

## Supplementary information

### Two-dimensional lanthanide coordination polymer nanosheets for detection of FOX-7

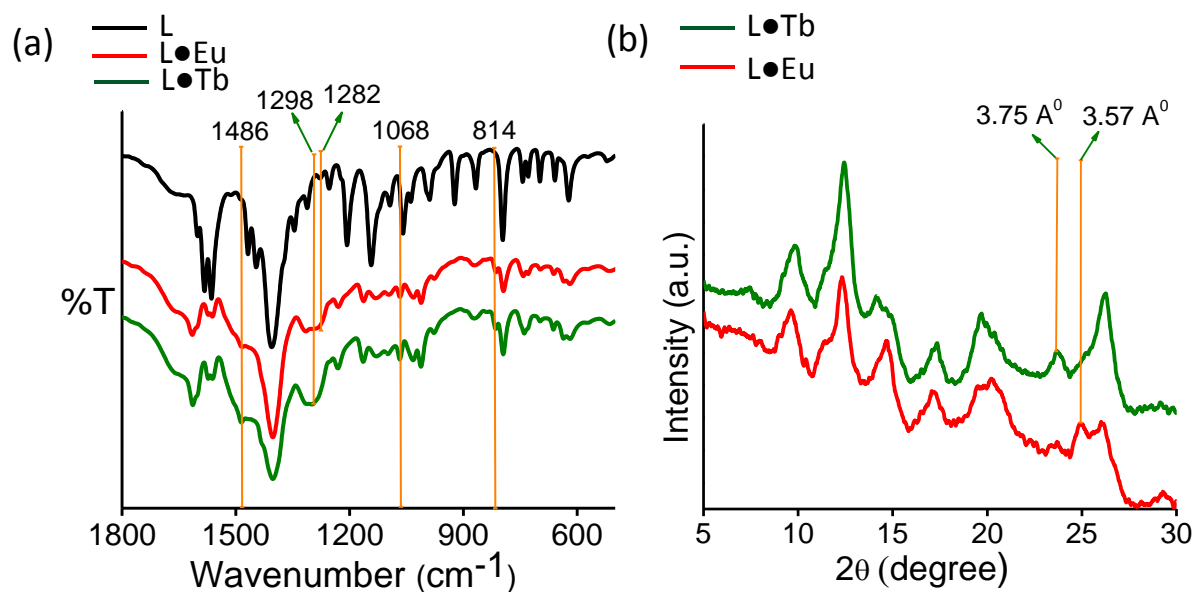
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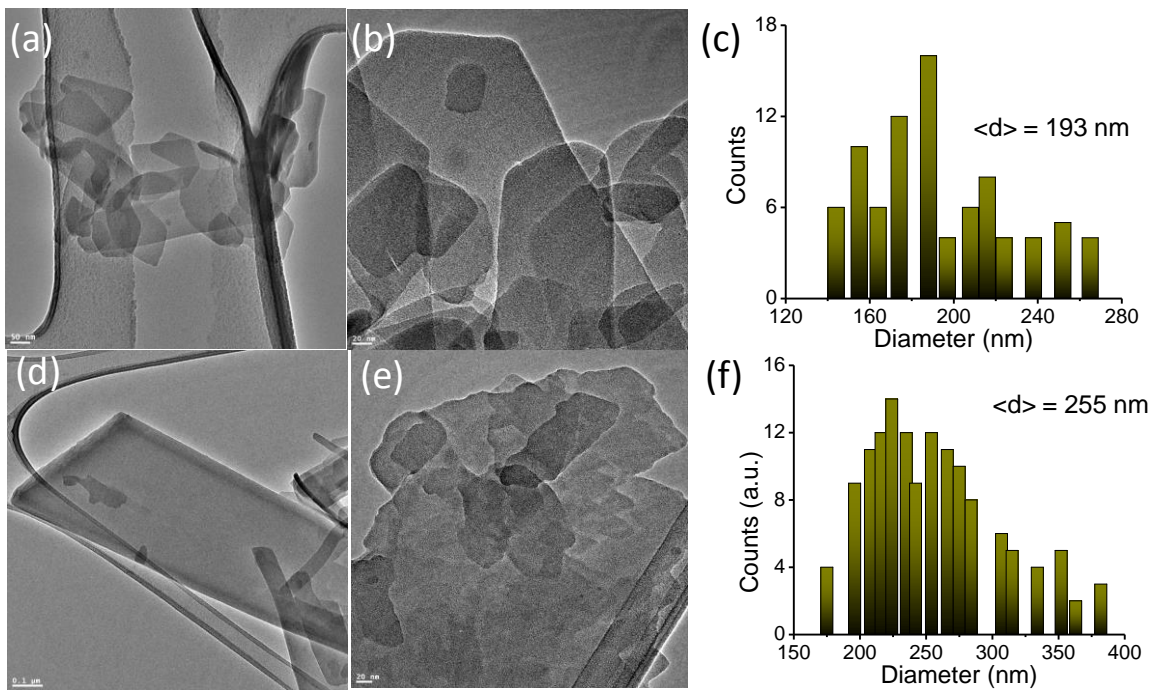
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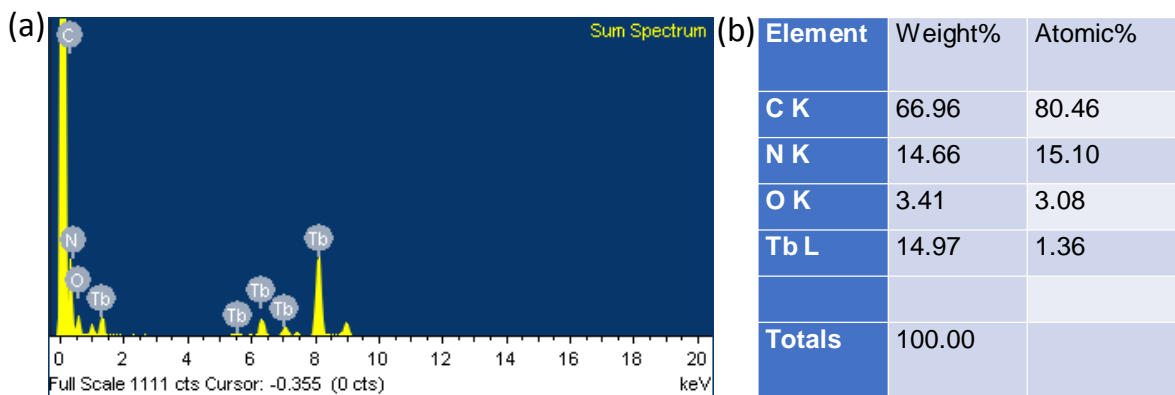
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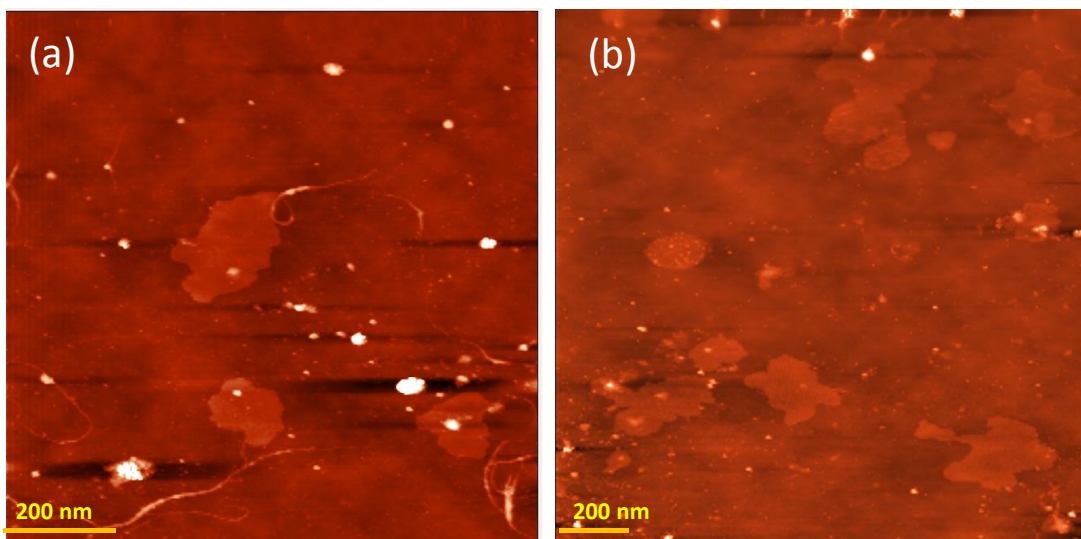
**Fig. S1.** Comparison of (a) FT-IR spectra of L, L•Eu and L•Tb and (b) PXRD patterns of L•Eu and L•Tb coordination polymers.



