

Personalized Health Care Devices with Bio-inspired Biosensors



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Abstract

Personalized health care is the emerging trend of many developed countries. It requires many novel medical devices for personal uses with miniaturization for wearable or implantable needs. Heterogeneous integration of MEMS sensors with CMOS technologies can enable many novel clinical applications. Recently, there are tremendous needs for the incorporation of biosensors to measure or monitor specific biomolecules from biological samples non-invasively or minimal invasively. It thus posts stringent requirements on safety, efficacy, and cost/performance for target applications. The infusion and interplay of public/private/academic efforts can share the risk to implement the technologies for promised better health care quality.

We will present and discuss the following projects:

- Surface Plasmon Resonance (SPR) devices for fast detection of biomolecular interactions as in vitro diagnostic.
- Stochastic digital nano-array for biomimicing behavior of membrane protein.
- Detection of LAMP isothermal amplification for fast HBV virus load.

Bibliography

C.-W. Lin received his B.S. from Department of Electrical Engineering, National Cheng-Kung University in 1984. He then started his career in biomedical engineering with M.S. degree from Graduate Institute of Biomedical Engineering, National Yang-Ming University in 1986. After two years services in Army, he went to Case Western Reserve University and received his Ph.D. degree in Biomedical Engineering on Jan., 1993. Before his return to Taiwan, he had been a research associate in Neurology Department, CWRU from Jan. 1993 to Aug. 1993. He worked in the Center for Biomedical Engineering, College of Medicine, National Taiwan University from Sept. 1993 till Aug. 1998. He is now professor in Graduate Institute of Biomedical Engineering and holds joint appointments in both Department of Electrical Engineering and Institute of Applied Mechanics, National Taiwan University. He is also a member of IEEE EMBS, IFMBE, and Chinese BMES. He is the president of Taiwan Association of Chemical Sensors from 2008-2010. His research interests include biomedical micro sensors, optical biochip, surface plasmon resonance, bio-plasmonics, nano-medicine, and personal e-health system.