



周大紓紀念研討會

Ta-shue Chou Lectureship Award Symposium

2023
March 9

A New Era, A New Map, A New Territory



14:00 Opening remarks by Director David Wu



14:10 **Lin, Po-Chiao** (*National Sun Yat-sen University*)
Fluorescence Turn-on Strategy for On-Demand Biomolecular Interactions
Chair: Wang, Cheng-Chung



14:40 **Li, Wen-Shan** (*Academia Sinica*)
Excursions and Opportunities in Drug Discovery
Chair: Tu, Hsiung-Lin



15:10 **Liu, Rai-Shung** (*National Tsing Hua University*)
Gold-Catalyzed N,O-Functionalizations of Alkyne Derivatives
Chair: Ong, Tiow-Gan

15:40 Group Photo & Coffee Break

16:00 **Award Ceremony**
Memory of Professor Chou, Ta-shue
by Huang, Kuo-Wei
(*King Abdullah University of Science and Technology*)

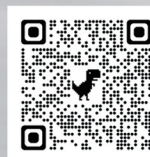


16:30 **Tan, Choon Hong**
(*Nanyang Technological University*)
Chiral Cation Catalysis
Chair: Yu, Hsiao-hua (Bruce)

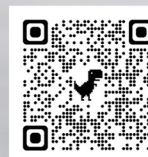
17:30 Closing remarks by Yu, Hsiao-hua (Bruce)

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Registration



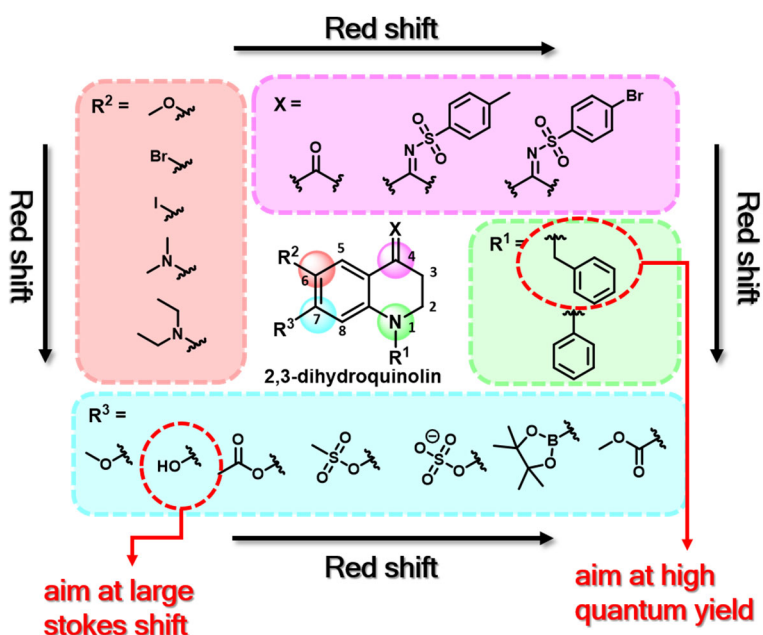
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Fluorescence Turn-on Strategy for On-Demand Biomolecular Interactions

Lin, Po-Chiao

Department of Chemistry, National Sun Yat-sen University, Taiwan

A systematic study in the synthesis and characterization of the environment-sensitive fluorophore, 2,3-dihydroquinolin-4-imine (DQI), allows for expanding structural complexity with significant photophysical properties. The DFT calculation further provides a guideline for preparing DQI analogs with the tailored emission. The solvatochromic property allows the DQI molecule to detect biomolecular interaction with the fluorescence turn-on mechanism. The fluorescence-enrichment strategy has been used in the monitoring of dynamic CAII expression during the growth of zebrafish larvae, as well as cell membrane staining. With the success in tracking proteins of interest, the DQI structure has been further modified for metal ion detection and pH sensing corresponding to chemical and biological stimulation.



References

1. Chou CH, Rajagopal B, Liang CF, Chen KL, Jin DY, Chen HY, Tu HC, Shen YY, Lin PC*. *Chem. Eur. J.*, **2018**, 24, 1112-1120.
2. Chou CH, Wu CY, Chen CL, Zhou JQ, Kao YC, Chen HY, Lin PC*. *Chem. Comm.* **2020**, 56, 11307-11310
3. Tu HC, Chen HY, Wu CY, Lin PC*. *Biosens. Bioelectro.* **2022**, 200, 113885.

