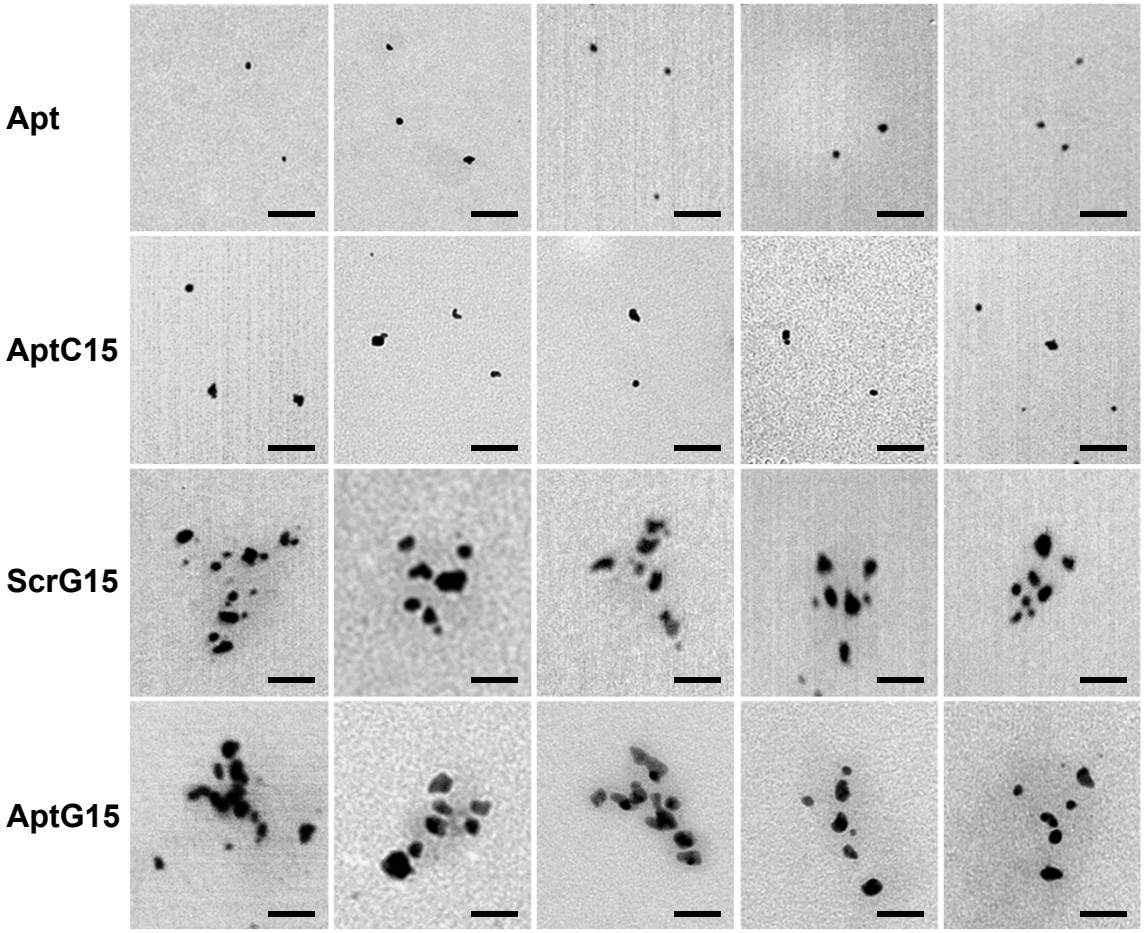
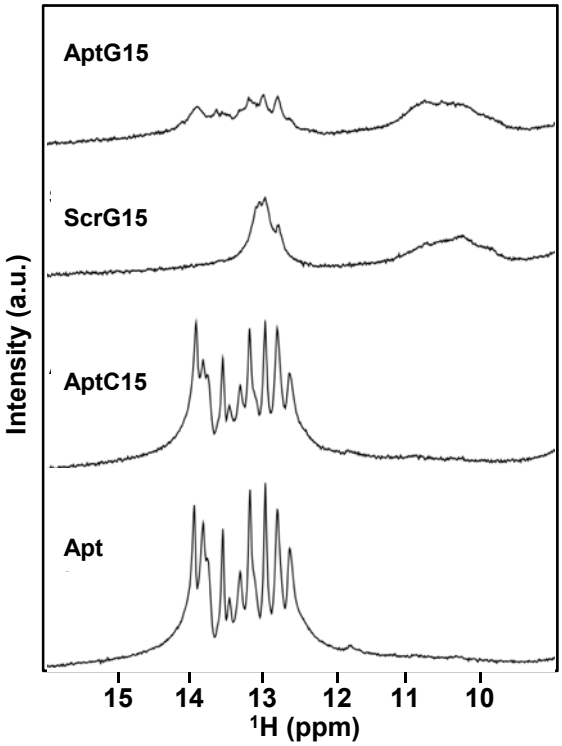
