Abstract Submitted
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Fabrication and Characterization of a Novel Nanodendrite-based Electrochemical Sensor for the Detection of Disease Biomarkers[1] TIMOTHY CONNOLLY, MICHELLE M. ARCHIBALD, NATHAN T. NESBITT, MATTHEW ROSSI, JENNIFER A. GLOVER, MICHAEL J. BURNS, MICHAEL J. NAUGHTON, THOMAS C. CHILES, Boston College — Technologies to detect early stage cancer would provide significant benefit to cancer disease patients. Clinical measurement of biomarkers offers the promise of a noninvasive and cost effective screening for early stage detection. We are currently developing a novel 3-dimensional nanopillar dendrite biosensor array for the detection of human cancer biomarkers (*e.g.* CA-125 for early-stage ovarian cancer) in serum and other fluids. Here, we describe a nanoscale 3D architecture that can afford molecular detection at room temperature. We report our efforts on the development of an all-electronic, ambient temperature, rapid-response dendritic biosensor fabricated by directed electrochemical nanowire assembly (DENA) that achieves molecular-scale sensitivity for protein biomarker based detection. Each sensor is a vertically-oriented nanodendritic array where an electrochemical signal is detected from the oxidation of the redox end-product of an enzyme-linked immunosorbent assay (ELISA). Our results demonstrate the feasibility of using the present nanodendritic array structure as a sensitive device to detect a range of proteins of interest, including disease biomarkers.

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