

Supporting Information

# Improved photophysical properties of ionic material-based combination chemo/PDT nanomedicine

*Samantha Macchi<sup>a</sup>, Mohd Zubair<sup>b</sup>, Robert Hill<sup>a</sup>, Nabeel Alwan<sup>a</sup>, Yusuf Khar<sup>c</sup>, Nawab Ali<sup>b</sup>,*

*Grégory Guisbiers<sup>d</sup>, Brian Berry<sup>a</sup>, and Noureen Siraj<sup>a,\*</sup>*

[a] Department of Chemistry. University of Arkansas at Little Rock. 2801 S. University Ave.,

Little Rock, AR 72204

[b] Department of Biology. University of Arkansas at Little Rock. 2801 S. University Ave.,

Little Rock, AR 72204

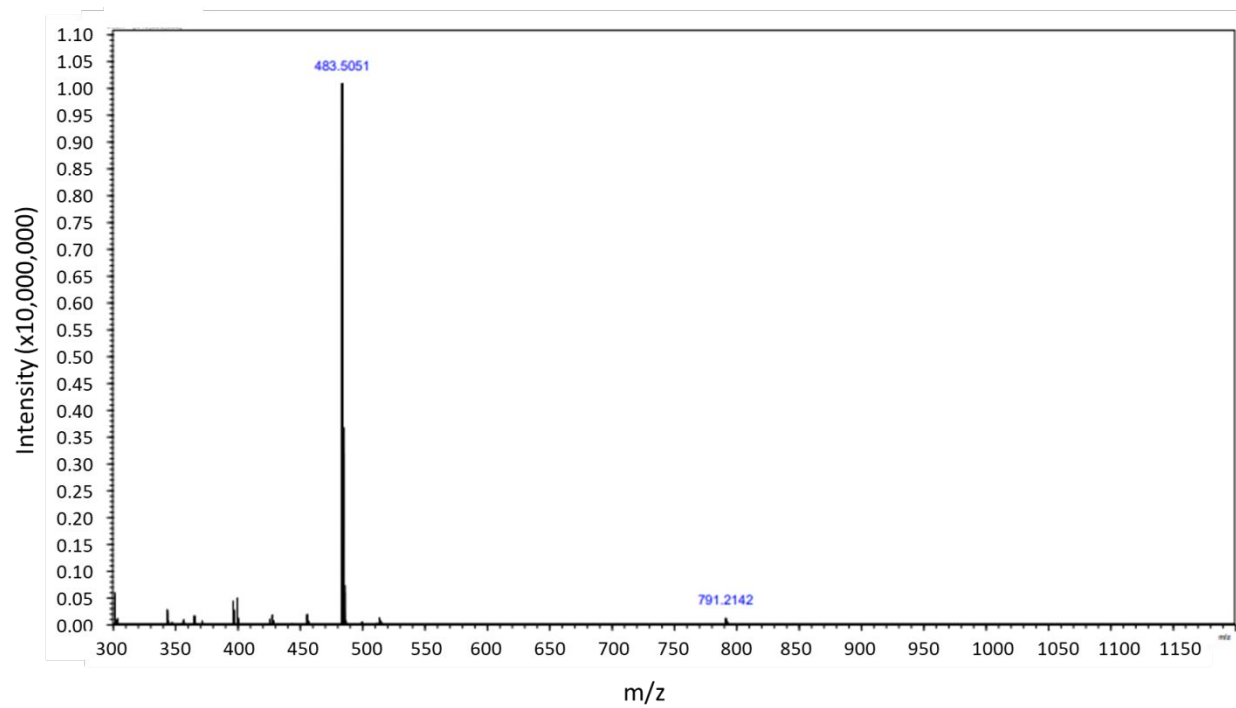
[c] Department of Electrical and Computer Engineering, University of Texas at Austin, Austin,