Lin, Po-Chiao

Professor
Department of Chemistry
National Sun Yat-sen University
Kaohsiung, Taiwan
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Education

Ph.D. (2008): Taiwan International Graduate Program (TIGP), Academia Sinica and National Tsing-Hua University
M. Sci. (2003): National Taiwan Normal University
B. Sci. (2001): National Taiwan Normal University

Academic Carrier

2019-present Professor/VP for Academic Affairs, National Sun Yat-sen University
2016-2017 Visiting Professor, University of Colorado, Boulder, U.S.A.
2014-2019 Jan Associate Professor, National Sun Yat-sen University
2010-2014 Assistant Professor, National Sun Yat-sen University
2009-2010 Post-doctoral Professor, Max-Planck Institute, Germany

Awards

2019 傑出青年化學家獎章，中國化學會(台灣)
2019 Asian Core Program Lectureship award (Hong Kong)
2018 Asian Core Program Lectureship award (China)
2015 Emerging Investigators in RSC Analytical Methods
2014 Asian Core Program Lectureship award (Singapore/Korea)
2009 Max-Planck research fellowship, Max-Planck Institute (Germany)

Representative Publications

- 1 Tu HC, Chen HY, Wu CY, Lin PC*. *Biosens. Bioelectro.* **2022**, 200, 113885.
- 2 Tang SC, Ma H, Tu HC, Wang HR, Lin PC*, Anseth KS*. *Adv. Sci.* **2018**, 1800638.
- 3 Chou CH, Lin PC*. *Biomacromol.* **2018**, 19, 3086-3095.
- 4 Yang YL, Lee YP, Yang YL, Lin PC*. *ACS Chem. Biol.* **2014**, 9, 390-397.

Research Interests

organic synthesis, biorthogonal chemistry, protein modification, protein microarray

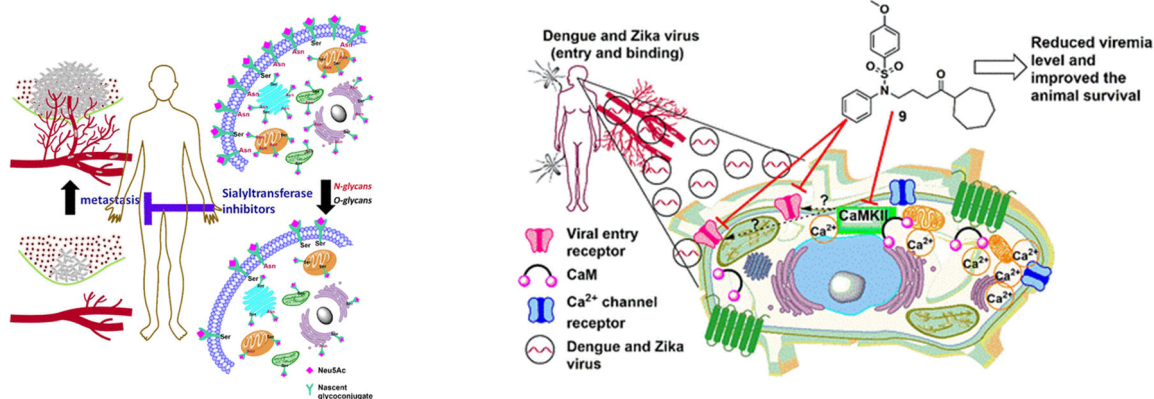
Excursions and Opportunities in Drug Discovery

Li, Wen-Shan

Institute of Chemistry, Academia Sinica, Taiwan

Biomedical Translation Research Center (BioTRC), Academia Sinica, Taiwan

It is important for precision medicine based on the foundation of targeted therapy. As we knew that cancer types vary rapidly from person to person and the treatment (using drugs or substances) to target specific proteins or receptors may block their functions leading to kill cancer cells or keep cancer cells from growing or spreading. In general, molecular targeted therapy could result in less harm to normal cells and reduce side effects than other type of cancer treatments.¹⁻² In infectious diseases, emerging and resurging mosquito-borne flaviviruses are an important public health challenge. The increased prevalence of dengue virus (DENV) infection has had a significant socio-economic impact on epidemic countries. The recent outbreak of Zika virus (ZIKV) has created an international public health emergency because ZIKV infection has been linked to congenital defect and Guillain-Barré syndrome.³ For these reasons, we continue to develop synthetic methods and biological approaches to discover, optimize, and validate the new chemical entities for the treatment of human diseases using pharmacological profiling analyses (e.g., enzyme activity, in vitro cell-based assay, drug stability analysis, and animal models of disease).



