**Renal Association Elective Report- Mrinalini Dey**

I am a final year medical student at the University of Cambridge. During summer 2015, I completed a 4-week elective placement at the Immunology Programme, Centre for Life Sciences (CeLS), National University of Singapore, under the supervision of Professor Paul MacAry.

My project was centred on the development of an assay, which will be used to define a role for human antibodies targeting Epstein-Barr Virus (EBV) in systemic lupus erythematosus (SLE). Having done previous placements in the vasculitis and lupus department at my local hospital, I was keen to carry out research in this field, in order to gain a more thorough understanding of the pathogenesis of autoimmune renal disease, particularly SLE.

EBV is a common gamma herpes virus that infects over 90% of the world's population and has been implicated as a potential infectious trigger for Systemic Lupus Erythematosus (SLE). Current data linking EBV to the onset of SLE is principally correlative and the group that I joined is seeking to determine if the natural human antibody repertoire engendered by EBV infection includes antibodies that also target host cells and tissues (autoantibodies) as a possible causative mechanism for this association. The group employs a single-cell PCR methodology to generate human antibodies from circulating B lymphocytes. To allow for functionality-driven human antibody discovery for EBV, culture, infection, neutralization and binding assays must first be developed that can be adapted for fluorescent or luminescent high-throughput screening. My role over the four weeks was to validate a human Non-Hodgkin's lymphoma cells line (RAJI) as a potential cellular target for in-vitro EBV infection employing a green-fluorescent protein-tagged variant of the virus (GFP-EBV). The combination of an immortalized human cellular target with the GFP-tagged virus represents the first step in the development of an assay that will be utilized to screen large numbers of human memory B cells taken directly from patients with active EBV viraemia. In the longer term, the anti-EBV human antibody repertoire derived from these experiments will be tested for auto-reactive binding to human cells and tissues and employed in competitive binding assays with sera derived directly from a Singaporean cohort of patients with SLE.

I worked alongside two PhD students and a trainee paediatric immunologist- this was especially encouraging, as she was a daily reminder of what life as a clinician scientist may entail, and the whole team was certainly instrumental in increasing my enthusiasm for immunology and academic medicine, particularly in the field of SLE. In order to contextualise my research, I spent some time at the neighbouring National University Hospital (NUH). One particular patient whom I saw in the SLE clinic was a twenty year old man who had presented one year earlier with a one week history of malar rash, on a background of fourteen years of progressive deafness and psychological disturbance. He was diagnosed with neurolupus, and immediately started on treatment. His hearing and mood improved, and he seemed almost completely healthy when I saw him. I found it interesting that this patient's symptoms started at the age when there is a peak of EBV infection, suggesting one possible cause for his disease.

This placement added much to my prior experiences of working in the fields of vasculitis and SLE, from a renal perspective, which had been focused on the clinical diagnosis and management of these diseases in both children and adults. My time at NUS, however, enabled me to gain a greater appreciation of the pathological mechanisms behind these

diseases, and a possible pathogenesis for SLE which I had not previously considered in depth. Singapore was the ideal environment in which to be doing such a project since the prevalence of autoimmune disease is much higher there, with one of the most common conditions being SLE. Although this work is still in the early stages, it may eventually lead to new pathways for diagnosis, as well as novel therapeutic strategies.

My elective far exceeded my objectives and expectations- being placed predominantly at the 'bench' with some time spent at the 'bedside,' I saw the benefit of having a skillset that spans both. The enthusiasm and guidance of staff was not only inspirational, but also ensured I was able to learn and utilise knowledge and techniques quickly in order to make the most of my time in the lab; I hope I am able to return in future to further contribute to this work. I am incredibly grateful to everyone with whom I worked during these four weeks, as well as the Renal Association for their award. My enthusiasm for research in renal autoimmune disease and SLE has most certainly increased, and I am confident that my elective experience will have a positive impact on my future practice.