

SPECIAL ISSUE

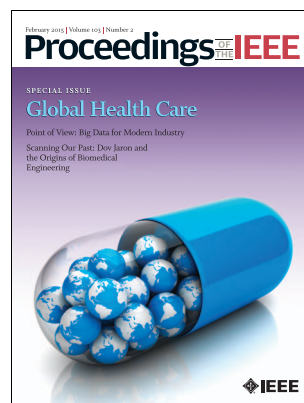
GLOBAL HEALTHCARE: ADVANCES AND CHALLENGES

Edited by M. Akay and T. Tamura

- 150 Microfluidics and Nanotechnology for Detection of Global Infectious Diseases**
 By G. L. Damhorst, M. Murtagh, W. R. Rodriguez, and R. Bashir
|INVITED PAPER| This paper reviews the state-of-the-art technologies for detection of HIV, malaria, and TB, and discusses opportunities and future prospects.
- 161 Advances in Nanotechnology and Microfluidics for Human Papillomavirus Diagnostics**
 By S. Tasoglu, H. Cumhuri Tekin, F. Inci, S. Knowlton, S. Wang, F. Wang-Johanning, G. Johanning, D. Colevas, and U. Demirci
|INVITED PAPER| This paper presents the existing assays and platforms employed for Human Papillomavirus (HPV) diagnosis, and highlights recent advances in nanotechnology and microfluidics that potentially enable new approaches for HPV diagnosis.
- 179 Wearable Sensors for Healthier Pregnancies**
 By J. Penders, M. Altini, C. Van Hoof, and E. Dy
|INVITED PAPER| This paper evaluates the use of wearable sensors as an enabling technology to motivate healthier lifestyle behaviors during pregnancy in developing and developed countries.
- 192 Diagnostic Tools for Lab-on-Chip Applications Based on Coherent Imaging Microscopy**
 By F. Merola, P. Memmolo, L. Miccio, V. Bianco, M. Paturzo, and P. Ferraro
|INVITED PAPER| This paper presents recent advances in developing imaging tools based on coherent imaging microscopy that can be very useful when applied into biomedicine.
- 205 Biomedical Applications of Untethered Mobile Milli/Microrobots**
 By M. Sitti, H. Ceylan, W. Hu, J. Giltinan, M. Turan, S. Yim, and E. Diller
|INVITED PAPER| This paper reviews the current advances in biomedical untethered mobile millirobots and microrobots.
- 225 AMPFLUID: Aggregation Magnified Post-Assay Fluorescence for Ultrasensitive Immunodetection on Digital Microfluidics**
 By C.-Y. Huang, P.-H. Shih, P.-Y. Tsai, I.-C. Lee, H.-Y. Hsu, H.-Y. Huang, S.-K. Fan, and W. Hsu
|INVITED PAPER| This paper describes the effect of bead aggregation in an immunoassay system and the aggregation-magnified post-assay fluorescence for ultrasensitive immunodetection on digital microfluidics.
- 236 Advances in Smartphone-Based Point-of-Care Diagnostics**
 By X. Xu, A. Akay, H. Wei, S. Wang, B. Pingguan-Murphy, B.-E. Erlandsson, X. Li, W. Lee, J. Hu, L. Wang, and F. Xu
|INVITED PAPER| This paper reviews the state-of-the-art advances in smartphone-based point-of-care diagnostic technologies and their applications in medicine and biology.

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On the Cover: This cover illustrates one of the themes of this special issue, namely that engineers and scientists are expected to play a critical role in developing novel and affordable health care technology and medications to solve global healthcare problems.

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SPECIAL ISSUE: Global Healthcare: Advances and Challenges

248 Demonstration of a Remote Optical Measurement Configuration That Correlates With Breathing, Heart Rate, Pulse Pressure, Blood Coagulation, and Blood Oxygenation

By *N. Ozana, I. Margalith, Y. Beiderman, M. Kunin, G. A. Campino, R. Gerasi, J. Garcia, V. Mico, and Z. Zalevsky*

[INVITED PAPER] This paper presents a compact and potentially low-cost optical sensing technology to monitor three additional biomedical indicators, breathing, blood oximetry, and blood coagulation, which may have potential clinical applications in the developing countries.

263 Engineering a Global Response to Infectious Diseases

By *J. P. Fitch*

[CONTRIBUTED PAPER] This paper presents a more robust, adaptable, and scalable engineering infrastructure to improve the capability to respond to infectious diseases.

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