For favour of posting

The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Professor Anant Ramakant Kapdi
Department of Chemistry
Institute of Chemical Technology
India

Title: Phosphatriazenes: Versatile Ligands for Bio-active Molecules Modification via Sustainable Palladium Catalysis

<< Abstract >>

Functionalization of nucleoside heterocycles by transition metal catalysed cross-coupling reactions are important tools to prepare modified nucleoside analogues. Palladium-catalyzed cross-coupling reactions are powerful methods to attach carbon (hetero) atom groups to the heterocyclic base. These nucleoside analogues after modification show high fluorescence and biological activity. The 1st generation palladium complexes allowed the modification of nucleosides in water as the sole reaction solvent for all 4 nucleosides at relatively low catalyst loading. Despite achieving the desired reactivity with the 1st generation catalytic system, column-free isolation of the products or recyclability of the catalyst was not possible. A rational ligand design was therefore needed for the development of 2nd generation Phosphatriazene-based ligands which allowed us to achieve the above objectives. The efficiency of the 2nd generation has also allowed the development of low temperature protocols for accessing useful heteroarenes as well as drugs.

Date: January 8, 2019 (Tuesday)

Time: 2:30 p.m.

Venue: L3, Science Centre

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Contact Person:
Prof. Michael F.Y. Kwong

For favour of posting

The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Professor Minh Le
Department of Biomedical Sciences
City University of Hong Kong

Title: Hanessing extracellular vesicles from red blood cells for a novel RNA drug delivery platform

Date: January 9, 2019 (Wednesday)

Time: 10:30 a.m.

Venue: L5
Science Centre

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Contact Person:
Prof. Jiang Xia

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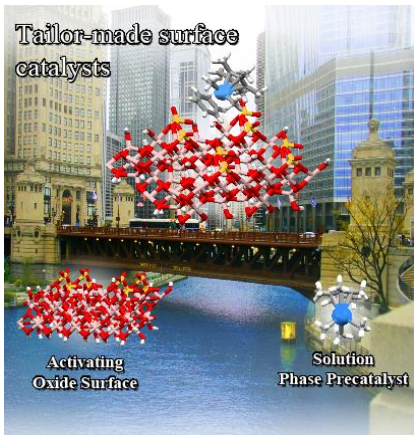
The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Professor Tobin J. Marks
Department of Chemistry
Northwestern University

Title: Surface Science Meets Homogeneous Catalysis. Surfaces as Activators and Ligands

<< Abstract >>

When chemisorbed upon certain surfaces, the reactivity of many types of organometallic molecules is dramatically enhanced in ways that historically have been poorly understood. High activities for a variety of catalytic reactions are illustrative consequences of this altered reactivity. This lecture focuses on the intricate non-covalent and covalent multi-center interactions that modulate these catalytic processes, focusing primarily on polymerization and hydrogenation/dehydrogenation processes. Specific interrelated topics include: 1) Catalytic chemistry of mononuclear and multinuclear d^0 catalysts anchored on/activated by surfaces versus those in homogeneous solution, 2) Catalytic chemistry and cooperativity effects in multinuclear groups 4 and 6 catalysts in homogeneous solution, 3) Definitive structural characterization of these catalysts on "super-acidic" oxide surfaces, and the broad scope of their catalytic properties, 4) Unusual catalytic chemistry of group 6 dioxo complexes adsorbed on activated carbon surfaces. It will be seen that the information obtained from these studies leads to design rules for next-generation homogeneous and supported catalysts, and for novel and useful polymerization and hydrogenation/-dehydrogenation processes, including the catalytic detoxification of gasoline, stereoselective aromatics hydrogenation, biofeedstock trans-esterification, and bio-alcohol dehydrogenation.



Date: January 21, 2019 (Monday)

Time: 4:30 p.m.

Venue: L1, Institute of Chinese Studies

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Contact Person:
Prof. Zuowei Xie

For favour of posting

The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Professor Peng Yang
School of Chemistry and Chemical Engineering
Shaanxi Normal University

Title: Amyloid-Inspired Protein Assembly and Interfacial Materials

Date: January 22, 2019 (Tuesday)

Time: 3:00 p.m.