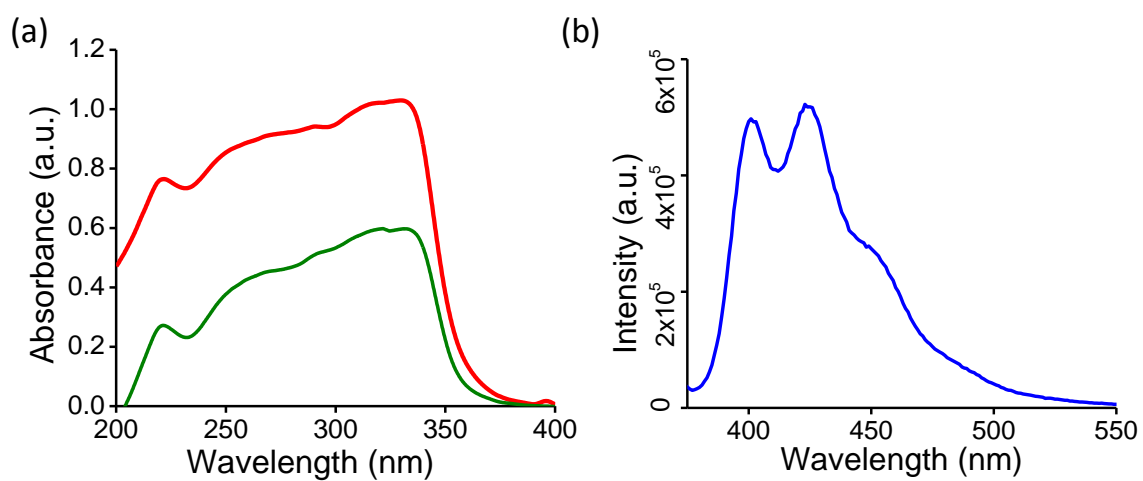
**Fig. S2.** (a-b) TEM images of the L•Eu 2D nanosheets on the lacey-carbon supported copper TEM grids, (d-e) TEM images of the L•Tb nanosheets. (c-f) The statistical analysis of TEM images showed that the average diameter of L•Eu and L•Tb nanosheets were around 193 and 255 nm, respectively



