Biophysical Society

Biophysical Society 62nd Meeting, Feb. 17-21, 2018, San Francisco, California

Electric Eel-Inspired Device Reaches 110 Volts

Using ion gradients across hydrogels, researchers developed a "soft power" source that they hope can one day power implantable devices.

EMBARGOED for release until 8 a.m. EST on Monday, Feb. 19, 2018

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WASHINGTON, D.C., February 19, 2018 -- In an effort to create a power source for future implantable technologies, a team led by Michael Mayer from the University of Fribourg, along with researchers from the University of Michigan and UC San Diego, developed an electric eel-inspired device that produced 110 volts from gels filled with water, called hydrogels. Their results show potential for a soft power source to draw on a biological system's chemical energy.

Anirvan Guha, graduate student at the University of Fribourg's Adolphe Merkle Institute, will present the research during the 62nd Biophysical Society Annual Meeting, held Feb. 17-21, in San Francisco, California. Inspired by the electric eel's ability to generate hundreds of volts, Guha and his colleagues stacked hydrogels full of varying strengths of salt water.

Ions are charged atoms or molecules and when ions accumulate on either side of a cell membrane, they form an ion gradient. The researchers harvested energy from the electric potential, or voltage, across the ion gradients. As more hydrogels were stacked on top of each other, the greater the voltage increase. The researchers were able to produce up to

voltage increase. The researchers were able to produce up to 110 volts.

To stack the thousands of individual hydrogels necessary to generate over 100 volts, the researchers used a printer that "deposits little droplets of gel … with the precision and spatial resolution to print an array of almost 2,500 gels on a sheet the size of a normal piece of printer paper," Guha said.

The team's next goal is to increase the current running through the hydrogel. "Right now, we're in the range of tens to hundreds of microamperes [the basic unit for measuring an electrical current], which is too low to power most electronic devices," Guha said.

In the future, the research team hopes their results will help develop power sources for implantable devices that can "utilize the [ion] gradients that already exist within the human body," Guha said. "Then you may be able to create a battery which continuously recharges itself, because these ionic gradients are constantly being re-established within the body."

970-Plat - "An eel-inspired artificial electric organ: 110 volts from water and salt" is authored by Anirvan Guha, Thomas B. H, Schroeder, Aaron Lamoureaux, Gloria Vanrenterghem, David Sept, Max Shtein, Jerry Yang and Michael Mayer. It will be presented at 9:45 a.m. PST, Monday, Feb. 19, 2018 in the Esplanade, Room 154 of the Moscone Center, South. Abstract: https://plan.core-apps.com/bpsam2018/abstract/598979c882021290aae09439cc4540a4

MORE MEETING INFORMATION

ABOUT THE MEETING

Each year, the Biophysical Society Annual Meeting brings together more than 6,000 researchers working in the multidisciplinary fields representing biophysics. With more than 3,600 poster presentations, over 200 exhibits, and more than 20 symposia, the BPS Annual Meeting is the largest meeting of biophysicists in the world. Despite its size, the meeting retains its small-meeting flavor through its subgroup symposia, platform sessions, social activities and committee programs. The 62nd Annual Meeting will be held at the Moscone Center (South) in San Francisco, California.

PRESS REGISTRATION

The Biophysical Society invites professional journalists, freelance science writers and public information officers to attend its Annual Meeting free of charge. For press registration, contact Ellen Weiss at EWeiss@biophysics.org or the Media Line at the American Institute of Physics at media@aip.org or 301-209-3090.

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NEWS RELEASES

Embargoed press releases describing in detail some of the breakthroughs to be discussed at the meeting are available on EurekAlert!, Newswise and Alpha Galileo or by contacting the Media Line at the American Institute of Physics at media@aip.org or 301-209-3090.

QUICK LINKS

Main Meeting Page: https://www.biophysics.org/2018meeting/Home/tabid/7117/Default.aspx
Symposia:
https://www.biophysics.org/2018meeting/Program/ScientificSessions/Symposia/tabid/7192/Default.aspx
Desktop Planner:
http://www.biophysics.org/2018meeting/GeneralInfo/MobileApp/tabid/7473/Default.aspx

ABOUT THE SOCIETY

The Biophysical Society, founded in 1958, is a professional, scientific Society established to encourage development and dissemination of knowledge in biophysics. The Society promotes growth in this expanding field through its annual meeting, monthly journal, and committee and outreach activities. Its 9,000 members are located throughout the U.S. and the world, where they teach and conduct research in colleges, universities, laboratories, government agencies, and industry. For more information on the Society, or the 2018 Annual Meeting, visit http://www.biophysics.org.

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