Venue: L3, Science Centre

< Abstract >

The development of versatile materials and engineering devices requires multifunctional conformal coatings that gains increasing interests. However, few methods can achieve a stable, large-area and colorless coating on substrates with different structure, composition and shapes. We report the one-step aqueous coating of virtually arbitrary material surfaces using self-assembled macroscopic bionanofilm made by pure lysozyme. The unfolding and subsequent phase transition of commercially available lysozyme initiates the spontaneous formation of amyloid-like nanofilm at a vapor/liquid or liquid/solid interface with a macro-scale size (e.g. 20 inches) and shape in a few minutes. The attachment of the nanofilm onto various surfaces could be accordingly achieved by the amyloid-mediated adhesion. In this talk, our newest understanding on the assembly and adhesion mechanism for such a new biomaterial would be addressed including the first example on macromolecular mesocrystals and novel amyloid-like biomaterials with excellent biocompatibility and multi-functions towards biointerface, micro/nano-fabrication and so on [1-5].

References:

1. F. Yang, F. Tao, C. Li, P. Yang*, *Nature Commun.* in press.
2. R. Qin, Y. Liu, F. Tao, C. Li, W. Cao, P. Yang*, *Adv. Mater.* **2018**, in press.
3. R. Liu, J. Zhao, Q. Han, X. Hu, D. Wang, X. Zhang, P. Yang*, *Adv. Mater.* **2018**, 30, 1802851.
4. F. Tao, Q. Han, K. Liu, P. Yang*, *Angew. Chem. Int. Ed.* **2017**, *56*, 13440.
5. C. Yue, H. Sun, W.-J. Liu, B. Guan, X. Deng, X. Zhang, P. Yang*, *Angew. Chem. Int. Ed.* **2017**, *56*, 9331-9335.
6. D. Wang, Y. Ha, J. Gu, Q. Li, L. Zhang, P. Yang*, *Adv. Mater.* **2016**, *28*, 7414-7423.
7. A. Gao, Q. Wu, D. Wang, Y. Ha, Z. Chen, P. Yang*, *Adv. Mater.* **2016**, *28*, 579-587.

Prof. Peng Yang obtained his Ph.D degree at Beijing University of Chemical Technology (BUCT) in 2006 under the supervision of Prof. Wantai Yang. After that, he finished his postdoctoral study in Max-Planck-Institute of Colloids and Interfaces, Duke University, and University of Tokyo. In 2012, he joined School of Chemistry and Chemical Engineering at Shaanxi Normal University as a Professor of Physical Chemistry and Polymer. His research interests include functional surfaces and interfaces, protein assembly, interfacial materials and green techniques for metal recovery from ore and waste. Prof. Yang is currently an Editorial Board member for Advanced Composites and Hybrid Materials (Springer) and Guest Editor for Colloids and Interface Science Communications (Elsevier).

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Contact Person:
Prof. To Ngai

For favour of posting

The Chinese University of Hong Kong

Department of Chemistry

第十二屆中國科學院院士系列講座

Speaker: (1) Professor Tan Weihong 譚蔚泓 院士

(2) Professor Guo Zijian 郭子建 院士

Title: (1) The Foundation of Molecular Medicine: A Chemical Biology Approach

(2) Chemical Biology of Metals and Metallodrugs

Date: January 23, 2019 (Wednesday)

Time: 4:30 p.m.

Venue: TY Wong Hall (5/F, Ho Sin Hang Engineering Building)
王统元堂 何善衡工程學大樓 5 樓

(Talks will be delivered in English)

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Contact Person:
Prof. Jiang Xia

化學部　譚蔚泓院士

分析化學和化學生物學專家。湖南大學教授。1960 年 5 月生於湖南省益陽市，籍貫湖南益陽。1982 年畢業於湖南師範大學，1985 年在中國科學院山西煤炭化學研究所獲碩士學位，1993 年在美國密西根大學獲博士學位。2015 當選為中國科學院院士。

長期從事生物分析化學和化學生物學的研究和教學工作，解決了分析化學與生物醫學交叉領域中的一些關鍵科學問題，在國際生物分析化學領域有著重要的影響。他在核酸適體、分子識別、納米生物傳感等領域做了大量系統的原創性工作。提出核酸適體細胞篩選新方法，揭示其細胞識別的基本性質；提出多種高靈敏、高時空分辨納米生物傳感方法，對生物分析化學的發展做出重要貢獻。曾獲國家自然科學二等獎。

