Abstract Submitted
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**Surface Functionalized Nanocoax Biosensors**[1] BINOD RIZAL, MICHELLE ARCHIBALD, GREGORY MCMAHON, Boston College, NATASHA ERDMAN, Joel USA, Inc., STEPHEN SHEPARD, MICHAEL J. BURNS, THOMAS C. CHILES, MICHAEL J. NAUGHTON, Boston College — We have adapted the nanocoax array architecture for high sensitivity, all-electronic chemical and biological sensing. We previously demonstrated ppb concentration level detection sensitivity to volatile organic compounds in dry air using the nanocoax array with nanoporous coax annuli [1]. Here, we report progress toward modifying/functionalizing the coax metal surfaces to enable specific binding of target molecules (e.g. proteins, toxins, pathogenic organisms), followed by electronic interrogation via capacitance/impedance spectroscopy. As a proxy for target molecules, and in order to confirm the ability to selectively functionalize desired surfaces in our nanopillar / nanocoax geometry, we have selectively attached strepavidin-functionalized core-shell CdSe/ZnS quantum dots to gold nanopillars. Next steps will include substituting antibodies for the quantum dots, and measuring the capacitance and impedance response to the introduction of protein (PSA , CA-125, etc.) in serum. Ref. [1]: H.Z. Zhao, B. Rizal, G. McMahon, H. Wang, P. Dhakal, T. Kirkpatrick, Z.F. Ren, T.C. Chiles, D. Cai and M.J. Naughton (submitted).

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