Supplementary Information

Mn-complex Modified NaDyF$_4$:Yb@NaLuF$_4$:Yb,Er@Polydopamine Core-shell Nanocomposite for Multifunctional Imaging-guided Photothermal Therapy

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Figure S1. The mechanism of the dopamine oxidation, cyclcation, and polymerization

Figure S2. The mechanism of the carboxyl activation and EDTA modification
Figure S3. Energy-dispersive X-ray analysis (EDAX) spectra of Dy and Dy@Lu.

Figure S4. XRD patterns of Dy and Dy@Lu.
**Figure S5.** The HR-TEM of Dy.

**Figure S6.** The HR-TEM of Dy@Lu.
Figure S7. Absorbance at 808 nm of Dy@Lu@PDA-Mn dispersion in water vs concentration.

Figure S8. Temperature change of Dy@Lu@PDA-Mn dispersion in water vs concentration. The result demonstrated that the temperature change was positive related to the concentration of Dy@Lu@PDA-Mn.
Figure S9. UV-vis-NIR absorbance spectra of Dy@Lu@PDA-Mn dispersion in water before and after laser irradiation for 30 minutes.

Figure S10. UV-vis-NIR absorbance spectra of Dy@Lu@PDA-Mn dispersion in water after 7 days standing.