

Figure S1. High-resolution SEM image of UCNPs.

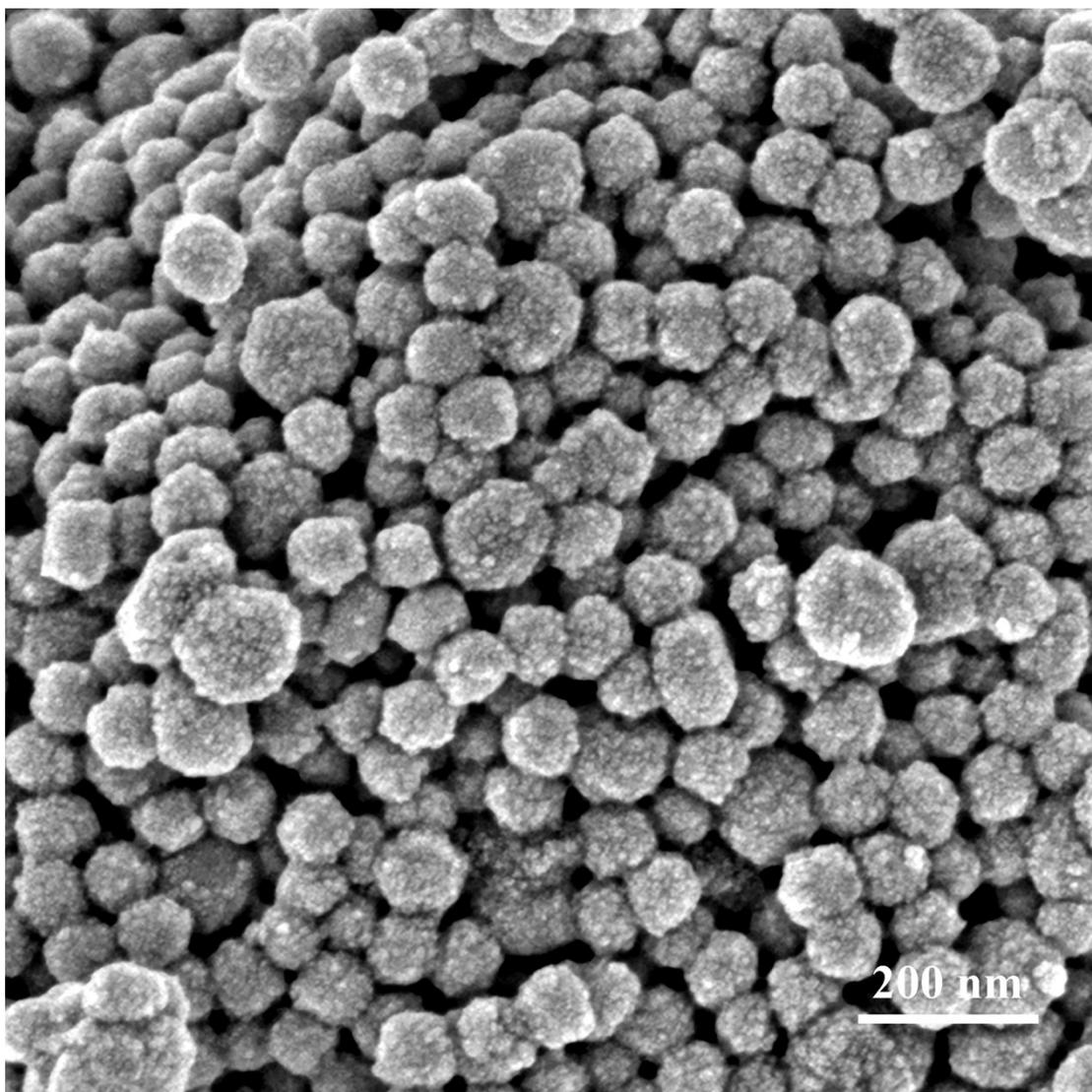


Figure S2. High-resolution SEM image of UCCM NPs.

