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Department of Chemistry
The University of Hong Kong

Hong Kong International Symposium on Synthetic Chemistry and Interdisciplinary Research

14-15 March 2026

Co-organised by

Department of Chemistry
The University of Hong Kong

State Key Laboratory of Synthetic Chemistry
合成化学 全国重点实验室

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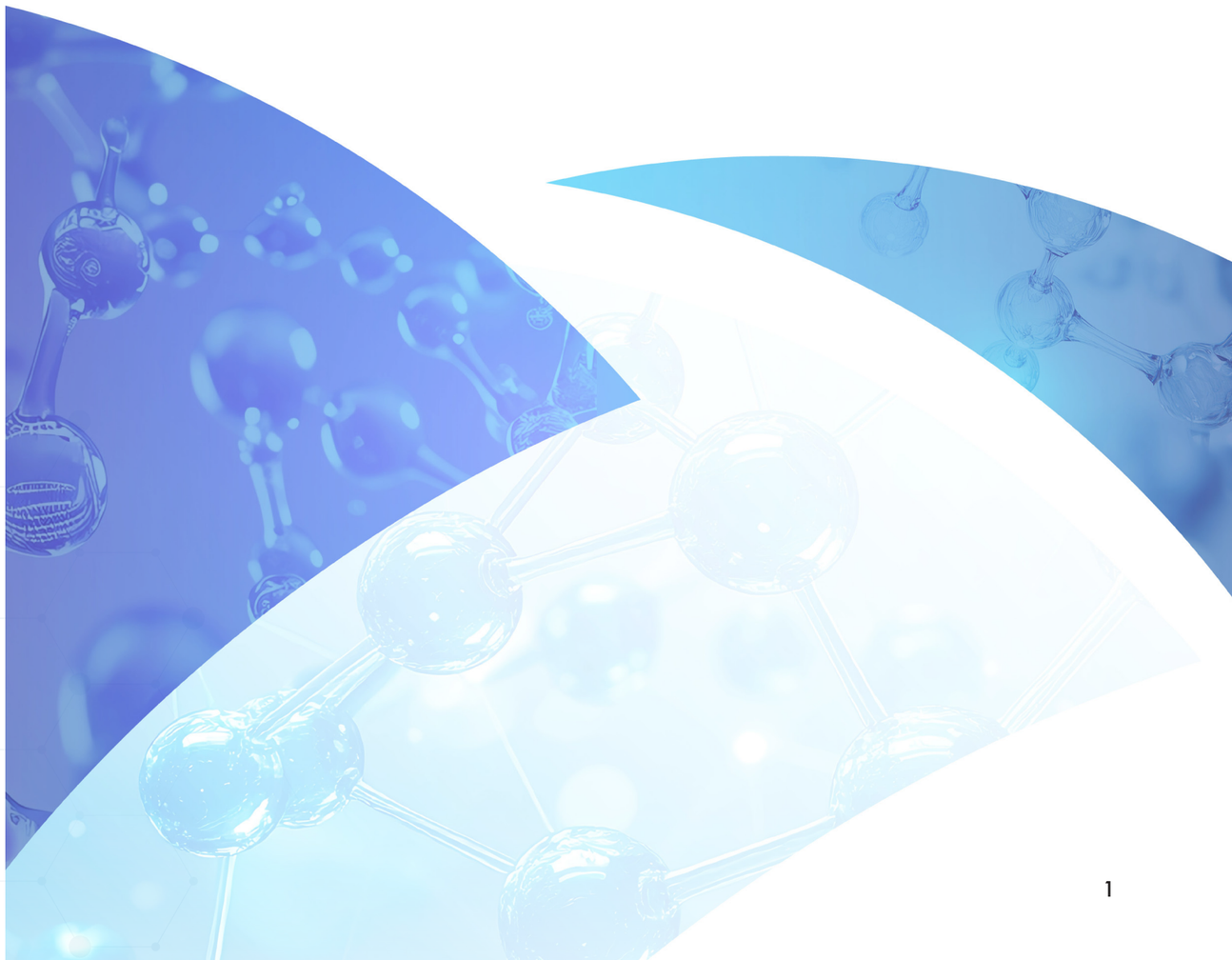
化學系
Department of Chemistry

About the Symposium

Synthetic chemistry is fundamental to many areas that matter to national development, from innovative drugs and fine chemicals to advanced materials for energy, electronics, and manufacturing. It provides reliable routes to key molecules and materials, while offering practical ways to reduce cost, waste, and environmental burden. The Hong Kong International Symposium on Synthetic Chemistry and Interdisciplinary Research aims to bring together experts from interdisciplinary areas grounded in synthetic chemistry, and to foster collaborations that translate new chemistry into solutions with real-world impact. It will also be an excellent opportunity for students and early-career researchers to broaden their scientific horizons.



Day 1 14 March 2026

8:30 – 8:50 **Registration**

9:00 – 9:15 **Welcome Remarks**

Opening Remarks

Prof. Chi-Ming CHE
Academician, Chinese Academy of Sciences
Chair, The Organising Committee for the Hong Kong International Symposium on Synthetic Chemistry and Interdisciplinary Research

9:15 – 9:20 **Photo Session**

9:20 – 10:05 Keynote Speech: Novel Synthetic Methods Using Photochemistry and Photocatalysis

Prof. Daniele LEONORI
W3 Professor and Chair of Organic Chemistry, RWTH Aachen University

10:05 – 10:30 Invited Lecture: Design and Application of Chiral Spirocycles

Prof. Jianwei SUN
Chair Professor, Department of Chemistry, The Hong Kong University of Science and Technology

10:30 – 10:55 Invited Lecture: Chan-Lam Coupling in Organosulfur Chemistry

Prof. Tiezheng JIA
Zhufeng Professor, School of Medicine and Pharmacy, Ocean University of China

10:55 – 11:15 **Coffee Break**

11:15 – 11:40 Invited Lecture: Studies Towards the Total Synthesis of (–)-Tubingensin B

Prof. Pauline CHIU
Professor (Associate Vice-President of Teaching and Learning), The University of Hong Kong

11:40 – 12:05 Invited Lecture: Recent Advances in Regioselective Aliphatic C–H Amidation: Interplay between Inner- and Outer-Sphere Pathway for Nitrene Cross-Coupling Reactions

Prof. Wing-Yiu YU
Professor, Department of Applied Biology and Chemical Technology, The Hong Kong Polytechnic University

12:05 – 12:45 Keynote Speech: σ-Dopants for Conjugated Polymers

Prof. Jian PEI
Chang Jiang Scholar Distinguished Professor, College of Chemistry and Molecular Engineering, Peking University

12:45 – 14:40 **Lunch Break**

14:40 – 15:05 Invited Lecture: Structure and Reactivity of Versatile Boron Anions

Prof. Zhenpin LU
Assistant Professor, Department of Chemistry, City University of Hong Kong

15:05 – 15:30 Invited Lecture: Controlling Electron Transfer by Spatiotemporal Separation and Proton Coupling

Prof. Jianchun WANG
Associate Professor, Southern University of Science and Technology

15:30 – 15:55 Invited Lecture: Decoding the Cryptic Chemistry of Microbiota for Drug Discovery

