

演題：**Subphthalocyanines: Supramolecular Organization and Self-assembling Properties**

講師：**Prof. Tomás Torres**

Department Organic Chemistry, Autonomía University of Madrid

日時：2017年4月4日（火）16:00～17:30

場所：フロンティア応用科学研究棟1階セミナー室

要旨：

Subphthalocyanines (SubPcs),<sup>1</sup> phthalocyanine analogues, are intriguing compounds made of three diiminoisoindoline units N-fused around a boron atom. Their 14 pi-electron aromatic core associated with their curved structures render them appealing building blocks for the construction of multicomponent photo- or electroactive assemblies. Recently, the development of an improved synthetic methodology for axially substituted SubPc allowed the efficient synthesis of a variety of SubPc-based hybrids. To enhance the understanding of the nature of these curved pi-extended surfaces, we have undertaken a series of studies, including the synthesis and characterization of SubPc-based capsules. SubPc pi-systems can be also organized at supramolecular level and used as active elements in molecular photovoltaics.



1. (a) C. G. Claessens, D. González-Rodríguez, A. Medina, M. S. Rodríguez-Morgade, T. Torres, *Chem. Rev.* **2014**, 114, 2192; (b) E. Caballero, J. Fernández-Ariza, V. M. Lynch, C. Romero-Nieto, M. S. Rodríguez-Morgade, J. L. Sessler, D. M. Guldi, T. Torres, *Angew. Chem. Int. Ed.* **2012**, 51, 11337; (c) I. Sánchez-Molina, B. Grimm, R. M. Krick Calderon, C. G. Claessens, D. M. Guldi, T. Torres, *J. Am. Chem. Soc.* **2013**, 135, 10503; (d) B. Verreert, D. Cheyns, P. Heremans, A. Stesmans, G. Zango, C. G. Claessens, T. Torres, B. P. Rand, *Adv. Energy Mater.* **2014**, 4, 1301413; (e) J. Guilleme, M. J. Mayoral, J. Calbo, J. Aragón, P. M. Viruela, E. Ortí, D. González-Rodríguez, T. Torres, *Angew. Chem. Int. Ed.* **2015**, 54, 2543; (f) J. Guilleme, L. Martínez, D. González-Rodríguez, I. Corral, M. Yáñez, T. Torres, *J. Am. Chem. Soc.* **2014**, 136, 14289; (g) M. Rudolf, O. Trukhina, J. Perles, L. Feng, T. Akasaka, T. Torres, D. M. Guldi, *Chem. Sci.* **2015**, 6, 4141; (h) J. Guilleme, D. González-Rodríguez, T. Torres *Chem. Commun.*, **2016**, 52, 9793.

連絡先：工学研究院応用化学部門 猪熊泰英（内線：6556）

フロンティア化学教育研究センター

演題：**P-キラルホスフィン配位子  
の化学**

講師：**今本 恒雄 先生**

**千葉大学名誉教授**

**日本化学工業（株）**

**研究開発本部技術顧問**



日時：2017年4月28日（金）16:00~17:30

場所：フロンティア応用科学研究棟 1F セミナー室 1

要旨：

光学活性ホスフィン配位子は遷移金属錯体触媒不斉合成において極めて重要な役割を担っている。本講演では不斉ホスフィン配位子の設計と合成および応用についての概論を述べ、リン原子上に不斉中心をもつホスフィン配位子に関する演者らの研究を紹介する。とりわけ、ホスフィン・ボランを用いる新規 P-キラルホスフィン配位子の合成とキラル医薬品中間体の触媒的不斉合成への利用について紹介する。

連絡先：工学研究院応用化学部門 伊藤 肇（内線：6561）

演題：**Vibrational Spectroscopy of Hydrogen-Bonded  
Complexes, Liquids and Solids**

講師：**Prof. Marek J. Wójcik**

Faculty of Chemistry,  
Jagiellonian University, Poland



日時：2017年5月24日（水）15:00~16:00

場所：理学部7号館2階 7-2-19・20室

要旨：

Theoretical model is presented for the X-H(D) stretching vibrations in hydrogen-bonded systems. The model takes into account an adiabatic coupling between the high-frequency X-H(D) stretching and the low-frequency intermolecular X...Y stretching modes, linear and quadratic distortions of the potential energy for the low-frequency vibrations in the excited state of the X-H(D) stretching vibration, resonance interactions between hydrogen bonds, Fermi resonance between the X-H(D) stretching and the overtone of the X-H(D) bending vibrations, and mechanical and electrical anharmonicities. The effects of deuteration and temperature on spectra are successfully reproduced by the model. Comparison between experimental and theoretical spectra is presented for different hydrogen-bonded systems, including ices. We present also the method of Car-Parrinello molecular dynamics used to calculate infrared spectra of crystals.

Proton tunneling in tropolone is described by two-dimensional model potentials. The potentials have been fitted to quantum-mechanically calculated two-dimensional grid of energies, and used to analyze proton dynamics. The model PES well reproduces experimentally observed promotion of the tunneling by the excitation of the planar modes and suppression by the excitation of the out-of-plane modes.

本講演は、大学院総合化学院『化学研究先端講義（修士課程選択科目）／  
総合化学特別研究第二（博士後期課程選択科目）』の一部として認定されています。

連絡先：理学研究院化学部門 武次徹也（内線：3535）

演題: **Hypervalent Iodine Reagents for Perfluoroalkylation: Synthesis, Applications and Mechanistic Studies**

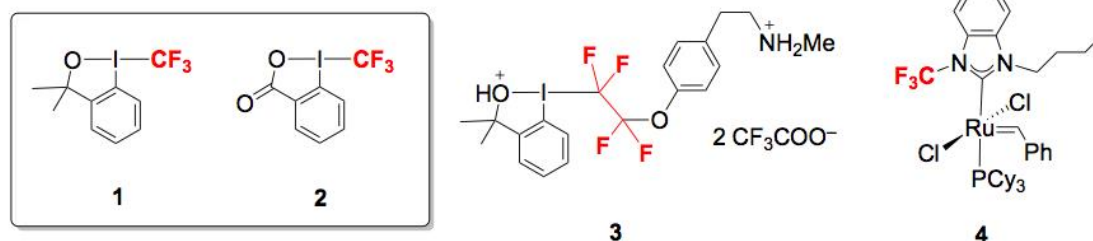
講師: **Prof. Antonio Togni**  
Department of Chemistry and Applied Biosciences,  
ETH Zürich, Switzerland



日時: 2017年7月5日(水) 16:30~18:00

場所: 工学部材料化学系棟 MC208 室

The iodanes 1-trifluoromethyl-1,3-dihydro-3,3-dimethyl-1,2-benziodoxole (**1**) and 1-trifluoromethyl-1,2-benziodoxol-3-(1*H*)-one (**2**), first reported in 2006 [1], have become widely used reagents for the trifluoromethylation of a large variety of substrates. Thus, not only disparate carbon nucleophiles will efficiently react, but also thiols, nitrogen-based heterocycles, primary and secondary phosphines, as well as selected oxygen functionalities, partly giving rise to rare and unexplored functional groups. The lecture will provide an overview of corresponding applications [2] and is going to include mechanistic considerations also based on quantum chemical studies [3]. Conceptually, these reagents can be extended to compounds able of transferring functionalized tetrafluoroethyl groups, such as e.g. **3** [4], with potential applications in bioconjugation. Finally, the trifluoromethylated Ru complex **4** (Grubbs II type catalyst) displays unexpected properties as ethenolysis catalyst [5].