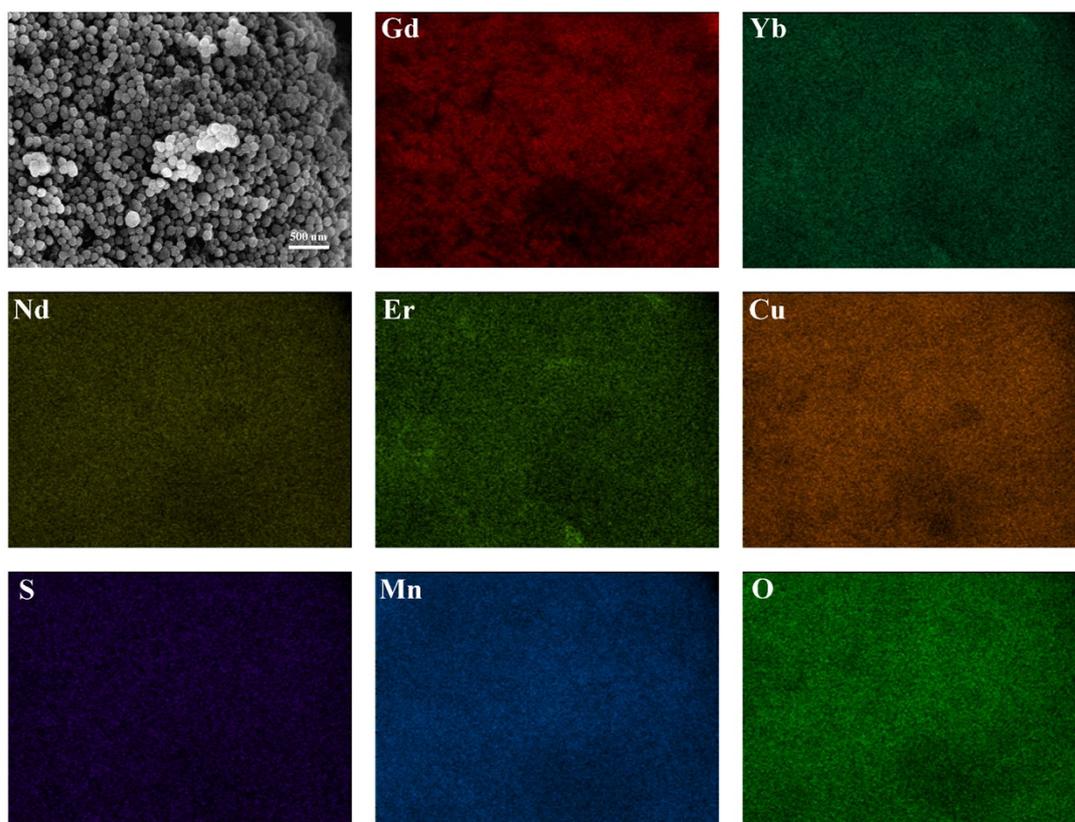


Figure S3. Energy-dispersive spectroscopy (EDS) analysis of UCCM NPs.

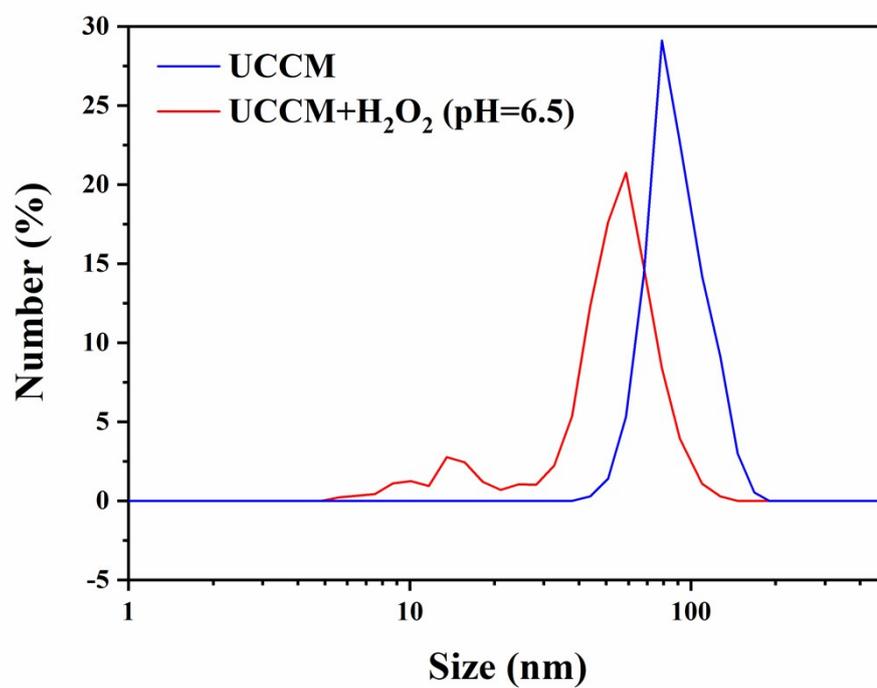


Figure S4. DLS images of UCCM NPs and UCCM NPs treated with  $\text{H}_2\text{O}_2$  at acidic PBS (pH=6.5) for 12 h.

