

# Internship at the University of Sheffield

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Period: three months (1<sup>st</sup> July - 29<sup>th</sup> September 2018)

Country: United Kingdom

Institute: University of Sheffield

Supervisor: Prof. Mike Williamson

## 1. Research in Prof. Mike Williamson group

I visited Prof. Mike Williamson's laboratory at the University of Sheffield in the United Kingdom. He is the first person to determine a protein structure in solution by nuclear magnetic resonance (NMR) spectroscopy. One of the coauthors, Prof. Kurt Wüthrich, was awarded the Nobel Prize in Chemistry in 2002. He visited our laboratory in Japan last year and gave us a talk about his works on high-pressure NMR spectroscopy. His talk interested me, and I came to want to study at his laboratory.

I studied high-pressure NMR techniques at the laboratory, which provides structural information on the "invisible" states of proteins at normal pressure. The "invisible" states are important for the functions of proteins. I focused on ShK, which is a small peptide potentially used as a drug for autoimmune diseases. All high-pressure NMR experiments were performed at the Manchester Institute of Biotechnology with Dr. Matthew Cliff. Thanks to his help, I got the data on pressure dependence of all  $^1\text{H}$ ,  $^{13}\text{C}$ , and  $^{15}\text{N}$  chemical shifts of ShK. By analysing the data, we got the information on the structural property of the "invisible" state of ShK. I hope that the findings will contribute to a development of new drugs for autoimmune diseases.



A picture with Prof. Mike Williamson (second from the left) and my colleagues.



The building where I worked (Firth Court).

## 2. Daily life in England

I stayed in Sheffield for three months from July to September. In summer, especially this summer, it is very hot in Japan. On the other hand, it was a very comfortable climate in Sheffield.

Trains are a little inconvenient in England. Trains are often delayed and cancelled because of some problems. I was very late for the appointment with Prof. Mike Williamson on the first day because of the cancellation.

Free Wi-Fi is available almost everywhere in England. I did not have mobile Wi-Fi, but there were no troubles.

I rented a flat that was owned by Prof. Qaiser Sheikh, one of the professors at the University of Sheffield. In the flat, four students including me shared a bathroom and a kitchen. One of the flatmates from Pakistan loves to talk, so we talked a lot about various things including our own research field.

In England, most people love football. Manchester, which is close to Sheffield, has two big football clubs, Manchester City and Manchester United. I became a supporter of Manchester City and watched a Premier League game between City and Fulham in Etihad stadium wearing City's kit. It was the first time I had watched a football game in a stadium. Fortunately, I got a ticket for the first row! I was overwhelmed by a lot of super plays. Manchester City won against Fulham by 3-0. It was one of the best trips during my stay in England.

I will try to make use of all my experiences in England for my research life.

## 3. Acknowledgement

I would like to appreciate Japan Gateway Program (JGP) for the financial help. I also appreciate Prof. Mike Williamson and Prof. Qaiser Sheikh at the University of Sheffield. Prof. Mike Williamson discussed with me about my research despite his tight schedule. Prof. Qaiser Sheikh provided me an accommodation and always cared about me.



**A model of green fluorescent protein (GFP) made out of origami in Firth Court.**



**My room in Sheffield.**