Vol. 32 No. 8(1) 2020

Sensors and Materials

Contents

Special Issue on Novel Sensing Technologies for Point of Care, Home Care, and Personal Health Care
Guest editor: Yu-Lin Wang (National Tsing Hua University)

Special Issue on CMOS-driven Biomedical Innovations
Guest editor: Kiichi Niitsu (Nagoya University)

Special Issue on Novel Sensing Technologies for Point of Care, Home Care, and Personal Health Care

Preface

Miniaturized microsensors utilize various sensing elements, including nanomaterials, biomaterials, or polymer materials, combined with transducers such as field-effect transistors and devices based on thermoelectric, piezoelectric or photonic characteristics for disease biomarkers, chemicals and gases, environmental contaminants, and biometrics. These sensors have attracted considerable interest owing to their small size, high sensitivity, low cost, low power, easy operation, and potential for high-throughput data collection and application to Internet-of-Things (IoT). Microfluidic channels integrated with sensors for protein detection or cell separation are also widely adopted for many point-of-care devices. Portable devices with special circuit designs for temperature, gas, pressure, chemicals or metabolite detection have also been used for personal healthcare monitoring, such as for heart beats, blood pressure, exhaled gas, and blood sugar. Homecare devices for cardiovascular biomarkers, such as cTnI, BNP, and CRP, have also been developed for daily or emergent tests. The strong demand for portable devices is triggering the rapid development of microsensors in this field. In this special issue, we have collected papers on field-effect transistor/nanomaterials-based gas sensors, microfluidic devices for cell separation, and self-powered thermoelectric devices using nanoparticles for real-time temperature monitoring on wearable and flexible substrates. These papers clearly show the potential for improving the current medical demand for these devices.

I would like to sincerely thank all the authors and reviewers for their contribution to this special issue. I also thank Ms. Misako Sakano of MYU K.K. for her great assistance in organizing this special issue.

Yu-Lin Wang
National Tsing Hua University
Taiwan, ROC

Special Issue on CMOS-driven Biomedical Innovations

Preface

CMOS electronics enrich our daily life, especially when used with information and communication technologies (ICTs). In particular, the energy efficiency of CMOS technology has markedly improved to meet the demand for IoT cutting-edge devices such as smartphones. By employing the advantages of CMOS electronics, biomedical innovations can be realized. This special issue focuses on state-of-the-art CMOS-driven biomedical innovations that use, for example, the high-performance CMOS biosensor, CMOS stimulator, CMOS lab-on-a-chip, and CMOS energy harvesting.

I believe that sustainable health monitoring has become very important owing to the impact of the new coronavirus. To realize sustainable health monitoring in harmony with human life, CMOS-integrated systems that are small and enable low power consumption will play an increasingly important role. This special issue is very valuable because it is in accordance with these trends.

I would like to conclude by expressing my gratitude to everyone involved in the preparation of this special issue, particularly to the editors of *Sensors and Materials* for inviting me to edit this special issue.

Kiichi Niitsu
Nagoya University
Japan