References

- [1] P. Eisenberger, S. Gischig, A. Togni, *Chem. Eur. J.* **2006**, *12*, 2579.
- [2] J. Charpentier, N. Früh, A. Togni, *Chem. Rev.* **2015**, *115*, 650.
- [3] O. Sala, H. P. Lüthi, A. Togni, M. Iannuzzi, J. Hutter, *J. Comput. Chem.* **2015**, *36*, 785; O. Sala, N. Santschi, S. Jungen, H.P. Lüthi, M. Iannuzzi, N. Hauser, A. Togni, *Chem. Eur. J.* **2016**, *22*, 1704.
- [4] V. Matoušek, J. Václavík, P. Hájek, J. Charpentier, Z. E. Blastik, E. Pietrasiak, A. Budinská, A. Togni, P. Beier, *Chem. Eur. J.* **2016**, *22*, 417; J. Václavík, R. Zschoche, I. Klimánková, V. Matoušek, P. Beier, D. Hilvert, A. Togni, *Chem. Eur. J.* **2017**, *23*, 6490.
- [5] (a) P. S. Engl, R. Senn, E. Otth, A. Togni, *Organometallics* **2015**, *34*, 1384; (b) P. S. Engl, A. Fedorov, C. Copéret, A. Togni, *Organometallics* **2016**, *35*, 887.

本講演は、大学院総合化学院『化学研究先端講義（修士課程選択科目）／総合化学特別研究第二（博士後期課程選択科目）』の一部として認定されています。

連絡先: 工学研究院応用化学部門 大熊毅 (内線: 6599)

演題：**Big data analytics for defining and attaining tactical and strategic goals**

講師：**Prof. Leo Paas**  
**School of Communication,**  
**Massey University, New Zealand**

日時：2017年7月11日（火）14:45~16:15

場所：工学部材料・化学棟大会議室（MC526）

共催：ALPリーディングプログラム

This presentation emphasizes the importance of strategy-driven data science in general and explaining some of the terminology used. For this the presentation will address what big data is and how big data can be analysed. The two main types of statistical analyses will be addressed, cluster analyses for categorizing purposes and predictive modelling for assessing the probability that specific customer behaviours will occur. The discussion will be supported with various real-life applications, displaying the usefulness of big data analytics for solving marketing strategy and tactical challenges. Next to discussing the banking example, mentioned above, I will discuss recent NZ applications conducted by Master of Analytics students studying at Massey University in Auckland (without mentioning the names of firms).

本講演は、大学院総合化学院『化学研究先端講義（修士課程選択科目）／総合化学特別研究第二（博士後期課程選択科目）』の一部として認定されています。

連絡先：工学研究院応用化学部門 助教 三浦章 (amiura@eng.hokudai.ac.jp)

11日にPaas先生との研究ディスカッション等の希望がありましたら、セッティングいたしますので三浦まで連絡をお願いいたします。





演題: **High performance effects with organic additives  
for high voltage EDLC system**

講師: **Prof. Soo-Gil Park**

**Chungbuk National University, Korea**

日時: 2017年7月12日(水) 16:00~17:00

場所: 工学部材料・化学棟大会議室 (MC526)

共催: 電気化学会北海道支部

要旨:

Recently, high power batteries and devices have been of interest due to increases in the electronic vehicles industry. Electrical double layer capacitors (EDLCs) and super-capacitors, have received substantial attention as large-scale energy storage devices due to their higher power densities and long cycle life compared to lithium ion batteries. However, electrochemical capacitors have lower energy densities than lithium ion batteries. In this study, we studied the enhanced the energy densities of electrochemical capacitors by using a composite solvent and inserting additive materials through the formation of stable SEI layers.

本講演は、大学院総合化学院『化学研究先端講義（修士課程選択科目）／総合化学特別研究第二（博士後期課程選択科目）』の一部として認定されています。

連絡先: 工学研究院応用化学部門 青木芳尚 (内線: 6752)



演題 : Formation of Rings, Chains and Nanotubes by Self-Assembly of Transition Metal Bis-Phospholane Complexes

講師: Prof. Evamarie Hey-Hawkins

Universität Leipzig, Faculty of Chemistry and Mineralogy, Institute of Inorganic Chemistry, Johannisallee 29, 04103 Leipzig, Germany

日時: 2017年7月18日(火)16:00 ~ 17:30

場所: フロンティア応用科学研究棟 1階セミナー室

要旨:

Since the development of the chiral bis-phosphine ligand DuPHOS by Burk et al. at DuPont, phospholane chemistry has been in the focus of interest.<sup>1</sup> Phospholanes are five-membered rings containing phosphorus and belong to the so-called “privileged structures”.<sup>2</sup> Due to the rigidity of the phospholane moiety, their corresponding transition metal complexes have found a wide range of applications in asymmetric catalysis, e.g., in hydroformylation.



However, bis-phospholane ligands with long flexible, semi-flexible or rigid spacers are scarce. These ligands are expected to combine the excellent properties of phospholanes with a backbone which allows them to be used as bridging ligands between metal complex fragments.

Selective formation of macrocycles, cages or chains is observed, without using high-dilution techniques, depending on the ligand backbone of bis-phospholane ligands. For gold(I), additionally polymeric chains, nanotubes or molecular wires are formed via aurophilic interactions. Examples of the fascinating coordination chemistry of highly flexible<sup>3</sup> as well as semi-flexible<sup>4</sup> bis-phospholane ligands with transition metals (e.g., Rh, Ni, Pd, Pt, Cu, Ag, Au<sup>3</sup>) will be presented.

1. M. J. Burk, J. E. Feaster and R. L. Harlow, *Organometallics* 1990, **9**, 2653.

2. T. P. Yoon and E. N. Jacobsen, *Science* 2003, **299**, 1691.

3. M. Streitberger, A. Schmied and E. Hey-Hawkins, *Inorg. Chem.* 2014, **53**, 6794.

4. A. Schmied, A. Straube, T. Grell, S. Jähnigen and E. Hey-Hawkins, *Dalton Trans.* 2015, **44**, 18760.

本講演は、大学院総合化学院『化学研究先端講義(修士課程選択科目)／総合化学特別研究第二(博士後期課程選択科目)』の一部として認定されています。

連絡先: 工学研究院応用化学部門 伊藤 肇 (内線: 6561)

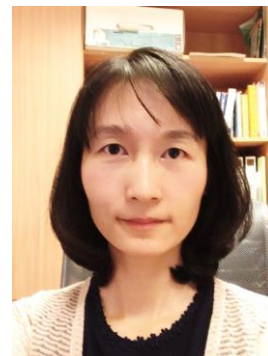


演題：**Bioenergy from microalgae and toxicology  
of diesel vs. biodiesel**

講師：**Prof. Yu-Tzu Huang**

Department of Environmental Engineering,  
Chung Yuan Christian University, Taiwan

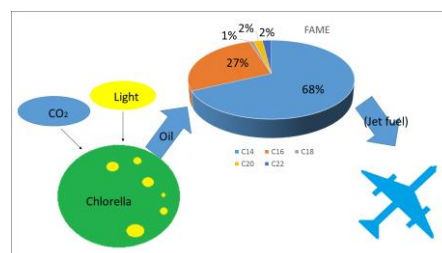
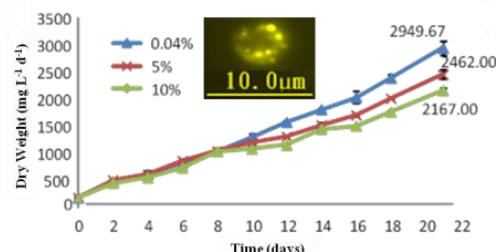
日時：2017年8月2日（水）13:00~14:00



場所：フロンティア応用科学研究棟 1F セミナー室1

共催：物質科学フロンティアを開拓する Ambitious リーダー育成プログラム  
要旨：

The bioenergy has become an urgent green energy source and may substitute for petroleum in the near future. Microalgal biomass can be converted into various bioenergy such as bioethanol, biodiesel, and biohydrogen with benefit of carbon dioxide (CO<sub>2</sub>) fixation. This study investigated the effects of culturing parameters on productivity of biomass and biodiesel. We aimed to optimize the culturing parameters (light source, CO<sub>2</sub> concentration, etc). Results showed that LED, BGII medium, and CO<sub>2</sub> had positive effect on accumulating of biomass or lipid. The main compositions of algal lipids were C18:2, C18:3, and C16:0, of which the compositions are closed to diesel and jet fuel. We also analyzed the possible toxicity of derived tail gas towards microorganisms through influence on cell surface structure and carbohydrate metabolism.



