

# JAMES RENNIE BEQUEST

## REPORT ON EXPEDITION/PROJECT/CONFERENCE

**Expedition/Project/Conference Title: European Network of Immunology Institutes Summer School** .....

**Travel Dates: 17 - 24 May 2009** .....

**Location: Capo Caccia, Sardinia**.....

**Group Member(s): Catriona Prendergast** .....

**Aims:** Presentation of my PhD data in the form of a poster and attending lectures from numerous guest speakers .....

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### OUTCOME (not less than 300 words):-

The European Network of Immunology Institutes (ENII) was founded in 1986 and now has 38 immunology institutes from across Europe as members. It aims to improve the quality of European education in Immunology as well as improving the level of research in immunology. The ENII achieves this by organising conferences, schools for PhD students and young post-docs, and by encouraging exchanges across the European Network. This year the 4<sup>th</sup> ENII-MUGEN sponsored summer school took place in the very picturesque Capo Caccia, Sardinia from 17<sup>th</sup>- 24<sup>th</sup> May.

The school was attended this year by around 130 delegates, mostly PhD students and a few early post-docs, all from around Europe and some from as far as Australia, Singapore and the US. The days were mainly organised into lectures from the guest speakers in the morning, and the afternoon/evening sessions involved a selection of short student talks and a tutorial sessions run by the guest speakers of the day. The tutorial sessions were informal –taking place either in the lecture auditorium or outside in the bright sunshine. They were very useful for asking the lecturers specific questions about their work, or how their work related to our own research. The poster sessions ran every evening after dinner and gave the delegates the opportunity to present and discuss their data with the guest lecturers as well as our peers. These sessions tended to be quite intense and ran until midnight every night!

I found the lectures from the guest speakers very interesting. Although some were not directly in my PhD subject area this gave a very good opportunity to learn about various aspects of immunology that I had not touched on before to increase my background knowledge. My PhD focuses on two T helper cell subsets, the Th1 and Th17 cells, and their role in autoimmune disease of the central nervous system (CNS). Having come from a background in Biochemistry I have had a steep learning curve of immunology in my PhD, so the summer school helped to increase this foundation.

On the first day the talks included ones from Reina Mebius and Michael Sixt. Reina Mebius spoke about the organogenesis of the immune system which I found fascinating. She focused on how lymph nodes are formed through the interactions between lymphoid tissue inducer (LTi) cells and stromal cells and how these interactions attract further cells which accumulate, and, over time result

in the formation of the lymph node. This was interesting also as LT<sub>i</sub> cells produce IL-17 (the signature cytokine of Th17 cells) and have been found to have a role in the lesions of chronic inflammatory disorders. These cells, therefore, may also prove to have a role in the formation of lesions in MS and/or EAE. Michael Sixt, who had previously given a seminar in the IIR department in Edinburgh, gave a talk on the mechanics and regulation of leukocyte migration in vitro and in vivo. He discussed how when cells move in vivo they use two different techniques, i.e. movement mediated by integrins and involving adhesion to the substrate and also movement as a result of following a chemokine gradient. He put these two models together to understand how T and B cells 'areas' are formed in the lymph node. And he found that both of these methods are required for cell movement in a lymph node –both by moving along an integrin-coated 'scaffold' and by following a chemokine gradient, namely chemokines CCL19 and CCL21. I found this very interesting as both CCL19 and CCL21 are thought to be important for the movement of T cells across the blood brain barrier into the central nervous system during EAE and MS.

Other highlights during the week included talks from Ulrich Kalinke and Adrian Hayday. Although most of the work of Ulrich Kalinke concentrates mainly on the effect of type I interferons (IFNs) on viral infection, he also looks at their action in the CNS during autoimmunity. He gave a very interesting talk about how type I IFNs clearly have an effect on CNS autoimmunity using EAE as their model. Mice deficient in the type I IFN receptor have exacerbated disease including increased inflammation and demyelination, however there does not seem to be an effect on the Th1/Th17 immune responses. This highlighted that type I IFNs may have a protective role in autoimmune inflammation of the CNS. Adrian Hayday gave an entertaining talk on the role of gamma-delta T cells in what he terms 'transitional immunity'. He showed a model for immune surveillance in which gamma-delta T cells are able to respond rapidly in response to stress as opposed to the slower response of conventional T cells. Interestingly, gamma-delta T cells have also been shown to have a role in the pathogenesis of EAE. During EAE IFN $\gamma$ -, TNF $\alpha$ - and IL-17-producing gamma-delta T cells infiltrate the CNS rapidly during the course of disease and produced more cytokine compared to the infiltrating alpha-beta cells. Their role in autoimmunity is still unclear and is being investigated, as they clearly are able to contribute to the disease.

Some of the students were able to present their data as oral talks as well. One of the students of Ari Waisman, in Germany, presented his data. During his PhD he has generated a new IL-17F reporter mouse which makes it possible to study the plasticity of Th17 cells both in vivo and in vitro and is therefore a very useful, and sort after, tool. Using this mouse he found similar results to mine in that Th17 cells generated in vitro are very plastic in vivo, and switch to being IFN $\gamma$ -producers in vivo. In his talk he also mentioned that he has found Th1 cells to also be plastic in nature which is an interesting find. Talking to him before and after his talk about our respective results was very useful and encouraging.

I am very glad that I had the opportunity to go to the ENII Summer School. The course was very well organised and included a short break every afternoon after lunch, allowing the students to relax and enjoy the beautiful surroundings and beaches! A boat trip to see the Grotto of Neptune was organised as well as a trip into the nearby town Alghero for sight-seeing and shopping. These short breaks from lectures were much appreciated, especially with the high temperatures that we experienced during the week. And it also allowed the delegates time to see part of the beautiful island Sardinia, as well as time to network with other fellow students and the lecturers who joined these trips. All in all, the summer school was a very interesting, enjoyable and invigorating experience! I came back feeling much more confident in my work, and in presenting my results to my peers as well as discussing ideas and results with experts in the field. I also made useful contacts which will help in the development of my future career. And so I thank the James Rennie Bequest for making the opportunity of going to the ENII summer school possible.

The beautiful Capo Caccia, Sardinia!

