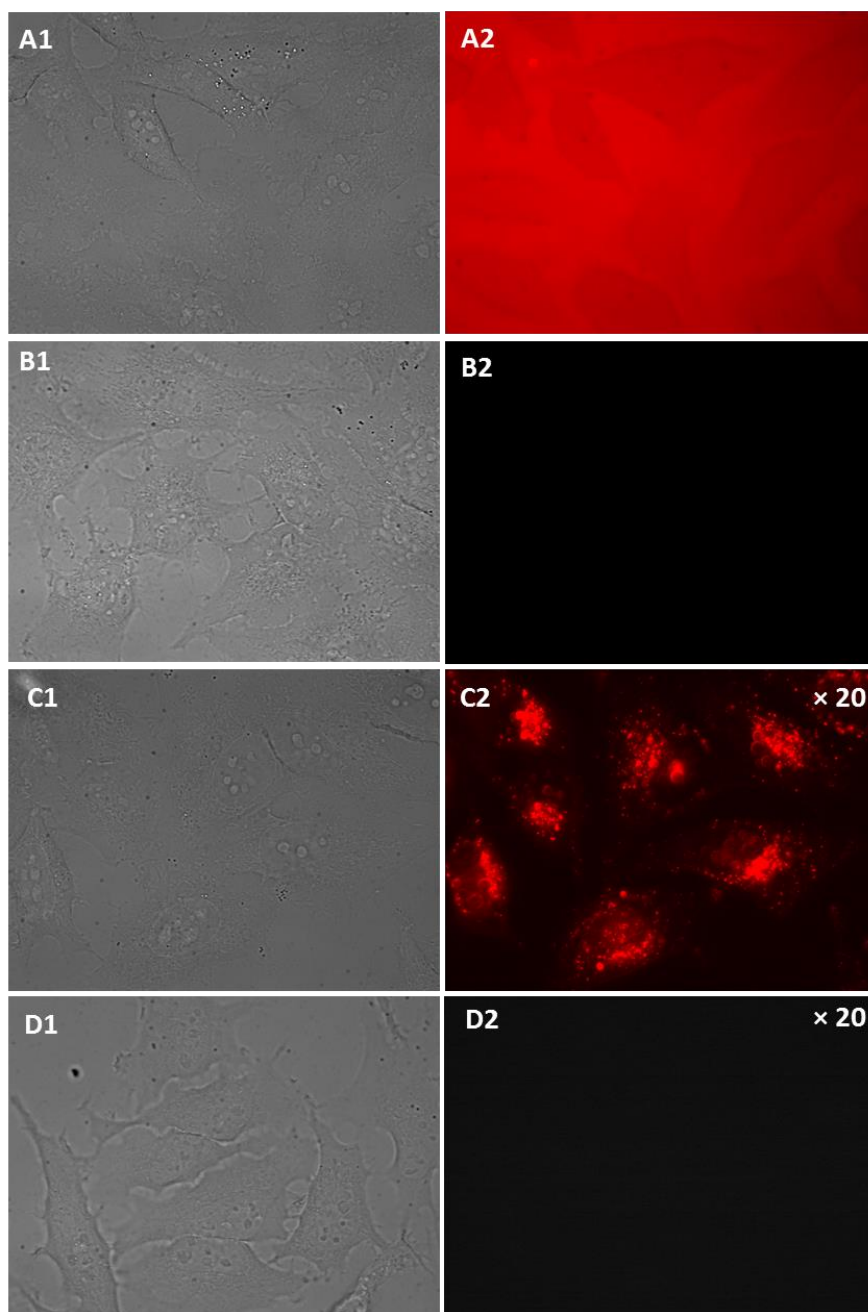


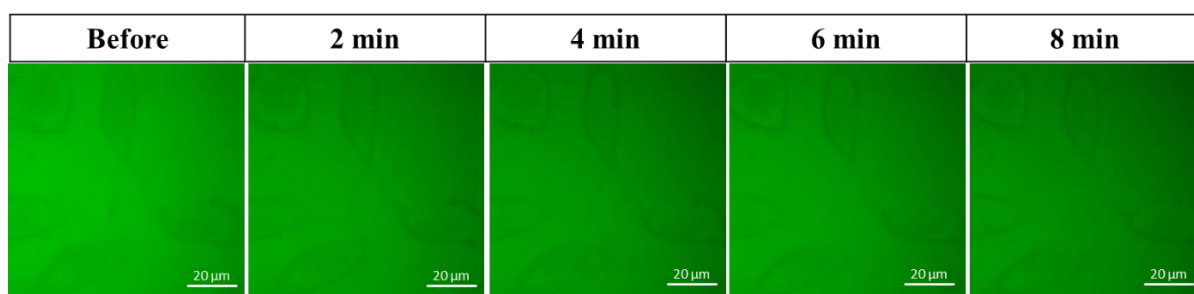
## **Supplementary Material**

### **Light-triggered release from dye-loaded fluorescent lipid nanocarriers *in vitro* and *in vivo***

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**Figure S1.** Bright field and fluorescence images of HeLa cells. (A1-A2) NR668 nanocarriers incubated for 15 min with HeLa cells. (B1-B2) NR668 nanocarriers incubated for 15 min with cells then washed by PBS. (C1-C2) NR668 without nanocarriers (added from DMSO) incubated for 15 min with cells. The signal in C2 is multiplied 20-fold for visibility. All experiments were done at 37 °C. (D1-D2) Control image of HeLa cells without NR888 using the same microscopy settings. The size of the images was 140 × 105 μm.



**Figure S2.** Fluorescence imaging of HeLa cells incubated for 15 min at 37 °C with F888-loaded nanocarrier (at 1 wt%) before and after illumination for 30 s. Each figure was taken every 2 min.

**Table S1.** FCS data of nanoemulsions in different media before and after illumination.<sup>a</sup>

Sample	Cps (kHz)	N	$\tau_d$ (ms)	Chi2	Brightness (kHz)	C (nM)	Size (nm)
<b>Before illumination</b>							
Water	32.1	0.82	1.35	0.999	38.8	1.7	33
Blank NCs	33.8	0.81	1.31	0.999	40.5	1.7	32
Blank NCs + Na <sub>2</sub> SO <sub>3</sub>	29.8	0.92	1.41	0.999	32.1	1.9	34
