Joining in re-inventing Japan project

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My research project is “Study on the antiviral activity of natural compounds against dengue virus (DENV).” I have been involved in the research since 4th bachelor’s degree. DENV infects 50-100million people annually. Infection of the virus causes symptoms such as headache, fever and erythema and death in a severe case. Recently, the incidence of DENV infection has grown dramatically and over 40% of the world’s populations are now considered to be at risk for DENV infection. In Japan, the incidence of DENV infection is mostly imported cases and the number has grown. In addition, more than 150 cases of local infection of dengue virus have been confirmed on August to October in 2014. Epidemic areas of DENV are tropical and subtropical regions, including Indonesia. In Indonesia, it is estimated that DENV infects about 150 thousand people annually. However, no approved vaccine and specific drug against DENV are available. There are abundant medical plants in Indonesia and they have a potential to be novel drugs against DENV. An opportunity to study on DENV at the epidemic area may be beneficial for my future research carrier. Indonesia has a lot of islands and the population is over 230 million. They have many kinds of culture and language and their religions are different depending on the place where they live. I want to come in touch with Indonesian lives and cultures and communicate with people having different backgrounds. I think this experience must be useful in my school life and my future. This is a reason I joined this program.


L) Inside of ITD R) Dormitory and cafeteria

Institute of Tropical Disease was established as a tropical research station of Airlangga University in Surabaya, the capital city of East Java province in 1991. It is one of the best research stations in Indonesia, and there are many researchers who have various research backgrounds work together. The Indonesia-Kobe university base of Collaborative Research Center for Emerging and Reemerging Infectious Diseases (CRC-ERID) is established in this faculty. Researchers of Airlangga and Kobe Universities have conducted collaborative research projects on avian influenza virus and hepatitis C virus since 2007, and on infectious diarrheal diseases and DENV since 2008. I had a laboratory training in the DENV group for three months. The members are consisted by one Japanese and four Indonesian researchers, and they have seven research projects. 1) DENV isolation in Surabaya; they are collecting the serum of patients from a hospital in Surabaya and analyzing serotype and genotype of virus. They isolate virus from the serum, extract RNA and amplify viral DNA by RT-PCR. After that, they perform sequencing analysis to determine viral serotype and genotype. All these experiments can be carrried out at ITD. I observed these experiment and thought it is difficult to isolate a small amount of virus from the patients. 2) DENV isolation in other locations in Indonesia; they are collecting the serum of patients from other cities in Indonesia including Jakarta, Bali, Pontianak, Papua and so on. It is important to collect the epidemiologic data about DENV in Indonesia and use it to estimate DENV prevalence. In this time, I accompanied them to Pontianak and Kalimantan to collect the samples. We introduced our research projects and shared the information about DENV. 3) Full genomic sequence of DENV; they collaborate with National Institute of Infectious

Diseases (NIID) to collect the epidemiologic data about DENV because there is a few full sequence data of DENV in Indonesia. In Japan, I usually order these experiment to outsourcing but I could observe these experiment. 4) Generation of human monoclonal antibody; they generate human monoclonal antibody which has neutralizing activity from the serum of dengue patients in Indonesia. We can apply these antibodies to the diagnostic or therapeutic purpose. 5) Antibody-dependent enhancement (ADE) activity of serum; they survey ADE activity of DENV by using the serum of the patients. It remains unknown the mechanism of this activity and these experiments may be useful to know it. I could learn about the role of antibody through these experiments. 6) Analyzing anti-DENV activity of medical plants in Indonesia; they analyze anti-DENV activity of crude extracts from medical plants. I could share our knowledge about this experiment with ITD researchers. It is useful to research my research projects in Japan. 7) Vector control study; they study the mosquito, which is a vector of DENV, to prevent DENV infection. There is a water tank in Indonesian house and the mosquito larvae live there. They try to prevent them growing up as putting some stuffs in a water tank. They did the experiment in the laboratory and fields. In the laboratory, we could confirm the affect of the stuff against the mosquito larvae. On the other hand, in fields, we couldn't confirm because of facing many difficulties. I felt the difficulties in the difference between laboratory and field experiments.

L) Laboratory training R) Mosquito larvae

I participated in some lectures held in ITD. In Biosafety Level Laboratory 3 (BSL-3) lecture, I learned how to use the virus, the equipment of laboratory

and the faculty in order to manage the safety of researchers and the environment outside faculty. ITD invited some researchers from UK and Portugal and they gave lectures on their researches and universities. In addition, I could participate in the meeting of CRC-ERID and know activities of other research groups. In the last week of my stay, I gave a presentation on my research outcomes to ITD members. Through these experiences, I learned what kind of slides for presentation should indicate to other people and how to explain my opinion in English.

L) BSL-3 lecture R) Jungle in east of Jawa

I also joined another activity in Indonesia. I visited a factory of Yakult in Surabaya. I could know how they make and sell their products in Indonesia. I watched the Japanese play performed by the students of Japanese humanism faculty in Airlangga University. It was interesting and I was surprised at the high quality of their Japanese speaking. I have stayed with students of veterinary medicine at a jungle in east Java. I went bird-watching and trekking in there. I could see many wild animals and plants. I had a valuable experience.

In Indonesian life, I have many friends and spent a lot of time with them. We went to the cigarette factory, mangrove, sightseeing of Surabaya, beach, amusement park and so on. We ate special Indonesian dishes such as Nasi Goreng, Rawan and Sate. I could be exposed Indonesian culture, nature and city life and spend a good time with kindly and cheerful Indonesian people.

I learned many things through involving many kinds of experiment not only in my own project and communicating with various researchers. In addition, I have been stimulated by many activities such as lectures, meetings and

presentation. I feel that I need to progress my English ability because it is not enough to communicate with other people in English. And I need to learn about DENV much more. Joining this program gave me many great opportunities to spend with great people in great faculties. I would like to use this experience in my school life and my future carrier.

L) A meal of Indonesian R) A picture with friends in the beech

I would like to appreciate all the people involved this program.