本講演は、大学院総合化学院『化学研究先端講義/総合化学特別研究第二』の一部として認定されています。

(ただし、8/3(木) 10:30からのProf. Kevin C.-W. Wu講演会もしくは13:00からのProf. Fa-Kuen Shieh講演会どちらかと併せて2件以上の聴講で出席一回とカウントします。)

連絡先：工学研究院応用化学部門 吉川琢也、中坂佑太、増田隆夫（内線：6551）





演題：**Functional Nanospace Materials for Lignocellulosic Biomass Conversion**

講師：**Prof. Kevin C.-W. Wu**

Department of Chemical Engineering,  
National Taiwan University, Taiwan



日時：2017年8月3日（木）10:30~11:30

場所：フロンティア応用科学研究棟 1F セミナー室1

共催：物質科学フロンティアを開拓する Ambitious リーダー育成プログラム  
要旨：

In this presentation, I will demonstrate the successful synthesis of functionalized nanospace materials including metal-organic frameworks (MOFs) and mesoporous silica nanoparticles (MSNs) as an effective, reliable, and re-usable solid catalysts for lignocellulosic biomass conversion. For enzyme-assisted catalytic system, we optimized the reaction conditions for cellulase-immobilized solid catalysts in cellulosic hydrolysis. We also use MOFs-derived nanoporous nanoparticles as effective solid catalysts for converting 5-hydroxymethylfurfural (HMF), one of the most promising platform of lignocellulosic biomass, into dimethylfuran (DMF) and 2,5-furandicarboxylic acid (FDCA) through hydrogenation/hydrogenolysis and oxidation, respectively. The results obtained in this study indicated that high yields of DMF and FDCA could be separately obtained from HMF via the combination of our newly designed MOFs-based nanoporous catalysts with the liquid-phase hydrogen/oxygen sources.



本講演は、大学院総合化学院『化学研究先端講義/総合化学特別研究第二』の一部として認定されています。

(ただし、8/2 (水) 13:00 からの Prof. Yu-Tzu Huang 講演会もしくは 8/3 (木) 13:00 からの Prof. Fa-Kuen Shieh 講演会どちらかと併せて2件以上の聴講で出席一回とカウントします。)

連絡先：工学研究院応用化学部門 吉川琢也、中坂佑太、増田隆夫（内線：6551）



演題：**From Imparting Functionality to Shielding Against Unfolding via Embedding Enzymes into Metal-organic Frameworks: the insight of material biology**

講師：**Prof. Fa-Kuen Shieh**  
Faculty of Chemistry,  
National Central University, Taiwan



日時：2017年8月3日（木）13:00~14:00

場所：フロンティア応用科学研究棟 1F セミナー室1

共催：物質科学フロンティアを開拓する Ambitious リーダー育成プログラム

要旨：Recently, our group has pioneered a de novo approach to embed enzyme in MOFs. This new approach provides a new tool to immobilize enzymes and has a great advantage compared to the previous works. MOFs of pore sizes smaller than the size of the enzymes can be used so that not only is leaching prevented but also the selection of enzymes and MOFs is greatly expanded; therefore, researchers could use a wider range of MOFs to impart various interesting functions to different enzymes. Furthermore, an enzyme maintains its biological function under a wider range of conditions after being embedded in metal-organic framework (MOF) microcrystals via this de novo approach. This enhanced stability arises from confinement of the enzyme molecules in the mesoporous cavities in the MOFs, which reduces the structural mobility of enzyme molecules. A fluorescence spectroscopy study shows that the structural conformation of the embedded enzyme changes less under these denaturing conditions than free enzyme.

*Ref: J. Am. Chem. Soc., 2017, 139, 6530-6533; J. Am. Chem. Soc., 2015, 137, 4276-4279*

本講演は、大学院総合化学院『化学研究先端講義 / 総合化学特別研究第二』の一部として認定されています。

(ただし、8/2 (水) 13:00 からの Prof. Yu-Tzu Huang 講演会もしくは 8/3 (木) 10:30 からの Prof. Kevin C.-W. Wu 講演会どちらかと併せて2件以上の聴講で出席一回とカウントします。)

連絡先：工学研究院応用化学部門 吉川琢也、中坂佑太、増田隆夫（内線：6551）

**演題: The Optical & Electrical Properties at the Nanoscale:  
Exciton, Plasmon, Polaron and Synapses****講師: Prof. Seonghoon Lee**  
**Department of Chemistry,**  
**Seoul National University, Korea**

日時: 2017年9月25日(月) 10:30~12:00

場所: フロンティア応用科学研究棟2階 セミナー室2

## 要旨:

The optoelectronic investigation of discrete quantum levels of giant artificial atoms and meta-molecules, organic semiconductors reveal **excitons** and **plasmons**, and **polarons**. The artificial atoms and meta-molecules, organic semiconductors were synthesized by wet chemical methods such as **molecular beaker epitaxy** (MBE). Colors originating from functional materials based upon those building elements are the results of absorption and emission due to quantum confinement effect, reflection, diffraction, and scattering. Practically, the thin flexible low-voltage driven R, G, B, and natural-look white light-emitting devices for next generation solid-state lightings and portable foldable displays were demonstrated. In addition, the first genuine UV-QLEDs were achieved and could open up the practical AI-plasmonics

Polarons transport formed by the strong electron-lattice interaction or band-like transport in organic semiconductors is the proper way to describe the motions of electrons and holes within any semiconducting or conducting materials. The reorganization energy and electron-transfer coupling matrix element between adjacent molecules, molecular order and packing are the factors influencing the transport in organic semiconductors. The transport through chemical structures such as a single molecule, organic nanofibers, & organic crystals was investigated.

The structural and functional plasticity of Aplysia mechanosensory presynaptic neurons has been studied in relation with the **mechanism underlying learning and memory**. The information transmission happens at the synapses. Our combined AFM-CLSM system is successfully adapted for measuring learning-related structural changes and the movement of synaptic molecules in the single live neuron through interaction force and fluorescence imaging. Our findings of the structural and functional plasticity of synaptic neurons shed light on artificial neural networks. How to change the weights of the synaptic connections between neurons is an essence in artificial intelligence or brain-like devices.