TX 78712, USA

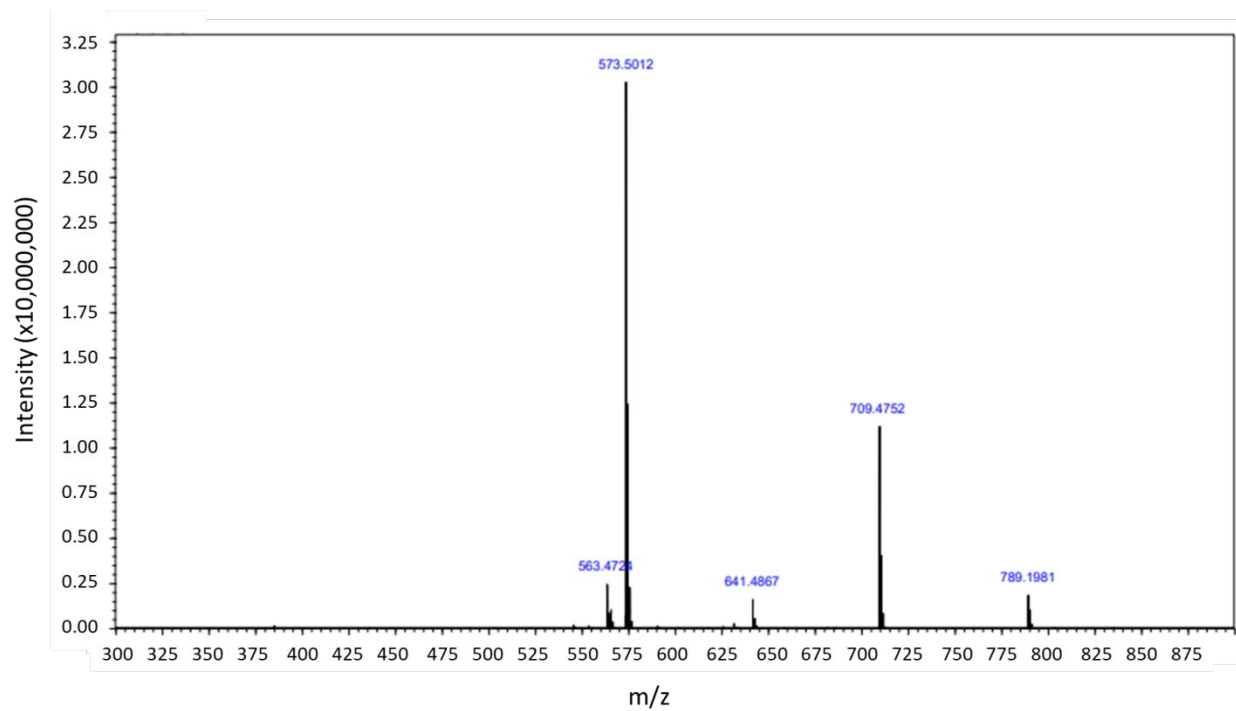
[d] Department of Physics and Astronomy. University of Arkansas at Little Rock. 2801 S.

University Ave., Little Rock, AR 72204

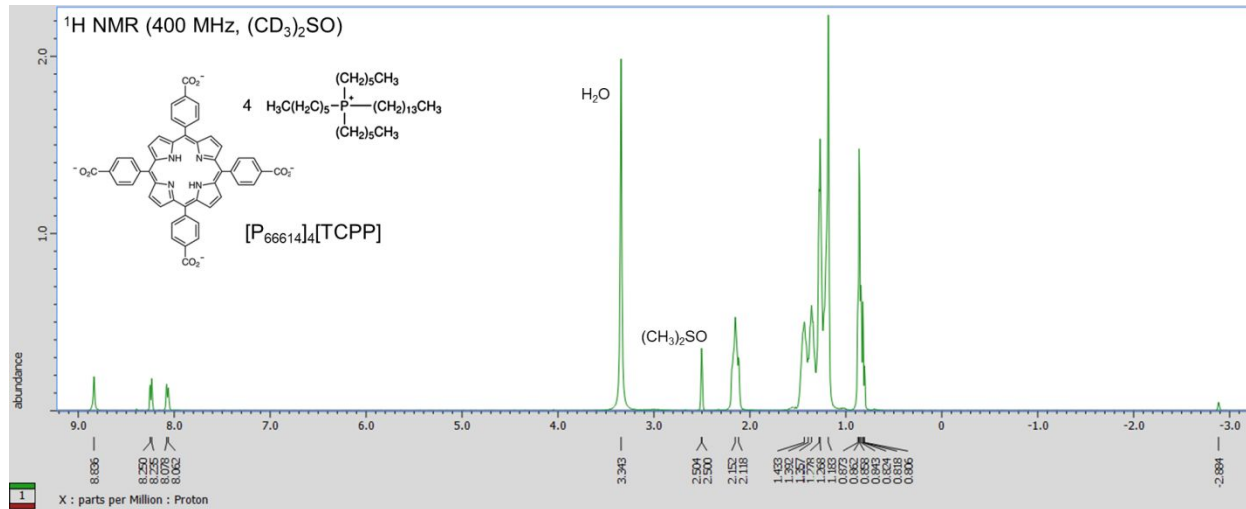
\*Corresponding author: Noureen Siraj (E) nxsiraj@ualr.edu (O) 501-916-6544



