

JSPS Summer Programme 2017 Report – Jonathan Davies

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Field: Chemistry
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Research Background

During my time in the Yoshida group I investigated the application of electrochemistry in organic synthesis. Electrochemistry can be used to selectively oxidise organic molecules at specific positions forming reactive cations. The Yoshida group have found that these intermediates can be controlled through the use of a stabilising group. The accumulation of these stabilised intermediates in solution forms what is known as a “stabilised cation pool”. This pool can then be reacted with a variety of nucleophiles to form novel compounds containing new carbon-carbon bonds.

Research Summary

My time in the group was spent trying to optimise the reaction conditions used in this methodology. To this end I used the stabilised cation pool technique to synthesise over 40 compounds using a variety of different conditions. This work has given us a good insight into the requirements and scope of this technique. Working on this project has taught me the fundamental principles of electrochemistry and I now feel confident building and using electrochemical reactors and undertaking electrochemical reactions. I hope to be able to implement these new skills during my PhD in the near future.

The Experience

My time in Japan has been one of the best experiences of my life so far and I would highly recommend the programme to anyone who has even as passing interest in Japan or research overseas. The culture and history of Japan is staggering, and in the short time I've been here I have scaled the heights of Mount Fuji, conversed with an apprentice Geisha, lodged with the Buddhist monks of Mount Koya, attended a sumo tournament in Nagoya, watched a baseball match in Yokohama, worn a yukata to Gion Matsuri festival in Kyoto, experienced my first typhoon, and sea kayaked off the coast of Zushi beach.

Advice

- Talk to as many people as possible during the pre-departure event and orientation week, you'll make some amazing friends to explore Japan with.
- English is not widely spoken so learning some basic Japanese goes a long way. The language barrier can otherwise be broken down using the google translate app and excessive miming.
- Useful phrases: *sumimasen* (sorry/excuse me), *arigatou gozaimasu* (thank you), *Bīru o hitotsu kudasai* (one beer please).

- Make the most of the weekends, you'll be amazed at how much you can see and do in two months.
- Bins, and counterintuitively, litter are very rare in Japan so be prepared to carry any rubbish you do have around with you.
- If you're staying in a major city make sure to get an IC card, it's a travel card that can be used on trains, subways, busses, and even some vending machines. It will make travel much easier.
- As part of the programme you'll stay with a Japanese host family for a weekend, it may seem daunting in theory but will definitely be one of the highlights of your trip.



Some of the UK fellows wearing Japanese yukata for Gion Matsuri



My host family, the Honnos