本講演は、大学院総合化学院『化学研究先端講義（修士課程選択科目）／  
総合化学特別研究第二（博士後期課程選択科目）』の一部として認定されています。

連絡先: 工学研究院応用化学部門 島田敏宏 (内線: 6576)



演題：**Nanostructured bioarchitectures based on carbon nanotubes and/or organic polymers for energy conversion or electroanalysis**

講師：**Prof. Serge COSNIER**

Grenoble Alpes University and  
UMR-CNRS, Grenoble, France



日時：2017年10月16日（月）14:45~15:45

場所：フロンティア応用科学研究棟 2階 セミナー室2

共催：大学院工学研究院 高分子化学研究室

要旨：

Concerning biofuel cells that convert enzymatically chemical energy into electrical energy, considerable attention has recently been paid to the implantation of biofuel cells in the human body with the aim to power implanted medical devices. Recent advances in the design of bioelectrodes based on electrically wired enzymes and functionalized carbon nanotube coatings will be reported. In particular, different strategies for achieving a controlled orientation of laccase or bilirubin oxidase on carbon nanotube-based electrodes for the direct dioxygen reduction will be presented. A new generation of flexible buckypaper electrodes was produced by using linear polynorbornene polymers containing multiple pyrene groups as crosslinker. These robust buckypapers will be applied to the covalent binding of redox groups or enzymes. Moreover, buckypapers based on bilirubin oxidase and FAD-dependent glucose dehydrogenase, were developed for the direct electron transfer and the mediated electron transfer, respectively. The resulting biofuel cell based on the  $O_2$ /glucose system, provides the highest volumetric power reported until now, namely  $24.07 \text{ mW cm}^{-3}$

本講演は、大学院総合化学院『化学研究先端講義（修士課程選択科目）／総合化学特別研究第二（博士後期課程選択科目）』の一部として認定されています。

連絡先：工学研究院応用化学部門 佐藤 敏文（内線：6602）

フロンティア化学教育研究センター



演題：**Carbohydrate-based Block Copolymer  
Self-Assemblies: Highly Nanostructured  
Thin Films and DSA Patterning**

講師：**Prof. Redouane BORSALI**

Grenoble Alpes University and  
CERMAV-CNRS, Grenoble, France



日時：2017年10月16日（月）16:00~17:00

場所：フロンティア応用科学研究棟 2階 セミナー室2

共催：大学院工学研究院 高分子化学研究室

要旨：

The self-assembly of carbohydrate BCP systems at the nanoscale level via the bottom-up approach, has allowed only recently the conception of very high-resolution patterning (thin films with sub\_10nm resolution) that has never been attained to date by petroleum-based molecules and provides these new materials with novel properties such as : New generation of Nanolithography, Memory devices, OPV, high resolution Biosensors,...

I will present recent results on the self-assemblies of carbohydrate-based block copolymer leading to highly nanostructured thin films (sub-10nm resolution) using DSA approach in combination of solvent and/or thermal annealing as well as new and ultra-fast microwave “cooking” approach.

本講演は、大学院総合化学院『化学研究先端講義（修士課程選択科目）／総合化学特別研究第二（博士後期課程選択科目）』の一部として認定されています。

連絡先：工学研究院応用化学部門 佐藤 敏文（内線：6602）



演題：**Redox Reactions of Aryl Boranes and  
the Advent of Catalytic Applications**

講師：**Prof. Matthias Wagner**

Faculty of Biochemistry, Chemistry and Pharmacy,  
Goethe University Frankfurt, Germany

日時：2017年10月25日（水）16:30~18:00

場所：フロンティア応用科学研究棟 1階セミナー室

要旨：

Polycyclic aromatic hydrocarbons (PAHs) are highly promising optoelectronic materials. Our group is particularly interested in boron as the electronically perturbative element. However, the actual preparation of boron-containing PAHs is still a considerable challenge.



In the recent past, we have developed synthesis routes based on B-B-coupling reactions, photocyclisation reactions, and the transition-metal mediated late-stage derivatisation of boron heterocycles. This enables us to systematically modify the molecular structure of a given target molecule, which is the prerequisite for an understanding of structure-property relationships.

本講演は、大学院総合化学院『化学研究先端講義（修士課程選択科目）／総合化学特別研究第二（博士後期課程選択科目）』の一部として認定されています。

連絡先：工学研究院応用化学部門 伊藤 肇（内線：6561）

演題： **Optimized fluorescent emitters based on a hydroxybenzazole or anil scaffold**

講師： **Dr. Julien Massue**

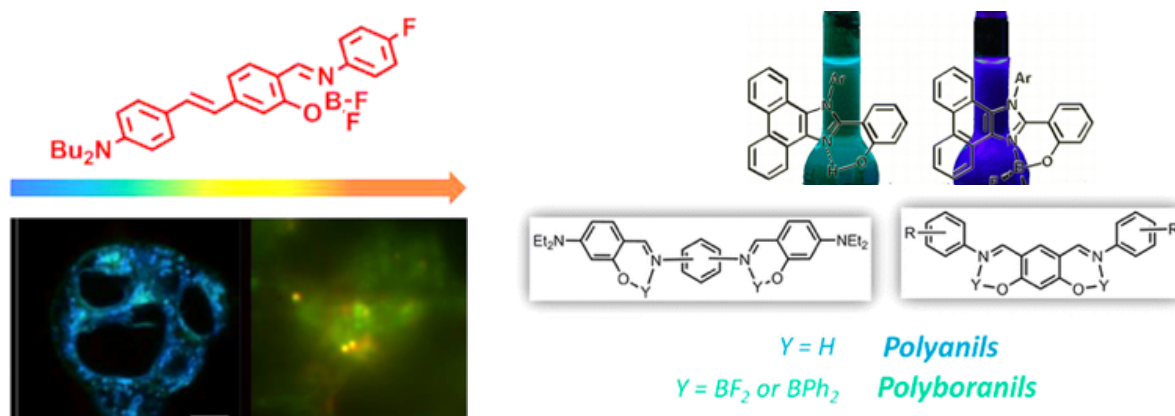
ICPEES, University of Strasbourg, France

日時： 2017年11月9日（木） 16:30~17:30

場所： 工学部材料・化学棟大講義室（MC030）

共催：

要旨： Massue 博士はホウ素を鍵元素とした発光性分子の合成と特性解明を広く展開しており、日本学術振興会の外国人招へい研究者事業にて日本に7ヶ月滞在する予定です。今回は含へテロ元素二座配位子系を有する分子群の化学に関して講演を行って頂きます。



本講演は、大学院総合化学院『化学研究先端講義(修士課程選択科目／総合化学特別研究第二(博士後期課程選択科目)』の一部として認定されています。

連絡先： 工学研究院応用化学部門

伊藤 肇（内線：6561）

演題：**Light-responsive metallo-supramolecular polymers for 2D and self-healable 3D materials**

講師：**Prof. Matteo Mauro**

Institute Le Bel, University of Strasbourg, France

日時：2017年11月17日（金）16:30~18:00

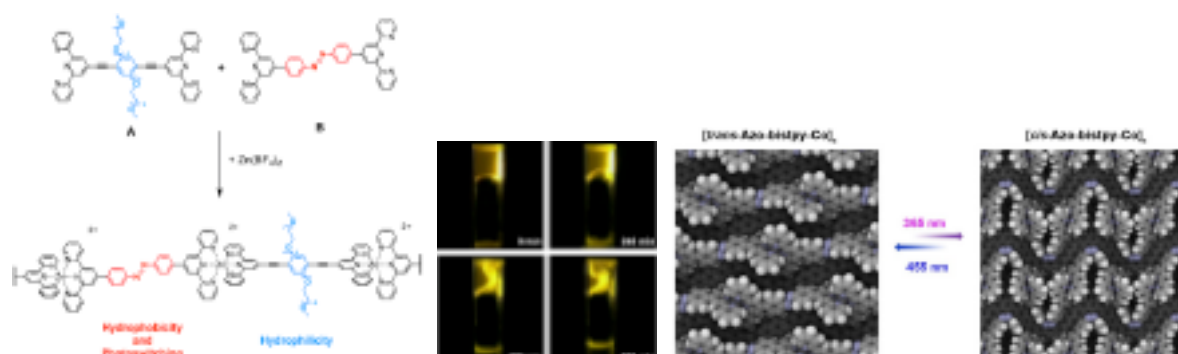
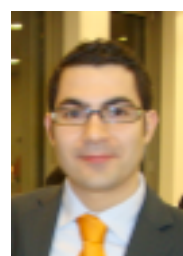
場所：工学部材料・化学棟大講義室（MC030）

共催：北海道大学 Ambitious リーダー育成プログラム



要旨：

The preparation of smart and adaptive soft materials able to respond to external stimuli and translate them into a well defined, controllable, and reversible macroscopic response is one of the most challenging research goals to date. Here, straightforward molecular design of photo-active supramolecular metallopolymers and their use as photo-responsive and adaptive self-healable gels is reported.



