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# Tiny self-assembling cubes could carry medicine

By Wai Lang Chu

16/12/2005 - Johns Hopkins researchers have devised a self-assembling cube-shaped perforated container, which may serve as a delivery system for medications and cell therapy that can easily be tracked via MRI.

The focus on building micro and nanosystems with medical applications hold great potential to the degree that [microcontainers](#) developed could someday incorporate electronic components.

This would allow the cubes to act as biosensors within the body or to release medication on demand in response to a remote-controlled radio frequency signal.

*"We believe these self-assembling microcontainers have great potential as a new tool for medical diagnostics and treatment,"* David Gracias, an assistant professor in the in the Whiting School of Engineering at Johns Hopkins.

The technique has the added advantage of being relatively inexpensive. The theory is that microcontainers can be mass-produced through a process that mixes electronic chip-making techniques with basic chemistry.

*"Our group has developed a new process for fabricating three-dimensional micropatterned containers for [cell encapsulation](#) and [drug delivery](#),"* said Gracias, who led the lab team.

*"We're talking about an entirely new encapsulation and delivery device that could lead to a new generation of 'smart pills.' The long-term goal is to be able to implant a collection of these therapeutic containers directly at the site or an injury or an illness,"* he added.

What is unique is that these tiny cubes are coated with a very thin layer of gold, so that they are unlikely to pose toxicity problems within the body.

To make the self-assembling containers, the researchers used identical techniques to make microelectronic circuits: thin film deposition, photolithography and electrodeposition.

Each square structure has small openings etched into it, so that it eventually allows medicine or therapeutic cells to pass through.

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