Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Quantum dot cluster (QDC)-loaded phospholipid micelles as FRET probe for phospholipase A_2 detection

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Experimental

Synthesis of single quantum dot-loaded phospholipid micelles without NBD

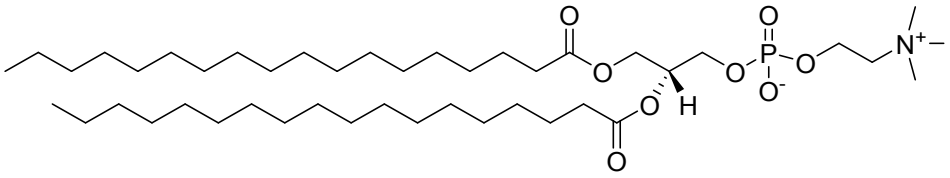
The single quantum dot-loaded phospholipid micelles without NBD was prepared using an oil-in-water emulsion-based self-assembly method. A mixture containing HSPC (0.88 mg) and QD (1 mg) in 150 μL chloroform was injected into a glass vial containing 3 mL of water, and the sample was sonicated until a homogenous mixture was obtained. The chloroform was then allowed to evaporate overnight. Following that, QDC-loaded phospholipid micelles samples were centrifuged at 1000 rpm for 30 minutes to remove large aggregates. To obtain the QDC-loaded micelle without NBD, the resulting supernatant was centrifuged at 3000 rpm for half hour, and the pellet was resuspended in water (1 mL). To obtain the single QD-loaded micelle without NBD, the resulting supernatant was then centrifuged at 10000 rpm for half hour, and the pellet was resuspended in water (1 mL). The collected samples of QDC- and QD-loaded phospholipid micelles were stored in the dark at 4 °C and used for UV-vis (Figure S2) and fluorescence (Figure S3) measurement.

Synthesis of NBD-containing liposomes

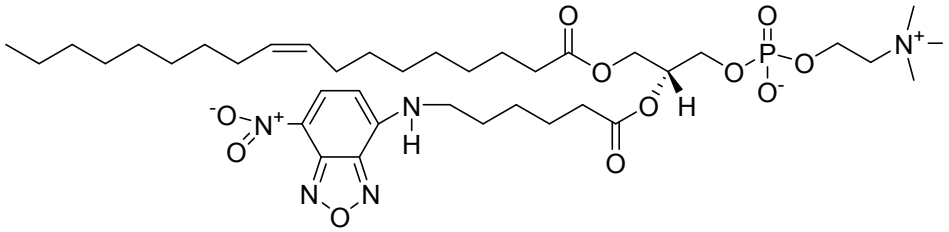
The NBD-containing liposome was prepared using an oil-in-water emulsion-based self-assembly method. A mixture containing HSPC (0.88 mg) and NBD PC (0.1 mg) in 150 μL chloroform was injected into a glass vial containing 3 mL of water, and the sample was sonicated until a homogenous mixture was obtained. The chloroform was then allowed to evaporate overnight. Following that, NBD-containing liposomes samples were centrifuged at 3000 rpm for 30 minutes to remove large aggregates, the

resulting supernatant was stored in the dark at 4 °C and used for NBD fluorescence measurement (Figure S4).

