

Nanotube Coating Meshes with Living Cells

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Using a polymer coating that mimics part of a cell's outer membrane, a team of investigators at the University of California, Berkeley, have developed a versatile method for targeting carbon nanotubes to specific types of cells. This new coating could spur the development of new anticancer agents that rely on the unique physical characteristics of carbon nanotubes.

Carolyn Bertozzi, Ph.D., and her colleagues created sugar-based polymers, or glycopolymers, that mimic those found on the outside of cells. Cells use different glycopolymers as identifiers that tell other cells what their function is in the body

Reporting their work in the *Journal of the American Chemical Society*, the researchers demonstrated that they could attach this coating to carbon nanotubes to form a stable cell-like surface on the nanotubes. The researchers then used a protein produced by a particular type of snail, one that binds to the exact sugar used to make the nanotube coating, to act as a crosslinker between the coated nanotubes and cells possessing the exact same glycopolymer on their outer membranes. The researchers note that by using different glycoprotein-crosslinking protein pairs it should be possible to target distinct types of cells based on their membrane glycoprotein fingerprint.

To test whether these coated nanotubes might be toxic to cells, the investigators mixed the coated nanotubes with two different types of cells growing in culture. The researchers found that the coated nanotubes had no effect on the growth of these cells. In contrast, uncoated

nanotubes inhibited significantly the growth of both types of cells.

This work is detailed in a paper titled, “Interfacing Carbon Nanotubes with Living Cells.” Investigators from the Lawrence Berkeley National Laboratory also participated in this study. This paper was published online in advance of print publication. An abstract is available at the journal’s [website](#).

Source: National Cancer Institute

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