Supporting Information:

**Upconversion NaYF<sub>4</sub>:Yb:Er nanoparticles co-doped with Gd<sup>3+</sup> and Nd<sup>3+</sup> for thermometry on nanoscales**

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**SI.Fig.1:** Power dependence ($\log I_{UC} - \log I_P$) plot of the Er<sup>3+</sup> transitions G1, G2 and R of oleic acid capped UCNP using different excitation wavelength (left: $\lambda_{ex} = 976$ nm; right: $\lambda_{ex} = 795$ nm).

**SI.Fig.2:** DLS analysis of UCNP and UCNP<sub>Nd</sub> fitted using a Gaussian function.
SI.Fig.3: Diffractogram of UCNP\textsubscript{Nd} with the reference data of α-NaYF\textsubscript{4} (JCPDS:77-2042) and β-NaYF\textsubscript{4} (JCPDS:16-0334) [39].

SI.Fig.4: Excitation emission spectra (total luminescence spectra) of UCNP and UCNP\textsubscript{Nd}. 

![Graph showing diffractogram and excitation emission spectra](image_url)
SI.Fig.5: Upconversion emission spectra of UCNP excited at $\lambda_{ex} = 976$ nm at temperatures between 293 K and 323K are shown.

SI.Fig.6: Temperature dependence of UCNP$_{Nd}$ dissolved in water at different irradiation wavelength and thermostat temperature over time.