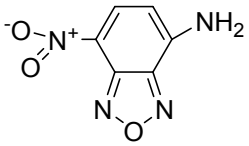
Chemical information



HSPC



NBD PC



NBD

Hydrophobic CdSe/ZnS QD

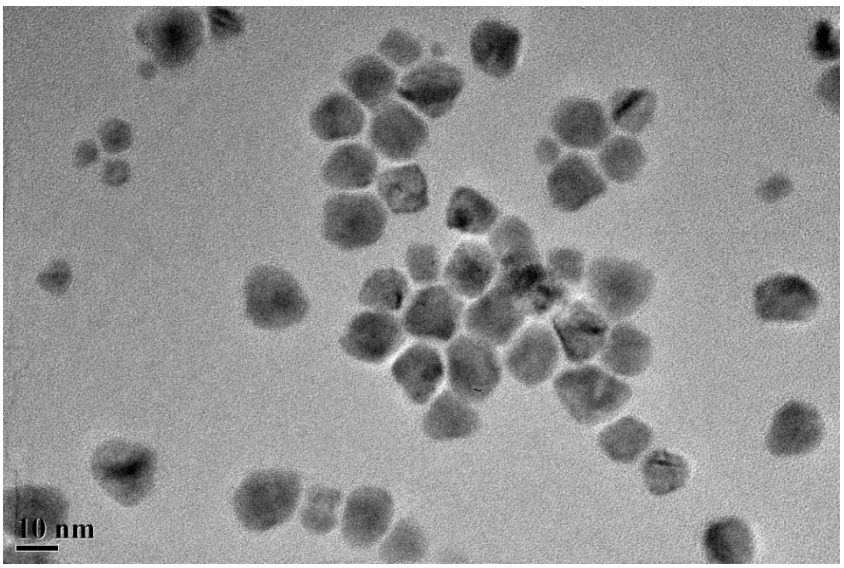


Figure S1 TEM image of single quantum dot-loaded phospholipid micelles.

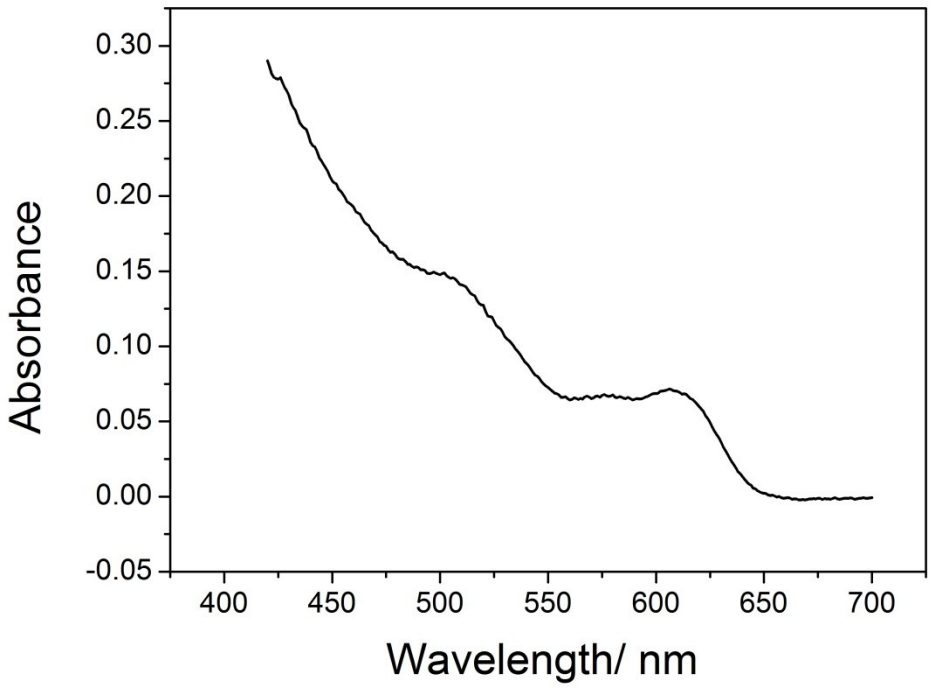


Figure S2 Absorption spectra of single quantum dot-loaded phospholipid micelles without NBD.

