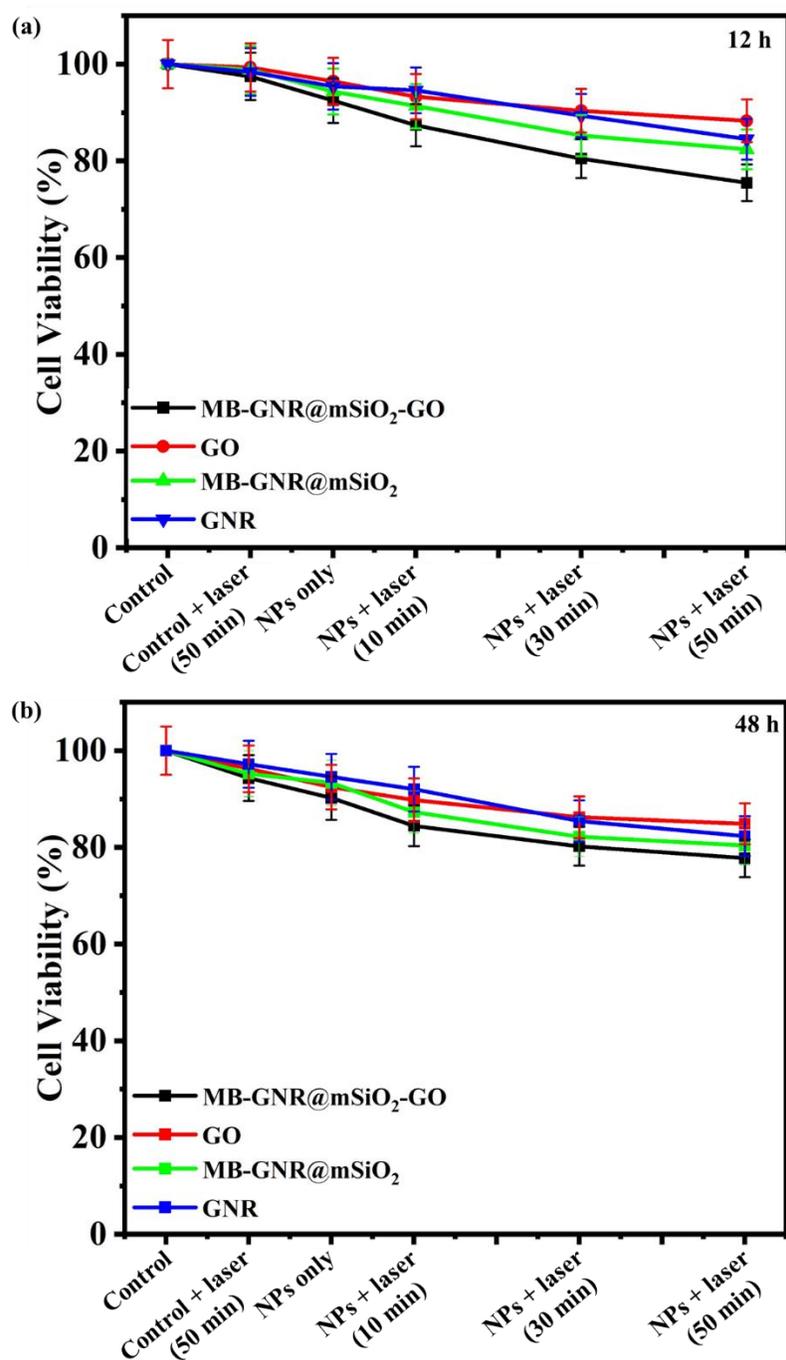
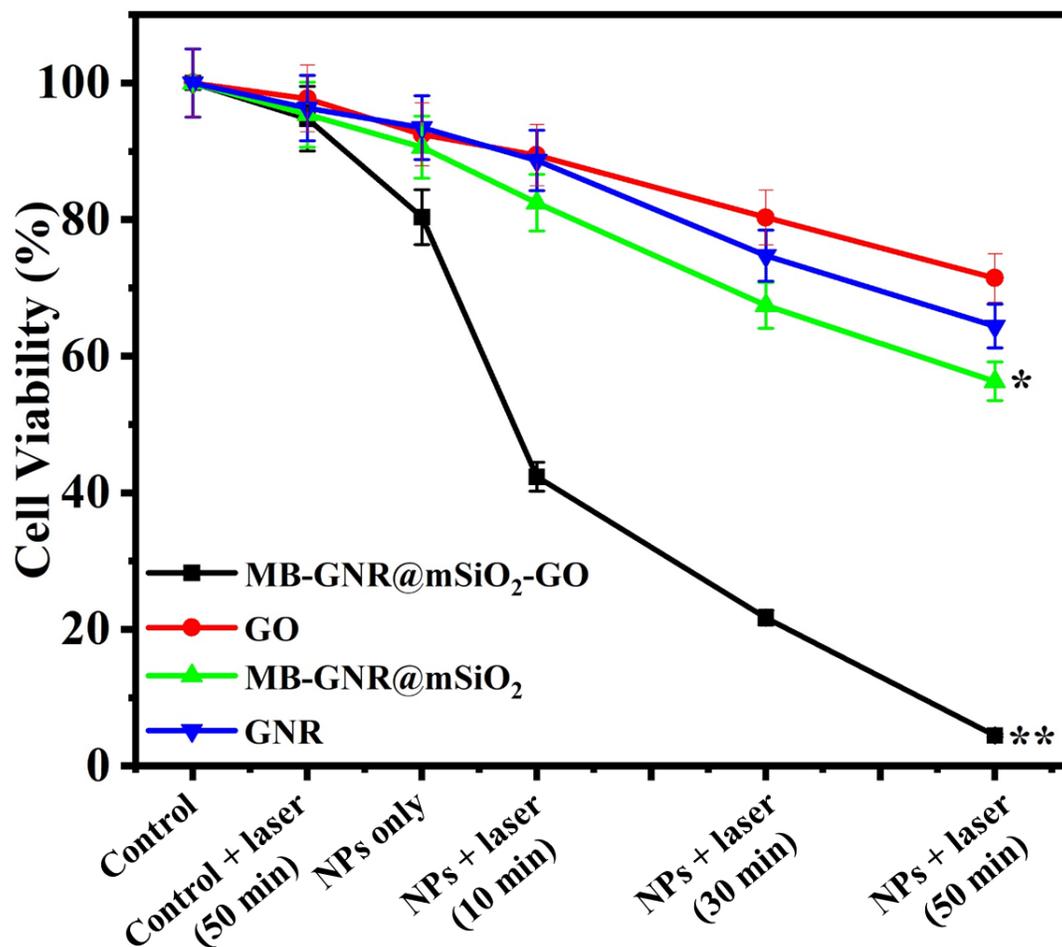


