Automated Approach to *In Vitro* Image-Guided Photothermal Therapy with Top-Down and Bottom-Up-Synthesized Graphene Quantum Dots

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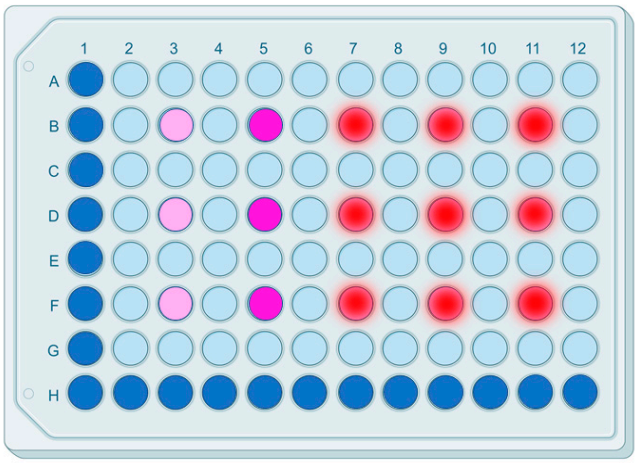

Figure S1. *In vitro* PTT setup for a 96-well plate: HeLa cells control (pink), GQD-treated cells (purple), GQD-treated and laser-irradiated cells (red), and heat sink/cleaning station wells for the thermocouple (blue).

Table S1. The code controlling the 3D printer for *in vitro* PTT experiments written using computer numerical control program language G-code.

Code Block	Purpose
;FLAVOR:Marlin **;TIME:0** **;Filament used: 0m** **;Layer height: 0.2** **;MINX:2.14748e+006** **;MINY:2.14748e+006** **;MINZ:2.14748e+006** **;MAXX:-2.14748e+006** **;MAXY:-2.14748e+006** **;MAXZ:-2.14748e+006** **;Generated with Cura_SteamEngine 4.6.1**	**Start Program**

M140 S44; Set platform temperature at 44 °C **M105; Report temperature** **G28; Home all axes** **G0 X0 Y0 Z25 F10000**	Warm up platform and position the thermocouple.
G4 S300	Standby for 10 min to warm up wells solution to 37 °C.
G0 X101.4 Y149 Z25 F10000 **G0 X101.4 Y149 Z7 F10000; Dip in** **G4 S1** **G0 X101.4 Y149 Z25 F10000; Dip out** **G0 X101.4 Y149 Z25 F10000** **G0 X101.4 Y149 Z7 F10000; Dip in** **G4 S1** **G0 X101.4 Y149 Z25 F10000; Dip out** **G0 X101.4 Y149 Z25 F10000** **G0 X101.4 Y149 Z7 F10000; Dip in** **G4 S1** **G0 X101.4 Y149 Z25 F10000; Dip out**	Thermocouple cleanup.
G0 X154 Y148 Z25 F10000; Laser Start Position **G4 S30** **G0 X119.4 Y139 Z25 F10000** **G0 X119.4 Y139 Z7 F10000; Dip in** **G4 S1** **G0 X119.4 Y139 Z25 F10000; Dip out** **G0 X119.4 Y139 Z25 F10000** **G0 X119.4 Y139 Z7 F10000; Dip in** **G4 S1** **G0 X119.4 Y139 Z25 F10000; Dip out** **G0 X119.4 Y139 Z25 F10000** **G0 X119.4 Y139 Z7 F10000; Dip in** **G4 S30** **G0 X119.4 Y139 Z25 F10000; Dip out** **G0 X101.4 Y140 Z25 F10000** **G0 X101.4 Y140 Z7 F10000; Dip in** **G4 S1** **G0 X101.4 Y140 Z25 F10000; Dip out** **G0 X101.4 Y140 Z25 F10000** **G0 X101.4 Y140 Z7 F10000; Dip in** **G4 S1** **G0 X101.4 Y140 Z25 F10000; Dip out** **G0 X101.4 Y140 Z25 F10000** **G0 X101.4 Y140 Z7 F10000;Dip in** **G4 S1** **G0 X101.4 Y140 Z25 F10000;Dip out**	Temperature measurement at well B3; followed by thermocouple cleanup.

