

京都大学若手人材海外派遣事業 スーパージョン万プログラム
研究者派遣プログラム

英文報告書

提出日：平成 26 年 7 月 31 日

1. 渡航者 (日本語)			
氏名	小島 崇寛	採択年度	H25 年度
部局	エネルギー理工学研究 所	電話	
職名	助教	メール	
研究課題名	ゼロエミッションエネルギーを目指した光・ナノ材料の開発		
海外渡航期間	平成 26 年 03 月 31 日～ 平成 26 年 06 月 30 日		
渡航先 (英語表記)	国名：シンガポール 大学等研究機関名：国立シンガポール大学 研究室名等： Kian Ping Loh group 受入研究者名： Prof. Kian Ping Loh		
2. 渡航の報告 (英文)			
<p>渡航先の研究環境、研究者との交流、研究発表の状況等、渡航中の滞在経験について英語 (500～1000 語) で記述して下さい。受入研究者と撮影した写真や研究発表で用いた図等について、可能な範囲で別添として提出して下さい。ページ数については増加してもかまいません。</p>			
<p>I stayed at National University of Singapore (NUS), Department of Chemistry, Prof, Kian Ping Loh group as a visiting researcher for three month.</p>			
<p><National University of Singapore (NUS)></p> <p>NUS is ranked among the best in Asia. The research environment of NUS is very comfortable. NUS has many instruments for research and ample funds. Additionally, many excellent researchers and students come from not only Singapore but also foreign countries. The one of factors of their success is that they are able to gather many excellent researcher and students in the world. Prof. Loh group also has many Post Docs and students who come from foreign countries. Therefore, research activity is quite high.</p>			
<p><Research ></p> <p>Recently, nano-carbon materials have attracted much attention for the next generation materials such as Grapehene which is two dimensional materials. Now we have focused on grapehene nanoribbons (GNRs) which are one dimensional materials based on aromatic hydrocarbons and shows semiconducting property. Additionally, we have reported the development of width-controlled GNRs (Sakaguchi <i>et al.</i>, <i>Adv. Mater.</i>, 2014,26, 4134.). On the other hand, Prof. Loh group research two dimensional materials such as graphene or molybdenum disulfide (MoS₂). He is very famous person</p>			

in this area. NUS has Graphene Research Center (GRC) where is well-known institute in the world and he belongs there. Therefore, we collaborated with his group. At NUS, we have investigated structure and bandgap of GNRs which have prepared with 2-Zone radical-polymerized chemical vapor deposition (2-Zone RP-CVD) technique with low temperature scanning tunneling microscope (LT-STM). Consequently, we could find the clear structures of them and determine these bandgaps. Additionally, we could find ribbons which have unique property by LT-STM measurement.

<Lab. Life>

Laboratory is managed under Prof. Loh's strong leadership. Group meeting has once a month generally. However, face to face meeting between Prof. Loh and group members have more frequently and Prof. Loh always give them accurate suggestions and advices. On the other hand, group members also propose new idea and project eagerly. Post Docs and students are very hard workers and always discuss each other about their research topics. And Post Docs teach students how to use instruments or give them advices kindly.

Assistant Professors in NUS manage own laboratory independently. Additionally, they also need give lecture. However, they balanced both, and achieve excellent works in spite of their busy schedule.

<Relationships with foreign researchers>

I had great opportunities to discuss with many foreign researchers during my stay. Prof. Loh introduced Dr. Goki Eda and Dr. Zhang Chun to me. One of our team members will stay at Dr. Goki Eda group for three month. So, we had discussions about each research topics. On the other hand, Dr. Zhang Chun is a specialist of theoretical chemistry and interested in our GNRs. Therefore, we have started collaboration. Additionally, Prof. Tamio Hayashi who was organic chemist and emeritus prof. at Kyoto University was also in Institute of Materials Research and Engineering (IMRE). Therefore, I saw him to have a discussion about recent research topics and next projects, and observed his Lab.

I am grateful that I could have an excellent opportunity to stay at NUS for three month. And I would like to incorporate this experience into my research career.

