Joanna Sacharz. Queen Mary University of London

JSPS kindly funded my short-term fellowship to work at the University of Tokyo for three months in 2014.

Proposed project was related to my Ph.D. project and was aiming to expand a fairly new concept of *heterogeneity* in prokaryotic membranes. According to recent models, the eukaryotic membranes are regarded as highly organised structures rather than randomly passive solvents of amphipathic proteins and lipids (Lingwood *et al.*, 2009). Famous concept of *lipid rafts* has been studied for over 20 years and it became clear that these specialized areas are formed by specific lipids (sphingolipid and cholesterol), which enhance formation of highly dynamic nano-scale heterogeneity in the biological membranes. In my study visualised *in vivo* membrane proteins (Figure 1) (where chimeric fusions of fluorescence protein was employed) in prokaryote revealed that their distributions are not even in the membrane, but their localisation is dedicated into specific clusters within them (Sacharz, *et al.*, 2014 in press). FtsH proteases, studied here, play important roles in degradation of misfolded and unfunctional proteins and even in certain condition when the degredation is at its maximum these proteases remain immobile and visible within membrane patches (clusters). This may suggest that by showing such proteases clusters we may be observing specialised membrane areas where protein degradation happens in prokaryotic cells. In my study I have optimised a biochemical approach for isolation of membrane fragments, which then allowed for identification of proteins associated with these proposed visible *repair centres*. However in order to confirm that work was performed on membrane not just random protein complexes, lipid analysis was essential for this project. Prof Hajime Wada and his laboratory was the best place to conduct this study. Prof Wada's expertise compromises lipid analysis in both prokaryotic and eukaryotic organisms. His kind help as well as collaboration with members of his group gave me a great opportunity to master lipid work and obtain interesting results which support the emerging hypothesis of membrane *heterogeneity* in prokaryote. We also established very specific lipid composition within these membrane structures shedding more light on membrane topology and segregation. On the side, Prof Wada encouraged and supported me in conducting an extra project. The outcome of this project will potentially be revealed in press in near future.

Overall my work in Japan was a life experience. Kindness, open attitude and support of Prof Wada and his group members made my stay amazing and unforgettable. This fairly short period in Japan made me plan for the future to to find a longer term job and spend more years in this beautiful country surrounded its kindest residents.

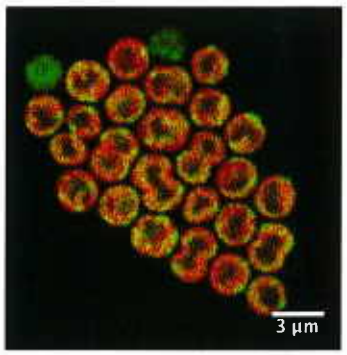

Figure 1. Dedicated protease localisation in prokaryotic membranes. Red – chlorophyll fluorescence, green – Green Fluorescent Protein (Sacharz, *et al.*, 2014 in press).

Photos from my stay:

As dear Sensei Wada said to me on several occasions during my stay at University of Tokyo*: We Japanese, we are open to accept almost anything*. That's most probably true, however we must always remember we are guest in Japan and we should be kind and polite.
Some small tips for fellows who are going to work in Japan from me: *be yourself but try to adapt to Japanese customs, show your interest in Japanese culture, tradition, language and cuisine. Try to make friends (it is easy!) and if you feel it is necessity, be the first to gently suggest activities. Don't be shy or afraid to ask questions (at work or outside), similarly in your response be straightforward but not rude. Be prepared to be patient, more patient.*
Travel and explore Japan, it is easy, save and very exciting (always remember to bring back some Omiyage even if your trip is an hour away).

On the side what not to do *I would keep radical opinions to myself, it is always easy to offend somebody (anywhere in the world) when discussing difficult issues. Try to look neat and not to be too loud when in public.*