G0 X172 Y148 Z25 F10000;Laser Start Position **G4 S30** **G0 X137.4 Y139 Z25 F10000** **G0 X137.4 Y139 Z7 F10000;Dip in** **G4 S1** **G0 X137.4 Y139 Z25 F10000;Dip out** **G0 X137.4 Y139 Z25 F10000** **G0 X137.4 Y139 Z7 F10000;Dip in** **G4 S1** **G0 X137.4 Y139 Z25 F10000;Dip out** **G0 X137.4 Y139 Z25 F10000** **G0 X137.4 Y139 Z7 F10000;Dip in** **G4 S30** **G0 X137.4 Y139 Z25 F10000;Dip out** **G0 X101.4 Y131 Z25 F10000** **G0 X101.4 Y131 Z7 F10000;Dip in** **G4 S1** **G0 X101.4 Y131 Z25 F10000;Dip out** **G0 X101.4 Y131 Z25 F10000** **G0 X101.4 Y131 Z7 F10000;Dip in** **G4 S1** **G0 X101.4 Y131 Z25 F10000;Dip out** **G0 X101.4 Y131 Z25 F10000** **G0 X101.4 Y131 Z7 F10000;Dip in** **G4 S1** **G0 X101.4 Y131 Z25 F10000;Dip out**	Temperature measurement at well B5; followed by thermocouple cleanup.
G0 X190 Y148 Z25 F10000;Laser Start Position **M106 S255** **G4 S60** **M107 S15** **G0 X155.4 Y139 Z25 F10000** **G0 X155.4 Y139 Z7 F10000;Dip in** **G4 S1** **G0 X155.4 Y139 Z25 F10000;Dip out** **G0 X155.4 Y139 Z25 F10000** **G0 X155.4 Y139 Z7 F10000;Dip in** **G4 S1** **G0 X155.4 Y139 Z25 F10000;Dip out** **G0 X155.4 Y139 Z25 F10000** **G0 X155.4 Y139 Z7 F10000;Dip in** **G4 S30** **G0 X155.4 Y139 Z25 F10000;Dip out** **G0 X101.4 Y122 Z25 F10000** **G0 X101.4 Y122 Z7 F10000;Dip in** **G4 S1** **G0 X101.4 Y122 Z25 F10000;Dip out**	Laser irradiation for 1 min and temperature measurement at well B7; followed by thermocouple cleanup.

G0 X101.4 Y122 Z25 F10000 **G0 X101.4 Y122 Z7 F10000;Dip in** **G4 S1** **G0 X101.4 Y122 Z25 F10000;Dip out** **G0 X101.4 Y122 Z25 F10000** **G0 X101.4 Y122 Z7 F10000;Dip in** **G4 S1** **G0 X101.4 Y122 Z25 F10000;Dip out**	
G0 X208 Y148 Z25 F10000;Laser Start Position **M106 S255** **G4 S300** **M107 S15** **G0 X173.4 Y139 Z25 F10000** **G0 X173.4 Y139 Z7 F10000;Dip in** **G4 S1** **G0 X173.4 Y139 Z25 F10000;Dip out** **G0 X173.4 Y139 Z25 F10000** **G0 X173.4 Y139 Z7 F10000;Dip in** **G4 S1** **G0 X173.4 Y139 Z25 F10000;Dip out** **G0 X173.4 Y139 Z25 F10000** **G0 X173.4 Y139 Z7 F10000;Dip in** **G4 S30** **G0 X173.4 Y139 Z25 F10000;Dip out** **G0 X101.4 Y113 Z25 F10000** **G0 X101.4 Y113 Z7 F10000;Dip in** **G4 S1** **G0 X101.4 Y113 Z25 F10000;Dip out** **G0 X101.4 Y113 Z25 F10000** **G0 X101.4 Y113 Z7 F10000;Dip in** **G4 S1** **G0 X101.4 Y113 Z25 F10000;Dip out** **G0 X101.4 Y113 Z25 F10000** **G0 X101.4 Y113 Z7 F10000;Dip in** **G4 S1** **G0 X101.4 Y113 Z25 F10000;Dip out**	Laser irradiation for 5 min and temperature measurement at well B9; followed by thermocouple cleanup.
G0 X226 Y148 Z25 F10000;Laser Start Position **M106 S255** **G4 S600** **M107 S15** **G0 X191.4 Y139 Z25 F10000** **G0 X191.4 Y139 Z7 F10000;Dip in** **G4 S1** **G0 X191.4 Y139 Z25 F10000;Dip out** **G0 X191.4 Y139 Z25 F10000** **G0 X191.4 Y139 Z7 F10000;Dip in**	Laser irradiation for 5 min and temperature measurement at well B11; followed by thermocouple cleanup.

