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'Shrink-wrap' electronics could help neurological disorders

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Photo by: Beckman Institute



Electrode array wrapped onto a model of the brain. The wrapping process occurs spontaneously, driven by capillary forces associated with dissolution of a thin, supporting substrate of silk.

Tue, 04/20/2010 - 6:00am | [Paul Wood \(/author/paul-wood\)](/author/paul-wood/) [\(/contact_author/225081\)](/contact_author/225081)

URBANA – Epilepsy and other neurological conditions could be treated with electrodes that "shrink-wrap to the brain's surface," says a University of Illinois professor who has pioneered flexible electronics.

The silk-based matrix, which dissolves without affecting the brain, has already been tested on cats and soon will be tested on dogs in Pennsylvania. The nationwide team's research is in the new issue of the journal Nature Materials.

UI Professor John Rogers said the research eventually could lead not only to neurological treatments but also to better prostheses and other medical benefits.

Rogers' team has previously come up with lightweight, flexible displays for computer screens or digital newspapers; an artificial retina; and stretchable integrated circuits.

Rogers, who works at the UI's Materials Research Laboratory and the Beckman Institute, was named a MacArthur "genius" [grant winner \(/news/miscellaneous/2009-09-23/genius-grant-winner-working-medical-devices.html\)](/news/miscellaneous/2009-09-23/genius-grant-winner-working-medical-devices.html) last year.

Much of his recent work has involved extremely thin materials, thin enough to have unusual properties. As he likes to say, "you can fold paper, but you can't fold a two-by-four."

His elegant silk design for the brain implant follows other uses for the fiber, created by silkworms. It is already approved by the FDA for use in sutures, Rogers noted.

The silk is combined with flexible electrodes and placed in the brain, where a device can function as a brain-computer interface, possibly helping to regulate some electrical processes.

It can work with electrical phenomena, including epilepsy.

Epilepsy is a disorder that results from the generation of electrical signals inside the brain, causing recurring seizures, according to the Mayo Clinic's website.

More in Tuesday's News-Gazette.

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