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## Phototherapy is Bringing Photonics Technology to a New Height

By PIDA

Recently, novel phototherapy devices have been brought to the table due to several major forces that drive market demands, including significant further progress in technology, as well as the obsession with beauty in the world wide.

In terms of advancement in technology, the application of ultraviolet light emitting diode (UV LED) and photocatalytic oxidation is aimed to provide functions such as sterilization, deodorization, giving out fragrant, and so on. The technology has been put in use in various fields from treating single symptom like acne, jaundice and joint pains, to being used to design automatic sterilization trash-can that restrains the bacterium more effectively, and to even much more precisely activating brain cells to release dopamine.

According to the U.S. National Institutes of Health, phototherapy is somewhat unique treatment for hyperbilirubinemia of the newborn because of its efficacy to decrease bilirubin level. In the past, commercially available devices are prohibitively expensive and approaches in designing less expensive devices are suboptimal due to reliance on inconsistently available line power and need for bulky, rigid supports that are expensive for distribution. A novel approach moving from fluorescent lamps to LED is to create an inexpensive, compact, freestanding unit that is solar charged and made with readily available materials.

Bangalore based Wipro GE Healthcare, a joint venture

between Wipro and GE's healthcare business, says LED-based phototherapy system cures jaundice in babies in an average of 7.6 hours compared with 10.4 hours using compact fluorescent lamp, or CFL, bulbs. The developing countries desperately need improvements in child health care as they have suffered from a lack of access to public health care, trained personnel and low levels of literacy among pregnant women.

The light source is allegedly inexpensive and sustainable with light source of flexible strips of small, high intensity LED bulbs commercially available materials. These are durable, long lasting, low energy-consuming and operable with a photovoltaic battery. Also, the approach specifically aims to optimize design to enable manufacture in target regions. This would dramatically decrease distribution cost and increase community engagement.

A number of research institutions are investigating a new frontier for the activation of brain cell with phototherapy. Washington University School of Medicine and the University of Illinois at Urbana-Champaign have developed tiny devices containing LEDs the size of individual neurons that activate brain cells with light. According to Washington University, the implantable LED light can activate brain cells to release dopamine and is smaller than the eye of a needle, allowing them to identify and map brain circuits involved in complex behaviors related to sleep, depression, addiction, and anxiety.

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