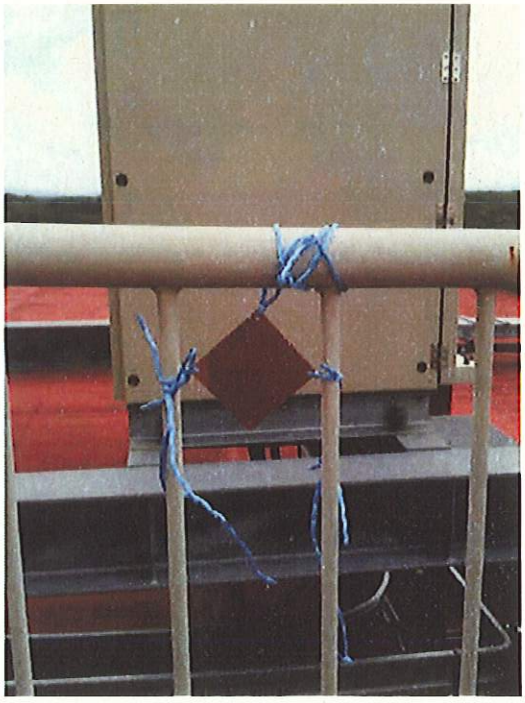
RESEARCH REPORT

(a) Outline of academic activities Discussions, lecture tour, etc.

During the stay in Hyogo University of Teacher Education (HUTE) campus, I have a lot of discussed with Prof. Fukuda. One topic is the cooperation science program with Hyogo University of Teacher Education (HUTE) and National Pingtung University of Education (NPUE), which is already started from last year. In HUTE, I was introduced to several professors regarding the cooperation science program. Particularly, Prof.Ozeki showed nice presentation on the research activity of acid rain and the experiment of the copper exposure monitoring. We have a great talk in Prof. Ozeki's office. The copper-oxone exposure assay design is very impress to me. He showed me the experimental equipment and how to extend the research in Taiwan. In the main time, we decide to carry out the same experiment in Taiwan, and my laboratory will in charged to take place this research. However, we established an important international cooperation research work between two universities.



The copper film exposure monitoring assay design in HUTE

(b) Impressions and thoughts on the present state of science in Japan in your field

Another interest topic in Chemical Biology field which is about the bio-catalytic material with Prof. Fukuda from HUTE and Prof. Naoki Tanaka from Kyoto institute of technology. With the help of Prof. Fukuda, I had a deep reading of Prof. Tanaka's paper, entitled 'Enzymatic conversion of atmospheric aldewhydes into alcohol in a phospholipid polymer film'. After the reading on his main research, I believe that there has an important research topic may need further communication with Prof. Naoki Tanaka. The topic namely "Oxidoreductase Enzymatic-Based Electron Transfer Biofilm Application of Methanol Biofuel Cell". Since the industrial revolution in 19 century, the human kind society started to move into the industrialization epoch. The considerable quantities of crude oil have extracted and the petroleum becomes the major energy resource. Unfortunately, the energy resource from nature is not unlimited. For solve the crisis of energy depletion, developing the new energy resource substitute for the petroleum is eagerest. The development of efficient fuel cell catalysts for the facile conversion of substrate (ex. methanol) to product (ex. carbon dioxide) has become a subject of considerable interest in recent years. The biofuel cells belong to one of the special types of the full cells which are connection between biology and electricity. The broader definition would consider biofuel cells as rely on microorganisms or enzymatic catalysis activity to directly transforming chemical to electrical energy through biochemical reaction pathway. Especially the enzymatic redox reactions of substrates by metallic protein or peptides as the bioreactor and electron transfer bridge, which acting ability to generate the electronic flow at an electrode surface. In this research project, we propose to establish a high performance of multi-enzyme methanol exploiting biofuel cell shown in Figure 1.

