

Supplementary Materials

Graphene Quantum Dots as Intracellular Imaging-Based Temperature Sensors

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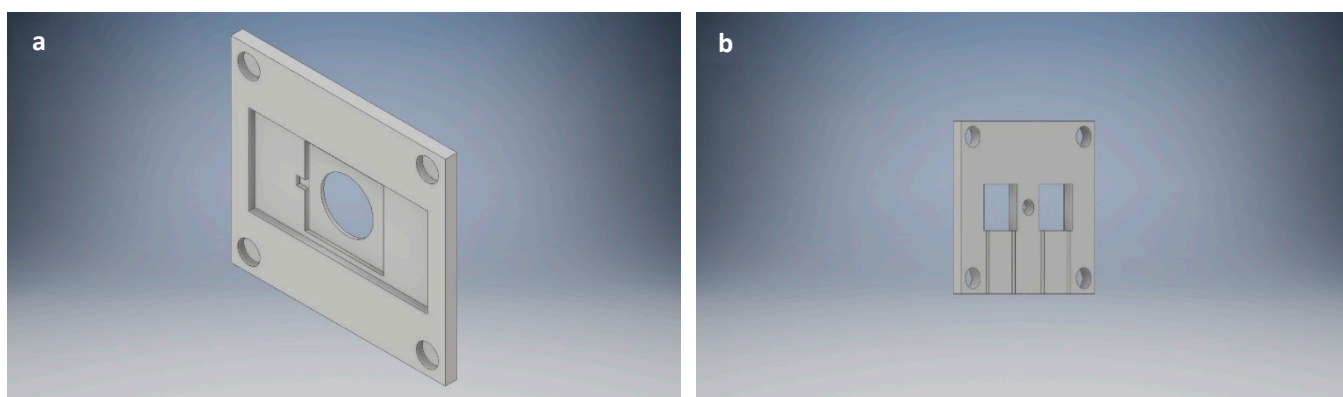


Figure S1. Schematic of the ITMD for temperature-controlled microscopy imaging. **(a)** Base of the holder intended for cover slips, copper plate for improved heat conductivity and a thermocouple for in situ temperature measurements **(b)** top of thermal device that holds Peltier thermoelectric modules. (Autodesk Pro.).