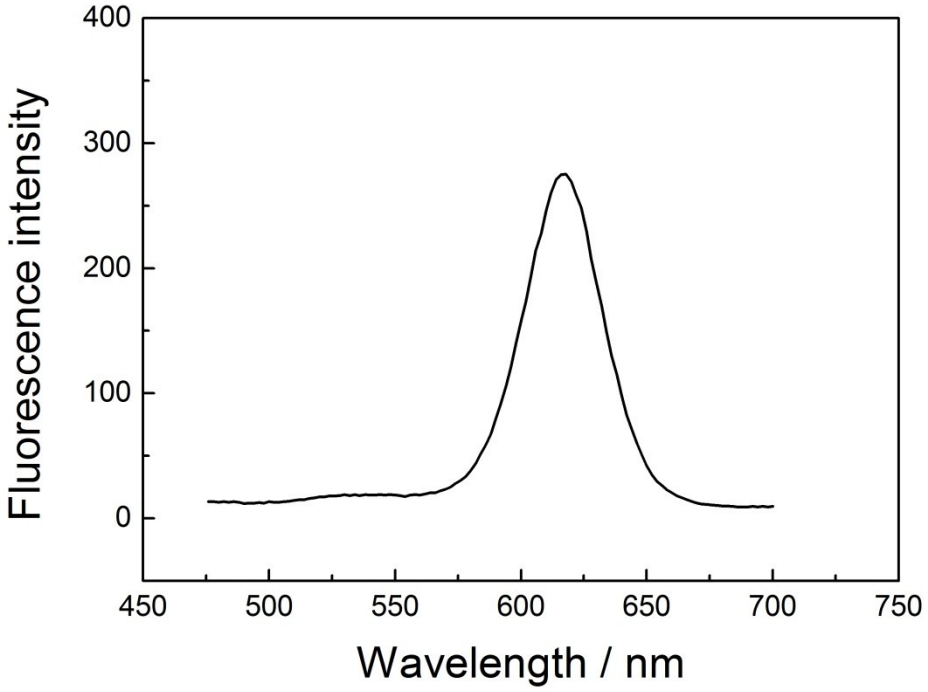


Figure S3. Emission spectra of QDC-loaded phospholipid micelles without NBD. Ex, 460 nm. Aliquots (900 μL) of 10.0 mM HEPES buffer (pH 7.4) containing 2.0 mM $CaCl_2$ and samples (50 uL).

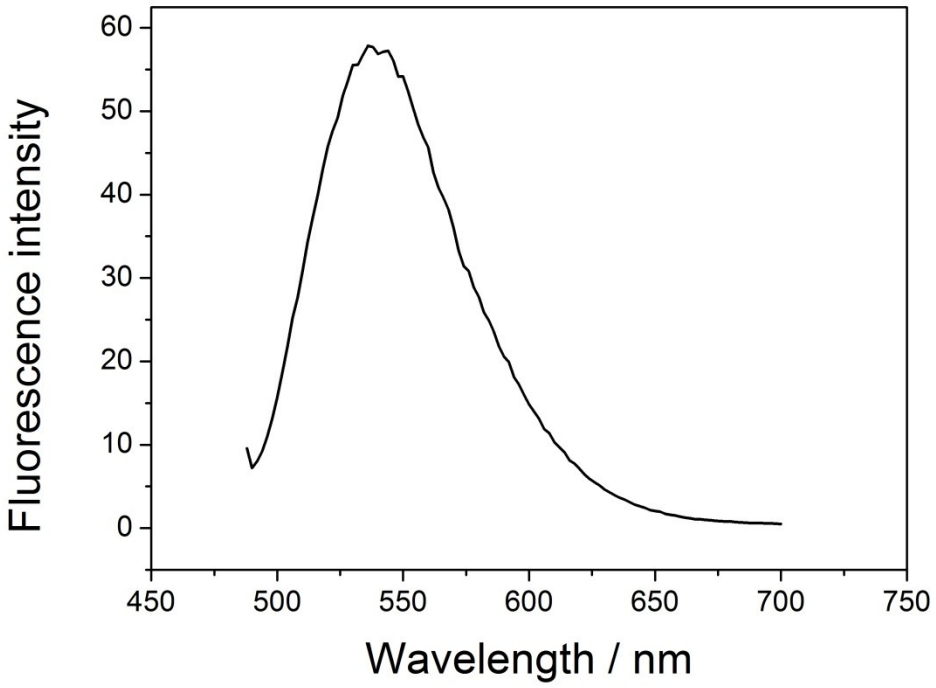


Figure S4. Emission spectra of NBD-containing liposome. Ex, 460 nm. Aliquots (900 μL) of 10.0 mM HEPES buffer (pH 7.4) containing 2.0 mM $CaCl_2$ and NBD-containing liposomes (50 uL).