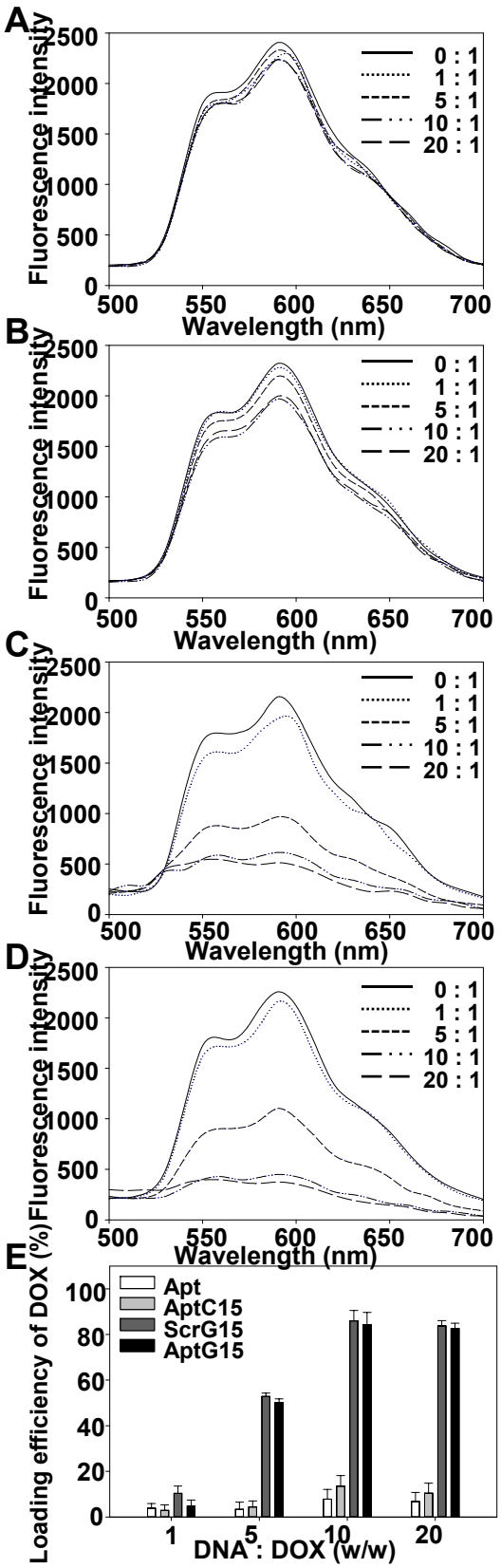
Electronic Supplementary Material (ESI) for Nanoscale.