G4 S1 **G0 X191.4 Y139 Z25 F10000;Dip out** **G0 X191.4 Y139 Z25 F10000** **G0 X191.4 Y139 Z7 F10000;Dip in** **G4 S30** **G0 X191.4 Y139 Z25 F10000;Dip out** **G0 X101.4 Y104 Z25 F10000** **G0 X101.4 Y104 Z7 F10000;Dip in** **G4 S1** **G0 X101.4 Y104 Z25 F10000;Dip out** **G0 X101.4 Y104 Z25 F10000** **G0 X101.4 Y104 Z7 F10000;Dip in** **G4 S1** **G0 X101.4 Y104 Z25 F10000;Dip out** **G0 X101.4 Y104 Z25 F10000** **G0 X101.4 Y104 Z7 F10000;Dip in** **G4 S1** **G0 X101.4 Y104 Z25 F10000;Dip out**	
G0 X154 Y130 Z25 F10000;Laser Start Position **G4 S30** **G0 X119.4 Y121 Z25 F10000** **G0 X119.4 Y121 Z7 F10000;Dip in** **G4 S1** **G0 X119.4 Y121 Z25 F10000;Dip out** **G0 X119.4 Y121 Z25 F10000** **G0 X119.4 Y121 Z7 F10000;Dip in** **G4 S1** **G0 X119.4 Y121 Z25 F10000;Dip out** **G0 X119.4 Y121 Z25 F10000** **G0 X119.4 Y121 Z7 F10000;Dip in** **G4 S30** **G0 X119.4 Y121 Z25 F10000;Dip out** **G0 X101.4 Y86 Z25 F10000** **G0 X101.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X101.4 Y86 Z25 F10000;Dip out** **G0 X101.4 Y86 Z25 F10000** **G0 X101.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X101.4 Y86 Z25 F10000;Dip out** **G0 X101.4 Y86 Z25 F10000** **G0 X101.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X101.4 Y86 Z25 F10000;Dip out**	Temperature measurement at well D3; followed by thermocouple cleanup.
G0 X172 Y130 Z25 F10000;Laser Start Position **G4 S30**	Temperature measurement at well D5;

G0 X137.4 Y121 Z25 F10000 **G0 X137.4 Y121 Z7 F10000;Dip in** **G4 S1** **G0 X137.4 Y121 Z25 F10000;Dip out** **G0 X137.4 Y121 Z25 F10000** **G0 X137.4 Y121 Z7 F10000;Dip in** **G4 S1** **G0 X137.4 Y121 Z25 F10000;Dip out** **G0 X137.4 Y121 Z25 F10000** **G0 X137.4 Y121 Z7 F10000;Dip in** **G4 S30** **G0 X137.4 Y121 Z25 F10000;Dip out** **G0 X110.4 Y86 Z25 F10000** **G0 X110.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X110.4 Y86 Z25 F10000;Dip out** **G0 X110.4 Y86 Z25 F10000** **G0 X110.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X110.4 Y86 Z25 F10000;Dip out** **G0 X110.4 Y86 Z25 F10000** **G0 X110.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X110.4 Y86 Z25 F10000;Dip out**	followed by thermocouple cleanup.
G0 X190 Y130 Z25 F10000;Laser Start Position **M106 S255** **G4 S60** **M107 S15** **G0 X155.4 Y121 Z25 F10000** **G0 X155.4 Y121 Z7 F10000;Dip in** **G4 S1** **G0 X155.4 Y121 Z25 F10000;Dip out** **G0 X155.4 Y121 Z25 F10000** **G0 X155.4 Y121 Z7 F10000;Dip in** **G4 S1** **G0 X155.4 Y121 Z25 F10000;Dip out** **G0 X155.4 Y121 Z25 F10000** **G0 X155.4 Y121 Z7 F10000;Dip in** **G4 S30** **G0 X155.4 Y121 Z25 F10000;Dip out** **G0 X119.4 Y86 Z25 F10000** **G0 X119.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X119.4 Y86 Z25 F10000;Dip out** **G0 X119.4 Y86 Z25 F10000** **G0 X119.4 Y86 Z7 F10000;Dip in**	Laser irradiation for 1 min and temperature measurement at well D7; followed by thermocouple cleanup.

