

## JSPS London Report: Steven Street

**Name:** Steven T. G. Street

**Field:** Chemistry

**Current Institution:** University of Bristol

**Host Institution:** Kyoto University

**Department:** Department of Synthetic Chemistry & Biological Chemistry, Graduate School of Engineering

**Host Researcher:** Prof. Jun-ichi Yoshida

### Research Summary:

My time in Japan under the JSPS Summer Programme will go down as one of the best opportunities and experiences that I've ever had. The opportunity to collaborate with world leading Japanese academics on a project of your choosing is something not to be missed.

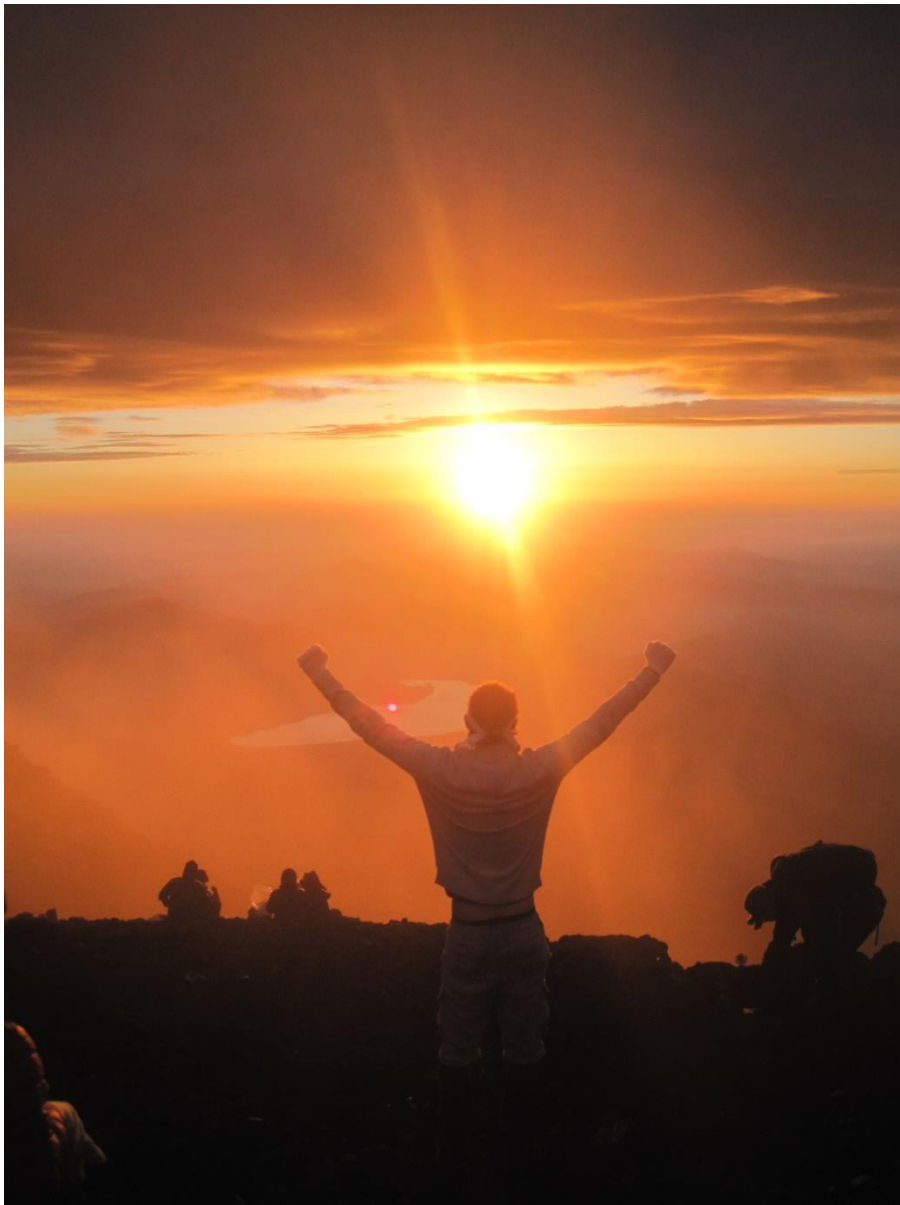
The initial aim of my research in Prof. Yoshida's group was to produce new biopolymers by initiating a living polymerization with glycosyl cations (carbohydrates) under flow micro-reactor conditions. Quite an ambitious task, considering only a handful of carbohydrate polymers have ever been produced, and the resulting products are of use as new materials and as biological probes. This work builds on previous research by the Yoshida group, namely the 'indirect cation pool' method for the generation of glycosyl cations and the cation pool initiated living polymerization. The problems with using glycosyl cations in living polymerization involve the potential side reactions of an electrogenerated acid (EGA) which is formed during electrolysis, as well as the competing reaction of the aryl sulfide cation initiator.

I gained some interesting results, as this was an entirely new area to me (my PhD is involved with carbohydrate based anti-cancer drugs). I examined a number of reactions in flow-micro reactors, and discovered that the EGA was an extremely efficient initiator, which suppressed the desired reaction of the glycosyl cation, leading to acid initiated polymers instead. Further understanding of the nature of this EGA was needed; however the mechanism of its formation is an unsolved 30 year mystery. After conducting a number of experiments probing the nature of formation of EGA, I gained evidence which supported previous theories about the acid being generated from trace water present in the reaction, and also discovered conditions which hinder its formation. I currently plan on returning to Prof. Yoshida's lab to continue this research at a later date.

This isn't including all the people you will meet and the friends you will make from all different corners of the globe, the parts of Japanese culture you will experience and all the amazing places you will visit. While I was there I experienced an earthquake, a typhoon, I climbed to the summit of Mt. Fuji, I cycled along one of the best cycling routes in the world, I saw a Sumo wrestling tournament, one of the best aquariums in Japan as well as many famous temples and sights.

Make the most of your time in Japan, your supervisor will realise that western countries have different working hours and working practices to Japan, as long as you are making progress with your work they will be fine with you taking the occasional time off to experience parts of Japan and its culture. The language can be very challenging at times, and the food is amazing, but very different to what you might be used to in the UK. Take everything as it comes, and don't be afraid to try new things or step outside of your comfort zone! I cannot recommend this programme enough.

**Pictures:**





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