

Supplementary Materials

Supplementary Table 1. The primer sequences used in the experiments.

Gene	Forward primer
	Reverse primer
GAPDH	5'-TGCACCACCAACTGCTTAGC-3'
	5'-GGCATGGACTGTGGTCATGAG-3'
CHOP	5'-GGAGCATCAGTCCCCCACTT-3'
	5'-TGTGGGATTGAGGGTCACATC-3'
BIP	5'-TGTTCAACCAATTATCAGCAAATC-3'
	5'-TTCTGCTGTATCCTCTTCACCAGT-3'
XBP1s	5'-AACCAGGAGTTAAGACAGCGCTT-3'
	5'-CTGCACCCTCTGCGGACT-3'
XBP1t	5'-CTGAATCTGAAGAGTCAATACCGCCAGAAT-3'
	5'-AGGAGTTAAGACAGCGCTTGGGGATGGAT-3'
ATF4	5'-GGCCACCATGGCGTATTA-3'
	5'-TGCTGAATGCCGTGAGAA-3'
ATF6	5'-CTTTTAGCCCGGACTCTTT-3'
	5'-TCAGCAAAGAGAGCAGAATCC-3'
EDEM	5'-TTGACAAAGATTCCACCGTCC-3'
	5'-TGTGAGCAGAAAGGAGGCTTC-3'
GRP94	5'-CAGTTTTGGATCTTGCTGT-3'
	5'-CAGCTGTAGATTCCTTTGC-3'

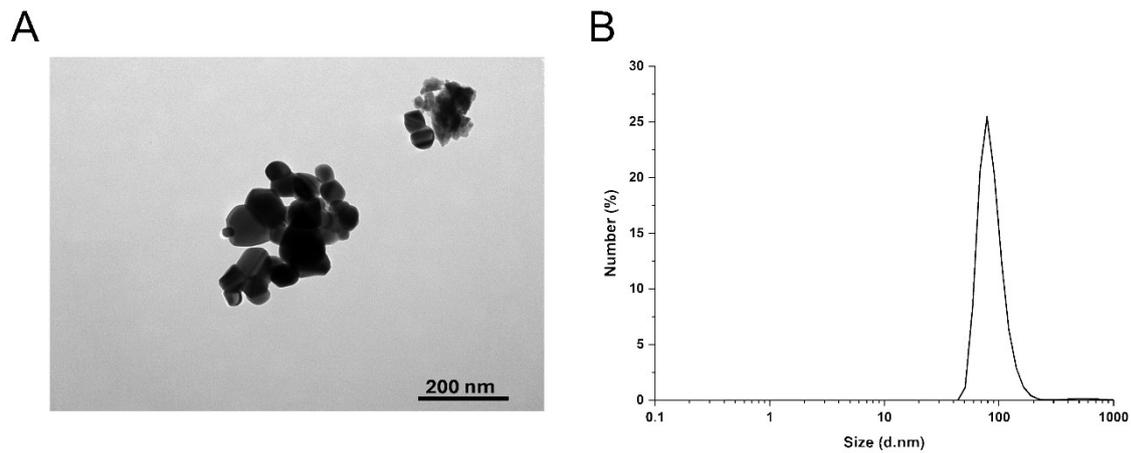


Figure S1. TEM images of the HfO₂NPs verify the quasi-spherical morphology and the approximate size of the particles (A). The hydrodynamic size of the citrate-coated nanoparticles was 90.75 nm according to DLS measurement (B).

