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Specific DNA Sequence Detection by Using of Biosensor

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Editorial

The detection of specific DNA sequences is currently a hot topic of research, as more evidence emerges that gene mutations are responsible for a wide range of inherited human illnesses. Pathogens that cause disease, such as bacteria and viruses, can also be identified by their nucleic acid sequences. As a result, the ability to quickly and easily determine specific DNA sequences in human, viral, and bacterial nucleic acids at low concentrations is currently in high demand.

For DNA detection, a variety of techniques have been developed, including fluorescence electrochemiluminescence, electrochemistry, surface plasmon resonance spectroscopy, and quartz crystal microbalance [1]. DNA electrochemical biosensors have gotten a lot of interest in these bioassay systems because of its benefits such low cost, quick response, compact size, high selectivity, and equipment miniaturisation.

Because of its vast specific surface area, high thermal and electrical conductivities, tremendous mechanical strength, and probable low manufacturing cost, graphene, a two-dimensional sheet of sp2 conjugated atomic carbon, has sparked intense study interest [2]. Graphene is an attractive material for the preparation of electrochemical sensors and biosensors due to its outstanding conductivity and electrocatalytic activity.

Bonanni and Pumera created a graphene platform that combines the sensitivity of Electrochemical Impedance Spectroscopy (EIS) with the great selectivity of hairpinshaped DNA probes for the quick detection of single nucleotide polymorphisms linked to Alzheimer's disease progression. A new gold nanoparticles-ionic liquid/3,4,9,10-perylene tetracarboxylic acid/graphene sensitive platform was developed and effectively employed for label-free DNA impedance sensing [3]. Because of its high biocompatibility for biomolecules, graphene-based chemo/biosensors have a bright future.

Non-covalent functionalization between graphene sheets and aromatic organic molecules based on -stacking interaction has been carried out to widen the use of graphene. This could preserve the intrinsic features of graphene while improving its solubility. Through synergistic non-covalent charge-transfer and – stacking force, thionine possesses a planar aromatic structure that facilitates robust contact with the surface of graphene sheets.

The positive charges on thionine aid solubility and prevent non-covalent functionalized graphene from aggregating. Furthermore, thioninemodified graphene sheets can covalently immobilise NH_2-substituted oligonucleotide probe via linker due to a large number of hydrophilic amino groups. A DNA sensing platform based on thioninegraphene nanocomposite was developed in this study. The sensitive detection of complementary oligonucleotide was achieved by detecting the Differential Pulse Voltammetry (DPV) signal of daunomycin intercalated in double-stranded DNA using daunomycin as a hybridization indicator (dsDNA) [4]. This sensing technique has the potential to be used for the ultrasensitive detection of various DNA sequences.

The DNA electrochemical biosensor's skeleton is given below. AuE was rigorously polished using 1.0, 0.3, and 0.05 m alumina slurries before being sonicated in Milli-Q water and ethanol for many minutes. Before use, the AuE was soaked in Piranha's solution for 10 minutes then rinse with pure ethanol and water. After that, the AuE was continuously scanned in a newly created potential range of 0.35 V to 1.70 V with deoxygenated 0.5 M H_2SO_4 until a voltammogram characteristic of the cleaned AuE was established [5].

Conflict of Interest

None.

References

1. Su, Liang, Wenzhao Jia, Changjun Hou, and Yu Lei. "Microbial biosensors: a review." *Biosens Bioelectron* 26 (2011): 1788-1799.
2. D'souza, S.F. "Microbial biosensors." *Biosens Bioelectron* 16 (2001): 337-353.
3. Dolatabadi, Somayeh, and D. Manjulakumari. "Microbial biosensors and bioelectronics." *Res J Biotechnol* 7 (2012): 102-108.
4. Wood, Keith V., and Monika G. Gruber. "Transduction in microbial biosensors using muliplexed bioluminescence." *Biosens Bioelectron* 11 (1996): 207-214.
5. Dai, Chunhui, and Seokheun Choi. "Technology and applications of microbial biosensor." (2013).

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