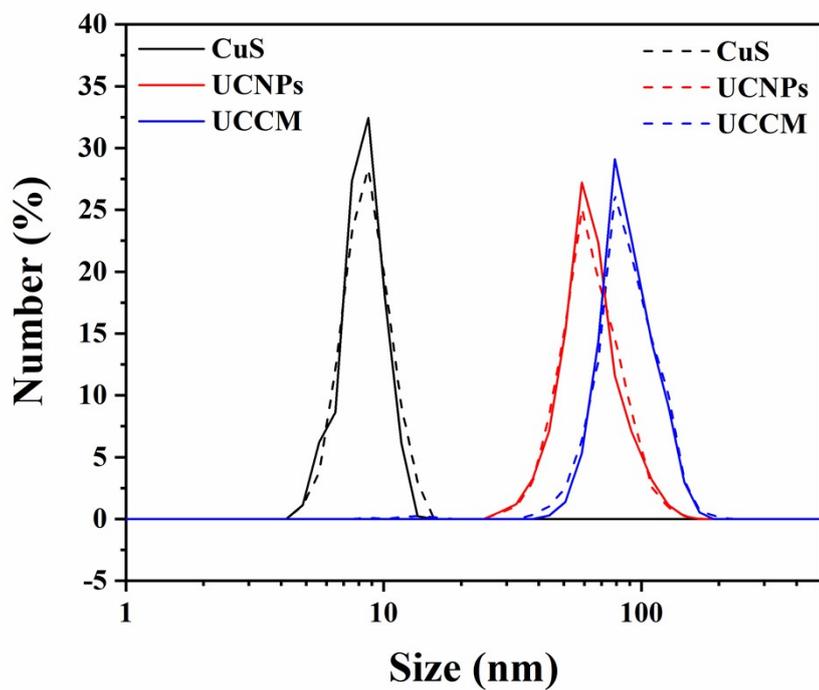


Figure S5. DLS images of CuS NPs, UCNPs and UCCM NPs (Solid), and DLS images of CuS NPs, UCNPs and UCCM NPs stored in PBS (pH=7.4) for two weeks (Dash).

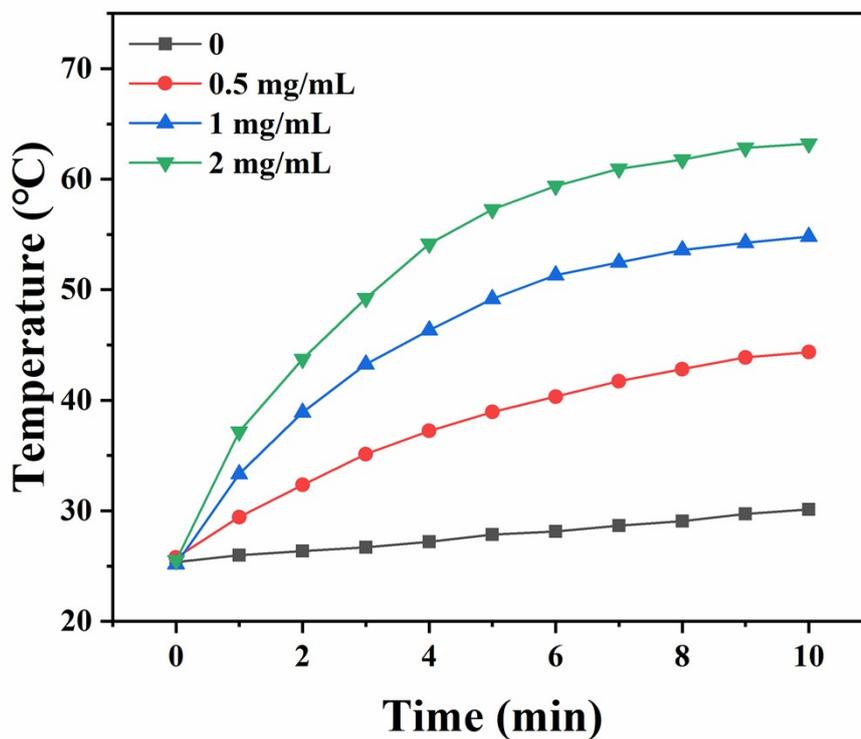


Figure S6. The temperature rise curve of UCCM NPs solutions with different concentrations under 1064 nm laser irradiation