G4 S1 **G0 X119.4 Y86 Z25 F10000;Dip out** **G0 X119.4 Y86 Z25 F10000** **G0 X119.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X119.4 Y86 Z25 F10000;Dip out**	
G0 X208 Y130 Z25 F10000;Laser Start Position **M106 S255** **G4 S300** **M107 S15** **G0 X173.4 Y121 Z25 F10000** **G0 X173.4 Y121 Z7 F10000;Dip in** **G4 S1** **G0 X173.4 Y121 Z25 F10000;Dip out** **G0 X173.4 Y121 Z25 F10000** **G0 X173.4 Y121 Z7 F10000;Dip in** **G4 S1** **G0 X173.4 Y121 Z25 F10000;Dip out** **G0 X173.4 Y121 Z25 F10000** **G0 X173.4 Y121 Z7 F10000;Dip in** **G4 S30** **G0 X173.4 Y121 Z25 F10000;Dip out** **G0 X128.4 Y86 Z25 F10000** **G0 X128.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X128.4 Y86 Z25 F10000;Dip out** **G0 X128.4 Y86 Z25 F10000** **G0 X128.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X128.4 Y86 Z25 F10000;Dip out** **G0 X128.4 Y86 Z25 F10000** **G0 X128.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X128.4 Y86 Z25 F10000;Dip out**	Laser irradiation for 5 min and temperature measurement at well D9; followed by thermocouple cleanup.
G0 X226 Y130 Z25 F10000;Laser Start Position **M106 S255** **G4 S600** **M107 S15** **G0 X191.4 Y121 Z25 F10000** **G0 X191.4 Y121 Z7 F10000;Dip in** **G4 S1** **G0 X191.4 Y121 Z25 F10000;Dip out** **G0 X191.4 Y121 Z25 F10000** **G0 X191.4 Y121 Z7 F10000;Dip in** **G4 S1** **G0 X191.4 Y121 Z25 F10000;Dip out**	Laser irradiation for 10 min and temperature measurement at well D11; followed by thermocouple cleanup.

G0 X191.4 Y121 Z25 F10000 **G0 X191.4 Y121 Z7 F10000;Dip in** **G4 S30** **G0 X191.4 Y121 Z25 F10000;Dip out** **G0 X137.4 Y86 Z25 F10000** **G0 X137.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X137.4 Y86 Z25 F10000;Dip out** **G0 X137.4 Y86 Z25 F10000** **G0 X137.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X137.4 Y86 Z25 F10000;Dip out** **G0 X137.4 Y86 Z25 F10000** **G0 X137.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X137.4 Y86 Z25 F10000;Dip out**	
G0 X154 Y112 Z25 F10000;Laser Start Position **G4 S30** **G0 X119.4 Y103 Z25 F10000** **G0 X119.4 Y103 Z7 F10000;Dip in** **G4 S1** **G0 X119.4 Y103 Z25 F10000;Dip out** **G0 X119.4 Y103 Z25 F10000** **G0 X119.4 Y103 Z7 F10000;Dip in** **G4 S1** **G0 X119.4 Y103 Z25 F10000;Dip out** **G0 X119.4 Y103 Z25 F10000** **G0 X119.4 Y103 Z7 F10000;Dip in** **G4 S30** **G0 X119.4 Y103 Z25 F10000;Dip out** **G0 X155.4 Y86 Z25 F10000** **G0 X155.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X155.4 Y86 Z25 F10000;Dip out** **G0 X155.4 Y86 Z25 F10000** **G0 X155.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X155.4 Y86 Z25 F10000;Dip out** **G0 X155.4 Y86 Z25 F10000** **G0 X155.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X155.4 Y86 Z25 F10000;Dip out**	Temperature measurement at well F3; followed by thermocouple cleanup.
G0 X172 Y112 Z25 F10000;Laser Start Position **G4 S30** **G0 X137.4 Y103 Z25 F10000** **G0 X137.4 Y103 Z7 F10000;Dip in**	Temperature measurement at well F5; followed by thermocouple cleanup.

