PLENARY SPEAKER

HIROAKI SUGA

The University of Tokyo, Japan

Hiroaki Suga is a Professor of the Department of Chemistry, Graduate School of Science in the University of Tokyo. He received his Bachelor of Engineering (1986) and Master of Engineering (1989) from Okayama University, and Ph. D. in Chemistry (1994) from the Massachusetts Institute of Technology. After three years of post-doctoral work in Massachusetts General Hospital, he became Assistant Professor in the Department of Chemistry in the State University of New York at Buffalo (1997) and promoted to the tenured Associate Professor (2002). In 2003, he moved to the Research Center for Advanced Science and Technology in the University of Tokyo. In 2010, he changed his affiliation to the Department of Chemistry, Graduate School of Science. He is the recipient of Akabori Memorial Award 2014, Japanese Peptide Society, Max-Bergmann Gold Medal 2016, Vincent du Vigneaud Award 2019, The Research Award of the Alexander von Humboldt Foundation 2020, MIT T.Y. Shen Lectureship 2022, ETHZ Prelog Medal Lecture 2022, Wolf Prize in Chemistry 2023 and others. He is also a founder of PeptiDream Inc. Tokyo, a publicly traded company in the Tokyo stock market, having many partnerships with pharmaceutical companies in worldwide. He is also a founder of MiraBiologics Inc. since 2017.

PLENARY SPEAKER

PLENARY LECTURE I

主持人：陳玉如理事長 (中國化學會)

Pseudo-Natural Peptides, Products and Neobiologics for Therapeutic Applications

Macrocyclic peptides possess a number of pharmacological characteristics distinct from other well-established therapeutic molecular classes, resulting in a versatile drug modality with a unique profile of advantages. Macrocyclic peptides are accessible by not only chemical synthesis but also ribosomal synthesis. Particularly, recent inventions of the genetic code reprogramming integrated with an in vitro display format, referred to as RaPID (Random non-standard Peptides Integrated Discovery) system, have enabled us to screen mass libraries (>1 trillion members) of non-standard peptides containing multiple non-proteinogenic amino acids, giving unique properties of peptides distinct from conventional peptides, e.g. greater proteolytic stability, higher affinity (low nM to sub nM dissociation constants similar to antibodies), and superior pharmacokinetics. The field is rapidly growing evidenced by increasing interests from industrial sectors, including mega-pharmas, toward drug development efforts on macrocyclic peptides and more recently extended to pseudo-natural products. This lecture discusses the aforementioned screening technology, the RaPID system, and several showcases of therapeutic potentials of macrocyclic peptides. This lecture also discusses the most recent advance in the display of pseudo-natural products generated by thiopeptide post-translationally modifying enzymes and the development of neobiologics using LassoGraft technology.

Chun-Guey Wu

National Central University, Taiwan

Professor Chun-Guey Wu is a professor in Department of Chemistry, National Central University, Taiwan, ROC, with courtesy appointment as a Dean of College of Science. Her research interests focus on the new generation photovoltaic cells, such as Dye-sensitized Solar Cells (DSCs) and Perovskite Solar Cells (PSCs). Prof. Wu's outstanding scientific contributions have been recognized with numerous awards, including Academic Medal from Chemical Society Located in Taipei (CSLT), MOST Outstanding Research Award, Y. Z. Hsu Scientific Paper Award, MOST Outstanding Technology Transfer Award. She has been a Distinguished Professor of NCU since 2007.

PLENARY LECTURE II

主持人：施增廉院長 (淡江大學)

A Journey to the New Generation PhotoVoltaics

New generation photovoltaic cells (NPVs) is a type of solar cell with the architecture or working mechanism different from the well-known silicon based photovoltaic devices. Two good characteristics of NPV are cheap processes and high power conversion efficiency (PCE) under weak (room) lighting. Dye-sensitized Solar Cells (DSCs) and Perovskite Solar Cells (PSCs) are the two representative new generation photovoltaic devices amongst others. In this talk I will introduce step-by-step how we designed the high efficiency ruthenium complexes dyes for DSCs based on the basic knowledge of Inorganic Chemistry. For PSCs, the combining of Science and Engineering to improve the quality of perovskite absorber to increase the PCE of PSCs as well as the scale-up processes for perovskite solar module (PSM) based on Chemistry will be demonstrated.