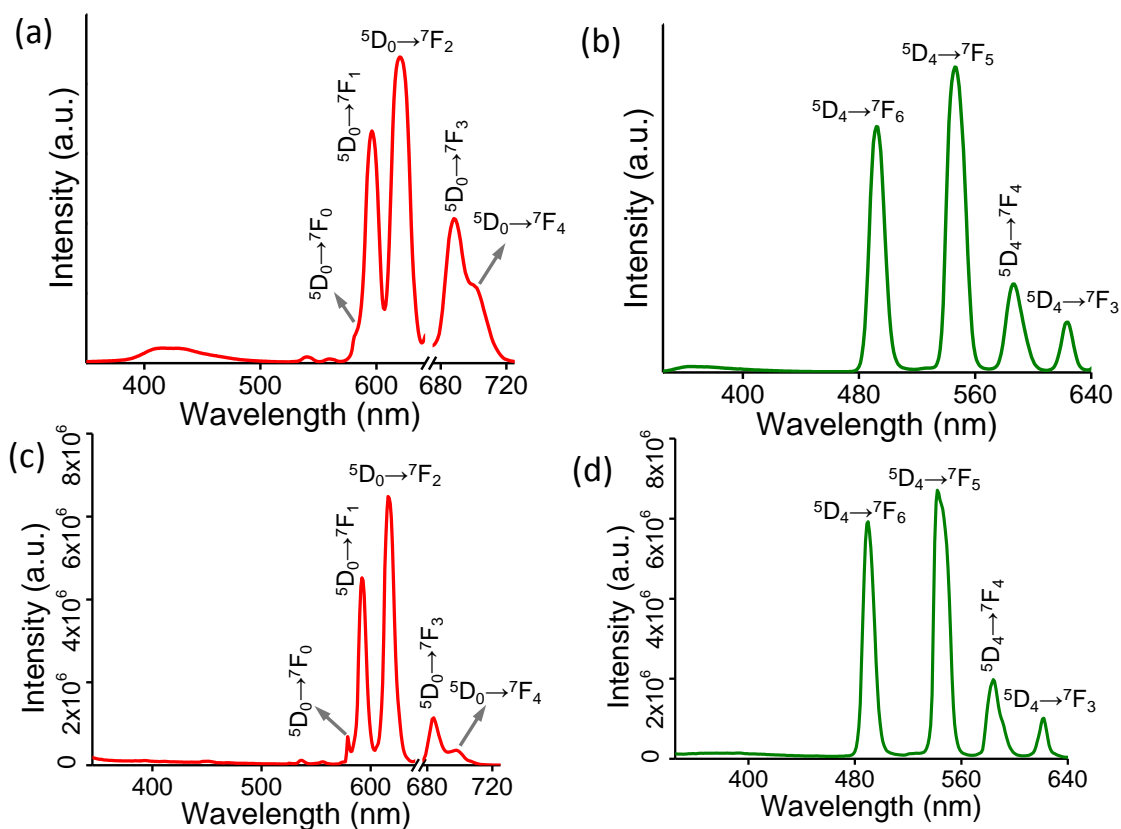
**Fig. S3.** Energy dispersive X-ray spectroscopy (EDXS) analysis with TEM confirmed the presence of C, N, O, and Tb in the L•Tb nanosheets