G4 S1 **G0 X137.4 Y103 Z25 F10000;Dip out** **G0 X137.4 Y103 Z25 F10000** **G0 X137.4 Y103 Z7 F10000;Dip in** **G4 S1** **G0 X137.4 Y103 Z25 F10000;Dip out** **G0 X137.4 Y103 Z25 F10000** **G0 X137.4 Y103 Z7 F10000;Dip in** **G4 S30** **G0 X137.4 Y103 Z25 F10000;Dip out** **G0 X164.4 Y86 Z25 F10000** **G0 X164.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X164.4 Y86 Z25 F10000;Dip out** **G0 X164.4 Y86 Z25 F10000** **G0 X164.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X164.4 Y86 Z25 F10000;Dip out** **G0 X164.4 Y86 Z25 F10000** **G0 X164.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X164.4 Y86 Z25 F10000;Dip out**	
G0 X190 Y112 Z25 F10000;Laser Start Position **M106 S255** **G4 S60** **M107 S15** **G0 X155.4 Y103 Z25 F10000** **G0 X155.4 Y103 Z7 F10000;Dip in** **G4 S1** **G0 X155.4 Y103 Z25 F10000;Dip out** **G0 X155.4 Y103 Z25 F10000** **G0 X155.4 Y103 Z7 F10000;Dip in** **G4 S1** **G0 X155.4 Y103 Z25 F10000;Dip out** **G0 X155.4 Y103 Z25 F10000** **G0 X155.4 Y103 Z7 F10000;Dip in** **G4 S30** **G0 X155.4 Y103 Z25 F10000;Dip out** **G0 X173.4 Y86 Z25 F10000** **G0 X173.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X173.4 Y86 Z25 F10000;Dip out** **G0 X173.4 Y86 Z25 F10000** **G0 X173.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X173.4 Y86 Z25 F10000;Dip out**	Laser irradiation for 1 min and temperature measurement at well F7; followed by thermocouple cleanup.

G0 X173.4 Y86 Z25 F10000 **G0 X173.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X173.4 Y86 Z25 F10000;Dip out**	
G0 X208 Y112 Z25 F10000;Laser Start Position **M106 S255** **G4 S300** **M107 S15** **G0 X173.4 Y103 Z25 F10000** **G0 X173.4 Y103 Z7 F10000;Dip in** **G4 S1** **G0 X173.4 Y103 Z25 F10000;Dip out** **G0 X173.4 Y103 Z25 F10000** **G0 X173.4 Y103 Z7 F10000;Dip in** **G4 S1** **G0 X173.4 Y103 Z25 F10000;Dip out** **G0 X173.4 Y103 Z25 F10000** **G0 X173.4 Y103 Z7 F10000;Dip in** **G4 S30** **G0 X173.4 Y103 Z25 F10000;Dip out** **G0 X182.4 Y86 Z25 F10000** **G0 X182.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X182.4 Y86 Z25 F10000;Dip out** **G0 X182.4 Y86 Z25 F10000** **G0 X182.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X182.4 Y86 Z25 F10000;Dip out** **G0 X182.4 Y86 Z25 F10000** **G0 X182.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X182.4 Y86 Z25 F10000;Dip out**	Laser irradiation for 5 min and temperature measurement at well F9; followed by thermocouple cleanup.
G0 X226 Y112 Z25 F10000;Laser Start Position **M106 S255** **G4 S600** **M107 S15** **G0 X191.4 Y103 Z25 F10000** **G0 X191.4 Y103 Z7 F10000;Dip in** **G4 S1** **G0 X191.4 Y103 Z25 F10000;Dip out** **G0 X191.4 Y103 Z25 F10000** **G0 X191.4 Y103 Z7 F10000;Dip in** **G4 S1** **G0 X191.4 Y103 Z25 F10000;Dip out** **G0 X191.4 Y103 Z25 F10000** **G0 X191.4 Y103 Z7 F10000;Dip in**	Laser irradiation for 10 min and temperature measurement at well F11; followed by thermocouple cleanup.

G4 S30 **G0 X191.4 Y103 Z25 F10000;Dip out**	
G0 X191.4 Y86 Z25 F10000 **G0 X191.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X191.4 Y86 Z25 F10000;Dip out** **G0 X191.4 Y86 Z25 F10000** **G0 X191.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X191.4 Y86 Z25 F10000;Dip out** **G0 X191.4 Y86 Z25 F10000** **G0 X191.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X191.4 Y86 Z25 F10000;Dip out** **G0 X200.4 Y86 Z25 F10000** **G0 X200.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X200.4 Y86 Z25 F10000;Dip out** **G0 X200.4 Y86 Z25 F10000** **G0 X200.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X200.4 Y86 Z25 F10000;Dip out** **G0 X200.4 Y86 Z25 F10000** **G0 X200.4 Y86 Z7 F10000;Dip in** **G4 S1** **G0 X200.4 Y86 Z25 F10000;Dip out**	Thermocouple cleanup
M140 S44; Turn-off bed **M84 X Y; Disable all steppers but Z**	**End Program**

