Electronic Supplementary Material (ESI) for RSC Advances.

Supporting information

Hierarchical Coated Metal Hydroxide Nanoconstructs as Potential Controlled Release Carriers of Photosensitizer for Skin Melanoma

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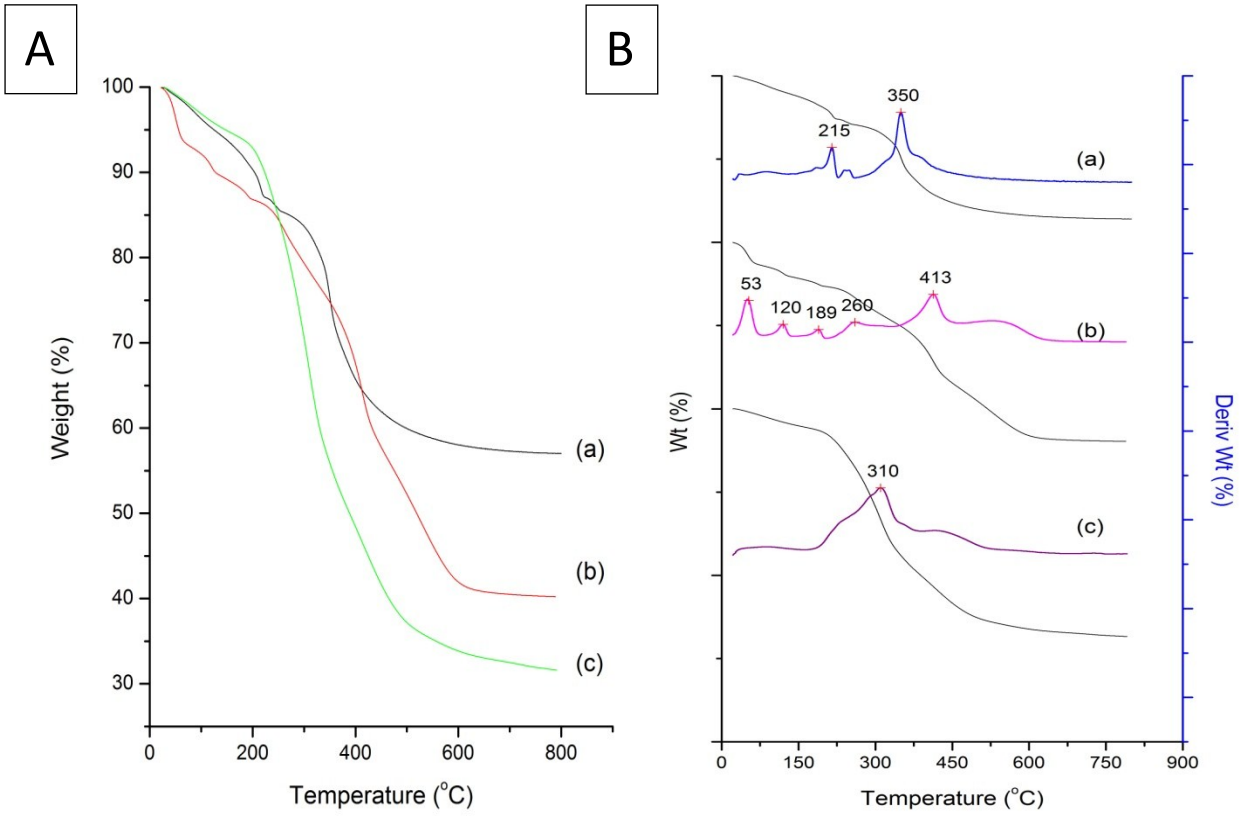


Fig. S1 TGA curves of (a) LDH, (b) LDH-IAA and (c) LDH-IAA-Lipo.

