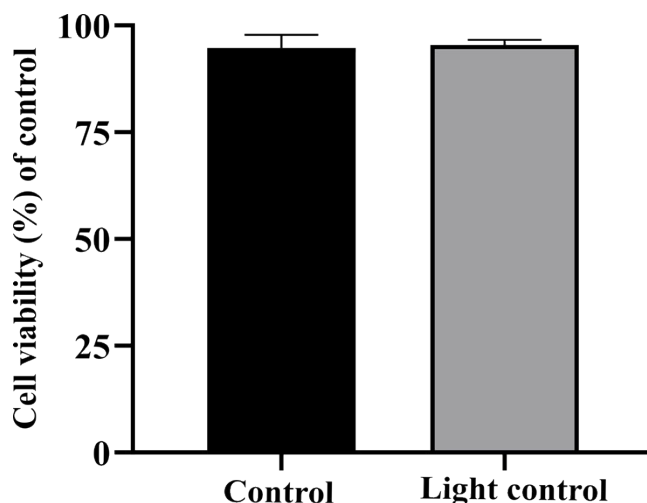
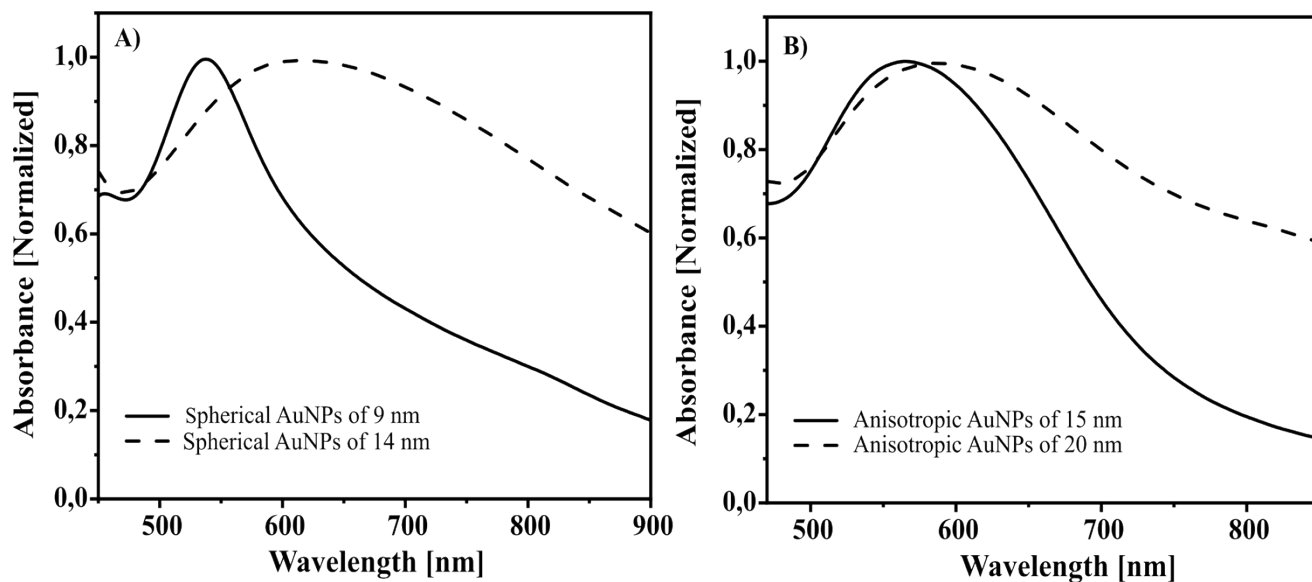