本講演は、大学院総合化学院『化学研究先端講義(修士課程選択科目／総合化学特別研究第二(博士後期課程選択科目)』の一部として認定されています。

連絡先：工学研究院応用化学部門 伊藤 肇（内線：6561）

演 題 : Na-ion batteries for large scale applications:  
challenges and opportunities

講 師 : **Prof. Teofilo ROJO**

Department of Inorganic Chemistry, Faculty of Science and  
Technology, University of the Basque Country, Bilbao, Spain

日 時 : 2017年11月24日(金) 10:15~11:30

場 所 : 工学部材料・化学棟5階大会議室 (MC526)



要 旨 : With the ever-increasing demands of modern societies, energy generation, storage, and distribution are becoming increasingly important research fields. Currently, one of the most promising areas of research and development is Sodium ion Battery (SiB) technology, which has a range of potential applications but remains particularly suited for use in stationary systems.

Here we will discuss SiB systems in terms of what may be considered its three most significant components: anodes, electrolytes, and cathodes. SiB anodes are mainly based on hard carbon materials, due to their attractive combination of low cost and high energy density. However, there has also been interest in other systems, such as intermetallic alloying materials and metal oxides, as well as exploiting specific electrolyte co-solvation effects so as to enable the use of graphite. In general, the SiB research community uses organic electrolytes which are analogous to already existing Lithium ion batteries (LiB). However, recently there has been growing interest in developing new electrolytes which are specifically tailored for use in SiBs, such as optimized liquid and solid electrolytes. At the present time, cathodes are one of the most explored SiB components - with a plethora of options to choose from, including Prussian blue and organic materials. However, the most promising are polyanionic and layered materials, with their good combinations of electrochemical performance, low cost, stability and available constituents. Although interest in SiB technology has only relatively new, when compared to LiBs, it has been already developed at the prototyping level.

A general overview of the most interesting electrode and electrolyte materials for Na-ion batteries paying special attention to those related to the current prototypes will be presented. By examining this topic in detail, it will be shown that there exists a strong drive to exploit this technology and that there are a wide range of opportunities to develop new and improved SiB technologies.

本講演は、大学院総合化学院『化学研究先端講義（修士課程選択科目）／  
総合化学特別研究第二（博士後期課程選択科目）』の一部として認定されています。

連絡先 : 工学研究院応用化学部門 忠永清治（内線 : 6572）

Nataly Carolina ROSERO NAVARRO

フロンティア化学教育研究センター

演題：**Chemo, Regio and Stereoselective Organic Transformations of 1,1-Diborylalkanes**

講師：**Prof. Seung Hwan Cho**

Department of Chemistry, Pohang University of Science and Technology, South Korea

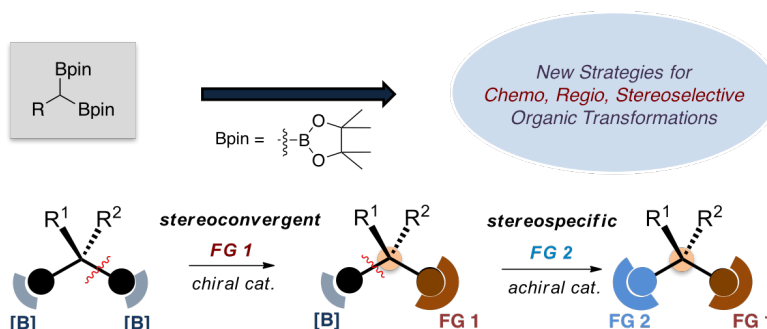
日時：2018年1月26日（金）16:00~17:30

場所：フロンティア応用科学研究棟  
1階セミナー室



要旨：

1,1-Organodimetallic reagents are valuable starting materials for the construction of multifunctionalized molecules. Among them, 1,1-diborylalkanes, which contain two boryl groups at the same carbon center, are particularly attractive due to their ease of handling, non-toxicity, stability, and propensity to undergo a variety of organic transformations. In this context, our lab is highly interested in the development of regio, chemo and stereoselective organic reactions using 1,1-diborylalkanes as new types of organodimetallic reagents. In this seminar, the details about our recent findings using 1,1-diborylalkanes in a range of organic transformations will be presented.



本講演は、大学院総合化学院『化学研究先端講義（修士課程選択科目）／総合化学特別研究第二（博士後期課程選択科目）』の一部として認定されています。

連絡先：工学研究院応用化学部門 伊藤 肇（内線：6561）



演題：Vertical Innovation のススメ  
～ 超高齢社会における薬とは？～

講師：島崎 真 博士

大塚製薬(株) 医薬品事業部 執行役員  
メディカルコミュニケーション担当

日時：2018年3月13日(火) 13:00~14:30

場所：フロンティア応用科学研究棟  
1階セミナー室

要旨：

7年後の2025年には、800万人とも言われる団塊の世代が後期高齢者入りして人口の1/4が75歳以上に。そして、更に15年後の2040年には、1/3が65歳以上となることが確実視されている。その「超高齢社会」と呼ばれる時代に向け、各種制度改革が急ピッチで進められ、社会環境に大きな変革をもたらしている。太古の昔、地球に衝突した隕石が急激な環境の変化を招き、それに順応できなかった恐竜は滅亡したと言われる。また、「デジタル革命」に代表されるように、ビジネス環境の変化が企業や産業の淘汰を余儀なくさせたことも多々ある。今、まさにそのような変革の時代を迎え、その時代をどう乗り越えて生き抜くか。。工学に託される期待とともに考察してみたい。



(これからの時代の医療が工学に何を期待しているかを知るチャンスです)

連絡先：工学研究院応用化学部門 伊藤 肇 (内線：6561)

フロンティア化学教育研究センター

演題: **Green Polymers - Dynamic Polymers to  
Lignin Based Polymers**

講師: **Prof. Kei Saito (齋藤 敬 先生)**

School of Chemistry, Monash University,  
Clayton, Australia



日時: 2018年3月14日(水) 16:00~17:30

場所: フロンティア応用科学研究棟1階セミナー室

要旨:

Dynamic polymers represent a relatively new class of materials that possess bonds capable of reversibly connecting and disconnecting monomers in response to stimuli such as heat or light. Using the green chemical principles, we have developed new dynamic polymers based on a biologically-inspired mechanism. We will also report new lignin chemical depolymerisations and repolymerisation developed using a redistribution mechanism and ionic liquids.

クマリン、チミン、マレイミド、シンナメート等の光二量化に代表される光可逆反応は、UV照射により結合、解結合する事が知られている。グリーン・サステイナブルケミストリーの観点からこの光可逆反応を応用、光可逆結合を用いた動的共有結合ポリマーを開発し光分解高分子、自己修復性高分子へと展開したので報告する。またリグニンの解重合の新技术およびその再重合も議論する。

#### References

1. P. Johnston, C. Braybrook and K. Saito, *Chem.Sci.*, **2012**, 3, 2301-2306.
2. M. Abdallah, M. Hearn, G. P Simon, K. Saito, *Polymer Chem.*, **2017**, 8, 5875-5883.
3. S. Nanayakkara, A. F. Patti, K. Saito, *Green Chem.*, **2014**, 16, 1897-1903

This seminar will be held in Japanese.

