

The Organic Nano-Piezoelectric Device Laboratory (ONPDL), Department of Physics of **Jadavpur University**, lead by Dr. Dipankar Mandal have designed a new flexible, biocompatible nanogenerator made with cellulose, the most abundant biopolymer on earth nanogenerator that can harvest energy from everyday motion and turn it into electrical power. It could also potentially harvest energy from the body, such as heartbeats, blood flow and other almost imperceptible but constant movements. It is expected that it have enormous potential to use as an implantable biomedical devices. This work has been highlighted in American Chemical Society (ACS) press release and several international and national media based on published article in *ACS Applied Materials & Interfaces* titled “*Native Cellulose Microfiber-Based Hybrid Piezoelectric Generator for Mechanical Energy Harvesting Utility*”.

Another similar research finding titled "*DNA-Assisted  $\beta$ -phase Nucleation and Alignment of Molecular Dipoles in PVDF Film: A Realization of Self-Poled Bioinspired Flexible Polymer Nanogenerator for Portable Electronic Devices*" reported in the journal *ACS Applied Materials & Interfaces* claim that they have fabricated the device made out of polyvinylidene fluoride (PVDF), where DNA has been used to generate the piezoelectric phase for the device that can lit up 55 blue LEDs just by gently tapping. Dr. Mandal said "[The device] exploited the electrical properties of the DNA molecules to generate useful piezoelectric power that can be implemented to run portable devices." The article was also selected for press release in *ACS News Service Weekly PressPac* where a video is also provided demonstrating the device being used to light up several LEDs instantly.

Piezoelectric devices are being extensively developed throughout the world as a source of unconventional energy. However, the group has successfully added an important feature that is biodegradability, which can render it useful for medical and implantation purposes. The device can help avoid the use of traditional batteries as power source for our everyday used portable electronic gadgets."Our laboratory successfully demonstrated the capability to produce power from biodegradable nanogenerator that could one day power our mobile devices such cell phones, tablets without a cord," said Dr. Mandal. The article has been highly appreciated for its originality and visionary approach towards energy harvesting through green technology. It has been covered extensively in several leading journals and magazines such as *The Economic Times*, *Materials Today*, *Science Daily* and many more.

The authors acknowledge funding from the Science and Engineering Research Board (SERB), Govt. of India.

## References

*Native Cellulose Microfiber-Based Hybrid Piezoelectric Generator for Mechanical Energy Harvesting Utility*: <http://pubs.acs.org/doi/abs/10.1021/acsami.5b08168>

ACS News Service Weekly PressPac (January 27, 2016)

<http://www.acs.org/content/acs/en/pressroom/presspacs/2016/acs-presspac-january-27-2016/cellulose-nanogenerators-could-one-day-power-implanted-biomedical-devices.htm>

The Telegraph (March 14, 2016)

<http://epaper.telegraphindia.com/paper/11-0-14@03@2016-1001.html>

PTI Coverage (Feb. 16, 2016)

<http://economictimes.indiatimes.com/news/science/cellulose-nanogenerators-may-power-medical-implants/articleshow/51007825.cms>

*DNA-Assisted  $\beta$ -phase Nucleation and Alignment of Molecular Dipoles in PVDF Film: A Realization of Self-Poled Bioinspired Flexible Polymer Nanogenerator for Portable Electronic Devices*: <http://pubs.acs.org/doi/abs/10.1021/acsami.5b04161>

ACS News Service Weekly PressPac (August 12, 2015):

<http://www.acs.org/content/acs/en/pressroom/presspacs/2015/acs-presspac-august-12-2015/flexible-biodegradable-device-can-generate-power-from-touch-video.html>

The Economic Times:

<http://economictimes.indiatimes.com/news/science/indian-scientists-dna-device-generates-power-from-touch/articleshow/48500875.cms>

Science Daily:

<http://www.sciencedaily.com/releases/2015/08/150812131650.htm>