

## Winners of Gandhian tech awards to address people's problems

By Dinesh C Sharma

New Delhi, March 6 (India Science Wire): New ideas ranging from cost-effective water purification techniques to early detection of cancer are among innovations selected for the Gandhian Young Technological Innovation (GYTI) Awards for the year 2017.

The awards celebrate the spirit of student innovation in engineering, science, technology and design through affordable and frugal solution as well as those pushing the technological edge. Of 2700 applicants from over 300 universities and institutions who competed for the awards this year, 22 innovations have been selected. Fifteen awardees in the medical and biotech field will get a support of Rs 15 lakh from Biotechnology Industry Research Assistance Council (BIRAC) to further develop their prototypes, while another 100 grassroots innovations and socially relevant solutions will get a grant of Rs 1 lakh each.

Among the new ideas are those dealing with water and sanitation, image processing, antimicrobials, sterilization and diagnostic devices. The five technologies related to water are concerned with purification of water including removal of pollutants (chemical, heavy metal or textile dye). All of them deploy new techniques like photometric sensing, polymer-coated optical fibre sensing, hollow membrane for micro and ultra-filtration. For instance, microbial and pathogen count is taken care by silver nano-particle decorated coconut charcoal in the concept proposed by Ramesh Kumar from IIT Madras.

Scientists from IIT Delhi and Kharagpur are working on technological improvements in microscopy. IITD is working on Digital Holographic Microscopy and Digital Infrared Thermal Imaging, while Manashi Chakraborty of IIT Kharagpur are working on early detection of oral cancer. Vishal Gupta at IIT Delhi has proposed a novel approach employing ultrasonic vibration with a diamond-coated hollow tool for drilling bones. Scanning electron microscopy can be used to observe microcracks and surface morphology.

Search for novel antimicrobials is always in forefront of drug research due to ever increasing resistance. A rapid test developed at IIT Kharagpur by Shantimoy Kar makes use of micro fluidics based paper kit and can give results in six hours compared to 18 to 24 hours taken by present techniques. Shivangi Sachdeva and her team at IIT Hyderabad has identified that E. coli outer membrane protein Wzi that acts as an anchor for capsular polysaccharide (CPS) onto the bacterial surface.

A highly suitable solution for sterilization of medical equipment in rural area has been developed by Saugandha Das at Institute of Chemical Technology, Mumbai using a method called 'Flash Freeze Elixir'. It comprises of a low-cost antimicrobial agent and a combination to form a cryogenic liquid. Scientists at the Indian Institute of Science, Bangalore have developed a fully automated handheld device to detect melamine from milk using a chemical dried cotton. Shanthanu Chakravarthy at IISc has developed a virtual reality (VR)-based endoscopy simulator for endoscopy training to medical students.

NeuroBuds is a brain wave mapping smart earphones developed by Nitin Vasanth at Cochin University of Science & Technology. It uses specially designed and fabricated carbon nanotube based sensor electrodes to detect brain waves via the ear canal of the users. Smartphone based processors can be used to process data, minimising the hardware requirement and hence the cost. Mallikarjunachari G. at IIT Madras is aiming to design a nano-mechanical device which can be utilised for both diagnosis as well as plaque removal. Ashish K. Agrawal and team at NIPER, Mohali have characterised smart nanocarriers for oral insulin delivery. (India Science Wire)