Gold nanorods target cancer cells

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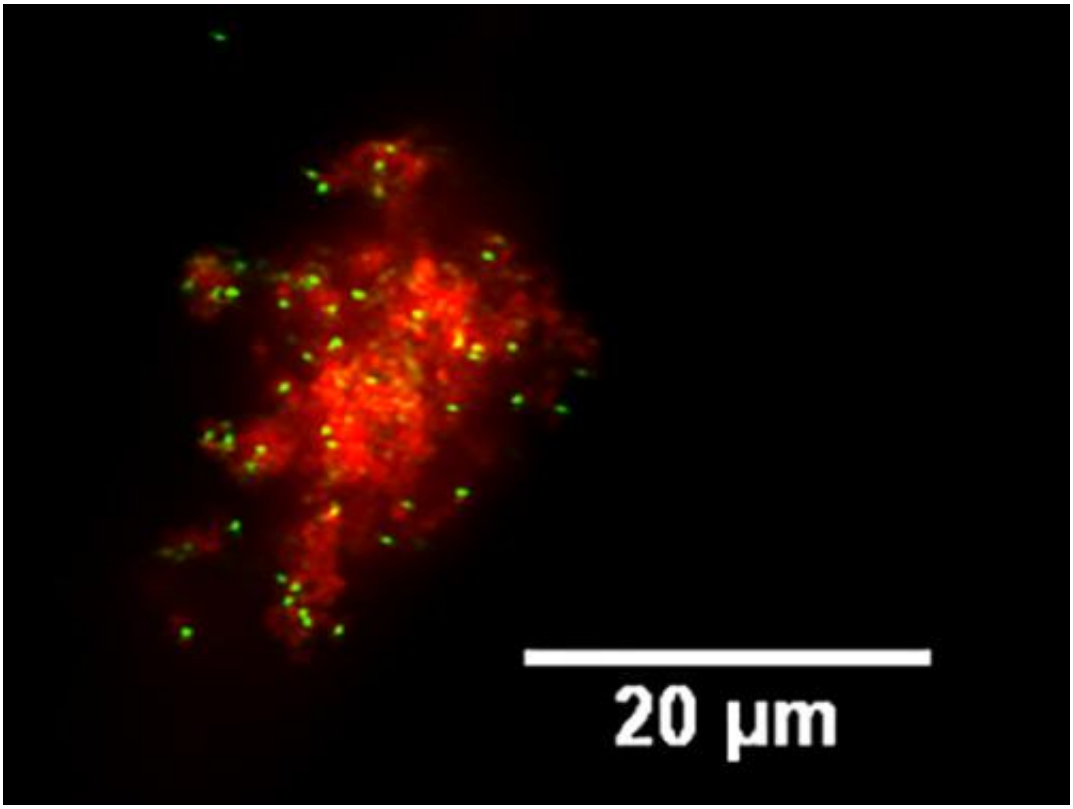

Laser confocal scattering image of a HeLa cells cultured with EGF-Nanospheres for 30 mins (in green) together with a lipophilic tracer (DiD, in red).

Using tiny gold nanorods, researchers at Swinburne University of Technology have demonstrated a potential breakthrough in cancer therapy.

They have shown for the first time that gold nanorods can be used to

inhibit cancer cell growth in cervical cancer.

Dr Chiara Paviolo from Swinburne's Centre for Micro-Photonics attached tiny particles to the cell receptors in HeLa cells from the first human cell line to be cloned to stop cancer cell proliferation.

"Cell receptors send growth signals to the cell by binding with an external molecule called a growth factor and then clustering together," Dr Paviolo said.

Growth factors are normally used to stimulate the growth of cells and are involved in 20 per cent of cancers.

"By placing growth factors at the ends of 100nm gold nanorods we could prevent the clustering of the receptors at a defined distance and thereby shut off the growth signal," she said.

"The simple explanation is that receptors need to cluster together to send a signal but if you keep them apart, it stops them from signalling."

Dr Paviolo said more research into the use of nanoparticles as blocking agents should be undertaken.

This work was undertaken by Dr Paviolo under the direction of Associate Professor Andrew Clayton and Associate Professor James Chon. It combines expertise in receptor biophysics and nanotechnology and highlights the multidisciplinary nature of the activities of the Centre for Micro-Photonics.

The research was funded by an ARC Discovery Grant and has been published in the prestigious nanotechnology journal *Small*.

More information: Paviolo, C., Chon, J. W. M. and Clayton, A. H. A.

(2014), "Inhibiting EGFR Clustering and Cell Proliferation with Gold Nanoparticles." *Small*. doi: 10.1002/smll.201402701