Supporting Information

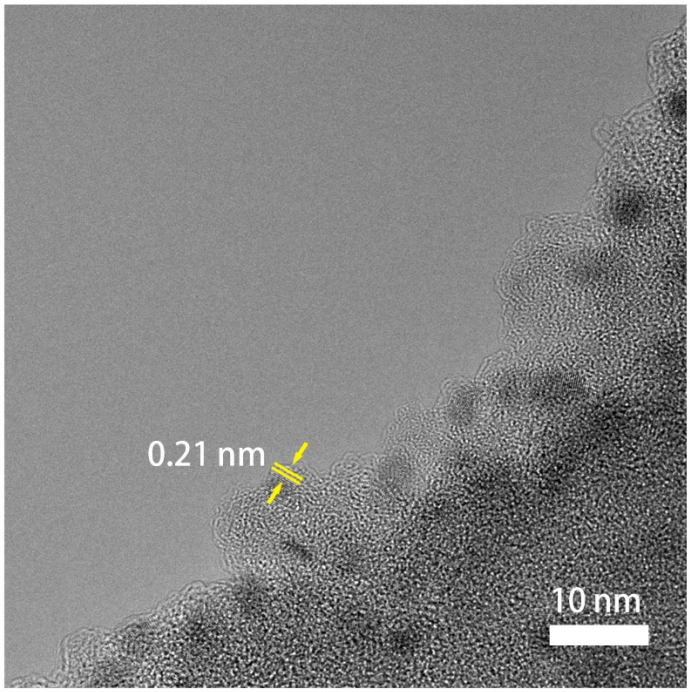

Figure S1. TEM image of Cu QDs

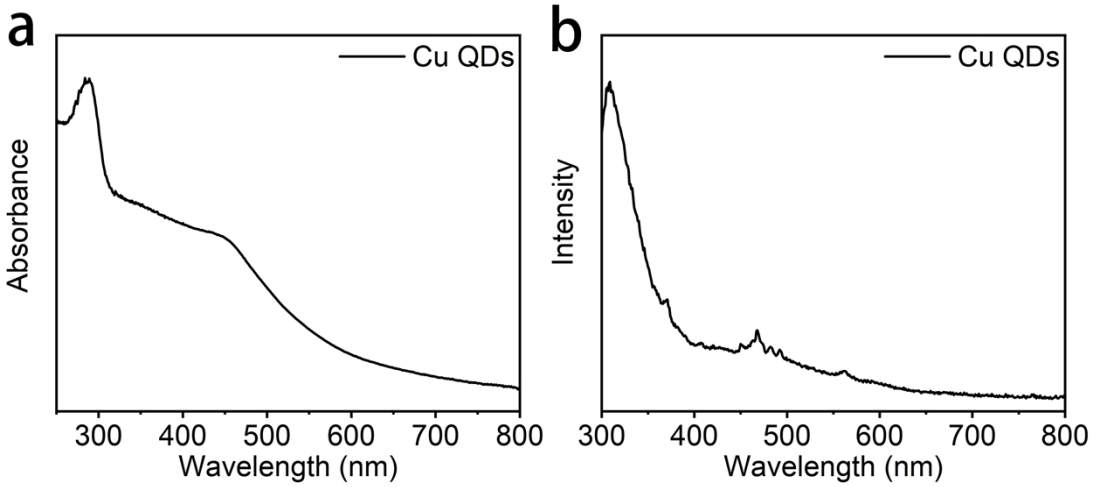

Figure S2. a) UV-vis absorption spectra and b) fluorescence spectroscopy spectra of SDBS-protected Cu QDs.

