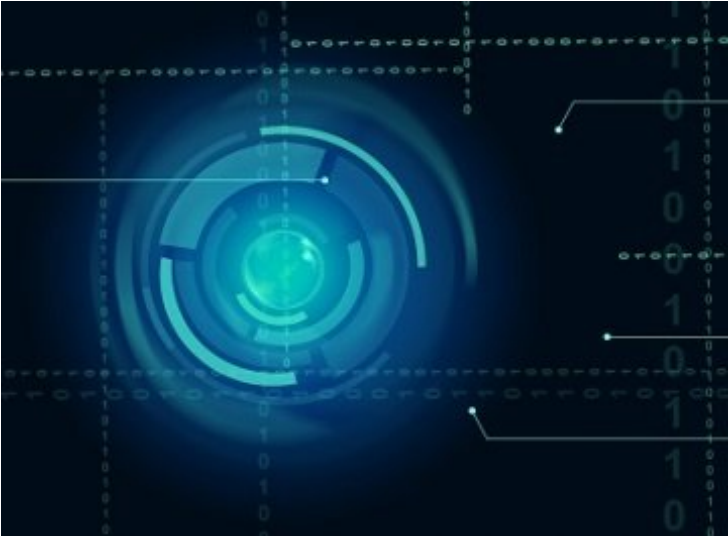


Indian-origin researcher developed a wearable vapour sensor

30 November -0001 | News | By BioSpectrum Bureau

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Researchers at the University of Michigan including one of Indian-origin, are developing a new wearable vapour sensor that could offer continuous disease monitoring for patients with diabetes, high blood pressure, anemia or lung disease. The new sensor can detect airborne chemicals either exhaled or released through the skin.

It would likely be the first wearable to pick up a broad array of chemical, rather than physical, attributes, researchers said.

"Each of the diseases has its own biomarkers that the device would be able to sense. For diabetes, acetone is a marker, for example," said Mr Sherman Fan, a professor of biomedical engineering.

Other chemicals it could detect include nitric oxide and oxygen, abnormal levels of which can point to conditions such as high blood pressure, anemia or lung disease.

Mr Fan is developing the sensor with Mr Zhaohui Zhong, an associate professor of electrical and computer engineering, and Mr Girish Kulkarni, a doctoral candidate in electrical engineering.

The researchers said their device is faster, smaller and more reliable than its counterparts, which today are much too big to be wearable.

"Nanoelectronic sensors typically depend on detecting charge transfer between the sensor and a molecule in air or in solution," Mr Kulkarni said.

"Instead of detecting molecular charge, we use a technique called heterodyne mixing, in which we look at the interaction

between the dipoles associated with these molecules and the nanosensor at high frequencies," he added.

This technique, made possible through the use of graphene, results in extremely fast response times of tenths of a second, as opposed to the tens or hundreds of seconds typical in existing technology.

It also dramatically increases the device's sensitivity. The sensor can detect molecules in sample sizes at a ratio of several parts per billion.