

## UROP: Undergraduate Research Opportunities Programme

### A Personal Perspective by Nils Floden

Nils had just completed the second year of an undergraduate degree in chemistry, and embarked on an UROP research experience in the summer of 2014 under the supervision of Prof Donald Craig (Department of Chemistry).

#### **Placement Title:** Organic Chemistry

As a chemistry student, I was often frustrated by the divide between studying science and doing science. No matter how interesting the subject, the student is set to learn to an unproportionally greater degree than he or she is set to apply and discover. Therefore, the opportunity to combine learning chemistry with discovering new chemistry was what motivated me to undertake a UROP placement.

After having had email conversations with several researchers and studying their research in depth, I settled on the opportunity to do visible-light catalysed chemistry in the laboratory of Professor Donald Craig. The field is very young and its potential is huge. With the whole of chemistry slowly turning green, the need for efficient catalysts, i.e. substances that promote a reaction but are used in very small amounts, is bigger than ever before. Being cheap and energy efficient, visible-light catalysis is hence at the very forefront of a greener chemistry and at the same time, it opens up for unprecedented synthetic opportunities.

After securing my internship, I began preparing by familiarising myself with previous literature published within this field. I believe this was very important and going into the lab without it would have been a very tough challenge. Throughout the project, I have taken days off simply to sit down and read. This is absolutely crucial and often a few hours of reading can save you weeks of laboratory work and this was very much true for me.

After receiving thorough safety training and orientation from both safety staff and group members, my work began. My task was to prepare compounds called tetrahydropyridines. They are pyridine-type molecules and are omnipresent in both pharmaceuticals and agrochemicals. More specifically, I was set to see if we can use visible-light catalysis to generate highly substituted tetrahydropyridines. By substituting a molecule, we can introduce complexity and this is key to any biological activity.

Apart from learning more about the theory of organic chemistry, the most useful skills and lessons I learned over the course of the summer are more subtle but perhaps more important. I'm now familiar and at ease with many of the laboratory techniques I will be using in my final years of study and in my future career. I'm also familiar with the methodology behind chemical research, or for that sake, any scientific research. Learning about the scientific method in a lecture is certainly a different thing to applying it in the lab and this is an experience I will carry with me wherever I end up in life.

Finally, the most important thing I experienced after spending countless of hours in the research environment is a growing confidence. This is not the confidence that make you brag about your knowledge or the confidence that turns the shy into the super social, it is much more personal. It is the type of confidence that enables you to begin to trust your scientific judgement. In research there is no answer key, there is only your hypothesis and the evidence that backs it up. I have begun to gain the confidence to be my own greatest critic, judge my own theories and finally trusting my own judgment. This is, in lack of better of a better word, the most important and most valuable lesson of my UROP.