INTERVIEW

Creating revolutionary chemistry

Discussing the art of organic synthesis with Dr. Abraham Mendoza, Ping Sui* finds out what might attract international scientists to start research projects in Sweden.

An assistant professor at the Department of Organic Chemistry at Stockholm University and also a member of the Berzelii EXSELENT Center, Abraham Mendoza was awarded a European Research Council (ERC) starting grant in 2016. In this ERC funded project, his group is investigating a family of simple, fast and environmentally friendly methods for building complicated molecules by installing just one single strategic carbon atom. This exciting "single-C" concept could start a revolution in organic synthesis.

Mendoza's group is also the first to apply visible light photochemistry on organometallic reagents, and Mendoza has picked up a Wallenberg Academy fellowship to develop the technique further. It is possible to seamlessly create compounds using common organometallics and visible light, which has less labour requirement and waste. Among the various classes of molecules that could benefit from this concept, catalysts are a main focus of the group due to their broad impact.

The methods developed by Abraham Mendoza's research group are fundamental and efficient, the kind of methods that may contribute to a more sustainable synthesis and a new approach to planning retrosynthesis.

Why do you study organic synthesis?

"I find organic chemistry creative, in the way synthetic molecules are designed and developed. And the deeper I delve into the subject, the more I like the artistic side of organic chemistry."

What made you choose to set up a research group in Sweden?

"When I was in the US, I had the opportunity to have lunch with Professor Jan-Erling Bäckvall, one of Sweden's leading chemists. He asked me about my plans. At that time, I was keen to establish my own group somewhere in Europe. He was kind to encourage me to apply for a grant from the Swedish Research Council, which funds young researchers like myself to set up new, independent research groups. The possibility of counting on this set-up within this renowned department really appealed to me. When I got the grant, I came to Sweden to pursue my own research program with the greatest expectations".

How does the Swedish research environment compare with that in other countries?

"The competition for grants is tough everywhere. Compared with other European countries, the research system in Sweden is more similar to the US, except the scale of funding. The way that the research is funded, the management within departments, and even the PhD studentships are all linked to the grant. That is not the case in many other countries. For example in Spain, PhD students usually receive fellowships, but the researchers have very few resources. To find staff, the researchers need to have access to PhD students with their own funding. Here in Sweden, first you have a research idea and apply for support. If you get funding, you would have access to all the resources you need to develop the idea. I find this is more efficient. The generous support to research from private foundations is also remarkable and perfectly complements national and European public sources".

Abraham Mendoza has a successful career in chemistry at Stockholm University and explains to Ping Sui how he made his choices.

What is your view on fundamental research and applied research?

"Research in industry is completely focused on applications. I think academic research has to be focused on fundamental science. However, good fundamental science will have at least one natural application. The better the fundamental research is, the more applications it will have, and thus we actively work with the EXSELENT Center to try to make an impact outside the academic world".

Do you have any tips on how to apply for grants?

"Find the grant best matched to your project. This is crucial, and you need to make thorough preparations. You can analyse yourself and your CV to find weaknesses, and then try to strengthen these in the years before the actual application. When you apply for the grant, you want to have the strongest possible CV and a bold unique concept, to have the best chances to succeed".

Any tips for graduated students who wish to pursue a career in research?

"Find a research group that is doing something that you find unique and exciting. There is no point in joining a big group simply because it is big. The tough part in research is to keep motivated all the time. If you are interested in the research or in the process of obtaining results, you will never be disappointed, and it is much easier to stay motivated".

What do you plan to do next?

"We are very generously funded. Now it's time to deliver. In the short term, the first thing is to deliver what we have promised. The second is to establish a stable structure for my research group, and to recruit long-term staff. In the longer term, I intend to select new topics within a new area, to find something truly revolutionary". KE