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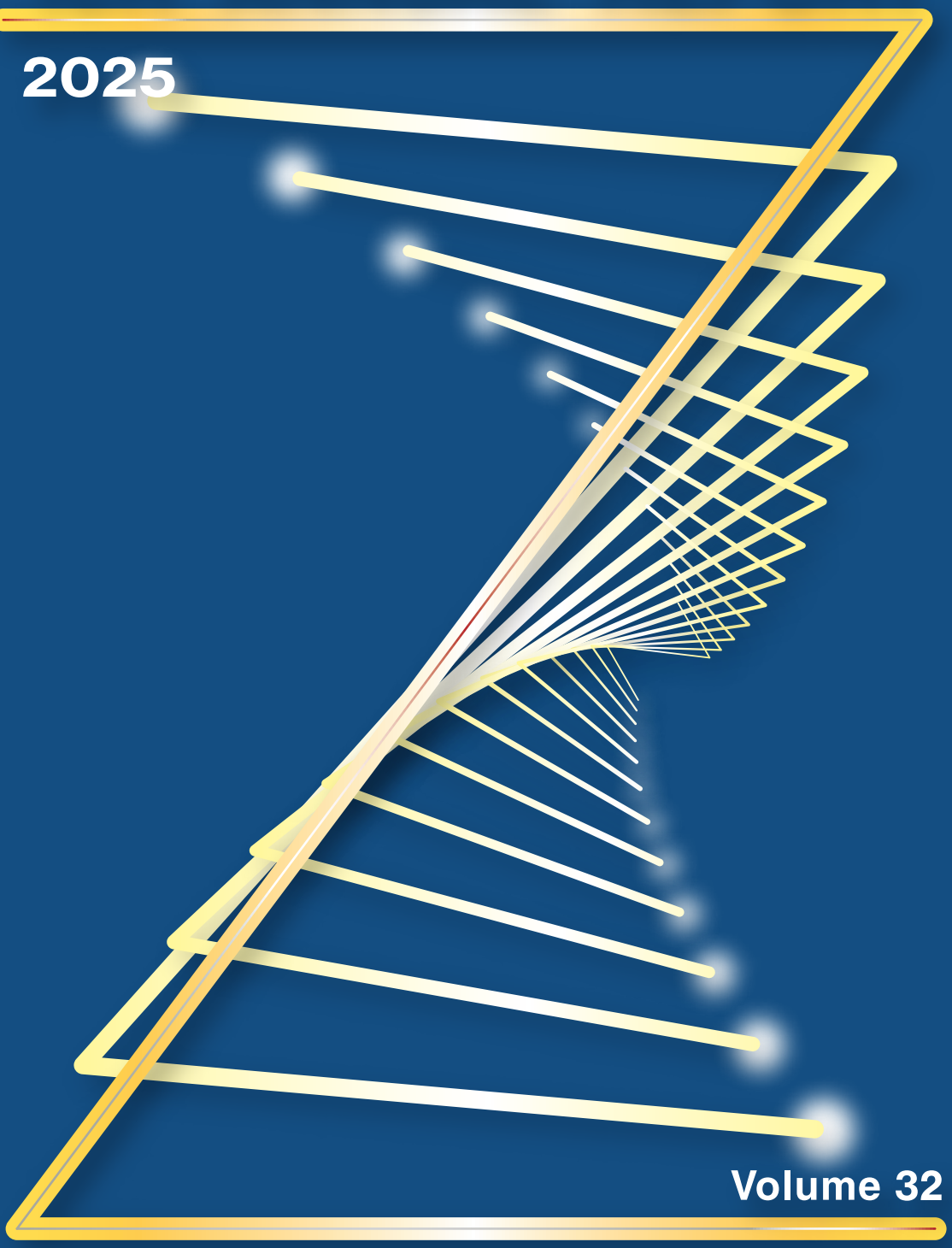
ICR ANNUAL REPORT

2025



Volume 32

Institute for Chemical Research
Kyoto University

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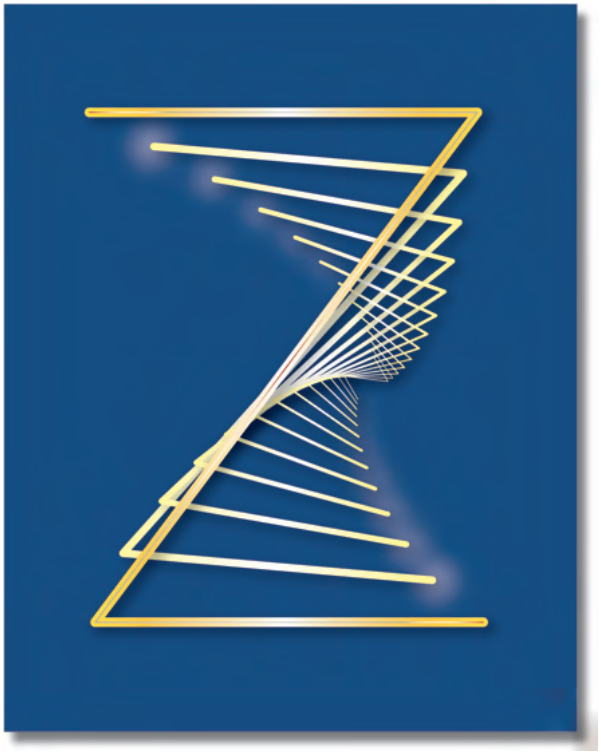
Request for Cooperation to the ICR's 100th Anniversary Fund

ICR has established a fund called "The ICR's 100th Anniversary Fund," which is a part of the Kyoto University Fund. Its aims are to hold the 100th anniversary event in 2026, to enhance the educational and research environments at ICR, and to promote social contribution activities. We ask for your kind understanding and cooperation.

■ https://www.kikin.kyoto-u.ac.jp/contribution/chemical/

ICR ANNUAL REPORT 2025



Institute for Chemical Research
Kyoto University

Volume 32

Preface

Founded in 1926 as the first research institute of Kyoto University, the Institute for Chemical Research (ICR) will celebrate its 100th anniversary this year. The ICR founded on the vision of "excelling in the investigation of the basic principles of chemistry and their applications". With this philosophy in mind, the ICR has consistently engaged in diverse and innovative pioneering research, flexibly and actively adapting to the changing times. Over the past 100 years, significant advances in science and technology have drastically altered people's living environments, as well as the chemistry we pursue and the chemistry society demands. In line with these changes, the ICR has conducted cutting-edge research, broadening our perspectives and strengthening our collaborations based on our own curiosity and drive for improvement. Today, we can design and synthesize novel chemical compounds at atomic and molecular levels, and analyze their structures and properties using state-of-the-art quantum beams and informatics. Through these efforts, the ICR contributes to the development of society by advancing a wide range of sciences, including chemistry, physics, biology, pharmacy, and information technology. To carry out such broad fields of science, the ICR is currently organized into five research divisions—Synthetic Chemistry, Materials Chemistry, Biochemistry, Environmental Chemistry, and Multidisciplinary Chemistry— and three research centers—Advanced Research Center for Beam Science, International Research Center for Elements Science, and Bioinformatics Center. In total, about 450 people are working and studying at the ICR, including 25 professors, 26 associate professors, and 44 assistant professors, 63 research associates, 51 staff members, and 244 graduate students.

Some of the research results in 2025 were outstanding. For example, (1) coherent photoelectrical readout of single spins in silicon carbide was achieved at room temperature. (2) Hydrogen-bond-directed supramolecular organic semiconductor thin films were realized *via* thermal precursor approach. (3) Stepwise deactivation of gibberellins during rice internode elongation was revealed. And (4) atomic diffusion barriers and inter-element miscibility were found to guide the development of unexplored crystal phases.

The ICR is a member of the Kyoto University Research Coordination Alliance and is collaborating with other research institutions and centers in Kyoto University. The ICR collaborates with other research institutions through MEXT projects, including the Inter-University Collaborative Projects "Integrated Consortium on Chemical Synthesis", the Large-scale Scientific Research Project "Spintronics Research Network of Japan", the "Quantum Leap Flagship Program (Q-LEAP)" and the "Frontier of Spin Life Sciences (Spin-L)". We are also operating an international Joint Usage/Research Center (iJURC) "Global Frontier and Interdisciplinary Research Core for Deepening Investigations and Promoting Collaboration in Chemistry-oriented Fields". The ICR continues to make efforts to promote both domestic and international collaborative research and the training of young researchers.

Given the rapid changes in the global landscape, it is clear that we have entered a new era. The research activities of our institute will also enter a new era based on our achievements over the past 100 years. We believe strengthening our international presence and training the next generation of young leaders are essential tasks on which we should focus. We hope this annual report updates you on our research progress and globalization efforts. We are committed to further developing both our research and the institute. We sincerely appreciate your continued encouragement and support.

January 2026

Y. Shimakawa

SHIMAKAWA Yuichi
Director

ICR News 2025

Fostering Future Talent in Chemistry

The Institute for Chemical Research is committed to fostering future talent in chemistry, not only through research and graduate-level training, but also by supporting science education and promoting public understanding of chemistry.

In April 2025, Professors Emeriti Kohei Tamao and Takahito Terashima were selected for the FY2025 MEXT Awards for Science and Technology (Public Understanding Promotion Category). During their tenure at the Institute, they planned and produced the now widely recognized "Ikka-ni Ichi-Mai Periodic Table," commonly referred to in English as the *One Per Household Periodic Table*. First published in 2005, the table has since been distributed to educational institutions and households across Japan, inspiring curiosity and enhancing scientific literacy among students and the general public.

In June 2025, prior to the 57th International Chemistry Olympiad (IChO), Japanese high school representative visited the Wakamiya Laboratory for hands-on training. A second-year doctoral student served as tutor, offering guidance and support throughout the session. The student later won a gold medal at the competition.

Through initiatives such as these, the Institute continues to inspire young learners and contribute to the future of chemistry education.

Professor Emeritus Kohei Tamao and Director Yuichi Shimakawa

"Ikka-ni Ichi-Mai Periodic Table"

Hands-on Training Session

New MoU in 2025

On February 13, 2025, the Department of Chemistry, SRM Institute of Science and Technology and ICR signed a MoU (Memorandum of Understanding), with the purpose of broadly mutual cooperation and contributing to the promotion of research for both parties.

The Department of Chemistry, SRM Institute of Science and Technology, similar to ICR, conducts research and educational activities in a wide range of chemical fields. Both parties agreed to sign an academic exchange agreement to further enhance collaboration and promote international education and research activities.

Prof. C. Muthamizhchelvan, the Vice Chancellor for the SRM Institute of Science and Technology and Prof. Atsushi Wakamiya (Molecular Aggregates) from ICR, attended the signing ceremony at the SRM Institute of Science and Technology.

In 2025, ICR also concluded an agreement with Kaunas University of Technology in Lithuania. Currently, ICR has a total of 71 MOUs.

Memorandum of Understanding for Collaboration (1984–2025)

Kyoto University Chemistry Talent-Spot 2025 Mumbai

In January 2025, ICR participated as a co-organiser in Kyoto University Chemistry Talent-Spot 2025 Mumbai, organised by the Institute for Integrated Cell-Material Sciences (iCeMS). This was the tenth edition of the event, which has been held in various locations across Asia (including online) since 2017. This time, with the cooperation of local universities, including the Indian Institute of Technology Bombay, students interested in studying abroad for their Masters and Ph. D. degrees were recruited. A total of 29 applications were received. From these, 17 students were selected through a document review process and participated in the event. After an introduction of the iCeMS and ICR and an overview of student life in Kyoto, individual interviews were held with the students. We heard comments from the participating students such as “Before the event, I was thinking about studying abroad in another country, but now I am considering studying in Japan”, and “This was a valuable opportunity to speak directly with professors, and it was meaningful for thinking about the future”.


Shanghai-Kyoto Chemistry Forum

On November 21, 2025, the international conference Shanghai-Kyoto Chemistry Forum was held at Fudan University in China. The forum is an international conference that aims to develop strategies for sharing research resources and equipment and identifying joint research opportunities utilizing the Kyoto University Shanghai Lab (Kyoto University On-site Laboratory), which was established in 2019. Marking the sixth year since the launch of the On-site Lab, this year’s forum—the fifth in the series—was hosted by Fudan University and featured presentations by seven researchers from the Institute for Chemical Research (ICR) and two from iCeMS, along with ten speakers from Fudan University. This year, early-career faculty members from both universities also participated, presenting research findings across a broad range of fields, including new materials, energy conversion, and chemical biology. In addition to discussions on the effective use of research resources and future directions for international collaboration, the forum provided a valuable opportunity for young researchers to gain new academic perspectives and explore future possibilities for research development.

