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My internship at the University of Glasgow

by Julian Erver

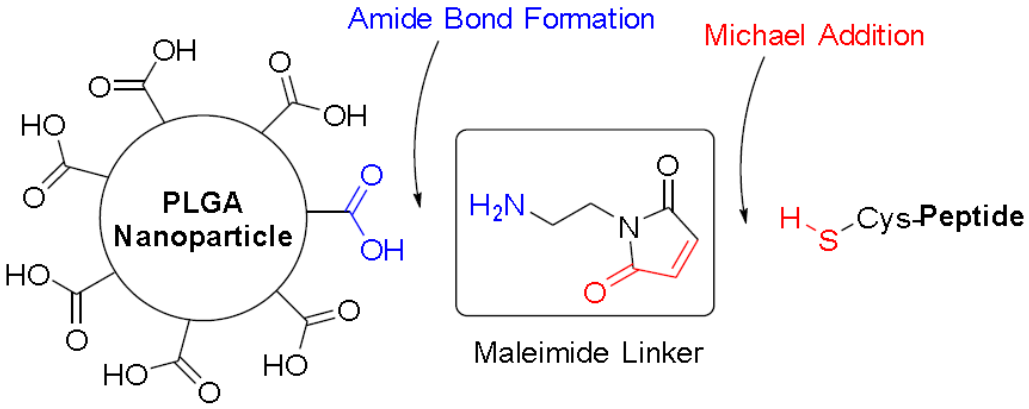
Since the beginning of my chemistry studies at the Ruhr-Universität Bochum, I wanted to experience one or two semesters abroad. I am interested in how chemistry is taught in a different country and how the people deal with chemistry. I thought a good time for an internship is after finishing the B.Sc. degree. In this way, I can overcome the linguistic barrier in the lectures by having enough background knowledge. One aim of my internship was to improve my English language skills, because I think English communication will be an important part in my future job. Of course, the Master program in Germany is in English, but I wanted to live in an entire English environment, in order to force myself to think in English. Great Britain was most attractive for me due to the native speakers. One of the Universities with Erasmus cooperation in chemistry was the University if Glasgow.

When I saw a picture of the university on the internet I knew that I would go to Glasgow. The main building just looks marvellous and every morning I walk along the building and feel good. Moreover, the university has good reputations and is a historically important place for chemistry and physics (e.g. Lord Kelvin was Professor for theoretical physics in Glasgow for over 50 years). Additionally, I always wanted to see the Scottish Highlands and feel the freedom in the green mountains.

During the last seven month I gained many new experiences. Firstly, the life in a shared flat required more organization in daily routine, which made me more independent. A good example is the cooking. In Bochum I used to eat in the canteen, here I prefer to cook my own food. Also, I now have to plan my finances. I visited lectures of physical, inorganic, organic and medicinal chemistry, which deepened my chemical understanding. I also learned a lot about entirely new topics, for example asymmetric synthesis or dynamics of molecular clusters and fluids. In order to free my mind and get new energy for studying, I learned to play tennis. The contact with my flatmates, colleagues, lecturers and supervisors helped me to improve my English language, both in chemistry and in everyday life. I notice, that I speak English more fluently now and express myself more precisely. Instead of several in-depth practicals with 8 CP I had only one with 20 CP. For this project, I wrote a thesis which was around 60 pages long. The finishing of this thesis enhanced my written English. Besides, it was a good training for writing a master thesis.

In my research project, I connected antimicrobial peptides to nanoparticles. The motivation of this project arises from the world-wide spreading of multidrug-resistant bacteria. Closely placed on the nanoparticles, the peptides could cooperate through multivalency and may have

a higher antimicrobial activity. The peptides were synthesized through solid phase peptide synthesis. Poly(lactic-co-glycolic acid) (PLGA) nanoparticles were prepared by solvent evaporation. The bifunctional *N*-(2-aminoethyl)maleimide was used to link the peptides to the nanoparticles. The maleimide linker forms an amide bond with PLGA on the one side and binds to the cysteine of the peptides through a Michael addition on the other side:



Peptide functionalized nanoparticles with peptide loadings of 18-25 % were finally obtained. During the project, I dealt with new devices, such as HPLC device, LC-MS device, CS Bio peptide synthesizer, microplate reader, homogenizer, centrifuge and scanning electron microscope. I also learned new lab methods, for example lyophilisation or setting up a microbiological assay. All in all, this project was very exiting for me, I experienced chemistry in a new way and I really enjoyed it.

Apart from the unexceptional English language in the lectures and especially in the lab, I could not spot many differences between chemistry studies in Glasgow and in Bochum. However, the lectures are differently structured. Instead of having one long lecture with one or two lecturers, the subject areas of organic, inorganic, physical and medicinal chemistry are divided into 4-6 short lectures with a different lecturer each. The advantage of this structuring is, that each lecturer is very fascinated about his/her topic and presents it in a unique way. Therefore the lectures are highly instructive.

Overall, the internship in Glasgow improved my English language and gave me new insights into the world of chemistry.