連絡先: 工学研究院応用化学部門 猪熊泰英 (内線: 6 5 5 6)



HOKKAIDO UNIVERSITY

# AMBITIOUS LEADER'S PROGRAM

Fostering Future Leaders to Open New Frontiers in Materials Science

Ambitious 物質科学セミナー

## Tactics and Strategy in Complex Molecular Synthesis

**Prof. Patrick G. Harran**

Molecular Biology Institute

(University of California, Los Angeles)



**平成 29 年 4 月 14 日(金) 13:30~15:00**

**北海道大学 理学部 7号館 7-310**

Patrick G. Harran 教授は、新規な有機合成反応及び方法論の開発から、アルカロイドやテルペノイドなどの全合成まで幅広い研究を展開しておられます。今回は、複雑な構造を有する天然物の全合成に関する最新の成果を講演して頂きます。

講師紹介：Harran 教授は、イェール大学で学位を取得された後、スタンフォード大学（ポスドク）、テキサス大学教授を経て、2008年から UCLA 教授（The inaugural D. J. & J. M. Cram Chair in Organic Chemistry）を務められています。

本講演は、大学院総合化学院『化学研究先端講義／総合化学特別研究第二』の一部として認定されています。

連絡先：北海道大学大学院理学研究院化学部門 谷野圭持  
(Tel: 011-706-2705, Mail: ktanino@sci.hokudai.ac.jp)





HOKKAIDO UNIVERSITY

# AMBITIOUS LEADER'S PROGRAM

Fostering Future Leaders to Open New Frontiers in Materials Science

**Ambitious 物質科学セミナー**

## Carbohydrate Block Copolymers:

Nanostructured Thin Films

### Prof. Redouane Borsali

フランス国立科学研究センター植物高分子研究所

(CERMAV-CNRS)



**平成 29 年 5 月 23 日 (火) 16:30~17:30**

**北海道大学 工学部 材料・化学棟 大会議室(MC526)**

Numerous studies have been focused on the self-assembly of petroleum-based BCPs for potential applications in multidisciplinary fields, such as nanoparticles for drug delivery, or nano-organized thin films for biosensors, or nanolithography. Very recently a new class of BCP - carbohydrates-based block copolymer systems- abundant, renewable and constitute a sustainable source of materials - are attracting much interest in various sectors and their industrial applications at the nanoscale level will have to expand very quickly in response to the transition to a bio-based economy. The self-assembly of carbohydrate BCP systems at the nanoscale level via the bottom-up approach, has allowed only recently the conception of very high-resolution patterning (thin films with sub 10nm resolution) as well as very high transistor memory performance that has never been attained to date by petroleum-based molecules and provides these new materials with novel properties. New and recent results on the self-assemblies of carbohydrate-based block copolymer leading to highly nanostructured thin films (sub-10nm resolution) will be presented in combination of solvent and/or microwave radiation annealing.

本講演は、大学院総合化学院『化学研究先端講義／総合化学特別研究第二』の一部として認定されています。

連絡先：北海道大学大学院工学研究院応用化学部門 磯野拓也

(Tel: 011-706-2290, Mail: isono@poly-bm.eng.hokudai.ac.jp)



# 化学部門特別講演会

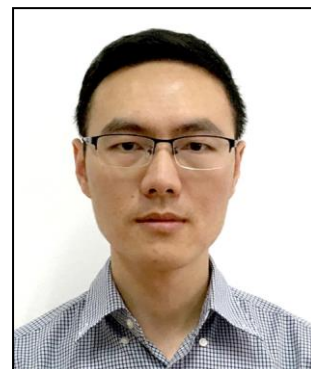
演題：**Multimodality molecular imaging of enzyme activity  
in vivo using activatable probes**

講師：**Deju Ye 教授**

南京大学化学化工学院

日時：2017年6月21日(水) 16:30～18:00

場所：北海道大学 理学部 7号館 7-310 室



講演内容：

Precise measurement of enzyme activity in living systems with molecular imaging probes is becoming an important technique to unravel the functional roles of different enzymes in biological processes. Activatable probes whose imaging signal can be specifically switched from the “off” to “on” state upon interaction with a target of interest, are particularly attractive due to their improved sensitivity and specificity. In this talk, I will introduce the recent studies of development of activatable probes in our group, and highlight their applications for multimodality imaging (fluorescence, MRI and PET) of protease activity in living cells and animals.

※本講演会は HSI 事業「世界を先導する物質化学 II ～生体電気化学の基礎と応用」、「化学研究先端講義（修士課程）／総合化学特別研究第二（博士後期課程）（注：HSI 受講者は履修対象外）」の一部として開催します。

共催：フロンティア化学教育研究センター **Frontier Chemistry Center**  
フロンティア化学教育研究センター

協賛：日本化学会北海道支部、電気化学会北海道支部、  
北海道大学 物質科学フロンティアを開拓する Ambitious リーダー育成プログラム

連絡先：世話人 北海道大学理学研究院化学部門 村越 敬

(TEL:011-706-2704)





HOKKAIDO UNIVERSITY

# AMBITIOUS LEADER'S PROGRAM

Fostering Future Leaders to Open New Frontiers in Materials Science

Ambitious 物質科学セミナー

## Coordination Chemistry of the Pincer Complexes of Co, Ni, Cu

Dr. Yunho Lee

Professor, Department of Chemistry, KAIST

平成 29 年 6 月 29 日 (木) 16:30~18:00

北海道大学 理学部 7号館 310



Transition metal adduct formations with small molecules such as dinitrogen, carbon monoxide and carbon dioxide are drawing much attention due to their importance in developing synthetic catalysts for various industrial chemical processes. This attention has been in part motivated by a desire to study species possessing uncommon metal-to-ligand multiple bond(s) such as metal-nitrene and carbene/carbyne via partial or complete group transfer. In our laboratory, a series of such species are currently under investigation to show their respective roles in small-molecule transformations that include the CO<sub>x</sub> and NO<sub>x</sub> (x = 1 – 3) transformations for modeling ACS/CODH active site chemistry and biological denitrification processes, respectively. Such fundamental study will contribute to develop synthetic catalytic systems for industrial applications such as hydroformylation, Fisher-Tropsch and Haber-Bosch processes. In this presentation, a particular study with low-valent 1<sup>st</sup> row mid to late transition metal complexes will be discussed. Synthesis and characterization of a four coordinate (PEP)M-L scaffold (M = Co, Ni or Cu; E = N, P or Si), where the L site is occupied by various ligands such as NHR<sub>2</sub>, NO<sub>x</sub>, N<sub>2</sub>, CO<sub>x</sub> and COOR will be described. Regarding the geometry and reactivity relationship, tetrahedral and square planar metal complexes were studied. In fact, unanticipated metal-ligand cooperation employing a (PPP)M scaffold was investigated from our laboratory, in which reversible methoxy group transfer occurs between a phosphide moiety of a PEP ligand and a nickel ion. This unusual group transfer reaction is tightly coupled with metal's local geometry and its oxidation state. This chemistry can be further applied to the catalytic conversion of various small molecules utilizing several pincer systems.

