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Magnetic Biosensors

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Message from the Guest Editors

The current demand for new clinical diagnostics has fostered the development of integrated healthcare solutions for the rapid diagnosis, monitoring and management of health conditions. Magnetic sensing is an established technology providing high sensitivity with tunable spatial resolution regarding the detection of magnetic signals. Magnetic sensors compatibility with standard silicon integrated circuit technology, with electronic and fluidic circuitry, as well as with a wide range of materials, including flexible substrates, have prompted the development of a new generation of biomedical devices. Indeed, over the past 10 years, a multitude of applications combining such sensing units with diagnostics have emerged in the literature, including the detection of nucleic acids, proteins and cells in point-of-care (PoC) diagnostic devices; the detection of low-frequency bio-signals, such as neuron activity, using both rigid and flexible probes; the in-situ manipulation of magnetic nanoparticles; or the fabrication of dense, packed arrays for bioimaging scanners. Accordingly, this Special Issue aims to merge these recent developments focusing on the integration of magnetic sensors with different technologies targeting smart diagnostics for health solutions. Authors are invited to contribute research papers or review articles focusing on the detection of biological molecules/cells in portable systems, integrated systems with multiple functionalities targeting the real-time monitoring of health status, precision diagnostics, high-content screens or innovative fabrication/architecture methods for the low-cost and/or large-scale production of magnetic-based bioanalytical devices.

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