Table S1. Particle size and surface ζ-potential values of Liposome coated LDH-IAA

	Material	Particle size (nm)	Zeta potential (mV)
a)	LDH	167	47.2 ± 0.97
b)	LDH-IAA	220	1.02 ± 0.1
c)	LDH-IAA-Lipo	320	-42.5 ± 0.68

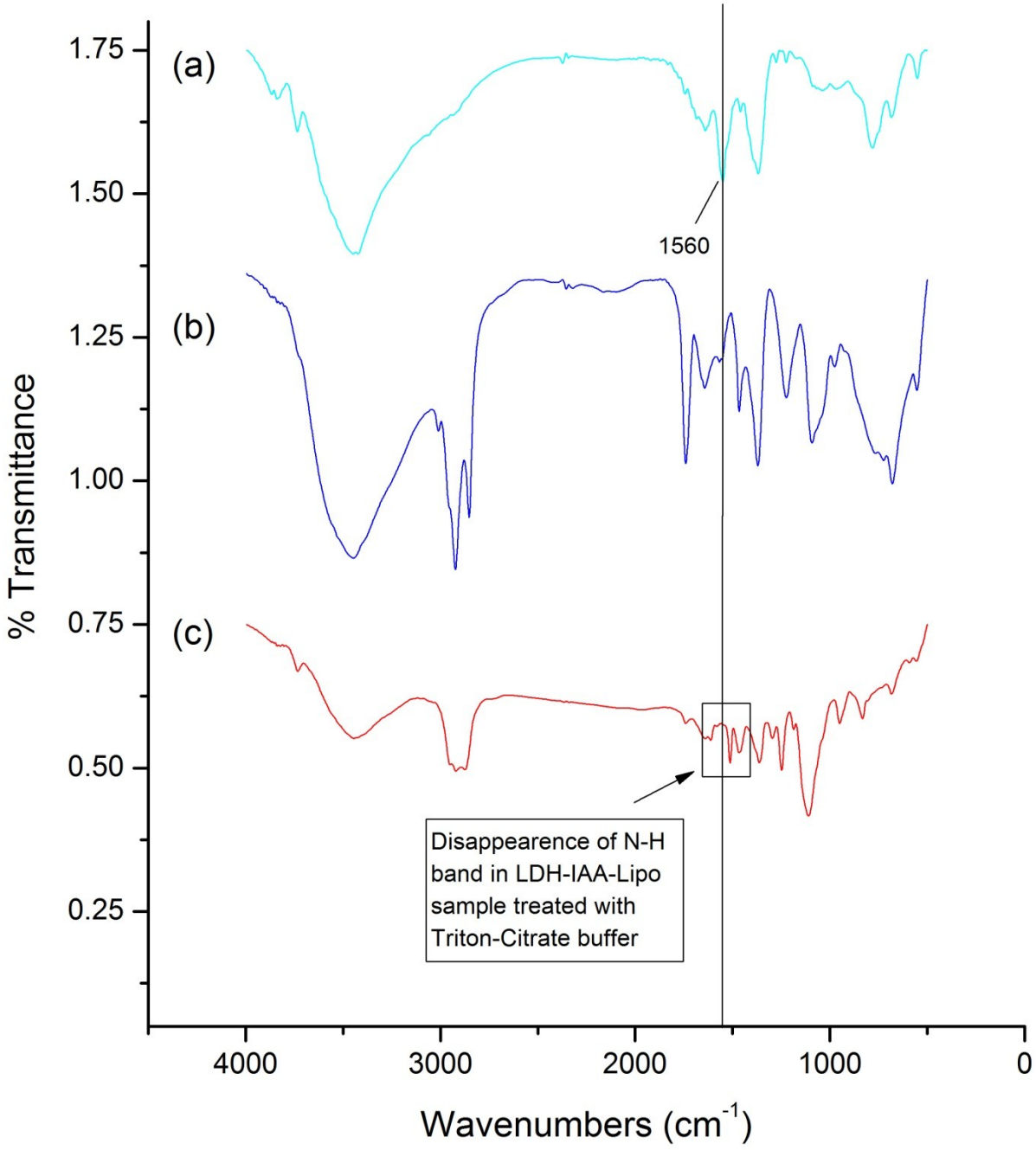


Fig. S2 FT-IR spectrum of (a) LDH-IAA, (b) LDH-IAA-Lipo and (c) LDH-IAA-Lipo after performing leaching study.

