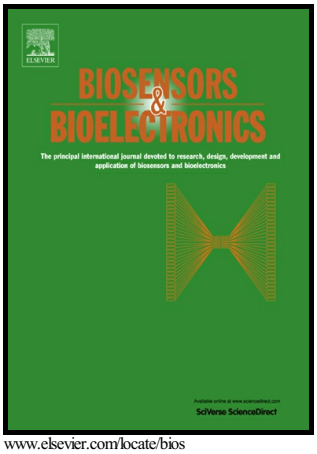

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Abstract

The development of nucleic acid-based portable platforms for the real-time analysis of diseases has attracted considerable scientific and commercial interest. Recently, 2D layered molybdenum sulfide (2D MoS_2 from here on) nanosheets have shown great potential for the development of next-generation platforms for efficient signal transduction. Through combination with DNA as a biorecognition medium, MoS_2 nanostructures have opened new opportunities to design and construct highly sensitive, specific, and commercially viable sensing devices. The use of specific short ssDNA sequences like aptamers has been proven to bind well with the unique transduction properties of 2D MoS_2 nanosheets to realize Aptasensing devices with many advantageous features (e.g., robust biointerfacing through various conjugation chemistries, facile sensor assembly, high stability with regard to temperature/pH, and high affinity to target). Most of the important MoS_2-DNA/aptamer sensors can operate on the principles of fluorescence, electro-chemiluminescence, and electrochemistry. This review encompasses the most current information on various designs and working principles of MoS_2/DNA sensor technology, which is emerging as one of the most sought-after and valuable fields with the advent of nucleic acid inspired devices. As detailed in this review,

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