Supplementary Information

A novel fluorescent assay for inorganic pyrophosphatase based on modulated aggregation of graphene quantum dots

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Fig. S1. Fluorescence excitation (red curve) and emission (black curve) spectra of as-prepared GQDs.

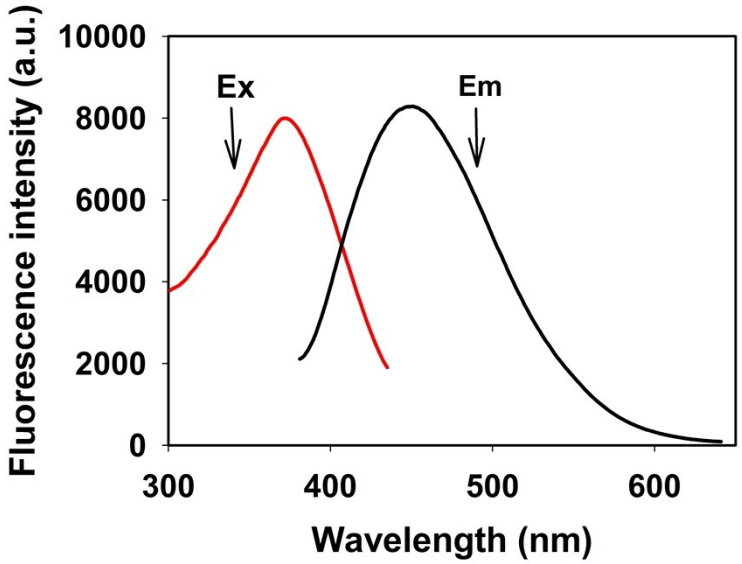

Fig. S2. The quantum yield of carboxyl-functionalized graphene quantum dots (blue curve) and the standard material of quinine sulfate (black curve).

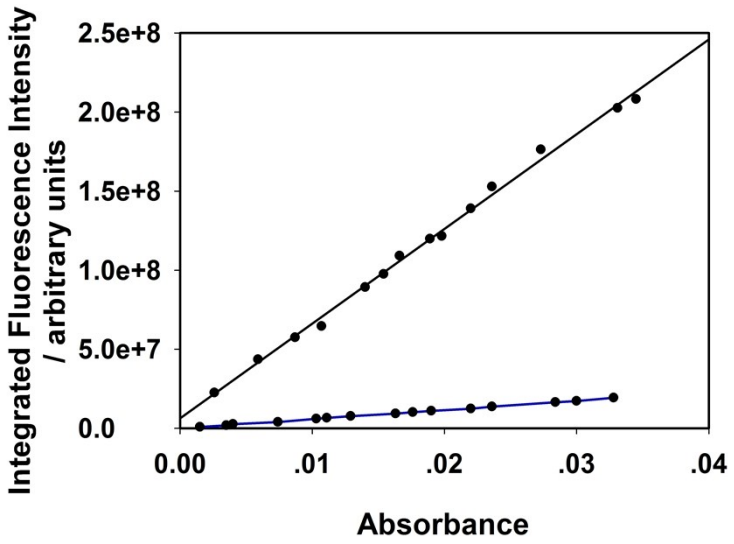

Fig. S3. (A) The zeta potential of GQDs, (B) The zeta potential of Cu^{2+}-GQDs Complexes.

