



British Association of Dermatologists
Undergraduate Elective Prize/Project Grant Report
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I recently completed my clinical elective in the Department of Dermatology of Nagoya University, Nagoya, Japan. I chose to visit Nagoya University because of existing collaborative links between the university and my home institution (King's College London). I first met my elective supervisor, Assistant Professor Takuya Takeichi, when he was a visiting post-doctoral research fellow at King's several years ago. This elective also offered me a valuable opportunity to visit and experience the culture and clinical practice in a country that I had not been to before.

The Department of Dermatology of Nagoya University was established more than 110 years ago and under the leadership of the current Head of Department Professor Masashi Akiyama, it has gained a reputation as one of the world-leading institutions in skin disease research, particularly in the study of keratinisation disorders such as ichthyosis and palmoplantar keratoderma. As with many major teaching hospitals across Japan, the clinical and academic elements of this department were closely integrated; thus I was able to participate in a research project during the elective alongside the scheduled clinical activities.

I saw a wide variety of important skin pathologies during the outpatient clinics, including conditions such as atopic dermatitis, psoriasis, bullous pemphigoid and pemphigus vulgaris. I found the set-up of the outpatient clinics interesting and intuitive – first, the patient would see a senior dermatologist who would take a history and examine the patient within ten minutes, and formulate an investigative and management plan based on the likely diagnosis. Following this, the patient would then be led a short distance along the corridor to the treatment rooms where dermatology trainees (junior registrars) would perform various procedures such as venepuncture, wound cleaning/dressing, suturing, cryotherapy and skin biopsies. They would immediately prepare and send off patient samples for further analysis (e.g. immunofluorescence), thus saving patients an additional visit to the hospital for sample collection. This seamless arrangement ensured that patient waiting times were kept to a minimum.



Nagoya Castle

I was also able to observe more serious skin diseases through the professor-led inpatient ward rounds, especially given the expertise of the Department in the care of patients with disorders of keratinisation. These included rare genetic conditions such as Netherton syndrome and harlequin ichthyosis. These debilitating diseases are often associated with significant morbidity and mortality, and because of their rarity, there is typically a lack of evidence-based management options. However, thanks to the vast clinical experience and promising research discoveries of the Department, the patients knew they were in safe hands.

For the research component of my elective, I analysed next-generation (whole-exome) sequencing data generated from patients with various genetic skin diseases, in order to identify the underlying mutation responsible for the disorder. It was challenging to pinpoint the precise genetic defect in most of the cases, but I identified a promising variant which may be the cause of a potentially uncharacterised skin disorder. This condition manifested as an ichthyosis-like phenotype along with multi-organ involvement, therefore further research into the underlying pathobiology of this condition may yield intriguing molecular insights germane to various body systems, not just the skin.

As this was possibly a novel and fascinating finding, I presented this data to the Department and they were keen to explore this further, for example by introducing this genetic mutation into a mouse model ('knock-in') to see if the human phenotype is recapitulated in mice. Because of the short duration of my elective, I was not able to further participate directly, but I managed to contribute to discussions and helped to plan the direction of the project, including suggesting ideas for possible experiments that could be performed. It will take a considerable amount of work yet to determine the validity of this research finding, but hopefully it will turn out to be a fruitful endeavour for the Department.

This elective has been an incredibly rewarding experience, and has consolidated my aspirations to pursue a clinical academic career in Dermatology in the future. I would like to express my gratitude to the British Association of Dermatologists for the award of their grant, which enabled me to have the privilege of visiting this Department. I would also like to thank my elective supervisors, Professor Masashi Akiyama and Assistant Professor Takuya Takeichi, for kindly welcoming me to their Department and Professor John McGrath for making this visit possible.



Cherry blossoms (Sakura)