

One-Step Photochemical Immobilization of Aptamer on Graphene for Label-Free Detection of NT-proBNP

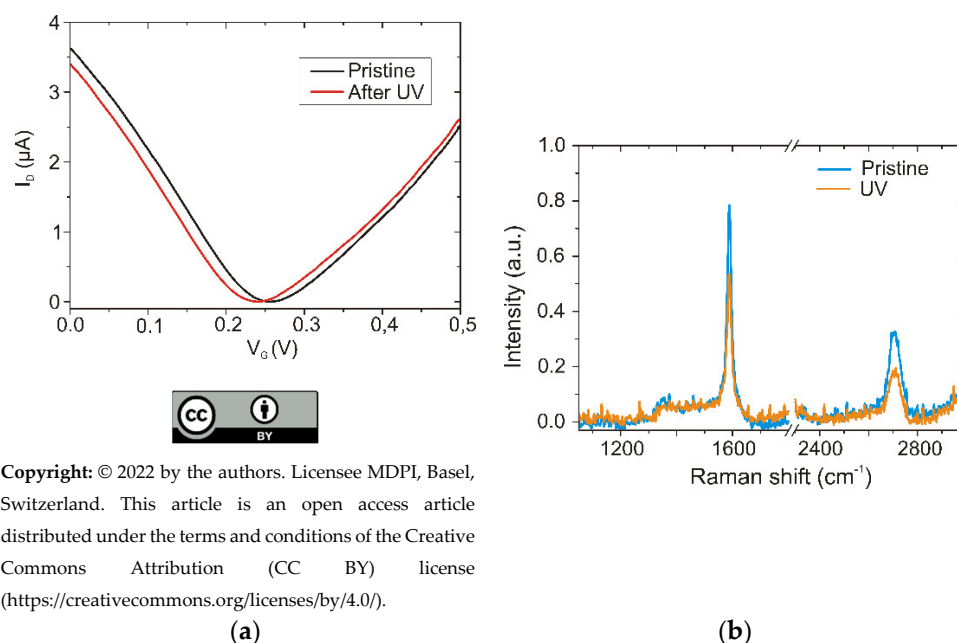
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Figure S1. Control GFET after UV irradiation in pure PBS. Change in CVCs for GFET after 10 min of UV irradiation in PBS solution **(a)**. Dirac point shifts at 17 mV. Raman spectra of graphene before and after UV processing in PBS **(b)**.

