6 month in Melbourne, Australia

Development of a workflow for targeted subcellular omics
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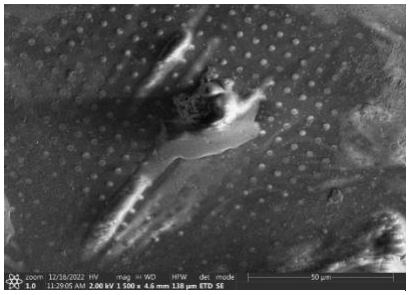
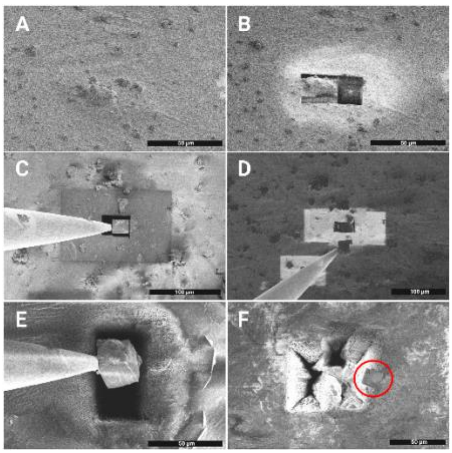
Going abroad not only offers the opportunity for great scientific experiences but also allows you to travel. You will see the most amazing places and meet the most amazing people!

For my project, we developed a method to target and isolate subcellular regions of a cell (right Figure 1). These subcellular regions can be used for various downstream experiments such as proteomics and transcriptomics. We used a cryo-Focused Ion Beam Scanning Electron Microscope (cryo-FIB/SEM). Usually, the FIB is used to thin biological samples to then perform cryo-Electron Tomography (cryo-ET). This allows for the acquisition of 3D high resolution images of the native cellular architecture.



1 HeLa cell on a cryo-EM grid



2 Process of lift-out

However, for our purpose we used the correlative cryo-FIB/SEM (with an integrated light microscope!) to isolate/cut single cells or subcellular regions and then perform lift-out. This is a process where we lift the isolated regions with a small needle and deposit the sample in a suitable buffer solution (left Figure E & F). Moreover, we were then able to detect RNA of subcellular regions (a quarter of a cell!) through RT-qPCR. Such results will pave the way for targeting, isolating, and analysing subcellular regions in their native state.

I am immensely grateful to have had this opportunity! The support from the institutes was fantastic, I want to say a big thank you! Also, Alex is a great PI who helped getting me down under and it was very pleasant working with the people from the group. Melbourne is an amazing city to live in. If I can give a tip to anyone who wants to travel Australia: get yourself a car! The Visa class 408 is phenomenal and traveling the east coast is highly recommended!