Kyoto University On-site Laboratories



CONTENTS

Abbreviations used in the columns

Prof. Em.	Professor Emeritus
Prof.	Professor
Vis. Prof.	Visiting Professor
Assoc. Prof.	Associate Professor
Vis. Assoc. Prof.	Visiting Associate Professor
Senior Lect.	Senior Lecturer
Assist. Prof.	Assistant Professor
Specially Appointed Prof.	Specially Appointed Professor
Specially Appointed Assoc. Prof.	Specially Appointed Associate Professor
Specially Appointed Assist. Prof.	Specially Appointed Assistant Professor
Program-Specific Assoc. Prof.	Program-Specific Associate Professor
Program-Specific Assist. Prof.	Program-Specific Assistant Professor
Techn. Staff	Technical Staff
Program-Specific Res.	Program-Specific Researcher
Proj. Res.	Project Researcher
Lect.(pt.)	Lecturer (part-time)
Specially Contracted Staff	Specially Contracted Staff Member
Support Staff	Support Staff
Assist. Res. Staff	Assistant Research Staff
Assist. Techn. Staff	Assistant Technical Staff
Assist. Admin. Staff	Assistant Administrative Staff
Guest Scholar	Guest Scholar
Guest Res. Assoc.	Guest Research Associate
Distinguished Visiting Prof.	Distinguished Visiting Professor
P. D.	Post-Doctoral Research Fellow
Res.(pt.)	Researcher (part-time)
Res. Support Staff	Research Support Staff
R. F.	Research Fellow
D1~3	Doctoral Course (Program) 1~3
iD1~5	Integrated Doctoral Course (Program) 1~5
M1~2	Master's Course (Program) 1~2
R. S.	Research Student
U. G.	Undergraduate Student
D. Sc.	Doctor of Science
D. Eng.	Doctor of Engineering
D. Agr.	Doctor of Agricultural Science
D. Pharm. Sc.	Doctor of Pharmaceutical Science
D. Med. Sc.	Doctor of Medical Science
D. Inf.	Doctor of Informatics
D. Bioscience	Doctor of Bioscience
Ph. D.	Doctor of Philosophy
(pt)	part-time

ORGANIZATION

Institute for Chemical Research

5 Divisions and 3 Centers — Laboratories

Research Divisions

Division of Synthetic Chemistry
- Organoelement Chemistry
- Structural Organic Chemistry
- Synthetic Organic Chemistry
- Advanced Inorganic Synthesis

Division of Materials Chemistry
- Chemistry of Polymer Materials
- Polymer Controlled Synthesis
- Inorganic Photonics Materials
- Nanospintronics

Division of Biochemistry
- Biofunctional Design-Chemistry
- Chemistry of Molecular Biocatalysts
- Molecular Biology
- Chemical Biology

Division of Environmental Chemistry
- Molecular Materials Chemistry
- Hydrospheric Environment Analytical Chemistry
- Chemistry for Functionalized Surfaces
- Molecular Microbial Science

Division of Multidisciplinary Chemistry
- Polymer Materials Science
- Molecular Rheology
- Molecular Aggregates

Research Centers

Advanced Research Center for Beam Science
- Particle Beam Science
- Laser Matter Interaction Science
- Electron Microscopy and Crystal Chemistry
- Atomic and Molecular Structures

International Research Center for Elements Science
- Synthetic Organotransformation
- Advanced Solid State Chemistry
- Organometallic Chemistry
- Optical Materials Science
- Structural Organic Chemistry
- Biofunctional Design-Chemistry

Bioinformatics Center
- Chemical Life Science
- Mathematical Bioinformatics
- Bio-knowledge Engineering
- GenomeNet Project Management Office

- Visiting Divisions
- International Joint Usage/Research Center
- Supercomputer System
- Low Temperature Laboratory

INTRODUCTORY COLUMNS OF LABORATORIES

Division of Synthetic Chemistry
– Organoelement Chemistry –

https://www.scl.kyoto-u.ac.jp/~oec/en/index.html

Prof.
YAMADA, Hiroko
(D. Sc.)

Assoc. Prof.
MIZUHATA, Yoshiyuki
(D. Sc.)

Assist. Prof.
YAMAUCHI, Mitsuaki
(D. Eng.)

Assist. Prof. *1
YAMAMOTO, Keitaro
(D. Eng.)

P. D.
MOUROT, Benjamin
(Ph. D.)

P. D.
LABRO, Marine
(Ph.D.)

Techn. Staff *2
HIRANO, Toshiko

Techn. Staff
INUTSUKA, Mayumi

*1 New Research Field Development Project
*2 Re-employed Staff
*3 National Institute for Materials Science

Assist. Admin. Staff

TOTANI, Fuyuko

Lecturer (pt.)

HAYASHI, Hironobu *3 (D. Eng.)

Students

YANG, Yi (D3)
KASAHARA, Shoma (D3)
UCHIDA, Daichi (D3)
UENO, So (D3)
MIYAZAKI, Kazuya (D2)
MURAKAMI, Hideyuki (D2)
REN, Zhe (D2)
HATAKENAKA, Ryoji (D1)
SUZUKI, Shinjiro (D1)
WANG, Yutang (D1)
NISHIKAWA, Takeru (M2)
TAKAHASHI, Keita (M2)
FURUTA, Minamo (M1)
HAYASHI, Hiroki (M1)
MAKI, Ayu (M1)

Scope of Research

π-Extended aromatic compounds such as higher acenes and porphyrins are attractive as organic functional materials. In particular, we focus on the control of thin-film structure by self-assembly of the materials to investigate the correlation between packing structure and charge carrier mobility. We are also interested in the compounds including heavy main group elements to elucidate the similarities and differences in structures and reactivities between organic compounds and the corresponding heavier congeners.

KEYWORDS

Organic Semiconductor Aromatic Compound Self-Assembly Main Group Element Reactive Intermediate

Recent Selected Publications

Murakami, H.; Yamauchi, M.; Fujita, T.; Yamada, H., Retro-Diels–Alder-Triggered Supramolecular Polymerization of Tetrabenzoporphyrin into Pyramidal Aggregates, *Angew. Chem. Int. Ed*., **64(40),** e202507402 (2025).
Uchida, D.; Yukimoto, M.; Tokitoh, N.; Yamauchi, M.; Yamada, H.; Mizuhata, Y., Reactivity of a Methylene-Bridged 1,3-Bis(germylene) in Dynamic Equilibrium with Its Dimer, *Angew. Chem. Int. Ed*., **64(34),** e202508927 (2025).
Ueno, S.; Yamauchi, M.; Shioya, N.; Matsuda, H.; Hasegawa, T.; Yamamoto, K.; Mizuhata, Y.; Yamada, H., Hydrogen-Bond-Directed Supramolecular Organic Semiconductor Thin Films Realized via Thermal Precursor Approach, *Angew. Chem. Int. Ed.*, **64(31),** e202425188 (2025).
Kasahara, S.; Hayashi, H.; Okumura, T.; Matsumoto, M.; Yamauchi, M.; Mizuhata, Y.; Aratani, N.; Yamada, H., Shape-Persistent Anthracene-Based Macrocycles Prepared by Reversible Boronic Ester Formation: Crystallization and Structural Analysis, *ChemPlusChem*, **90(5),** e202500014 (2025).
Miyazaki, K.; Teranishi, K.; Matsuda, H.; Matsuo, K.; Yamauchi, M.; Mizuhata, Y.; Shioya, N.; Hasegawa, T.; Yamada, H., Single-Crystal Organic Field-Effect Transistors Based on 5,15-Bisaryl-Tetrabenzoporphyrins: Synthesis, Structure, and Charge Transport Properties, *Adv. Mater. Interfaces*, **12(20),** 2400946 (2025).

Division of Synthetic Chemistry
– Structural Organic Chemistry –

https://www.scl.kyoto-u.ac.jp/~kouzou/en/index.html

Prof.
MURATA, Yasujiro
(D. Eng.)

Assoc. Prof.
HIROSE, Takashi
(D. Eng.)

Assist. Prof.
HASHIKAWA, Yoshifumi
(D. Eng.)

Students

HU, Weizhe (D5)
ZHANG, Zheng (D5)
GU, Jiajian (D4)
LIU, Zhibo (D3)
MIOMO, Sota (M1)
NAGAI, Ryoya (U. G.)

Scope of Research

Fundamental studies are being conducted for the creation of new functional π-systems with novel structures and properties, and for evaluation of their application as organic semiconducting materials for photovoltaic and electroluminescent devices. The major subjects are: 1) organochemical transformation of fullerenes C_{60} and C_{70}, specifically organic synthesis of endohedral fullerenes by the technique of molecular surgery; 2) generation of ionic fullerene species and their application for the synthesis of functional material; 3) synthesis of new carbon-rich materials by the use of transition metal complex; and 4) creation of new functional π-materials with unique photoelectric properties.

KEYWORDS

π-Conjugated Systems
Functional Materials
Radical Species
Endohedral Fullerenes
Helical Structures

Recent Selected Publications

Zhang, Z.; Zhu, H.; Gu, J.; Shi, H.; Hirose, T.; Jiang, L.; Zhu, Y.; Zhong, D.; Wang, J., Nonplanar Nanographene with a Large Conjugated π-Surface, *J. Am. Chem. Soc*., **146,** 24681-24688 (2024).

Nakazono, R.; Hu, W.; Hirose, T.; Amaya, T., Synthesis and Characterization of a Cyclic Trimer of a Chiral Spirosilabifluorene, *Chem. Eur. J.*, **30,** e202401343 (2024).

Hashikawa, Y.; Okamoto, S.; Murata, Y., Synthesis of Inter-[60]Fullerene Conjugates with Inherent Chirality, *Nat. Commun*., **15,** 514 (2024).

Liu, W.; Huang, G.; Chen, C.-Y.; Tan, T.; Fuyuki, H.; Hu, S.; Nakamura, T.; Truong, M. A.; Murdey, R.; Hashikawa, Y.; Murata, Y.; Wakamiya, A., An Open-Cage Bis[60]fulleroid as Electron Transport Material for Tin Halide Perovskite Solar Cells, *Chem. Commun*., **60,** 2172-2175 (2024).

Huang, G.; Sadai, S.; Hashikawa, Y.; Murata, Y., Reactions of Diaminonaphthalenes with a Cage-Opened C_{60} Derivative, *Asian J. Org. Chem*., **13,** e202300634 (2024).

Division of Synthetic Chemistry
– Advanced Inorganic Synthesis –

https://www.scl.kyoto-u.ac.jp/~teranisi/index_E.html

Prof.
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TAKAHATA, Ryo *
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MATSUMOTO, Kenshi
(D. Sc.)

P. D.
WEN, Dingchen
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P. D.
TIAN, Wu
(D. Sc.)

P. D.
DU, Xiangxin
(Ph. D.)

*New Research Field Development Project

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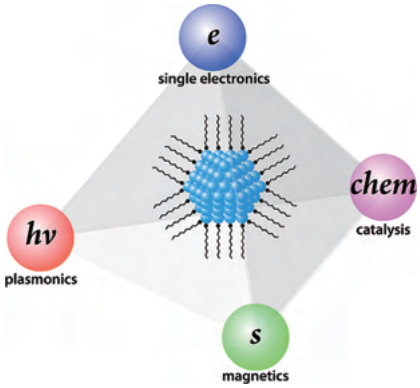
XIA, Yan (D3)
ZHU, Lingkai (D3)
JIN, Yirou (D3)
NAGAI, Nao (D2)
LEE, Hyunji (D2)
PENG, Xiaoxiao (D2)
MUTO, Mitsuki (D1)
FUKUYAMA, Mitsuki (M2)
KAMIYA, Aki (M1)
YAMASHITA, Jumpei (M1)
WADA, Masaki (M1)

Scope of Research

We are focusing on the precise synthesis of inorganic nanoparticles by controlling the primary (size, shape, composition, *etc.*) and secondary (spatial arrangement) structures to tune properties such as electron confinement, carrier oscillation, spin, and catalysis. These high-quality inorganic nanoparticles are applied to both high-performance nanodevices (*e.g.*, single electron transistor, plasmon waveguide, and nanocomposite magnet) and photo-energy conversion materials (*e.g.*, overall water splitting and solar cell).



KEYWORDS

Inorganic Nanomaterials
Oxidation Reduction Reactions
Quantum Dots
Photocatalysts
Plasmonics

Recent Selected Publications

Zhu, L.; Nagai, N.; Xia, Y.; Muto, M.; Teranishi, T.; Saruyama, M., Direct Synthesis of Three-Dimensional Ag Nanocrystals Superlattices and Their Superhydrophobic Film for a Potential Surface-Enhanced Raman Scattering Substrate, *Nanoscale*, **17(40),** 23416-23424 (2025).

Matsumoto, K.; Kudo, M.; Tatetsu, Y.; Sato, R.; Takahata, R.; Teranishi, T., Atomic Diffusion Barriers and Inter-Element Miscibility Guide the Development of Unexplored Crystal Phases, *Chem. Sci.*, **16(40),** 18705-18712 (2025).

Takekuma, H.; Sato, R.; Iida, K.; Kawawaki, T.; Haruta, M.; Kurata, H.; Nobusada, K.; Teranishi, T., Intrinsic Visible Plasmonic Properties of Colloidal $PtIn_2$ Intermetallic Nanoparticles, *Adv. Sci.*, **11,** 2307055 (2024).

Saruyama, M.; Takahata, R.; Sato, R.; Matsumoto, K.; Zhu, L.; Nakanishi, Y.; Shibata, M.; Nakatani, T.; Fujinami, S.; Miyazaki, T.; Takenaka, M.; Teranishi T., Pseudomorphic Amorphization of Three-Dimensional Nanocrystal Superlattices through Morphological Transformation of Nanocrystal Building Blocks, *Chem. Sci*., **15,** 2425-2432 (2024).

Tahara, H.; Sakamoto, M.; Teranishi, T.; Kanemitsu, Y., Coherent Electronic Coupling in Quantum Dot Solids Induces Cooperative Enhancement of Nonlinear Optoelectronic Responses, *Nat. Nanotechnol*., **19,** 744-750 (2024).

Li, Z.; Saruyama, M.; Asaka, T.; Teranishi, T., Waning-and-Waxing Shape Changes in Ionic Nanoplates upon Cation Exchange, *Nat. Commun*., **15,** 4899 (2024).

Division of Materials Chemistry
– Chemistry of Polymer Materials –

http://www.cpm.kuicr.kyoto-u.ac.jp/index_en.html

Prof.
TSUJII, Yoshinobu
(D. Eng.)

