

## **Carnegie Mellon's Christopher Bettinger Develops Edible Electronics for Medical Device Industry**

PR Newswire

PITTSBURGH, April 10, 2013 /PRNewswire/ -- It sounds futuristic, but today Carnegie Mellon University researchers are developing edible electronic devices that can be implanted in the body to improve patient care.

"We are creating electronically active medical devices that can be implanted in the body," said Christopher Bettinger, an assistant professor in the departments of [Materials Science and Engineering](#) [1] and [Biomedical Engineering](#) [2] at CMU. "The idea is for a patient to consume a pill that encapsulates the device."

Bettinger, along with Jay Whitacre, a professor of materials science and engineering, is creating edible power sources for medical devices that can be taken orally using materials found in the daily diet.

"Our design involves flexible polymer electrodes and a sodium ion electrochemical cell, which allows us to fold the mechanism into an edible pill that encapsulates the device," Bettinger said.

CMU researchers report that the edible device could be programmed and deployed in the gastrointestinal tract or the small intestine depending upon packaging. Once the battery packaging is in place, Bettinger's team would activate the battery.

Bettinger reports that the battery could power biosensors to measure biomarkers or monitor gastric problems. The battery also could be used to stimulate damaged tissue or help in targeted drug delivery for certain types of cancer.

"There's so much out there we can do with this novel approach to medical devices," said Bettinger, [a recipient of the National Academy of Sciences Award for Initiatives in Research](#) [3] for his innovative work on advanced materials for next-generation implanted medical devices.

Bettinger has worked for more than a decade at the interface of materials science and biomedical engineering. Some of his innovative technologies include new synthetic materials that mimic the natural properties of soft tissue and biodegradable electronics that could usher in a new era of electronically active implants.

For additional information about Bettinger, see [www.materials.cmu.edu/people/bettinger.html](http://www.materials.cmu.edu/people/bettinger.html) [4]

### **About Carnegie Mellon University:**

Carnegie Mellon ([www.cmu.edu](http://www.cmu.edu) [5]) is a private, internationally ranked research

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university with programs in areas ranging from science, technology and business, to public policy, the humanities and the arts. More than 12,000 students in the university's seven schools and colleges benefit from a small student-to-faculty ratio and an education characterized by its focus on creating and implementing solutions for real problems, interdisciplinary collaboration and innovation. A global university, Carnegie Mellon's main campus in the United States is in Pittsburgh, Pa. It has campuses in California's Silicon Valley and Qatar, and programs in Africa, Asia, Australia, Europe and Mexico. The university is in the midst of "Inspire Innovation: The Campaign for Carnegie Mellon University," which aims to build its endowment, support faculty, students and innovative research, and enhance the physical campus with equipment and facility improvements.

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### Links:

[1] <http://www.materials.cmu.edu/>

[2] <http://www.bme.cmu.edu/>

[3] [http://www.cmu.edu/news/stories/archives/2012/january/jan23\\_christopherbettinger.html](http://www.cmu.edu/news/stories/archives/2012/january/jan23_christopherbettinger.html)

[4] <http://www.materials.cmu.edu/people/bettinger.html>

[5] <http://www.cmu.edu/>