講題：The Foundation of Molecular Medicine: A Chemical Biology Approach

摘要：A full understanding of the molecular basis of diseases depends on the development of molecular probes able to recognize disease targets of interest. Until very recently, such tools have been absent from the clinical practice of medicine. The newest molecular probe, and one that holds most promise, is a new class of designer nucleic acids, termed aptamers, which are single-stranded DNA/RNA able to recognize specific targets, such as single proteins and even small molecules. Recently, we applied a simple, fast and reproducible cell-based aptamer selection strategy called Cell-SELEX which uses whole, intact cells as the target for aptamer selection. This selection process then generates multiple aptamers for the specific recognition of biological cells, but without the need for prior knowledge about the signature of target cell-surface molecules. The selected aptamers have dissociation constants in the nanomolar to picomolar range. Thus far, we have selected aptamer probes for many different diseases, and used them to carry out studies at the vanguard of biomedical science, including ultrasensitive detection of tumors, molecular imaging, targeted drug delivery, and, most critically, cancer biomarker discovery. Taken together, these molecular level tools form a solid scientific platform from which to pursue advanced studies in molecular medicine. We will report our most recent progress in this exciting research area, especially in molecular engineering, nanomedicine and molecular elucidation of cancer biomarkers and theranostics.

化學部　郭子建院士

化學生物學家。1961 年 10 月出生于河北河間市，河北滄州人。1982 年畢業於河北農業大學，1994 年在義大利帕多瓦大學獲博士學位。現任南京大學配位元化學國家重點實驗室學術委員會副主任，Coord Chem Rev 副主編。2017 年當選為中國科學院院士。

主要從事金屬及其配合物的化學生物學研究。設計構築了系列金屬離子螢光探針，建立和發展了相關的體內外螢光成像方法，觀察到離子的遷移和富集現象。探索了金屬抗腫瘤藥物反應性能及活性差異，構建了新型鉑類藥物靶向傳輸體系。發展了系列基於銅配合物的人工核酸?，研究了它們的構效關係及金屬中心間的協同效應、DNA 斷裂能力及抗腫瘤活性間的關聯等。曾獲義大利化學會 Sacconi 獎章、教育部自然科學獎一等獎等。

講題：Chemical Biology of Metals and Metallodrugs

摘要：金屬離子在生命信號傳遞過程中發揮著不可替代的作用，金屬離子信號物種的變異與多種疾病相關。以鋅離子為例，由於其在神經信號傳遞、轉導和基因轉錄中的關鍵作用以及與其它信號遞質分子的協同效應而備受關注。與此同時，金屬藥物在疾病的診斷與治療中發揮著重要作用。以順鉑為代表的金屬抗腫瘤藥物在臨床中廣泛使用，但其毒性、抗藥性等問題影響了這類藥物的進一步應用。報告將圍繞以上兩個領域展開，重點介紹生命鋅離子探針設計及其體內外成像、新型鉑類抗腫瘤配合物的設計、作用機制及其靶向輸運等方面的研究進展。

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The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Professor Bradley D. Olsen
Department of Chemical Engineering
Massachusetts Institute of Technology

Title: Quantifying Molecular Defects and Relaxations in Polymeric Networks

Date: January 24, 2019 (Thursday)

Time: 10:30 a.m.

Venue: LT2, Lady Shaw Building

<< Abstract >>

The design of polymer networks is one of the oldest and most important challenges in chemistry, impacting many of the highest volume chemical industries from rubber to adhesives to biomedical materials. However, more than any other branch of materials, networks have resisted precise characterization. This leaves many open challenges in understanding how their chemical design is linked to their physical properties of relevance for applications such as food science, biomedical materials, and consumer products. This lecture will discuss recent advances in our understanding of polymer networks held together by chemical and/or physical bonds and how this is leading to new advances in the design and application of these materials. We will show how new theories of topological defects in polymer networks can be used to more effectively characterize their chemistry and mechanics, including predictions of gel point, network topology, and linear mechanical properties. These new efforts, validated by experimental measurement, provide for predictive design of many different polymer gel and elastomer properties. Furthermore, they provide interesting new insight into the complex fundamental physics of polymer networks.

Prof. Bradley Olsen an Associate Professor in the Department of Chemical Engineering at MIT. He earned his S.B. in Chemical Engineering at MIT, his Ph.D. in Chemical Engineering at the University of California – Berkeley, and was a postdoctoral scholar at the California Institute of Technology. He started as an assistant professor at MIT in December 2009. Prof. Olsen's research expertise is in materials chemistry and polymer physics, with a particular emphasis on molecular self-assembly, block copolymers, polymer networks and gels, and protein biomaterials. He is a member of the ACS, APS, AIChE, and a fellow of the ACS POLY division.