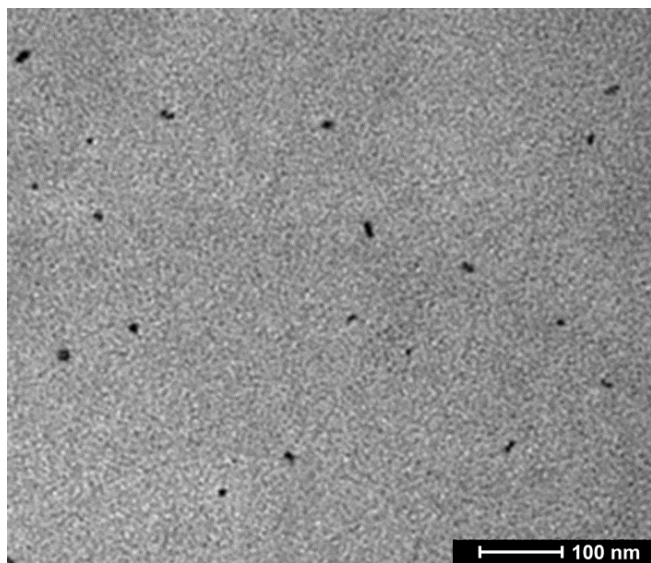
**Figure S1.** ESI-MS of  $[P_{66614}]_4[TCPP]$  in positive ion mode



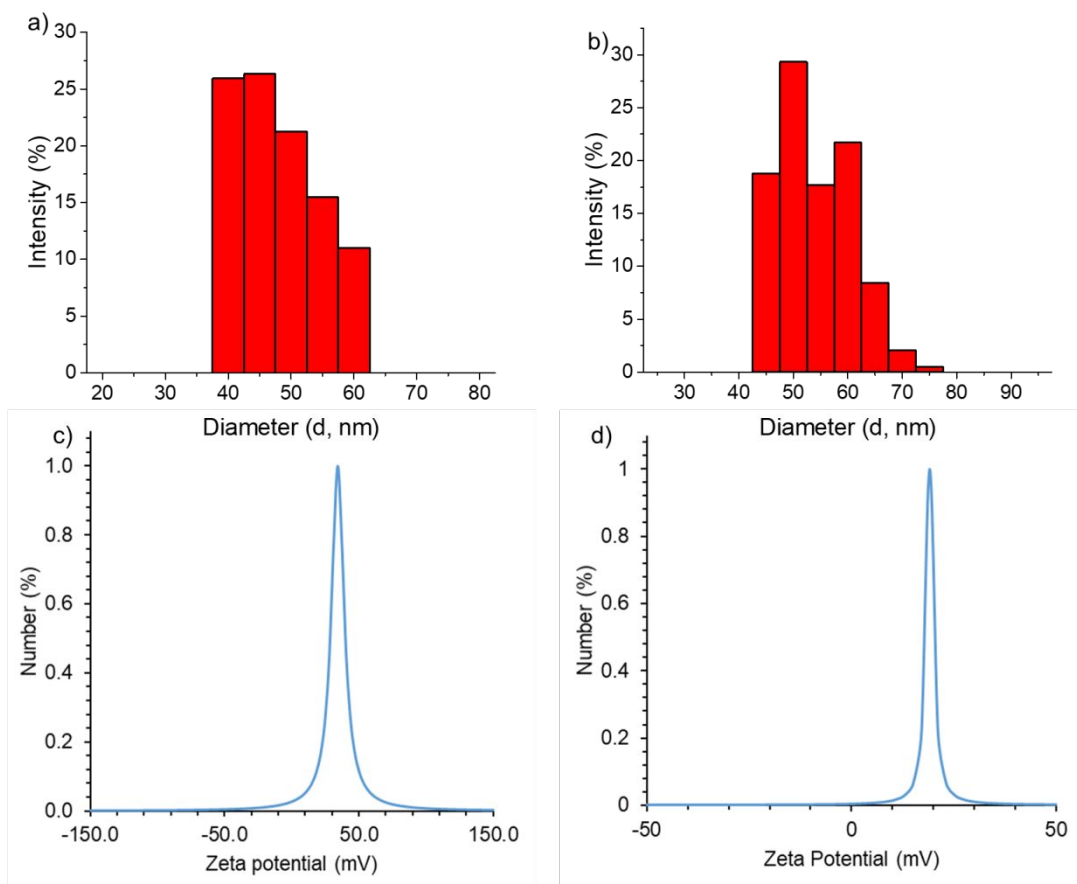
**Figure S2.** ESI-MS of  $[P_{66614}]_4[TCPP]$  in negative ion mode



