

Buckyballs Ferry Drugs into Cancer Cells Safely

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Scientists at Rice University and Baylor College of Medicine have developed a new type of buckyball nanoparticle that acts as a passkey, allowing peptide-based drugs to enter cancer cells.

The new buckyballs, known as bucky amino acids, are made of a buckyball linked to the amino acid phenylalanine and were designed to mimic viruses capable of penetrating the cell membrane. This work was published in the journal *Organic and Biomolecular Chemistry*.

"Drugs are far more effective if they're delivered through the membrane, directly into the cell," said lead researcher Andrew Barron, Ph.D., of Rice University. "Viruses, which are often toxic, long ago developed ways of sneaking through cell walls. While we're mimicking some techniques used by viruses, we're using non-toxic pieces of protein, and we're incorporating buckyballs as a passkey."

Tests with cultured liver cancer cells and neuroblastoma cells showed that the bucky amino acids were capable of ferrying attached peptides into these cells. These findings are particularly notable because neuroblastoma cells are well known for the difficulty in transporting drugs through their cell membrane.

The investigators note that their experimental findings suggest strongly that the bucky amino acid actively assists in uptake by the cells, perhaps because buckyballs mix readily with the fatty molecules that make up cell membranes.



This work is detailed in a paper titled, "The use of fullerene substituted phenylalanine amino acid as a passport for peptides through cell membranes." An abstract of this paper is available <u>through PubMed</u>.

Source: National Cancer Institute

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