本講演は、大学院総合化学院『化学研究先端講義／総合化学特別研究第二』の一部として認定されています。

連絡先：北海道大学大学院理学研究院化学部門 加藤 昌子

(Tel: 011-706-3817, Mail: mkato@sci.hokudai.ac.jp)





モントリオール大学の Stephen Michnick 教授による講演会を企画いたしました。Michnick 教授は、細胞内タンパク質ネットワーク研究において、多くの顕著な業績を上げておられます。先生の最新の研究について、興味深いお話が伺えるものと思います。多数のご参加をお待ちしております。

演題: “Endocytosis caused by liquid-liquid phase separation of proteins”

講師: **Prof. Stephen Michnick**  
(Université de Montréal, Canada)

日時: **2017年7月27日(木) 15:00～16:00**

場所: 理学部 6号館 6-204-02室(多目的演習室)

共催: 北海道大学大学院総合化学院, フロンティア化学教育研究センター,  
北海道大学物質科学フロンティアを開拓する Ambitious リーダープログラム,  
日本生化学会北海道支部, 生命分子化学セミナー

要旨:

Clathrin-mediated endocytosis (CME) underlies intra- and extracellular material trafficking in eukaryotes, and is essential to protein metabolism, intercellular signaling, membrane remodeling and other cell regulatory processes. Although CME is usually driven by F-actin polymerization, CME can also occur through unknown actin independent mechanisms. Here, we present evidence that CME is driven by the accumulation of proteins at sites of endocytosis initiation that undergo liquid-liquid phase separation to form viscoelastic droplets. The surfaces of these droplets, through adhesion with the membrane and surrounding cytosol, generate the work required to drive membrane invagination. The proposed mechanism expands the repertoire of functions of liquid-liquid phase separation of proteins to include their ability to do work due to soft interfaces that shape and organize cellular matter.

本講演は、大学院総合化学院『化学研究先端講義 / 総合化学特別研究第二』の一部として認定されています。

連絡先: 理学研究院化学部門 生物化学研究室  
坂口 和靖 (011-706-2698)



HOKKAIDO UNIVERSITY

# AMBITIOUS LEADER'S PROGRAM

Fostering Future Leaders to Open New Frontiers in Materials Science

Ambitious 物質科学セミナー



## Macrocyclic ligands in catalysis

Dr. David SÉMERIL

Laboratoire de Chimie Inorganique  
Moléculaire et Catalyse  
Université de Strasbourg, France



平成 29 年 7 月 27 日(木) 16:30~18:00

北海道大学 理学部 7号館 7-219/220

How a macrocyclic cavity can influence the catalytic properties of a metal center? In order to answer to this question, various phosphine or *N*-heterocyclic carbene ligands have been grafted onto a calix[4]arene, resorcin[4]arene and  $\alpha$ - or  $\beta$ -cyclodextrin platform. The resulting complexes have proved to be excellent candidates for carrying out a catalytic reaction in confined environment, leading to remarkable regio- or enantioselectivities. This presentation will focus on the use of macrocavitands in reactions such as the hydroformylation of olefins and various cross-couplings.

**共催 : Hokkaido Summer Institute 2017,**

**フロンティア化学教育研究センター(FCC)**

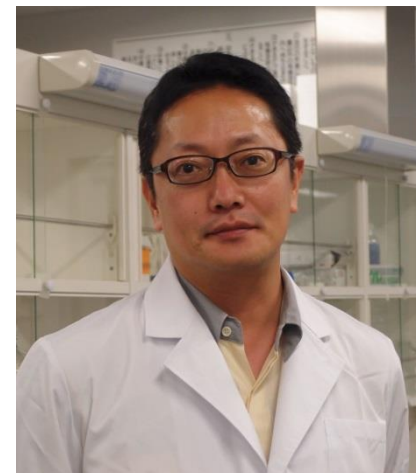
本講演は、大学院総合化学院『化学研究先端講義』 / 『総合化学特別研究第二』の一部として認定されています。

連絡先 : 北海道大学大学院 理学研究院化学部門 佐田和己

(Tel: 011-706-3473, Mail: sadatcm@sci.hokudai.ac.jp)

# 第16回生物計測化学懇談会

演題 幹細胞の増殖・分化制御システムの開発  
講師 西野 泰斗  
日産化学工業株式会社 生物科学研究所  
医療材料グループリーダー  
日時 2017年7月28日(金) 17:00～18:00  
場所 工学部材料・化学棟(MC102)  
主催 工学研究院応用化学部門生物計測化学研究室  
共催 フロンティア化学教育研究センター



西野先生は、造血幹細胞や多能性幹細胞の増殖・分化に関する研究および事業化を行っています。懇談会では、低分子化合物を用いた血小板生産と多能性幹細胞の3D培養技術の最新の成果について講演していただきます。

連絡先 工学研究院応用化学部門 渡慶次学(内線6744)

演題：**Honeycomb-like Polymeric Films  
from Dendritic Polymers Presenting  
Shape-memory Effect**



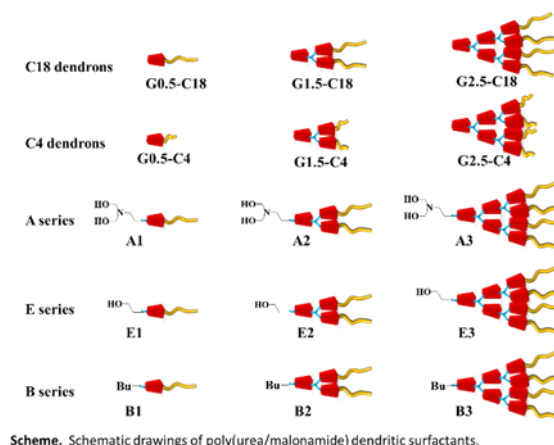
講師：**Prof. Ru-Jong Jeng**

Institute of Polymer Science and Engineering,  
National Taiwan University, Taipei 106, Taiwan

日時：2017年8月4日（金）14:45~16:15

場所：工学部材料・化学棟 MC208

要旨：In this work, a series of dendritic surfactants (dendrons; Scheme), featuring a focal part rich in hydrogen bonding groups and a periphery rich in non-polar units that undergo van der Waals interactions have been developed, and subsequently grafted onto polystyrene (PS) and polyurethane (PU) polymers that then self-assembled, in conjunction with a breath-figure process, into honeycomb-like polymeric films. With the addition of a small amount of dendritic surfactants to the polymers such as poly(D,L-lactide), PS, poly(methyl methacrylate), etc., a well-organized honeycomb-like surface also has been achieved. Moreover, honeycomb-like films could be obtained from dendritic side-chain polymers presenting reactive pendant units. Through chemical modifications, one could readily manipulate the surface properties of these honeycomb-like films with controllable surface roughness. Through further molecular design and process improvement, a honeycomb-like structure with shape-memory behavior has been realized. This approach opens a facile route to an efficient, inexpensive and versatile method to prepare films with switchable wettability. Apart from that, possible applications of these honeycomb-like polymeric films in fields such as microanalysis in analytical chemistry will be also addressed.



Scheme. Schematic drawings of poly(urea/malonamide) dendritic surfactants.

本講演は、大学院総合化学院『化学研究先端講義（修士課程選択科目）／総合化学特別研究第二（博士後期課程選択科目）』の一部として認定されています。

連絡先：工学研究院応用化学部門 佐藤 敏文（内線：6602）  
フロンティア化学教育研究センター



# 第17回生物計測化学懇談会

- 演題 Advances in Photothermal Spectroscopy  
講師 Prof. Mikhail Proskurnin  
Chemistry Department,  
M.V. Lomonosov Moscow State University  
日時 2017年9月12日(火) 15:00~16:00  
場所 工学部材料・化学棟(MC102)  
主催 工学研究院応用化学部門生物計測化学研究室



The lecture will survey the main trends of research in photothermal spectroscopy related to applied chemistry and chemical analysis. The advantages and drawbacks of photothermal spectroscopy will be considered. Particular attention will be given to the hyphenation of photothermal spectroscopy to other techniques. Measurements of biomedical samples and disperse systems will be exemplified.

本講演は、大学院総合化学院『化学研究先端講義(修士課程選択科目)』/  
総合化学特別研究第二(博士後期課程選択科目)』の一部として認定されています。

連絡先 工学研究院応用化学部門 渡慶次学(内線6744)

# 特別講演会のお知らせ

## Royal Society of Chemistry Meet the Editor



10月13日（金） 13：30－14：30  
北海道大学理学部 7号館7-219/220室

---

### Title: The publication process demystified: tips on writing research papers for maximum impact

---

What the Editors do and look at after you've submitted a manuscript?