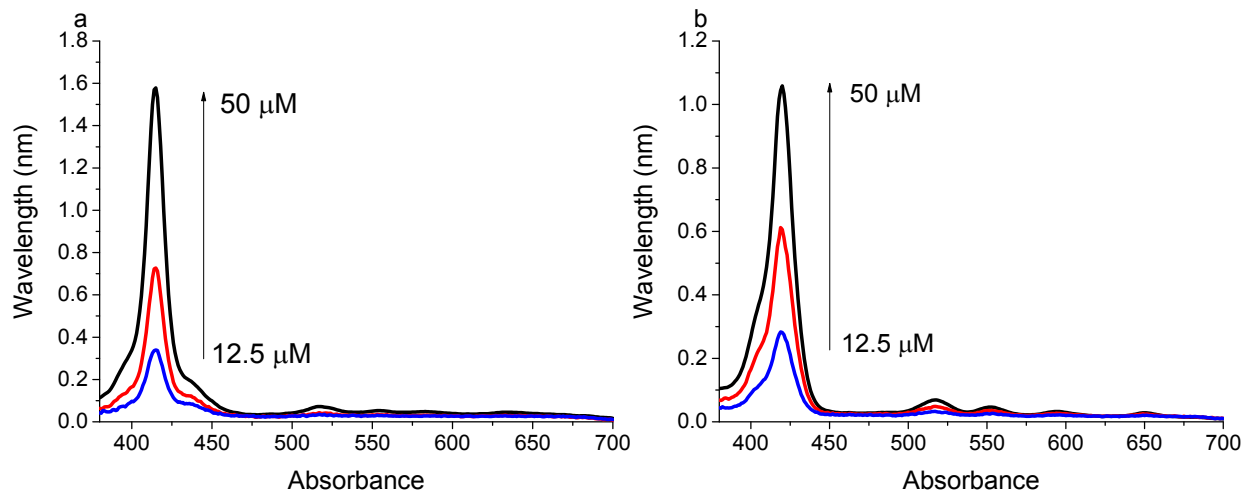
**Figure S3.** NMR spectra of  $[P_{66614}]_4[TCPP]$



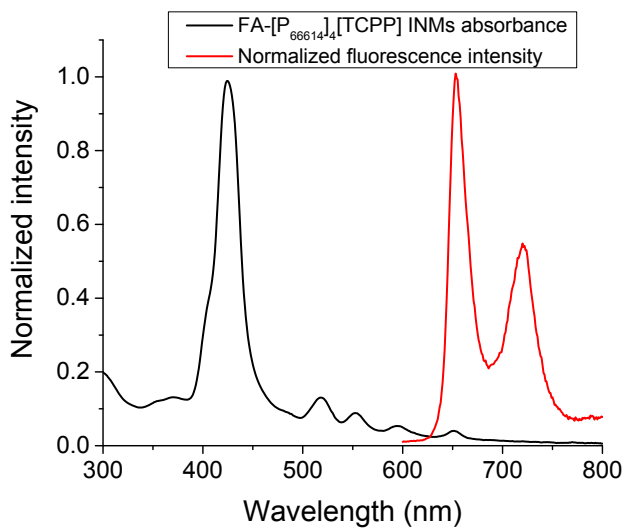
**Figure S4.** TEM image of  $[P_{66614}]_4[TCPP]$  INMs