Prof. Yongxin LI
Associate Professor, Department of Chemistry, The University of Hong Kong

15:55 – 16:15 **Coffee Break**

16:15 – 16:40 Invited Lecture: Exploration of C-P Bond Formation for the Assembly of Chiral Phosphorus Compounds

Prof. Jun WANG
Professor, Department of Chemistry, Hong Kong Baptist University

16:40 – 17:05 Invited Lecture: Role of Proton in Electrochemical CO_2 Reduction Reaction in Acid

Prof. Ying WANG
Associate Professor, The Chinese University of Hong Kong

17:05 – 17:45 Keynote Speech: Iron-based Catalysts for Syngas Conversion Reaction

Prof. Ding MA
Academician, Chinese Academy of Sciences
Professor, College of Chemistry and Molecular Engineering, Peking University

Day 2 15 March 2026

9:00 – 9:40 Keynote Speech: When Replication Meets a Poison: Single-Molecule Views of Topoisomerase II-DNA-Drug Collisions

Prof. Hung-Wen LI
Chair and Distinguished Professor, Department of Chemistry, National Taiwan University

9:40 – 10:05 Invited Lecture: New Adventures in Silicon-Stereogenic Silane Chemistry

Prof. Chuan HE
Associate Professor, Department of Chemistry, Southern University of Science and Technology

10:05 – 10:30 Invited Lecture: Development of New Chemoproteomics and Cysteine Chemistry for Targeted Cancer Therapy

Prof. Clive Yik-Sham CHUNG
Assistant Professor, School of Biomedical Sciences and Department of Pathology, The University of Hong Kong

10:30 – 10:50 **Coffee Break**

10:50 – 11:15 Invited Lecture: Binary Active-Passive Colloidal Crystals

Prof. Yufeng WANG
Associate Professor, Department of Chemistry, The University of Hong Kong

11:15 – 11:55 Keynote Speech: Angle Control and Synergistic Promotion Strategies in Asymmetric Catalysis

Prof. Wanbin ZHANG
Academician, Chinese Academy of Sciences
K. C. Wong Chair Professor, Shanghai Jiao Tong University

Speakers

Pauline CHIU

Professor (Associate Vice-President of Teaching and Learning)
The University of Hong Kong

Pauline Chiu was born in Hong Kong and grew up in Toronto, Ontario, Canada. She completed her B.Sc. (Honours) in Chemistry at the University of Toronto, then joined the laboratory of the late Prof. Adrian Brook to obtain her M.Sc. in 1990 researching on the chemistry of silenes. She pursued her Ph.D. under the supervision of Prof. Mark Lautens at the same university in 1990-1994, working on the organometallic transformations of oxabicyclic compounds. Following postdoctoral work on the total synthesis of gelsemine with Prof. Samuel J. Danishefsky at Columbia University in 1994-1995, she started her independent career at the Department of Chemistry in the University of Hong Kong, where she has been Professor in organic chemistry since 2011.

Pauline has served in a number of administrative roles, including Associate Dean of Teaching and Learning, and Interim Dean of the Faculty of Science at HKU. She has been on the Board of the RSC journal *Organic and Biomolecular Chemistry* (2010-2015), the monograph *Strategies and Tactics in Organic Synthesis* (2014-2021), and *Organic Letters (2018-2024)* as Associate Editor. She is the first from Hong Kong to be elected to the Board of Editors for *Organic Syntheses* in 2021. She is also a Committee Member of Division of Organic Chemistry, Chinese Chemical Society (2022-2026). Since 2022, she has been Associate Vice-President of Teaching and Learning at The University of Hong Kong.

Title & Abstract

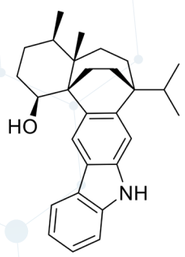
Studies Towards the Total Synthesis of (–)-Tubingensin B

Yun He, Ruby Chan, and Pauline Chiu

Department of Chemistry and the State Key Laboratory of Synthetic Chemistry, The University of Hong Kong, Pokfulam Road, Hong Kong

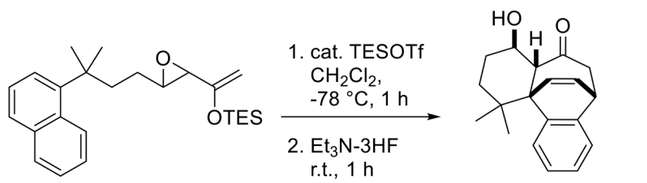
Email: pchiu@hku.hk

(–)-Tubingensin B was isolated from the fungus *Aspergillus tubingensis* in 1989. It possesses a bicyclo[3.2.2]nonane core, which is fused to a six-membered ring and carbazole unit. Five stereogenic centers, including three that are quaternary, make the synthesis challenging. Garg's group completed the first and the only total synthesis of tubingensin B in 2017.



Tubingensin B
anti-viral, cytotoxic

We present our explorations on a new synthetic strategy toward this natural product that employs as the key reaction, an intramolecular **(4+3) cycloaddition** that results in the **dearomatizations of benzenoids,** to build the polycyclic framework. We will also present fundamental computational studies on the (4+3) cycloadditions involving epoxy enolsilanes, to explain the rather unexpectedly facile dearomatizing reaction that engages benzenoids as dienes in the cycloaddition.



Clive Yik-Sham CHUNG

Assistant Professor
The School of Biomedical Sciences and Department of Pathology
The University of Hong Kong

Prof. Clive Yik-Sham Chung is an Assistant Professor in the School of Biomedical Sciences and Department of Pathology at The University of Hong Kong (HKU). He is also an associate member of State Key Laboratory of Liver Research at HKU and a project team leader (Medicinal Chemistry and Drug Development) in the Centre for Oncology and Immunology. He obtained his BSc in chemistry and PhD under the supervision of Prof. Vivian Yam at HKU. He then conducted postdoctoral studies with Prof. Chi-Ming Che on inorganic medicines, Prof. Christopher Chang on molecular imaging and Prof. Daniel Nomura on chemoproteomics. Since 2020, he established his own laboratory at HKU, focusing on the following research areas: (1) development of chemoproteomic probes to identify new druggable hotspots (Nat Commun, 2023); (2) integration of chemoproteomics and protein structure-guided discovery to identify therapeutic covalent ligands for targeted therapy (Sci Transl Med, 2025; Cell Chem Biol, 2025); (3) development of chemical probes capable of molecular imaging and chemoproteomics to study cellular redox biology (Nat Commun, 2023; RSC Chem Biol 2024); (4) establishing new cysteine chemistry to develop next-generation therapeutic modalities. He has 22 awarded/pending patent applications, with 1 licensing. His research has been recognized by the Faculty Outstanding Research Output Award (LKS Faculty of Medicine, HKU, 2023), 2024 RSC Chemical Biology Emerging Investigators, and State Key Laboratory of Liver Research Young Researcher Award (HKU, 2025).