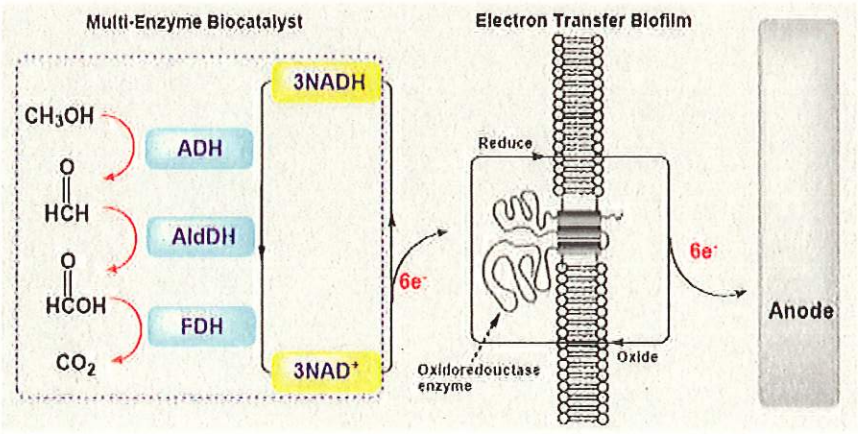


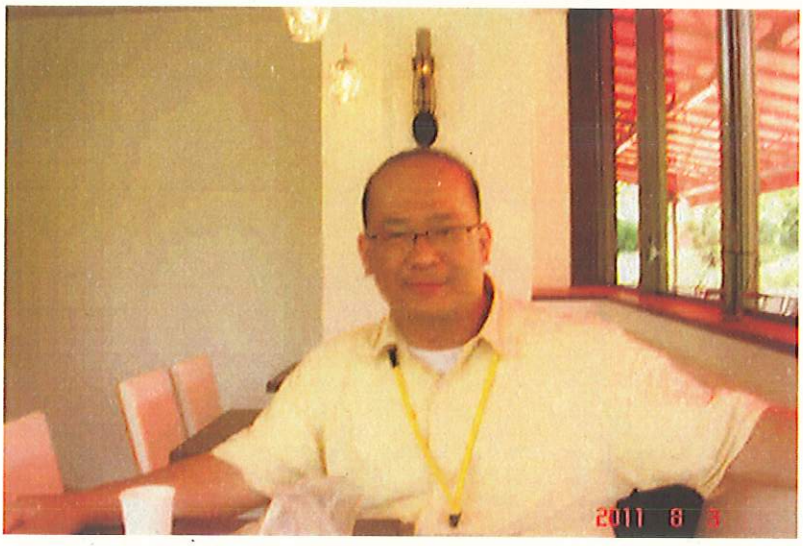
Figure 1. A scheme of novel multi-enzymatic methanol expolied biofuel cell.

Methanol is one of the most popular resources of the biofuel cell due to their relatively low cost and access easier. Investigating the biophysical and biochemical feature of the novel biofuel cell. The coupling of the enzymatic reaction with electrochemical reactions is call bioelectrocatalysis. The strategy of biologically catalyzed device is carrying out their specific reaction via the specific purified enzyme for generate the electron density.

(c)Comments or suggestions to HUTE, especially concerning this program

I was satisfied with the circumstances of HUTE such as the dormitory and fresh air. The HUTE SHORT-TERM FELLOWSHIP PROGRAM is quite nice. In the future, I want many faculties in NPUE visit HUTE. In the meantime, I have to address to "College Bus" and "Campus Café" just really a great service for the international guest. Compare to two years ago, there is no any inconvenient to buy daily necessaries or transportation. However, the College Bus service is really help. On the other hand, I shall try to make more communication with HUTE and KIT depends on this program. Japan is one of the most advanced countries in the biochemistry and biological chemistry. Our international cooperation research interests will endeavour on multi-enzymatic biocatalyst and the metallic oxidoreductase biofilm mediator combination system with Prof. Fukuda from HUTE and Prof. Naoki Tanaka from KIT.

The main gate of HUTE



Visiting HUTE campus cafe

(d) Other comments

I would like to offer my heartfelt thanks to President Kajisa, Vice Prisident Fukuda, Mr. Takashima, the entire international business officer and bus driver for the kind and generous hospitality during my visit to Hyogo/Kato city the past two weeks. I had a good time. It was good to interact with HUTE faculties, and students. The experience was wonderful. I hope more of my colleagues will join the international research project between HUTE and NPUE and visit the beautiful Yashido campus in the near further.