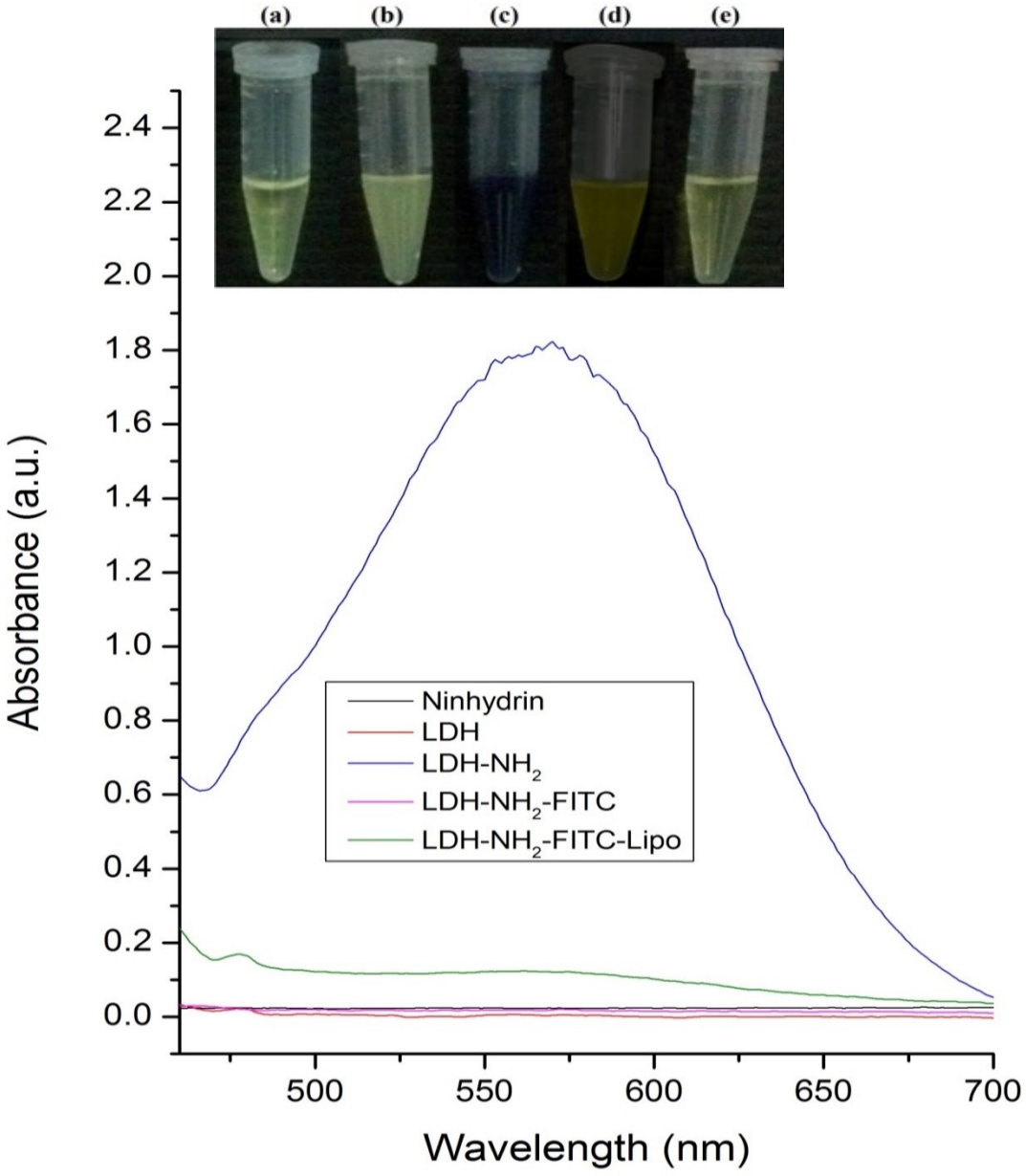
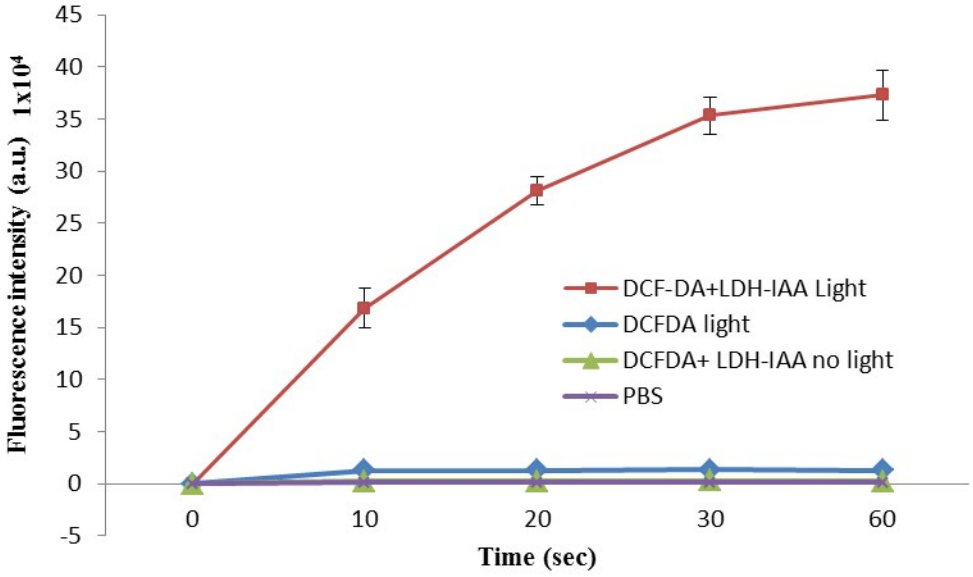
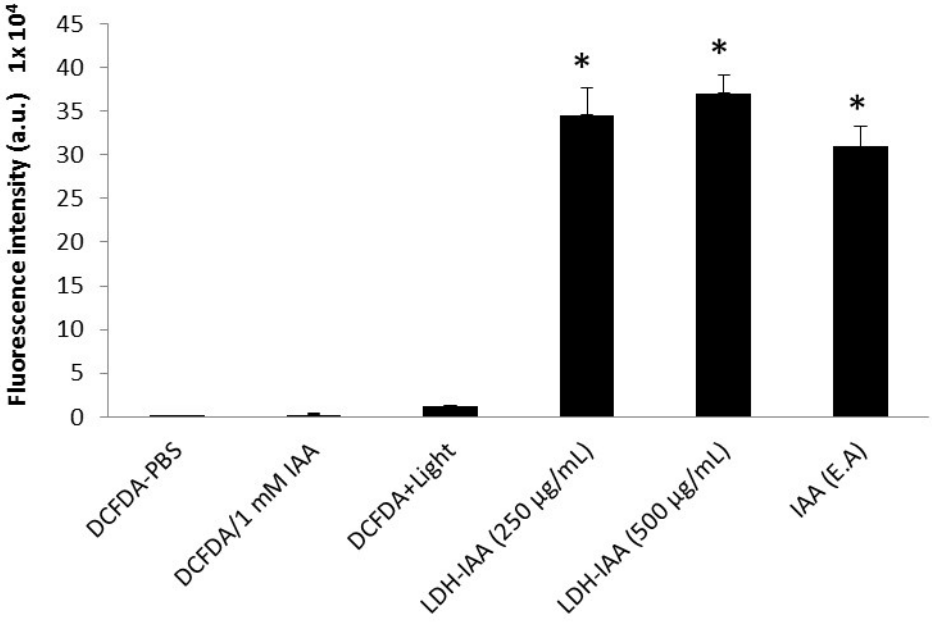