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ISHIDA, Koichiro
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Res. (pt.)

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IKENAGA, Keiko YANADA, Mizuho
MORIKI, Yoshihito

Students

KISHIDA, Takaki (M2) SAIDA, Junnosuke (M1) YAMAMOTO, Nozomu (M1)
YOSHIGAI, Toshiya (M2) MATSUMOTO, Yuji (M1) TSUGOSHI, Toshiaki (U. G.)
GOTO, Haruki (M2)

Scope of Research

We perform kinetic and mechanistic analyses toward understanding chemical and physicochemical reactions occurring in polymerization systems and better routes for synthesis of well-defined polymers. In particular, new well-defined polymers or polymer assemblies are prepared by living polymerization techniques, and their structure–properties relationships are precisely analyzed. Projects in progress include: 1) kinetics and mechanisms of living radical polymerization (LRP); 2) synthesis of new polymeric materials by living polymerizations and their structure/properties studies; and 3) synthesis, properties, and applications of concentrated polymer brushes (CPB).

KEYWORDS

Precision Polymerization
Living Radical Polymerization
Polymer Brush
Tribology
Hybrid Materials

Recent Selected Publications

Okubo, H.; Hase, K.; Tamamoto, K.; Tsujii, Y.; Nakano, K., In-Situ Observation of Ice-Adhesion Interface Under Tangential Loading: Anti-Icing Mechanism of Hydrophilic PPEGMA Polymer Brush, *Tribol. Lett*., **72,** 96 (2024).

Takahashi, Y; Mizukami, M.; Tsujii, Y.; Kurihara, K., Surface Forces Characterization of Concentrated PMMA Brush Layers under Applied Load and Shear, *Langmuir*, **40,** 325-334 (2023).

Okubo, H.; Kagiwata, D.; Nakano, K.; Tsujii, Y., Layered Structure and Wear Mechanism of Concentrated Polymer Brushes, *Langmuir*, **39,** 18458-18465 (2023).

Ishida, K.; Kondo, T., Evaluation of Surface Free Energy Inducing Interfacial Adhesion of Amphiphilic Cellulose Nanofibrils, *Biomacromolecules*, **24,** 3786-3793 (2023).

Ishida, K.; Kondo, T., Anisotropic Frictional Properties Induced by Cellulose Nanofibril Assembly, *Biomacromolecules*, **24,** 3009-3015 (2023).

Division of Materials Chemistry
– Polymer Controlled Synthesis –

http://os.kuicr.kyoto-u.ac.jp/index.html

Prof.
YAMAGO, Shigeru
(D. Sc.)

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AKIYOSHI, Misato
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Techn. Staff
FUJIHASHI, Akiko

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YAMIN, Naila (D3)
TONG, Tianxiang (D2)
WANG, Donghao (D1)
SHINODA, Yukine (M2)
IMAI, Satsuki (M1)
SUZUKI, Jun (M1)
HASE, Chihaya (M1)
NIU, Zijing (M1)
ZHANG, JIngyi (M1)
WU, Jia-De (R. S.)
KAMO, Wataru (U. G.)
MIZOWAKI, Taichi (U. G.)
YAMAGAMI, Touma (U. G.)

Scope of Research

Our research focuses on creation of new organic molecules with potential as key reagents and materials for future science and technologies. Furthermore, we have been developing new organic and polymeric materials based on our tailor-made molecules. For example, we are developing a new living radical polymerization method using heavier heteroatom compounds as controlling agents. Another topic is the synthesis of cycloparaphenylenes, hoop-shaped π-conjugated molecules, based on new synthetic strategies. We also study various condensed states of polymers by both static and dynamic methods to understand the relationship between structure and physical properties.

KEYWORDS

Organic Synthesis
Living Radical Polymerization
Curved π-Conjugated Molecules
Polymer Synthesis
Polymer Properties

Recent Selected Publications

Tong, T.; Kibune, M.; Tosaka, M.; Matsumiya, Y.; Watanabe, H.; Yamago, S., Melt Rheology of Dendritic Hyperbranched Polyacrylates Synthesized by Controlled Radical Polymerization: Evidence of Self-Similar Branch Structure Formation, *J. Am. Chem. Soc.,* **147(29),** 25652-25661 (2025).

Yamago, S.; Tong, T.; Tosaka, M.; Morimitsu, Y.: Tanaka, K., Atomic Force Microscopy Visualization of Branches in Dendritic Hyperbranched Polymers Synthesized by One-Step Radical Polymerization, *Small,* **21(45),** e08975 (2025).

Kayahara, E.; Okahara, R.; Shibata, A.; Abe, M.; Yamago, S., Synthesis and Physical Properties of [*n*]Cycloparaphenylene Ketone (*n* = 6, 7, 8, and 10), *Angew. Chem. Int. Ed*., **64(33),** e202509754 (2025).

Kayahara, E.; Hirata, S.; Mizuhata, Y.; Yasuda, Y.; Kusakabe, Y.; Kaji, H.; Yamago, S., Synthesis of π-Extended [1.1]Paracyclophanes, [1.1][*n*]PCP (*n*=2, 3, and 4), and Their Through-Space Conjugation, *Chem. Eur. J.*, **31(1),** e202402225 (2025).

Yamin, N.; Tosaka, M.; Yamago, S., Elucidation of the Termination Mechanism of the Radical Polymerization of Isoprene, *Macromolecules*, **58(9),** 4665-4672 (2025).

Division of Materials Chemistry
– Inorganic Photonics Materials –

https://mizuochilab.kuicr.kyoto-u.ac.jp/indexE.html

Prof.
MIZUOCHI, Norikazu
(D. Sc.)

Assoc. Prof.
MORIOKA, Naoya
(D. Eng.)

Assoc. Prof.
FURUITA, Kyoko
(D. Bioscience)

Program-Specific Assoc. Prof.
SHIGEMATSU, Ei
(D. Eng.)

Program-Specific Assoc. Prof.
OHKI, Izuru
(D. Bioscience)

Assist. Prof.
NISHIKAWA, Tetsuri
(D. Eng.)

Program-Specific Assist. Prof.
HERBSCHLEB, Ernst David
(Ph. D.)

Program-Specific Res.
FUJIWARA, Masanori
(D. Sc.)

Res. (pt.)

KAWASHIMA, Hiroyuki (Ph. D.)
SO, Frederick Tze Kkit (D. Eng.)
MORITA, Kohki

Students

KAWASE, Riku (D3)
NAKAMURA, Masaya (D2)
DEGUCHI, Hiroshige (D2)
OKAJIMA, Kazuki (D1)
CHUANG, Fu-Chieh (D1)
OHORI, Masanao (M2)
KONDO, Kazuki (M2)
NAKAGAWA, Hiromu (M2)
KITAYAMA, Motoki (M1)
SHIOTAHI, Ryo (M1)
NAGATA, Ryoma (M1)
MIYATANI, Shungo (U. G.)
YAMAGUCHI, Shoma (U. G.)

Scope of Research

NV centers in diamond have been extensively interested because a single spin of the NV center can be manipulated and detected at room temperature. Furthermore, a spin-coherence time of the NV center is very long. The spin-coherence time is the time to retain coherence (superposition state) and directly relates to the sensitivity of sensors of magnetic field, electric field and temperature. Therefore, the unique and excellent properties of the NV center are expected to be applied for quantum computing, quantum communication, bio-imaging, and high-sensitive sensor with nano-scale resolution.

KEYWORDS

Diamond Quantum Materials NV Center Quantum Sensing Quantum Information Science

Recent Selected Publications

Nishikawa, T.; Morioka, N.; Abe, H.; Murata, K.; Okajima, K.; Ohshima, T.; Tsuchida, H.; Mizuochi, N., Coherent Photoelectrical Readout of Single Spins in Silicon Carbide at Room Temperature, *Nat. Commun.*, **16,** 3405 (2025).
Fujiwara, M.; Ohori, M.; So, F. T. K.; Makino, Y.; Morioka, N.; Ohki, I.; Igarashi, R.; Nishikawa, M.; Mizuochi, N., Single Tin-Vacancy Center in Nanoscale Diamond., *Discover Nano*, **20,** 81 (2025).
Chigusa, S.; Hazumi, M.; Herbschleb, E. D.; Matsuzaki, Y.; Mizuochi, N.; Nakayama, K., Nuclear Spin Metrology with Nitrogen Vacancy Center in Diamond for Axion Dark Matter Detection, *Phys. Rev. D*, **111,** 075028 (2025).
Kawase, R.; Kawashima, H.; Kato, H.; Tokuda, N.; Yamasaki, S.; Ogura, M.;Makino, T.; Morioka, N.; Mizuochi, N., Control of Impurity Incorporation into CVD Diamond Synthesized with *Tert*-Butylphosphine for Quantum Applications, *Appl. Phys. Lett.*, **126,** 074002 (2025).
So, F. T.-K.; Hariki, N.; Nemoto, M.; Shames, A. I.; Liu, M.; Tsurui, A.; Yoshikawa, T.; Makino, Y.; Ohori, M.; Fujiwara, M.; Herbschleb, E. D.; Morioka, N.; Ohki, I.; Shirakawa, M.; Igarashi, R.; Nishikawa, M.; Mizuochi, N., Small Multimodal Thermometry with Detonation-Created Multi-Color Centers in Detonation Nanodiamond, *APL Mater.*, **12,** 051102 (2024).

Division of Materials Chemistry
– Nanospintronics –

https://www.scl.kyoto-u.ac.jp/~onoweb/

Prof.
ONO, Teruo
(D. Sc.)

Assoc. Prof.
SHIOTA, Yoichi
(D. Eng.)

Assist. Prof.
HISATOMI, Ryusuke
(D. Eng.)

Assist. Prof. *
MATSUKI, Hisakazu
(Ph. D.)

*New Research Field Development Project

Program-Specific Assoc. Prof.
KARUBE, Shutaro
(D. Sc.)

Program-Specific Res.
MATSUMOTO, Hiroki (D. Sc.)

P. D.
JANG, Heechan (D. Sc.)
YE, Feifan (D. Sc.)

Support Staff
TANAKA, Yuko

Students
SUGIURA, Itaru (D3)
TSENG, Chih-Hsiang (D3)
IIJIMA, Ryo (D2)
TOKORO, Fugo (D1)
HIRATA, Susumu (D1)
MANDOKORO, Tetsuma (D1)
JEONG, Dongchan (D1)
INAOKA, Yuma (M2)
TAKAHASHI, Takuya (M2)
YOSHIDA, Shoko (M2)
TSUJII, Takasi (M1)
YAMADA, Akihiro (M1)

Scope of Research

Conventional electronics uses only the charge of electrons, while traditional magnetic devices use only the spin degree of freedom of electrons. Aiming at complete control of both charge and spin in single solid-state devices, an emerging field called spintronics is rapidly developing and having an impact on information technologies. By combining the atomic-layer deposition with nanofabrication, we focus on the development of spin properties of various materials and the control of quantum effects in mesoscopic systems for novel spintronics devices.

KEYWORDS
Spintronics
Magnetism
Magnetic Materials

Recent Selected Publications

Shiota, Y.; Taniguchi, T.; Hayashi, D.; Narita, H.; Karube, S.; Hisatomi, R.; Moriyama, T.; Ono, T., Handedness Manipulation of Propagating Antiferromagnetic Magnons, *Nat. Commun*., **15,** 9750 (2024).

Kobayashi, Y.; Itoh, T.; Hisatomi, R.; Moriyama, T.; Shiota, Y.; Fan, X.; Ono, T., Spin-Torque Ferromagnetic Resonance Based on Current-Induced Impedance, *Appl. Phys. Lett*., **125,** 022405 (2024).

Narita, H.; Ishizuka, J.; Kan, D.; Shimakawa, Y.; Yanase, Y.; Ono, T., Magnetization Control of Zero-Field Intrinsic Superconducting Diode Effect, *Adv. Mater.*, **35,** 2304083 (2023).

Moriyama, T.; Sánchez-Tejerina, L.; Oda, K.; Ohkochi, T.; Kimata, M.; Shiota, Y.; Nojiri, H.; Finocchio, G.; Ono, T., Micromagnetic Understanding of Evolutions of Antiferromagnetic Domains in NiO, *Phys. Rev. Mater.*, **7,** 054401 (2023).

Hayashi, D.; Shiota, Y.; Ishibashi, M.; Hisatomi, R.; Moriyama, T.; Ono, T., Observation of Mode Splitting by Magnon-Magnon Coupling in Synthetic Antiferromagnets, *Appl. Phys. Express*, **16,** 053004 (2023).

Division of Biochemistry
– Biofunctional Design-Chemistry –

https://www.scl.kyoto-u.ac.jp/~bfdc/index.html

Prof.
IMANISHI, Miki
(D. Pharm. Sc.)

Assist. Prof.
KAWAGUCHI, Yoshimasa
(D. Pharm. Sc.)

Program-Specific Assist. Prof.
KIMURA, Seigo
(D. Pharm. Sc.)

Students

IDA, Naka (D3)
NAKAGAWA, Yuna (D3)
TANAKA, Kamui (D3)
YAMASAKI, Daisuke (D1)
KAWAHITO, Yuri (D1)
BABA, Nozomi (M2)
KIKKAWA, Ayumi (M2)
KIYOKAWA, Megumi (M2)
OBATA, Keito (M2)
SASAKI, Yuri (M2)
FURUTAMA, Yusei (M1)
SEKIGUCHI, Kaname (M1)
NOZAWA, Tomohito (M1)
UCHIDA, Azumi (U. G.)
OGAWA, Shieri (U. G.)
KITAGAWA, Maho (U. G.)
TSUJINO, Kyoko (U. G.)

