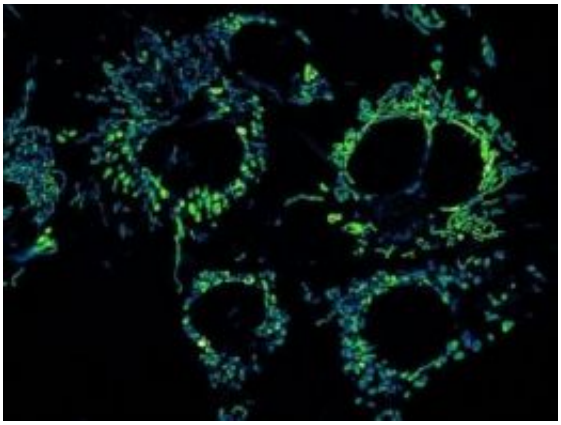
Tiny delivery system with a big impact on cancer cells

December 15 2008



A new group of nanocomposite particles could lead to improved anti-cancer drugs, researchers report. Credit: Hari S. Muddana

Researchers in Pennsylvania are reporting for the first time that nanoparticles 1/5,000 the diameter of a human hair encapsulating an experimental anticancer agent, kill human melanoma and drug-resistant breast cancer cells growing in laboratory cultures. The discovery could lead to the development of a new generation of anti-cancer drugs that are safer and more effective than conventional chemotherapy agents, the scientists suggest. The research is scheduled for the Dec. 10 issue of ACS' *Nano Letters*.

In the new study, Mark Kester, James Adair and colleagues at Penn State's Hershey Medical Center and University Park campus point out

that certain nanoparticles have shown promise as drug delivery vehicles. However, many of these particles will not dissolve in body fluids and are toxic to cells, making them unsuitable for drug delivery in humans. Although promising as an anti-cancer agent, ceramide also is insoluble in the blood stream making delivery to cancer cells difficult.

The scientists report a potential solution with development of calcium phosphate nanocomposite particles (CPNPs). The particles are soluble and with ceramide encapsulated with the calcium phosphate, effectively make ceramide soluble. With ceramide encapsulated inside, the CPNPs killed 95 percent of human melanoma cells and was "highly effective" against human breast cancer cells that are normally resistant to anticancer drugs, the researchers say.

Penn State Research Foundation has licensed the calcium phosphate nanocomposite particle technology known as "NanoJackets" to Keystone Nano, Inc. MK and JA are CMO and CSO, respectively.

Article: "Calcium Phosphate Nanocomposite Particles for In Vitro Imaging and Encapsulated Chemotherapeutic Drug Delivery to Cancer Cells", pubs.acs.org/stoken/presspac/p … ll/10.1021/nl802098g

Provided by ACS