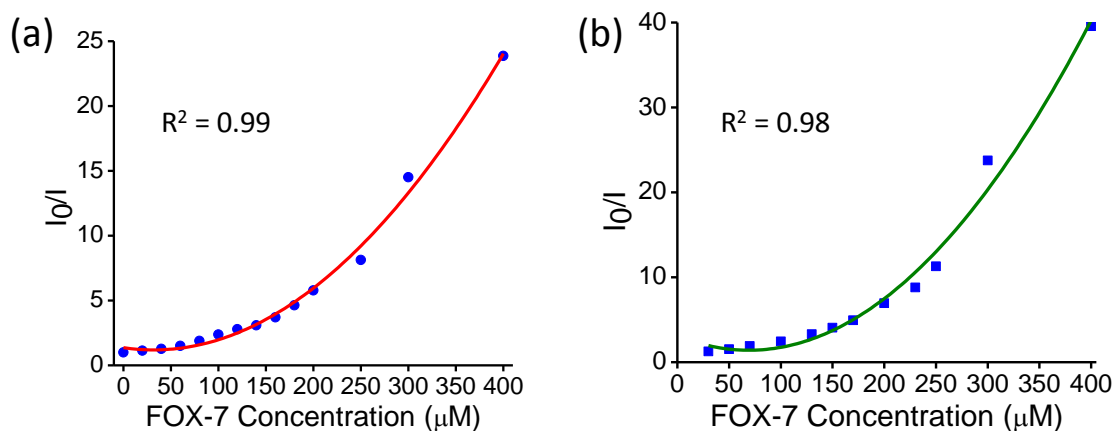
**Fig. S4.** AFM topography (height) scanning images of randomly distributed nanosheets of (a) L•Eu and (b) L•Tb deposited on a silicon wafer.



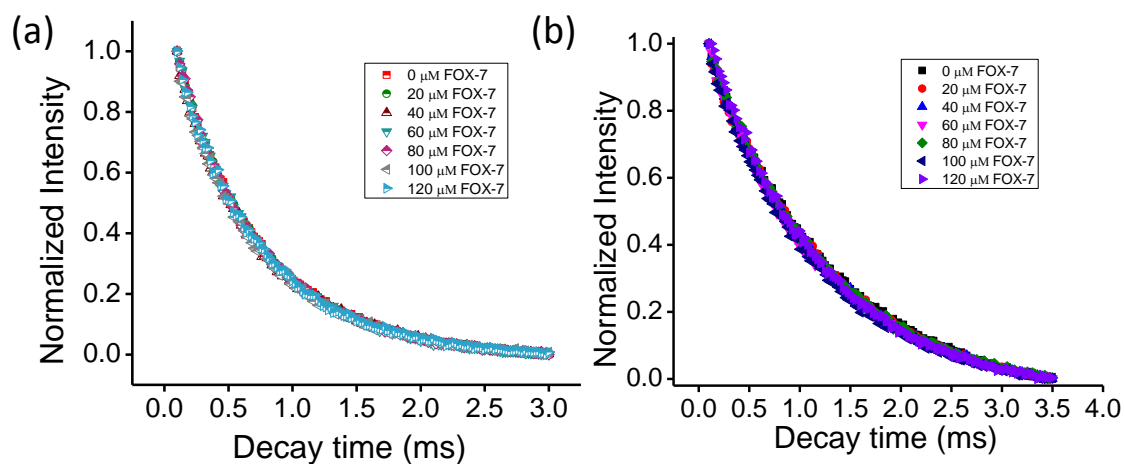
**Fig. S5.** (a) Solid-state UV-vis spectra of the bulk material of L•Eu and L•Tb. (b) The photoluminescent spectra of ligand (L) ( $1.0 \times 10^{-5}$  M in MeCN) upon excitation at 325 nm



**Fig. S6.** Fluorescence emission spectra of (a) L•Eu and (b) L•Tb bulk coordination polymers in solid state and (c) L•Eu and (d) L•Tb drop-casted nanosheets (2mg/2mL in MeCN) on a glass slide surface ( $\lambda_{\text{ex}} = 325 \text{ nm}$ ).