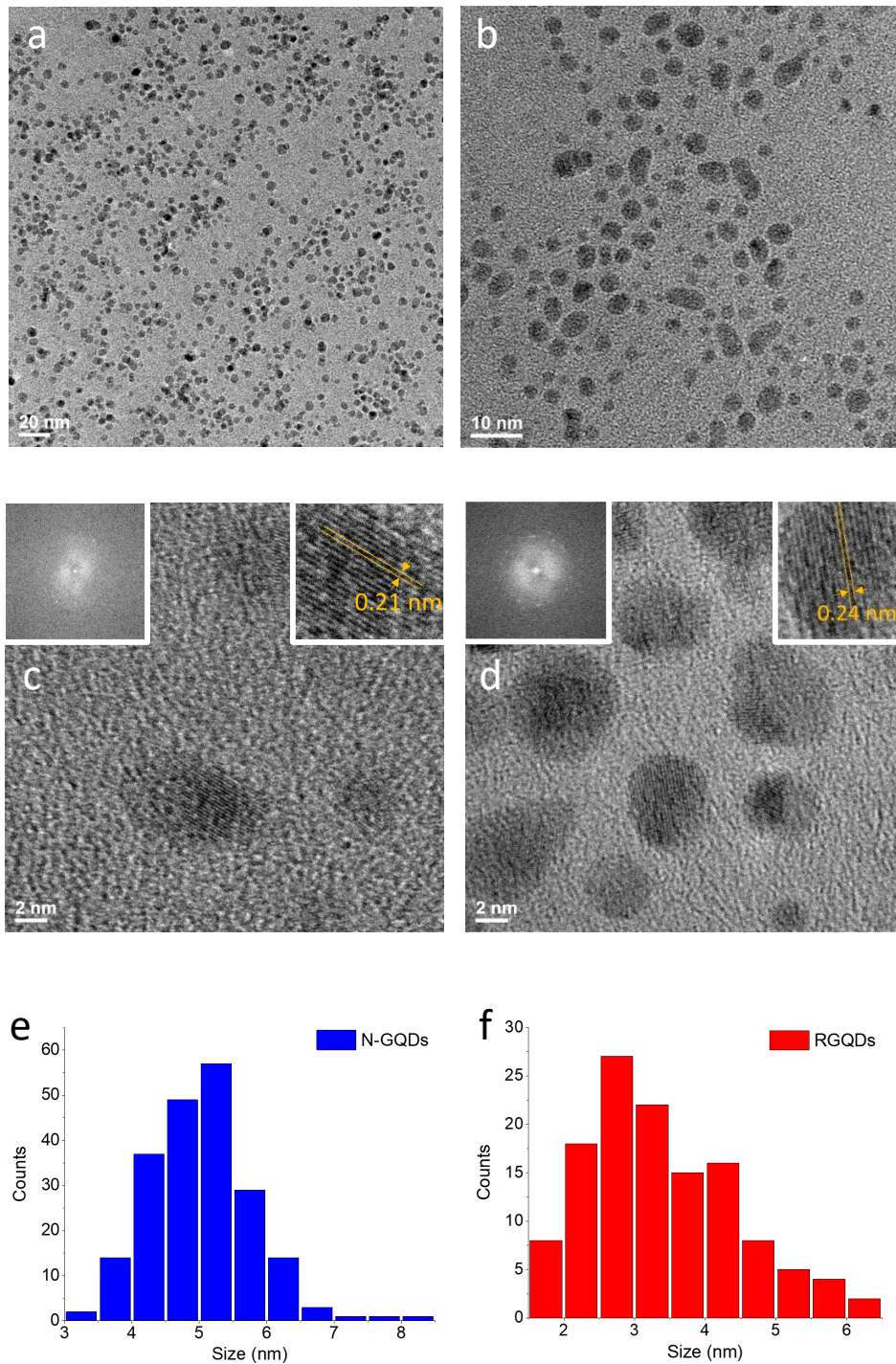


Figure S2. TEM images of as-synthesized N-GQDs (a) and RGQDs (b). HRTEM images of as-synthesized N-GQDs (c) and RGQDs (d) with corresponding insets showing diffraction pattern with discernable lattice fringes (indicating crystallinity) and zoom-in on an individual GQD showing the lattice spacing corresponding to graphene lattice. Size distribution of N-GQDs (e) and RGQDs (f) with a size of 5.0 ± 0.7 and 3.4 ± 1.1 nm (mean \pm s.d.), respectively.

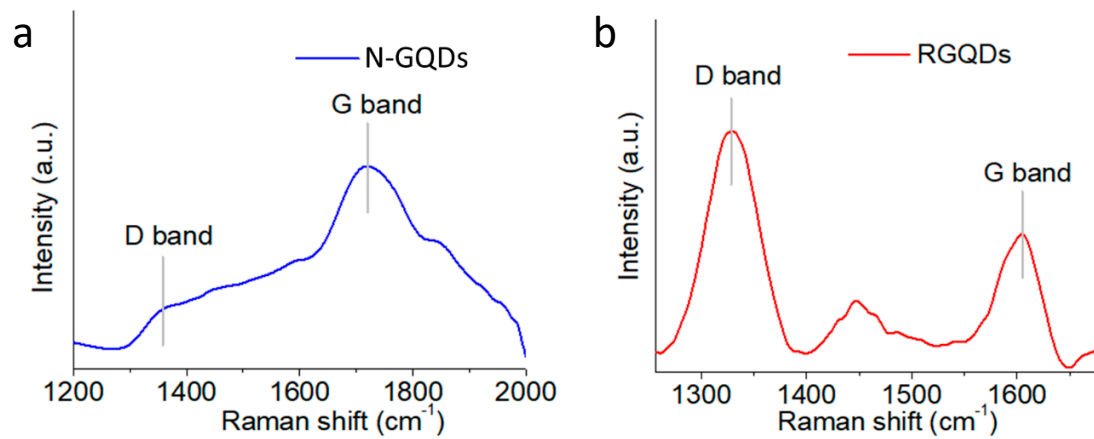


Figure S3. Raman spectra of N-GQDs (a) and RGQDs (b).

