

Fighting cancer with nanotechnology

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Imagine a test that sifts through millions of molecules in a drop of a patient's blood to detect a telltale protein signature of a cancer subtype, or a drug ferry that doesn't release its toxic contents until it slips inside cancer cells.

These and other nanotechnologies could be game changers in how we diagnose, monitor and treat cancer, according to Mark Davis, Professor of Chemical Engineering at the California Institute of Technology, and a member of the Experimental Therapeutics Program of the Comprehensive Cancer Center at the City of Hope.

Davis discussed how nanotechnology was revolutionizing the battle against cancer when he gave the Fred Kavli Distinguished Lectureship in [Nanoscience](#) at the fall meeting of the Materials Research Society – a lecture that has since become available on the web. Focusing on nanoparticles, Davis said during the lecture, "We're trying to create these nanoscale particles for solid tumors [and] there really is, in my opinion, a very high potential to create new types of therapies and allow people to have a high quality of life."

Later discussing these advances with three other researchers, Davis elaborated, saying, "What's really exciting to me is the patient evidence that reveal nanoparticles are actually going into tumor cells and releasing their payloads... [We're also] starting to see preliminary evidence that these therapies are having some effects in patients while also giving them a high quality of life."

According to Michael Phelps, Norton Simon Professor, and Chair of Molecular and Medical Pharmacology at the University of California Los Angeles, another promising technology is PET molecular imaging probes, which can rapidly search for cancer throughout all tissues of the body, as well as characterize each cancer lesion it detects within an individual patient. "All cancer treatments are in need of better molecular diagnostics... to better characterize the biology of cancer," said Phelps.

"Nanotechnology is an amazing discovery tool ...giving us a new set of eyes that are opening up a whole new world," said James Heath, Professor of Chemistry at Caltech and a founding Board member of Caltech's Kavli Nanoscience Institute. "All evidence suggests that when you do careful engineering of these nanotechnologies, the benefits are great."

Anna Barker agreed. The Former Deputy Director of the National Cancer Institute (NCI) and current Director of Arizona State University's Transformative Healthcare Networks, she said, "The nanotechnologies that are currently in use in the cancer community are actually making [cancer](#) therapies safer. They are uniformly increasing the efficiency, while reducing the toxicity for patients."

More information: [www.kavlifoundation.org/scienc ... ancer-nanotechnology](http://www.kavlifoundation.org/scienc...ancer-nanotechnology)

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