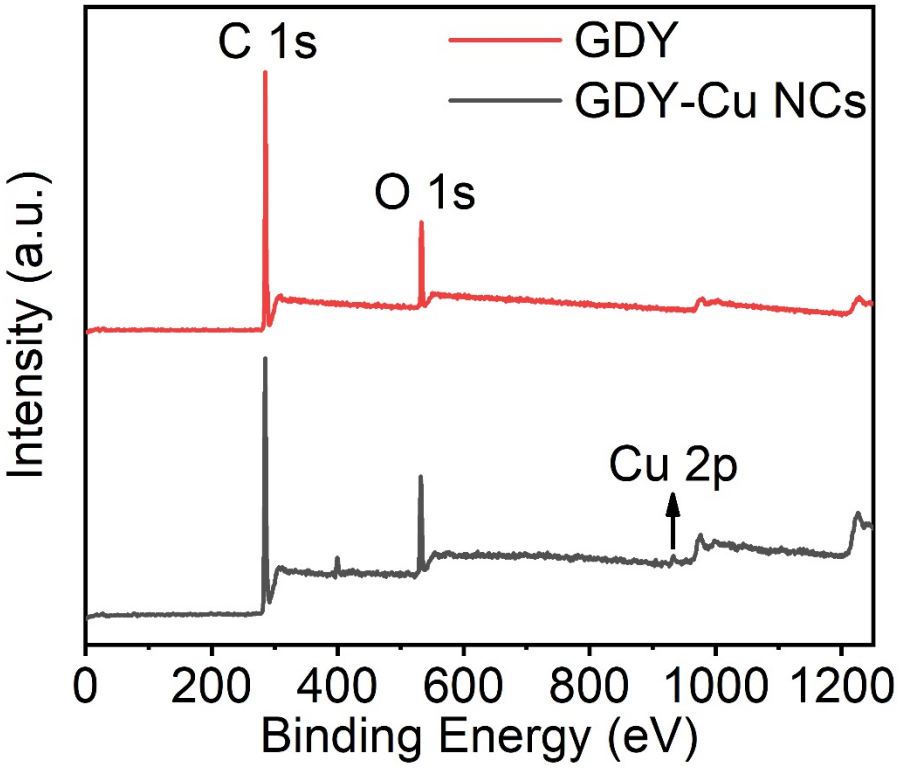

Figure S3. XPS survey spectra of GDY-Cu_{55} NCs and GDY.