Scope of Research

The ultimate goal of our research is the regulation of cellular functions by designed peptides and proteins. Current research subjects include (1) Detection and manipulation of RNA modifications and RNA higher-order structures towards understanding of RNA-mediated gene regulation, (2) design of artificial regulators of gene expression, and (3) development of novel intracellular delivery systems aiming at elucidation and control of cellular functions using designed membrane permeable peptide vectors.

KEYWORDS

Protein/Peptide Design
RNA Modification
Nucleic Acid Structure
Intracellular Delivery
DNA/RNA Binding Protein

Recent Selected Publications

Otonari, K.; Asami, Y.; Ogata, K.; Ishihama, Y.; Futaki, S.; Imanishi, M., Highly Sequence-Specific, Timing-Controllable m^{6}A Demethylation by Modulating RNA-Binding Affinity of m^{6}A Erasers, *Chem. Commun*., **61(1),** 69-72 (2025).

Kuriyama, M.; Hirose, H.; Kawaguchi, Y.; Michibata, J.; Maekawa, M.; Futaki, S., *KCNN4* as a Genomic Determinant of Cytosolic Delivery by the Attenuated Cationic Lytic Peptide L17E, *Mol. Ther*., **33(2),** 595-614 (2025).

Kawaguchi, Y.; Kikkawa, A.; Kimura, S.; Abe, H.; Futaki, S., Microcondensate-Mediated Intracellular Infusion of mRNA Across the Plasma Membrane, *Angew. Chem. Int. Ed*., **65(1),** e12139 (2026).

Obata, K.; Tanaka, K.; Futaki, S.; Imanishi, M., Structural Control of RNA Demethylation: G-Quadruplex Proximity Suppresses ALKBH5 Activity, *Chem. Eur. J.*, **31(71),** e01788 (2025).

Michibata, J.; Kawaguchi, Y.; Furuyama, Y.; Sasaki, Y.; Akiyoshi, K.; Futaki, S., Addition of Oligoarginine to a Membrane Permeabilizing Peptide M-Lycotoxin Facilitates Intracellular Antibody Infusion from Microcondensate, *Bioconjug. Chem*., **36(7),** 1494-1503 (2025).

Division of Biochemistry
– Chemistry of Molecular Biocatalysts –

https://www.scl.kyoto-u.ac.jp/~plant/index.html

Prof.
YAMAGUCHI, Shinjiro
(D. Agr.)

Assist. Prof.
MASHIGUCHI, Kiyoshi
(D. Agr.)

Assist. Prof.
HAYASHI, Kengo
(D. Sc.)

Program-Specific Assist. Prof.
SUN, Rui
(D. Life Sc.)

Students

ZHAO, Shuo (D2)
HUANG, Yihao (D2)
ZHANG, Wenqiang (D2)
XU, Qianfan (M2)
WANG, Zizheng (M1)
KANG, Yuan (M1)
MIN, An (R. S.)

Scope of Research

Plant hormones are a group of small molecules that are synthesized by plants and control their growth, development and environmental responses. This laboratory aims at elucidating how plant hormones are made and act in plants. Towards this goal, we combine chemical (organic chemistry, biochemistry, and analytical chemistry) and biological (molecular genetics, physiology, molecular biology, genomics) approaches. We are also looking for new hormone-like compounds by using mutant plants that show morphological phenotypes.

KEYWORDS

Plant Hormone
Biosynthesis
Hormone Perception
Unknown Hormone
Transporter

Recent Selected Publications

Ishida, T.; Zhang, Y.; Zhu, H.; Fudano, S.; Peng, Y.; Seto, Y.; Mashiguchi, K.; Liu, J.; He, Z.; Zhang, S.; Yamaguchi, S., Stepwise Deactivation of Gibberellins during Rice Internode Elongation, *Proc. Natl. Acad. Sci. USA*, **112(23),** e2415835122 (2025).

Mashiguchi, K.; Morita, R.; Tanaka, K.; Kodama, K.; Kameoka, H.; Kyozuka, J.; Seto, Y.; Yamaguchi, S., Activation of Strigolactone Biosynthesis by the DWARF14-LIKE/KARRIKIN-INSENSITIVE2 Pathway in Mycorrhizal Angiosperms, but Not in Arabidopsis, a Non-Mycorrhizal Plant, *Plant Cell Physiol.*, **64,** 1066-1078 (2023).

Cui, J.; Nishide, N.; Mashiguchi, K.; Kuroha, K.; Miya, M.; Sugimoto, K.; Itoh, J.-I.; Yamaguchi, S.; Izawa, T., Fertilization Controls Tiller Numbers via Transcriptional Regulation of a *MAX1*-like Gene in Rice Cultivation, *Nat. Commun.*, **14,** 3191 (2023).

Mashiguchi, K.; Seto, Y.; Onozuka, Y.; Suzuki, S.; Takemoto, K.; Wang, Y.; Dong, L.; Asami, K.; Noda, R.; Kisugi, T.; Kitaoka, N.; Akiyama, K.; Bouwmeester, H.; Yamaguchi, S., A Carlactonoic Acid Methyltransferase That Contributes to the Inhibition of Shoot Branching in Arabidopsis, *Proc. Natl. Acad. Sci. U.S.A.*, **119(14),** e2111565119 (2022).

Ishida, T.; Watanabe, B.; Mashiguchi, K.; Yamaguchi, S., Synthesis and Structure-Activity Relationship of 16,17-Modified Gibberellin Derivatives, *Phytochem Lett.*, **49,** 162-166 (2022).

Division of Biochemistry
– Molecular Biology –

https://www.scl.kyoto-u.ac.jp/~molbio/en/index.html

Assoc. Prof.
TSUGE, Tomohiko
(D. Sc.)

Assist. Prof.
KATO, Mariko
(D. Agr.)

Students

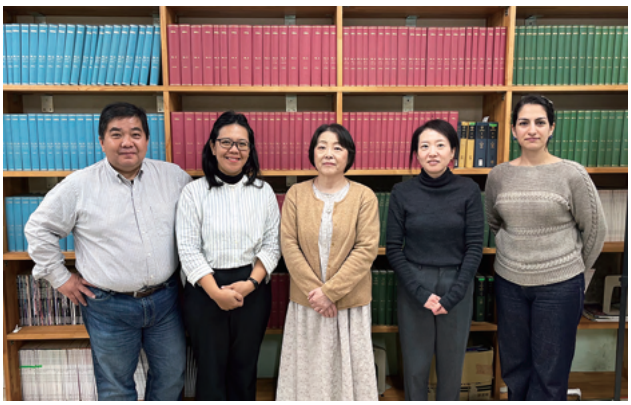
HAGHIR, Shahrzad (D3)
ODOI, Miku (D3)
SILVOSA MILLADO, Cyrose Suzie (D2)

Guest Scholars

KAWACHI-REUSCHER, Miki (D. Agr.)	Georg-August-Universität Göttingen, Germany, 14 October 2025–24 October 2025
NAMBARA, Eiji (D. Agr.)	University of Toronto, Canada, 5 December 2025–16 December 2025

Scope of Research

This laboratory aims to clarify the molecular bases of regulatory mechanisms involved in plant development, especially morphogenesis and environment adaptation, using techniques of forward and reverse genetics, molecular biology, and biochemistry. Current major subjects are: 1) COP9 signalosome modulating signal transduction in the nuclei, 2) RNA processing mediated gene expression regulation, 3) phospholipid signaling in cell morphogenesis, and 4) transcriptional network for cell morphogenesis.



KEYWORDS

Morphogenesis
mRNA Processing
Phospholipid Signaling
Signal Transduction
COP9 Signalosome

Recent Selected Publications

Szewc, L.; Zhang, X.; Bajczyk, M.; Bielewicz, D.; Zimna, M.; Yura, K.; Kato, M.; Nomoto, M.; Garcia-León, M.; Rubio, V.; Tada, Y.; Furumoto, T.; Aoyama, T.; Szweykowska-Kulinska, Z.; Staiger, D.; Jarmolowski, A.; Tsuge, T., The Plant Cleavage Factor I Complex Is Essential for Precise Cleavage and Polyadenylation Site Determination, *Plant Physiol*., **199(3),** kiaf483 (2025).

Haghir, S.; Yamada, K.; Kato, M.; Tsuge, T.; Wada, T.; Tominaga, R.; Ohashi, Y.; Aoyama, T., The *Arabidopsis* Basic-Helix-Loop-Helix Transcription Factor LRL1 Activates Cell Wall-Related Genes During Root Hair Development, *Plant Cell Physiol*., **66(3),** 384-399 (2025).

Kato, M.; Watari, M.; Tsuge, T.; Zhong, S.; Gu, H.; Qu, L.-J.; Fujiwara, T.; Aoyama, T.; Redundant Function of the Arabidopsis Phosphatidylinositol 4-phosphate 5-kinase Genes *PIP5K4-6* is Essential for Pollen Germination, *Plant J*., **117(1),** 212-225 (2024).

Division of Biochemistry
– Chemical Biology –

https://www.scl.kyoto-u.ac.jp/~uesugi/

Prof.
UESUGI, Motonari
(D. Pharm. Sc.)

Assist. Prof.
ABO, Masahiro
(D. Pharm. Sc.)

Assist. Prof.
NISHIO, Kosuke
(D. Med. Sc.)

Assist. Prof.
SINGH, Vaibhav Pal
(D. Med. Sc.)

Students

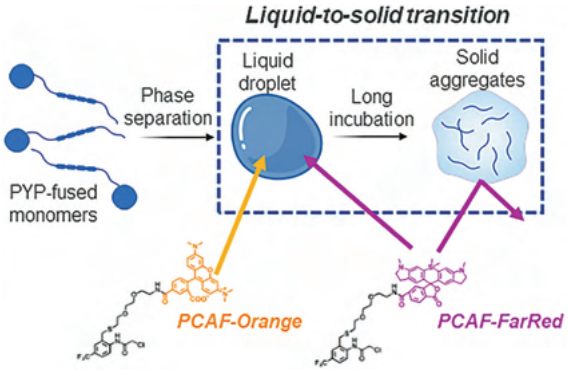
FARRAG, Asmaa Mostafa Abdelbari Soliman (D4)
LATOS, Krystian (D2)
YAMAMOTO, Yuma (D1)
OKITA, Ryunosuke (iD1)
ASANO, Junta (iD1)
HERRERA, Matthew Dewell (M1)
AYATOLLAHI, Parisa Sadat (M1)
OBEID Omar (M1)
SONG, Sereimongkol (M1)
JAISWAL, Sakshi (R. S.)
HARITH, Muhammad (R. S.)
OMOTE, Koyo (U. G.)

Guest Res. Assoc.

KIM, Hyosuk (Ph. D.) Yonsei University, Korea, R., 1 April 2023–31 March 2026

Scope of Research

Chemical biology is an interdisciplinary field of study that is often defined as "chemistry-initiated biology." As biological processes all stem from chemical events, it should be possible to understand or manipulate biological events using chemistry. Our laboratory has been discovering or designing unique organic molecules that modulate fundamental processes in human cells. Such synthetic organic molecules often serve as tools for basic cell biology. Discovery or design of small molecules with unique biological activities permits small-molecule-initiated exploration of complex cellular events. Our mission is to create a new world of bioactive synthetic molecules: new modes of activity, new shapes, and new sizes. We hope that these basic studies open new avenues for small-molecule applications in a range of fields.



KEYWORDS

Chemical Biology
Self-Assembly
Chemical Library
Chemoproteomics
Immunology

Recent Selected Publications

Farrag, A. M. A. S.; Ota, K.; Yoshimura, H.; Takemoto, M.; Mitarai, T.; Kamikawa, T.; Abo, M.; Singh, V. P.; Cui, C.; Zhou, L.; Ishidate, F.; Fujiwara, T.; Sato, S.; Hori, Y.; Ozawa, T.; Kikuchi, K.; Uesugi, M., Live-Cell Monitoring and Omics Analysis of Liquid-Solid Transitions of Biomolecular Condensates, *J. Am. Chem. Soc.,* **147 (41),** 37056-37064 (2025).

Takemoto, M.; Delghandi, S.; Abo, M.; Yurimoto, K.; Odagi, M.; Singh, V. P.; Wang, J.; Nakagawa, R.; Sato, S.; Takemoto, Y.; Farrag, A. M. A. S.; Kawaguchi, Y.; Nagasawa, K.; Honjo, T.; Chamoto, K.; Uesugi, M., Covalent Plant Natural Product That Potentiates Antitumor Immunity, *J. Am. Chem. Soc*., **147(3),** 2902-2912 (2025).

Singh, V. P.; Hirose, S.; Takemoto, M.; Farrag, A. M. A. S.; Sato, S.; Honjo, T.; Chamoto, K.; Uesugi, M., Chemoproteomic Identification of Spermidine-Binding Proteins and Antitumor-Immunity Activators, *J. Am. Chem. Soc.*, **146(24),** 16412-16418 (2024).

Zhuo, S.; Noda, N.; Hioki, K.; Jin, S.; Hayashi, T.; Hiraga, K.; Momose, H.; Li, W.; Zhao, L.; Mizukami, T.; Ishii, K.; Li, Y.; Uesugi, M., Identification of a Self-Assembling Small-Molecule Cancer Vaccine Adjuvant with an Improved Toxicity Profile, *J. Med. Chem.*, **66(18),** 13266-13279 (2023).

