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Monday, February 23, 2009

Making Safer Nanomedicine

Nontoxic silicon nanoparticles soak up drugs like a sponge and break down into smaller particles that are cleared by the kidneys
By Katherine Bourzac

Credit: UC San Diego.

Some nanomaterials can ferry cancer drugs to tumors; others can act as

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While researchers are working to make these materials even more efficient tumor targeters and imaging agents, they will also need to make sure they are safe. But until now, "there has been little effort to engineer the self-destruction [of nanomaterials]...into non-toxic, systemically-eliminated products," write researchers in this week's issue of *Nature Materials*.

The researchers, from MIT and University of California, have now developed nanomaterials and carefully characterized their degradation into non-toxic breakdown products that are cleared from the body in urine. Because the materials are photoluminescent, it's possible to see whether or not they've reached a tumor. Mouse studies demonstrate that the particles are not only harmless, but that they soak up cancer drugs like sponges. The particles, which range in size from about 130 to 180 nanometers (the ideal size for getting into tumors via leaky blood vessels) are riddled with 5 to 10 nanometer holes. As the the particles break down inside a tumor, the drugs come out.

The nanoparticles haven't been tested in clinical trials yet, but there is good reason to suspect they'll be harmless in people. For one thing, earlier this month researchers presented results at the American Association for the Advancement of Science meeting of a gene expression study demonstrating that exposing human immune cells to silica particles with a range of different surface areas didn't harm the cells. And the researchers felt comfortable enough to expose themselves for the above photo, which shows the nanoparticles emitting fluorescent light under UV.

Tags: drug delivery, cancer, nanoparticles, nanomedicine, nanotoxicity, silicon

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I wonder if this is going to be discussed at the The 10th US-Japan Symposium on Drug Delivery Systems in Hawaii this December. Here is the Link I found http://www.drugdeliverysymposium.com

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