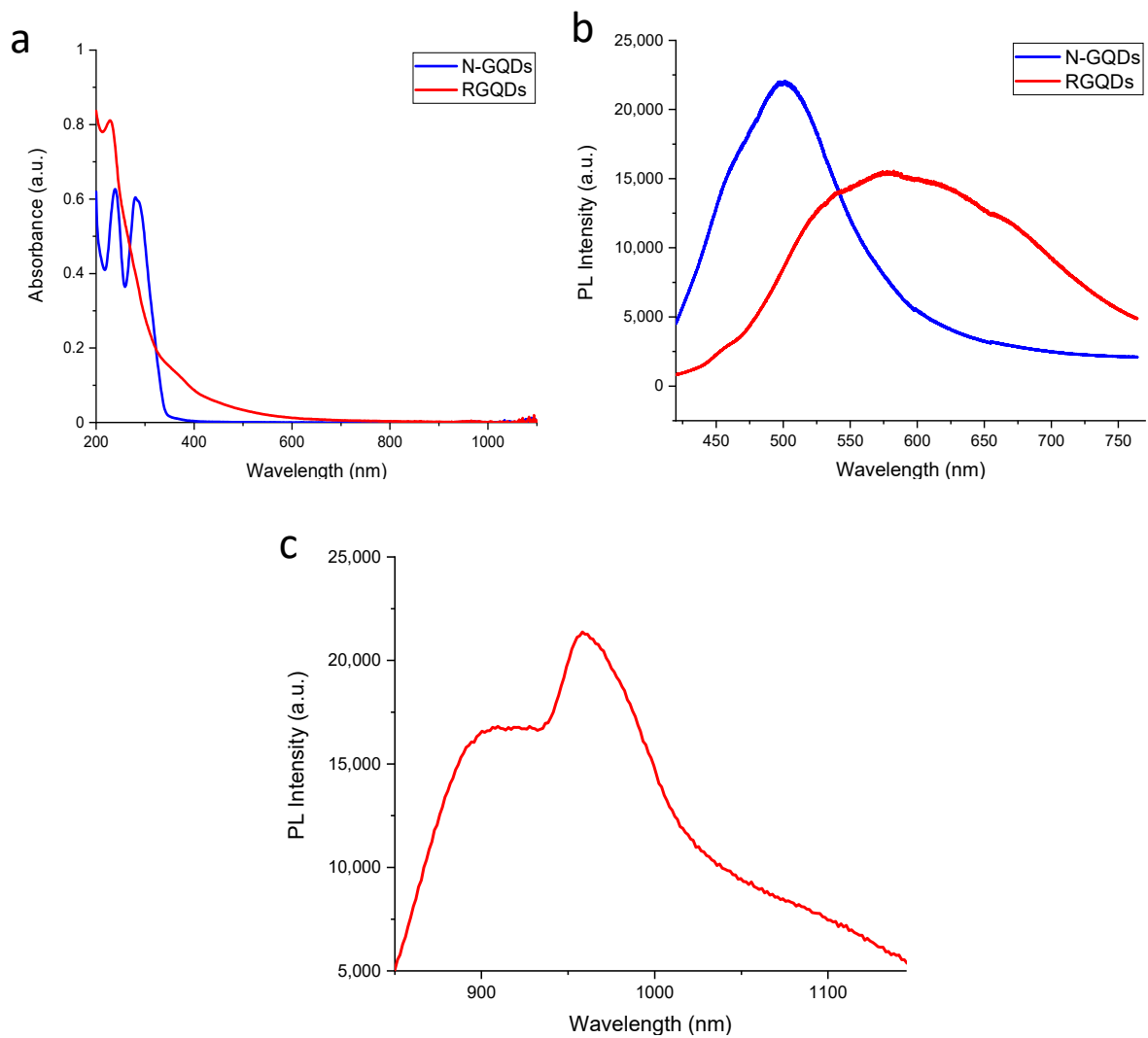


Figure S4. (a) Absorption of N-GQDs (blue) and RGQDs (red). (b) Visible fluorescence emission of N-GQDs (blue) and RGQDs (red) with 400 nm excitation. (c) NIR fluorescence emission of RGQDs with 475 nm excitation.

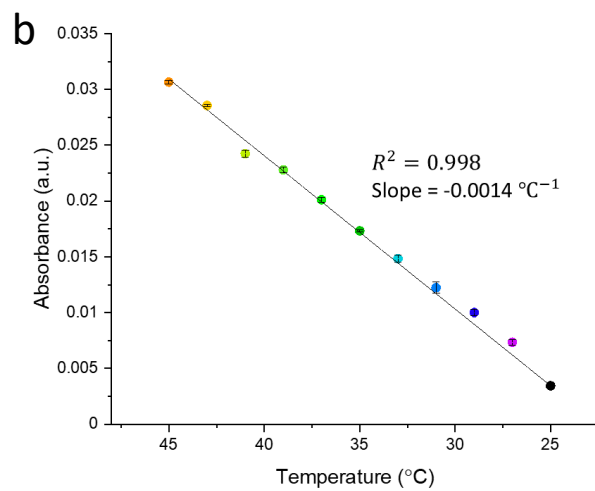
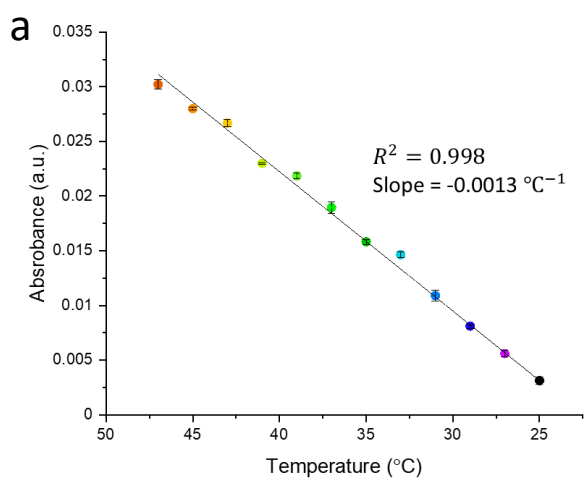


