Surface Functionalization of Graphene Field Effect Transistors with Polyhistidine-Tagged Proteins\textsuperscript{1} YE LU, JOSEPH MITALA, JONG-HSIEN LIM, MITCHELL LERNER, ZHENG TANG LUO, NICHOLAS KYTEBERT, BRETT GOLDSMITH, BOHDANA DISCHER, A.T. CHARLIE JOHN-SON, University of Pennsylvania, PHYSICS AND ASTRONOMY TEAM, BIOCHEMISTRY AND BIOPHYSICS TEAM — We have developed a facile and reliable method to covalently functionalize the surface of graphene field effect transis-
tors (FETs) with polyhistidine-tagged proteins We demonstrated success of chemical functionalization by both atomic force microscopy (AFM) and Raman spectroscopy. Additionally, we characterized the electronic properties of graphene FETs at suc-
cessive functionalization stages. The specificity enabled by such functionalization,
along with the two dimensional nature and intrinsic high sensitivity of graphene, fa-
cilitates the emergence of graphene as a promising candidate in surface biochemistry research as well as graphene-based biosensor applications.

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