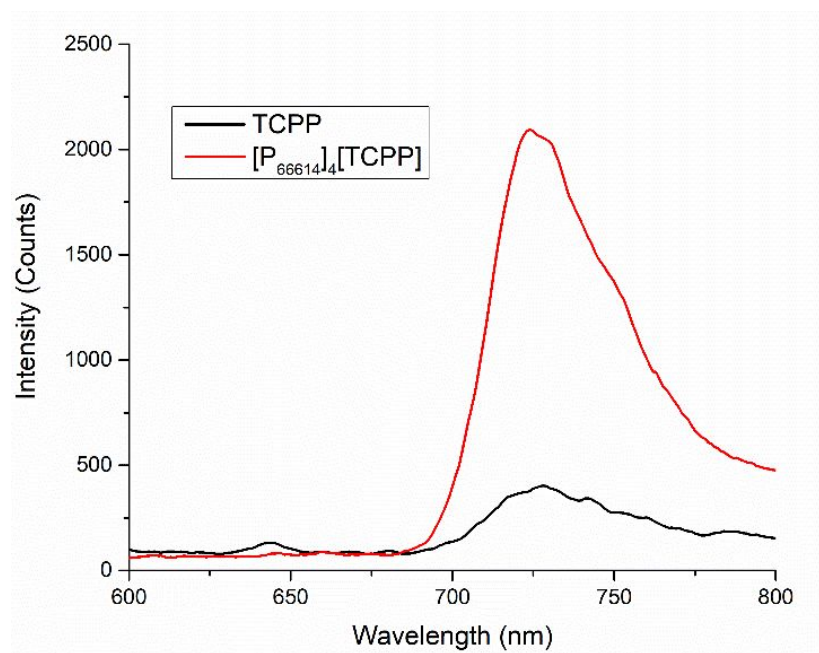
**Figure S5.** Particle size distribution of a)  $[P_{66614}]_4[TCPP]$  INMs and b) FA- $[P_{66614}]_4[TCPP]$  coated INMs at a concentration of 50  $\mu\text{M}$  and zeta potential distribution of the same suspension of c)  $[P_{66614}]_4[TCPP]$  INMs and d) FA- $[P_{66614}]_4[TCPP]$  coated INMs



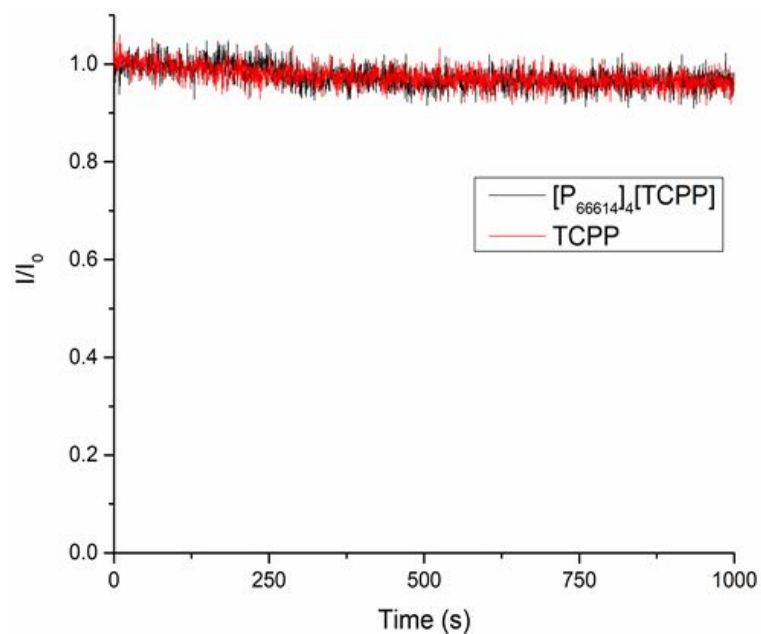
**Figure S6.** Absorbance of a) TCPP and b)  $[P_{66614}]_4[TCPP]$  in water at high concentration using sub-micron 4-sided cuvet (0.3 cm path length).