**Fig. S7.** The non-linear Stern-Volmer plots of (a) L•Eu and (b) L•Tb dispersion (2mg/2mL) in MeCN with the concentration of FOX-7 in the range of 0–400  $\mu\text{M}$ .



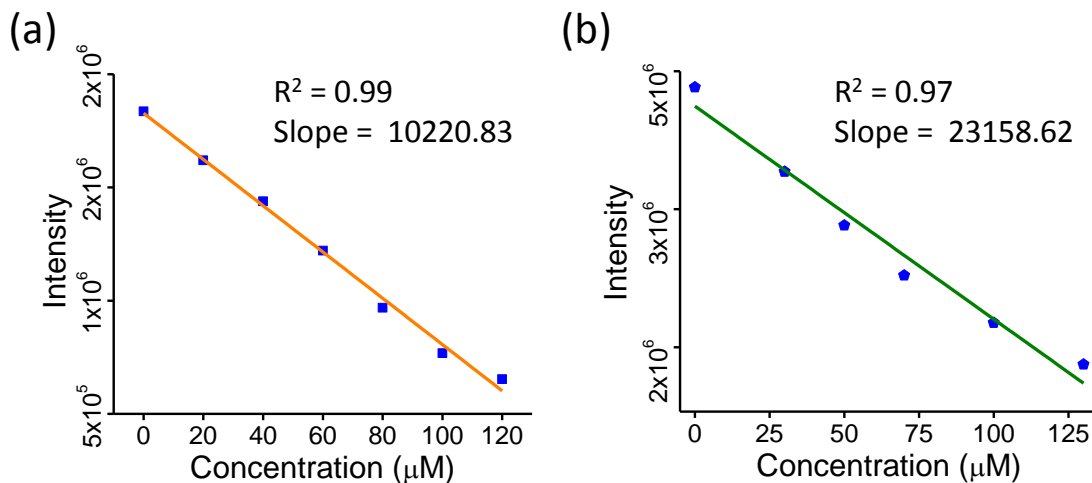
**Fig. S8.** Fluorescence decay curves of (a) L•Eu and (b) L•Tb dispersion (2mg/2mL) in MeCN with different FOX-7 concentrations (0–120  $\mu$ M) monitoring at 618 and 544 nm, respectively. Excitation at 325 nm

**Table S1.** Fluorescence decay experiments of L•Eu dispersion with different FOX-7 concentrations monitoring at 618 nm. Excitation at 325 nm.