Title & Abstract

Development of New Chemoproteomics and Cysteine Chemistry for Targeted Cancer Therapy

Many cancer targets remain undrugged due to the absence of deep pockets for small-molecule binding. To address this challenge and uncover new opportunities for targeting these important cancer proteins, chemoproteomics has emerged as a powerful approach for identifying reactive amino acids on proteins, which can serve as hotspots for small-molecule binding. In particular, reactive cysteine residues on oncoproteins have been successfully exploited by covalent drugs, with inhibitors of EGFR, BTK, and KRAS G12C as notable examples. Recently, my lab developed a novel chemoproteomic probe, NAIA, which enables the discovery of previously untargetable cysteines in cancer samples. By integrating the probe into an activity-based protein profiling (ABPP) platform, we successfully identified a novel covalent ligand, CL76, which targets proteasome assembly for cancer treatment. In addition, by integrating protein structure-guided discovery with chemoproteomics, we can target functional sites on proteins that drive cancer metastasis and plasticity, both of which are cancer hallmarks. Furthermore, we have developed a novel cysteine chemistry for specific protein functionalization and engineering, enabling the modular and effective generation of protein-based therapeutics. Together, these results highlight the powerful applications of new chemoproteomics and cysteine chemistry in biomedical studies and drug research.

Chuan HE

Associate Professor
Department of Chemistry
Southern University of Science and Technology

Chuan He received his BS degree in Chemistry from Wuhan University in 2008, after which he studied for a Ph.D. at the same university under the supervision of Prof. Aiwen Lei. In 2013, he joined Prof. Matthew Gaunt's group as a postdoctoral researcher and Marie Curie Research Fellow at the University of Cambridge. In 2018, he started his independent research career at SUSTech.

His current research interests focus on chiral organosilicon and organoboron chemistry, particularly aiming to develop new synthetic methods to expedite the synthesis of silicon-stereogenic silanes and boron-stereogenic compounds, and to explore their applications in asymmetric catalysis, chiral materials, and chiral bio-active molecules.

Since joining SUSTech, he has published more than 50 peer-reviewed papers as a corresponding author, including 1 *Nat. Chem.*, 1 *Nat. Synth.*, 1 *Acc. Chem. Res.*, 2 *CCS Chem.*, 4 *JACS*, 7 *ACIE*, 3 *Nat. Commun. etc.* He has received several highly competitive awards, including Shenzhen Excellent Science and Technology Innovation Distinguished Young Scholar (2023); SUSTech President's Young Research Award (2022) and Young Faculty of the Year Award (2022); Thieme Chemistry Journals Award (2021); NSFC Outstanding Young Scholar (2021); Guangdong Province Pearl River Youth Talent (2020); National Specially Appointed Young Expert (2018) and so on.

Title & Abstract

New Adventures in Silicon-Stereogenic Silane Chemistry

Chuan He
Department of Chemistry, Southern University of Science and Technology
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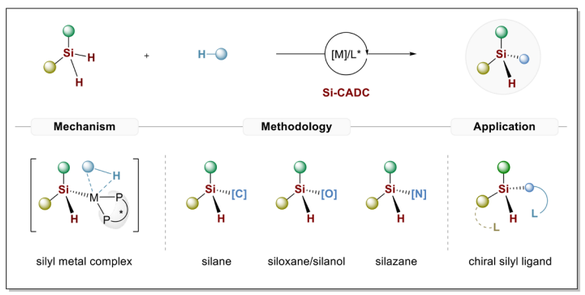
While carbon-centered chiral compounds have been extensively investigated, the chemistry of silicon-stereogenic silanes remains significantly underdeveloped. The stereoselective construction of enantioenriched organosilanes bearing silicon stereocenters presents a formidable challenge, attributed to silicon's unique physicochemical characteristics. Over the past six years, our team has developed a series of **C**atalytic **A**symmetric **D**ehydrogenative **C**oupling reactions towards **Si**-stereogenic silanes (**Si-CADC**) with high efficiency.[1] This general Si-CADC strategy establishes a versatile platform for accessing diverse silicon-stereogenic architectures, addressing longstanding limitations in enantiocontrol, synthetic practicality, and scalability.[2] The demonstrated efficacy of Si-CADC not only advances fundamental chiral organosilicon chemistry but also unlocks potential applications in asymmetric catalysis, functional materials, and pharmaceutical development.



Keywords: Si-Stereogenic Silanes; Organosilicon Chemistry; Asymmetric Catalysis; Si-CADC

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Tiezheng JIA

Zhufeng Professor
School of Medicine and Pharmacy
Ocean University of China

Dr. Tiezheng Jia earned his Bachelor and Master of Pharmacy under the supervision of Professors Qianqun Gu and Weiming Zhu from Ocean University of China (OUC). He then pursued his Ph.D. in organic chemistry at University of Pennsylvania advised by Professor Patrick Walsh. Subsequently, he conducted postdoctoral research of chemical biology with Professor Peter Dervan at California Institute of Technology. In 2017, he joined the Department of Chemistry at Southern University of Science and Technology as an assistant professor, and was promoted to associate professor with tenure in 2023. In 2025, he moved back to School of Medicine and Pharmacy at OUC as a Zhufeng Professor. His research focuses on sulfur chemistry, DNA recognization, and biomolecule-compatible methodologies. He has been awarded the Thieme Chemistry Journal Award (2022) and Shenzhen Peacock Program (2018), and has been serving as the member of Editorial Board of *Organic Letters* since 2023.

Title & Abstract

Chan-Lam Coupling in Organosulfur Chemistry

Ever since established thirty years ago, Chan-Lam coupling has emerged as a powerful tool to construct C-N, C-O and C-S bonds in both academia and industry due to its mild and simple conditions as well as the broad substrate scope. However, limited attention has been devoted to this useful protocol from the standpoint of methodology development, since Chan-Lam coupling is considered to be "too simple". Our group has exploited two new paradigms of Chan-Lam coupling under external-oxidant-free conditions, which allow us to apply them as an efficient tool to realize late-stage functionalization of complex drug molecules as well as to tag protein under biomolecule-compatible conditions. In addition, Chan-Lam coupling of sulfenamides (R^1-N-S-R^2) has been developed in chemoselective fashion to afford *N*-aryl sulfenamides via C-N formation or sulfilimines via C-S bond formation. A combined experimental and computational study has been performed by our group and collaborators to shed light on the reaction mechanisms, and an array of spectroscopic methods, such as EPR, have been used to investigate the dynamic behaviors of catalysts and intermediates.

References:

[1] Liang, Q.[#]; Zhang, X.[#]; Rotella, M. E.[#]; Xu, Z.; Kozlowski, M. C.*; **Jia, T.*** *Nat. Catal.* **2024**, *7*, 1010.
[2] Han, K.[#]; Liu, H.[#]; Rotella, M. E.[#]; Xu, Z.; Tao, L.; Chen, S.*; Kozlowski, M. C.*; **Jia, T.*** *Nat. Comm.* **2024**, *15*, 4747.
[3] Liang, Q.[#]; Wells, L. A.[#]; Han, K.; Chen, S.; Kozlowski, M. C.*; **Jia, T.*** *J. Am. Chem. Soc.* **2023**, *145*, 6310.
[4] Meng, T.[#]; Wells, L. A.[#]; Wang, T.; Wang, J.; Zhang, S.; Wang, J.; Kozlowski, M. C.*; **Jia, T.*** *J. Am. Chem. Soc.* **2022**, *144*, 12476.

