

# Report on Biophysical Society 58<sup>th</sup> Annual Meeting and Visiting Two Laboratories

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Destinations :

Biophysical Society's 58th Annual Meeting (Moscone Center, San Francisco)

Dr. Alex Dunn lab (Stanford University)

Dr. Dyche Mullins lab (University of California, San Francisco)

From February 15 – 23, I visited San Francisco, California to attend the Biophysical Society's 58<sup>th</sup> Annual Meeting, held on February 15-18, where I gave a poster presentation of my recent work. I also collected the latest information in my research field. For the rest of my stay, I visited two laboratories; one in Stanford University, and another in the University of California, San Francisco (UCSF), to discuss about my recent research works.

The Biophysical Society's 58<sup>th</sup> Annual Meeting was held at the Moscone Centre, on Feb. 15 – 19, 2014. In the field of biophysics, this conference is the largest in the world, in size. The conference included talk sessions of a variety of numerous research themes. This year, there were many intriguing sessions such as “Cell Mechanics and Motility”, “Membrane Receptors and Signal Transduction”, “Mechanosensing in Eukaryotes”, and “Mechanobiology”. In particular, many researchers attended the “Mechanosensing and Mechanobiology” session. As this research field is relevant to my research theme, I myself, also enjoyed hearing about the current cutting-edge research that were introduced during this session.

On the last day of the conference, I gave my poster presentation entitled “Regulation for Phosphatidylinositol Lipid Signalling System by Talin”. Cellular motility is a basic cellular function that take part in various important physiological phenomena such as the immune response, wound healing, and embryogenesis. Motility is modulated by an adhesive system and the external stimulations that are transduced via receptor-mediated signalling systems, along with the actomyosin system that works as an internal force-generator. All of the above systems work collectively to form a united anterior-posterior polarity that ensures effective cell migration. In *Dictyostelium discoideum*, actin polymerization is induced by PI(3,4,5)P<sub>3</sub>-enriched domains on the cell membrane at the leading edge. This arise, in a self-organized manner from the chemotactic signalling system consisting of PI(3,4,5)P<sub>3</sub>-producing PI3Kinase and PI(3,4,5)P<sub>3</sub>-degrading PTEN. However, how the adhesive system is correlated to the Phosphatidyl Inositols (PtdIns) signalling system is unknown, which should be an essential mechanism in regulating cell migration. Our experimental data suggest that talin, a component of focal adhesion, affect the behaviour of the PtdIns system. Mutant cells lacking talin, by disruptions of talA and talB, demonstrated an enhancement of PI(3,4,5)P<sub>3</sub> domains forming on the cell membrane. Furthermore, we investigated PtdIns features in talin mutant cells. We examined the PI(3,4,5)P<sub>3</sub> response to an external stimulus and PI(3,4,5)P<sub>3</sub> localization in PI3K inhibitor applied cells.

During my poster presentation, four foreign researchers and two Japanese researchers came to see my poster. I was asked some technical questions such as details of the fluorescent probes I was using and my experimental conditions. They all seemed to be interested in my experimental data and stayed to listen for some time. I used this time to discuss my current work with them and was able to receive constructive suggestions for future work.

The following day (Feb. 20), I had the opportunity to give a talk of my research in a seminar held by Dr. Alex Dunn's lab in Stanford University. Dr. Alex Dunn is a specialist in the field of cell motility and motor proteins, and is currently working on cell adhesion and its regulating signal transduction system. During my presentation, there were some questions regarding experimental conditions and data analysis. Since my talk session was short (10-20 min), I needed to describe experimental information in detail, in my slides. A postdoc in Dunn lab was familiar with the PtdIns signalling in cell migration, so she and I were able to have a detailed discussion of my work. She asked me several significant questions and proposed a new experiment that I could do in the future: to observe the response of cells when the stimulus is removed and reintroduced from a different place (e.g. the opposite side). After the seminar, we all went to have lunch together at the university restaurant and continued our discussions on research and other matters.

The next day (Feb. 21), we visited Dr. Dyche Mullins lab in the University of California, San Francisco (UCSF) and had a tour of the lab and saw many things. I felt that there were some differences to laboratories in Japanese universities. In UCSF, different laboratories shared a common theme (e.g. actin binding protein) from which they varied differently in the specifics of their research (e.g. live cell imaging and in vitro assay) so they were a lot of interactions between laboratories. Thus differs to labs in Japanese universities there is nearly any interaction. Many researchers and students were working in the same room, sharing some of the equipment.

In this trip, many researchers showed an interest towards my work and provided me with good advices and nice ideas, which I feel will be a good influence on my future research work. I would like to thank this support program who gave me this opportunity to have such a memorable experience.