Fig. S3 UV-Vis spectra and bright field view of sample images (a) Ninhydrin, (b) LDH, (c) LDH-NH_2, (d) LDH-NH-FITC and (e) LDH-NH-FITC-Lipo.

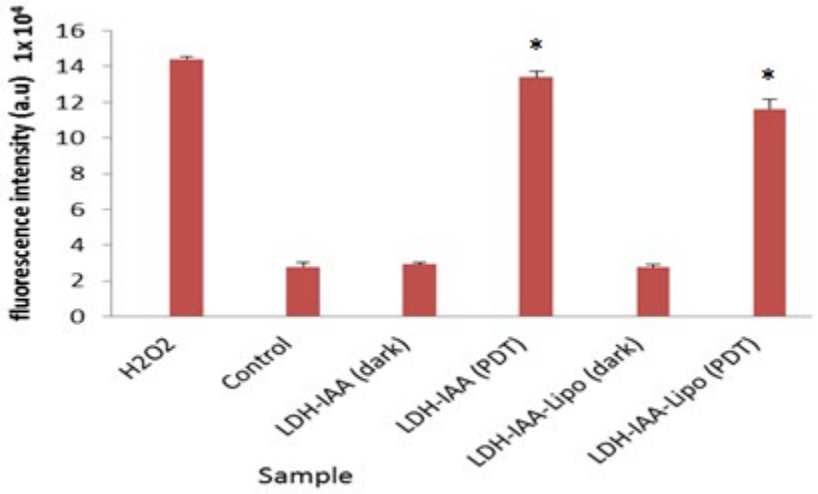
(a)