Daniele LEONORI

W3 Professor and Chair of Organic Chemistry
RWTH Aachen University

Daniele obtained his PhD in Organic Chemistry from the University of Sheffield (UK), and did postdocs with Magnus Rueping and Peter Seeberger. He then joined the group of Prof. Varinder K. Aggarwal (University of Bristol) as a Research Officer. Daniele began his independent academic career at the University of Manchester in 2014 as a Lecturer, was promoted to Reader in 2018, and to Professor in 2020. In 2022, he was appointed W3 Professor and Chair of Organic Chemistry at RWTH Aachen University. Research in the Leonori group focuses on the development of novel synthetic methodologies based on radical and photochemical strategies.

Title & Abstract

Novel Synthetic Methods Using Photochemistry and Photocatalysis

Daniele Leonori
Institute of Organic Chemistry, RWTH Aachen University, Aachen, Germany
Email: daniele.leonori@rwth-aachen.de

In this presentation I will highlight recent work from my group focused on the use of photochemistry and photocatalysis to aid the synthesis of high-value molecules. The presentation will focus on:

Boryl radical reactivity. Amine-ligated boryl radicals are highly reactive open-shell intermediates with significant potential for the synthesis of borylated materials. In this presentation, I will highlight the use of these species for the C(sp^2)–H borylation of azines (e.g., pyridine, quinoline) at positions that are inaccessible via conventional C–H activation methods.[1] Additionally, I will discuss their reactivity with alkenes to form sp^3-hybridized materials.[2] These unique reactivities have led to the development of novel, stable borylated materials with a strong capacity to participate in Suzuki-Miyaura cross-coupling reactions. Furthermore, I will present our recent work demonstrating the ability of amine-ligated boryl radicals to activate organic halides via halogen-atom transfer (XAT), and how this strategy can be integrated with nickel and copper catalysis for broader couplings involving aryl halides, aryl boronic acids, and amides.[3]

Photoexcited nitroarenes. Nitroaromatics are widely available feedstocks that are routinely used for the preparation of anilines upon reduction. I will present our most recent work that demonstrates how these species can be used, upon blue light irradiation, to promote the ozonolysis-style cleave of olefins[4] and also allow preparation of complex and highly functionalised saturated heterocycles.[5] Furthermore, I will present our recent work where modulation of the excited configuration of these species has enabled the currently elusive ozonolysis of aromatics in the presence of olefins.

References:

1. *Nature* **2021**, *595*, 577.
2. *J. Am. Chem. Soc.* **2024**, *146*, 24042.
3. *Nat. Synth.* **2024**, asap. & *J. Am. Chem. Soc.* **2024**, *146*, 22423.
4. *Nature* **2022**, *610*, 81.
5. *Nat. Chem.* **2024**, *16*, 771 & *J. Am. Chem. Soc.* **2023**, *150*, 27810.2.

Hung-Wen LI

Chair and Distinguished Professor
Department of Chemistry
National Taiwan University

Hung-Wen Li is currently the Chair and the Distinguished Professor in the Chemistry Department at National Taiwan University (NTU). He received his B.S. degree from NTU in 1993 and earned his Ph.D. in Chemistry from UC Berkeley in 2000. From 2000 to 2004, he was a Damon Runyon Cancer Research Foundation Postdoctoral Fellow at Brandeis University, where he began applying single-molecule microscopy tools to investigate the mechanisms of DNA enzymes. In 2004, he began his independent career as an assistant professor in the Department of Chemistry at McGill University in Canada. In 2007, he returned to his alma mater, NTU, where he has played a leading role in establishing the single-molecule research community in Taiwan. His research group develops and applies single-molecule techniques to study the assembly of protein-DNA complexes and their regulation. Prof. Li served as the Chair of the reviewing and strategic planning committee for Chemistry at Taiwan's National Science and Technology Council from 2021 to 2023. His honors include the Chemical Biology Lectureship at NTU, the NSTC Outstanding Research Award, the University Excellence Teaching Award, the FAOS Outstanding Young Scholar Award, and the FQRNT New Investigator Award. Most recently, he and his team received the Science Vanguard Research Grant to develop new tools that integrate structural and dynamic views, enabling a deeper understanding of how biological systems function.

Title & Abstract

When Replication Meets a Poison: Single-Molecule Views of Topoisomerase II-DNA-Drug Collisions

DNA topoisomerase prevents DNA entanglement during replication by cleaving and re-ligating DNA to alter DNA topology. Topoisomerase II (Top2) forms a transient cleavage complex in which the enzyme is covalently linked to DNA through two transient phosphotyrosyl bonds at the cleavage site. The anticancer drug etoposide acts as a Top2 inhibitor by stabilizing a ternary complex with Top2 and DNA, thereby blocking the re-ligation step. Encounters between this stabilized Top2-DNA-etoposide ternary complex and other DNA translocating machineries can be highly deleterious, as the complex acts as a physical barrier to replication fork progression. Such encounters may lead to permanent DNA breaks due to the covalent nature of the Top2-DNA linkage, a mechanism thought to underlie the cytotoxic activity of these drugs. Despite their importance, the molecular consequences of these encounters remain poorly characterized. Here, we used single-molecule tethered particle motion experiments to directly visualize collisions between the Top2 ternary complex and DNA polymerase. Surprisingly, we find that the Top2 ternary complex can be removed by DNA polymerases at limited dNTP concentrations. In contrast, at saturating dNTP concentrations, replication stalls at the ternary complex site, consistent with a direct collision. This collision induces a conformational change within the Top2 ternary complex. We further developed single-molecule fluorescence assays to characterize the dynamics of this encounter at the molecular level. Together, these studies provide new insights that may help guide future therapeutic strategies targeting topoisomerases.

Yongxin LI

Associate Professor
Department of Chemistry
The University of Hong Kong

Prof. Yongxin Li received his BS degree from Peking University in 2008 and his PhD degree from the Hong Kong University of Science and Technology in 2014. In fall 2019, Dr. Li joined the Chemistry department at the University of Hong Kong. With a focus on data mining, synthetic biology, and drug discovery, Dr. Li is particularly skilled in the discovery, biosynthesis, and bioengineering of microbial metabolites. Over the years, he and his team have built a strong foundation in the bioinformatics-guided discovery, biosynthesis, and bioengineering of peptide antibiotics. The team's recent key strategy integrates advanced deep-learning methodologies with synthetic biology techniques, unlocking the genetic potential of complex microbiota to explore new bioactive peptides. Further, they are skilled in deciphering the complex chemical "dialogue" that occurs in microbial interactions. This capability allows them not only to discover new antimicrobials but also to develop probiotic systems that can interrupt pathogenic networks or manipulate host immunity.

He received the prestigious Young Peptide Scientist Award (Chinese Peptide Society, 2024) and the Rising Star in Biological, Medicinal, and Pharmaceutical Chemistry (ACS Bio & Med Chem Au, 2024).