Opti-MEM	33.1	1.00	1.41	0.999	32.0	2.1	34
FBS	29.6	1.12	1.38	0.999	26.3	2.3	33
FBS + Na <sub>2</sub> SO <sub>3</sub>	32.1	1.26	1.42	0.999	25.6	2.6	34
<b>After illumination</b>							
Water	10.2	0.83	1.37	0.999	12.3	1.7	33
Blank NCs	18.6	3.63	1.28	0.998	5.11	7.5	31
Blank NCs + Na <sub>2</sub> SO <sub>3</sub>	13.6	1.23	1.43	0.999	11.0	2.6	34
Opti-MEM	12.1	1.02	1.39	0.998	11.9	2.1	33
FBS	17.2	4.45	1.30	0.996	3.86	9.2	31
FBS + Na <sub>2</sub> SO <sub>3</sub>	16.4	1.96	1.34	0.998	8.32	4.1	32
TMR ( rhodamine )	67.0	24.08	0.0417	0.998	2.77	50	1.0

<sup>a</sup> The effect of 30 min illumination by 532-nm laser (power density 60 mW/cm<sup>2</sup>) on lipid nanocarriers (NCs) loaded with NR668 in different media: water, Opti-MEM, emulsion of blank nanocarriers and FBS. In some samples oxygen depleting agent sodium sulphide (Na<sub>2</sub>SO<sub>3</sub>) was used. Cps: count rate. N: the mean number of emissive species within the two-photon excitation volume. Chi2: the goodness of the fit.  $\tau_d$ : diffusion (correlation) time. C: concentration of emissive species. Size: the hydrodynamic diameter of NCs ( $d_{NCs}$ ) was calculated as:  $d_{NCs} = \tau_{d(NCs)} / \tau_{d(TMR)} \times d_{TMR}$ , where  $d_{TMR}$  is a hydrodynamic diameter of TMR (1.0 nm). Each value is the mean of 20 recorded correlation curves (the recording time for each curve was 10 s for NCs and 30 s for TMR).