# Exploring the Utilization of Tampon-Derived Vaginal Fluids for Early Detection of Endometrial Cancer

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Introduction: Endometrial Cancer (EC), the most common and deadliest gynecological cancer in the U.S., has seen a steady rise in incidence and mortality since 2003 across all races. When identified early, 5-year survival for patients is 95%, but drops to <15% upon metastasis. Despite this, there is no standardized screening method for EC, highlighting the need for novel, non-invasive detection strategies. This study explores the ability of molecular analyses of tampon-derived vaginal fluids to detect EC. Methods: Tampon samples were collected from 20 women presenting for suspicion of EC at the Gynecologic Oncology clinic at the University of Alabama at Birmingham and were consented under a pre-approved translational research IRB. i) 10 samples (five benign, five cancerous) underwent mass spectrometry-based proteomics. ii) The remaining 10 cancerous samples underwent a modified gDNA isolation protocol for future qPCR experiments to detect EC-associated mutational signatures using gene-specific primers. iii) RenCa-Luc gDNA was diluted (1, 2, 5, 10, 20, 50, 100 ng) and used in SYBR Green qPCR with an 18S rRNA primer set. Results: i) Proteomic analysis revealed differentiation between the protein profile of benign and cancerous samples. ii) The average gDNA yield was 3.29 µg with purity ratios (260/280=2.01 and 260/230=1.95) sufficient for future molecular analyses. iii) qPCR amplification curves were sigmoidal, and non-template controls confirmed the absence of contamination. The standard curve had a coefficient of determination of 0.993 and an efficiency of 90.8%. Conclusion: This exploratory study has demonstrated the potential for a non-invasive, tampon-based sampling method to detect EC early through proteomic and genomic analysis.

**Awards Won:**