JAMES RENNIE BEQUEST

REPORT ON EXPEDITION/PROJECT/CONFERENCE

Expedition/Project/ Conference Title: 26th Anniversary World Congress on Biosensors (Biosensors 2016)

Travel Dates: 24th – 28th May 2016

Location: Swedish Exhibition and Congress Centre, Gothenburg, Sweden

Group member(s): Xinyi Wan, PhD student

Aims:

1. Presenting my work in an oral format
2. Learning different research topics about biosensors worldwide
3. Networking with other researchers

OUTCOME (not less than 300 words):-

James Rennie Bequest Travel Award has greatly assisted my participation to the Biosensors 2016 conference in Sweden, which was my first international conference I have attended during my PhD. The congress is the most premier event for the biosensors community - the largest in the field with > 1100 attendees and happening once every two years. It is a great news for me that my abstract has been accepted for an oral presentation in this conference.

This conference included more than 170 oral presentations and more than 850 poster presentations with about 20 different topics. My work is mainly about engineering whole cell based biosensors to sense different contaminations in drinking water. Far beyond my expectation, presentations about whole cell based biosensors were only 10% among all the topics, and building biosensors by engineering genetic circuits in cells was only 10% of whole cell biosensors topic. Other 90% of whole cell biosensors were more about high throughput detection of whole cells (e.g. pathogenic bacteria), different methods to detect in cell reactions and using cell physiology (e.g. cell membrane distortion) to detect environment change (e.g. pH).

I presented my work in one of the seminar rooms with 30-40 people. As it was my first time to give a presentation in an international conference, I was very nervous and even couldn't sleep before my presentation. However, it went very well during my presentation. I stayed very calm and knew what I was talking about, I showed what I wanted in my presentation and didn't miss any parts, and I was facing to my audiences most of the time (it was very helpful for people to take photos of me). Most importantly, I finished my talk in time, and still left 2 min for discussion. Although nobody asked questions, I got some good feedbacks afterwards from my supervisor and other researchers. From those feedbacks, I learnt that my presentation was very clear. More surprisingly, I realised that many people were interested in my work, or something related to my work. Also, I found there were actually more researchers studying whole cell based sensors than what the conference officially showed.

Apart from whole cell based biosensor, many other methods have been studied to make biosensors. The most popular method was probably the one based on immunology, such as the use of antibodies, which are very sensitive and have been used for most commercial

biosensors. There are also many other methods based on biology and physics, such as using electrode and acetyl choline sensitive material to detect acetyl choline, and using crystal's colour change to report the existence of target molecules or cells. There were also a lot of new technologies have been showed for detection and analysis, such as reading the detection result by smart phone, and analysing target DNA fragments in less than 5 min PCR reaction.

I also found some basic research about biosensors. There was a PhD student from Heriot-Watt University studying how different cell lines from insects responded to different chemicals. As I was studying antennal sensors of insects from Tropiduchidae for more than a year during my BSc project, her topic turned out to be very appealing to me. More interestingly, we have met few days ago in a workshop organised by Edinburgh Local GRADschool. We had a great chat about the insect sensors in the conference. I was mainly studying the morphology of antennal sensors, and estimated their functions based on their types and distribution. I also wanted to test their real response to different chemicals *in situ* by using capillary electrodes, but we didn't have the facilities at that moment. Moreover, the antenna will lose its function gradually once been removed from the host. She had the same issues at the beginning. However, instead of using the capillary electrode, she cultured different cell lines from insects, and directly tested them *in vitro*. Although the study was still in early stage, I thought this can be a great idea to study the antennal sensors. Moreover, I also got some ideas linked to my previous study on insects, and have talked about them with my previous supervisor. He said they were great. But considering setting up and performing this kind of basic research will take very long time, I am not sure whether he will try it or not.

Additionally, I was also surprised that my home country China was one of the countries that had the most attendees coming to this conference. I have learnt some popular research topics in China. I am very happy to see the diversity of their research field, and glad to know that some of them are related to my study. I also have chatted with some of the groups, and have been invited to their online group chat app.

Overall, the conference was well organised and very successful, and I was really enjoying it. My presentation went very well this time, at it has improved my presentation skills and made me feel more confident about myself. I also have exchanged my contact details with some of the researchers, and hopefully we can get in touch sometime. For the research, I think the topic I am working on is still in an early stage, but has attracted some interests, and I feel more confident about the advantages of my work. Also, attending this international conference has broaden my horizon about biosensors. I was really surprised by the diversity of this field and different interesting ideas presented by the attendees. One thing I was disappointed about was that not much basic research (e.g. study and create different sensor components) have been presented in this conference, which reflected the fact that not many people were doing or interested in basic research. It may be because the basic research can take very long time and may turn out to be 'useless' in the end. However, basic research is still very important, and it was the foundation of most of the studies presented here. I hope the universities or research institutes, and the conference organisers could let more people know the importance of the basic research, and encourage more people to do it in the future.

After returning to my lab at the University of Edinburgh, I have provided feedbacks to the rest of my lab team and encouraged them to apply for the next Biosensors conference. Also, I have continued my work and optimised further of my biosensors. Thanks to James Rennie Bequest for the financial support, which allowed me to go to Sweden for the conference. Also, thanks to my supervisors and other lab members for supporting me and my project.