

Laser-induced Graphene Non-enzymatic Glucose Sensors

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Technology Summary

This work reports a uniform metal (e.g., Ni, or Ni/Au) coating process on porous laser-induced graphene (LIG) with electroless plating for excellent glucose-sensing performance and low risk of allergic reaction. The resulting glucose sensor shows a high sensitivity and a large linear sensing range under a small bias voltage. Further, this sensor technology includes the use of an applied bias voltage to provide a basic environment for non-enzymatic glucose sensing. In addition, this technology innovatively integrates the 3D porous non-enzymatic glucose sensor with a microfluidic component and a replaceable basic solution in the reaction cavity for highly efficient sweat sampling and real-time glucose sensing.

Application & Market Utility

Diabetes monitoring and therapy are of high interest. Because the functional recovery of insulin secretion in diabetes patients is challenging, it is crucial to continuously monitor the blood glucose concentration for timely treatment with the injection of artificially synthesized insulin. Although noninvasive measurements of glucose exist, they are associated with expensive equipment and subject to interference from movement and temperature. Because of its simplicity, electrochemical analysis has been extensively employed in portable glucose sensors for daily monitoring and clinical diagnostics.

Next Steps

The research team seeks collaboration, investment, and licensing opportunities.

TECHNOLOGY READINESS LEVEL

4-7

Seeking

Investment | Licensing | Research

Keywords

- Laser-induced graphene foams or fibers
- Non-enzymatic glucose sensors
- Integrated reaction cavity
- Porous/3D structures

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