

Work visit at the Weizmann Institute of Science (Israel) by Theo van den Broek

Many e-mails had been sent back and forth between the people responsible at the Weizmann Institute of Science and us. Discussing the shipment of the selected samples, but also practical issues such as housing and transport. A date was set and the countdown to spend a 2-3 month work-visit at one of the most prestige research institutes in the world had started. Unfortunately, days before my departure, missiles directed towards Jerusalem en Tel Aviv were fired from the Gaza. The initially set safety zone of 40km around the Gaza, was expanded to around 70km. This included the city Rehovot (south of Tel Aviv) where the Weizmann Institute is located. After a bus bombing a day before my departure in Tel Aviv both the professor in Israel and I decided that we should postpone my visit. A week after these dreadful events the professor and I thought it was again safe for me to start my work-visit at the Institute.

When I arrived at the gate of the Institute I was welcomed by the professor of the laboratory and he brought me to the apartment for visiting scientists on the Institute. The whole Weizmann Institute of Science consists of many different buildings consisting of many laboratories and encompass all the different field of science studies. Including, mathematics, computer science, physics, chemistry, biological chemistry and biology. In 2011, the magazine *'The Scientist'* rated the Weizmann Institute as the best place in the world to work in academia among non-US institutions. I was of course very excited to start my work-visit here.

My research project was focused on the T cell reconstitution and dynamics seen after neonatal thymectomy. Due to a specific cardiac surgery procedure at young age the cardiac surgeon is necessitated to remove the thymus to obtain an unrestricted view of the heart. As a results of the thymectomy and the loss of new T cell production several immunological consequences have been documented, but no severe clinical consequences. Many concerns encompass the premature aging of the immune system, immunosenescence, as seen in the elderly. In addition, in a minority of children auto-antibodies were documented. It is known that T cell lymphopenia is associated with autoimmunity and that this might be due to compensatory T cell proliferation via self-antigen recognition. We were curious to see if we could detect changes in the development of the autoantibody repertoire after neonatal thymectomy in children. Professor I.R. Cohen has invented an unique technique to investigate and measure the natural and pathological antibody repertoire. With small amounts of for instance plasma, (auto) reactivity can be tested to many different antigens. With this technique he has shown that each newborn child starts with a repertoire of natural autoantibodies and that this is similar to each child. The developing reactivity pattern in later life is a dependent on the environmental influences each individual encounters. We tested around 900 antigen reactivities in plasma of neonatally thymectomized individuals. During my work-visit, I was taught the understanding of the technique, but most importantly the required data-analysis techniques required to analyze and interpret the data. At the same time I was involved in the labmeetings and other scientific meetings in the Institute. Preliminary results now show that individuals thymectomized at neonatal age have a clear change in their natural autoantibody repertoire in comparison to healthy controls. What the cause and consequences are of this changed natural autoantibody repertoire is the current focus of the project.

During my work-visit at the Weizmann Institute I did not only learn many new things in and outside of my field of research, but I also had time to explore and enjoy Israel. The country has many beautiful and historical places to visit and I tried to see as many as I could. During this 2-month work-visit I was able to set up a good collaboration with the group of prof. I.R. Cohen, and I immensely enhanced my perspective on immunological research via several private discussions with prof. I.R. Cohen. In addition, I gained a great experience of working, living and traveling in Israel and fully understand why *'The Scientist'* had the Institute very highly rated.