Report on completion of the short-stay study abroad program

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The goal of Population Genomics Group is to understand the evolutionary dynamics of genomes at population level using computational approaches and to bridge evolutionary history and genomic medicine. They are focusing on analysis of genetic structure, inference of human genetic history, detection of natural selection, mapping genes underlying complex diseases in human populations, and identifying the differentially expressed genes among populations. And recently they started a new study which is allele-allele interaction and gene-gene interaction in recent admixed populations. Their main interests are some ethnic groups in China, especially population from northwest China, like Uyghur, Tajik, Tibetan and so on.

I am a second year student and I am interested in human population study in general. During the first two years of my study I mainly focused on the ancient DNA analysis of the Sakhalin Ainu in Japan. And for following study, I am very interested in the Xinjiang Uyghur population in China. Professor Shuhua Xu in PGG is an expert in this topic in China. His group has been working on the different ethnic groups in China including Uighurs and they have many available data of Uyghur population. So I think this is a great opportunity for me to stay in Professor Xu’s lab.

With this perspective, I applied the short stay aboard program of SOKENDAI. And I got 229,320Yen for this short visit. And after discussing with my professor and hosting professor. I arranged the short stay from February 15th- 29th. During my stay, the hosting professor kindly gave me a chance to join their research group and participate in a major research program on Genome Wide Population Structure Analysis and Population
History of Uygur. Students in Professor Xu’s lab introduced me their study and current progress. With the decreasing of NGS sequencing cost, they could obtain more sequences from each population, which sufficiently helped them to get more information about the population they are interesting in. The main work flow of their group is, first through collaboration to get some DNA from local people, then send those samples to sequencing company. For different purposes of their studies, they will choose different sequencing parameters. After obtaining the raw data, they will use different approaches, like software to analyze the raw data. The main analysis they are doing in Professor Xu’s lab are genetic history, detection of natural selection in admixed populations. They shared their newly obtained results from the whole genome sequencing data of 92 Uyghur population with me. This results gave us more information about Uyghur people which they could not get from genome typing data of their previous studies. During the stay, I also discussed my currently data analysis of Sakhalin Ainu with some students in Professor Xu’s lab. I received many very nice suggestions from students there also, which I believe will be useful for my study.

And in the last days of my stays, we also discussed about the possible collaborations with Professor Xu’s group in the near future.

And the language we used in discussion is mainly Chinese, but I got to know that in PGG, the poster presentation they will have to use English like NIG. Professor Xu’s lab is dry lab, all of them they are doing pure computational analysis, the experiments like extracting DNA, sequencing will be performed by some companies. And students in this lab, most of them are using Python and Perl to write some scripts which are needed in data analysis.

The short visit to Professor Xu’s lab helped me a lot in understanding the current progress of the Uyghur population study which I am interested in for my following study. And through the discussions I also learned some new methods and strategies in data analysis that benefit my current study of the whole genome data analysis of Sakhalin Ainu. I am
very grateful to SOKENDAI to provide such a great chance for students. This research program is significant for students’ studies. And I also would like to thank my academic supervisor, Professor Naruya Saitou for his supports throughout my study, and last but not the least I would like to thank Professor Xu's in PGG for his kind host and great suggestions.

Attached pictures: