Experimental gadgets do job, then dissolve in body

MALCOLM RITTER - AP Science Writer - Associated Press

Scientists reported Thursday that they succeeded in creating tiny medical devices sealed in silk cocoons that did the work they were designed for, then dissolved in the bodies of lab mice. It's an early step in a technology that may hold promise not only for medicine but also for disposal of electronic waste.

The new work is "a remarkable achievement" in combining materials to produce a working device, said Christopher Bettinger of Carnegie Mellon University. He works on biodegradable electronics but was not involved in the study.

The U.S.-funded research was reported online in the journal Science.

Doctors already use implants that dispense drugs or provide electrical stimulation, but they don't dissolve. The new work is aimed at making devices that do their jobs as long as needed and then dissolve, without the need for surgical removal or the risk of long-term side effects.

In the experiment, the devices — which look like tiny computer chips — were designed to generate heat, a potential strategy for fighting infection after surgery by killing germs, said John Rogers of the University of Illinois at Urbana-Champagne, an author of the study.

The devices worked in the mice for more than a week, until their silk coatings dissolved enough for bodily fluids to erode key parts of the devices, he said. After three weeks, the tiny gadgets had basically disappeared.

Someday for people, similar devices might be programmed to monitor the body and release drugs accordingly, or produce electric current to accelerate bone healing, Rogers said.

The researchers used the protective cocoon envelope because silk can be processed to stay intact for varying periods of time — from seconds to weeks and potentially for years, he said. The device's circuitry itself was built from other materials that degrade in the body, such as magnesium and silicon.

Apart from medicine, the technology offers a way to cut down on electronic waste if portable consumer devices could be made with decomposing components, the researchers wrote.

And there are other potential uses, Rogers suggested. For example, such devices could be scattered near a chemical spill to monitor things like chemical concentrations without any need to retrieve them later.

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