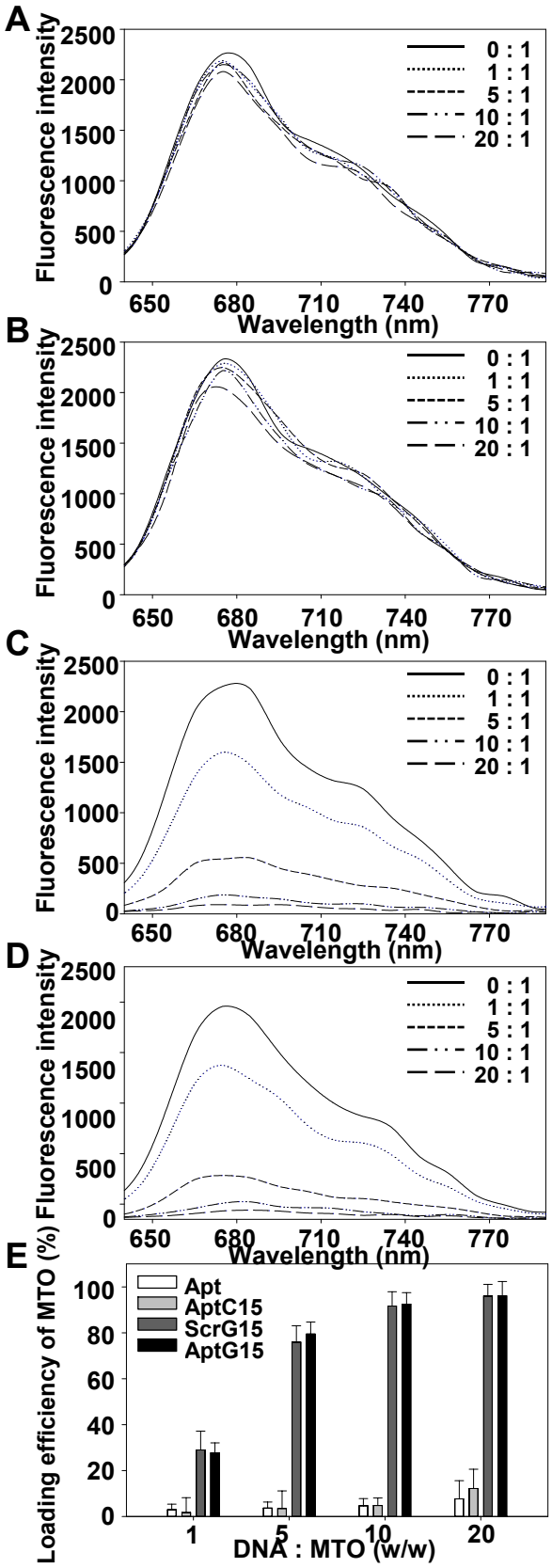
Supplementary Figure 1. The morphologies of gold-incorporated DNA nanostructures. For transmission electron microscopy (TEM) imaging, chloroauric acid was added to DNA-based nanostructures for 1 h at room temperature. After removal of free chloroauric acid following reduction, the gold-loaded DNA nanostructures were visualized by TEM. For each condition, five pictures were presented. Scale bar: 25 nm.



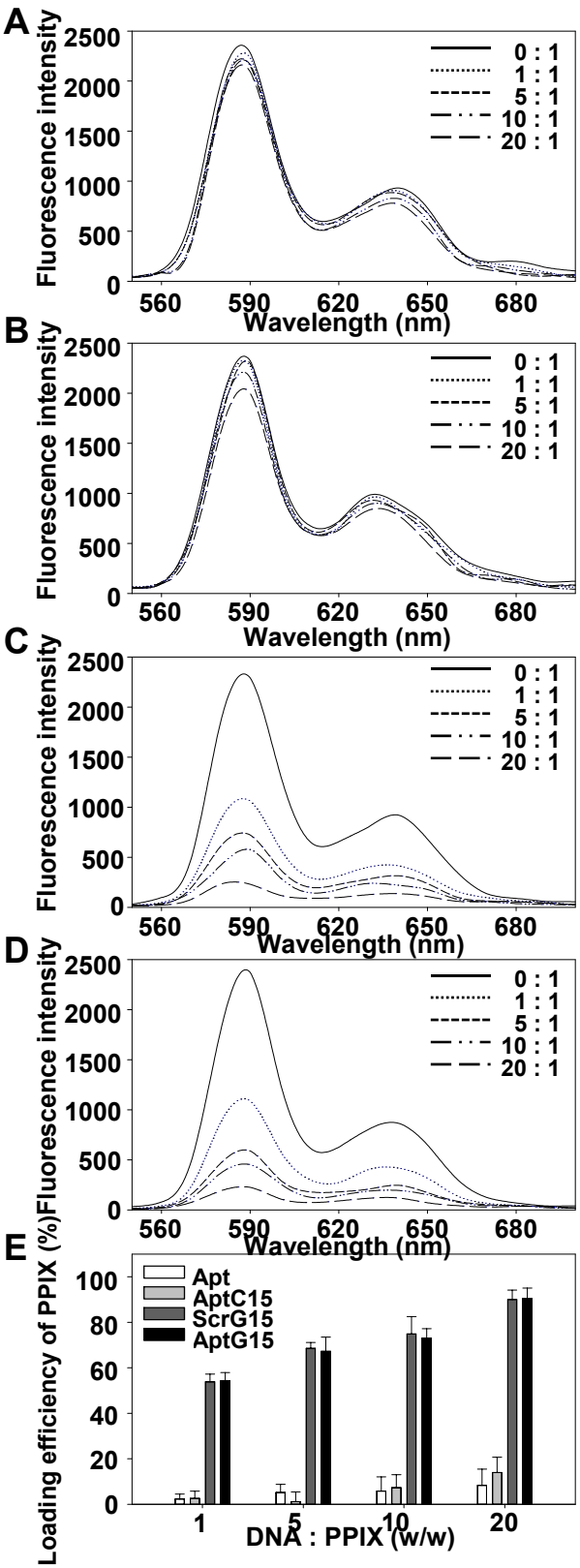
Supplementary Figure 2. NMR spectra of stemmed DNA nanostructures. The 1D ^{1}H NMR was performed to evaluated the imino regions of the DNA nanostrurues. The DNAs were prepared at a final concentration of 0.12 mM and the NMR spectra were recorded at 288 K under 10 % D_2O condition.



