

Carbon nanotube-based biosensors: Principles and applications

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Nowadays, it is necessary to develop sensitive and selective real-time analytical methods suitable for the detection/monitoring of a wide range of biochemical analytes. In this context, biosensors - a new class of analytical devices - are especially interesting due to their simplicity, high sensitivity, minimal sample preparation, and field applicability. Carbon nanotube (CNT)-based biosensors are one of the most promising, being able to detect biochemical analytes with high sensitivity (down to pM concentration), due to their unique mechanical and electrical properties, biocompatibility, and low-cost processability. This presentation focuses on the development and evaluation of CNT-based biosensing platforms for the detection of different analytes covering every aspect from fabrication, functionalization with specific bio-recognition elements (such as antibodies and aptamers) to achieve the desired biosensor selectivity, to electrical characterization, as well as a critical discussion of the present issues and challenges.