I visited the United States for studying at Prof. Martin laboratory (University of Florida) from 6th of January to 5th of February. University of Florida is in the small town named Gainesville, in the north of about 200 km from Orlando. I stayed at the motel located about 10 minutes by bus from the laboratory, because it was very difficult to find an apartment for a month in Gainesville, namely there were only one year contacts. There were many facilities around here, thus it is very convenient. I had thought that it is warm in Florida, but a cold wave had approached the eastern land of the United States in this winter, so the climate in Gainesville was not so different from that of the winter in Japan. However, the mentality of the people, and the southern atmosphere made me felt very comfortable.

Research in the Martin group is conducted at the interface between analytical chemistry and materials science. This entails developing new approaches to do chemical analyses and separations and developing the new materials that will make these separations and analyses possible. His group has pioneered a powerful new method to prepare nanomaterials called the "template method." This method entails using the nanoscopic pores in a host membrane as templates to prepare monodisperse nanoscopic particles of a desired material. They are trying the application of these nanomaterials to bioanalytical chemistry. I was very interested in this field, so this internship program was a very good chance for me to learn a concept and an approach about that. I discussed my research project with Prof. Martin, and planned to make carbon nanotube membranes templated by



University of Florida's icons (Century Tower & Auditorium)

porous aluminum oxide membranes. My first assignment during my first one week at the laboratory was to get used to the ambience of the laboratory and to communicate with lab members through discussions about their subject of study. The language was also one of the main reasons for me to go to the United States. Initially, it was hard to understand everything, because it

cost a lot of concentration. However, I was very glad that they were kind and friendly for me.

I opened up my research from the second week. First, I learned to prepare porous aluminum oxide membranes by anodic oxidation of aluminum metal plates, and finally translucent membranes were obtained. The making procedure was very complex and it cost several days. After that, preparation of carbon nanotube membranes was conducted by chemical vapor deposition of



Martin group's members with me

carbon onto the prepared template membranes. These carbon nanotubes are not so-called "SWNTs or MWNTs" but amorphous carbon, so it is very easy to modify the inner of nanotubes. It is also advantage that this template procedure can be widely applied for various materials. This experience was valuable for me not only to get supplementary techniques, not described in detail in the paper, but also to acquire new ideas.

My experience in Japan, especially concerning Scaning Probe Microscopes, was very useful in this internship, because Prof. Martin was looking for a person who had experience in electrochemistry and Scaning Probe Microscope. I taught Dr. Kang in situ Atomic Force Microscopy with a liquid cell, and we exchanged opinions animatedly about that. It was very exciting. We became very familiar, and came to chat about the hobby etc. The gladdest thing was that he held the 'shabu-shabu' party for me. I did not think that I was able to eat the shabu-shabu in the United States, thus I was very surprised and moved profoundly.



Porous aluminum oxide template membranes



Preparation of carbon nanotubule membranes by depositing carbon by chemical vapor deposition onto porous aluminum oxide template membranes

During my one-month stay, I have made many unforgettable friendships and memories. I learned a lot about the United States culture from the lab members I spent time with. Of course, I also enjoyed the American food. These made me see my own country with different eyes. I am very thankful for this internship program. I believe that this visit is precious experience for my life.