**Figure S1.** FETEM images of methylene blue-loaded mesoporous silica-coated gold nanorods on graphene oxide (MB-GNR@mSiO<sub>2</sub>-GO).



**Figure S2.** Viability of BLO-11 cells treated with gold nanorod (GNR), methylene blue-loaded mesoporous silica-coated gold nanorod (MB-GNR@mSiO<sub>2</sub>), graphene oxide (GO), and methylene blue-loaded mesoporous silica-coated gold nanorods on graphene oxide (MB-GNR@mSiO<sub>2</sub>-GO) (200  $\mu$ L/mL) for 12 h (a) and 48 h (b) with or without 785 nm laser irradiation at 0.8 W/cm<sup>2</sup> for various time points (0, 10, 30, and 50 min). Data were expressed as mean  $\pm$  S.D ( $n = 3$ ).



**Figure S3.** Viability of MDA-MB-231 cells treated with gold nanorod (GNR), methylene blue-loaded mesoporous silica-coated gold nanorod (MB-GNR@mSiO<sub>2</sub>), graphene oxide (GO), and methylene blue-loaded mesoporous silica-coated gold nanorods on graphene oxide (MB-GNR@mSiO<sub>2</sub>-GO) (200  $\mu$ L/mL) for 48 h with or without 785 nm laser irradiation at 0.8 W/cm<sup>2</sup> for various time points (0, 10, 30, and 50 min). Data were expressed as mean  $\pm$  S.D. ( $n = 3$ , \* significant  $P < 0.05$ , \*\* significant  $P < 0.01$ ).