Toh, K.; Nishio, K.; Nakagawa, R.; Egoshi, S.; Abo, M.; Perron, A.; Sato, S.; Okumura, N.; Koizumi, N.; Dodo, K.; Sodeoka, M.; Uesugi, M., Chemoproteomic Identification of Blue-Light-Damaged Proteins, *J. Am. Chem. Soc.*, **144(44),** 20171-20176 (2022).

Nishio, K.; Toh, K.; Perron, A.; Goto, M.; Abo, M.; Shimakawa, Y.; Uesugi, M., Magnetic Control of Cells by Chemical Fabrication of Melanin, *J. Am. Chem. Soc.*, **144(37),** 16720-16725 (2022).

Division of Environmental Chemistry
– Molecular Materials Chemistry –

https://www.scl.kyoto-u.ac.jp/~moma/index-e.html

Prof.
KAJI, Hironori
(D. Eng.)

Assoc. Prof.
SUZUKI, Katsuaki
(D Human & Envirnmtl. Studies)

Assist. Prof.
CHOI, Heekyoung *
(D. Sc.)

Techn. Staff
MAENO, Ayaka

Techn. Staff
KAKUYAMA, Keisuke
(D. Sc.)

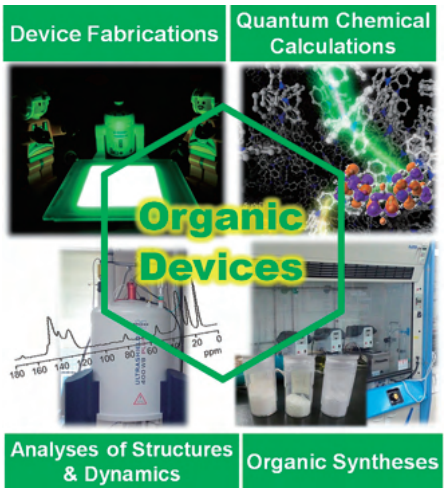
*New Research Field Development Project

Students

MURAKAMI, Kimiya (D3)
FUJINAKA, Masatoshi (D3)
SATO, Hiroki (D3)
ISHIHARA, Kuraudo (D2)
YASUDA, Yuka (D1)
OKUMURA, Ryosuke (D1)
TAKARAKO, Masataka (M2)
KAWABATA, Kazuhiro (M2)
KOZAKA, Shunsuke (M2)
KONDO, Ryo (M1)
NISHIKAWA, Kohei (M1)
SAKURAI, Yuta (M1)
AZUMA, Yusaku (U. G.)
SHIRAGA, Riku (U. G.)
TAKAHASHI, Kento (U. G.)

Scope of Research

Our research goal is to develop high-performance organic electroluminescence devices, organic solar cells, and polymer materials. Toward this, we carry out syntheses, device fabrications, precise structure characterizations, and quantum chemical calculations for high functional organic materials. Along with exploring novel synthetic routes and novel devices, we perform detailed analyses of structures and dynamics, mainly by sophisticated solid-state NMR spectroscopy, in order to obtain structure–dynamics–property relationships.



KEYWORDS

Organic Light-Emitting Diodes
Quantum Chemical Calculation
Dynamic Nuclear Polarization Enhanced NMR
Solid-State NMR
Amorphous Materials

Recent Selected Publications

Ishihara, K.; Kaji, H., Predictions of Molecular Orientation and Charge Mobility in Organic Vacuum-Deposited Thin Films by Multiscale Simulation, *Commun. Mater.*, **6(1),** 116 (2025).

Yasuda, Y.; Shizu, K.; Tanaka, H.; Kaji, H., Enhanced Luminance of Pentaazaphenalene-Based Delayed Fluorescence Emitters by Breaking Forbidden Transition, *Angew. Chem. Int. Ed.*, **64(24),** e202504390 (2025).

Sato, H.; Kanda, S.; Kaji, H., Elucidation of Molecular-Level Charge Transport in an Organic Amorphous System, *npj Comput. Mater.*, **11(1),** 39 (2025).

Okumura, R.; Tanaka, H.; Shizu, K.; Fukushima, S.; Yasuda, Y.; Kaji, H., Development of an Organic Emitter Exhibiting Reverse Intersystem Crossing Faster than Intersystem Crossing, *Angew. Chem. Int. Ed.*, **63,** e202409670 (2024).

Shizu, K.; Kaji, H., Quantitative Prediction of Rate Constants and Its Application to Organic Emitters, *Nat. Commun.*, **15,** 4723 (2024).

Shizu, K.; Ren, Y.; Kaji, H., Promoting Reverse Intersystem Crossing in Thermally Activated Delayed Fluorescence via the Heavy-Atom Effect, *J. Phys. Chem. A*, **127,** 439-449 (2023).

Division of Environmental Chemistry
– Hydrospheric Environment Analytical Chemistry –

https://inter3.kuicr.kyoto-u.ac.jp/scope_E.html

Prof.
SOHRIN, Yoshiki
(D. Sc.)

Assoc. Prof.
TAKANO, Shotaro
(D. Sc.)

Assist. Prof.
ZHENG, Linjie
(D. Sc.)

Assist. Prof. *
ALAM, Mahboob
(Ph. D.)

*New Research Field Development Project

Techn. Staff
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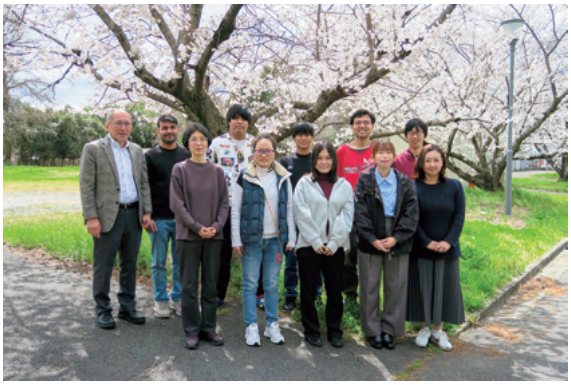
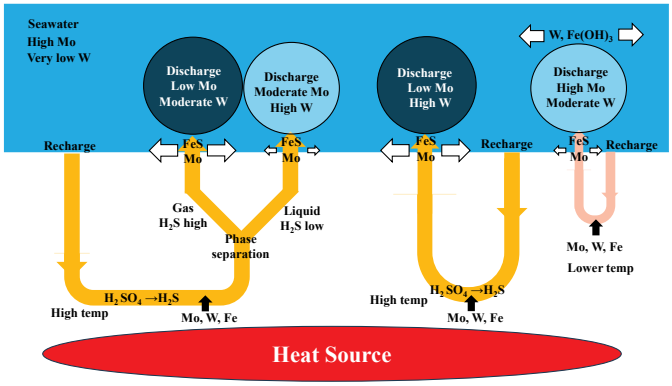
Students

MATSUOKA, Kohei (D3)
GODA, Aoi (M2)
GOSHONA, Shinya (M2)
MIZUTANI, Atsuki (M2)
TAKANO, Miyu (M1)

Scope of Research





(i) Biogeochemistry of trace elements in the hydrosphere: Novel analytical methods are developed for trace metals and their isotopes. Distribution of trace elements in the hydrosphere and their effects on the ecosystem are investigated. The study also covers hydrothermal activity, deep biosphere, and paleocean. (ii) Ion recognition: Novel ligands and ion recognition system are designed, synthesized, and characterized.

KEYWORDS

Marine Chemistry Analytical Chemistry Trace Elements Stable Isotopes Metal Ion Recognition

Recent Selected Publications

Matsuoka, K.; Takano, S.; Kawagucci, S.; Toki, T.; Sohrin, Y., Concentrations and Isotope Ratios of Mo and W in Okinawa Trough Hydrothermal Fluids: Novel Probes for Hydrothermal Processes in a Back-Arc Basin, *Geochem. J.*, **59(6),** 283-298 (2025).

Sohrin, Y.; Zheng, L.; Chan, C.-Y.; Nakaguchi, Y.; Takano, S.; Sohrin, R.; Liao, W.-H.; Ho, T.-Y., Acid-Leachability of Metals from Suspended Particles in the Pacific Ocean, *Mar. Chem.*, **273,** 104571(2025).

Zheng L., Study on the Biogeochemical Cycling Processes of Trace Metals in the Pacific Ocean Based on Multi-Element Analysis, *Oceanography in Japan*, **34,** 185-202 (2025).

Sakata, K.; Takano, S.; Matsuki, A.; Takeichi, Y.; Tanimoto, H.; Sakaguchi, A.; Kurisu, M.; Takahashi, Y., Atmospheric Chemistry in East Asia Determines the Iron Solubility of Aerosol Particles Supplied to the North Pacific Ocean, *Atmos. Chem. Phys.*, **25,** 11087-11107 (2025).

Chan, C.-Y.; Zheng, L.; Sohrin, Y., The Behaviour of Nickel, Copper, Zinc, and Cadmium in the Subarctic Pacific Ocean: East-West Differences, *J. Oceanogr.*, **81,** 149-162 (2025).

Division of Environmental Chemistry
– Chemistry for Functionalized Surfaces –

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Prof.
HASEGAWA, Takeshi
(D. Sc.)

Assist. Prof.
SHIOYA, Nobutaka
(D. Sc.)

Res. (pt.)
MATSUDA, Hiroshi
(D. Eng.)

Students

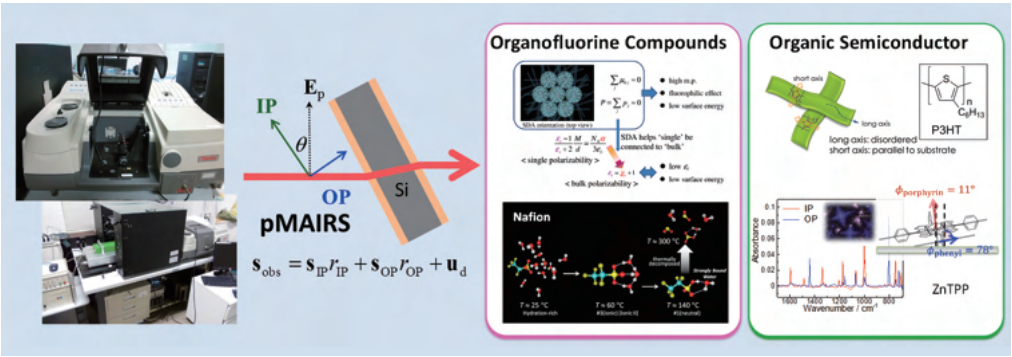
OKA, Takayuki (D2)
ARAKI, Taisuke (D1)
SUGIMOTO, Emi (M2)
OONUKI, Tomoya (M2)
KONNO, Shun (M1)
TAKADA, Seiichiro (M1)
NAKAJIMA, Hayato (M1)

Scope of Research

To understand the chemical structure and properties of a molecular aggregated system, the keywords of molecular interactions and orientation are focused on, and the molecular aggregates are investigated by using originally developed spectroscopic techniques. The current major topics are: (1) perfluoroalkyl-specific properties in a condensed system; (2) controlling factors of molecular packing and orientation in a thin film of an organic semiconductor compound; (3) development of new molecular orientation analytical technique “MAIRS2.”

KEYWORDS

Infrared and Raman Spectroscopy
Surface and Interface Chemistry
Perfluoroalkyl Compounds
Organic Semiconductors
pMAIRS and MAIRS2



Recent Selected Publications

Shimoaka, T.; Ootsuki, M.; Yamaguchi, Y.; Shioya, N.; Hasegawa, T., Molecular Orientation Analysis of Perfluoroalkyl Groups in the Solid Surface by Backscattering Raman Spectrometry, *Anal. Sci.*, **41(8),** 1355-1364 (2025).

Oonuki, T.; Araki, T.; Oka, T.; Matsuda, H.; Shioya, N.; Kano, J.; Hibara, A.; Hasegawa, T., Molecular Disaggregation Process of PTFE Using Sodium Chloride: A Study by Infrared Spectroscopy, *J. Phys. Chem. B*, **129(17),** 4249-4255 (2025).

Oka, T.; Shioya, N.; Abe, R.; Maruyama, S.; Hasegawa, T., Suppression of Molecular Disordering in Liquid Crystalline Thin Films by Side-Chain Engineering, *J. Phys. Chem. C*, **129(9),** 4806-4813 (2025).

Division of Environmental Chemistry
– Molecular Microbial Science –

https://molmicro.kuicr.kyoto-u.ac.jp/en/

Prof.
KURIHARA, Tatsuo
(D. Eng.)

Assoc. Prof.
KAWAMOTO, Jun
(D. Agr.)

Assist. Prof.
OGAWA, Takuya
(D. Agr.)

Specially Contracted Staff

KITAYAMA, Kaori

Students

INOUE, Hiromu (D3)
YOUN, Jae Hyung (D2)
YANG, Yuanzheng (D2)
SHIMODA, Kaichi (M2)
TAKANO, Haruka (M2)
YAMASHITA, Atsuki (M2)
SANKARALINGAM, Nivitha Vani (M2)
KAMADA, Mayu (M1)
SOGA, Akinori (M1)
GE, Yirun (M1)

Scope of Research

Microorganisms are found almost everywhere on Earth. They have a great diversity of capacities to adapt to various environments, including chemically and physically unusual environments. Our main subject is to clarify the molecular basis of environmental adaptations of microorganisms and their application. Specific functions of proteins and lipids with essential roles in environmental adaptation of extremophilic microorganisms are of our particular interest. We also undertake mechanistic analysis of microbial enzymes, in particular, those involved in unique metabolic pathways, and their application.

