

Abstract Submitted
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Nanoscale Radiofrequency Molecular Biosensing JEAN-LUC FRAIKIN, DAVID WOOD, MIKE STANTON, ANDREW CLELAND, UCSB — We are developing an all-electronic, radiofrequency, nanoscale-biosensor. We use RF reflectometry to measure impedance changes in the sensor electrodes, which should occur upon binding of the target analyte, enhanced through the subsequent attachment of gold nanospheres, using a sandwich-type assay. The sensor is embedded in a microfluidic, lab-on-a-chip configuration, allowing for in-situ sensor functionalization. We are pursuing various routes to sensor functionalization, including both oligonucleotide and peptide linking chemistries. The electrical functionality of our sensor prototype has been demonstrated, yielding sensitivity to impedance changes of order 1 part in 10^5 , with an active sensing volume of order a few hundred attoliters. Using this technique we expect sensitivity to single-nanosphere binding events to be attainable.

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