

## LASER ABLATION-RESONANCE ENHANCED PHOTOIONIZATION MASS SPECTROMETRY (LA-REPMS) OF PARTICLE-BASED ASSAYS TO IMPROVE EARLY DETECTION OF CANCER

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Early detection of cancer has a drastic impact on the successful treatment of the disease. However, detection of early signs of cancer is a challenge especially for a type of cancer such as epithelial ovarian cancer (EOC), with few or no symptoms at the early-stages. Development of a noninvasive method that can improve the detection of biomarkers with sufficient selectivity, sensitivity, and reproducibility is a promising approach to overcome the challenges of early detection. This study aims to develop novel optical and mass spectrographic techniques to detect biomolecules in complex matrices. To accomplish this, Laser Ablation-Resonance Enhanced Photoionization Mass Spectrometry is combined with nano- and micro-particle immunoassay to improve the detectability in a complex media. While there are many commercial mass spectrometry configurations available, none of them meet our specific needs, so a significant portion of the effort in this research to date has been dedicated to designing and building the custom apparatus to meet our needs. We present an overview of the design, testing, and preliminary studies on biomolecules.