京都大学若手人材海外派遣事業 スーパージョン万プログラム
研究者派遣プログラム

英文報告書

提出日：平成 26 年 10 月 21 日

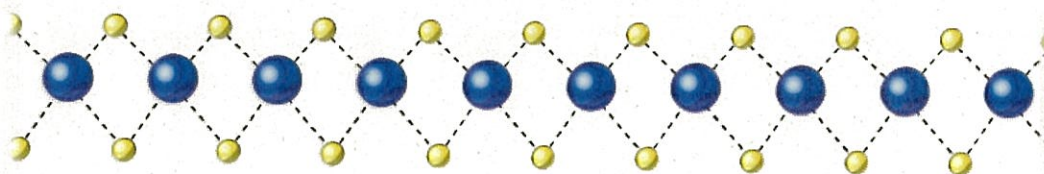
1. 渡航者 (日本語)			
氏名	小澤大知	採択年度	平成 26 年度
部局	エネルギー理工学研究 所	電話	
職名	大学院生	メール	
研究課題名	光ナノ科学による革新的太陽エネルギー利用に関する研究		
海外渡航期間	平成 26 年 6 月 29 日～ 平成 26 年 9 月 30 日		
渡航先 (英語表記)	国名：シンガポール 大学等研究機関名：シンガポール国立大学 研究室名等：Nanomaterials & Devices Group 受入研究者名：Goki Eda		
2. 渡航の報告 (英文)			
<p>渡航先の研究環境、研究者との交流、研究発表の状況等、渡航中の滞在経験について英語(500～1000語)で記述して下さい。受入研究者と撮影した写真や研究発表で用いた図等について、可能な範囲で別添として提出して下さい。ページ数については増加してもかまいません。</p>			
<p>The research environment in the group is very good because they have a large research budget and many postdoc researchers are working for the group. I obtained great experiences to use up-to-date optical setups which I have not accessed. Another advantage to study in NUS (National University of Singapore) is that various collaborations are available. Great researchers in various fields belong to the university.</p> <p>I had many chances to discuss them and improved understanding for the experimentally obtained physical behavior. I also get an opportunity to have a discussion on the experimental results with a theoretical physicist. That accelerated my understanding of the phenomena obtained from my experiments. This would be one of advantages to study in NUS as I mentioned above. Interesting things would be the multinational environments. In our group, they are from China, Germany, Russia and Italy, and other collaborators in other groups are from India and Portugal. I came into contact with a different culture and background.</p> <p>I gave two presentations of the research progress in their group meeting as well as the discussions. I tried to give a clear explanation using simple figures and expressions in the presentation. It is also good chance to conduct a research in an international stage.</p>			

別添

受入研究者と撮影した写真(研究室の集合写真)



研究発表で用いた図



京都大学若手人材海外派遣事業 スーパージョン万プログラム
研究者派遣プログラム

英文報告書

提出日：平成 26 年 3 月 13 日

1. 渡航者 (日本語)			
氏名	小島 崇寛	採択年度	H25 年度
部局	エネルギー工学研究 所	電話	
職名	助教	メール	
研究課題名	ゼロエミッションエネルギーを目指した光・ナノ材料の開発		
海外渡航期間	平成 26 年 10 月 1 日～ 平成 26 年 12 月 31 日		
渡航先 (英語表記)	国名：Singapore 大学等研究機関名：National University of Singapore 研究室名等：Kian Ping Loh group 受入研究者名：Prof. Kian Ping Loh		
2. 渡航の報告 (英文)			
渡航先の研究環境、研究者との交流、研究発表の状況等、渡航中の滞在経験について英語(500～1000語)で記述して下さい。受入研究者と撮影した写真や研究発表で用いた図等について、可能な範囲で別添として提出して下さい。ページ数については増加してもかまいません。			
I could get a opportunity of staying at National University of Singapore (NUS), Department of Chemistry, Prof, Kian Ping Loh group as a visiting researcher for three month.			
<National University of Singapore (NUS)>			
National University of Singapore (NUS) and Nanyang Technological University (NTU) are top rank university in Singapore. Additionally, NUS is ranked among the best in Asia. The research environment of NUS is very comfortable and research activity is also quite high. NUS has many instruments for research and ample funds. Additionally, many excellent researchers and students come from not only Singapore but also foreign countries. The one of factors of their success is that they are able to gather many excellent researcher and students in the world. Prof. Loh group also has many Post Docs and students who come from foreign countries.			
<Research >			
Recently, nano-carbon materials have attracted much attention for the next generation materials such as Graphene which is two dimensional materials. Now we have focused on graphene nanoribbons (GNRs) which are one dimensional materials based on aromatic hydrocarbons and shows metallic or semiconducting property. Their width and edge structure should be controlled to achive designated properties. Therefore, bottom-up synthesis of GNR was suitable for controlling their			