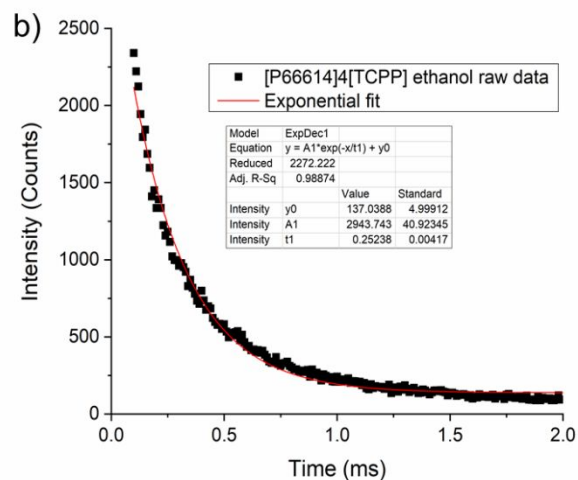
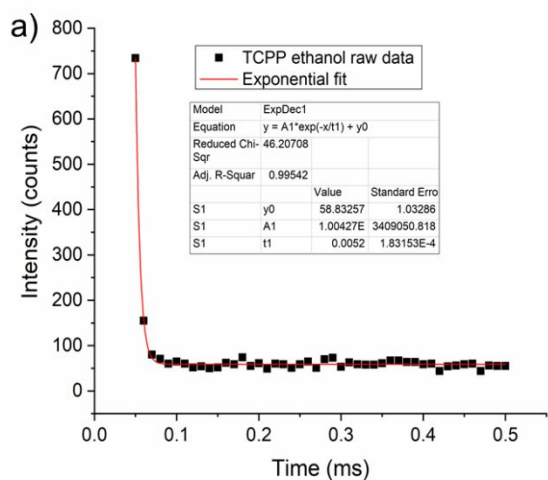
**Figure S7.** FA-coated NP absorbance (black line) and fluorescence emission (red)



**Figure S8.** Phosphorescence of 1  $\mu\text{M}$  TCPP and  $[\text{P}_{66614}]_4[\text{TCPP}]$  in ethanol at 77K at an excitation wavelength of 420 nm and at 0.1 ms delay time.

