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Highly Sensitive, Conformal And Wearable In2O3 Nanoribbon Transistor Biosensors With Integrated On Chip Side Gate For Glucose Monitoring In Body Fluid

Tech ID: 29333 / UC Case 2018-211-0

SUMMARY

UCLA researchers in the Department of Electrical Engineering have invented a novel wearable sensor that is capable of measuring glucose levels in bodily fluids.

BACKGROUND

Wearable sensor technologies are essential to the realization of personalized medicine through continuously monitoring an individual's state of health. Typically these wearable sensors detect movement, heart rate, etc. Newer wearable technologies can now detect molecules like glucose or ions like sodium and potassium in saliva or sweat. However, these devices use bulky electrodes or metal wires which have prevented these sensors from being truly wearable.

INNOVATION

Researchers led by Mohammed Amer from the Center of Excellence for Green Nanotechnologies at UCLA have developed a wearable sensor that can measure glucose levels in sweat and saliva. Rather than using conventional glucose detectors which require blood samples, their device uses In₂O₃ nanomaterials for non-invasive glucose detection. The wearable device can be fully integrated into a chip that can do the entire signal processing onboard without an external computer. This device can be laminated onto watches and onto skin, making it truly wearable and can detect glucose in perspiration. Their device shows high sensitivity with a wide detection range that can detect as little as 10 nanomolar of glucose. The high mechanical robustness of their device allows the user to perform many strenuous activities while wearing the device.

APPLICATIONS

- ▶ Wearable electronics
- ▶ Athletic performance optimization
- ▶ Continuous and remote medical monitoring
- ▶ Drug monitoring

ADVANTAGES

- ▶ Can be laminated onto the skin and watches
- ▶ Onboard signal processing for real time analysis
- ▶ Mechanically robust to cover a range of activities while wearing the device
- ▶ Highly sensitive with a wide detection range

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,813,057	11/14/2023	2018-211

CONTACT

UCLA Technology Development Group
 ncd@tdg.ucla.edu
 tel: 310.794.0558.



INVENTORS

- ▶ Amer, Mohammed R.

OTHER INFORMATION

KEYWORDS

Wearable technology, biosensor, sensor, sweat, saliva, bodily fluids, glucose, monitoring, electrolyte

CATEGORIZED AS

- ▶ **Biotechnology**
 - ▶ Health
- ▶ **Engineering**
 - ▶ Engineering
- ▶ **Medical**
 - ▶ Devices
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- ▶ **Sensors & Instrumentation**
 - ▶ Biosensors
 - ▶ Medical

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UCLA Technology Development Group

10889 Wilshire Blvd., Suite 920, Los Angeles, CA 90095

tdg.ucla.edu

Tel: 310.794.0558 | Fax: 310.794.0638 | ncd@tdg.ucla.edu

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