Figure S5. Near-infrared absorbance peak value vs. temperature for the cooling process for **(a)** N-QDs and **(b)** RGQDs.

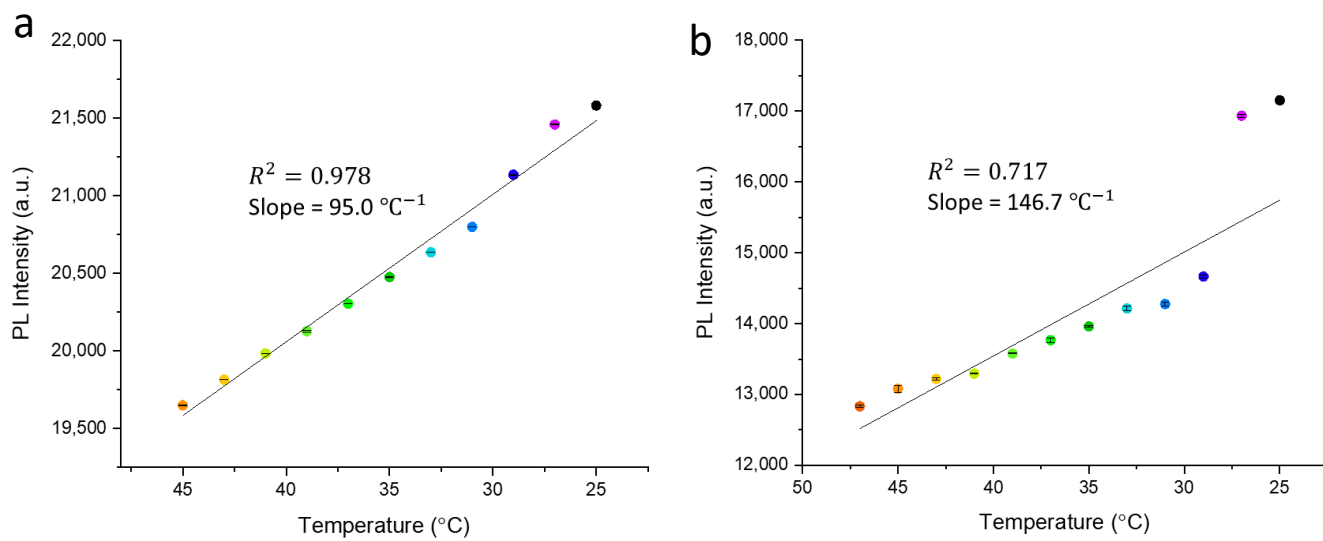


Figure S6. Peak photoluminescence intensity vs. temperature for the cooling process of RGQDs NIR (a) and visible (b) fluorescence.

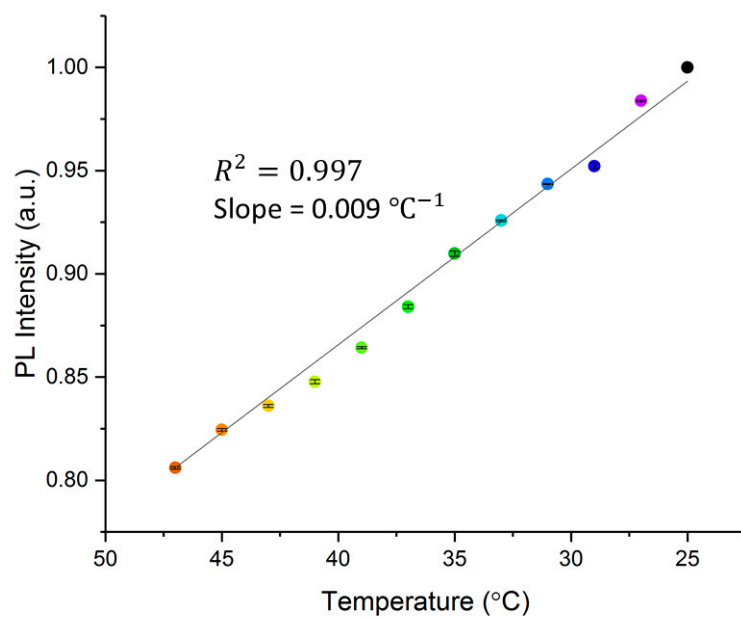


Figure S7. Visible peak photoluminescence intensity vs. temperature for the cooling process of N-GQDs.

