



K.D.K. College of Engineering

Department of Electrical Engineering



Issue – 47

UMANG

A monthly newsletter of Department of Electrical Engineering

November 2017

CHIEF PATRONS

Hon.Smt. Sumanmala B. Mulak
(Chairperson, B.C.Y.R.C., Nagpur)

Hon. Shri. Rajendra Mulak
(Hon. Secretary, B.C.Y.R.C., Nagpur)

Hon. Smt. Prerna Mulak
(Managing Director, B.C.Y.R.C., Nagpur)

Hon. Mr. Yashraj R. Mulak
(Treasurer, B.C.Y.R.C., Nagpur)

ADVISORY COMMITTEE

Dr. D.P. Singh
(Principal, K.D.K.C.E.)

Dr. A.M. Badar
(Vice-Principal, K.D.K.C.E.)

Dr. (Mrs.) S. S. Ambekar
(HOD, Electrical Engineering)

Prof. C. J. Sharma
(Faculty In-charge, EESA)

EDITOR

Mrs. V. B. Hardas

CO- EDITOR
Mr. N. Khobragade

STUDENT COMMITTEE

Nikhil Gupta
Vrushali Chaudhari



VISION

To impart quality technical education for developing competent electrical engineers capable of accepting challenges of the modern society.

MISSION

- M1 To provide an adoptive academic environment with a continuous motivation to budding electrical engineers for making them academically excellent and technically competent having good managerial skills to fulfill the expectations of industries for developing sustainable solutions.
- M2 To work for all round growth of students having good moral values in a dedicated manner.
- M3 To inculcate a sense of responsibility among the students for well being of the society.

PROGRAM EDUCATIONAL OUTCOMES (PEO)

- To develop graduate engineers with sound technical knowledge and all round personalities ready to pursue high level academic career.
- To produce graduate engineers with broad based trainings to cater to the requirements of modern electrical industries and ready for working as electrical consultants.
- To produce graduate engineers having sensitivity towards global environmental issues and sustainable developments through use of renewable energy sources.
-

PROGRAM SPECIFIC OUTCOMES (PSO)

The Department of Electrical Engineering will prepare the graduate engineers having:-

- Technical and managerial skills necessary to enter careers in design, application, installation, manufacturing, testing, operation and/or maintenance of electrical systems.
- Knowledge of information technology skills including word processing, spread sheet, power point presentation, electrical system simulation, computer programming, internet/library research and electrical CAD drawing encouraging and increasing one's abilities for lifelong learning.

Using electrical signals to train the heart's muscle cells

Columbia Engineering researchers have shown, for the first time, that electrical stimulation of human heart muscle cells (cardiomyocytes) engineered from human stem cells aids their development and function. The team used electrical signals, designed to mimic those in a developing heart, to regulate and synchronize the beating properties of nascent cardiomyocytes, the cells that support the beating function of the heart. The study, led by Gordana Vunjak-Novakovic, The Mikati Foundation Professor of Biomedical Engineering and a professor of medical sciences (in medicine), is published online January 19 in *Nature Communications*.]

Cardiovascular disease is one of the major health problems around the world, especially because the heart cannot repair itself: if cardiomyocytes are lost to injury or disease, they have only a minimal ability to regenerate. Scientists have been trying to develop ways to regenerate hearts by using cardiomyocytes grown from the patient's cells taken from skin or blood.

To be successful, these cardiomyocytes need to respond to and integrate with the surrounding heart muscle. But, currently, the immaturity and resultant irregular beating of human cardiomyocytes derived from stem cells have limited their usefulness for regenerative medicine and biological research.

"We've made an exciting discovery," says Vunjak-Novakovic. "We applied electrical stimulation to mature these cells, regulate their contractile function, and improve their ability to connect with each other. In fact, we trained the cell to adopt the beating pattern of the heart, improved the organization of important cardiac proteins, and helped the cells to become more adult-like. This preconditioning is an important step to generating robust cells that are useful for a wide range of applications including the study of cardiomyocyte biology, drug testing, and stem cell therapy. And we think that our method could lead to the reduction of arrhythmia during cell-based heart regeneration."

Vunjak-Novakovic worked with George Eng and Benjamin Lee, both of whom recently received their PhD from the Department of Biomedical Engineering. They are also MD students and the study's co-leading authors. The team grew human stem cell-derived cardiomyocytes and engineered them into three-dimensional structures. They then exposed these structures to electrical signals that mimicked those in a healthy heart--over just one week. They showed that this electrical stimulation increased cardiomyocyte connectivity and the regularity of muscle contraction.

Benjamin Lee adds, "As a student in both engineering and medicine, I am particularly interested in how electrically conditioned cardiomyocytes can be used in a clinical context."

Journal Reference:George Eng, Benjamin W. Lee, Lev Protas, Mark Gagliardi, Kristy Brown, Robert S. Kass, Gordon Keller, Richard B. Robinson, Gordana Vunjak-Novakovic. **Autonomous beating rate adaptation in human stem cell-derived cardiomyocytes.** *Nature Communications*, 2016; 7: 10312
DOI: [10.1038/ncomms10312](https://doi.org/10.1038/ncomms10312)

NEWS FOR THE MONTH



The Installation Ceremony of EESA (Electrical Engineering Students Association) for session 2017-2018 was organized on 7th October, 17 in Electrical Department of KDK college of Engineering. The function was graced by Er. S.C. Chaudhari, Senior Divisional officer, Ajni Loco Shed, Nagpur as the Chief Guest of the function, Dr. D. P. Singh, Principal, KDKCE, Dr. A. M. Badar, Vice-Principle, KDKCE, Dr. G. H. Aggarwal, Dean Student development cell, Dr. (Mrs). S. S. Ambekar, HOD, Electrical Department, Prof. C.J. Sharma, EESA Faculty Incharge. The team of office bearers of EESA has 12 new members. Sanjay Kale, student of final year is declared as the president and Vikas Maske is declared as Secretary. The report was read by the president, listing the events schedule for the current session and formal vote of thanks was proposed by secretary. Er. S.C. Chaudhari congratulated all the team members and discussed the present scenario of generation in India. The entire teaching and non teaching staff of Electrical department were present at the ceremony. Department feels proud and pay regards to Shri. Rajendra. Bhausahab Mulak, Secretary, BCYRC and Yashraj Mulak, Treasurer, BCYRC for their support and guidance.

MOTIVATIONAL THOUGHTS

- It's not who you are that holds you back, it's who you think you're not.

--Anonymous

- "Live as if you were to die tomorrow. Learn as if you were to live forever."

--Mahatma Gandhi

- "If you only do what you know you can do- you never do very much."

--Tom Krause

- "Reach high, for stars lie hidden in your soul. Dream deep, for every dream precedes the goal."

--Pamela Vaull Starr

- "When it is obvious that the goals cannot be reached, don't adjust the goals, adjust the action steps."

--Anonymous