through the gut-brain axis. Of particular interest is the role of microbial metabolites in triggering neuroinflammatory responses and behavioral changes, offering new insights into ASD pathophysiology.

**Conclusion:** This study establishes a potential link between oral microbiota and ASD, providing a foundation for developing microbiota-based diagnostic tools. Such tools could enable early, non-invasive detection of ASD, especially in regions with limited microbiota data, like India.

## Biography

Anamika Chambiyal is a student researcher at UPES, contributing to the field of neuroscience with a focus on autism. Her research investigates the role of dopamine in the social interaction challenges associated with Autism Spectrum Disorder (ASD), drawing comparisons with addiction mechanisms. This innovative approach offers fresh perspectives for diagnosis and intervention strategies, reinforcing UPES's commitment to pioneering research

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