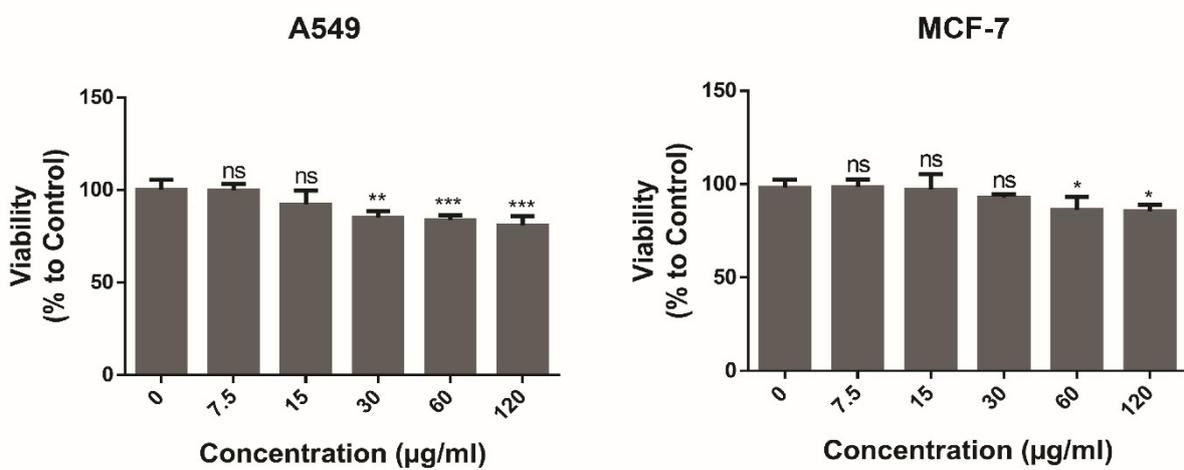


Figure S2. The effect of hafnium oxide nanoparticles on the viability of cancer cells. A549 and MCF-7 cells treated with HfO₂NPs show a minor reduction in viability with increasing HfO₂NP concentration. One-way ANOVA, Dunnett's multiple comparisons test, ***P < 0.001, **P < 0.005, *P < 0.05

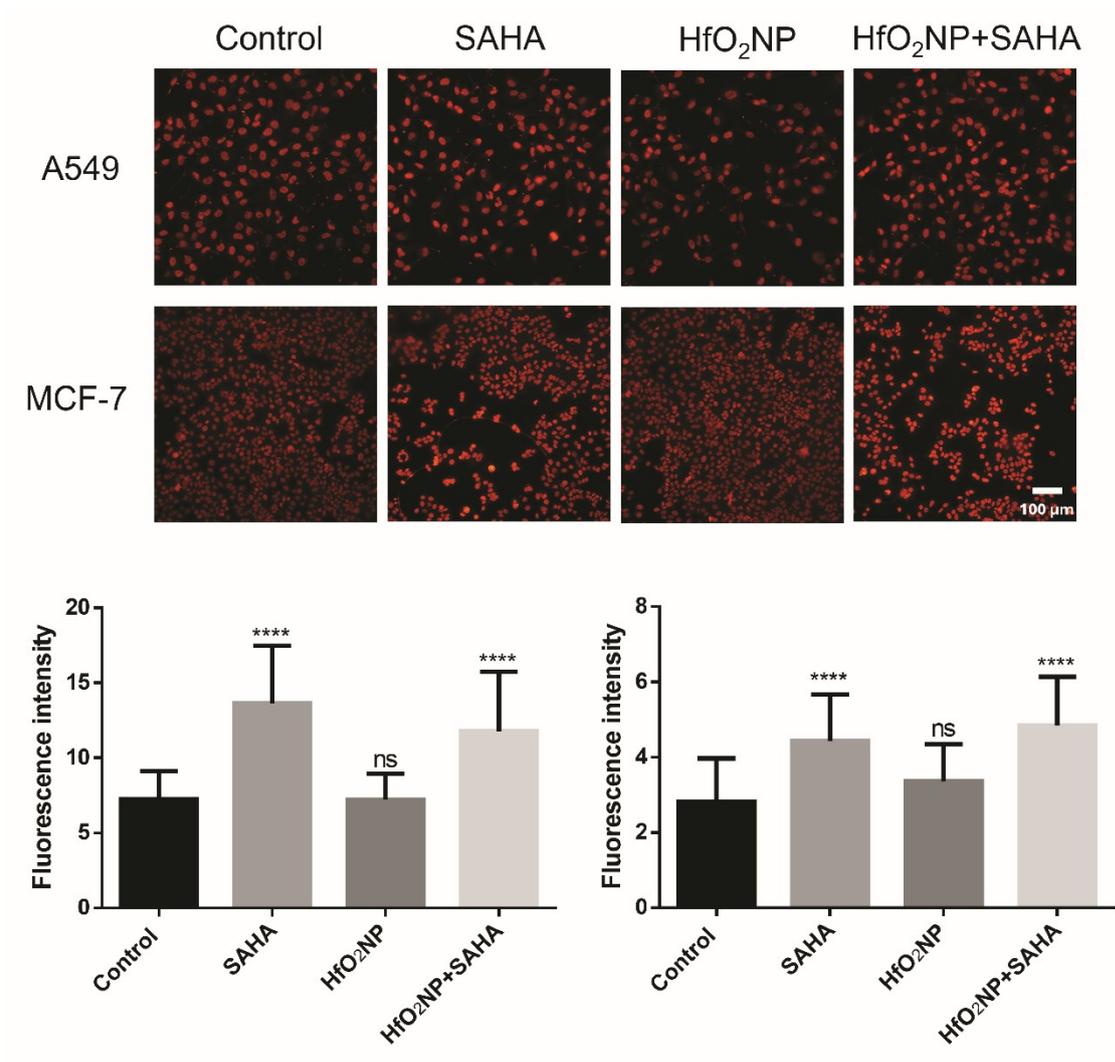


Figure S3. The SAHA alone and in combination with HfO₂NPs significantly increased the amount of acetylated lysine in A549 and MCF-7 cells. One-way ANOVA, Dunnett's multiple comparisons test, ****P < 0.0001