KEYWORDS

Extremophiles
Bacterial Cold-Adaptaion Mechanism
Polyunsaturated Fatty Acid
Phospholipid Acyltransferase
Extracellular Membrane Vesicle

Recent Selected Publications

Inoue, H.; Kawano, K.; Kawamoto, J.; Ogawa, T.; Kurihara, T., Rapid Screening and Identification of Genes Involved in Bacterial Extracellular Membrane Vesicle Production Using a Curvature-Sensing Peptide, *J. Bacteriol.*, **207(5),** e0049724 (2025).

Suwanawat, N.; Ogawa, T.; Toyotake, Y.; Kawamoto, J.; Kurihara, T., Biochemical Characterization and Mutational Analysis of Lysophosphatidic Acid Acyltransferases of *Escherichia coli* Hilighting Their Involvement in the Generation of Membrane Phospholid Diversity, *J. Biochem.*, **177(4),** 259-272 (2025).

Zhu, M.; Kawamoto, K.; Imai, T.; Ogawa, T.; Kurihara, T., Enhancing Extracellular Membrane Vesicle Productivity of *Shewanella vesiculosa* HM13, a Prospective Host for Vesiculation-Mediated Protein Secretion, by Weakening Outer Membrane-Peptidoglycan Linkage, *J. Biosci. Bioeng.*, **138,** 137-143 (2024).

Casillo, A.; Fanina, S.; Kamasaka, K.; Kawamoto, J.; Kurihara, T.; Lanzetta, R.; Corsaro, M. M., Structural Study of a Polysaccharide Component of *nfnB* Mutant of *Shewanella vesiculosa* HM13, *Carbohydr. Res.*, **541,** 109148 (2024).

Ogawa, T.; Kuboshima, M.; Suwanawat, N.; Kawamoto, J.; Kurihara, T., Division of the Role and Physiological Impact of Multiple Lysophosphatidic Acid Acyltransferase Paralogs, *BMC Microbiol.*, **22,** 241 (2022).

Division of Multidisciplinary Chemistry
– Polymer Materials Science –

https://www.scl.kyoto-u.ac.jp/~polymat/e-index.html

Prof.
TAKENAKA, Mikihito
(D. Eng.)

Assoc. Prof.
OGAWA, Hiroki
(D. Eng.)

Assist. Prof.
NAKANISHI, Yohei
(D. Eng.)

Assist. Prof.
SHIBASAKI, Kazuki *
(D. Eng.)

*New Research Field Development Project

Techn. Staff

ISODA, Kumiko
TATEISHI, Nayuko

Res. (pt.)

NISHIDA, Koji (D. Eng.)

Students

SEKO, Tamio (D3)
ARAWAKA, Masato (D3)
SAWADA, Satoshi (D2)
TAMURA, Yukiko (D2)
BANDO, Shusuke (D2)
HOSOMI, Yu (M2)
KUBO, Haruki (M2)
YOSHINO, Syunki (M2)
SHITOTSU, Yui (M1)
MATSUMOTO, Ryohei (M1)
SASAKI, Asaka (M1)
TAKAHATA, Momoko (U. G.)
TERUYAMA, Jun (U. G.)
NAKAYAMA, Tsubasa (U. G.)

Scope of Research

The structure and molecular motion of polymer substances are studied, mainly using scattering methods such as X-ray, neutron, and light with intent to solve fundamentally important problems in polymer science. The main projects are studied on 1) the morphologies and the dynamics of self-assembling processes in block copolymers, 2) the hierarchical structures in crystalline polymer and rubber-filler systems, 3) the viscoelastic effects in glassy materials, 4) formation processes and ordering structures in polymer thin films.

KEYWORDS

Polymer Physics Polymer Properties Self Assembly Softmatter Hierarchical Structure

Recent Selected Publications

Tamura, Y.; Arakawa, M.; Takenaka, M.; Nakanishi, Y.; Fujinami, S.; Shibata, M.; Yamamoto, K.; Miyata, N.; Yamada, M.; Seto, H.; Yamada, N. L.; Aoki, H.; Miyazaki, T., Modeling the Extraction of Bound Rubber from Silica-Filled Styrene-Butadiene Rubber with Toluene, *Polymer*, **333,** 128662 (2025).

Ogawa, H.; Tobita, N.; Ono, S.; Wang, P.; Kubozono, T.; Yoshihara, D.; Yamada, S.; Arakawa, M.; Yamamoto, S.; Tanaka, K.; Takenaka, M., Nondestructive Evaluation of the Spatial Distribution of Nanofillers and Network Structures in Buried Epoxy Resins under Adhesion Conditions, *Acs Appl. Polym. Mater.*, **7(15),** 10051-10061 (2025).

Ogawa, H.; Mashita, R.; Kishimoto, H.; Ono, S.; Yashiro, W.; Kabe, T.; Masunaga, H.; Takenaka, M., New Insights into the Fracture Precursors of Rubber Reinforced with a Nanofiller, *Small Struct.*, **6(9)** 2500257 (2025).

Kishimoto, M.; Mita, K.; Ogawa, H.; Shibasaki, K.; Arakawa, M.; Takenaka, M., Strain-Induced Density Fluctuations in Linear Low-Density Polyethylene, *J. Appl. Crystallogr.*, **58(3),** 879-885 (2025).

Arakawa, M.; Kabe, T.; Iwata, T.; Takenaka, M., Differences in Hierarchical Structural Changes between Unoriented P(3HB) and P(3HB-*co*-3HH) under Stretching, *J. Appl. Crystallogr.*, **58(3),** 886-896 (2025).

Division of Multidisciplinary Chemistry
– Molecular Rheology –

https://molrheo.kuicr.kyoto-u.ac.jp/en/

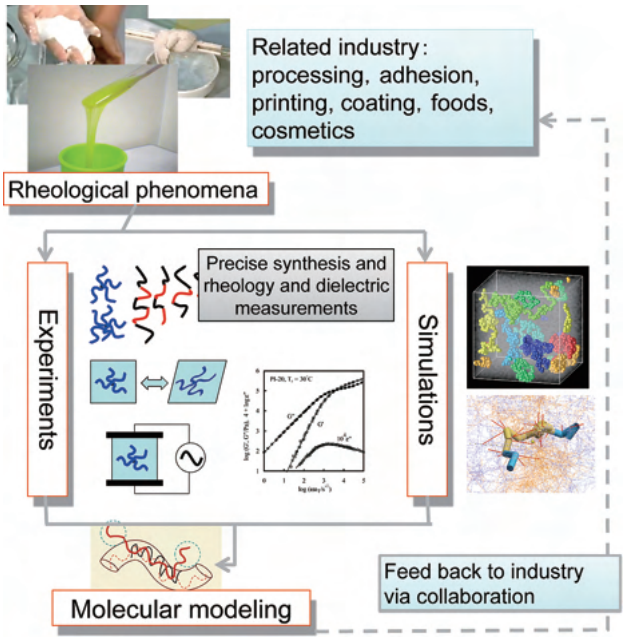
Assoc. Prof.
MATSUMIYA, Yumi
(D. Eng.)

Students

HAYASHI, Taichi (M2)
TOMIURA, Yuya (M2)

Scope of Research

Research focus is placed on the molecular origin of rheological properties of various materials. Depending on time and temperature, homogeneous polymeric materials exhibit typical features of glass, rubber, and viscous fluid while heterogeneous polymeric systems exhibit plasticity in addition to these features. For basic understanding of these features, the molecular motion and structures at various scales are studied for polymeric systems in deformed state. Rheological measurements are performed with various rheometers. Auto-correlation of the molecular orientation is also investigated with dynamic dielectric spectroscopy. Analysis of rheological and dielectric behavior elucidates a new aspect of softmatter physics.



KEYWORDS

Rheology
Soft Matter
Dielectric Spectroscopy
Mesoscopic Model

Recent Selected Publications

Matsumiya, Y.; Watanabe, H., Non-university of Constraint Release Relaxation in Entangled Linear Polymers of Various Chemical Structures, *Rubber Chem. Tech*., **97(4),** 471-511 (2024).
Zhang, Y.; Tang, J.; Chen, Q.; Kwon, Y.; Matsumiya, Y.; Watanabe, H., Nonlinear Stress Relaxation of End-Associative Star Chain. 2. Behavior Under Double-Step Strain, *J. Soc. Rheol. Jpn.*, **52(2),** 143-160 (2024).
Zhang, Y.; Tang, J.; Chen, Q.; Kwon, Y.; Matsumiya, Y.; Watanabe, H., Nonlinear Stress Relaxation of End-Associative Star Chain. 1. Behavior Under Single-Step Strain, *J. Soc. Rheol. Jpn*., **52(2),** 123-141 (2024).

Division of Multidisciplinary Chemistry
– Molecular Aggregates –

https://www.scl.kyoto-u.ac.jp/~wakamiya/english/index.html

Prof.
WAKAMIYA, Atsushi
(D. Eng.)

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NAKAMURA, Tomoya
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Assist. Prof. *1
TRUONG, Minh Anh
(D. Eng.)

Specially Appointed Assist. Prof.
CHEN, Chien-Yu
(Ph. D.)

Guest Res. Assoc. *2
SERIWATTANACHAI, Chaowaphat

Guest Res. Assoc. *3
Nguyen Thi Hue

*1 New Research Field Development Project
*2 School of Materials Science and Innovation, Mahidol University, Thailand, 7 July 2025–24 December 2025
*3 Institute for Photovoltaics, University of Stuttgart, Vietnam, Germany, 6 October 2025–31 March 2026

P. D.
TAN, Tiancheng (D. Sc.)

Program-Specific Res.
MURATA, Hiroshi
SHIMAZAKI, Ai
IWASAKI, Yasuko
MATSUSHIGE, Yuko

Res. (pt.)
NAKAMURA, Yuki

Assist. Techn. Staff
HARAMATSU, Megumi

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HASEGAWA, Akio (D3)
MIYAKE, Yuki (D2)
HARATA, Fuyuki (D2)
HIRA, Shota (D2)
ALY, Aly (D2)
SAKAMOTO, Chihiro (D1)
CHO, Woojin (M2)
LING, Yükhe (M2)
YANASE, Ibuki (M2)
NORIEGA, Javier Pablo (M2)
CHEN, Yongyong (M1)
TANAKA, Hayato (M1)

Scope of Research

We design and synthesize unique electronic materials with sophisticated device applications in mind. These materials have novel solid-state aggregation structures or well-defined interface orientation that promote efficient electrical current flow or enhance device lifetime. Electronic devices based on these new materials are then evaluated using advanced measurement techniques, and the results are used to inform the next direction of the materials chemistry. We call this synergistic approach for achieving our research goals “Needs Inspired Fundamental Science”.

KEYWORDS
Molecular Design and Synthesis Molecular Aggregation Functional Materials Semiconductors Perovskite Solar Cells

Recent Selected Publications

Harata, F.; Kaneko, R.; Hu, S.; Ohashi, N.; Nakamura, T.; Truong, M. A.; Murdey, R.; Wakamiya, A., Substrate-Independent and Antisolvent-Free Fabrication Method for Tin Perovskite Films via Imidazole-Complexed Intermediates, *ACS Energy Lett.*, **10(10),** 5047-5056 (2025).
Tan, T.; Murdey, R.; Sumitomo, S.; Sato, K.; Abe, T.; Wakamiya, A., Tailored 3-Alkoxy-*N*,*N*,*N*,2,2-Pentamethylpropan-1-Ammonium *Bis* (trifluoromethylsulfonyl)Imide Ionic Liquids for Room-Temperature Fluoride-Ion Batteries, *Angew. Chem., Int. Ed.*, **64(23),** e202422299 (2025).
Truong, M. A.; Funasaki, T.; Adachi, Y.; Hira, S.; Tan, T.; Akatsuka, A.; Yamada, T.; Iwasaki, Y.; Matsushige, Y.; Kaneko, R.; Asahara, C.; Nakamura, T.; Murdey, R.; Yoshida, H.; Kanemitsu, Y.; Wakamiya, A., Molecular Design of Hole-Collecting Materials for Co-Deposition Processed Perovskite Solar Cells: A Tripodal Triazatruxene Derivative with Carboxylic Acid Groups, *J. Am. Chem. Soc.*, **147(3),** 2797-2808 (2025).
Nakamura, T.; Nagai, T.; Miyake, Y.; Yamada, T.; Miura, M.; Yoshida, H.; Kanemitsu, Y.; Truong, M. A.; Murdey, R.; Wakamiya, A., Single-Isomer Bis(Pyrrolidino)Fullerenes as Electron-Transporting Materials for Tin Halide Perovskite Solar Cells, *Chem. Sci.*, **16(5),** 2265-2272 (2025).
Hu, S.; Wang, J.; Zhao, P.; Pascual, J.; Wang, J.; Rombach, F.; Dasgupta, A.; Liu, W.; Truong, M. A.; Zhu, H.; Kober-Czerny, M.; Drysdale, J. N.; Smith, J. A.; Yuan, Z.; Aalbers, G. J. W.; Schipper, N. R. M.; Yao, J.; Nakano, K.; Turren-Cruz, S.-H.; Dallmann, A.; Christoforo, M. G.; Ball, J. M.; McMeekin, D. P.; Zaininger, K.-A.; Liu, Z.; Noel, N. K.; Tajima, K.; Chen, W.; Ehara, M.; Janssen, R. A. J.; Wakamiya, A.; Snaith, H. J., Steering Perovskite Precursor Solutions for Multijunction Photovoltaics, *Nature*, **639(8053),** 93-101 (2025).

Advanced Research Center for Beam Science – Particle Beam Science –

https://pbs.kuicr.kyoto-u.ac.jp/en/

Prof.
WAKASUGI, Masanori
(D. Sc.)

