

medtechinsider

from the publisher of **medical device technology** & **EMDM** EUROPEAN MEDICAL DEVICE MANUFACTURERS

subscribe to our weekly newsletter 

- [Home](#)
- [Product News](#)
- [medtechinsider auf Deutsch](#)
- [EMO Show Preview](#)
- [About Us](#)
- [Meet the Bloggers](#)



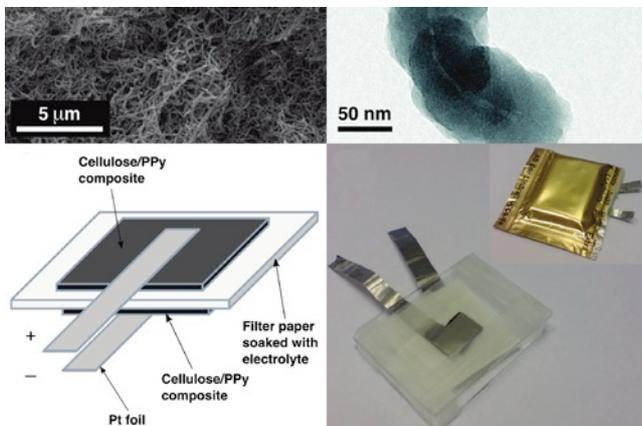
Medical grade sealing solutions.

U.S.A. plant containing a Class 10,000 ISO Class 7, Certified Cleanroom.

[Click to Learn More](#)

Algae-Based Battery Could Be Used in Medical Diagnostic Applications

September 16, 2009 – 10:27 am



A novel battery developed by Swedish researchers is constructed primarily from algae, paper and salt-water. The thin and flexible batteries would be an inexpensive and environmentally friendly alternative to conventional lithium batteries. Developed at [Uppsala University](#), the flexible battery uses thin mats of tangled cellulose fibers as electrodes and a saline solution as an electrolyte.

Lead researcher Maria Strømme suggests that it might be used to power cheap medical diagnostics devices or sensors on packaging materials or embedded into fabric. “You don’t need advanced equipment to make the batteries,” Strømme says. Potential applications include a variety of low-power portable devices including wireless sensors, smart cards, medical implants and RFID tags.

The battery uses a type of rechargeable thin-film design that many other researchers and companies have been working on for several years.

From the press release on the [university’s website](#):

Despite extensive efforts in recent years to develop new cellulose-based coating substrates for battery

applications, satisfactory charging performance proved difficult to obtain. However, nobody had tried using algal cellulose. Researcher Albert Mihranyan and Professor Maria Strømme at the Nanotechnology and Functional Materials Department of Engineering Sciences at the Ångström Laboratory had been investigating pharmaceutical applications of the cellulose from Cladophora algae for a number of years. This type of cellulose has a unique nanostructure, entirely different from that of terrestrial plants, that has been shown to function well as a thickening agent for pharmaceutical preparations and as a binder in foodstuffs. The possibility of energy-storage applications was raised in view of its large surface area.

“We have long hoped to find some sort of constructive use for the material from algae blooms and have now been shown this to be possible,” says Maria Strømme, Professor in Nanotechnology and leader of the research group. “The battery research has a genuinely interdisciplinary character and was initiated in collaboration with chemist professor Leif Nyholm. Cellulose pharmaceuticals experts, battery chemists and nanotechnologists have all played essential roles in developing the new material.”

The article in Nano Letters, in effect, introduces an entirely new electrode material for energy storage applications, consisting of a nanostructure of algal cellulose coated with a 50 nm layer of polypyrrole. Batteries based on this material can store up to 600 mA per cm³, with only 6 per cent loss through 100 charging cycles.

“This creates new possibilities for large-scale production of environmentally friendly, cost-effective, lightweight energy storage systems,” says Maria Strømme.

“Our success in obtaining a much higher charge capacity than was previously possible with batteries based on advanced polymers is primarily due to the extreme thinness of the polymer layer,” says Gustav Nyström.

The abstract on the research is available from [American Chemical Society](#).

[Brian Buntz](#)

Tags: [algae](#), [battery](#), [Maria Stromme](#), [Maria Strømme](#), [medical diagnostics](#), [RFID](#), [Uppsala University](#)

Post a Comment

Name (required)

E-mail (will not be published) (required)

Website

Submit Comment