Title & Abstract

Decoding the Cryptic Chemistry of Microbiota for Drug Discovery

Yongxin Li, Associate Professor

The escalating global health crisis posed by antibiotic-resistant "superbugs" demands urgent innovation in antimicrobial drug discovery. While traditional approaches struggle to keep pace, the human microbiota—an underexplored reservoir of bioactive natural products—holds immense potential. These microbial communities produce a vast array of antimicrobial compounds, which serve as both weapons in intermicrobial competition and signals in host-microbe communication. To harness this untapped resource, we present an interdisciplinary platform integrating deep learning, synthetic biology, and chemical biology to systematically mine the microbiota's genetic and metabolic diversity[1]. Our approach enables the targeted discovery of structurally novel antimicrobial peptides (AMPs) by decoding biosynthetic gene clusters and elucidating cryptic pathways underlying natural product biosynthesis. Beyond drug discovery, we investigate the chemical ecology of host-microbe interactions, aiming to decipher the chemical "language" that governs microbial behavior and resilience. By linking ecological insights to therapeutic design, we identify not only new antibiotics but also engineer probiotic systems capable of disrupting pathogenic networks or modulating host immunity[2]. This synergistic strategy bridges the gap between ecological understanding and translational innovation, offering a roadmap to combat resistance and pioneer next-generation antimicrobial therapies.

References:

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Zhenpin LU

Assistant Professor
Department of Chemistry
City University of Hong Kong

Dr. Zhenpin Lu completed his doctoral studies (2016, supervised by Prof. Hermann A. Wegner, Justus-Liebig University, Germany) in organic chemistry. Afterward, he undertook postdoctoral studies in UK (Cambridge University, supervised by Prof. Jonathan R. Nitschke) and Germany (University of Würzburg, supervised by Prof. Frank Würthner). In November 2019, he worked as a research assistant professor in the group of Prof. Xie Zuowei at the Chinese University of Hong Kong. In January 2022, he was appointed as an assistant professor at the City University of Hong Kong.

Title & Abstract

Structure and Reactivity of Versatile Boron Anions

Zhenpin Lu,[1]* Shuchang Li,[1] Haokun Li,[1] Yuhao Wu,[1] and Gan Xu[1]
[1]*Department, Faculty, University, City, Country*
* Email: zhenpilu@cityu.edu.hk

In recent years, borate anions have shown valuable applications across various fields, including organic synthesis, materials science, energy storage devices, and biological and pharmaceutical studies.[1] In our research, we developed a series of new borate anions that exhibit intriguing reactivities toward small molecules and unsaturated substrates. We utilized bipyridine, a simple yet versatile ligand, to synthesize a reactive borate anion, **1**.[2] This borate anion demonstrates remarkable reduction capabilities, reducing Li^+ to produce elemental lithium metal and boron radicals. Additionally, through a reductive B-B coupling of 9-borafluorene, we successfully synthesized the hexaaryl-substituted diboron(6) dianion, **2**.[3] Notably, this compound exhibits the unique ability to undergo homolytic B-B bond cleavage at room temperature, resulting in the formation of boryl radical anions. Furthermore, based on a diborencine macrocycle, we successfully trapped a single electron, forming a B-B one-electron σ-bond.[4] The reactivity of this unique bond **(3)** has also been investigated. Finally, we developed a novel Zn-B bonded species **(4)**, and its reactivity and catalytic applications have been demonstrated.[5]

Keywords: Boron anions, boron, radical, reactivity

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[5] Xu, G.; Chan, H. T.; Li, S.; Wong, T. Y.; Zhang, L.; Zhang, Q.; Lin, Z.; Lu, Z. *Nat. Commun*, **2025**, 16, 6349.

Ding MA

Professor
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Ding Ma, Professor in *College of Chemistry and Molecular Engineering, Peking University*. His research interests are heterogeneous catalysis, especially those related with energy issues, including C_1 chemistry (methane, CO_2 and syngas conversion), hydrogen production/transportation, new reaction route for sustainable chemistry and the development of in-situ spectroscopic method that can be operated at working reaction condition to study reaction mechanism.

Title & Abstract

Iron-based Catalysts for Syngas Conversion Reaction

Ding Ma[a)]

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Transformation of syngas (CO/H_2) derived from shale gas, biomass and coal has been developed as a promising alternative to oil to prepare liquid fuels and commodity chemicals.

Here we reported that Zn and Na modulated Fe catalysts can be fabricated through a simple co-precipitation/washing method. Zn greatly changed the size of iron species, serving as the structural promoter while the existence of Na on the surface of Fe catalyst alters the electronic structure of the catalyst, making it very active for CO activation. Most importantly, the unique electronic structure suppresses the hydrogenation of double bonds and promotes desorption of products, which confers the catalyst unexpected reaction patch towards the alkenes, especially C_{5+} alkenes, at the same time of lowering the selectivity towards underside products.

A combination of Na-Zn-Fe_5C_2 and hierarchical zeolite with uniform mesopores dramatically changed the product distribution of FTS, leading to 51% aromatic selectivity under the stable stage with CO conversion > 85%. C_{12+} heavy hydrocarbons almost disappeared and the catalyst showed good stability. The hierarchical zeolitic structure and Brønsted acidity of zeolite can be precisely tuned by controlling alkali treatment conditions and ion-exchange degrees. It is the appropriate density and strength of the Brønsted acid sites and the hierarchical pore structure of HZSM-5 that endows the catalyst un-precedented aromatics yield.

Jian PEI

Chang Jiang Scholar Distinguished Professor
College of Chemistry and Molecular Engineering
Peking University

He has long been committed to the research of conjugated polymers, conducting in-depth and systematic research on the synthesis, condensed-state behavior, device fabrication and industrialization of conjugated polymer as follows: 1. Development of brand-new structural units and realization of performance breakthroughs in n-type conjugated polymers; 2. Establishment of a theoretical system for multi-level assembly of conjugated polymers and strategies for condensed-state regulation, and pioneered the research on side-chain engineering that utilizes flexible alkyl chains to modulate the assembly process of rigid backbones; 3. Achievement of light-controlled precise doping of conjugated polymer thin films and high-precision device fabrication.

Title & Abstract

σ-Dopants for Conjugated Polymers

Xin-Yi Wang, Yi-Fan Ding, Ze-Fan Yao, Jie-Yu Wang[2], Jian Pei*

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Doping is a primary method to modulate the electrical properties of semiconductors, enabling the success of fabricating various homo/heterojunctions and complex devices. For organic semiconductors (OSCs), the electrical performance has been extensively improved by the development of doping methods and dopants. However, the spatial resolution remains low and requires specific fabrication processes, limiting the construction of complex electronic devices. Here, we present a facile light-triggered doping strategy and develop a series of inactive photoactivable dopants (iPADs) for regionally controlled n-doping of OSCs. By converting iPADs into active dopants through ultraviolet (UV) exposure, controllable doping in various n-type OSCs can be realized, achieving a high electrical conductivity over 30 S cm^{-1}. Moreover, regionally controlled doping is demonstrated in OSCs with a resolution down to less than 1 μm due to the limitation of the UV exposure techniques. Transistors, logic circuits, thermoelectrics, and electronic circuits demonstrate improved performance using the fabricated devices with such light-triggered doping. Overall, our dopants have achieved tunable doping levels in OSCs with high spatial resolution, which is also expected to be highly suited for integrated circuits in both roll-to-roll and laboratory-scale environments.