Assoc. Prof.
TSUKADA, Kyo
(D. Sc.)

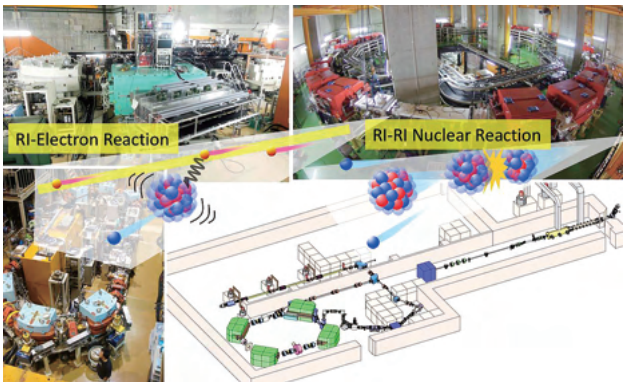
Techn. Staff
TONGU, Hiromu

Students

KAGAMI, Rin (M2)
KOBAYASHI, Hiroki (M2)
OHTAKE, Ryuji (M1)

Scope of Research

One of our research is an experimental research for unstable nuclear structures by means of the electron and heavy-ion accelerators. We address the technical development in an RI beam production driven by a high-energy electron beam, an electron scattering from the RI's in combination with the RI target inserted in an electron storage ring, and the precision mass measurement for extremely short-lived and rare exotic nuclei using a heavy-ion storage ring. We will address some technical development aiming at a nuclear photo-absorption cross-section measurement and the beam recycling in a heavy-ion storage ring to study the nuclear reactions involving rare exotic nuclei.



KEYWORDS

Beam Physics
Unstable Nuclear Physics
Electron Linac
Accelerator Physics
Storage Ring

Recent Selected Publications

Tsukada, K.; Abe, Y.; Enokizono, A.; Goke, T.; Hara, M.; Honda, Y.; Hori, T.; Ichikawa, S.; Ito, Y.; Kurita, K.; Legris, C.; Maehara, Y.; Ohnishi, T.; Ogawara, R.; Suda, T.; Tamae, T.; Wakasugi, M.; Watanabe, M.; Wauke, H., First Observation of Electron Scattering from Online-Produced Radioactive Target, *Phys. Rev. Lett.*, **131,** 092502 (2023).

Ogawara, R.; Abe, Y.; Ohnishi, T.; Enokizono, A.; Hara, M.; Hori, T.; Ichikawa, S.; Kurita, K.; Maehara, Y.; Suda, T.; Tsukada, K.; Wakasugi, M.; Watanabe, M.; Wauke, H., Ion-Trapping Properties of SCRIT: Time Evolutions of 138Ba Charge State Distributions, *Nucl. Instr. Met.*, **B541,** 90-92 (2023).

Miyata, K.; Ogawara, R.; Ishikawa, M., Improvement of Crystal Identification Accuracy for Depth-of-Interaction Detector System with Peak-to-Charge Discrimination Method, *Sensors*, **23,** 4584 (2023).

Li, H. F.; Naimi, S.; Sprouse, T. M.; Mumpower, M. R.; Abe, Y.; Yamaguchi, Y.; Nagae, D.; Suzaki, F.; Wakasugi, M.; Arakawa, H.; Dou, W. B.; Hamakawa, D.; Hosoi, S.; Inada, Y.; Kajiki, D.; Kobayashi, T.; Sakaue, M.; Yokoda, Y.; Yamaguchi, T.; Kagesawa, R.; Kamioka, D.; Moriguchi, T.; Mukai, M.; Ozawa, A.; Ota, S.; Kitamura, N.; Masuoka, S.; Michimasa, S.; Baba, H.; Fukuda, N.; Shimizu, Y.; Suzuki, H.; Takeda, H.; Ahn, D. S.; Wang, M.; Fu, C. Y.; Wang, Q.; Suzuki, S.; Ge, Z.; Litvinov, Yu. A.; Lorusso, G.; Walker, P. M.; Podolyak, Zs.; Uesaka, T., First Application of Mass Measurements with the Rare-RI Ring Reveals the Solar r-Process Abundance Trend at A = 122 and A = 123, *Phys. Rev. Lett.*, **128,** 152701 (2022).

Kusumoto, T.; Inoue, S.; Ogawara, R.; Kodaira, S., Measurement of the Energy Spectrum of Laser-Accelerated Protons Using FNTD: Development of an Easy and Quick Method for Energy Spectrometry, *Radiat. Meas.*, **151,** 106715 (2022).

Advanced Research Center for Beam Science
– Laser Matter Interaction Science –

https://en.laser.kuicr.kyoto-u.ac.jp/

Prof.
TOKITA, Shigeki
(D. Eng.)

Assist. Prof.
OKAZAKI, Daiki
(D. Eng.)

Assist. Prof.
KIRITA, Yuri
(D. Sc.)

Program-Specific Res.
BU, Xiangbao
(Ph. D.)

Res (pt.)
HASHIDA, Masaki
(D. Eng.)

Res. (pt.)

MASUNO, Shin-ichiro

Assist. Techn. Staff

MATSUMOTO, Keiko
KAMEI, Yuki

Students

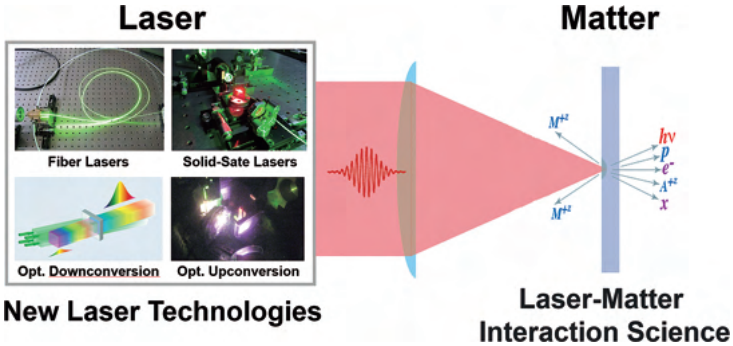
CUI, Qingyue (D1)
UETA, Isshin (M2)
HIYANE, Soshi (M2)
LEE, Sungho (M2)
ISHIHARA, Shunto (M1)
ITO, Hiroaki (M1)
NAKAGAWA, Haruto (M1)

Scope of Research

We are developing cutting-edge high-intensity laser sources and studying experimental research on the laser interaction with matter by using the new laser sources. We are promoting cross-disciplinary research based on high-intensity laser technologies such as development of high-intensity mid-infrared solid-state lasers and fiber lasers, research on particle acceleration and wavelength conversion with plasmas produced by high-intensity ultrafast lasers, development of laser isotope separation method for neutrino research, and search for dark matter using high-intensity lasers.

KEYWORDS

High Power Laser Optics
Ultrafast Laser Physics
Laser-Plasma Interaction Physics
Laser Isotope Separation
Dark Matter



Recent Selected Publications

Ishida, G.; Sugimoto, M.; Uehara, H.; Tokita, S.; Nishijima, Y.; Goya, K., Fiber-in-Line Infrared Spectrometer Fabricated by Femtosecond Laser Structuring of Microchannels in Fluoride Glass Fiber, *Opt. Express*, **33(17),** 35550-35559 (2025).

Yu, L.; Okazaki, D.; Kirita, Y.; Tokita, S.; Uehara, H.; Yasuhara, R., Numerical Investigation of Fe-Doped Chalcogenide Chirped Pulse Amplifier, *Opt. Express*, **33(16),** 33435-33445 (2025).

Fujioka, K.; Matsumoto, Y.; Tamaru, Y.; Yoshida, H.; Ogino, J.; Tokita, S.; Tsubakimoto, K.; Yamamoto, K.; Yogo, A.; Kawanaka, J.; Miyanaga, N., Fabrication, Spectroscopic Characteristics, and Lasing Performance of Nd,La:CaF_2 Transparent Ceramics, *Opt. Mater. Express*, **15(4),** 890-902 (2025).

Goya, K.; Noda, S.; Ishida, G.; Tachibana, K.; Uehara, H.; Tokita, S., Mid-Infrared Refractometer Based on Side-Polished Indium Fluoride Fiber for Monitoring Relative Humidity, *Appl. Phys. Express*, **18(3),** 032003 (2025).

Furuse, H.; Ueno, D.; Omata, K.; Imai, M.; Tokita, S., Mid-Infrared Fine-Grained Er:Y_2O_3 Laser Ceramics Fabricated by Spark Plasma Sintering, *Ceram. Int.*, **50(22),** 46925-46931 (2024).

Advanced Research Center for Beam Science
– Electron Microscopy and Crystal Chemistry –

http://eels.kuicr.kyoto-u.ac.jp/EMCC/home-en.html

Assoc. Prof.
HARUTA, Mitsutaka
(D. Sc.)

Assist. Prof.
NEMOTO, Takashi
(D. Sc.)

Program-Specific Res.
MATSUNO, Junya (D. Sc.)
KIYOMURA, Tsutomu

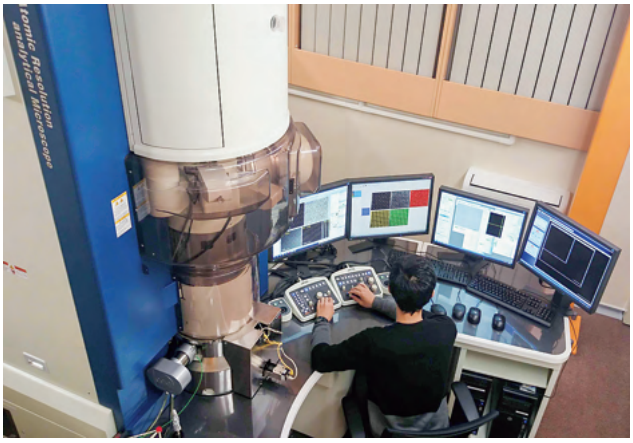
Researcher (pt.)
OGAWA, Tetsuya (D. Sc.)

Students
WU, Jiayi (D1)
SEKOGUCHI, Maho (M2)
CHO, Minhyuk (M1)

Scope of Research

In the field of nanotechnology, the importance of high spatial resolution analysis of materials further increases. We study the structure and the electronic state of materials at atomic scale through direct imaging of atoms or molecules by (scanning) transmission electron microscopy ((S)TEM) combined with energy dispersive X-ray spectroscopy (EDS) and electron energy-loss spectroscopy (EELS), which gives the information of elemental and electronic state. And we are studying with the aim of establishing new analytical methods using electron microscopes and evaluating materials using these methods.

KEYWORDS
STEM
EELS
EDS
Elemental Mapping
Electronic State



Recent Selected Publications

Iwashimizu, C.; Haruta, M.; Kurata, H., Anisotropic Atomic Contrast by Final-state Selection in Electron Energy-loss Spectroscopy, *Phys. Rev. B*, **111(15),** [155147-1]-[155147-8] (2025).

Lin, I-C.; Haruta, M.; Nemoto, T.; Kurata, H., Isotropic Behavior of Oxygen Vibrations in $PbTiO_3$ Investigated by Ti $L_{2,3}$-Edge Electron Energy-loss Spectroscopy, *Phys. Rev. B*, **110,** [035109-1]-[035109-8] (2024).

Lin, I-C.; Haruta, M.; Nemoto, T.; Goto, M.; Shimakawa, Y.; Kurata, H., Extraction of Anisotropic Thermal Vibration Factors for Oxygen from the Ti $L_{2,3}$-Edge in $SrTiO_3$, *J. Phys. Chem. C*, **127(36),** 17802-17808 (2023). Supplemental cover

Iwashimizu, C.; Haruta, M.; Nemoto, T.; Kurata, H., Different Atomic Contrasts in HAADF Images and EELS Maps of Rutile TiO_2, *Microscopy*, **72(4),** 353-360 (2023). Editor's Choice

Haruta, M.; Kikkawa, J.; Kimoto, K.; Kurata, H., Comparison of Detection Limits of Direct-Counting CMOS and CCD Cameras in EELS Experiments, *Ultramicroscopy*, **240,** [113577-1]-[113577-6] (2022).

Advanced Research Center for Beam Science
– Atomic and Molecular Structures –

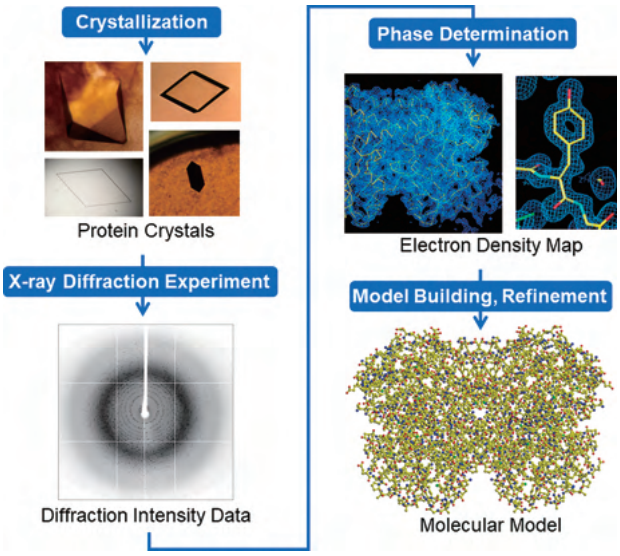
https://www.scl.kyoto-u.ac.jp/~fujii/indexE.html

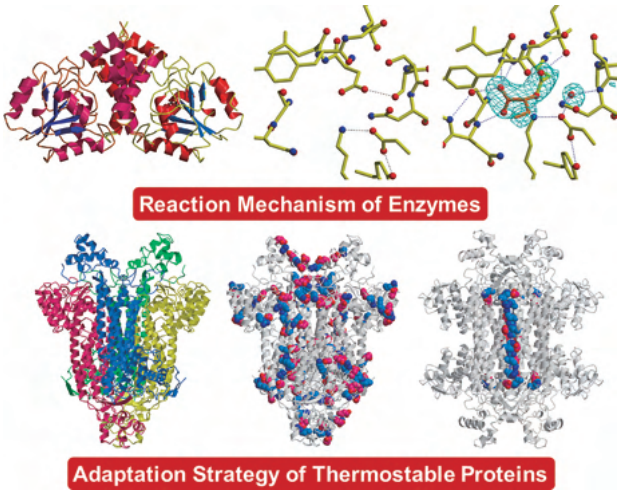
Assist. Prof.
FUJII, Tomomi
(D. Sc.)

