Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supplementary

	Advantages	Limitations
Enzyme-linked immunosorbent assay (ELISA)	Ultra-high sensitivity	Resource intensive; limited information on enzyme activity
Colorimetric assay	Naked eye detection	Long lag time (≈ 20 min)
SPR-based assay	Lag time free (< 2 min)	Low sensitivity (1.82 nM)

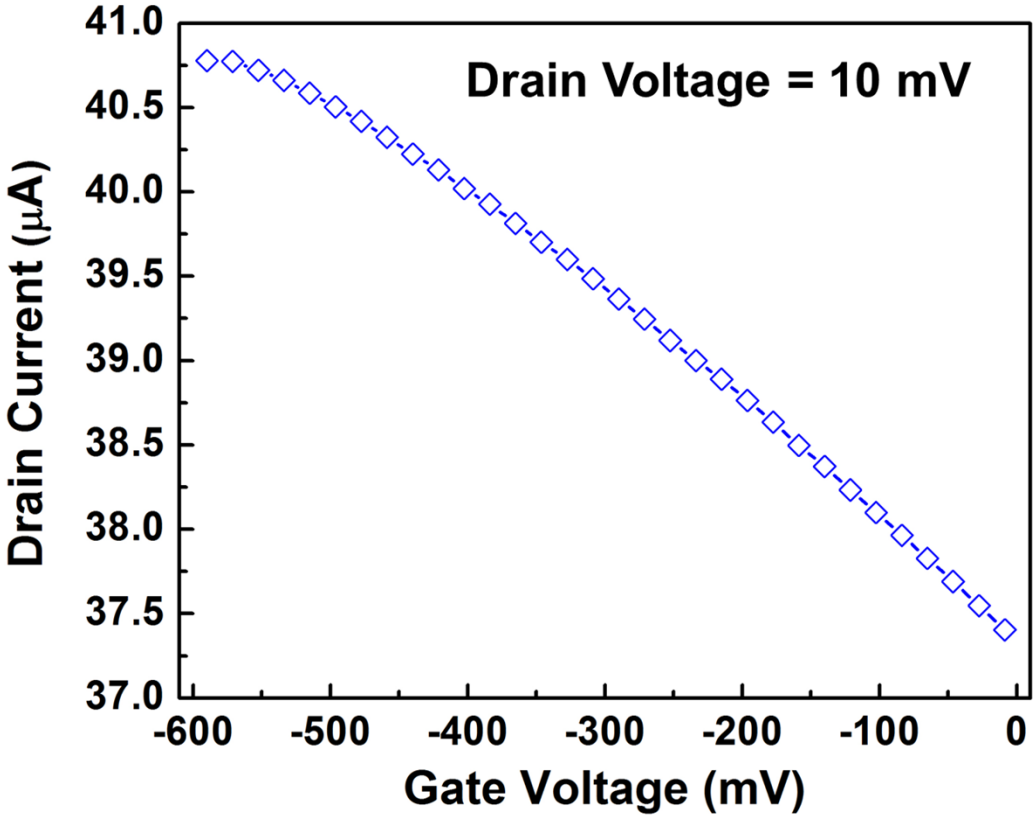
Table S1. A comparison of current PLA_2 assays.

The commercially available sensors based on ELISA for PLA_2 are not ideal candidates for practical applications as ELISA is resource intensive (long assay time, expensive equipment and well-trained personnel) and can only provide limited information on the enzyme activity, in spite of its excellent sensitivity. Aili et al. (Aili et al. 2010) reported a colorimetric approach for the detection of phospholipase concentration and activity using Au nanoparticles (AuNP) and polypeptides. This approach achieves naked eye detection, while its lag time is relatively long. Another assay reported (Chen et al. 2014) involved hybrid nano-constructs as label-free optical probes for SPR-based detection of PLA_2. In this approach, the specificity was excellent and the assay time was significantly reduced, but the sensitivity of this assay was relatively low (LOD = 1.82 nM).

Figure S1(a) and (b) show the I_d vs. V_g at a drain voltage of 10 mV and I_d vs. V_d at different gate voltages, respectively. The device shows typical semiconducting behavior in the range from –

600 mV to 0 mV, indicating its good functionality as a transistor. Meanwhile, the linear relation between I_d and V_d illustrated that the contact between the rGO films and the Au electrode was a good Ohmic contact.

(a)



(b)

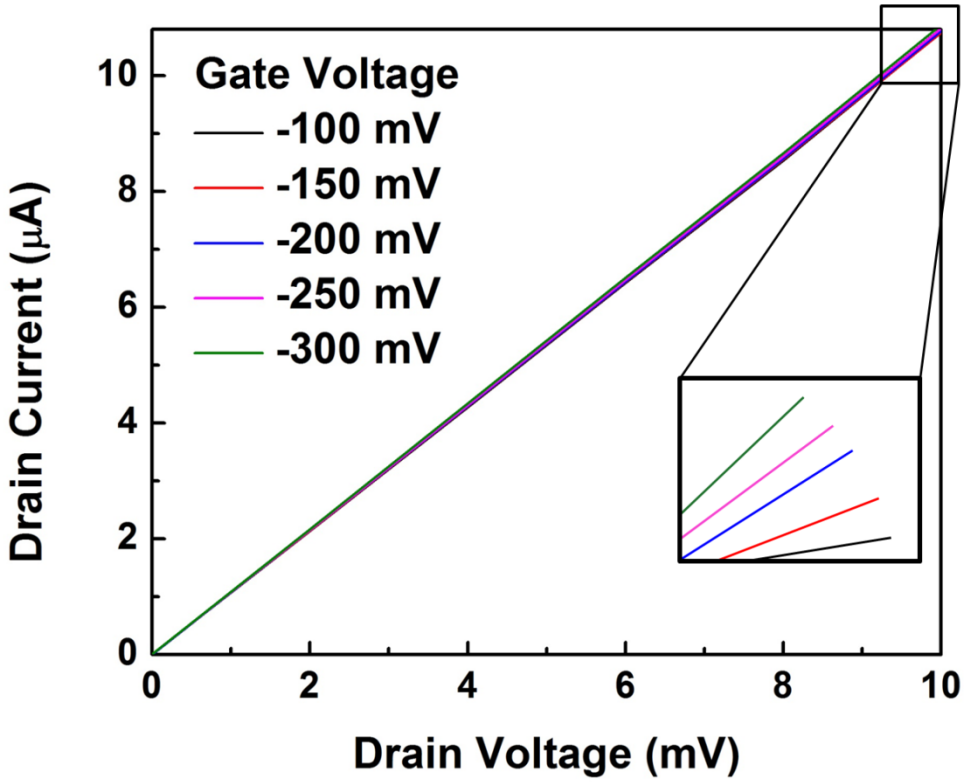


Figure S1. (a) I_d vs. V_g at a fixed V_d (10 mV); (b) I_d vs. V_d at different gate voltages (ranging from - 100 mV to – 300 mV).