

International Conference on Women Health



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The Role of the Microbiome in Women's Health

Abstract:

The human body harbors trillions of microbes within the gastrointestinal, vaginal, and oral microbiomes. Emerging research underscores the microbiome's significant role in women's health.

Our research utilizes large cohorts from both healthy and disease states, with a focus on vaginal microbiome function. We have demonstrated that a non-Lactobacillus-dominant vaginal microbiota is strongly associated with conditions such as bacterial vaginosis, HPV infection, and related cervical dysplasia. This indicates a crucial role for the vaginal microbiota in HPV persistence and cervical carcinogenesis. Furthermore, in one of the largest pregnancy studies to date, we have investigated how the vaginal microbiome relate to pregnancy outcomes and HPV status.

We have also integrated human factor analyses and revealed that microRNA signatures cluster distinctly according to vaginal microbiota composition. Comparative analysis of gut and salivary microbiota between healthy and diseased participants identified specific bacteria significantly enriched in disease states. Our current work explores immune response-related genes and investigates the mechanisms of vaginal microbiome-driven inflammation using in vitro 2D and 3D models. We characterize the comprehensive immune responses elicited by different vaginal microbial communities. Additionally, by integrating whole-genome sequencing of vaginal microbes with metabolomic and proteomic data, we have uncovered previously unexplored microbial functions.

Overall, our findings have significant implications for advancing women's health, enhancing disease surveillance, and translating microbiome research into clinical practice.

Keywords: microbiome, women's health, HPV, pregnancy, microbe-host interaction