Report of The Biophysical Society’s 58th Annual Meeting and the visiting laboratory of Stanford University and University of California, San Francisco

派遣先 Moscone Convention Center, San Francisco, California
Stanford University, Dr. Alex Dunn’s Lab
University of California, San Francisco, Dr. Dyche Mullins Lab
I attended The Biophysical Society’s 58th Annual Meeting held in San Francisco, California and visited Stanford University and University of California, San Francisco during February 14th to 23th. It was the fourth to attend the annual meeting of the biophysical society, and second to oral presentation.

The annual meeting of the biophysical society is the largest meeting of biophysicists. Many biophysicists, more than 6,500 participants, around the world gathered this meeting. In the annual meeting, I attend many workshops, mini-symposia, platform sessions and poster presentations. I collected a lot of cutting edge researches.

In February 16th, I presented my resent work in platform session, titled “Evaluating Intracellular Crowded with a Glycine-Inserted Mutant Fluorescent Protein.”

A cell is filled with a lot of proteins, rather than water molecules. In other words, proteins are crowded inside a cell. Protein-crowding affects protein-protein interaction, stability of protein folding, enzymatic activity, and so on. The condition in vitro where biochemical assay is conducted is much different from that in cells. Now it is thought that protein-crowding is one of important factors in cellular events. In the past, the diffusion coefficient of a chemical probe has been used as an evaluation index of the intracellular crowded condition. However, crowding depends not only on the mobility, but also the density of the crowding agents. We have succeeded in making a yellow fluorescent protein (YFP) that senses crowding density via hydrophobicity by inserting into the YFP a glycine and conjugating it to cyan fluorescent protein (CFP), which is insensitive to Förster resonance energy transfer (FRET) probe. This probe has been named GimRET (Glycine inserted mutant FRET probe).

Last year, I presented how to develop the GimRET in platform session. In this time, I presented the mechanism of detecting the protein crowding of GimRET, and demonstration of observing the protein crowding inside cells of GimRET.

After my presentation, I got some technical questions. I could answer almost all questions, but not a few. One question is “Does the sensitivity of GimRET for protein crowding depend on the size of proteins?” I always used
BSA for calibration agent of protein crowding and I did not think such a thing. So, I did not change the size of proteins. After the trip, I did the experiment.

In the meeting I listened many platform and poster sessions. Mainly I attend the imaging technique session and biosensor. Some famous groups presented their new methods and proves. And I noticed that many researchers used super-resolution technique. Using optical microscope, the spatial resolution is 200 nm because of property of light. During these 10 years, some researchers combined detection system with analysis and achieved less than 200 nm of spatial resolution, which technique called super-resolution technique. The first time of my attending the meeting, super-resolution technique was special method and the data was very rare. But now, many researchers used the technique like microscope. I think I saw the progress of technique.

After the meeting, I visited Dr. Alex Dunn's Lab in Stanford University. Dr. Alex Dunn is a famous biophysicist and specializes in not only biology but also chemistry and physics. I presented my resent work and debated it. I get some good idea for investigating the property of GimRET. And one of his students was studying fluorescent protein, we discuss how to make a good mutant of fluorescent protein more efficiently.

Next day I visited Dr. Dyche Mullins Lab in University of California, San Francisco. Dr. Dyche Mullins is a young but very good molecular biologist. His lab is mainly searching relationship between the cell migration and actin binding proteins. He gave me some good advice about the way of use of GimRET. Now I prepare the next experiment.

This trip was a good opportunity for trying my communication skill of English and discussing my recent work with researchers of other fields. I spent a wonderful time in San Francisco. At last, I want to show my appreciation for financial support from the TAKUETSU support program.