Graphene-Based Electrochemical Lateral Flow for Alzheimer's Disease Prognosis

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Alzheimer's Disease (AD) is the most common form of dementia [1], currently relying on diagnostic methods that are expensive, invasive, or time-consuming. These methods, based on blood biomarkers, still face challenges, and the design of cost-effective and simple testing protocols remains a significant barrier.
Here, we propose a novel and cost-effective Point-of-Care (PoC) system for early diagnosis of AD and progression. Leveraging a low-cost green IR laser-assisted print/stamp technology, we fabricate reduced graphene oxide (rGO) electrodes integrated into lateral flow assay (LFA) strips [3]. These rGO electrodes can be functionalized with aptamers that specifically bind to key AD biomarkers, enabling their accurate and sensitive detection. We demonstrate proof of concept using thrombin as protein model, showcasing the system's capability for rapid, sensitive, and reliable detection through changes in the electrochemical signal.

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