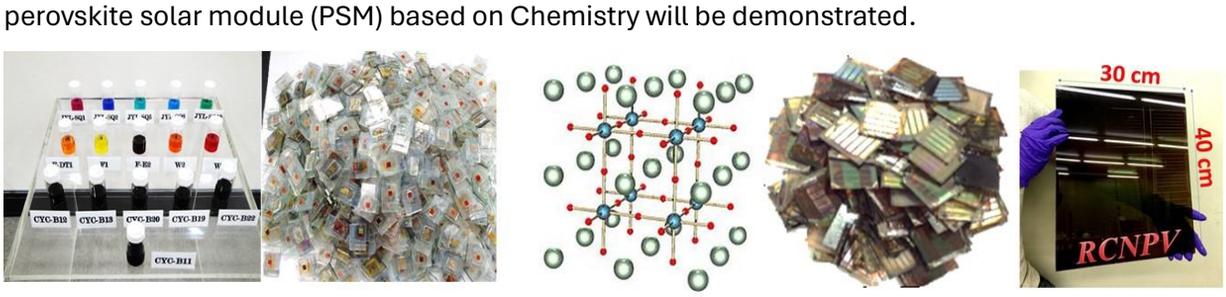

Figure: The sensitizers for DSCs and materials and processes for PSCs and PSMs

PLENARY SPEAKER

Xiaodong Chen

Professor Xiaodong Chen holds the President's Chair Professorship in Materials Science and Engineering at Nanyang Technological University (NTU), Singapore, with courtesy appointments in both Chemistry and Medicine. His research interests span mechanomaterials science and engineering, flexible electronics technology, sense digitalization, cyber-human interfaces and systems, and carbon-negative technology. Prof. Chen's outstanding scientific contributions have been recognized with numerous awards, including the Singapore President's Science Award, Singapore National Research Foundation (NRF) Investigatorship and NRF Fellowship, the Friedrich Wilhelm Bessel Research Award, Dan Maydan Prize in Nanoscience and Nanotechnology, Winner of Falling Walls, and Kabiller Young Investigator. He is a member of the Singapore National Academy of Science and the Academy of Engineering Singapore, and a fellow of the Royal Society of Chemistry and the Chinese Chemical Society. Prof. Chen also serves on the editorial advisory boards of numerous esteemed international journals, including Advanced Materials, Small, and Nanoscale Horizons. Currently, he is the Editor-in-Chief of ACS Nano, a flagship journal in nanoscience and nanotechnology.

Nanyang Technological University, Singapore

PLENARY SPEAKER

PLENARY LECTURE III

主持人：黃家琪教授 (淡江大學)

Decoding the Essence of Materials Chemistry in Bio-interfaced Electronics

In the digital and big data era, electronic devices are crucial for addressing societal challenges and enhancing life quality. However, the rigid nature of traditional electronics limits their applicability. Flexible electronic devices emerge as a solution, offering seamless integration with various environments and human experiences. Despite considerable progress in research, the market adoption of flexible sensors remains limited. This talk delves deep into the fundamental materials chemistry questions within flexible electronics, aiming for a clearer and deeper understanding of its core principles. Additionally, I will explore the principles of conformal sense digitalization, its applications, and the challenges ahead in unlocking its full potential.

Kirk Hwang

Chung Hwai Pulp Corporation, Taiwan

Kirk Hwang, Chairman and CEO of Chung Hwai Pulp and CSO of the YFY group, is a Tamkang University chemistry alumnus who holds a PhD in Chemistry and Material Science from the University of Wisconsin-Madison. He has spent 16 years in research and management at 3M in Minnesota, including roles in international management. Since 1999, Kirk has been actively involved in the business and industrial sectors in Taiwan and internationally, focusing on personal care, textiles, and the pulp and paper industries. Over the last decade, he has dedicated himself to promoting the circular economy and the adoption of sustainable green materials. Kirk is a firm believer in the power of collective action for sustainable development across both academic and industrial circles.

PLENARY LECTURE IV

主持人：陳志欣主任 (淡江大學)

Navigating Sustainability: Reducing Petrochemical Dependency by Bio-based Solutions

In the realm of environmental sustainability, industries and businesses must adapt and innovate to address the challenge of global warming, which is fueled by greenhouse gas emissions from excessive reliance on petroleum. This urgency is emphasized at this year's Chemistry Society Annual Conference, themed "ESG + AI = Infinity".

As the call to reduce the reliance on fossil fuels and petrochemicals grows, there is increasing momentum towards embracing bio-based fuels and saccharide derivative green chemistry. Much of the spotlights has been on innovation and the utilization of biomass resources sourced from forests and agriculture. Historically, prior to the industrial revolution's introduction of petroleum, agriculture and forests stood as the primary sources for materials and energy.

After years of tremendous scientific effort, advancements in cellulose technology, including Nanocellulose and various cellulose derivatives, have positioned bio-based materials as crucial for industry sustainability and integral components of the global carbon cycle.

Transitioning towards saccharide-based materials offers a significant opportunity to reduce our environmental footprint. Additionally, the strategic integration of artificial intelligence (AI) has streamlined operational processes and minimized energy consumption, demonstrating a commitment to aligning innovation with sustainability.

The presenter will highlight the efforts of companies like YFY and CHP as they transition from traditional chemical pulp and paper production to becoming biomass-based green chemistry companies.

PLENARY SPEAKER