BITS Pilani
Pilani | Dubai | Goa | Hyderabad | Mumbai
An Institution of Eminence

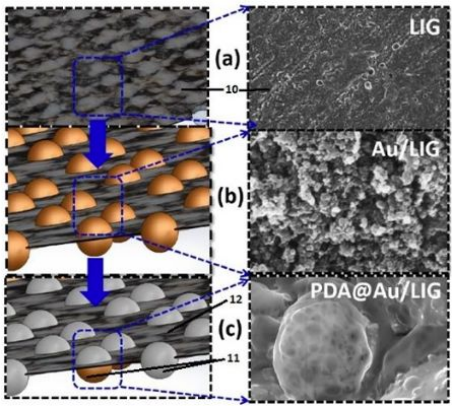
विज्ञान एवं प्रौद्योगिकी विभाग
DEPARTMENT OF
SCIENCE & TECHNOLOGY
सत्यमेव जयते

BITS Pilani
TECHNOLOGY ENABLING CENTRE
DST Supported

PENDING

(IN202311002716)

Graphene bioelectrode comprising polydopamine coated gold nanoparticles, method of synthesis and biosensor system thereof



NEED

Current biosensors often fail to detect low-concentration biomarkers quickly and accurately. Many require expensive reagents or complex procedures, causing 30–50% diagnostic delays and misdiagnoses in critical illnesses. But what if these failures could be prevented with a stable, low-cost bioelectrode activated by sunlight?

TECHNOLOGY OVERVIEW

This invention presents a graphene-based bioelectrode embedded with gold nanoparticles, held together by polydopamine, forming a sensitive and stable interface for biomarker detection. The synthesis uses dopamine, gold salt, and sunlight-induced polymerization. It enables protein immobilization through functional groups, forming part of a complete electrochemical biosensor system.

TECHNOLOGY KEY FEATURES

Graphene-gold hybrid bioelectrode enables sensitive protein binding, sunlight-based synthesis, and stable electrochemical response. It offers low-cost, high-efficiency detection for biomarker-driven diagnostics.

Read more here

MARKET ANALYSIS

The Indian biosensor market is projected to grow at 11.8% CAGR, reaching USD 1.8 billion by 2033. Globally, the biosensor market is expected to hit USD 55.3 billion by 2033 at 8.2% CAGR, driven by demand for rapid diagnostics, personalized medicine, and wearable health tech. (Source: IMARC, 2024)

Target Industries

Biomedical sensor developers integrating biosensing materials; diagnostic device manufacturers focusing on lab-on-chip or wearable diagnostics; research labs and healthcare innovators exploring scalable protein detection technologies

AT A GLANCE

- SDG 3: Good Health and Well-being; SDG 9: Industry, Innovation and Infrastructure; SDG 13: Climate Action

Technology is available for licensing/ co-development.

Reach out to Prof. Deepak Chitkara, Coordinator, BITS Technology Enabling Centre,
BITS Pilani Contact Details: tec.bits@pilani.bits-pilani.ac.in, 91 1596-255913

innovate achieve lead