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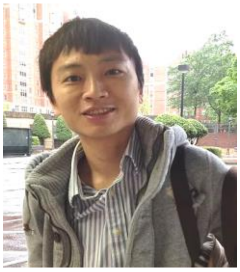
Materials Research Society-Taiwan

# Invited speaker's information form of IUMRS-ICA2017

## Presentation on Symposium of "smart materials (D7)"



**Presentationtitle:** Biocompatible Nanogenerators for Energy Harvesting and Self-Powered Applications

**Speaker's name and affiliation:**Zong-Hong Lin (National Tsing Hua University)

**City/ Country:**Taiwan

**Email:**linzh@mx.nthu.edu.tw

**Brief biography of Speaker:**

Zong-Hong Lin received his Ph.D. (2009) in Department of Chemistry from the National Taiwan University. After one year in the army (2009-2010), he started his postdoctoral career at the National Taiwan University between 2010 and 2012. Then he joined Georgia Institute of Technology as a postdoctoral researcher between 2012 and 2014. Currently he is an Assistant Professor in Institute of Biomedical Engineering, National Tsing Hua University. Dr. Lin's main research interests are in the field of wearable nanogenerators, self-powered nanosensors, and disinfection nanomaterials/systems.He has published over 70 SCI papers (sum of the times cited: 4266, h-index: 36) and has been awarded with Yong Investigator Award of the 5th Asian Biomaterials Congress (ABMC5) andYong Investigator Award of the 21th Symposium of Association for Chemical Sensors in Taiwan (2016 SACST).

**Abstract:**

Electrochemical sensors which utilize the direct redox reactions of biological samples have been demonstrated as efficient analytical approaches over the past decades. In recent years, several new sensing concepts and related devices have been proposed. For examples, wearable and flexible textile-based electrochemical sensors have shown their potential to detect lactate in sweat. In this study, we developed the self-powered electrochemical sensors for glucose and lactate detection by integrating triboelectric nanogenerator (TENG) with electrochemical cells. TENG was firstly developed in 2012 and now has become a good candidate as the power source for self-powered sensing systems due to its performance in converting mechanical energy into electricity. In our design, gelatin/glycerol and PTFE films were selected as the triboelectric layers of TENG due to their biocompatible properties. In the electrochemical sensing units, carbon fiber fabrics were adopted as the conductive substrates to assemble electrocatalytic nanomaterials. The results showed that the presence of bimetallic Au/Pd nanoparticles is crucial in self-powered electrochemical sensors as the overall sensitivity is significantly improved. Now we are moving forward to fabricate all self-powered textile-based electrochemical sensors and believe they will help people to monitor their health status immediately.

References:

1. Nano Energy 2016, 21, 238–246.
2. Nano Energy 2016, 22, 564–571.