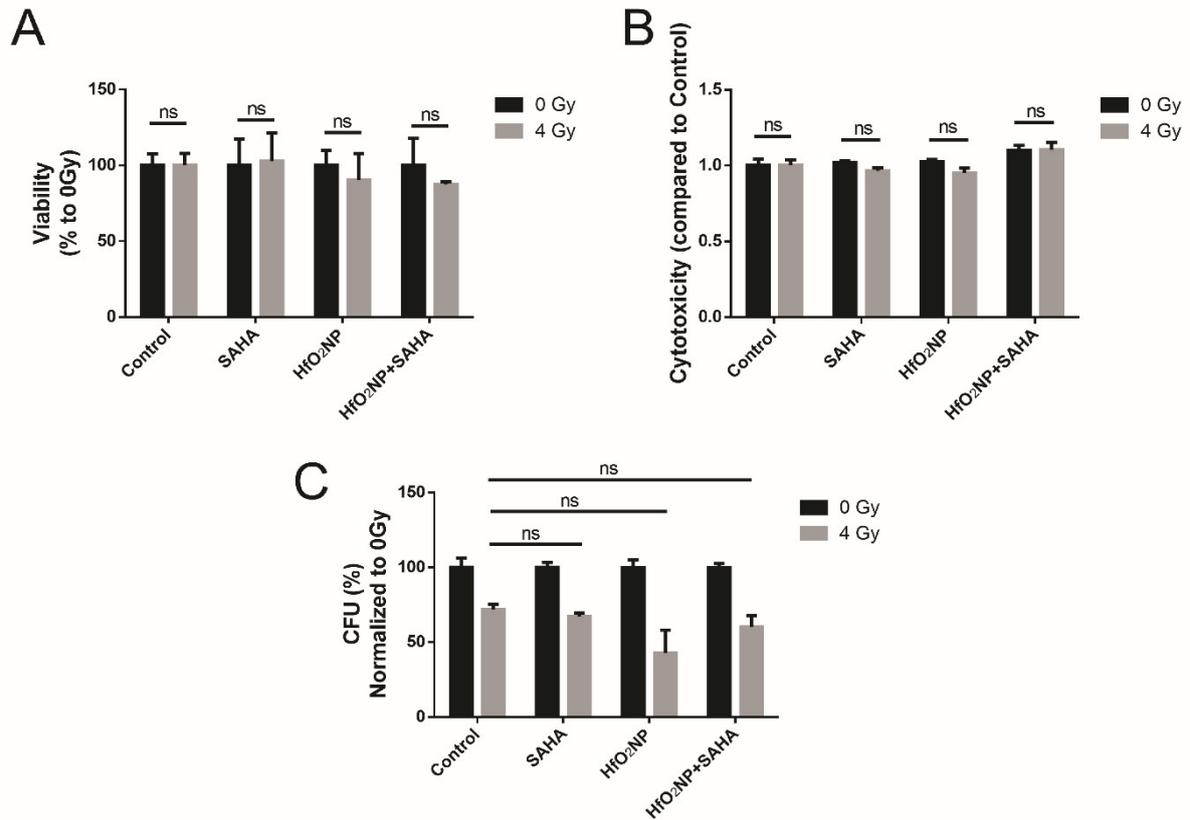


Figure S4. Neither SAHA, nor HfO₂NP, nor the combination of HfO₂NP+SAHA affected the viability of MRC-5 non-cancerous lung fibroblast cells (**A**). SAHA, HfO₂NPs, and HfO₂NPs+SAHA treatments did not cause lactate dehydrogenase release, thus are not cytotoxic to MRC-5 fibroblast cells upon ionizing radiation (**B**). There are no significant differences observed in the colony-forming abilities of MRC-5 cells following SAHA, HfO₂NP, or HfO₂NP+SAHA treatments and 4 Gy irradiation compared to the 4 Gy-irradiated control samples (**C**). Two-way ANOVA, Sidak's multiple comparisons test.

