Tumor Cell-Specific Photothermal Killing by SELEX-Derived DNA Aptamer-Targeted Gold Nanorods

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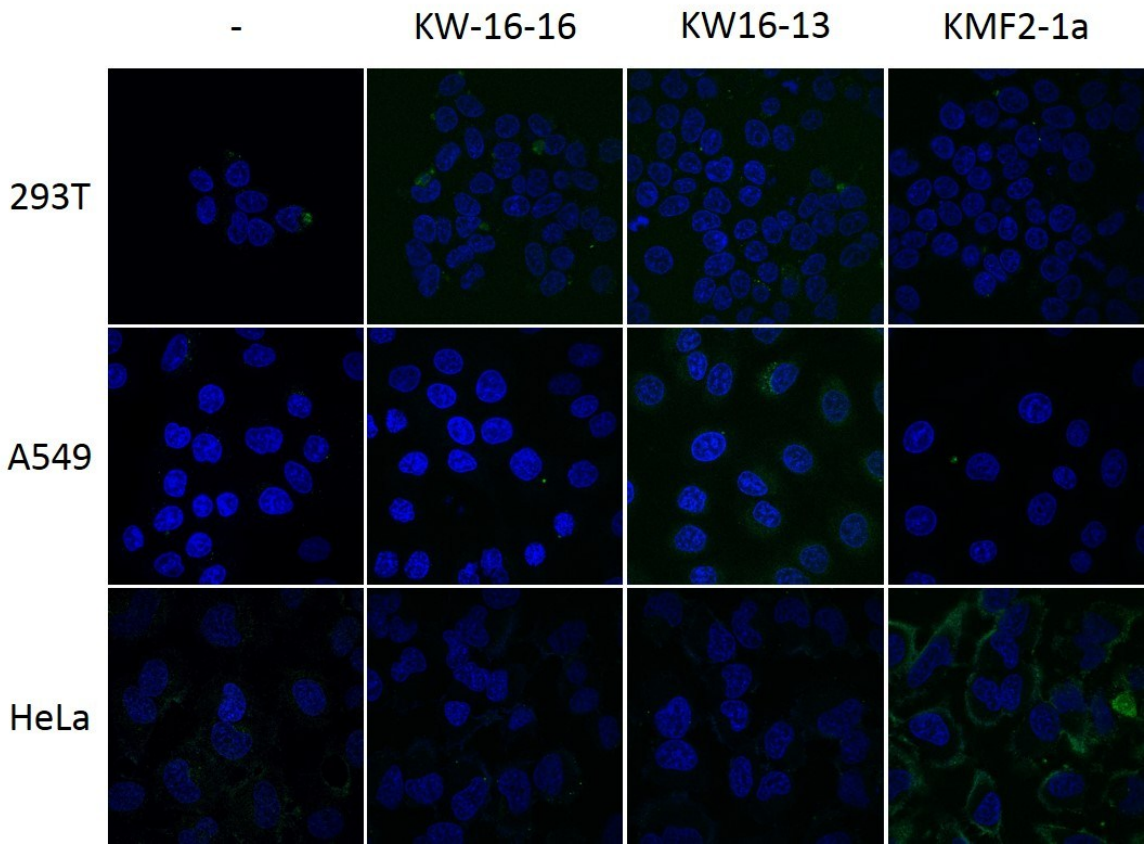
ǂ Electronic Supplementary Information (ESI) available: Confocal images of aptamer incubated with 293T, A549 or HeLa cells, FTIR Spectra of PEG-GNR, Gel Electrophoresis of Apt-GNR and Time dependent temperature curve of GNRs.

Supplementary Data

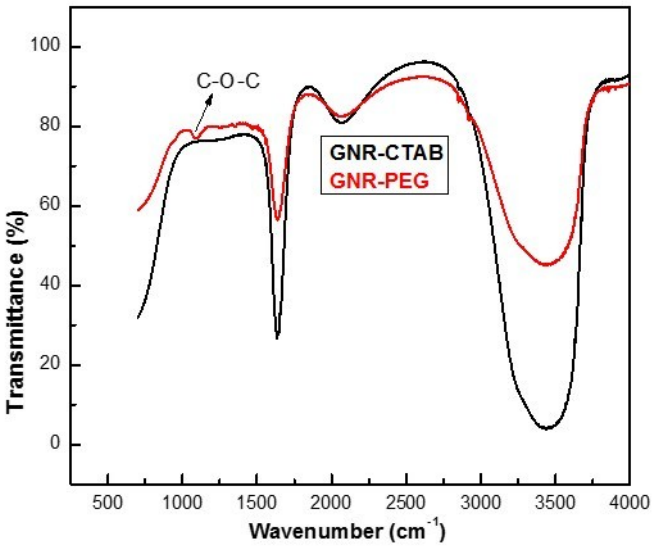
Supplementary Figure S1.