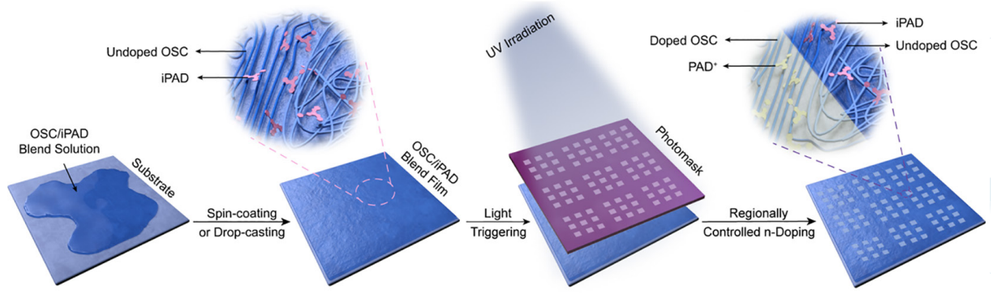

Fig. 1 Schematics of the light-triggered doping method. OSCs are directly mixed with iPADs to fabricate films by spin-coating or drop-casting, followed by a light-triggered transformation of iPADs to highly active PADs for regionally controlled n-doping OSCs.

Jianwei SUN

Chair Professor
Department of Chemistry
The Hong Kong University of Science and Technology

Jianwei Sun is a Chair Professor in the Chemistry Department of the Hong Kong University of Science and Technology. He completed his BSc and MSc in chemistry at Nanjing University before taking his PhD study at the University of Chicago and Postdoctoral research at MIT. Prof. Sun's research interest lies in synthetic organic chemistry, with an emphasis on asymmetric organocatalysis, chiral catalyst design, and transition metal catalysis specifically for alkyne functionalization. The Sun laboratory aims to develop new strategies to address the challenges in organic synthesis. His work has been recognized by several honors, including Croucher Senior Research Fellow, Early Career Award (Hong Kong RGC), Asian Core Program Lectureship Award, and Thieme Chemistry Journal Award. He is also a fellow of the Royal Society of Chemistry and a member of the Hong Kong Young Academy of Sciences.

Title & Abstract

Design and Application of Chiral Spirocycles

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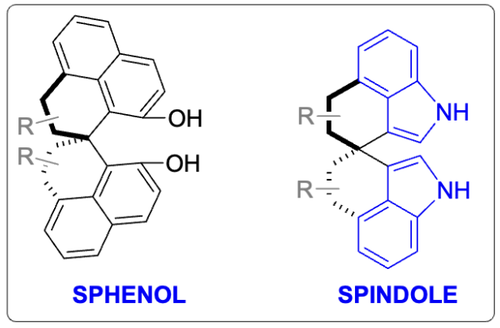
The development of effective chiral catalysts continues to play an important role in modern asymmetric synthesis. While nature has provided a range of useful chiral catalysts (e.g., enzymes) for biosynthesis, rationally designed manmade chiral catalysts have often shown superb and complementary performance in a broad spectrum of asymmetric reactions. Specifically, chiral spirocyclic molecules have emerged as powerful privileged backbones for chiral catalysts. In particular, 1,1'-spirobiindane-7,7'-diol (SPINOL) has gained tremendous success in this regard owing to its rigid C_2-symmetric skeleton.

In this context, our laboratory developed a new structure SPHENOL (2,2′,3,3′-tetrahydro-1,1′-spirobi[phenalene]-9,9′-diol) featuring two naphthol rings in a spirocyclic structure. It not only exhibits good performance as a chiral catalyst backbone, but more importantly, features convenient synthesis owing to the high nucleophilicity of the naphthol ring as well as the established enantiocontrol over the key *ortho*-quinone methide intermediate. More recently, we have further incorporated indole rings into spirocyclic structures, which have been demonstrated as a new family of chiral backbones. Their synthesis and catalytic performance will be presented.



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Jianchun WANG

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Dr. Jianchun Wang received his B.S. degree in Chemistry from Peking University in 2014. He earned his Ph.D. from the University of Chicago in 2019 with Prof. Guangbin Dong, where he developed new catalysts for Pd/norbornene cooperative catalysis. From 2019 to 2021, he carried out postdoctoral research at the California Institute of Technology with Prof. Robert H. Grubbs, focusing on polymer-modified electrodes to enhance the selectivity of electrochemical CO_2 reduction. He joined the Southern University of Science and Technology (SUSTech) in 2021 and has been a tenure-track Associate Professor (Research Fellow) since 2022. His work bridges organic synthesis, electrochemistry, and materials design to achieve kinetic control of electron transfer. His work has been published in top scientific journals, including *Nat. Catal.*, *J. Am. Chem. Soc.*, *Nat. Commun.*, and *Angew. Chem. Int. Ed.*

Title & Abstract

Controlling Electron Transfer by Spatiotemporal Separation and Proton Coupling

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Synthetic electrochemistry is emerging as a transformative platform for sustainable chemical production. Because electron transfer governs the rate and selectivity of electrochemical reactions, our group pursues *kinetic control* of electron transfer by designing both heterogeneous (electrode-based) and homogeneous electrocatalytic systems.

Our first thrust integrates oxidation and reduction in a compatible fashion to access redox-neutral transformations. We developed chemically modified electrodes that reconcile mismatched catalyst potentials, enabling cyclic deracemization, [1] and we are extending this concept to anti-Markovnikov hydration of olefins. [2] In parallel, we used alternating-current electrolysis to separate oxidation and reduction into different time phases (a deplete–regenerate strategy), enabling diol epimerization that is ineffective under direct-current electrolysis. [3]

Our second thrust uses proton-coupled processes to tune electron-transfer kinetics and suppress unproductive pathways. We designed a nickel catalyst featuring a pendant-amine proton relay to accelerate formation of Ni–H intermediates, enabling tunable alkene isomerization and hydrogenation while minimizing competing hydrogen evolution. [4] We also replaced stoichiometric silanes with electrons and protons to achieve reductive allylic C–H amination via a hydrogen-bond-stabilized nitroso intermediate, thereby avoiding overreduction. [5]

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Jun WANG

Professor
Department of Chemistry
Hong Kong Baptist University

Prof. Jun (Joelle) Wang embarked her academic journey by a bachelor's degree from Lanzhou University and an M.Phil. at the Shanghai Institute of Organic Chemistry (SIOC), Chinese Academy of Sciences. She earned her Ph.D. at Hong Kong Polytechnic University under the supervision of Prof. Albert S. C. Chan. After postdoctoral research at UT Southwestern Medical Center (UTSW) in Dallas USA, she worked as an assistant and tenured associate professor at the Southern University of Science and Technology (SUSTech) during 2012-2020. In 2020, she joined the Department of Chemistry at Hong Kong Baptist University (HKBU), and was promoted to full professor in 2023.

Prof. Wang was honored with the Thieme Chemistry Journals Award and the Asian Core Program Lectureship Award from Singapore in 2017. In 2022, she was elected as a member of the Hong Kong Young Academy of Sciences (YASHK). She was awarded the Research Excellence Paper Award 2022/2023 by faculty of science and the Outstanding Research Output Award 2023/24 by HKBU. In 2024, Prof. Wang was awarded the JSPS Invitational Fellowship, during which she delivered about 20 lectures at universities in Japan. In 2025, she has received the Asian Core Program Lectureship Award from Taiwan and Thailand. Most recently, she has been selected as one of nine awardees for the 2025/26 RGC Senior Research Fellow Scheme (SRFS).