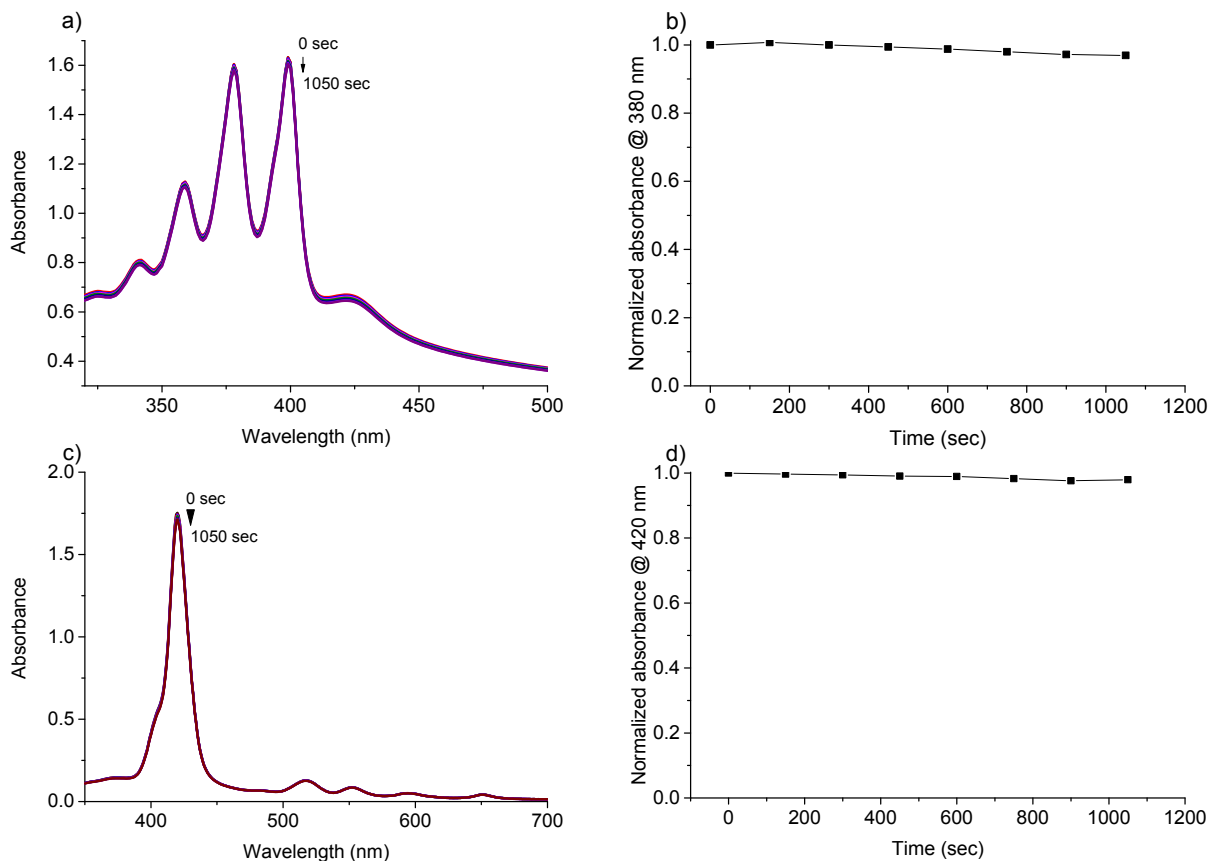


**Figure S9.** Photostability of  $[P_{66614}]_4[TCPP]$  and TCPP parent in ethanol over 1000 s. The ratio represents the fluorescence intensity ( $I$ ) at any time over the initial fluorescence intensity ( $I_0$ ) of each compound.

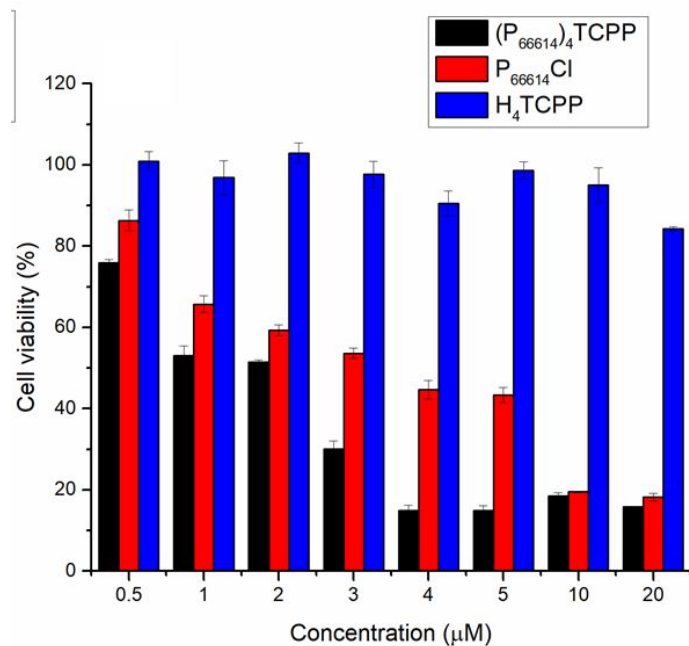




**Figure S10.** Phosphorescence decay profile of a) TCPP and b)  $[P_{66614}]_4[TCPP]$  in ethanol at 77 K with 1 exponential fit of data



**Figure S11.** a) Absorbance of probe (ABDA) after irradiation for 1050 sec and b) normalized absorbance monitored at 380 nm during irradiation at 420 nm. c) Absorbance of  $[P_{66614}]_4[TCPP]$  INMs after irradiation for 1050 sec and d) normalized absorbance monitored at 420 nm during irradiation at 420 nm.



**Figure S12.** Cytotoxicity of parent compounds and unmodified nanodrug incubated for 24 hr in MCF-10A cells

**Table S1.** Calculated IC<sub>50</sub> concentrations (μM) of drugs in MCF-7 at 10<sup>4</sup> cells per well after 4 hr in dark (-) and light (+) conditions.

Sample	With irradiation (+)	W/out irradiation (-)
TCPP	27.4	N/A
[P <sub>66614</sub> ] <sub>4</sub> [TCPP]	5.2	7.3