properties. And, we have reported the development of width-controlled GNRs (Sakaguchi *et al.*, *Adv. Mater.*, 2014, 26, 4134.).

On the other hand, Prof. Loh group research two dimensional materials such as graphene or molybdenum disulfide (MoS_2). He is very famous person in this field. NUS has Graphene Research Center (GRC) where is well-known institute in the world and he belongs there. Therefore, we collaborated with his group. At NUS, we have investigated structure and bandgap of GNRs which have prepared with 2-Zone radical-polymerized chemical vapor deposition (2-Zone RP-CVD) technique with low temperature scanning tunneling microscope (LT-STM). Additionally, we have started collaboration with Prof. Tamio Hayashi for synthesis of new type GNRs and Assistant Prof. Zhang Chun for computational chemistry.

<Lab. Life>

Laboratory is managed under Prof. Loh's strong leadership. Group meeting has once a month generally. In this time, I have joined their group meeting and got a opportunity of presentation about my research. We have discussed about each research topics. Additionally, face to face meeting between Prof. Loh and group members have more frequently and Prof. Loh always give them accurate suggestions and advices. On the other hand, group members also propose new idea and project eagerly. Post Docs and students are very hard workers and always discuss each other about their research topics. And Post Docs teach students how to use instruments or give them advices kindly.

Assistant Professors in NUS manage own laboratory independently. Additionally, they also need give lecture. However, they balanced both, and achieve excellent works in spite of their busy schedule.

<Relationships with foreign researchers>

I had great opportunities to discuss with many researchers during my stay. And I could get many fruitful advices from them. Dr. Zhang Chun is a specialist of theoretical chemistry and interested in our GNRs. Therefore, we have started collaboration. Additionally, Prof. Tamio Hayashi who is organic chemist and emeritus prof. at Kyoto University is also in Institute of Materials Research and Engineering (IMRE). Therefore, I saw him to have a discussion about recent research topics and next projects, and observed his Lab in last my stay. And I have started with collaboration for synthesis of new GNR in this time.

I am grateful that I could have an excellent opportunity to stay at NUS for three month. And I would like to incorporate this experience into my research career.

