

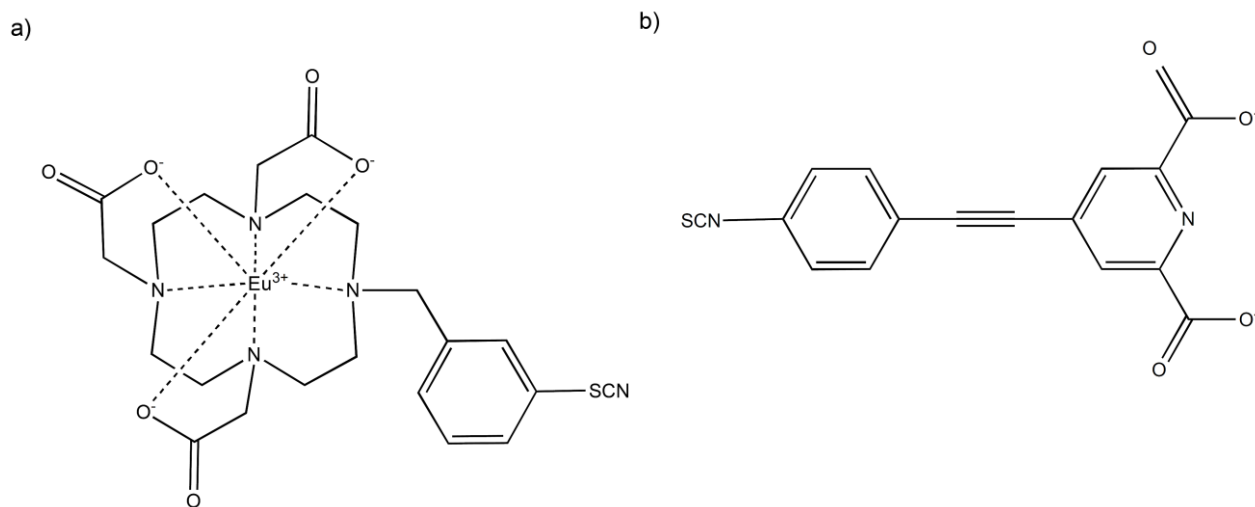
## Supplementary information

### Aptamer-directed lanthanide chelate self-assembly for rapid thrombin detection

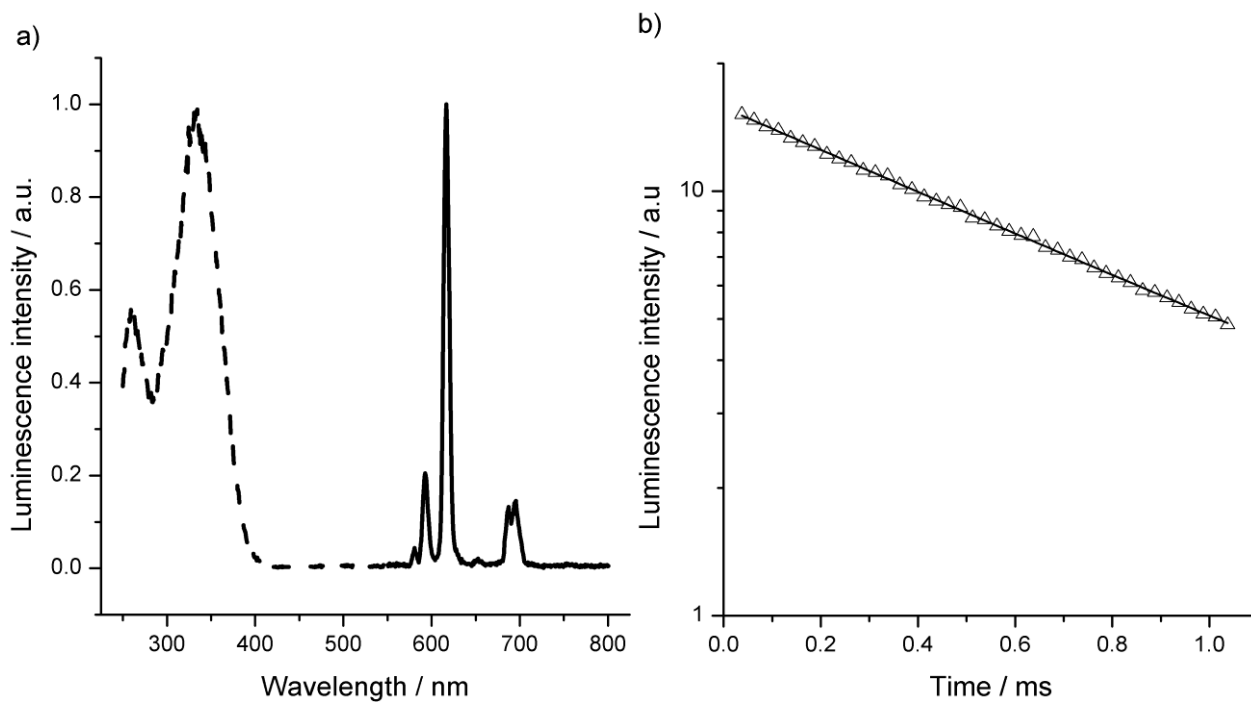
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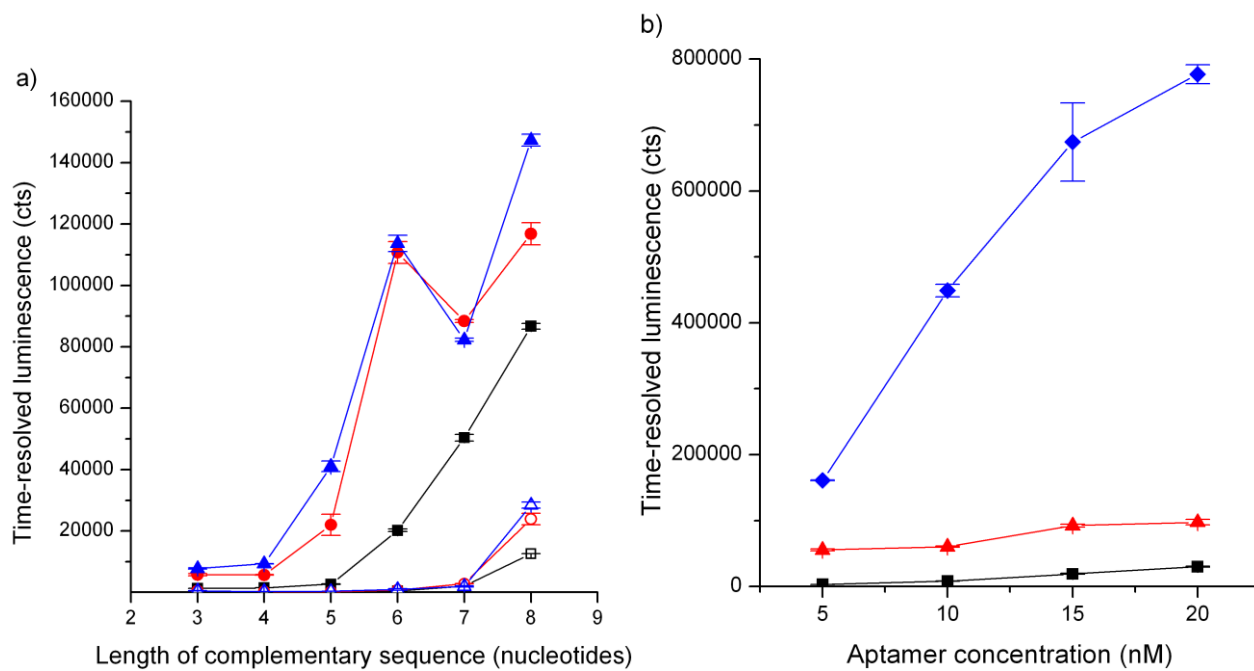
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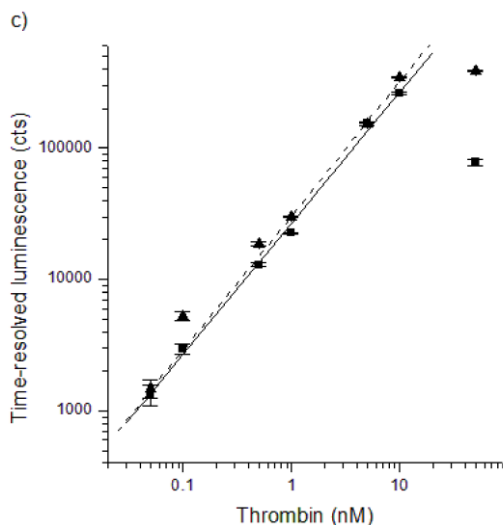


**Figure S-1.** a) Europium(III) ion carrier chelate. b) Light-harvesting antenna ligand.



**Figure S-2.** a) Normalized excitation (dashed line) and emission (solid line) spectra and b) luminescence decay of the mixed chelate complex. The data was fitted to the equation of mono-exponential decay  $I(t)=A_1\exp(-t/\tau_1)+I_0$ , ( $R^2=0.999$ ), where  $A_1=15.4\pm 0.207$ ,  $I_0=0.335\pm 0.237$  and  $\tau_1=0.851\pm 0.023$ .





**Figure S-3.** (a) Signal levels from optimization of the complementary sequence and salt concentration. Open symbols represent signals with 0 nM and solid symbols with 1 nM thrombin. Results with 0 mM NaCl are presented with black squares, 50 mM NaCl in red circles and 150 mM NaCl in blue triangles. (b) Signal levels from optimization of the TBA1 and TBA2 concentrations using thrombin concentrations of 0 nM (black squares), 0.5 nM (red triangles) or 5 nM (blue diamonds). (c) Calibration curves using 0-50 nM thrombin and either 5 nM (squares) or 10 nM aptamers (triangles). The equation of the linear fitting with 5 nM aptamers (solid line) was  $y=4.44+0.999x$ ,  $R=0.999$  and with 10 nM aptamers (dashed line)  $y=4.48+1.02x$ ,  $R=0.997$  and the limits of detection were 12 pM and 26 pM, respectively.