References

1. Chen JY, Tang YA, Huang SM, Juan HF, Wu LW, Sun YC, Wang SC, Wu KW, Balraj G, Chang TT, Li WS*, Cheng HC*, Wang YC*. *Cancer Res.* **2011**, 71, 473.
2. Fu CW, Tsai HE, Chen WS, Chang TT, Chen CL, Hsiao PW, Li WS*. *J. Med. Chem.* **2021**, 64, 527-542.
3. Chen WC, Simanjuntak Y*, Chu LW, Ping YH, Lee YL, Lin YL*, Li WS*. *J. Med. Chem.* **2020**, 63, 1313-1327.

Li, Wen-Shan

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Education

Ph.D. (1997): Case Western Reserve University, OH, USA
M. Sci. (1989): National Taiwan Normal University
B. Sci. (1986): National Taiwan Normal University

Academic Carrier

2023-: Deputy Director, Biomedical Translation Research Center (BioTRec),
National Biotechnology Research Park, Academia Sinica
2022-: Research Fellow, Institute of Chemistry, Academia Sinica
2022-: Joint Appointment Research Fellow, BioTRec
2007-2022: Tenured Associate Research Fellow
2021-2022: Joint Appointment Associate Research Fellow, BioTRec
2020-: Adjunct Associate Professor, Tamkang University
2018-: Joint Appointment Associate Professor, Kaohsiung Medical University
2017-: Adjunct Associate Professor, Taipei Medical University
2011-: Joint Appointment Associate Professor, National Sun Yat-Sen University
2001-2007: Assistant Research Fellow, Institute of Chemistry, Academia Sinica
1999-2001: Postdoctoral Research Fellow, Texas A&M University, USA
1997-1999: Postdoctoral Research Fellow, Purdue University, USA
1991-1992, 1986-1989: Teaching Assistant, National Taiwan Normal University
1985-1986: Intern Teaching Assistant, National Taiwan Normal University

Awards

2011 Asian Core Program (ACP) Lectureship Award
2007 Chinese Chemical Society Journal Paper Award
1987 National Science Council Academic Research Award (TA level), Taiwan
1986 National Science Council Academic Research Award (TA level), Taiwan

Representative Publications

- 1 Fu CW, Tsai HE, Chen WS, Chang TT, Chen CL, Hsiao PW, Li WS*. *J. Med. Chem.* **2021**, 64, 527-542.
- 2 Chen WC, Simanjuntak Y*, Chu LW, Ping YH, Lee YL, Lin YL*, Li WS*. *J. Med. Chem.* **2020**, 63, 1313-1327.
- 3 Chen JY, Tang YA, Huang SM, Juan HF, Wu LW, Sun YC, Wang SC, Wu KW, Balraj G. Chang TT, Li WS*, Cheng HC*, Wang YC*. *Cancer Res.* **2011**, 71, 473-483.

Research Interests

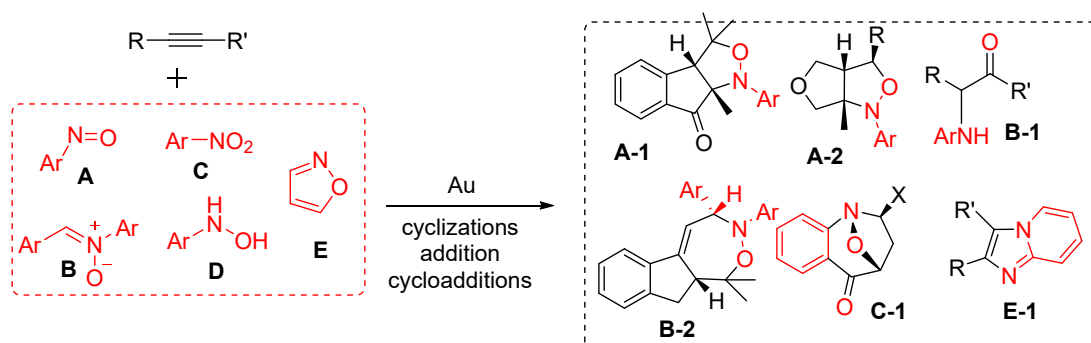
Medicinal Chemistry, Enzymology, Photobiology and Photochemistry, Cell Biology