京都大学若手人材海外派遣事業 スーパージョン万プログラム
研究者派遣プログラム

英文報告書

提出日：平成 27 年 9 月 11 日

1. 渡航者 (日本語)			
氏名	仲野 瞬	採択年度	平成 25 年度
部局	エネルギー理工学研究所	電話	
職名	助教	メール	
研究課題名	ゼロエミッションエネルギーのための光・ナノ科学材料に関する研究		
海外渡航期間	平成 27 年 1 月 5 日～平成 27 年 6 月 30 日		
渡航先 (英語表記)	国名：シンガポール 大学等研究機関名：シンガポール国立大学 研究室名等：Department of Chemistry, Chemical Bioimaging Lab 受入研究者名：Prof. Young-Tae Chang		
2. 渡航の報告 (英文)			
<p>渡航先の研究環境、研究者との交流、研究発表の状況等、渡航中の滞在経験について英語(500～1000語)で記述して下さい。受入研究者と撮影した写真や研究発表で用いた図等について、可能な範囲で別添として提出して下さい。ページ数については増加してもかまいません。</p> <p>This project was performed with Prof. Young-Tae Chang's laboratory at National University of Singapore for a half year to develop the fluorescent sensors. In this stay, the screening of fluorescent ribonucleopeptide (RNP) sensors was performed. We aimed to construct the RNP sensors with high relative fluorescence for higher sensitive detection of the small molecules. The sensors were constructed by using our RNP and the probe library that is constructed by Prof. Chang's group. The candidates of fluorescent probes for the construction of new RNP sensor were successfully selected from a number of probes. The results will be published after more precise functional evaluation of these sensors. Now, we are performing the secondary screening for checking the exact performance of these sensors.</p> <p>The laboratory members clean all experimental rooms every morning to keep clean and a safe state. The university has also carried out a regular safety checks frequently; they pay special attention for keeping the safety by such strict inspection. So, the experimental environment is quite good for the smooth operation.</p> <p>Fortunately, I have many chances to discuss with the members in NUS and SBIC (Laboratory of Bioimaging Probe Development) regarding the biological application of fluorescent sensors and the related techniques. I joined the monthly symposium in Prof. Chang's laboratory for reporting my study and hearing those of other members, and discuss with all NUS and SBIC members. The meeting helps me to think deeper about our study and to understand the detail of the studies in other fields. Because there are many specialists for the biological assay in SBIC, I can ask and see how to do the measurements and analyses for the usage of the fluorescent sensors in vivo. And, I have a chance to meet and talking with some Japanese scientists who are working in the same building. Their energetic studies are also quite interesting and give an inspiration for the further development of our study.</p>			

京都大学若手人材海外派遣事業 スーパージョン万プログラム
研究者派遣プログラム

英文報告書

提出日：平成 27 年 12 月 14 日

1. 渡航者 (日本語)			
氏名	田村 友樹	採択年度	平成 27 年度
部局	エネ研	電話	
職名	D3	メール	
研究課題名	ゼロエミッションエネルギーのための光・ナノ科学材料に関する研究		
海外渡航期間	平成 27 年 8 月 2 日 ~ 平成 27 年 10 月 30 日		
渡航先 (英語表記)	国名 : Singapore 大学等研究機関名 : National University of Singapore 研究室名等 : Chemical Bioimaging Laboratory 受入研究者名 : CHANG Young-Tae		
2. 渡航の報告 (英文)			
<p>渡航先の研究環境、研究者との交流、研究発表の状況等、渡航中の滞在経験について英語 (500~1000 語) で記述して下さい。受入研究者と撮影した写真や研究発表で用いた図等について、可能な範囲で別添として提出して下さい。ページ数については増加してもかまいません。</p> <p>I stayed in Chemical Bioimaging Laboratory in National University of Singapore. The laboratory was very active. There were various researchers and students from China, Korea, India, United Kingdom and other countries around the world. First two weeks, I made appointment with members, and interviewed them to introduce me and know who they are and what they are doing. Their research projects were developing novel bioimaging tools through “diversity oriented fluorescence library approach (DOFLA)”. They have a fluorescence library containing over fifteen thousand chemicals to screen and find novel probes that detect a variety of biological molecules in vitro and also in vivo. Chemists in the laboratory are trying to increase the diversity of the library and biologists are trying to use the library with cells or animals to find a probe. I tried in the laboratory to construct combination library consisted of the fluorescence library and functional biomacromolecular library prepared in our group in Kyoto University and screened it to select novel biosensor. After starting my experiment, I felt free to ask everyone because I already knew that they were very kind by the interview. Every week I send my experimental data to Prof. Chang and he gave me meaningful advices and suggestions. Researchers in the laboratory, especially Chinese student and Indian post-doctor, also advised me frequently about the experiment. We often discussed my and their research, and it was exceedingly nice experience for me. As facilities are very new and convenience, the environment of the laboratory was extremely good. I appreciate that I had excellent opportunity to stay and study in Singapore for three months.</p>			