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Contact Person:
Prof. Chi Wu

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The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Professor Masaya Sawamura
Department of Chemistry
Hokkaido University
Japan

Title: Non-covalent Interactions in Enantioselectve C–H Transformations

Date: January 24, 2019 (Thursday)

Time: 2:30 p.m.

Venue: Room C2
Lady Shaw Building

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Contact Person:
Prof. Michael F.Y. Kwong

For favour of posting

The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Professor Bradley D. Olsen
Department of Chemical Engineering
Massachusetts Institute of Technology

Title: Where Do Our Materials Come From, and Where Do They Go?

Date: January 25, 2019 (Friday)

Time: 4:30 p.m.

Venue: L1, Science Centre

<< Abstract >>

Periods in the development of human history have traditionally been defined based on the source for materials used in human society, such as the stone, bronze, and iron ages. Today, we live in the age of plastics, which are critical to our food security, health care, transportation, housing, and clothing. However, there is growing recognition that the large volume of plastics used is having an extreme environmental impact through the accumulation of waste in the environment. This has triggered a variety of changes in societies, including both regulation and a search for more sustainable alternatives, including both recycling and innovation in new materials. This talk will discuss two such efforts, one in the area of recycling tires, and a second in the area of the development of new polyurethane-like materials where the urethane blocks are replaced by proteins from waste biomass. In both cases, new chemistry and materials science to enable materials synthesis will be highlighted, and the sustainability of such processes in the context of a green economy will be discussed.

Prof. Bradley Olsen an Associate Professor in the Department of Chemical Engineering at MIT. He earned his S.B. in Chemical Engineering at MIT, his Ph.D. in Chemical Engineering at the University of California – Berkeley, and was a postdoctoral scholar at the California Institute of Technology. He started as an assistant professor at MIT in December 2009. Prof. Olsen's research expertise is in materials chemistry and polymer physics, with a particular emphasis on molecular self-assembly, block copolymers, polymer networks and gels, and protein biomaterials. He is a member of the ACS, APS, AIChE, and a fellow of the ACS POLY division.

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Contact Person:
Prof. Chi Wu

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The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Professor Duo Wu
College of Chemistry, Chemical Engineering and Materials Science
Soochow University

Title: Uniform Functional Microparticles Tailored by Micro-Fluidic Spray Granulation Technology

Date: January 30, 2019 (Wednesday)

Time: 2:30 p.m.

Venue: Room 158, Science Centre

< Abstract >

Particles in micrometer size have served a variety of applications, including those in drug delivery and controlled release, enzyme immobilization, adsorption and segregation, catalysis, etc. To perform these and other functions, microparticles are preferably of uniform and well-controlled properties, e.g. size, morphology, texture, density, flowability, wettability, re-dissolubility, etc. We have recently reported a specially designed micro-fluidic spray granulation technology (MFSGT), i.e. micro-fluidic spray dryer and spray freeze tower, which provides a scalable and efficient means to produce uniform microparticles with tailored characteristics and functionalities. This talk will introduce the key instrument and processing design of the MFSGT. A few case studies will be highlighted, especially on particle formation mechanism and structure-activity relationship, as well as the potential applications in the field of microencapsulated biomaterials, hierarchical porous adsorbents, and super-dispersed catalysts.

Prof. Duo (Winston) Wu obtained B.Eng. in Metallurgical Engineering at Central South University (2005), M.Eng. in Biomedical Engineering at The University of Melbourne (2007), and Ph.D. (2010) and Postdoctoral research training in Chemical Engineering at Monash University until early 2013, when he joined Soochow University. Winston's research has mainly focused on functional particle micro/nanostructure design and manipulation, innovative spray granulation technology and product development in the field of Biochemical and Environment Engineering. He has published over 50 peer-reviewed journal papers and applied for 20 patents. Since 2015 as PI Winston has been undertaking 6 government funded research projects and 4 R&D projects with industry partners, with total funding of more than 10 million RMB. In 2017, four successfully developed new products has help cooperated enterprise increase the revenue by more than 100 million RMB with new profit of over 22 million RMB.

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Contact Person:
Prof. To Ngai