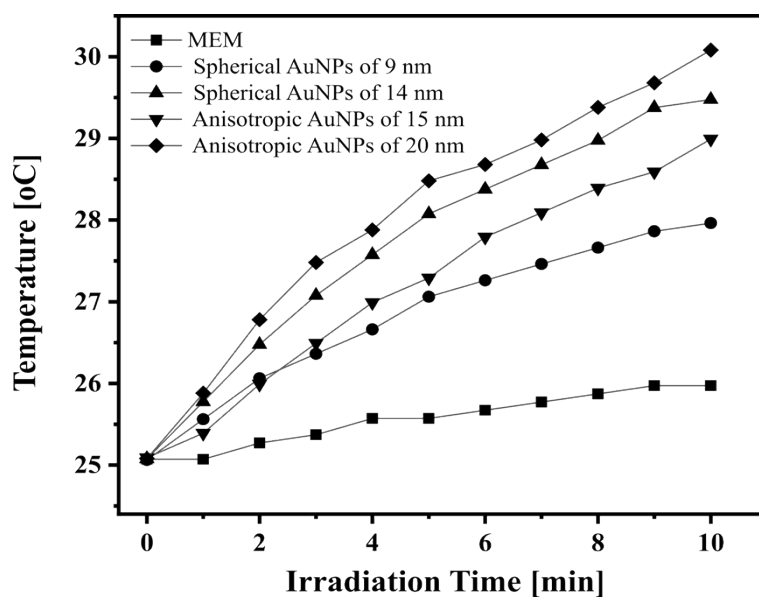
## Supporting Information



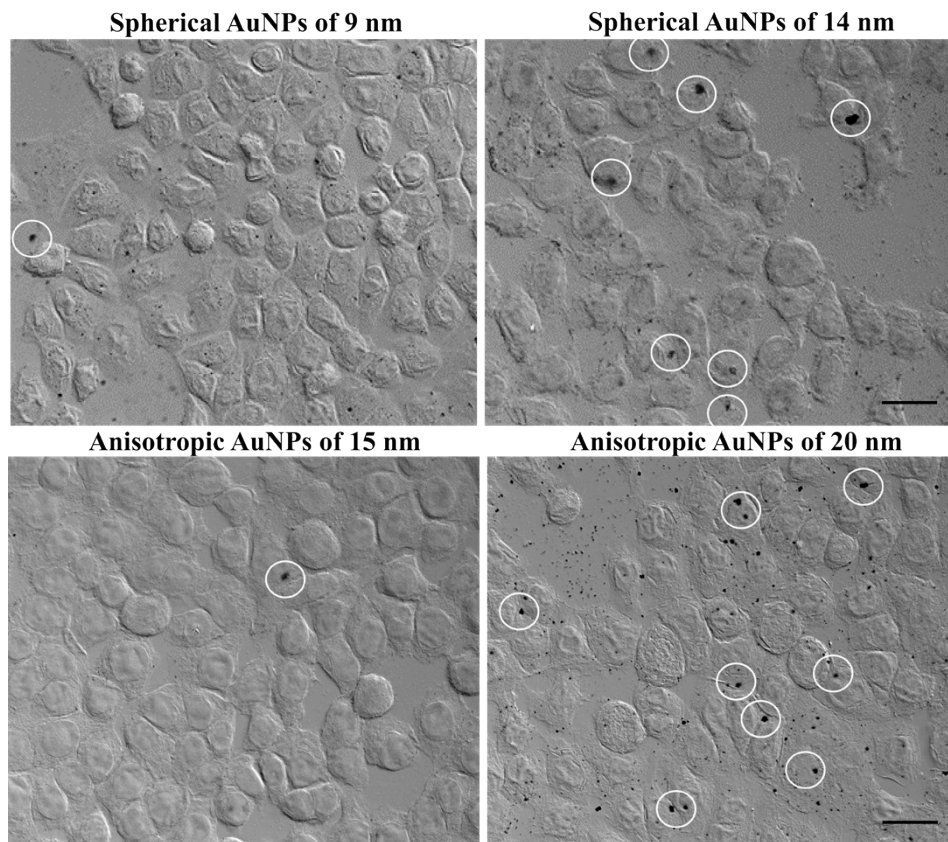
**Figure S1.** Cell viability assays of HeLa experimental control and laser control (cells exposed to 638 nm laser at 1.56 W/cm<sup>2</sup> power density for 5 min without AuNPs). The values represent the mean  $\pm$  standard deviation of three independent experiments.



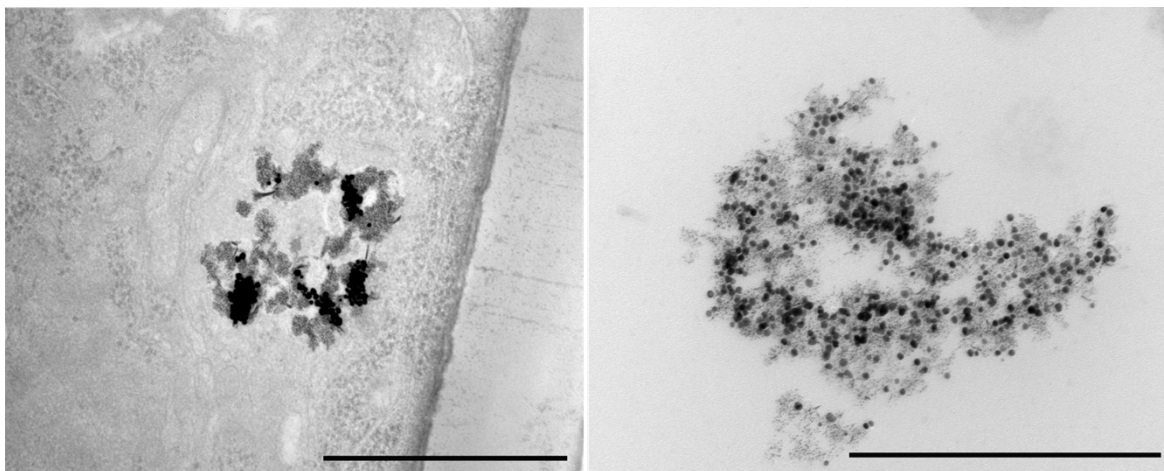
**Figure S2.** LSPR absorption bands of A) spherical AuNPs and B) anisotropic AuNPs in an aqueous medium.