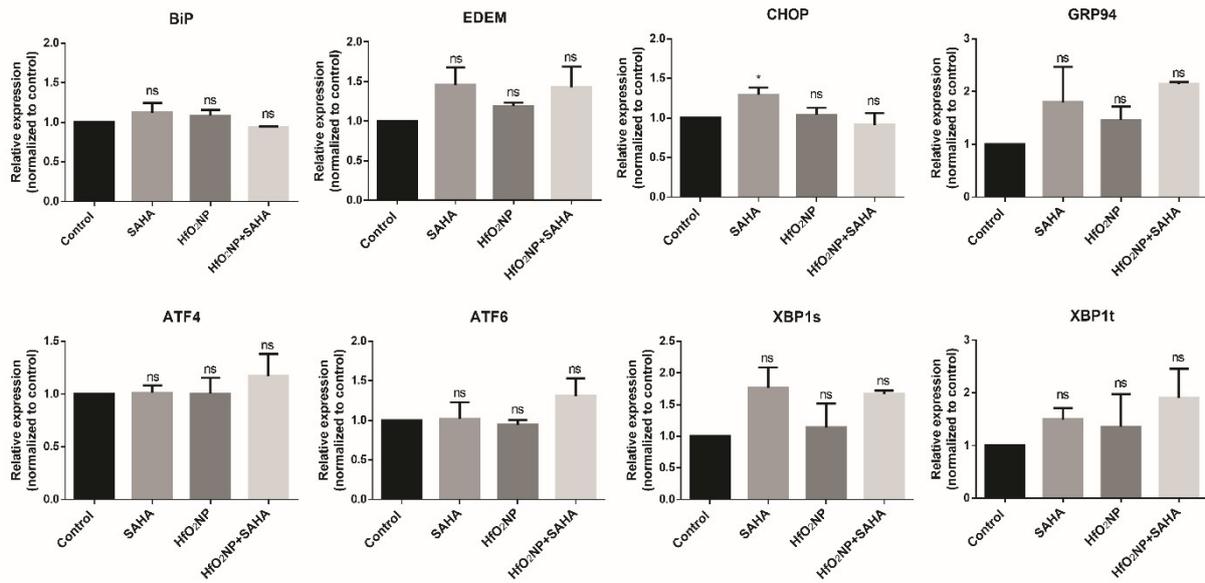


Figure S5. The expression changes of endoplasmic reticulum and unfolded protein response markers upon SAHA-, HfO₂NP-, and HfO₂NP+SAHA-treated A549 cells following irradiation with 4 Gy dose. ANOVA, Dunnett's multiple comparisons test, *P = 0.0177

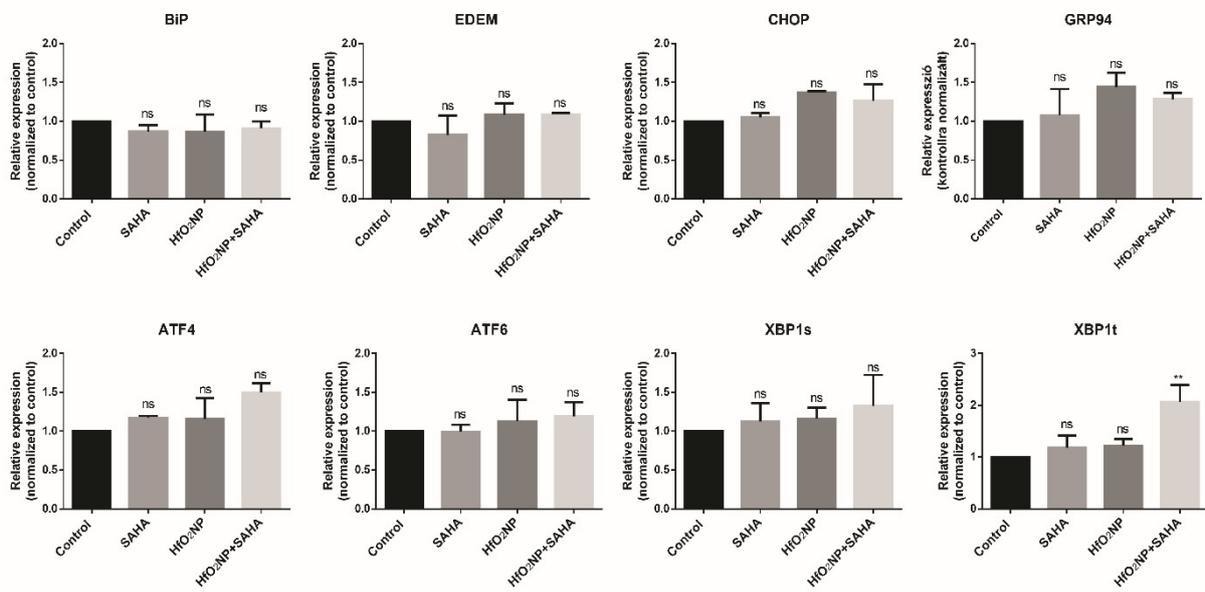


Figure S6. The expression changes of endoplasmic reticulum and unfolded protein response markers upon SAHA-, HfO₂NP-, and HfO₂NP+SAHA-treated MCF-7 cells following irradiation with 4 Gy dose. ANOVA, Dunnett's multiple comparisons test, **P = 0.0048