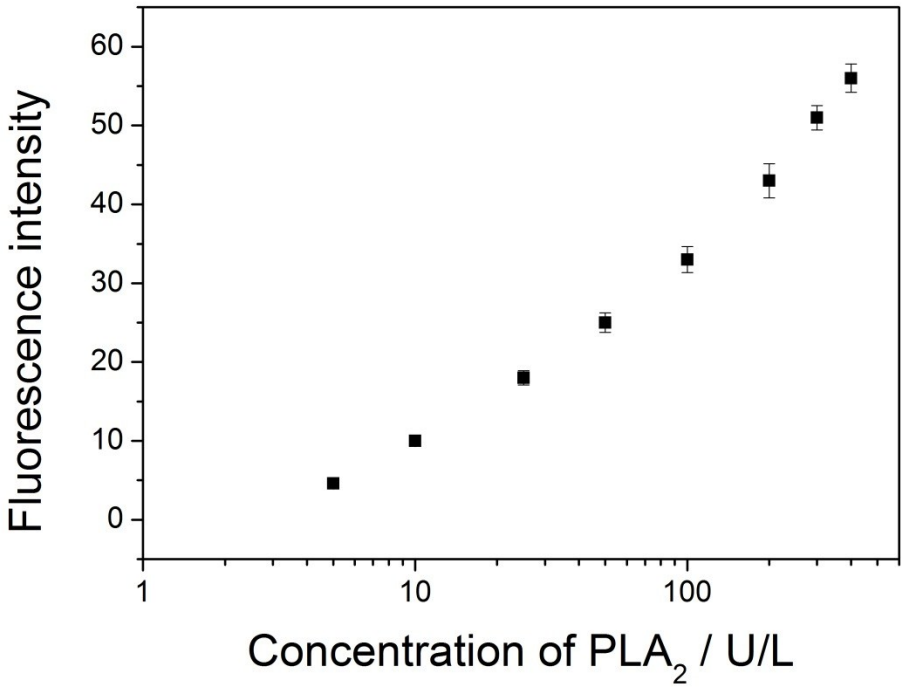


Figure S5 Linear range of the probe for the PLA_2 detection. Concentration of PLA_2, 5, 10, 25, 50, 100, 200, 300, 400 U/L. Ex, 460 nm, Em, 545 nm.

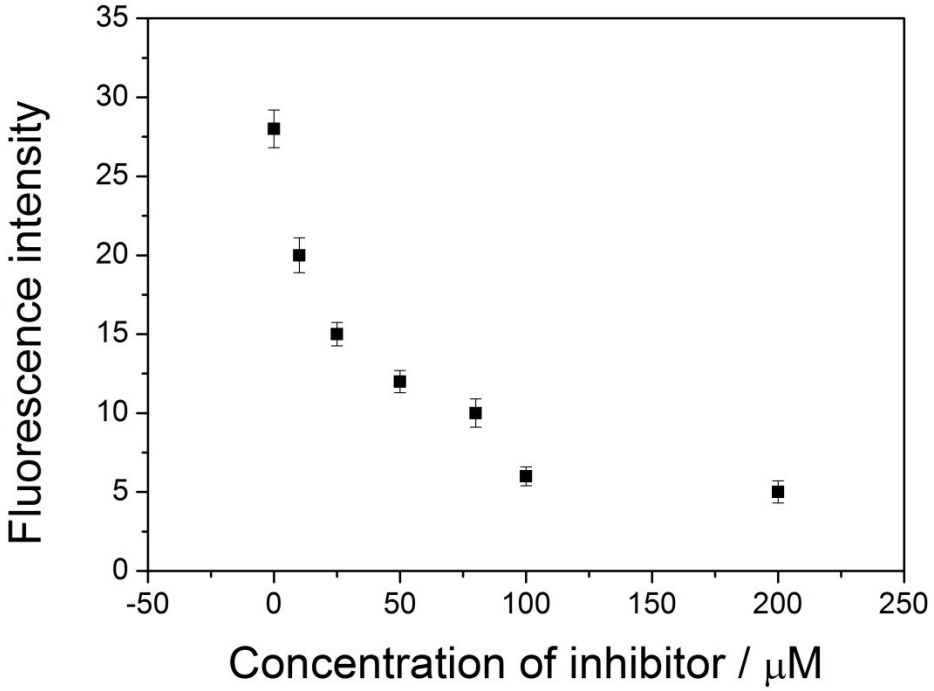


Figure S6 Dependence of fluorescence intensity on inhibitor LY311727 concentrations. Concentrations of inhibitor LY311727: 0, 10 μM, 25 μM, 50 μM, 80 μM, 100 μM, 200 μM. The concentration of PLA_2, 50 unit/L.