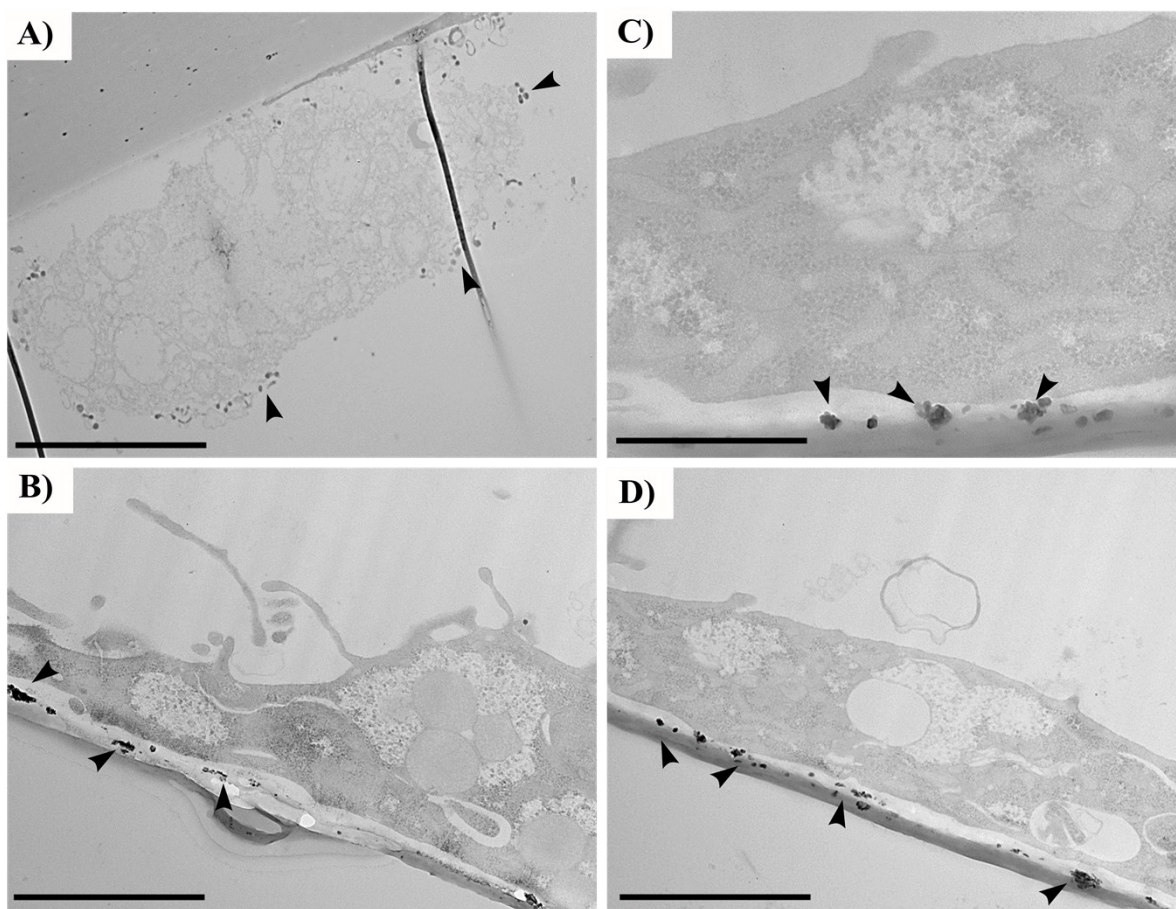
**Figure S3.** Temperature increase induced by Photothermal heating of spherical, anisotropic AuNPs solutions, and control media (MEM) without AuNPs upon exposure to 638 nm laser excitation at 1.56 W/cm<sup>2</sup>.



**Figure S4.** Differential interference contrast (DIC) images of HeLa cells treated with spherical and anisotropic AuNPs at 100  $\mu$ M. White circles shows agglomerates of AuNPs decorated HeLa cells, which increase as the particle size increases. Bar = 20  $\mu$ m.



**Figure S5.** Transmission electron microscopy of AuNPs inside HeLa cell after 5 min of laser treatment at 638 nm and 1.56 W/cm<sup>2</sup> with 100 μM. Bar = 1 μm.



**Figure S6.** TEM images of FA-AuNPs distribution in Vero cells upon irradiation treatment with 630 nm at 1.56 W/cm<sup>2</sup> with 50 μM spherical and anisotropic FA-AuNPs: A) spherical FA-AuNPs of 9 nm, B) spherical FA-AuNPs of 14 nm, C) anisotropic FA-AuNPs of 15 nm and D) anisotropic FA-AuNPs of 20 nm. Electron-dense areas correspond to the FA-AuNPs (arrowhead). Bar = 2 μm.