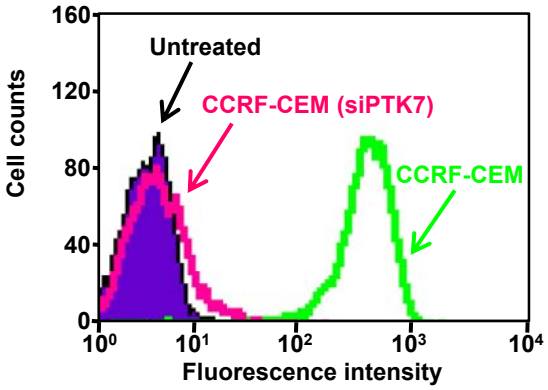
Supplementary Figure 3. Loading of DOX onto stemmed DNA nanostructures. Various weight ratios of DNA:DOX were mixed, and the loadings of DOX to Apt (A), AptC15 (B), ScrG15 (C), and AptG15 (D) were analyzed by fluorescence spectroscopy and quantified (E). The results were expressed as a mean of four separate experiments.



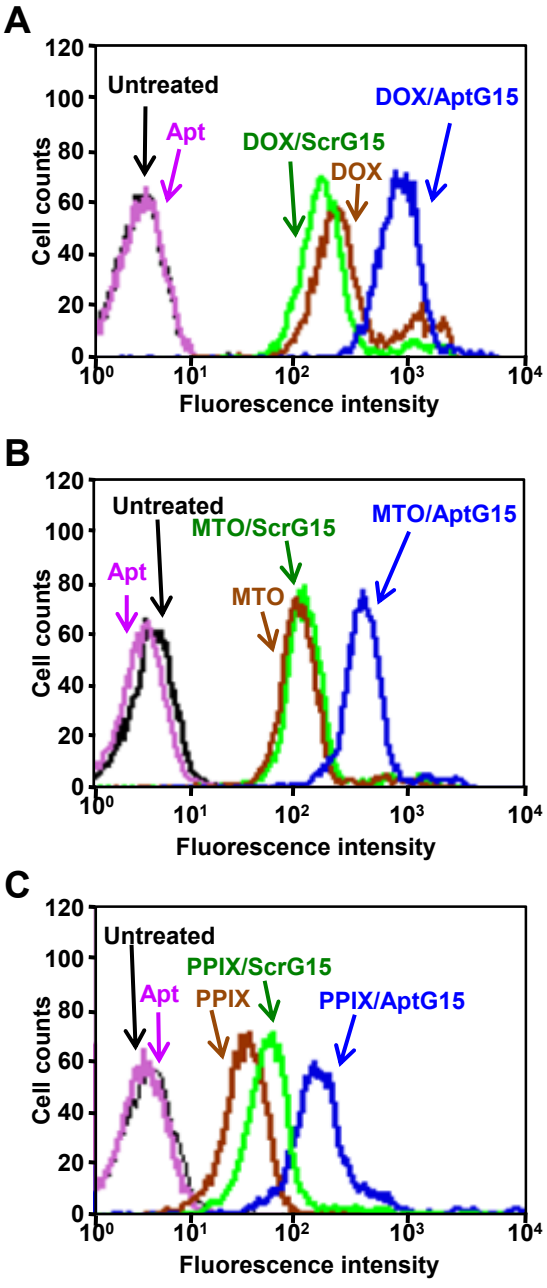
Supplementary Figure 4. Loading of MTO onto stemmed DNA nanostructures. Various weight ratios of DNA:MTO were mixed, and the loadings of MTO to Apt (A), AptC15 (B), ScrG15 (C), and AptG15 (D) were analyzed by fluorescence spectroscopy and quantified (E). The results were expressed as a mean of four separate experiments.



