

## **Expedition Fund Report – Multiple Sclerosis research in Hamburg, Germany**

I was grateful to receive an award from the expeditions fund as it helped me to travel to Hamburg, Germany and spend one month working closely with a Postdoc in a multiple sclerosis research laboratory. This was a great opportunity because of my interests in neurology and in getting an insight into the work that goes on around medical research.

I volunteered at the Institute of Neuroimmunology and Multiple Sclerosis (INIMS) which is part of the University Medical Centre Hamburg-Eppendorf (UKE), a teaching hospital and associated research groups. The hospital there is a world class centre for multiple sclerosis (MS) treatment and research, and the large number of patients they care for creates a big pool which can provide samples for research. The research group I worked with specialised in stimulating immune cells and measuring the production of various cytokines using flow cytometry, comparing cells from MS patients with healthy individuals. The aim was to try and identify the major cellular contributors to the inflammatory process seen in MS, with the ultimate goal of determining the disease pathology and targets for new treatments.

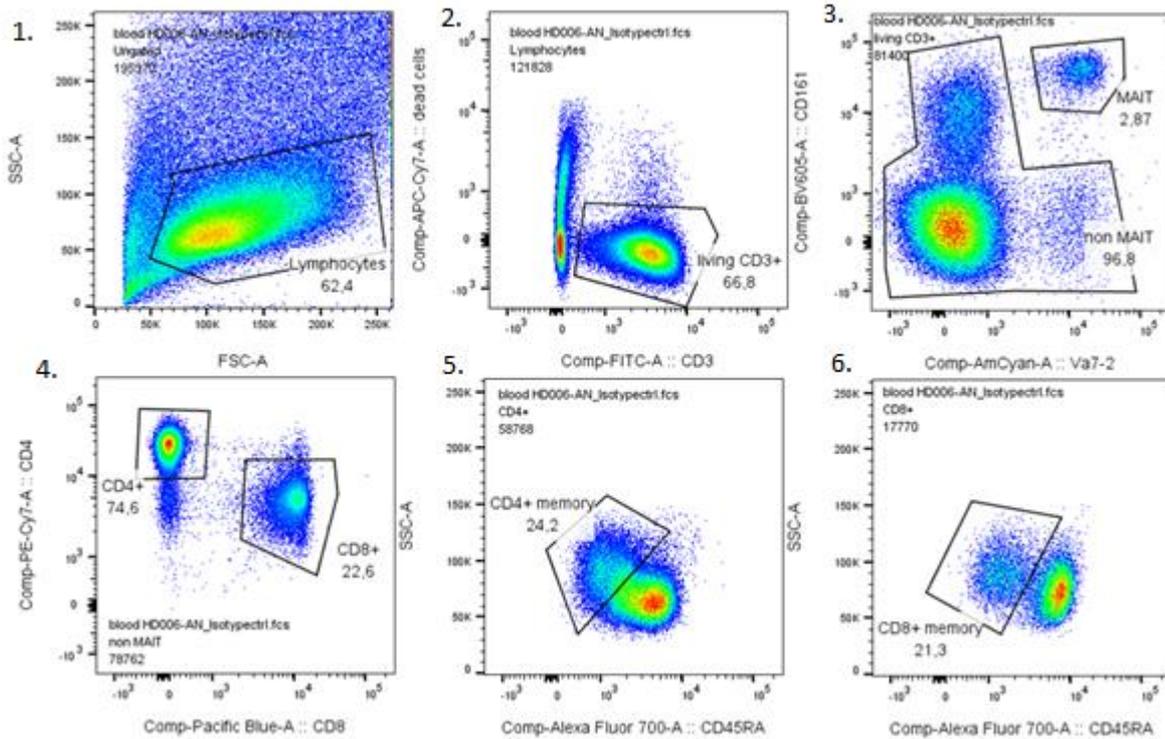
Working closely with a postdoc, I was taught the principles of flow cytometry and how to process samples through the machine and interpret the results. I was also taught how to determine the optimum concentration for use of each new antibody the lab received.

In this context, flow cytometry works by passing individual cells through laser beams of various wavelengths. The forward and sideways scatter of the beam as a cell passes through indicates the size and granularity of the cell, respectively. By staining samples with fluorescently marked antibodies for various proteins (e.g. surface receptors), and applying gating to the results, this technique can be used to sort the signals into cell type and to examine the level of cytokines produced by the cells of interest.

The figure below shows an example of flow cytometry data and how gating is applied to isolate subsets of cells. Initially by looking at the forward scatter (x axis) and sideways scatter (y axis) (1) the lymphocyte population can be identified. Then by comparing signals from various antibody stains, populations of subsets of cells within the initial lymphocyte population can be identified.

The lab also specialised in biobanking and genetic analysis of blood and tissue samples. I assisted with all steps in this process, from the collection of the sample, to the processing and isolation of the desired cell type from the blood and its storage. The samples were also genetically analysed by a separate team so that this information would be readily available to the researchers during future experiments.

On one occasion I was able to attend a multiple sclerosis clinic within the hospital. It was very interesting to be able to see the difference between another country's healthcare system and our own. The doctor was very helpful in explaining a great number of things, and in speaking to and examining patients at different stages of their MS diagnosis.



I stayed in the district of Altona in Hamburg which was a short walk from the river Elbe and an easy bus ride to the laboratory. The picture below is the view from the Altonaer Balkon overlooking the shipping port. It was fascinating to see this in action at all times of day and night. The picture shows the huge cranes used to load containers onto ships, and the silver tankers for fuel storage. It resembled some kind of futuristic city scape, especially when lit up at night. I worked hard during the weekdays but was also able to enjoy exploring this beautiful city during my time off. Overall I enjoyed my time there greatly and strongly recommend Hamburg as a place to visit to anyone. I hope to return in the future and am thankful that I was able to experience living and working there for a short time over summer.