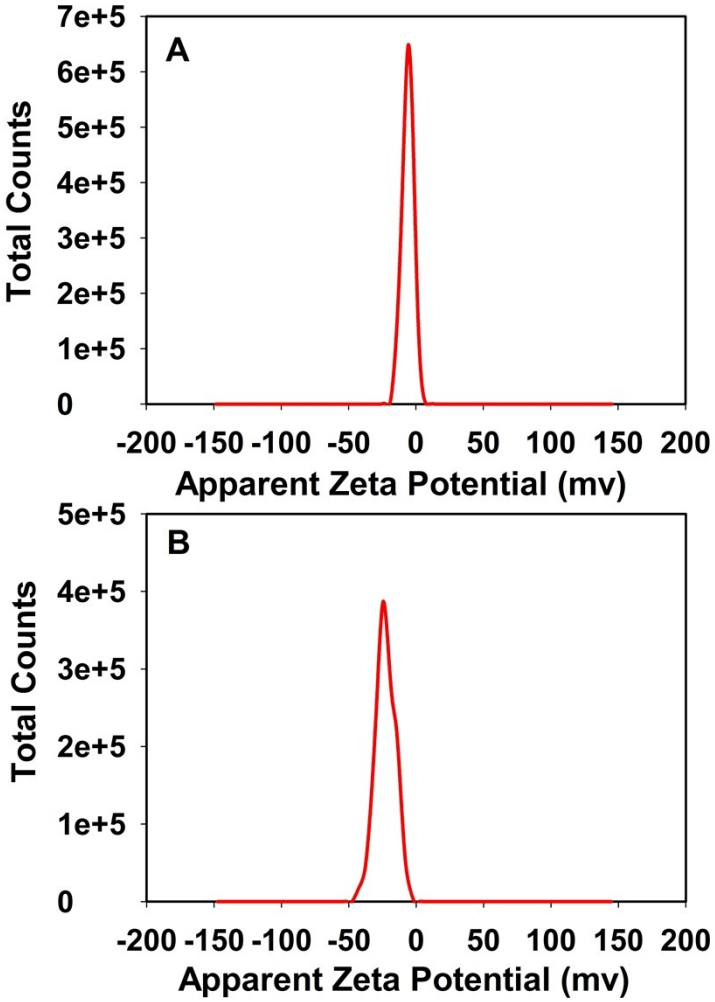

Fig. S4. Fluorescence intensity (*I* at 449nm) for mixture of GQDs and Cu^{2+} with respect to the PPi concentrations in 10 mM HEPES buffer at pH 7.2.

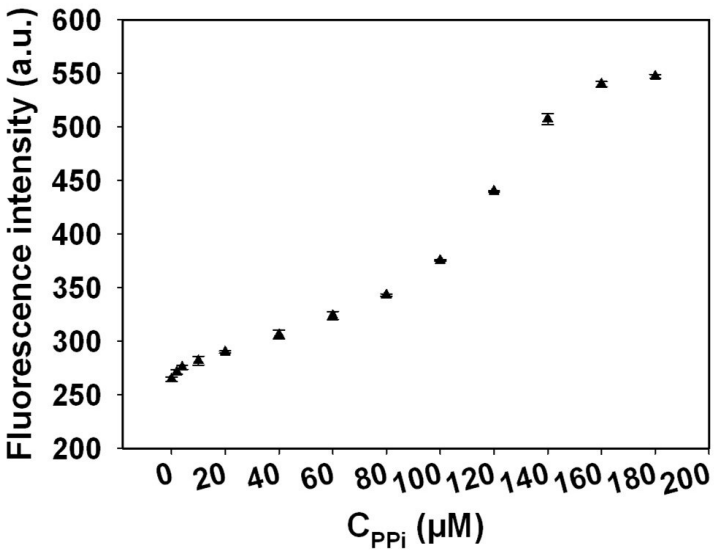

Fig. S5. Fluorescence intensity (*I* at 449nm) for mixture of GQDs, Cu^{2+} and PPi with respect to the PPase concentrations in 10 mM HEPES buffer at pH 7.2.

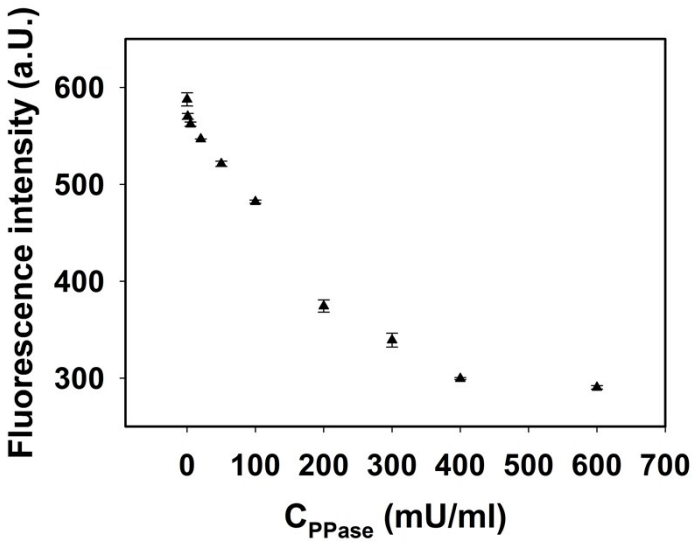

Table S1 Comparison of the developed assay with literature reports fluorescence assay for PPase

Materials used	Analytical range (mU/mL)	Limit of detection (mU/mL)	Reference
Firefly luciferase	40-2500	40	[1]
Gold nanoparticals	41.7-666.7	16.7	[2]
Cu(Ⅱ)	2.5-50	1	[3]
Fluorescent 11-mercaundecanoic acid-capped AuNCs	0.5-10	0.5	[4]
2,2-azinobis(3-ethyl benzothiazoline)-6-sul-fonic acid	30-400	27	[5]
GQDs	1-200	1	Our work

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