Special Issue

Electrochemical Aptamer-Based Biosensors

Message from the Guest Editors

Electrochemical biosensors are powerful analytical tools generally providing multiplex analysis, fast response, sensitivity, and specificity at low cost. Aptamers are short single-stranded DNA or RNA oligonucleotides that are isolated, in vitro, from a synthetic oligonucleotide library using the automated technique SELEX. Aptamers are able to bind their target with high affinity (ranging from nano- to picomolar level) and specificity. The analytes cover a wide range, from small molecules and proteins to complex structures like whole cells and viruses. Aptamers are characterized by numerous relevant properties suitable for electroanalytical applications, as follows: (1) highly efficient and reproducible chemical synthesis, (2) high-affinity binding capacity, (3) thermal and conformational stability, (4) easily controlled chemical modification, (5) a highly flexible structure, and (6) low cross-reactivity. Electrochemical aptasensors can be applied in several areas such as health (clinical diagnostic and therapeutic purposes), the food industry, and environmental monitoring.

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