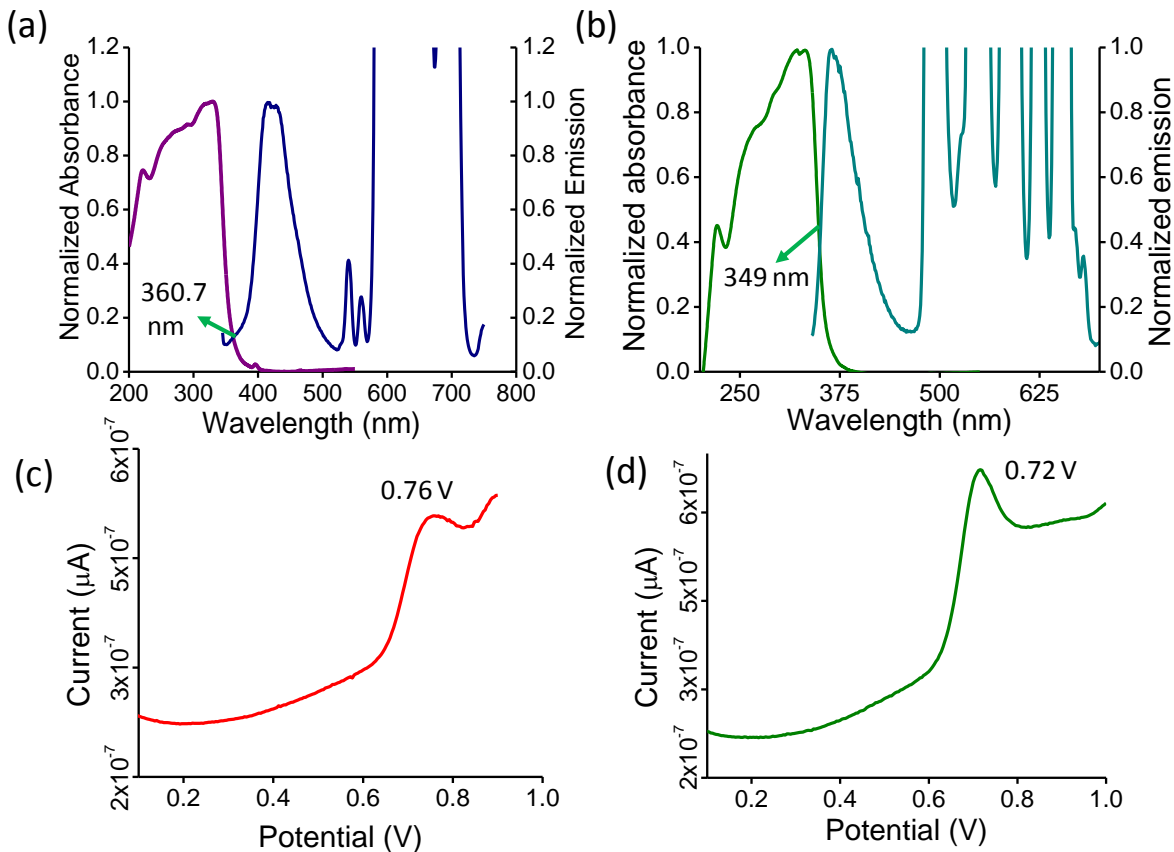
Sl No	L•Eu (2mg/2 mL MeCN)	MeCN	FOX-7 (MeCN)	Total amount of solution	Concentration of FOX-7 ( $\mu$ M)	Lifetime (ms)
1.	30 $\mu$ L	2.970 mL	0 $\mu$ L	3 mL	0 $\mu$ M	0.66492
2.	30 $\mu$ L	2.910 mL	60 $\mu$ L	3 mL	20 $\mu$ M	0.65526
3.	30 $\mu$ L	2.850 mL	120 $\mu$ L	3 mL	40 $\mu$ M	0.65216
4.	30 $\mu$ L	2.790 mL	180 $\mu$ L	3 mL	60 $\mu$ M	0.65052
5.	30 $\mu$ L	2.730 mL	240 $\mu$ L	3 mL	80 $\mu$ M	0.63822
6.	30 $\mu$ L	2.670 mL	300 $\mu$ L	3 mL	100 $\mu$ M	0.64505
7.	30 $\mu$ L	2.610 mL	360 $\mu$ L	3 mL	120 $\mu$ M	0.65098

**Table S2.** Fluorescence decay experiments of L•Tb dispersion with different FOX-7 concentrations monitoring at 544 nm. Excitation at 325 nm.