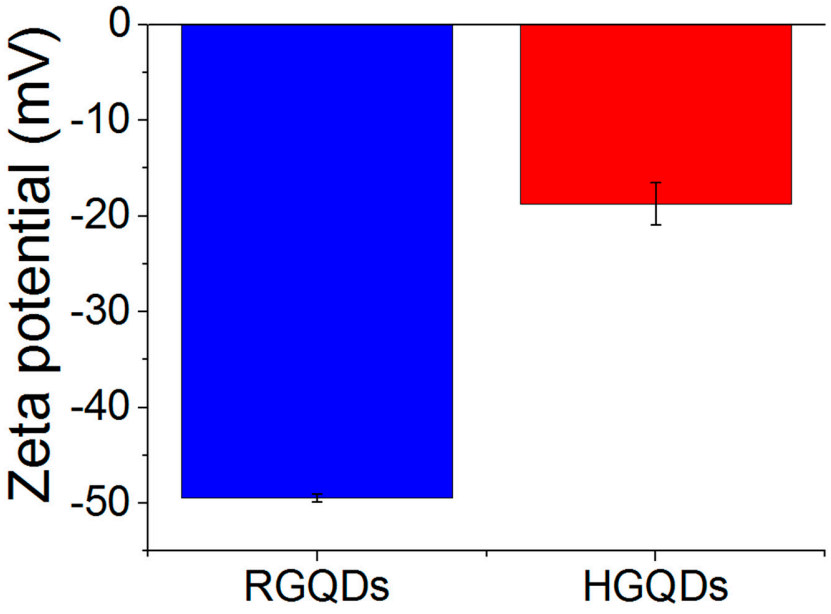

Figure S2. Zeta potential of RGQDs (blue) and HGQDs (red).