Beyond her research achievements, Prof. Wang is deeply committed to academic service and leadership. Since 2014, she has been elected as committee member of the Women Chemists Committee of the Chinese Chemical Society. Her service extends to the Physical Sciences Panel (Joint Research Schemes) of RGC, Biology and Medicine Panel for Competitive Research Funding Schemes for the Local Self-financing Degree Sector (APSF). She also served as Executive Director for State Key Laboratory of Environmental and Biological Analysis during 2024 to June 2025.

Title & Abstract

Exploration of C-P Bond Formation for the Assembly of Chiral Phosphorus Compounds

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Asymmetric catalysis is a very broad and exciting field. In spite of hundreds of chiral ligands developed, phosphine ligands are keeping their prestigious role as the most powerful and frequently-used ligands. With the exceptionally high demand of chiral phosphine ligand, it is significant to develop efficient methods for construction these chiral organophosphorus compounds. Transition metal-catalyzed asymmetric hydrophosphination and C-P coupling reactions are among the most direct and efficient pathways for synthesizing chiral phosphine compounds. Recently, our research group has developed asymmetric hydrophosphination protocols for alkenes, allenes, and alkynes,[1] alongside diverse C-P coupling strategies.[2] These approaches enable concise, direct, and modular access to a library of potentially valuable chiral phosphorus compounds.

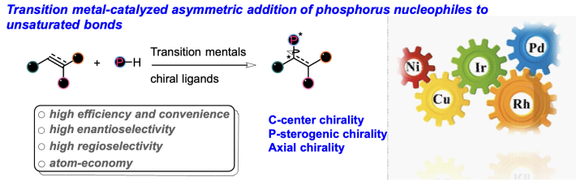

Figure 1. asymmetric hydrophosphination

Keywords: hydrophosphination, C-P coupling, ligand design, asymmetric catalysis

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Ying WANG

Associate Professor
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The Chinese University of Hong Kong

Dr. Ying Wang is an Associate Professor of Chemistry at The Chinese University of Hong Kong (CUHK), where she leads a research group dedicated to developing CO_2 conversion technologies. She earned her D.Phil. from the University of Oxford under the supervision of Prof. Richard G. Compton (MAE, FRSC), focusing on the fundamentals of electrochemistry. At CUHK, Dr. Wang's research explores how electrochemical processes can convert carbon waste into renewable fuels and chemicals, integrating catalysis, materials science, and electrochemical engineering. Her team aims to achieve efficient, scalable, and sustainable carbon utilization — advancing both scientific understanding and practical applications. Her contributions have been recognized, including the Chinese Society of Electrochemistry Young Scientist Award (2025), and World's Top 2% Scientists (2024). She was also named one of MIT Technology Review's 35 Innovators Under 35 Asia Pacific (2022) and received the Excellent Young Scientists Fund (Hong Kong and Macau) (2022).

Title & Abstract

Role of Proton in Electrochemical CO_2 Reduction Reaction in Acid

The electrochemical CO_2 reduction reaction (CO_2RR) offers a promising avenue for closing the anthropogenic carbon cycle; however, the formation of carbonates in conventional alkaline and neutral electrolytes presents a critical bottleneck for industrial implementation. While acidic electrolysis is theoretically proposed to mitigate this challenge, practical realization remains elusive. Various mitigation strategies have been explored—including pulsed electrolysis for carbonate removal and the use of acid vapor feeds—but these approaches largely treat the symptoms rather than eliminating the root cause. Understanding the fundamental role of protons and the specific electrode processes in acidic CO_2RR is essential to addressing the carbonate issue at its source.

Recently, we employed Rotating Ring-Disk Electrode (RRDE) voltammetry and Scanning Electrochemical Microscopy (SECM) to investigate the reaction kinetics on benchmark silver catalysts. We elucidate the reaction pathway, demonstrating that protons participate directly as reactants in the rate-determining step (RDS). This mechanism is characterized by distinct pH-dependent behavior and is facilitated by the early onset of CO_2 adsorption, which effectively suppresses the competing Hydrogen Evolution Reaction (HER). Despite this favorable mechanism, we identify that carbonate formation persists in mild acidic conditions due to a fundamental spatiotemporal mismatch between the rate of electron transfer (proton consumption) and mass transport (proton supply). By regulating hydrodynamics to reduce the proton diffusion length by 80%, we successfully enhanced the single-pass carbon utilization efficiency of CO_2-to-CO to 44% at −100 mA cm^{-2}. Nevertheless, our findings suggest that hydrodynamic modulation alone cannot fully overcome the intrinsic limitations of mild acidic media. We conclude that future strategies must pivot toward designing catalysts with high intrinsic activity capable of operating in strong acid or metal-cation-free environments to definitively resolve the carbonate challenge.

Yufeng WANG

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The University of Hong Kong

Prof. Yufeng Wang received his BS degree in chemistry from Peking University in 2008 and PhD degree from New York University in 2013. He had his postdoctoral training at Massachusetts Institute of Technology before he joined the chemistry department, the University of Hong Kong in fall 2016. Dr. Wang has been promoted to Associate Professor with tenure in 2022. Dr. Wang's research fields are physical /materials chemistry and soft matter, with a special expertise on the synthesis and self-assembly of colloids, nanoparticles, and polymers. Prof. Wang and his team have established strength in the design, synthesis, and assembly of anisotropic particles, which are the essential components for creating mesoscale materials with application in photonics, sensing, microrobotics, cargo delivery, and active matter. The team's recent and key strategy is to fabricate particles with low-symmetry shapes and heterogeneous surfaces, which introduces specific and directional interactions between particles and leads to the assembly of complex structures. The reduced symmetry also encodes information that guides the particle's dynamics, making them useful toward active materials, which propel, combine, reconfigure, and evolve emulating those in the biological and living systems. Dr. Wang is the principal investigator (PI) for multiple competitive grants including one Early Career Scheme (ECS 2017) and three General Research Fund (GRF 2018, 2020, 2021, 2022, 2024) and a co-PI for two Collaborative Research Fund (CRF 2018, 2022, 2025), from the Research Grants Council of Hong Kong. Dr. Wang has published his work in high-profile international Journals including *Nature*, *Nature Communications*, *Journal of the American Chemistry Society*, *Angewandte Chemie*, *Advanced Materials*, *ACS Nano*, *Chemistry of Materials*, etc. He is the recipient of the prestigious Croucher Innovation Award (Croucher Foundation, 2019) and the National Natural Science Foundation of China (NSFC) Excellent Young Scientist Fund (HK and Macau, 2020), Outstanding Young Researcher award of the University of Hong Kong (2022).

Title & Abstract

Binary Active-Passive Colloidal Crystals

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Classic binary materials, ranging from polymer blends to table salts, contain equilibrium phases or crystals of two interacting components. In this talk, I will discuss the construction of binary colloidal materials out of equilibrium by employing active particles and passive particles that dynamically interact and organize. Key to our scheme is the introduction of photoactive microspheres whose activity can be precisely tuned. This system allows us to leverage the complex nonequilibrium interplay between the constituent components for dynamic co-assembly. A wide variety of binary structures have thus been realized, including the liquid−crystal phases and crystal−crystal phases via phase separation and, counterintuitively, the binary crystalline compounds.