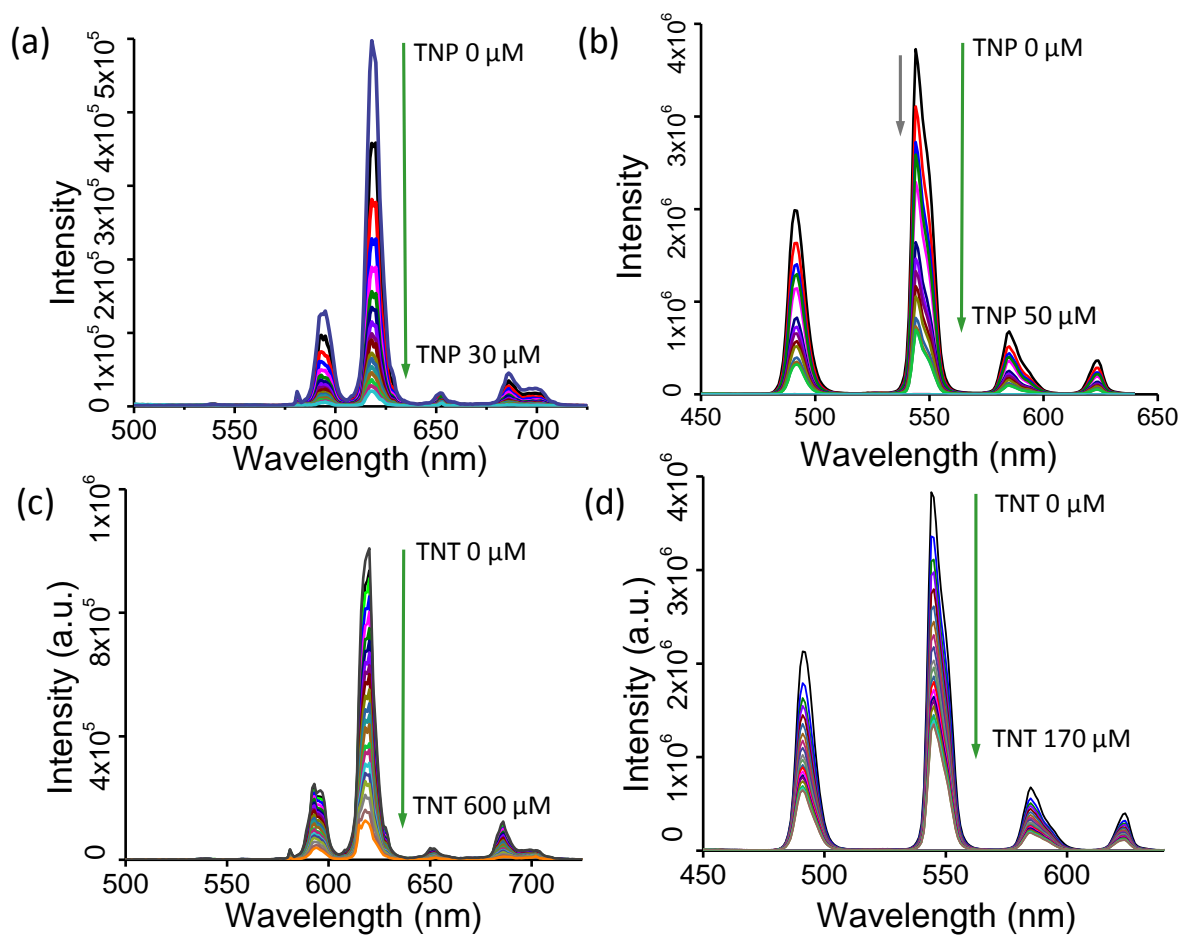
Sl No	L•Tb (2mg/2 mL MeCN)	MeCN	FOX-7 (MeCN)	Total amount of solution	Concentration of FOX-7 ( $\mu$ M)	Lifetime (ms)
1.	30 $\mu$ L	2.970 mL	0 $\mu$ L	3 mL	0 $\mu$ M	1.21917
2.	30 $\mu$ L	2.910 mL	60 $\mu$ L	3 mL	20 $\mu$ M	1.21188
3.	30 $\mu$ L	2.850 mL	120 $\mu$ L	3 mL	40 $\mu$ M	1.16068
4.	30 $\mu$ L	2.790 mL	180 $\mu$ L	3 mL	60 $\mu$ M	1.1205
5.	30 $\mu$ L	2.730 mL	240 $\mu$ L	3 mL	80 $\mu$ M	1.15487
6.	30 $\mu$ L	2.670 mL	300 $\mu$ L	3 mL	100 $\mu$ M	1.10019
7.	30 $\mu$ L	2.610 mL	360 $\mu$ L	3 mL	120 $\mu$ M	1.10872



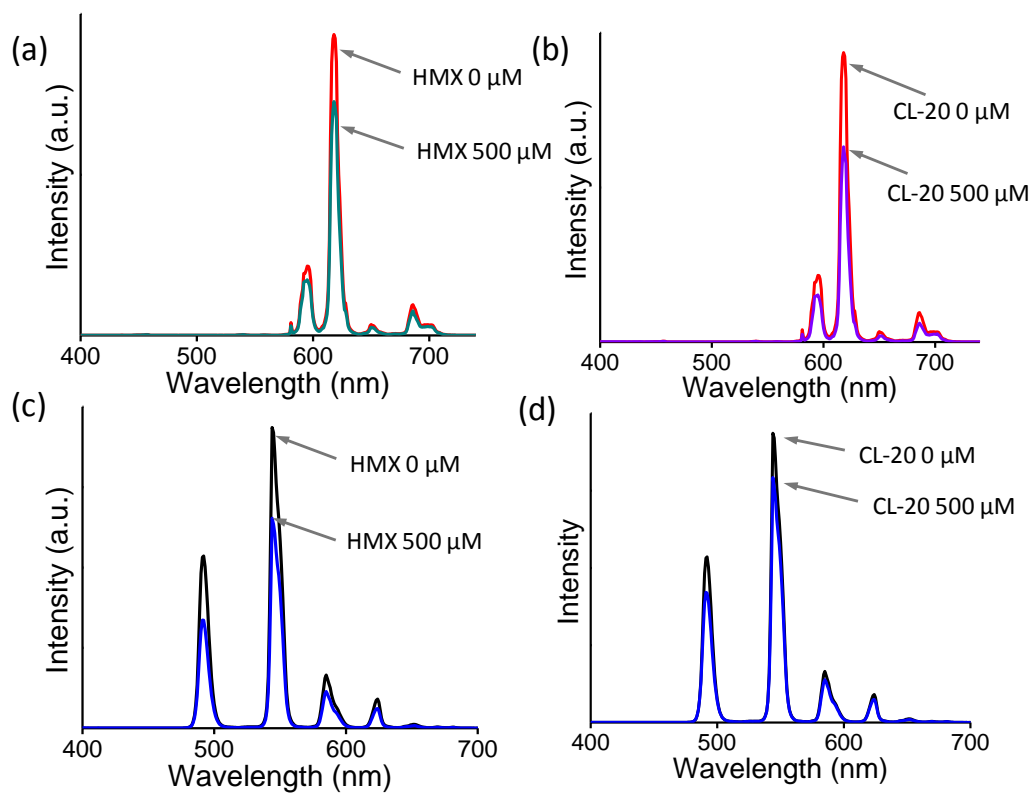
**Fig. S9.** Initial linear region of the fluorescence intensity of L•Eu and L•Tb dispersion (2mg/2mL) in MeCN with varying the concentration of FOX-7.