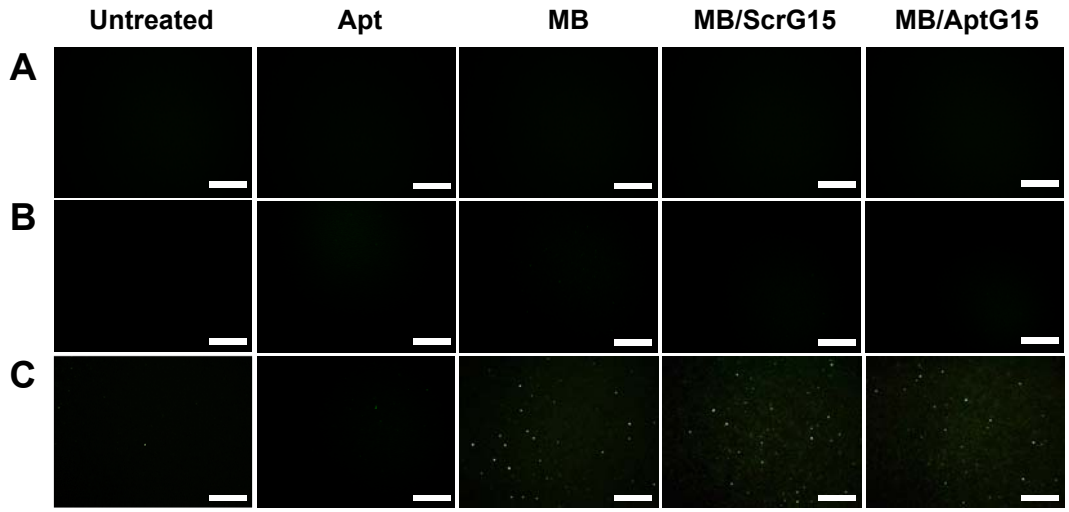
Supplementary Figure 5. Loading of PPIX onto stemmed DNA nanostructures. Various weight ratios of DNA:PPIX were mixed, and the loadings of PPIX to Apt (A), AptC15 (B), ScrG15 (C), and AptG15 (D) were analyzed by fluorescence spectroscopy and quantified (E). The results were expressed as a mean of four separate experiments.



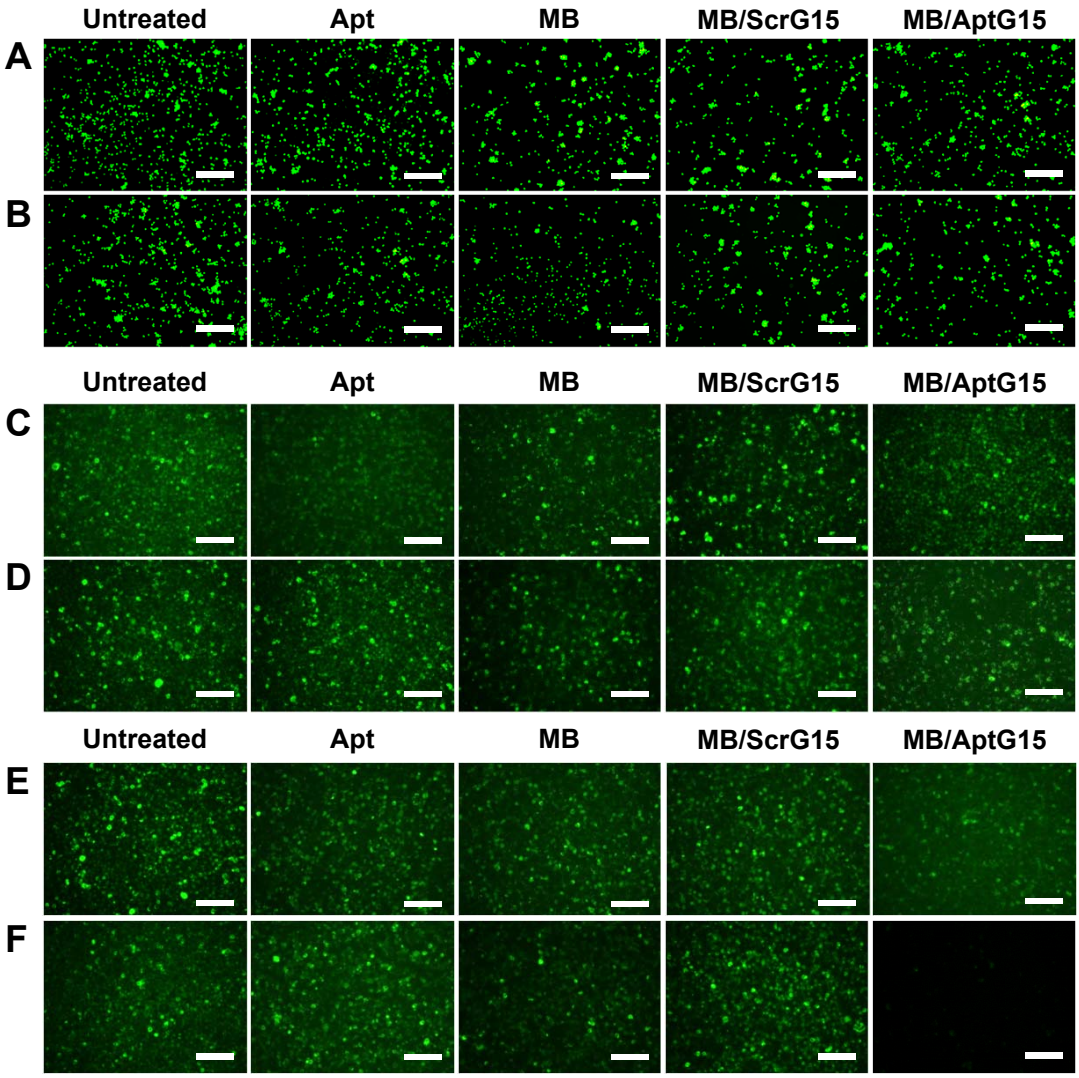
Supplementary Figure 6. *In vitro* reduction of target PTK7 expression. CCRF-CEM cells were transfected with siPTK7. Seventy-two hours post tra nsfection, PTK7 proteins on the cell surfaces were stained with fluorescein-conjugated anti-PTK7 antibody and then analyzed by flow cytometry.



Supplementary Figure 7. Cellular uptake of various drugs delivered by AptG15. CCRF-CEM cells were seeded onto a 48-well plate at a density of 8 × 10^4 cells/well. On the next day, the cells were left untreated or treated with Apt, drug, drug/ScrG15, or drug/AptG15. Apt/G15-loaded drugs were DOX (A), MTO (B), or PPIX (C), respectively. After 15 min of incubation, the cellular fluorescence was evaluated by flow cytometry.



Supplementary Figure 8. ROS production of PTK7-negative, -knockdown and -positive cells in the absence of light irradiation.
Ramos cells (A), PTK7-knockdown CCRF-CEM cells (B) and CCRF-CEM cells (C) were left untreated or treated with Apt, MB, MB/ScrG15, or MB/AptG15. After incubation for 15 min, the fluorescence intensity of ROS indicator was observed using a fluorescence microscopy without 660-nm light irradiation. Scale bar: 100 μm.



Supplementary Figure 9. ROS production-inducing cell killing effect. Ramos cells (A, B), PTK7-knockdown CCRF-CEM cell (C, D), and PTK7-positive CCRF-CEM cells (E, F) were left untreated or treated with Apt, M B, MB/ScrG15, or MB/AptG15. After incubation for 15 min, some cells (B, D, F) were irradiated using the 660-nm for 10 min. On the next day, cells w ere stained with 2 uM of calcein-AM for 10 min. The stained live cell image s were obtained using fluorescence microscopy (Leica DM IL). Scale bar: 1 00 μm.