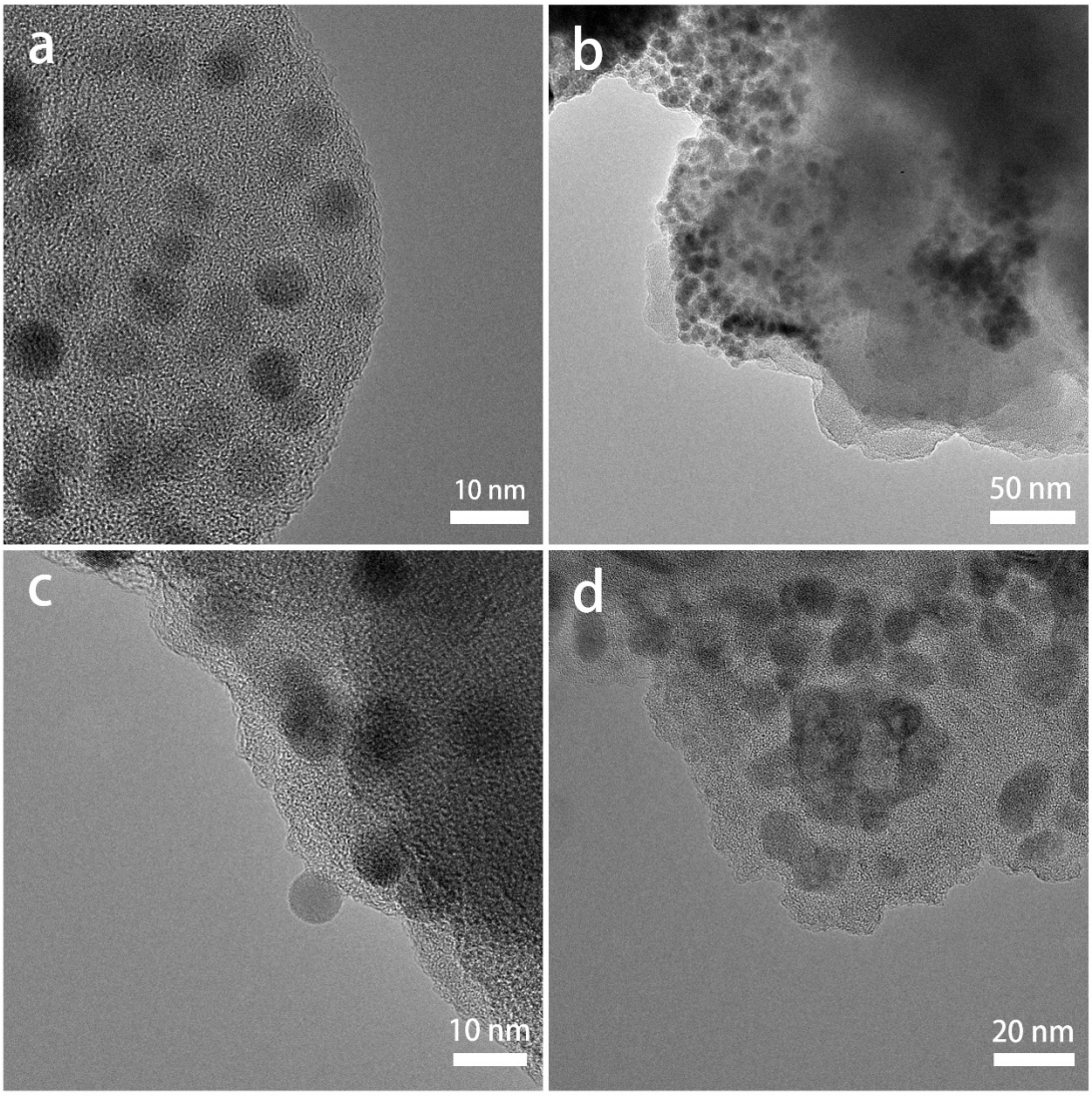

Figure S4. a) TEM images of GDY-Cu QDs; (b-c) TEM images of physical mixing of GDY and Cu QDs; d) TEM images of GDY-Cu NPs