Fluorescence intensity (a.u.) 1x10⁴
45
40
35
30
25
20
15
10
5
0
-5
0
10
20
30
60
Time (sec)
DCF-DA+LDH-IAA Light
DCFDA light
DCFDA+ LDH-IAA no light
PBS

(b)


Fluorescence intensity (a.u.) 1x 10⁴
45
40
35
30
25
20
15
10
5
0
*
*
*
DCFDA-PBS
DCFDA/1 mM IAA
DCFDA+Light
LDH-IAA (250 µg/mL)
LDH-IAA (500 µg/mL)
IAA (E.A)

(c)



(d)

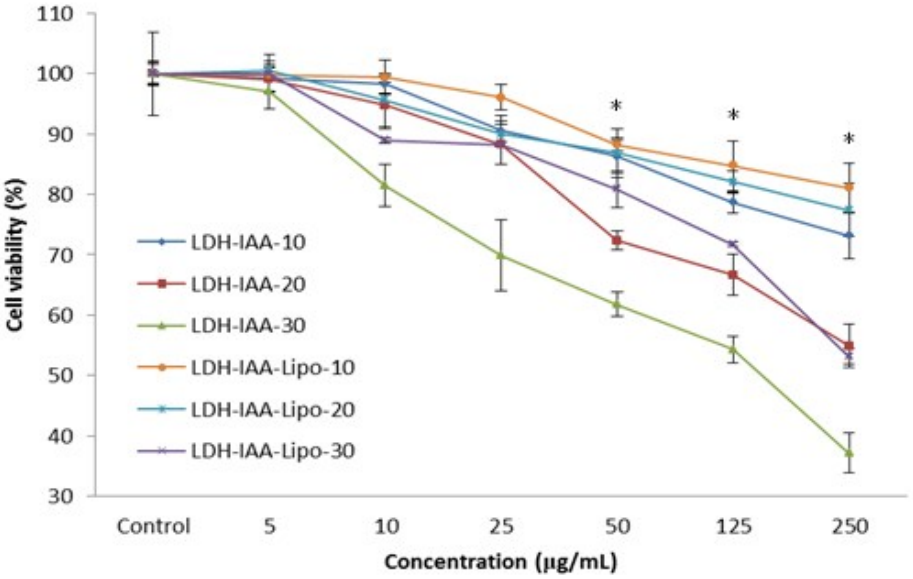


Fig. S4 Free radical determination on irradiation with visible light at 532 nm, free radical was measured with intensity of dichlorofluorescein (DCF) fluorescence. (a) Free radical formation with increasing light irradiation time. LDH-IAA at various exposure times 0-60 sec, (b) Fluorescent intensity of the free radicals generated from LDH-IAA at 30 seconds exposure time, (c) Fluorescent intensity of free radicals generated in presence of B16F10 cell line with LDH-IAA and LDH-IAA-Lipo (both treated @ 250 µg/mL). Hydrogen peroxide @ 1mM concentration, (d) Cell viability of LDH-IAA and LDH-IAA-Lipo (PDT) 0-250 µg/mL at various

light irradiation exposure times (10, 20, 30 seconds) in B16F10 cell line, Significance for all the three curves. * represents $p<0.001$ (one way ANOVA using Tukey test)