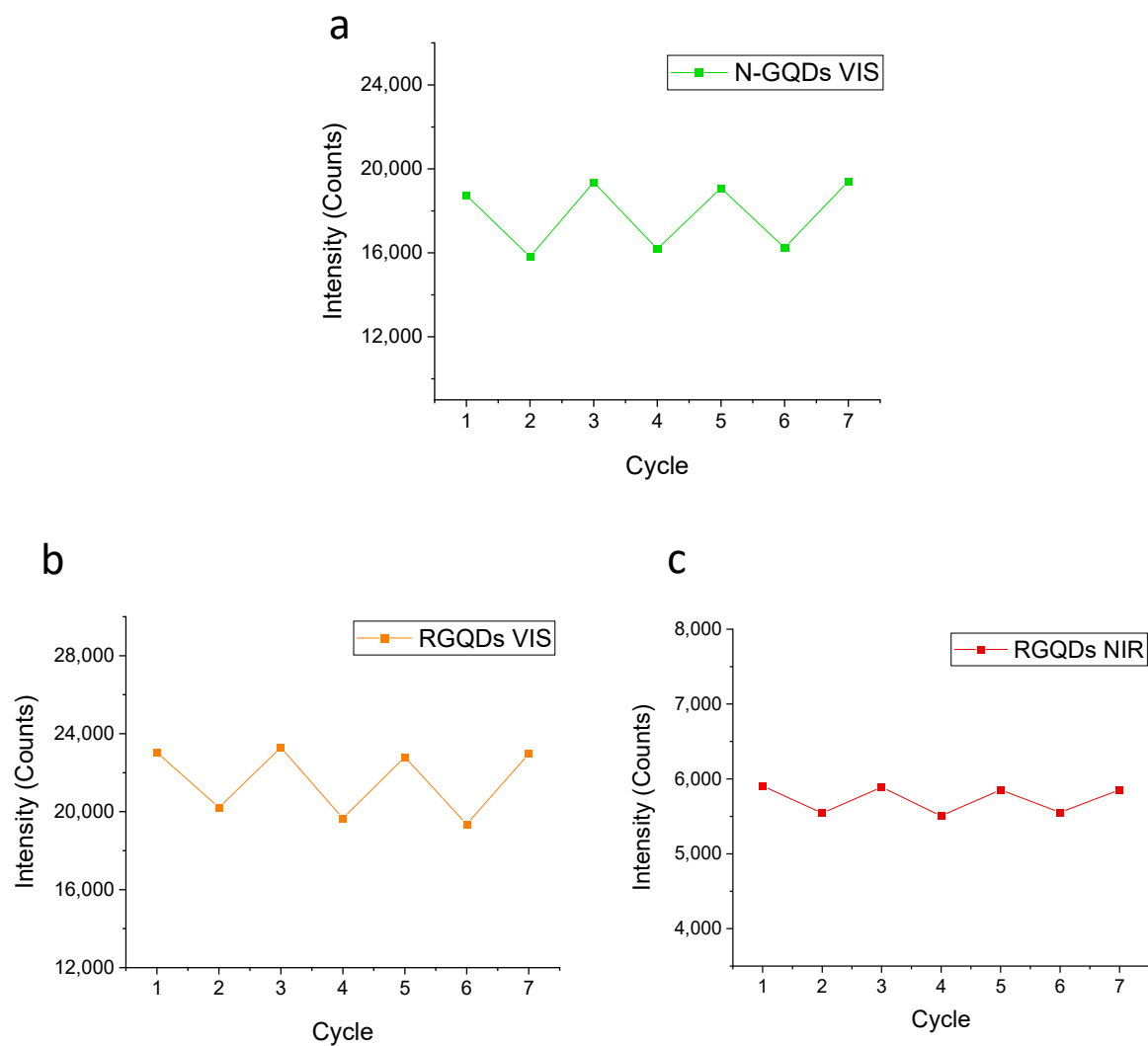


Figure S8. Heating and cooling cycles of the visible N-GQDD fluorescence (a) visible RGQD fluorescence (b) and NIR RGQD fluorescence (c) between 25 °C and 49 °C.