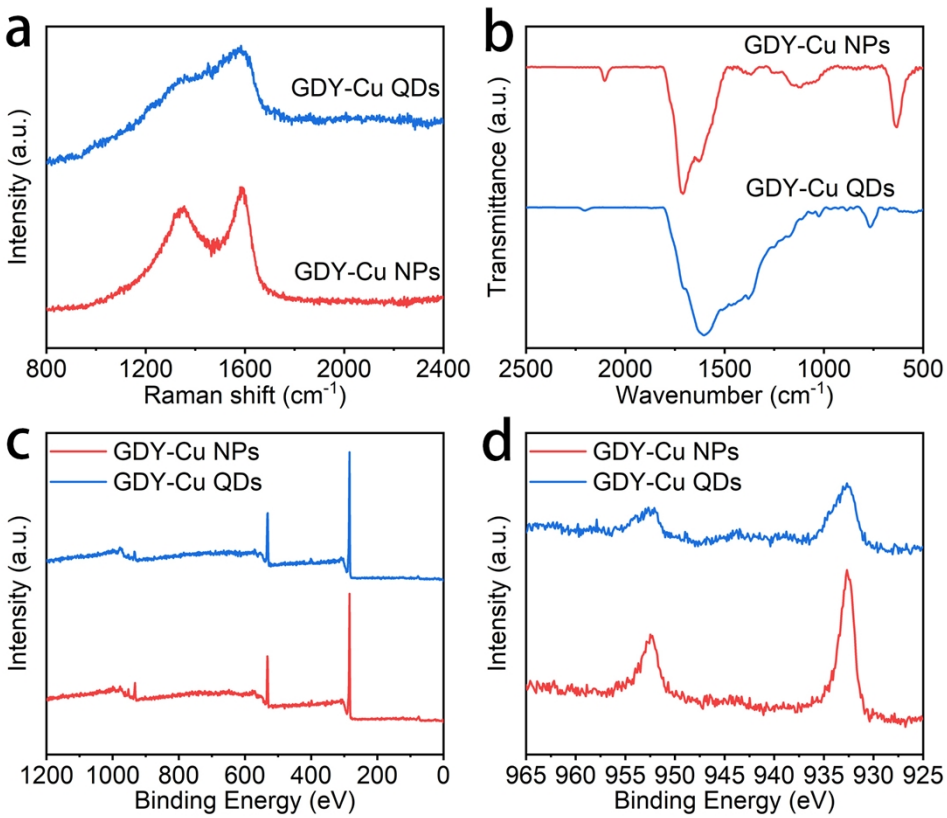

Figure S5. a). Raman spectra of GDY-Cu NPs and GDY-Cu QDs; b). FTIR spectra of GDY-Cu NPs and GDY-Cu QDs; c). XPS survey spectrum of GDY-Cu NPs and GDY-Cu QDs; d). XPS spectrum of Cu 2p electrons GDY-Cu NPs and GDY-Cu QDs.

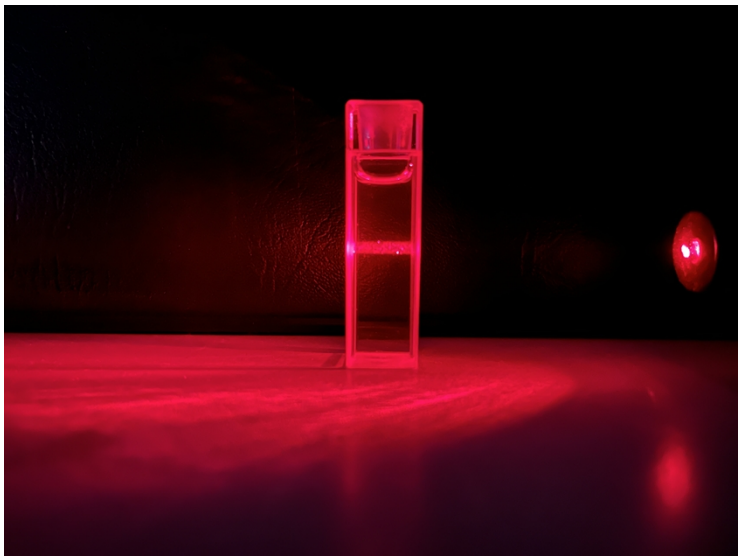

Figure S6. Optical image of GDY-Cu_{55} NCs colloidal solution with Tyndall effect.

.

