

Abstract Submitted  
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**Electrical Detection of Immobilized Proteins With Ungated AlGa<sub>N</sub>/Ga<sub>N</sub> High Electron Mobility Transistors** BYOUNG SAM KANG, FAN REN, Department of Chemical Eng. University of Florida, LIN WANG, CHARLES LOFTON, WEIHONG TAN, Department of Chemistry University of Florida, STEPHEN PEARTON, Department of Material Science and Engineering University of Florida, A. DABIRAN, A. OSINSKY, P. CHOW, SVT Associates, DEPARTMENT OF CHEMICAL ENG. UNIVERSITY OF FLORIDA COLLABORATION, DEPARTMENT OF CHEMISTRY UNIVERSITY OF FLORIDA COLLABORATION, DEPARTMENT OF MATERIAL SCIENCE AND ENGINEERING UNIVERSITY OF FLORIDA COLLABORATION, SVT ASSOCIATES COLLABORATION — Ungated AlGa<sub>N</sub>/Ga<sub>N</sub> High Electron Mobility Transistor structures were functionalized in the gate region with aminopropyl silane. This serves as a binding layer to the AlGa<sub>N</sub> surface for attachment of fluorescent biological probes. Fluorescence microscopy shows that the chemical treatment creates sites for specific absorption of probes. Biotin was then added to the functionalized surface to bind with high affinity to streptavidin proteins. The HEMT drain-source current showed a clear decrease of 4 uA as this protein was introduced to the surface, showing the promise of this all-electronic detection approach for biological sensing.

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