

Title:

Single Molecule Assays for Early Breast Cancer Detection

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Abstract:

The goal of this project is to use single molecule detection of proteins to develop a fingerprint for early detection of breast cancer. Protein biomarkers that have the potential to indicate earlier diseased states likely exist in serum at concentrations currently below the detectable limits of standard methods, such as ELISA. The sensitivity of the previously established single molecule array (SiMoA) detection platform employs a digital counting methodology, enabling the detection of very low concentrations of proteins in bodily fluids, such as blood. This approach facilitates the development of a simple, minimally invasive sampling method that could provide biological information about a newly formed tumor. As such, SiMoA could be used to not only detect, but also help with diagnostic and prognostic analysis of breast cancer. This work outlines efforts to develop single molecule assays for biomarkers of interest in breast cancer as well as preliminary results from mouse models.