

Self-driven disposable sensor for easy measurement of blood glucose levels at home

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Credit: AI-generated image ([disclaimer](#))

Electrochemical biosensors utilize biomolecules, such as enzymes and antibodies, as bioreceptors that recognize specific substances in a sample. This recognition generates an electrical signal that provides information about what is present and in what quantity. For instance, to determine the concentration of glucose in the blood, an electrochemical

sensor with an enzyme that selectively recognizes glucose is used. However, this type of sensor usually requires a dedicated electrode and a device to control the reaction that takes place at the electrode.

In this new research, a biofuel cell on a chip was used as a sensor. This [innovative design](#) allows the reaction between the enzyme and glucose to occur without the need for an external device or power source. To take a measurement, a few microliters (one-millionth of a liter) of blood are dropped onto the chip, and the reaction proceeds. The current flowing between the two electrodes of the biofuel cell is then measured to determine the blood glucose level. This information can be read using general-purpose devices, such as smartphones. The device has been published in the journal *Biosensors and Bioelectronics*.

By applying this principle and modifying the enzyme based on the substance to be measured, it is expected that disposable sensors capable of detecting various biomarkers will be developed.

More information: Jannatul Morshed et al, A disposable enzymatic biofuel cell for glucose sensing via short-circuit current, *Biosensors and Bioelectronics* (2023). [DOI: 10.1016/j.bios.2023.115272](https://doi.org/10.1016/j.bios.2023.115272)

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