Richard Kelly, Executive Editor of organic chemistry and chemical biology journals will present on the journals publishing process at Royal Society of Chemistry journals. This will include tips on writing papers to emphasize importance and impact, the differences between submitting to the Editorial Office or an Associate Editor, how we select referees and how we make decisions.



**Dr. Richard Kelly**

*Royal Society of Chemistry  
Executive Editor, Organic Journals*

Organic &  
Biomolecular  
Chemistry



[www.rsc.org](http://www.rsc.org)  
Registered charity number 207901

本講演は、大学院総合化学院『化学研究先端講義（修士課程選択科目／総合化学特別研究第二（博士後期課程選択科目））の一部として認定されています。

連絡先：北海道大学大学院理学研究院化学部門（有機金属化学研究室）  
澤村正也（011-706-3434）





演題：**Natural decomposition of *Pinus contorta*:  
Physiological processes inferred from  
metatranscriptome and proteome investigations**

講師：**Prof. Daniel Cullen**

Forest Products Laboratory,  
US Department of Agriculture, the U.S.A.

日時：2017年10月25日（水）15:00~16:30

場所：工学部材料・化学棟講義室（MC208）

主催：工学研究院応用化学部門 バイオ分子工学研究室

要旨：

Wood decay fungi play a pivotal role in forest carbon cycling. Certain basidiomycetes, collectively referred to as white rot fungi, efficiently degrade all the major components of wood, including the recalcitrant lignin. Brown rot fungi are phylogenetically related but unable to remove lignin. The precise mechanisms of lignocellulose conversion by these fungi are uncertain. However, laboratory studies have implicated oxidative systems in lignin and cellulose depolymerization by white rot and brown rot fungi, respectively. Relatively few investigations have examined complex microbial communities in natural environments.

Addressing this issue, metagenome, metatranscriptome and metaproteome analyses of decaying *Pinus contorta* have been and are being conducted via collaborative efforts of Hokkaido University, Boston University, the US Departments of Energy and Agriculture. For these analyses, genomic DNA, Poly(A)RNA and protein were extracted from extensively decayed wood collected in western Montana. Mass spectroscopy-based identification of proteins was initially restrained by the paucity of reference fungal genomes. However, protein databases derived from de novo transcriptome assemblies substantially increased the number of proteins identified. Together with transcript analysis, the data supported the central involvement of white and brown rot fungi in decay and revealed an impressive diversity of enzymes involved in lignocellulose conversions. Systematic studies along these lines contribute to our understanding of microbial communities and physiological processes involved in carbon cycling in forest systems. The investigations also identified novel enzymes of potential value in plant cell wall bioprocessing.

本講演は、大学院総合化学院『化学研究先端講義（修士課程選択科目）／  
総合化学特別研究第二（博士後期課程選択科目）』の一部として認定されています。

連絡先：工学研究院応用化学部門 堀 千明 助教（内線：6612）

フロンティア化学教育研究センター



HOKKAIDO UNIVERSITY

# AMBITIOUS LEADER'S PROGRAM

Fostering Future Leaders to Open New Frontiers in Materials Science

Ambitious 物質科学セミナー

## Engineering luminescent supramolecular architectures: lights, camera, action!

**Prof. Matteo Mauro**

Institute Le Bel, University of Strasbourg, France

平成 29 年 11 月 9 日 (木) 16:30~18:00

北海道大学 理学部 7号館 219



Nowadays, the possibility to precisely control functional architectures with long-range order at the nano- and micro-meter scale is a challenging research topic. In this respect, self-assembly through weak non-covalent interactions has been shown to provide a way to organize molecules in supramolecular structures with properties superior to common bulk materials. In the first part of the talk, luminescent dinuclear Re(I) complexes that are able to self-assemble in aqueous environment into soft nanostructures will be presented.[1] In the second part, a class of platinum(II) complexes featuring metallophilic interactions will be discussed.[2] Such molecules are able to self-assemble into highly luminescent supramolecular fibers that show linearly-polarized light excitation and emission from an excited state with triplet metal-metal-to-ligand charge transfer (3MMLCT) character.[3] On the other hand, when such class of platinum complexes are decorated with chiral pendants, the corresponding self-assembled structures display interesting chirality transfer features with opposite helicity.[4] Furthermore, their self-assembly ability have been employed for unraveling evolution of complex biomimetic assembly processes *in* and *out* of the thermodynamic equilibrium in real-time (Fig. 1).[5] Finally, taking advantage of the presence of the ground-state 1MMLCT band their application as longlived and highly emissive bio-imaging labels *in vitro* that can be easily excited in the visible region will be demonstrated.[6]



新学術領域研究

ソフトクリスタル

高秩序で柔軟な応答系の学理と光機能

本講演は、大学院総合化学院『化学研究先端講義／総合化学特別研究第二』の一部として認定されています。

連絡先：北海道大学大学院理学研究院化学部門 加藤 昌子

(Tel: 011-706-3817, Mail: mkato@sci.hokudai.ac.jp)







総合化学院・フロンティア化学教育研究センター学術講演会

# New strategies for chemical synthesis: from C-H activation to protein functionalization

Gaunt 教授は有機化学反応の開発、触媒開発などで卓越した業績をあげている気鋭の研究者です。今回、大塚製薬株式会社との学術交流を目的として来日されるのを機に、北海道大学と英国ケンブリッジ大学の大学間交流促進のため本学を訪問されます。

本学術講演会では、「有機合成新手法の開発」から「たんぱく質の化学修飾」に至るまで、最新の成果を幅広く解説して頂く予定です。

多数のご来場をお待ち申し上げます。

講演者：

**Professor Matthew Gaunt**

Department of Chemistry,

University of Cambridge, UK



日時

**2017年11月30日(木)**

**16:00-17:30**

場所

**北海道大学理学部 5号館大講堂**

本講演は、大学院総合化学院『化学研究先端講義（修士課程選択科目）／総合化学特別研究第二（博士後期課程選択科目）』の一部として認定されています。

主催：理学研究院（総合化学院） 共催：フロンティア化学教育研究センター

問合せ先：北海道大学大学院理学研究院 化学部門（有機金属化学研究室） 澤村正也教授（内線：3434）

Email: sawamura@sci.hokudai.ac.jp



## Physical biochemistry of disease



Dr. Damien Hall

(Associate Professor (Specially Appointed) at Osaka University, Institute for Protein Research/ANU  
– Level C Academic (Group Leader) Australian National University, Research School of Chemistry)

2018年3月28日(水) 15:00–16:00

創成科学研究棟4階 セミナー室C

<http://www.cat.hokudai.ac.jp/access.html>

My research program involves the application of physical chemistry / biophysics type theoretical and experimental approaches to the study of three disease states (i) cancer, (ii) virus infection, and (iii) amyloidosis proteopathies. In this talk a brief introductory survey of these three areas will be made before focussing on recent research progress related to the amyloidosis diseases.

Month/Date/Year

10/1/13 – Present: The Australian National University, Research School of Chemistry  
Level C Academic – (Group Leader – Full time)

04/01/15 – 09/30/18: Osaka University, Institute for Protein Research

Specially Appointed Associate Professor (Adjunct Staff – 6 months per year)

04/01/18 – 03/31/19: Osaka University, Institute for Protein Research

Guest Associate Professor



問合せ先: 触媒科学研究所・中野 環 ([tamaki.nakano@cat.hokudai.ac.jp](mailto:tamaki.nakano@cat.hokudai.ac.jp)・011-706-9155)