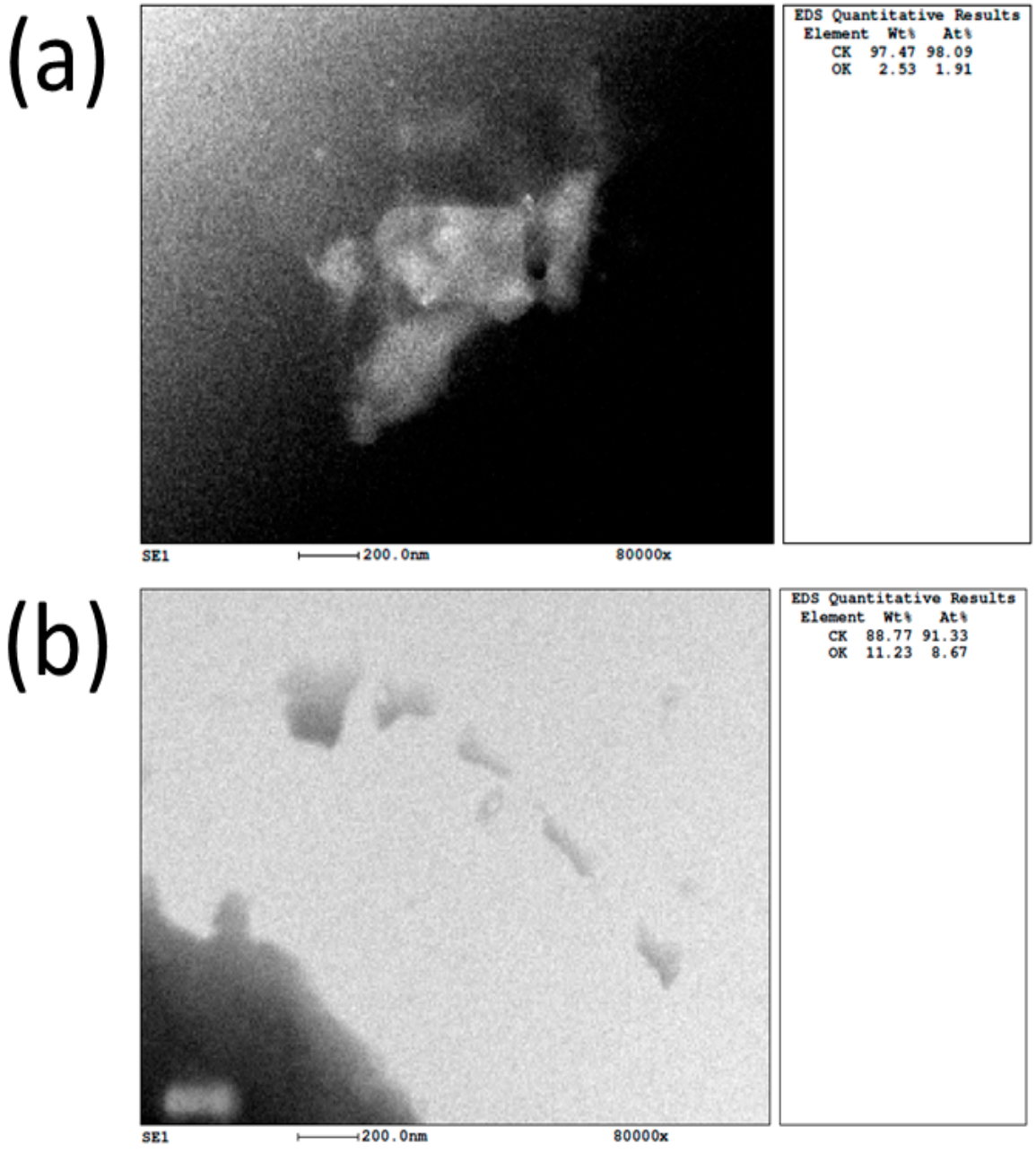

Figure S3. EDX images and atomic percentages of carbon and oxygen for a region with (a) HGQDs and (b) RGQDs.

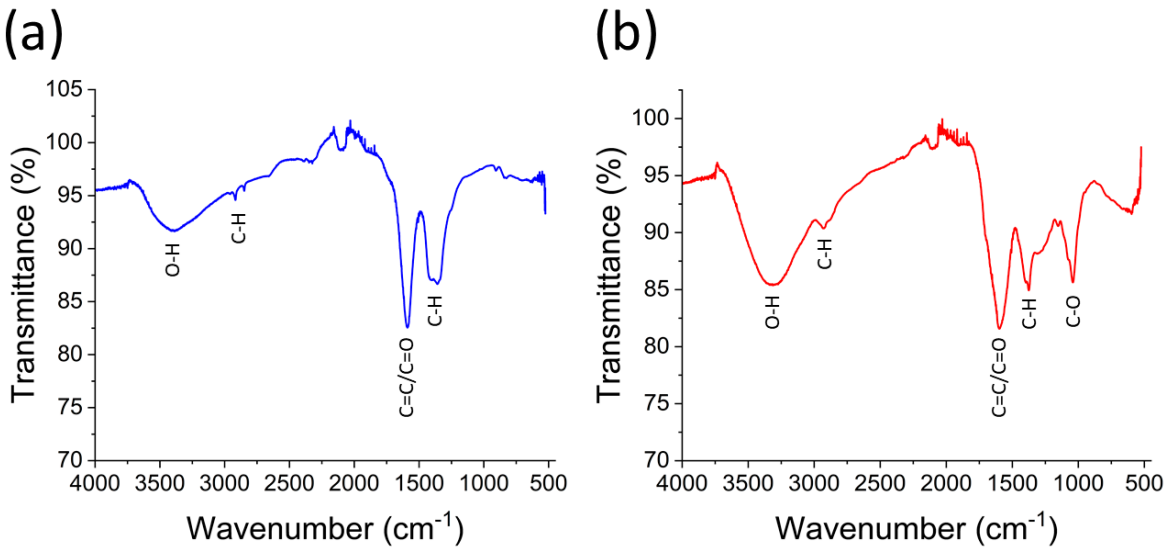

Figure S4. FTIR spectra of (a) RGQDs (blue) and (b) HGQDs (red).