Supplementary Figure 1. KW16 aptamers do not bind to other tumour cell types.

The indicated aptamers were incubated with 293T, A549 or HeLa cells for 4 h at 37°C, washed and imaged live by CLSM in the presence of DAPI.

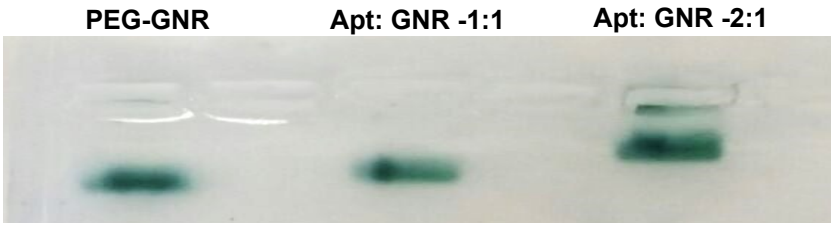
Supplementary Figure S2.



Supplementary Figure 2 FTIR spectra comparing CTAB and PEG coated GNRs

The CTAB and PEG coated GNRs were analysed using FTIR spectra. The presence of 1100 cm^{-1} corresponding to C-O-C stretching present in PEG-GNR but not in CTAB-GNR confirmed the replacement of CTAB with mPEG-SH[1].

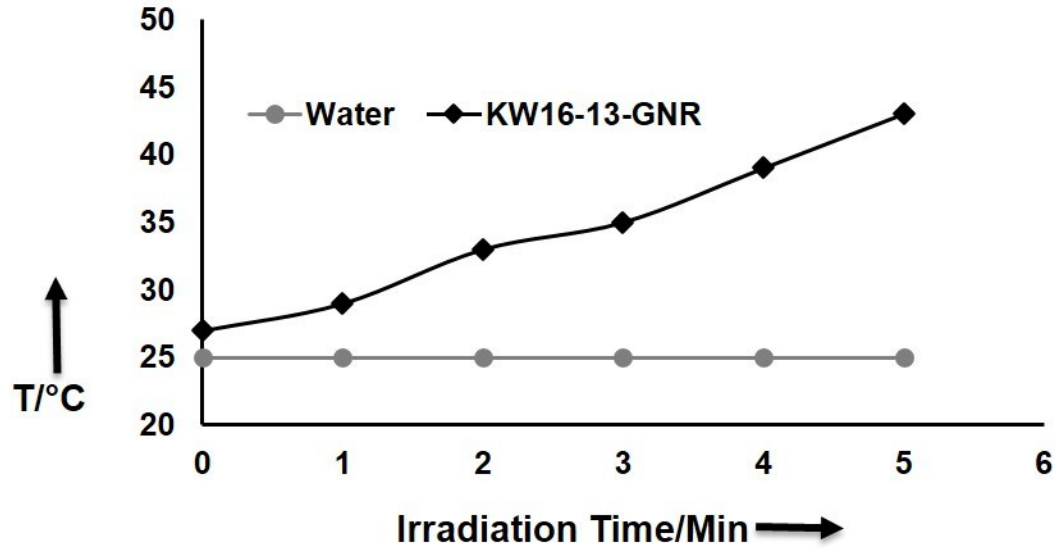
Supplementary Figure S3



Supplementary Figure 3 Agarose Gel Electrophoresis

The indicated PEG- or APT-GNR constructs were subjected to agarose gel electrophoresis for 30 min at 90 V. The KW16-13 Apt-GNRs showed reduced mobility compared to the PEG-GNRs, consistent with an increase in mass from the Apt functionalization. Similarly the GNRs coupled with KW16-13 in a 2:1 ratio had a further decrease in mobility compared to those coupled at 1:1 consistent with extra mass resultant from additional Apt coupling.

Supplementary Figure S4



Supplementary Figure 4 Temperature-time curve of KW16-13-GNRs upon irradiation with 808 nm laser.

500 µl of Apt-GNRs (0.8 nM) dispersed in water were irradiated with 808 nm CW diode laser (Chanchung New Industries Opto electronics Tech.co. Ltd) at a power density of 600 mW for 5 mins. The temperature change per minute was recorded using a Ryobi Digital Infrared Thermometer. As the time increased, the temperature also increased from 27°C to 43°C clearly indicating their plasmonic photothermal property.

References:

1. J. Vonnemann, N. Beziere, C. Böttcher, S. B. Riese, C. Kuehne, J. Dernedde, K. Licha, C. von Schacky, Y. Kosanke, M. Kimm, R. Meier, V. Ntziachristos and R. Haag, *Theranostics*, 2014, **4**, 629-641.