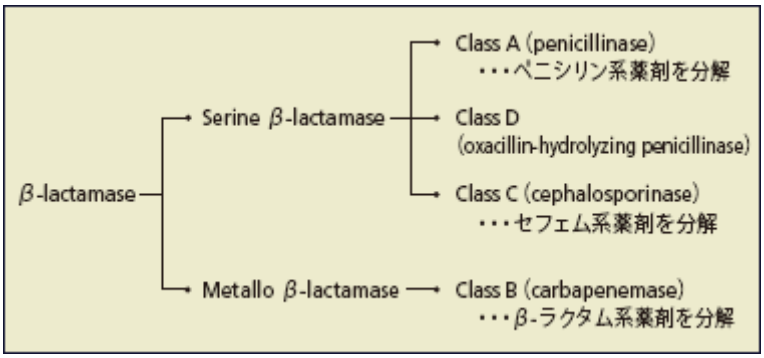
Research Internship In Airlangga University (Indonesia)

Kobe University School of Medicine Faculty of Health Sciences
Sadakuni Mami

[My main study]

I have attended the program of Re-Inventing Japan Project, and I have studied in the Institute of Tropical Disease(ITD), Airlangga University, Surabaya, Indonesia between 28 July and 23 August. I visited Indonesia to detect the CREs (Carbapenem-Resistant Entetobacteriaceae) and to decide the gene type of CRE.

CREs are drug-resistant bacteria which are taken up as a subject for discussion all over the world now. In Japan, the law of infectious diseases was revised in 2014, and the infectious disease related to CREs came to be known as one of the dangerous infectious diseases. The genus *Esherichia* like *Esherichia coli* (*E.coli*), the genus *Klebsiella* like *Klebsilla pneumoniae* (*K. pneumoniae*), the genus *Serratia,* the genus *Shigella*, the genus *Salmonella* and so on belong to the family Enterobacteriaceae. There are many antibacterial agents in the world, but bacteria have shown resistance against the drugs in several ways. One of the drug-resistant mechanisms is production of β-lactamase. β-lactamase is a breakdown enzyme, and it breaks up the antibacterial agents which can block composition of the bacterium`s cell wall. Carbapenemase is a kind of the β-lactamase, and it can show resistance not only carbapenem antibiotic(Imipenem, Meropenem etc) but also other β-lactam antibiotic(penicillin, cephem antibiotic etc). CREs have carbapenemase, so many medicine do not work for them and they are paid attention all over the world.

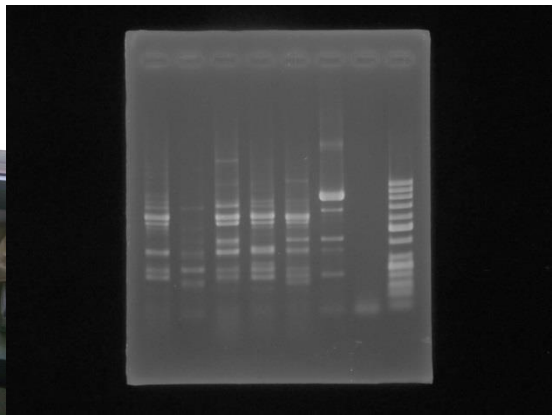


Picture 1. The classification of β-lactamase

I have studied CREs at the Gastroenteritis/Salmonellosis Laboratory in Airlangga University. I have used urine and stools sent from Sutomo hospital or those stored in the University. In the laboratory, I experienced the gram stain and cultured in the several test medium to isolate the bacteria or to judge species of bacteria. After that, I performed drug susceptibility using some drug disks. I actually used 2 stool samples and 4 urine samples, but I could not find Enterobacteriaceae. I found only *Staphylococcus aureus*.

There were 29 strains isolated as carbapenem resistant *E. coli* or *K. pneumoniae* in the laboratory. So I also tried to perform the DNA extraction from all strains and to decide the gene type of them. I was able to extract the DNA from all strains, but I used 5 stains and did PCR by using 2 kinds of primers (for IMP1, KPC) because a PCR machine had broken down or there were different reagents from ones which I had used in Japan and because of lack of samples. When I used primers for IMP1, I could not decide the gene type because I was not able to extract the positive control. Using primers for KPC, I was not able to find the same type as positive control.

