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Biosensors and Bioelectronics on Smartphone for Portable Biochemical Detection

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Introduction

Biosensors are analytic devices that include biological or biologically-derived sensing components that are either integrated inside or closely related with physicochemical transducers for analyte detection. Various biologically derived materials, such as enzymes, cells, nucleic acids, antigen-antibody complexes, and microorganisms, have been incorporated into various electrochemical, optical, acoustic, and mechanical detectors in order to fabricate biosensors with high sensitivity and selectivity over the last few decades [1]. These biosensor and bioelectronic devices have been effectively employed in a variety of sectors, including clinical diagnostics, drug screening, environmental monitoring, and food quality control, thanks to readout devices with related electronics and signal processors. As an alternative to traditional chemical and physical sensors, they supplied strong detecting and analysing tools [2].

About the Study

Miniaturization of biosensor and bioelectronic devices, such as micro-fabricated transducers and small readout equipment, is currently being worked on to provide real-time, point-of-care, and easy-to-use analyte detections, particularly for clinic and environmental samples. Biosensors may be shrunk to micro- and nanoscale and incorporated into lab-on-a-chip devices as sensitive arrays for biosensor detections using Micro-Electro-Mechanical Systems and nanotechnology.

Researchers have sought to lower the total size and cost of the devices by integrating smartphones with biosensors and three bioelectronics. Biosensors and bioelectronics for smartphones were created as a result of biosensing experiments with obsolete feature phones [3]. Several studies have suggested biosensor and bioelectronics designs for portable healthcare diagnostics outside of well-resourced facilities utilising feature phones.

Low computing capabilities and a poor user interface, on the other hand, made it difficult for feature phones to undertake biosensing procedures on their own, and computers were required to analyse signals and display final test findings in the designs. Smartphones are the most recent generation of telephones featuring advanced features like touch screens, multicore processors, and digital cameras [4]. Smartphones have more sophisticated computer capabilities, greater picture quality, and an open-source operating system than earlier cellphones, all of which allow designing biosensors and bioelectronics on smartphones easier and more powerful than on previous cellphones.

In biosensor and bioelectronic systems, a smartphone may be used to replace input buttons, data analyzers, screen displays, and even detectors that were originally developed for readout devices. It effectively reduced the total cost of the systems by simplifying electronic architecture, reducing bulk size, and allowing portable and point-of-care testing outside of laboratories.

In the near future, biosensors and bioelectronics on smartphones might play a critical role in environmental monitoring, healthcare diagnostics, and food analysis. Smartphones, in particular, have become one of the most extensively used mobile devices, with an estimated 1.75 billion users globally, with the number expected to rise to 2.03 billion.

The widespread availability ensures a simple and cost-effective smartphone purchase, as well as a huge number of prospective subscribers for smartphone-based sensor systems [3]. All of these factors contribute to an increase in the number of peripheral devices coupled to smartphones for biosensing applications. This paper outlines the most recent advancements in biosensors and bioelectronics for biochemical detection on smartphones. Optics, surface plasmon resonance, electrochemistry, and near field communication are used to incorporate biosensors and bioelectronics on smartphones using integrated sensor approaches [4,5].

Conclusion

To begin, the fabrications of such systems are detailed in terms of biosensor techniques, sensor coupling methods, and smartphone usages of four built-in capabilities. The systems' capabilities and benefits are then reviewed, as well as their applications in biochemical detection. Finally, existing limitations and associated constraints of biosensors and bioelectronics on smartphones are discussed briefly, with future development directions and possible possibilities forecasted in the outlook.

References

1. Zhang, Diming, and Qingjun Liu. "Biosensors and bioelectronics on smartphone for portable biochemical detection." *Biosens Bioelectron* 75 (2016): 273-284.
2. Li, Shuang, Daizong Ji, Gang Xu, and Jinglong Liu, et al. "Biosensors and Bioelectronics on Smartphone." *Handbook of Cell Biosensors* (2022): 627-655.
3. Zhang, Diming, and Qingjun Liu. "Biosensors and bioelectronics on smartphone for portable biochemical detection." *Biosens Bioelectron* 75 (2016): 273-284.
4. Su, Kaiqi, Xianxin Qiu, Jiaru Fang, and Quchao Zou, et al. "An improved efficient biochemical detection method to marine toxins with a smartphone-based portable system—Bionic e-Eye." *Sens Actuators B Chem* 238 (2017): 1165-1172.
5. Lu, Yanli, Zhenghan Shi, and Qingjun Liu. "Smartphone-based biosensors for portable food evaluation." *Curr Opin Food Sci* 28 (2019): 74-81.

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