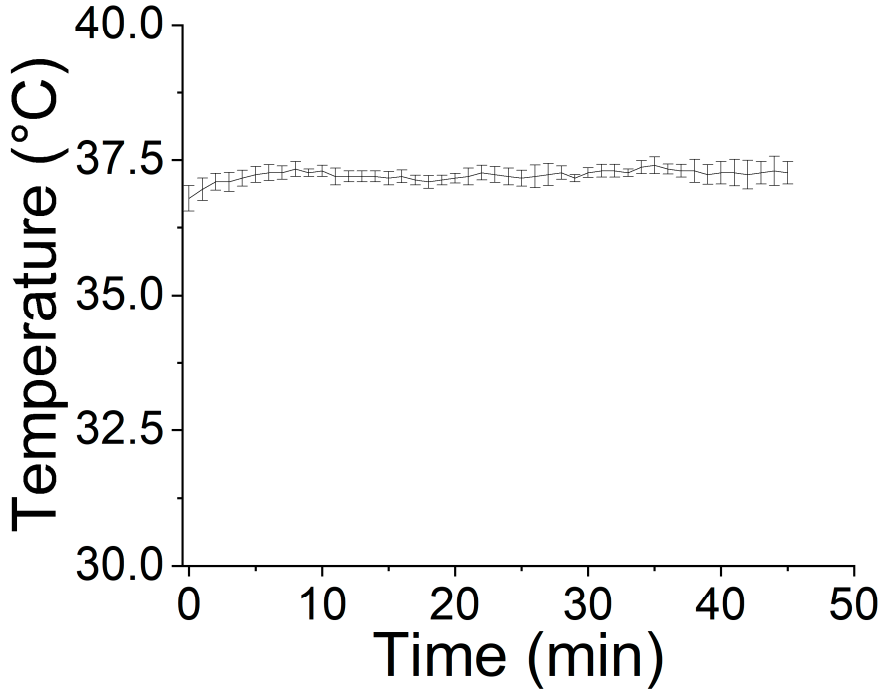

Figure S5. Temperature of water control with 0.9 W/cm^2 808 nm laser irradiation.

Table S2. Tabulated results of Figure 5b.

Well	Irradiation Time (min)	Temperature (°C)	Cell Viability (%)
RGQDs			
Trial 1			
B3	0	36.9	100
B5	0	36.9	72.7
B7	1	39.4	92.5
B9	5	42.9	32.3
B11	10	43.6	48.6
Trial 2			
D3	0	38.2	100
D5	0	37.9	93.1
D7	1	40.1	97.5
D9	5	43.3	49.8
D11	10	43.7	28.6
Trial 3			
F3	0	38.4	100
F5	0	38.0	101
F7	1	40.2	92.2
F9	5	43.1	43.4
F11	10	43.3	38.7
HGQDs			
Trial 1			
B3	0	36.6	100
B5	0	36.7	72.6
B7	1	46.2	39.6
B9	5	55.3	23.5
B11	10	55.1	19.9
Trial 2			
D3	0	38.2	100
D5	0	37.8	57.8
D7	1	46.4	62.4
D9	5	55.0	24.1
D11	10	54.4	21.3
Trial 3			
F3	0	38.1	100
F5	0	37.8	62.2
F7	1	46.4	38.9
F9	5	54.3	31.0
F11	10	54.1	27.8

Table S3. Table of GQDs developed for PTT applications.

Synthesis Method	Precursor	Temperature (ºC)		Fluorescence		Biocompatibility (mg/mL)	Ref.
		In solution	*In vitro* PTT	NIR	VL		
Bottom-up	Phenol	From 0 to ~18 ºC for 5 min at 0.1 mg/mL with 1064 nm (1.0 W/cm^2)	NA	No	Yes	0.1	1
Bottom-up	Citric acid and urea	From ~24 to 45 ºC for 5 min at 0.8 mg/mL with 808 nm (1.16 W/cm^2)	NA	Yes	Yes	0.5	2
Bottom-up	F. racemosa	From 37 to 45 ºC for 5 min at 0.25 mg/mL with 808 nm (0.5 W/cm^2)	NA	No	Yes	0.25	3
Bottom-up	Hyaluronic acid	From 37 to 46 ºC for 47 min at 1.7 mg/mL with 808 nm (0.9 W/cm^2)	From 37.4 to 54.5 ºC for 10 min at 1.7 mg/mL with 808 nm (0.9 W/cm^2)	Yes	Yes	1.7	Present work
Top-down	RGO	From 37 to 47 ºC for 47 min at 1.5 mg/mL with 808 nm (0.9 W/cm^2)	From 37.6 to 43.5 ºC for 10 min at 1.5 mg/mL with 808 nm (0.9 W/cm^2)	Yes	Yes	1.5	Present work

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