SEMINAR SERIES

International Institute for Carbon-Neutral Energy Research
Kyushu University

Title **Development of In vivo Analytical Methods for Understanding the Processes of Oxidative Stress**

Speaker Prof. Yang Tian
Visiting professor
East China Normal University
China

Date & Time Wednesday, October 10, 2018 10:30 a.m.

Place I^{2}CNER hall, I^{2}CNER Bldg. 1, Ito campus, Kyushu University

Abstract

Reactive oxygen species have gained increasing attention in a wide range of brain research fields, because they are considered as the mediators of biochemistry of cellular pathology and are involved in oxidative stress and progressive neurodegenerative diseases. Our group is focusing on development of new methods for in vivo analysis of reactive oxygen species and related molecules, aiming at understanding the processes of oxidative stress, with high selectivity, sensitivity, and accuracy by creating a series of novel ratiometric sensors through integration of highly specific recognition and inner reference element.

In vivo analysis of chemical signals in brain extracellular fluid (ECF) using implanted electrochemical biosensors is a vital way to study brain functions and brain activity mapping. By implanting a microelectrode in a specific brain region, changes in the concentration of a variety of ECF chemical species can be monitored through applying a suitable electrical signal and usually recording the resulting Faradaic current. Our groups developed a novel methodology for designing electrochemical biosensors for simultaneous determination of two molecules via one recognition molecule. A new recognition molecule, Hemin-aminoferrocene, was firstly designed and synthesized to simultaneously detect pH and O_2 in brain upon ischemia and in tumor during cancer starvation therapy, in which hemin was taken as recognition for O_2 and pH through monitoring both current and potential outputs, Fc group was served as an inner reference. Followed by this dual signal outputs model, we further realized the simultaneous detection of pH and glucose in diabetic rat brain using glucose oxidase as specific recognition element for both glucose and pH in rat brain followed by ischemia.

About the Speaker

Prof. Yang Tian, distinguished professor of East China Normal University, who got national outstanding youth fund of China. Graduated from Beijing university of aeronautics and astronautics. She studied at Tokyo university of technology in Japan and obtained her doctor degree in 2003. Since Oct. 2003, she has been engaged in postdoctoral research at the university of Tokyo as a special research fellow of JSPS. She has been a professor and doctoral supervisor in Tongji university since December 2005. In Dec. 2013, she joined East China Normal University as a distinguished professor. In 2006, she was selected into the "new century outstanding talent" program of the ministry of education and Shanghai pujiang talent program. In 2013, she was awarded The Distinguished Lectureship Award by The national outstanding youth fund and The Japanese chemical society. In the past five years, 45 research papers were published as communications contacts, including Acc. Chem. Res., Angew. Chem. Int. Ed.

Host: Professor Yukina Takahashi

For registration, please visit our website:
http://i2cner.kyushu-u.ac.jp/

Contact: Research Support and International Affairs division
International Institute for Carbon-Neutral Energy Research
Tel:092-802-6934 Email:wpikenkyu@jimu.kyushu-u.ac.jp