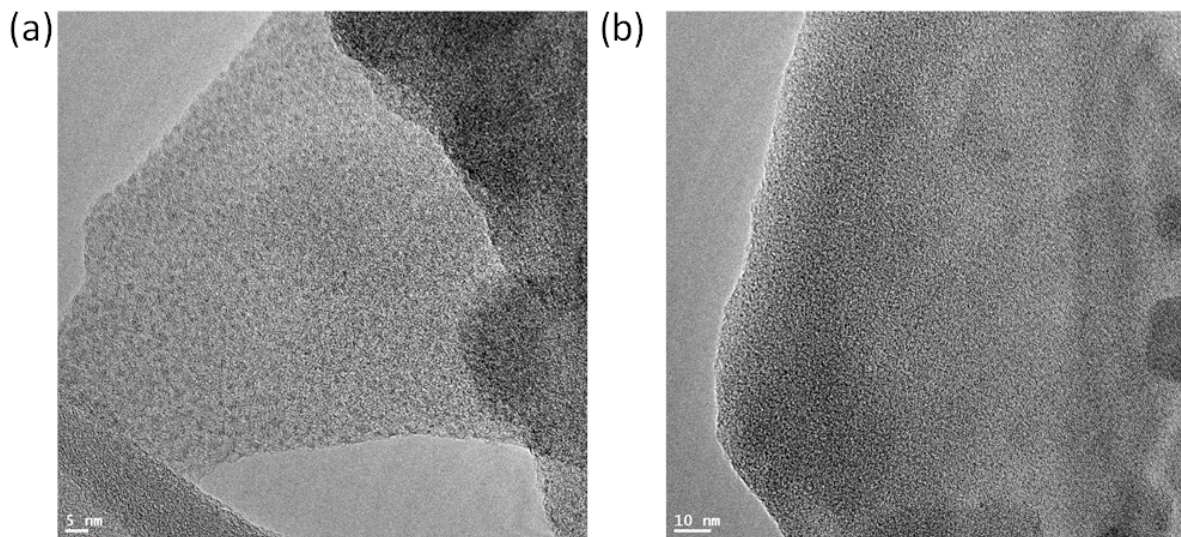
**Fig. S10.** Intersection of the normalized absorption and emission spectra of (a) L•Eu and (b) L•Tb. Differential pulse voltammetry (DPV) spectra for (c) L•Eu and (d) L•Tb in deoxygenated DMF in the presence of 0.1 M TBAPF<sub>6</sub> as supporting electrolyte, by using a Ag/AgCl (saturated KCl) electrode as the reference electrode.



**Fig. S11.** (a and b) Fluorescence spectra of L•Eu and L•Tb nanosheets dispersed in MeCN in the presence of an incremental concentration of TNP ( $\lambda_{\text{ex}} = 325$  nm). (c and d) Fluorescence spectra of L•Eu and L•Tb nanosheets dispersed in MeCN in the presence of an incremental concentration of TNT ( $\lambda_{\text{ex}} = 325$  nm).



**Fig. S12.** Fluorescence spectra of L•Eu and L•Tb nanosheets dispersed in MeCN in the presence of HMX and CL-20 ( $\lambda_{\text{ex}} = 325 \text{ nm}$ ).



**Fig. S13.** TEM images of the L•Eu and L•Tb 2D nanosheets after treatment of FOX-7 on the lacey-carbon supported copper TE