Gold-Catalyzed N,O-Functionalizations of Alkyne Derivatives

Liu, Rai-Shung

Department of Chemistry, National Tsing-Hua University
Hsinchu, Taiwan, ROC

Gold catalysts can facilitate the additions of weak nucleophiles at activated or unactivated alkynes. In this laboratory, gold-catalyzed additions of nitroxy-containing nucleophiles on alkynes have been extensively explored. Because of an intrinsically weak N-O bond, these new catalytic reactions often lead to 1,2- or 1,n-N,O-functionalizations of alkyne substrates through a facile reductive cleavage of resulting cyclic nitroxy species. This lecture focuses on the use of common nitroxy species including nitroarenes, nitrones, nitrosoarenes, *N*-hydroxyanilines and isoxazoles to functionalize alkynes. The reactions were performed in one-pot operation to afford useful heterocycles. Several examples are depicted in the following scheme. Among them, we have also developed highly enantioselective versions of resulting cyclic nitroxy products. These N,O-functionalizations are also mechanistically interesting because easily readable alkynes were used as the surrogates of α -imino gold carbenes, ketone-derived nitrones or gold enolates to furnish subsequent cyclizations, cycloadditions or addition reactions.



References

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2. Sahani RL, Patil MD, Wagh, SB, Liu RS*. *Angew. Chem. Int. Ed.* **2018**, 57, 14878.
3. Jadhav PD, Lu X, Liu RS*. *ACS Catal.* **2018**, 8(10), 9697-9701.
4. Sahani RL, Liu RS*. *Angew. Chem. Int. Ed.* **2017**, 56, 12736-12740.
5. Sahani RL, Liu RS*. *Angew. Chem. Int. Ed.* **2017**, 56(4), 1026-1030.
6. Chen CN, Liu RS*. *Angew. Chem. Int. Ed.* **2019**, 58(29), 9831-9835.
7. Bhanudas Dattatray Mokar BD, Huplé DB, Liu RS*. *Angew. Chem. Int. Ed.* **2016**, 55, 11892-11896.
8. Ye LW*, Zhu XQ, Sahani RL, Xu Y, Qian PC, Liu RS*. *Chem. Rev.* **2021**, 121, 9039-9112.
9. Chen CN, Cheng WM, Wang JK, Chao TH, Cheng MJ*, Liu RS*. *Angew. Chem. Int. Ed.* **2021**, 60, 4479-4484.

Liu, Rai-Shung

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E-mail: rsliu@mx.nthu.edu.tw



Education

Ph. D. (1981): Columbia University
B. Sci. (1976): National Tsing Hua University

Academic Carrier

2018-2022: Director of the Center of Excellence, Frontier Research Center of Matter Science and Technology, MOST/MOE
2013-2016: Academic Advisor, Shanghai Institute of Organic Chemistry (SIOC), China
2013-2019: Academic Advisor, Acadmic Sinica, Taiwan
2013-2019: Dean of Science, National Tsing Hua University
2009-2012: Chairman, Chemistry Department, National Tsing Hua University
2003-2006: Coordinator, Chemistry, Ministry of Science and Technology (MOST)
1987- now: Professor, Department of Chemistry, National Tsing Hua University
1982-1987: Associate Professor, National Tsing Hua University
1981-1982: Postdoctoral, Texas A&M

Awards

2019-2021 Morris Chang Chair Professor
2005-2008 National Chair Professorship from Education Ministry with permanent honor
2001-2004 National Chair Professorship from Education Ministry

Representative Publications

- 1 Chen CN, Cheng WM, Wang JK, Chao TH, Cheng MJ*, Liu RS*, *Angew. Chem. Int. Ed.* **2021**, 60, 4479-4484.
- 2 Ye LW*, Zhu XQ, Sahani RL, Xu Y, Qian PC, Liu RS*, *Chem. Rev.* **2021**, 121, 9039-9112.
- 3 Jadhav P D, Chen JX, Liu RS*, *ACS Catal.* **2020**, 10, 5840-5845.
- 4 Kardile RD, Chao TH, Cheng MJ*, Liu RS*, *Angew. Chem. Int. Ed.* **2020**, 59, 10396-10400.
- 5 Giri SS, Liu RS*, *ACS Catal.* **2019**, 9, 7328-7334.
- 6 Kulandai Raj AS, Liu RS*, *Angew. Chem. Int. Ed.* **2019**, 58, 10980-10984.
- 7 Chen CN, Liu RS*, *Angew. Chem. Int. Ed.* **2019**, 58, 9831-9835.
- 8 Sahani RL, Liu RS*, *ACS Catal.* **2019**, 9, 5890-5896.