Picture 2. In the laboratory



Picture 3.the result of PCR (for KPC)

[Others]

・Experience in Avian Influenza Laboratory

ITD studies many diseases. There are some laboratories which connect with Kobe University and there are Japanese teachers in some laboratories. In Avian Influenza Laboratory, there are 2 Japanese teachers. I had a tour of the laboratory in the research facility for a day, on 18 August. I learned the real-time PCR, and I actually looked at the

chart of PCR. I also helped them with Hemagglutination (HA) test or Hemagglutination inhibition (HI) test and observed the results. They performed HA test to check the titer of the flu virus, and did HI test to research titer of the antigens against flu virus. I was also able to enter the biosafety lebel (BSL) 3 room where the members of the laboratory have used dangerous virus like H5N1-avian influenza virus. There was a front room in front of main room, and double-entry doors which I could not open both from inner side and from outer side. When they did something there, they had to wear protective clothing. I was surprised at the nice facilities.

・A tour of Sutomo hospital

Sutomo hospital is located in Surabaya, Indonesia to the east of Java. It is a state hospital and has about 1500 beds .It is the largest hospital in Surabaya. It cooperates with Airlangga University, and staff of the University examines samples from Sutomo hospital. I had a tour of the hospital on 5 August. There were some stands in front of the entrance and the hospital had a shop at the center of the entrance of the hospital. There were many patients in the entrance. The hospital was larger and kept cleaner than I expected it. In Japan there were more male doctors, but there are many women in the hospital. I was surprised at it. There were no air conditioners at corridors of the hospital, and some corridors were not covered with walls. I thought that it was hard for patients to go along there on a hot day and a rainy day.

・Experiences on holidays or memories in the everyday life

I had dinner with members of the university and we went there by taxi or by bike. They took me to the karaoke. I went shopping mall near the University to do shopping and to eat lunch or dinner on holidays. I also went to the zoo in Maran with ITD`s members and saw the sights of Surabaya by sightseeing bus. I had a lot of experiences as well as study about bacteria in Indonesia. In Japan, I had never ridden a moped motorcycle. There were many people who rode a moped motorcycle in two or more in Indonesia and I was able to really experience 2-crew.In Surabaya, most people have believed in Islam, so I did not eat pork. I often ate chicken, turkey, beef and seafood. I usually went lunch or dinner with Indonesian. They taught me the food and I had a meal while enjoying conversation.

Picture 4. Nasi Gudeg

Picture 5. A one day tour bas in Surabaya

[Conclusion]

Through this studying abroad program, it was most difficult thing for me to communicate with Indonesian. In the days of the beginning, I could not hear the content that the partner said and it was hard for me to say technical terms in English because I knew only easy words. When I was asked to translate a manual written in Japanese into English, I made a great effort while remembering the word that I knew. Almost all the people spoke Indonesian language at the place except the university, so I could hardly understand what they said. If I go to Indonesia again, it may be important to learn Indonesian language before I go there. Through this studying abroad program, I could improve abilities to listen or to speak English and got stronger mentally as well as could gain knowledge of the research field.

I had never been abroad by myself, and had never been to Indonesia, which were a developing country. I was afraid whether I could spend a month there. However, Indonesian people were peaceful and very kind, so I could have many pleasant and precious experiences there. One month passed in an instant. My study did not advance as expected because of brief period, different facilities and reagent. I am going to continue a similar study in the graduate school and want to make good use of this experience.

Finally, this program made me grow and I could have many precious experiences. I thanks for that I was able to have such an opportunity. I want to make this experience useful for my work in the future.

Picture 6. With teacher (center) and staff (lower left) of the Laboratory and students from other university in Surabaya (right 3persons)

Thanks for everyone concerned of Airlangga University and Kobe University, and everyone who supported me for this program.