

# Researchers say cell manipulation could lead to better drug delivery

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(PhysOrg.com) -- UT Arlington researchers are using focused laser beams to manipulate cells that lead drug-carrying nanoparticles that deliver medicine to cancer cells that need it.

Samarendra Mohanty, assistant professor of physics, and Kytai Nguyen, associate professor of bioengineering, are part of the collaborative research effort in The University of Texas at Arlington's Biophysics and Physiology Lab.

Those focused laser beams are called optical tweezers and are used in cell manipulation.

The team has tested the process at the microscopic level using human cells and will present the research at the March meeting of American Physical Society in Dallas.

Nguyen said results from this research would help investigators design [nanoparticles](#) that have more therapeutic benefits while reducing severe side effects often seen in chemotherapy.

"A focused laser holds the cell. We then use a force against the cell to measure the single cell's elasticity," Mohanty said. Elasticity measures how much that cell can stretch. "A cancer cell is normally more brittle, so those can be identified. A nanoparticle carrying a drug is then introduced with the optical tweezers."

Nguyen said how these nanoparticles interact with the cell gives the researchers valuable information about the cell.

“We can coat them with an antibody that is bound to diseased cells and deliver drugs to only these cells to treat illnesses,” Nguyen said.

Mohanty also is working in the field of optogenetics, an emerging field using low-power light to stimulate neuronal cells. Mohanty said those specific genetically targeted neurons are stimulated with a micro LED (light emitting diode).

He said there has been some success using optogenetics to treat retinitis pigmentosa, an eye disease in which there is loss of vision due to degeneration of photoreceptors in retina.

Provided by University of Texas at Arlington

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