sensors

Special Issue

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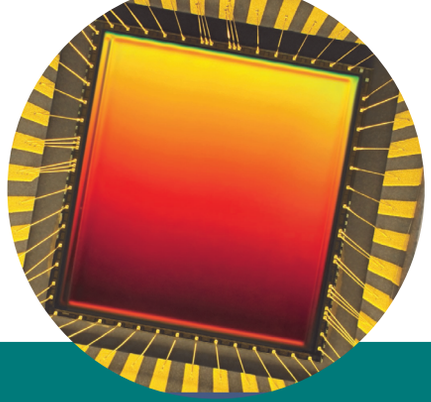

On-Chip Sensors

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Dear Colleagues,

The original idea of lab-on-a-chip (LOC) technology involves integrating on-chip sensors with advanced microfluidic technology to build miniaturized devices that can monitor bio/chemical responses in real time (quantitatively), or on/off signals (qualitatively), without a bulky and complex laboratory setup. Such a technique would find broad and numerous applications in genomics, proteomics, point-of-care testing, chemical analysis, drug discovery and environment monitoring.

(1) Ideally, the on-chip sensors are integrated into the LOC devices, which are disposable. For example, CMOS, electrochemical, FET, RF, mechanical and optical sensors have been integrated with the LOC devices for on-chip sensing. The main challenge is not only to enhance the quality of the on-chip sensors but also to fabricate the LOC devices cost-effectively. (2) Alternatively, the sensors can be assembled into the reusable miniaturized hand-held instruments' side rather than the disposable LOC devices' side as stand-alone components. For this approach, user-friendly and contamination-free interfacing between the microfluidic devices and the instruments needs to be highlighted, along with compact design of the instruments. Recent examples include a lens-free holographic microscope installed on an existing smart phone camera. (3) Another methodology is to utilize mobile micro/nano particles/cells as a sensing system in microfluidic devices that can be excited and scanned by external optical instruments, such as micro SERS (surface enhanced Raman scattering) and micro SPR (surface plasmon resonance).

In this special issue, we solicit review articles and original research papers addressing technical challenges on developing on-chip sensors for LOC applications. The papers can cover all aspects of on-chip sensors including, but not limited to, recent developments in the following areas: fabrication and application of on-chip sensors; point-of-care sensing; sensor for LOC systems; CMOS sensor; capacitive sensor; electrochemical sensor; FET sensors; RF sensor; on-chip mechanical sensor (e.g., cantilever, QCM, SAW); on-chip optical sensor; lens-free smartphone microscope; micro SERS; micro SPR; cell-based sensors and nanobio sensors. Authors are invited to contact the guest editors prior to submission if they are uncertain whether their work falls within the general scope of this Special Issue.

Prof. Kwang W. Oh
Guest Editor

Special Issue Topics:

- sensor
- on-chip sensor
- biosensor
- nanobio sensor
- microfluidics
- integrated sensor
- point-of-care sensing
- electrochemical sensor
- CMOS, FET, RF sensor
- capacitive sensor
- on-chip mechanical sensor
- ultrasound, QCM, SAW
- on-chip optical sensor
- SERS, SPR, plasmonic sensor
- cell/particle-based sensor
- sensing w/ smartphones

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