

Emmy Borgmästars: Exploring the Vaginal Microbiome to Enable Early Detection of Ovarian Cancer

Ovarian cancer is often detected at a late stage, resulting in a five-year survival rate of just 51%. Emmy Borgmästars, postdoctoral researcher at the Department of Immunology, Genetics and Pathology at Uppsala University, is determined to change that. With a PhD in Medical Science from Umeå University and a strong background in molecular medicine and bioinformatics, Borgmästars combines laboratory precision with clinical insight to explore new frontiers in early cancer detection.

Her research focuses on identifying biomarkers in the vaginal microbiome that could make it possible to detect ovarian cancer earlier, before symptoms appear and when treatment outcomes are far better. By analyzing self-sampled dried cervico-vaginal fluid (CVF) and ovarian tumor tissue, Borgmästars and her team aim to pinpoint bacterial signatures that can distinguish ovarian cancer from benign tumors and other gynecologic cancers.

A distinctive aspect of Borgmästars' study is the examination of bacterial fluctuations across the menstrual cycle. This provides insight into the natural variability of the vaginal microbiome, a critical factor for designing reliable future screening strategies. Using advanced long-read 16S rRNA gene sequencing combined with multi-omics analyses, her team is building a comprehensive dataset from hundreds of samples collected at Uppsala University Hospital, including paired CVF and tumor samples from the same women, as well as CVF samples from women in Göteborg.

“By studying the vaginal microbiome in self-sampled fluid, we hope to develop a flexible, home-based method for early ovarian cancer detection,” says Emmy Borgmästars. “This approach could make screening more accessible and less invasive, while also providing critical insights into tumor development and progression.”

Borgmästars' work builds on promising preliminary findings, in Stefan Enroth's lab, including proteomic analyses of dried CVF samples that identified an 11-protein biomarker panel with potential for early ovarian cancer detection. The inclusion of daily menstrual cycle samples provides an unprecedented resource for understanding microbiome dynamics and ensuring that potential biomarkers are robust and reliable across different phases of the cycle.

Ultimately, Emmy Borgmästars' research has the potential to transform ovarian cancer care by creating a patient-friendly, scalable screening method. By enabling early detection through a simple self-sampled test, she is working to give women a better chance at survival, and a renewed sense of hope.