

(For JSPS Fellow)

Form B-5

Date (日付)

30/09/2015 (Date/Month/Year: 日/月/年)**Activity Report -Science Dialogue Program-**
(サイエンス・ダイアログ事業 実施報告書)- Fellow's name (講師氏名): Rui SHANG (ID No. P14342)- Participating school (学校名): The University of Tokyo- Date (実施日時): 11/09/2015 (Date/Month/Year: 日/月/年)

- Lecture title (講演題目):

(in English) Catalysis in Organic Synthesis, New Bond Formation Reactions Based on Catalytic C-H Activation and Decarboxylation(in Japanese) 有機合成化学における触媒反応; 触媒的 C-H 活性化と脱炭酸反応による新規炭素-炭素結合形成反応

- Lecture summary (講演概要): Please summary your lecture 200-500 words.

The development of transition-metal-catalysis in organic synthesis significantly changed the way and improved the capability of human beings to create complex chemicals. The "Nobel Prize of 2010 in Chemistry" was awarded to three chemists including two Japanese (Prof. Akira Suzuki and Prof. Eiichi Negishi) who devoted in field of "Palladium Catalysed Cross-Couplings in Organic synthesis". Traditional transition-metal-catalyzed cross-coupling reactions (Kumada Coupling, Negishi Coupling, Stille Coupling, Suzuki Coupling, etc.) rely on the use of unstable and prefunctionalized reagents and precious metal catalyst, which is often expensive, limited and toxic. To overcome these problems and to make chemical compounds can be accessed in more easy and convenient ways, chemists are still seeking for new methodologies to construct chemical bond for organic synthesis (new type of cross-coupling reactions). Two of the recent frontiers in cross-coupling chemistry are trying to directly utilize carbon-hydrogen bond and carboxylic acid as coupling reagents. Developing new catalyst based on earth-abundant-metal elements, such as iron, is an ideal way to solve the sustainability and toxicity issue related with using precious metal catalyst (the element strategy in Japan). In this lecture, we will talk about the traditional cross-coupling chemistry (2010 Nobel Prize in Chemistry) and show how did these new reactions affect the life and society of human beings. In the second part and third part of this lecture, recent developments of carbon-carbon formation based on decarboxylation and iron-catalysed carbon-hydrogen bond activations will be addressed.

- Language used (使用言語): English

- Lecture format (講演形式): PPT

- ◆Lecture time (講演時間) 90 min (分), Q&A time (質疑応答時間) 20 min (分)
- ◆Lecture style(ex.: used projector, conducted experiments)
(講演方法 (例: プロジェクター使用による講演、実験・実習の有無など))
used projector
- ◆Interpretation(ex.: assistance by accompanied person, provided Japanese explanation by yourself) (通訳 (例: 同行者によるサポート、講師本人による日本語説明))
assistance by accompanied person
- ◆Name and title of accompanied person (同行者 職・氏名)
特任研究員 板橋 勇輝
- ◆Other note worthy information (その他特筆すべき事項):
None

- Impressions and opinions from accompanied person (同行者の方から、本事業に対する意見・感想等がありましたら、お願いいたします。)

高校には難しい内容かつ英語での講演でしたが、ルイ氏が丁寧に説明したため、2010年にノーベル賞のクロスカップリング反応、さらには近年盛んに研究されている不活性結合の活性化、元素戦略について少しは理解していただけたかと思っています。事前に高校の先生と内容について話し合いをすれば、ルイ氏の講演と生徒さんの知識のギャップを小さくすることができたのではないと思います。本事業は、高校生が最先端の研究に触れる大変よい機会であると感じました。