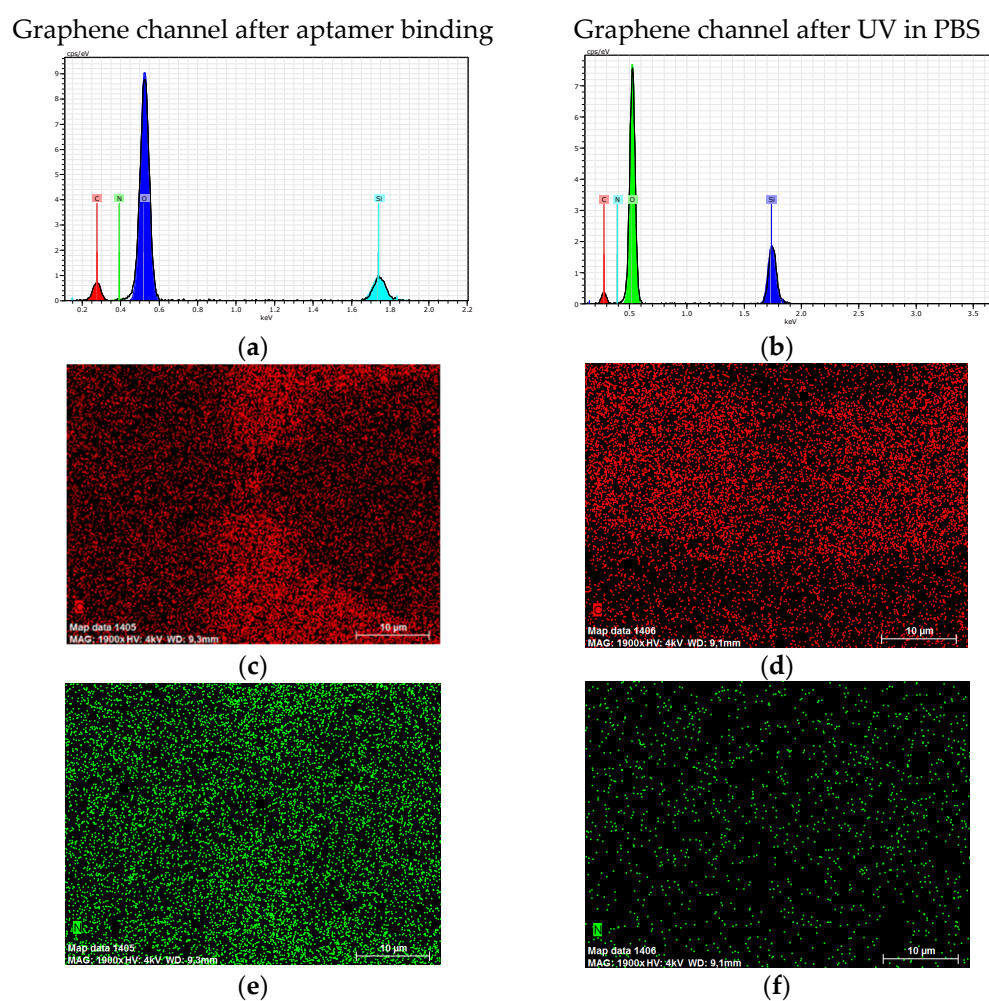


Figure S2. Energy dispersive spectroscopy characterization of modified graphene channels. Results of graphene surfaces after azide aptamer binding (left column) and after 5 min UV treatment without aptamer (right column). Red (c, d) and green (e, f) dots represent the parts covered with a carbon and nitrogen element, respectively. Scale bar: 10 μm .

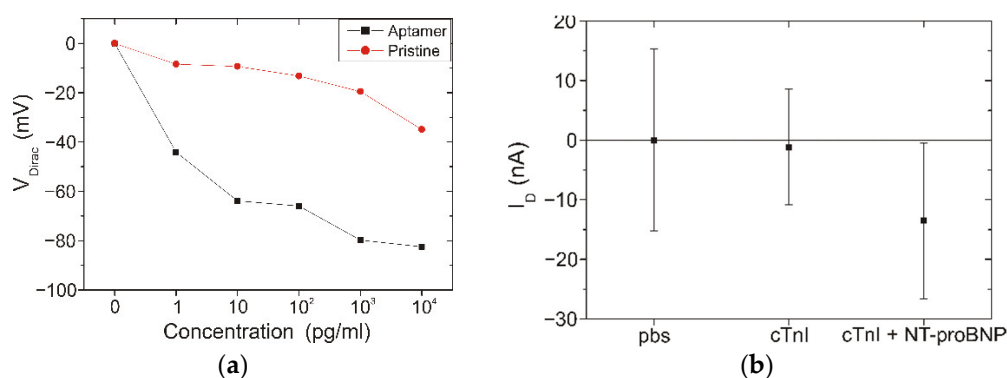


Figure S3. Control experiments on selectivity and specificity. (a) Dirac point shift for pristine (after 10 min UV treatment) and aptamer-modified graphene channels for increasing NT-proBNP concentrations. (b) ΔI_D for pure PBS, cTnI (3.5 ng/ml) and mix of 3.2 ng/ml cTnI + 1 ng/ml NT-proBNP for N20a aptamer-modified GET at a fixed gate voltage $V_G = 250$ mV. The current values were treated to start at zero using the equation $\Delta I_D = I_D - \text{minimum}(I_D)$.

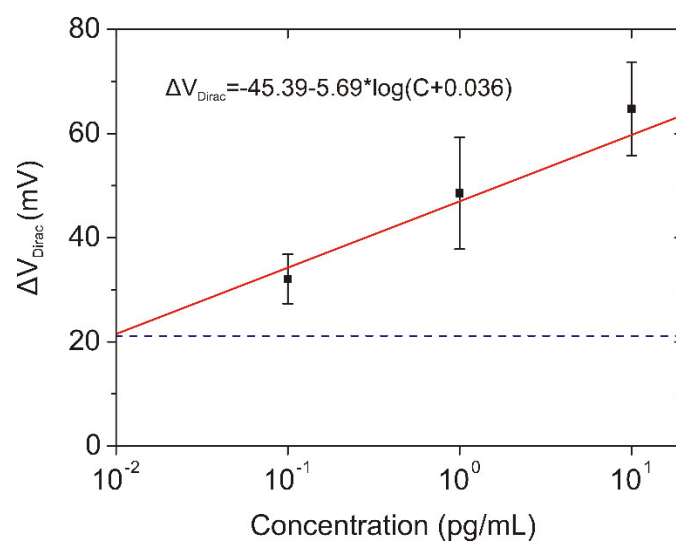


Figure S4. Calculation of LOD for GFET sensor, modified by azide-aptamer. Based on data at Figure 3b. The LOD was calculated as intersection of data from linear range and 3 times multiplied noise level of GFET.