JAMES RENNIE BEQUEST

REPORT ON EXPEDITION / PROJECT / CONFERENCE

Expedition/Project/ Conference Title: Seeing is believing: imaging the molecular processes of life

Travel Dates: 03-10-23 / 07-10-23

Location: Heidelberg, Germany

Group member(s): Dominika Kwecka

Aims: Explore the world of imaging from different perspectives.

Photography consent form attached: *(please refer to your award letter)*

☐ Yes
☐ No

OUTCOME (a minimum of 500 words):-

The Seeing is believing conference took place in Heidelberg, Germany at the beginning of October. This symposium brought together people related to imaging from a myriad of areas ranging from microscope and algorithm development, through to imaging of whole organs and tissues.

The conference was divided into multiple sessions with my favourite two being “Imaging structure and function of single molecules in situ” and “Tissue and organoid imaging”. In the former, I discovered new ways of microscopy including imaging of a single virus replicating within the cell and spreading to neighbouring cells, and imaging of mRNA translation by single molecule tracking. My favourite talk described in detail the formation and symmetry of the nuclear pore complex imaged using cryo-electron microscopy. This is a technique that I had not employed but was familiar with, and it was exciting to hear in detail how it works and how it can be used to gain a better understanding of the molecular architecture of complexes within the cell. In the second session, a talk that was directly related to me involved the design of biomolecular sensors to study the activity of kinases. This talk was highly interesting because it described the generation of a sensor to measure the activity of Protein Kinase A (PKA) in mammalian cells, which is the protein I work on in malaria parasites. Until then I had not considered using such a biochemical approach to study a kinase, so it was exciting to learn about new approaches that could be used to study a signalling pathway.

In the conference I was invited to give a flash talk about my research focusing on using expansion microscopy (a super resolution imaging technique) to study the role of PKA during transmission of malaria parasites. This was a great opportunity to gather interest in my field of work and many scientists passed later on by my poster to ask questions and give advice. This was very useful as until then I had only attended conferences about parasitology or malaria specific, so having to explain my research to a non-expert audience was a great exercise. As the majority of scientists that attended the symposium worked on mammalian cells as opposed to singled cell parasites, I gained new insights into proteins that serve a similar role to the protein I study but in a different organism. This was also very helpful when writing my thesis as it broadened my field of research.

Aside from talks, there were over 300 poster presentations. I found very interesting talking to other scientists using expansion microscopy to hear their experiences with the technique as

well as advice. One poster was focused on a making this technique more quantitative by measuring exactly the level of expansion that had taken place, and another poster explored the composition of vesicle, which was made achievable by employing this technique.

Overall, the conference was very useful to understand the broad applicability of imaging within extremely different fields of biology, from single molecules of mRNA or receptors on a vesicle, to imaging whole zebra fish through their development and tracking each cell lineage. I really enjoyed this conference and I am very grateful to the James Rennie Bequest committee for the support I received to attend the meeting.