Wing-Yiu YU

Professor
Department of Applied Biology and Chemical Technology
The Hong Kong Polytechnic University

Wing-Yiu Yu received his Ph.D. (1993) under the supervision of Prof. Chi-Ming Che at the University of Hong Kong. With the support of the Croucher Foundation, he joined Prof. Howard Alper's research group (Ottawa University, Canada) for postdoctoral research on asymmetric carbonylations. He joined PolyU as an Assistant Professor in 2004 and is now a Full Professor in Chemistry. His research focuses on the design of effective catalytic cross-coupling reactions for regio- and enantioselective carbon−carbon and carbon−heteroatom bond formation via C−H bond activation.

Title & Abstract

Recent Advances in Regioselective Aliphatic C–H Amidation: Interplay between Inner- and Outer-Sphere Pathway for Nitrene Cross-Coupling Reactions

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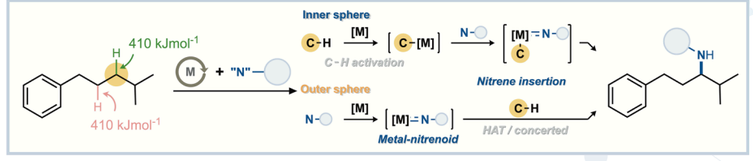
Catalytic aliphatic C–H bond amidation is attracting considerable attention for developing atom- and step-economical synthesis of amines.[1] Yet, effective regiocontrol C–H amidation remains the most formidable challenge. Indeed, major advances have been accomplished in the design of transition metal catalysts that would target selectively benzyl versus tertiary C(sp^3)–H bonds by tuning the catalysts' electronic and steric properties.[2] Yet, methylene C(sp^3)–H bonds are the most abundant moieties that form the hydrocarbon skeleton. Due to their similar electronic and steric properties, effective strategies that bring about regiocontrolled methylene C(sp^3)–H amidation remains elusive. In this presentation, we showcase our strategies by manipulating the inner-sphere and outer-sphere reaction pathways for effective regiocontrolled amidation of methylene C(sp^3)–H bonds.[3-7]



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Wanbin ZHANG

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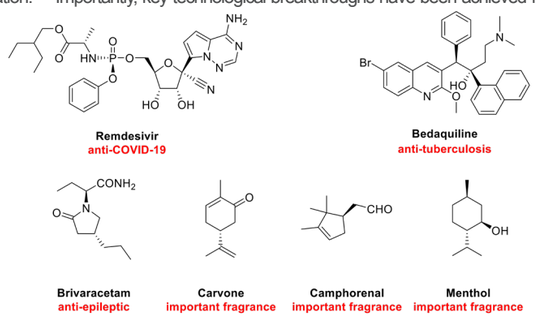
Shanghai Jiao Tong University

Wanbin Zhang received his B.S. and M.S. from East China University of Science and Technology (ECUST) in 1985 and 1988, respectively. He earned his Ph.D. at Osaka University in 1997 under the supervision of Prof. Isao Ikeda. Following his Ph.D., he remained at Osaka University as an Assistant Professor until 2001, after which he continued his career as a Research Fellow at Mitsubishi Chemical Corporation in 2003. Since 2003, he has been a professor in the School of Chemistry and Chemical Engineering at Shanghai Jiao Tong University (SJTU). He was promoted to Distinguished Professor in 2013 and subsequently appointed as Chair Professor in 2021, followed by the K. C. Wong Chair Professor in 2025. He has been appointed as Director of Shanghai key laboratory for Molecular Engineering of Chiral Drugs since 2017. Professor Zhang's current research interests include organometallic chemistry, asymmetric catalysis, and pharmaceutical process chemistry. He has published more than 300 research papers in internationally peer-reviewed journals including *Science*, *Nat. Chem.*, *J. Am. Chem. Soc.*, *Angew. Chem.*; with over 70 patents granted in China and abroad. Several asymmetric catalytic technologies derived from his discoveries have already been applied in industry. He received the National Natural Science Award (2nd class, 2023), the first class prize of the China Industry-University-Research Cooperation Innovation Achievement Award (2022), the first class prize of the Shanghai Natural Science Award (2020), and the outstanding class prize of the Shanghai Industry-University-Research Cooperation Excellent Project Award (2019).

Title & Abstract

Angle Control and Synergistic Promotion Strategies in Asymmetric Catalysis

We have focused on asymmetric catalysis from the viewpoint of activity and selectivity for more than 20 years and developed a series of novel chiral ligands or catalysts and highly eficient asymmetric catalytic systems based on angle control and synergistic promotion strategies, respectively. The research achievements included: 1) the development of novel chiral bicyclic imidazole organocatalysts, which were applied for the first example of the catalytic asymmetric synthesis of P-stereogenic phosphoric acid derivatives;[1-2] 2) the development of several novel bimetallic catalytic systems, which were applied for the first example of stereodivergent dual catalysis involving two metal catalysts;[3-4] 3) the synergistic catalytic effect of CH···HC weak attractive interactions between the chiral ligand and the substrate was found to be crucial for reactivity and stereocontrol in rare or earth-abundant metal-catalyzed asymmetric hydrogenation.[5-6] Importantly, key technological breakthroughs have been achieved for the industrial synthesis of several important chiral compounds, such as the fragrance including Menthol, Carvone and Camphorenal, antimalarial drug Artemisinin, anti-tuberculosis drug Bedaquiline, anti-epileptic drug Brivaracetam, and antiviral drug Remdesivir. Subsequently, Wanhua and Aurisco have respectively established China's first asymmetric catalytic production line for menthol and the world's first for brivaracetam. In addition, Wanxiang Technology Co., Ltd. has constructed a production line with an annual capacity exceeding 5,000 tons, which includes products such as (*R*)-carvone, carvacrol, campholenic aldehyde, and brahmanol.



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About the Organiser

粵港澳大灣區
院士聯盟
The Greater Bay Area
Association of Academicians

The GBAAA was officially established on 1 April 2021, as a non-profit organisation registered in Hong Kong. Combining Hong Kong's strengths in scientific research and its advantages as an international city, the GBAAA aims to bring together leading scientists in the region to foster cross-disciplinary exchange and collaboration and promote technology and popular science education. The organisation also provides a driving force for the synergistic innovation and technology development of Guangdong, Hong Kong, and Macao, as well as the development of Hong Kong and the Greater Bay Area into an International Innovation and Technology Centre, thus making contributions to the nation's advancement in technology.

Vision & Mission

- Foster cross-disciplinary exchanges and collaborations among association members, explore cooperative research and development projects, and contribute to innovation and technology development in the GBA.
- Discuss innovation and technology policies related to the GBA and offer advice to advance synergistic development of Guangdong, Hong Kong, and Macao.
- Work with government departments, industries, academia, and research institutes to promote innovation and technology development and cooperation in the GBA.
- Organise educational events to boost the public's knowledge and interests in innovation and technology and enhance the innovative environment of the GBA.

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