Gold Nanorods Modified with Affibody Molecules Kill HER2-Positive Cancer Cells Under LED Irradiation

Scientific Achievement

A CINT User Team modified gold nanorods with affibody molecules to drive HER2-specific cancer photothermal therapy.

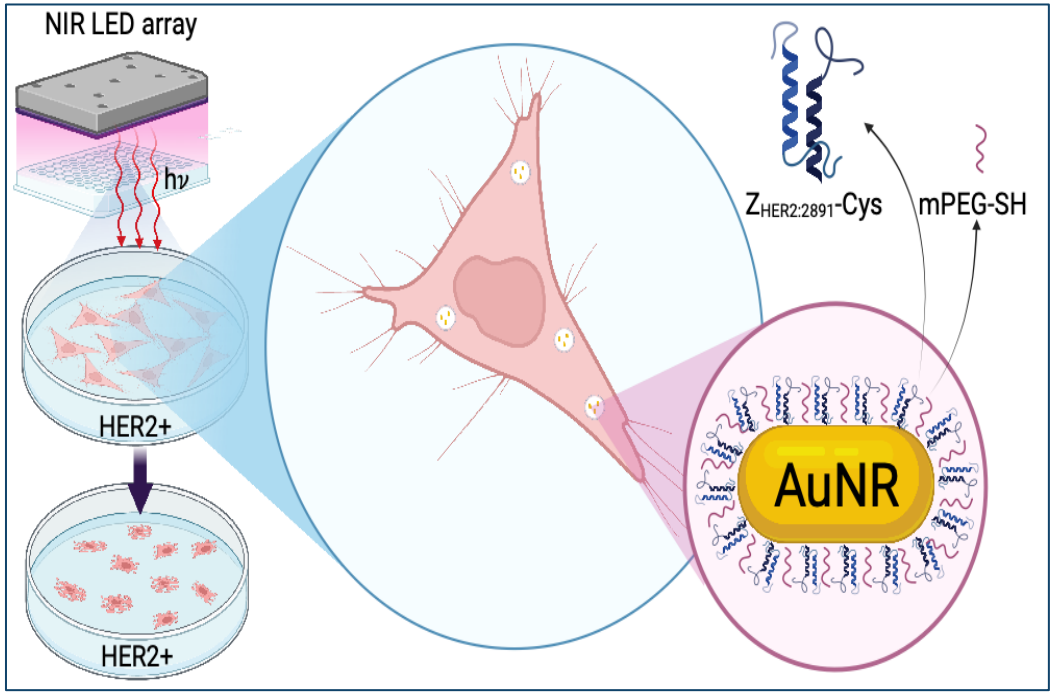

Figure: Gold nanorods (AuNRs) modified by HER2-specific affibody molecules ($Z_{HER2:2891}$-Cys) are internalized specifically by HER2-positive cancer cells and promote HER2-specific photothermal cytotoxicity when irradiated by an 808 nm LED array.

Significance and Impact

This work enables *in vitro* photothermal cytotoxicity of HER2-positive cancer cells under LED irradiation.

Research Details

- Gold nanorods functionalized with a HER2-specific affibody molecule.
- *In vitro* photothermal therapy evaluated on HER2-positive and low-HER2-expressing cells.
- Demonstrated HER2-specific photothermal cytotoxicity.

Nevárez Martínez, M. C.; Wieczerzak, E.; Lobo, C. S.; Da Pieve, C.; Kreft, D.; Grzegorczyk, M.; Mahlik, S.; Narajczyk, M.; Rodziewicz-Motowidło, S.; Werner, J. H.; Hollingsworth, J. A.; Zaleska-Medynska, A.; Kramer-Marek, G.; Morales, D. P. Gold Nanorod-Affibody Conjugates Mediate Cancer Photothermal Therapy under 808 Nm LED IRRADIATION. *ACS Applied Nano Materials.* 2026.

Work was performed, in part, at the Center for Integrated Nanotechnologies.