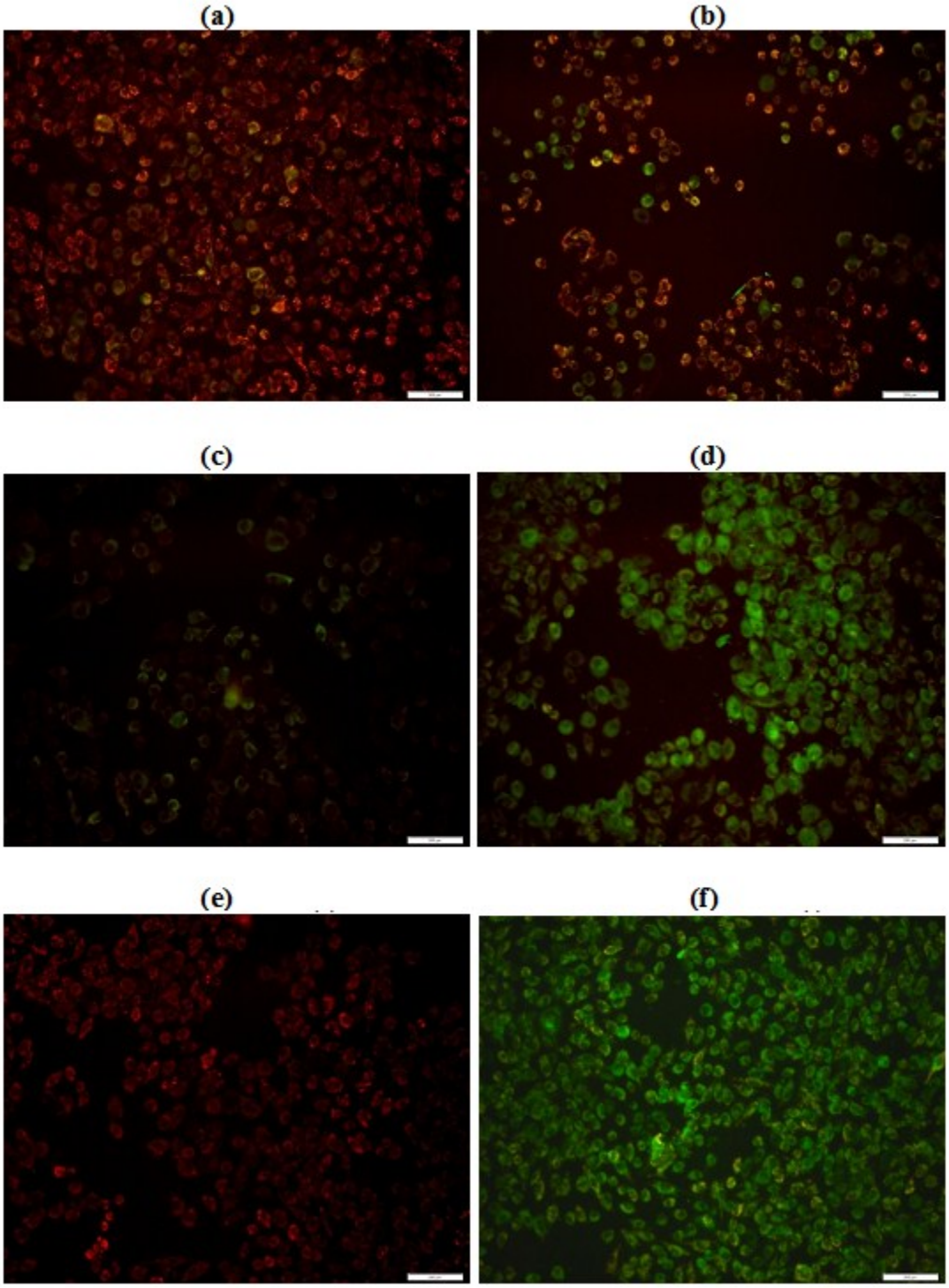


Fig. S5 Mitochondria membrane potential using JC-1 stain, merged images (a) control in dark, (b) control irradiated with light, (c) LDH-IAA (250 µg/mL) in dark, (d) LDH-IAA (250 µg/mL)

in presence of light, (e) LDH-IAA-Lipo (250 μg/mL) in dark and (f) LDH-IAA-Lipo (250 μg/mL) in presence of light.

Light Power of Laser (532 nm) used in PDT

Calculation of the power integrated over unit area

Power integrated over unit area can be calculated for the total energy transferred at unit time for unit area. Total energy at irradiated light wavelength was calculated as follows.

$$E = h\nu = h\,c/\lambda = 6.626 \times 10^{-34}\,Js \times \frac{3 \times 10^{8}\,\text{m/s}}{532 \times 10^{-9}\,\text{m}} = 3.7 \times 10^{-19}\,J$$

Total energy per unit time (t) refers to power and its exposure at unit area (A) (r = 0.2 cm) gives the power integrated over unit area ($A = \pi r^2$) for 30 s exposure of time.

$$\text{Power/cm}^2 = \frac{E}{t \times A} = \frac{3.7 \times 10^{-19}\,J}{30\,s \times 3.14 \times (0.2\,cm)^2} = 1 \times 10^{-9}\,J/s/cm^2$$