Research Interests

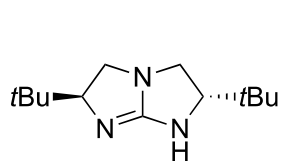
Transition-metal organic chemistry including gold- and Ru-catalysis.
Organometallics in organic synthesis.
Synthesis of oxygen heterocycles via Au and Ru-catalyzed reactions on alkynes.
Development of relay or cascade gold catalysis for green chemistry.

Chiral Cation Catalysis

Tan, Choon Hong

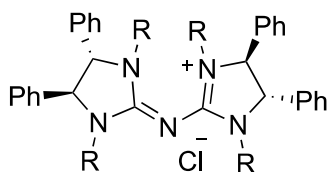
*School of Chemistry, Chemical Engineering and Biotechnology
Nanyang Technological University*

Chiral cations have found useful applications as phase transfer catalyst i.e. in partnership with inorganic basic salts such as hydroxides and carbonates for basic reactions. We have over the past decade developed several chiral cation catalysts including pentanidium and bis-guanidinium. Herein, we report three topics related to these chiral cation catalysts. Firstly, we will discuss the role of these catalysts in ion pair catalysis. We will discuss reactions in which they are partnered with polyoxometalates such as tungstate and molybdate. We will also discuss reaction involving hypervalent silicate intermediates. In the second topic, we will discuss how these catalysts are used to investigate roles of halogen bonding in catalysis. Lastly, we will explain the desymmetrisation of sulfinate, which provide a route to a range of enantio-enriched sulfur stereogenic centers.



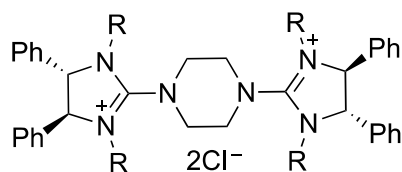
Bicyclic Guanidine

Brønsted Base Catalysis



Pentanidium

*Halogen Bonding in
Catalysis*



Bisguanidinium

*Chiral Cationic Ion Pair
Catalysis*

Tan, Choon Hong

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Prof. Tan received his BSc (Hons), First Class from the National University of Singapore in 1995 and completed his PhD from the University of Cambridge in 1999. Following that, he carried out two years postdoctoral training at the Department of Chemistry and Chemical Biology, Harvard University. Subsequently, he worked as a Research Associate at Department of Biological Chemistry and Molecular Pharmacology, Harvard Medical School for another year before joined the Department of Chemistry, National University of Singapore as Assistant Professor in 2003. He was then promoted to Associate Professor in 2010. He joined Nanyang Technological University in 2012 as an Associate Professor and was promoted to Full Professor in 2016. His research interest is in the field of Synthetic Organic Chemistry and Catalysis.

Professor Tan is the immediate past President of Singapore National Institute of Chemistry and current Vice-President of the Singapore National Academy of Science. He is recently named the recipient of the 2023 Ta-Shue Chou Lectureship Award.

Selected Publications:

D. Leow, C.-H. Tan, Chiral guanidines catalyzed enantioselective reactions, *Chemistry - An Asian Journal*, **2009**, 4, 488 – 507.

T. Ma, X. Fu, C. W. Kee, L. Zong, Y. Pan, K.-W. Huang, C.-H. Tan, Pentanidium catalyzed enantioselective phase transfer conjugate addition reactions, *Journal of the American Chemical Society*, **2011**, 133, 2828 – 2831. (Highlighted by Synfacts 2011, 5, 0556-0556; contributors: Benjamin List, Saihu Liao)

L. Zong, C.-H. Tan, Phase transfer and ion pairing catalysis of pentanidiums and bisguanidiniums, *Accounts of Chemical Research*, **2017**, 50, 842 – 856.

X. Zhang, J. Ren, S. M. Tan, D. Tan, R. Lee, C.-H. Tan, Enantioconvergent Halogenophilic Nucleophilic Substitution (SN2X) Reaction, *Science*, **2019**, 363, 400 – 404.

X. Zhang, Esther C. X. Ang, Z. Yang, C. W. Kee, C.-H. Tan, Synthesis of chiral sulfinate esters by asymmetric condensation, *Nature*, **2022**, 604, 298 – 303.