

**Electronic Supplementary Information (ESI)**

**Designed Synthesis of Multi-functional PEGylated**

**Yb<sub>2</sub>O<sub>3</sub>:Gd@SiO<sub>2</sub>@CeO<sub>2</sub> Islands Core@Shell Nanostructure**

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Table S1. Result of EDS corresponding to Figure 1F.

Element	Series	unn. C <sup>[a]</sup>	norm. C <sup>[b]</sup>	Atom. C <sup>[c]</sup>
O	K	32.32	36.28	64.68
Si	K	25.84	29.00	29.46
Ce	L	0.66	0.74	0.15
Gd	L	5.84	6.56	1.19
Yb	L	24.43	27.42	4.52
Total:		89.09	100.00	100.00

[a] unnormalized content (wt %). [b] normalized content (wt %). [c] atomic content (at %).

Table S2. Result of ICP-MS for PEGylated Yb<sub>2</sub>O<sub>3</sub>:Gd@SiO<sub>2</sub>@CeO<sub>2</sub>.

Analyte	Content (μg g <sup>-1</sup> )
Yb3289	282700
Gd3350	69090
Ce4040	5224