

Report on MERIT Overseas Dispatch Program

4th generation student of MERIT

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1. Abstract

Period: 1st June, 2018–1st August, 2018

Research institute: Nanyang Technological University (Singapore)

Supervisor: Prof. Yanli Zhao

Research project title: Development of new functional hybrid materials

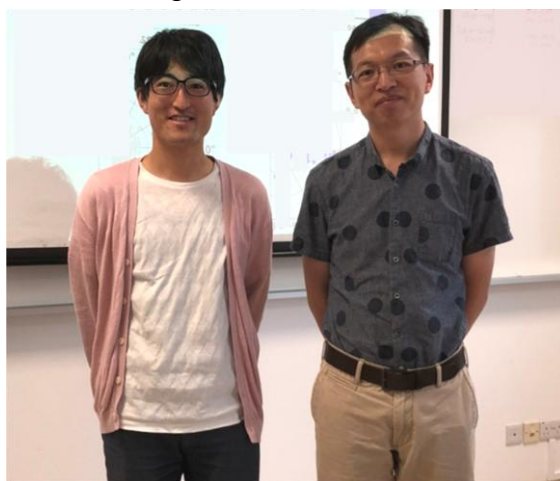
2. My background on application for this overseas dispatch program

I have studied materials chemistry to develop new materials under the guidance of my supervisor, Prof. Takashi Kato. I have also collaborated with Prof. Yuichi Ikuhara, who is my supervisor in MERIT program. We succeeded in developing novel liquid-crystalline nanomaterials based on the same materials as human bones and teeth (Nakayama, Kato et al. *Chem. Sci.* 2015; Nakayama, Kato, Ikuhara et al. *Nature Commun.* 2018). These materials are expected to be applied to biomedical fields because of the biocompatibility. In September 2017, Prof. Yanli Zhao (Nanyang Technological University) visited our group and gave us a lecture about his researches. Then I learned that Prof. Zhao group has reported significant papers in biomedical fields such as drug delivery by combining chemistry with biology. I had only focused on chemical researches until then, but I strongly desired to demonstrate biological functions of my materials inspired by his lecture. Afterwards, Prof. Kato introduced me to Prof. Yanli Zhao, so I obtained the opportunity to challenge biological researches in Prof. Zhao group through this program.

3. Research in Singapore

Before I left Japan, I discussed about our collaborative researches with Prof. Kato and Prof. Zhao, and then conceived two projects in which we can take advantage of characteristics of our nanomaterials. One project is to develop new nanocarriers for drug delivery by hybridizing drug molecules and our nanomaterials. The other project is to develop cell culture scaffolds based on

oriented films of our nanomaterials for control of cell growth. The experiments using cells for these projects demonstrated the biological functions and great potentials of our nanomaterials for use as biomaterials. We are now preparing for submission of papers and presentation in academic conference. In these collaborative researches, we do not just send materials to each other, but I actually joined their group, did cell experiments by myself and discussed about our researches daily, which gave me solid experiences of doing different fields of researches. This experience will broaden my perspectives, and help me to create new ideas and to challenge new fields in future,



Prof. Yanli Zhao (right) and me(left)

4. My life in Singapore

In Singapore there are different official languages but you can communicate with people in English in most cases. In addition, Singapore is a safe country so it is comfortable for me to live in Singapore. You can visit eateries called Hawker Center, where I enjoyed various kinds of reasonable local foods including Chinese, Indian and Malaysian cuisine. From the view point of sightseeing, you can visit modern city areas while you can also feel the nature in tropical areas. It is very interesting for me to learn arts, culture and history in National Gallery Singapore and to watch animals in Night safari. Most of all, it was so fun to communicate with group members. They are all very friendly. Wei Qi and Fiona often took me to various spots and shops in Singapore, which has become wonderful memories for me.



Dinner with group members at Hawker Center in Chinatown

5. Acknowledgements

I really thank Prof. Yanli Zhao and his group members for accepting me and giving me helpful advices. I also appreciate Prof. Takashi Kato for his great support. I am grateful to MERIT office for the assistance.