Novel Surface Functionalized FET platform for highly sensitive Non-enzymatic glucose sensors

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Nanozymes with specific enzyme-like characteristics have been emerging due to their ability to resolve the limitations of the traditional enzyme such as long-time stability and high cost in biosensor applications. Recent studies have highlighted different candidates of non-enzymatic glucose sensors for mimicking the activity of natural enzymes i.e. glucose oxidase enzyme. However, there are still challenges like selectivity, PH dependence, and mechanistic understanding of non-enzymatic glucose sensors towards the simple, efficient, and cost-effective approach. Here, we report a novel modified graphitic carbon nitride material as a promising alternative candidate due to their higher catalytic activity, selectivity, low cost, and environment-friendly nature. After the initial syntheses and characterization, we have developed a novel fabrication of ZnO field-effect transistor (FET) and functionalized with modified GCN material to check the response time of different glucose concentrations. Finally, we demonstrate a Bio-FET based modified GCN functionalized platform at the micro or nanoscale level, which makes it highly advantageous for the practical biosensor applications.