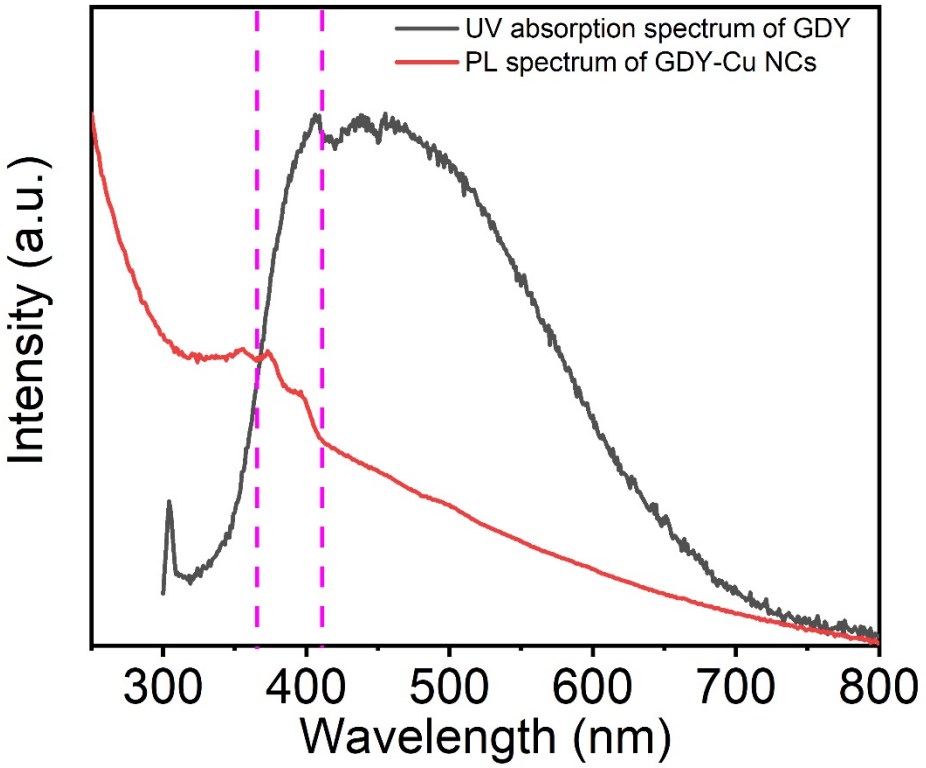

Figure S7. The overlapping band of UV absorption spectrum of GDY and PL spectrum of GDY-Cu_{55} NCs (from 364nm to 411nm)

Fluorescence lifetime calculation and Quantum yield (QY) measurement

All FL decay curve was fitted into a tri-exponential function as mentioned below.

$$I(t) = A_1 e^{\left(-t/\tau_1\right)} + A_2 e^{\left(-t/\tau_2\right)} + A_3 e^{\left(-t/\tau_3\right)} \quad (1)$$

Where τ_i is the decay time of components, and A_i is the corresponding contributions. The average decay time can be further calculated by the equation.

$$T = \left(A_1\tau_1 + A_2\tau_2 + A_3\tau_3\right) / \left(A_1 + A_2 + A_3\right) \quad (2)$$

The fluorescence lifetime of GDY-Cu_{55} NCs was calculated to be 6.96 ns.

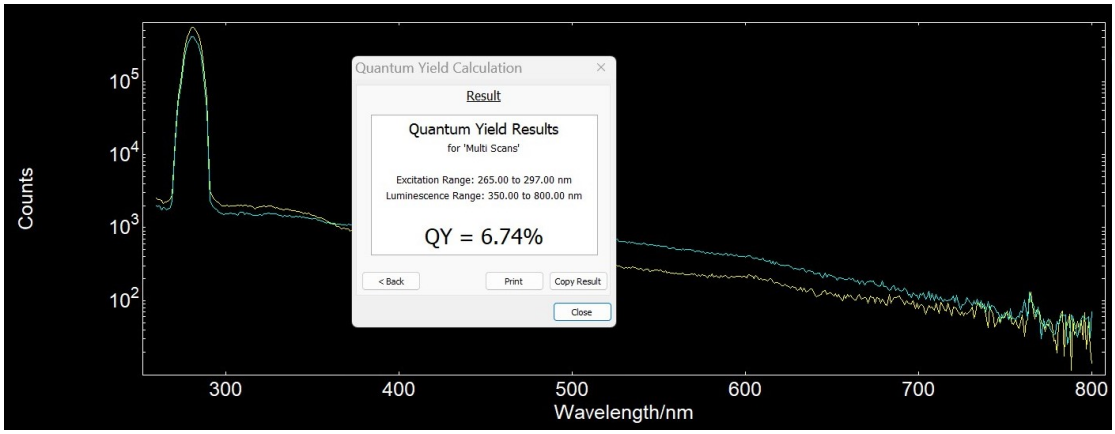

Figure S8. The fluorescence quantum yield of GDY-Cu NCs

The fluorescence quantum yield of GDY-Cu_{55} NCs was 6.74%.