Scope of Research

This laboratory analyzes X-ray crystallographic structures of biological macromolecules and studies the structural biology about the relationships between protein structures and their functions and properties based on the crystal structures. The main research themes are elucidation of the reaction mechanism of enzymes, the relationship between the multiform conformation and the functional variety of proteins, the structural basis for the domain-arrangements of multi-domain proteins or protein-protein interactions, structure determination for structure-based protein engineering and industrial application, and the adaptation strategy of proteins from thermophilic or cold-adapted bacteria.

KEYWORDS
Crystal
X-ray Crystallographic Analysis
Structural Biology
Protein Crystallography
Structure and Function





Recent Selected Publications

Fujii, T.; Sato, A.; Okamoto, Y.; Yamauchi, T.; Kato, S.; Yoshida, M.; Oikawa, T.; Hata, Y., The Crystal Structure of Maleylacetate Reductase from *Rhizobium* sp. Strain MTP-10005 Provides Insights into the Reaction Mechanism of Enzymes in Its Original Family, *Proteins: Structure, Function, and Bioinformatics*, **84,** 1029-1042 (2016).

Fujii, T.; Yamauchi, T.; Ishiyama, M.; Gogami, Y.; Oikawa, T.; Hata, Y., Crystallographic Studies of Aspartate Racemase from *Lactobacillus sakei* NBRC 15893, *Acta Crystallogr. Sect. F Struct. Biol. Cryst. Commun.*, **71,** 1012-1016 (2015).

Fujii, T.; Goda, Y.; Yoshida, M.; Oikawa, T.; Hata, Y., Crystallization and preliminary X-ray Diffraction Studies of Maleylacetate Reductase from *Rhizobium* sp. Strain MTP-10005, *Acta Crystallogr. Sect. F Struct. Biol. Cryst. Commun.*, **64,** 737-739 (2008).

Fujii, T.; Oikawa, T.; Muraoka, I.; Soda, K.; Hata, Y., Crystallization and Preliminary X-ray Diffraction Studies of Tetrameric Malate Dehydrogenase from the Novel Antarctic Psychrophile *Flavobacterium frigidimaris* KUC-1, *Acta Crystallogr. Sect. F Struct. Biol. Cryst. Commun.*, **63,** 983-986 (2007).

Fujii, T.; Sakai, H.; Kawata, Y.; Hata, Y., Crystal Structure of Thermostable Aspartase from *Bacillus* sp. YM55-1: Structure-based Exploration of Functional Sites in the Aspartase Family, *J. Mol. Biol.*, **328,** 635-654 (2003).

International Research Center for Elements Science – Synthetic Organotransformation –

https://www.scl.kyoto-u.ac.jp/~elements/en/

Prof.
NAKAMURA, Masaharu
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Assoc. Prof.
ISOZAKI, Katsuhiro
(D. Eng.)

Senior Lect.
PINCELLA, Francesca
(D. Eng.)

Assist. Prof.
DOBA, Takahiro
(D. Sc.)

Program-Specific Assist. Prof.
NAKAGAWA, Yuka
(D. Sc.)

Program-Specific Assist. Prof.
MINEO, Keito
(D. Agr.)

Students

ISERI, Kenta (D3)
YIN, Haozhi (D3)
WU, Beiling (D3)
WU, Dongran (D3)
CHEN, Litian (D2)
ZHANG, Hao (D2)
JAYAWEERA KANKANAMGE, Hema Malani (D2)
FUKUDA, Kenji (D1)
TAKEUCHI, Soshi (M2)
WANG, Nan (M2)
ANDO, Masaki (M1)
SEKIYA, Sota (M1)
KOGUCHI, Shiori (M1)
YU, Zixuan (R. S.)
SOGA, Teppei (U. G.)
ITAI, Hyotaro (U. G.)
OGAWA, Mitsuki (U. G.)

Program-Specific Res.

IMAI, Makiko (D. Agr.)
KATHRIARACHCHIGE DON, Suresh Kalum Kathriarachchi (D. Sc.)
LIU, Haoyue (D. Agr.)

Res. (pt.)

MATSUMURA, Hiroyuki (D. Eng.)
AVENA, Ramon Francisco Bernardino
AOKI, Satoshi (D. Sc.)
HATANO, Osamu (D. Med. Sc.)
ENOMOTO, Terumichi (D. Sc.)
NISHIMURA, Nozomi
MINAMI, Yohei (D. Eng.)
YAMAMOTO, Senri (D. Agr.)

Scope of Research

Our research activity focuses on the development of new molecular transformations, which can contribute to better or ideal synthesis of functional molecules as well as to exploitation of new chemical (metal and carbon) resources. The present research subjects are (1) metal-catalyzed carbon–carbon and carbon–heteroatom bond forming reactions by using universal metals such as iron (2) development of small metallic nanocluster catalysts based on supramolecular approaches (3) utilization of woody biomass as the renewable carbon resources by mild catalytic transformations of wood molecules into useful compounds and materials.

KEYWORDS

Iron Catalysis Organotransformation Woody Molecular Transformation Supramolecular & Superatomic Catalysis

Recent Selected Publications

Wu, D.; Doba, T.; Nakamura, M., Iron-Catalyzed C–N Coupling Using Polycyclic Aromatic Hydrocarbon as a Redox Mediator, *Org. Lett.*, **27(49),** 13643-13648 (2025).

Matsuda, H.; Hong, S. H.; Ahn, S.; Avena, R. F.; Jeong, Y.; Hwang, K. M.; Son, E.; Kang, S.; Ko, S.-B.; Kim, T.; Nakamura, M., Sustainable Iron-Catalyzed Carbazole Dimerization for High Triplet Host/Electron Blocking Materials of Efficient Deep Blue OLEDs, *Commun. Mater.*, **6(1),** 248 (2025).

Ueda, K.; Saito, R.; Iseri, K.; Sekiya, S.; Nakamura, M.; Isozaki, K., Accelerated Catalysis of Atomically Precise Thiolate-Protected Gold Nanoclusters by Supramolecular Ligand Engineering, *ACS Catal.*, **15(14),** 12260-12268 (2025).

Saito, R.; Isozaki, K.; Mizuhata, Y.; Nakamura, M., Synthesis of N_2-Type Superatomic Molecules, *J. Am. Chem. Soc.*, **146(30),** 20930-20936 (2024).

Pincella, F.; Isozaki, K.; Sato, R.; Teranishi, T.; Takaya, H.; Nakamura, M., Reusable Magnetite Nanoparticle (Fe_3O_4 NP) Catalyst for Selective Oxidation of Alcohols under Microwave Irradiation, *ACS Omega.*, **9(23),** 24477-24488 (2024).

International Research Center for Elements Science – Advanced Solid State Chemistry –

https://www.scl.kyoto-u.ac.jp/~shimakgr/indexE.html

Prof.
SHIMAKAWA, Yuichi
(D. Sc.)

Assist. Prof.
GOTO, Masato
(D. Sc.)

Techn. Staff
ICHIKAWA, Noriya
(D. Eng.)

Program-Specific Res.

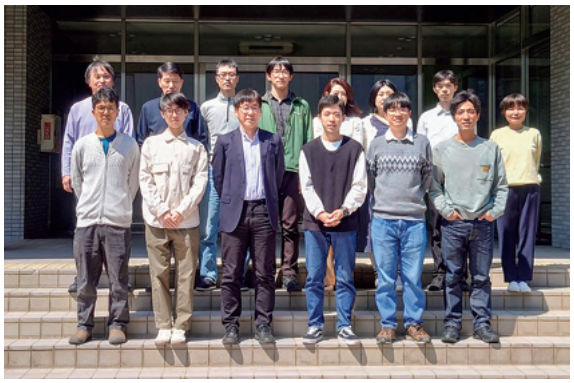
JI, Kunlang (Ph. D.)
IPUTERA, Kevin (Ph. D.)

Students

XIE, Ling-Ling (D3)
CHEN, Chen (D3)
WATANABE, Rei (D3)
FUJI, Souta (D1)
MAKI, Rintaro (M2)
TSURUNAGA, Daiki (M2)
TANAKA, Yusei (M1)

Scope of Research

Transition metal oxides have a wide variety of interesting and useful functional properties, including electronic conduction, superconductivity, ferroelectricity, and ferromagnetism. In fact, some of these oxides are used in current electronic devices. Our research mainly focuses on perovskite-structured transition metal oxides with novel functional properties due to complex couplings between their lattices, charges and spins. We are currently exploring such functional oxides with advanced oxide-synthesis techniques such as high-pressure synthesis and epitaxial thin film growth.



KEYWORDS

Solid State Chemistry Functional Metal Oxides High Pressure Synthesis Epitaxial Thin Film Growth Heterointerface

Recent Selected Publications

Ramachandran, H.; Mu, E. W.; Lomeli, E. G.; Braun, A.; Goto, M.; Hsu, K. H.; Liu, J.; Jiang, Z.; Lim, K.; Busse, G. M.; Moritz, B.; Kas, J. J.; Vinson, J.; Rehr, J. J.; Park, J.; Abate, I. I.; Shimakawa, Y.; Solomon E. I.; Yang, W.; Gent, W. E.; Devereaux, T. P.; Chueh, W. C., A Formal $Fe^{III/V}$ Redox Couple in an Intercalation Electrode, *Nat. Mater.*, **25,** 91-99 (2026).

Fuji, S.; Isoda, Y.; Lingling, X.; Haruta,M.; Majima, T.; Shimakawa, Y.; Kan, D., Correlation between Structural Properties and Electrochemical Proton Insertion in (001) VO_2 Epitaxial Films. *Appl. Phys. Express*, **18(4),** 045501 (2025).

Goto, M.; Sato, K.; Chen, W.-T.; Huang, W.-H.; Shimakawa, Y., Robust Unusually High Valence Fe^{5+} State and Large Magnetic Interaction Change in the Double Perovskites $La_{2-x}Ca_xLiFeO_{6-0.5x}$, *Chem. Mater.*, **37(5),** 2008-2013 (2025).

Shen, Y.; Ooe, K.; Shitara, K.; Kobayashi, S.; Yoshimura, T.; Yamada, T.; Xie, L.; Shimakawa, Y.; Kan, D., Ultrathin Freestanding Membranes of ZrO_2 with Metastable Structures and Strain-Dependent Electrical Properties, *Phys. Rev. Mater.*, **9(2),** 024411/1-9 (2025).

Isoda, Y.; Pham, T.; Aso, R.; Nakamizo, S.; Majima, T.; Hosokawa, S.; Nitta, K.; Morikawa, Y.; Shimakawa, Y.; Kan, D., Stabilization of Oxygen Vacancy Ordering and Electrochemical-Proton-Insertion-and-Extraction-Induced Large Resistance Modulation in Strontium Iron Cobalt Oxides $Sr(Fe,Co)O_y$, *Nat. Commun.*, **16(1),** 56/1-9 (2025).

International Research Center for Elements Science – Organometallic Chemistry –

https://www.om.kuicr.kyoto-u.ac.jp/

Prof.
OHKI, Yasuhiro
(D. Eng.)

Assist. Prof.
TANIFUJI, Kazuki
(D. Sc.)

Assist. Prof.
IZU, Hitoshi
(D. Sc.)

Res. (pt.)

FUJISAKI, Yoshie

Program-Specific Res.

YAMANASHI, Ryotaro (D. Eng.)
LU, Siming (D. Eng.)
Kamal (Ph. D.)

Students

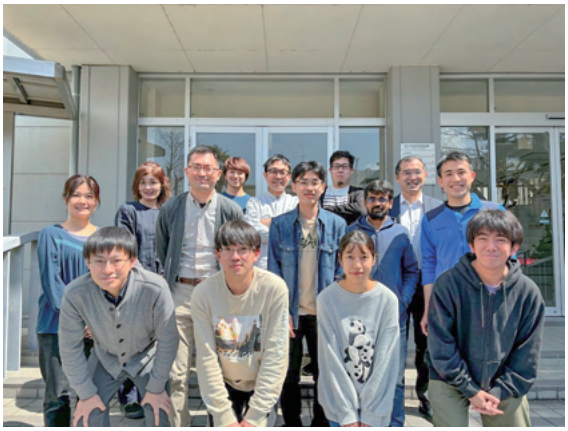
TANAKA, Kanata (D2)
MATSUOKA, Yuto (D2)
NOMURA, Satsuki (D1)
SAEED, Hassan (D1)
SHIMOYAMA, Sayaka (D1)
ADACHI, Taira (M1)
KOIKE, Yuya (U. G.)
NAKANO, Shoki (U. G.)

Scope of Research

Developing efficient energy storage systems and innovative material production processes is a significant challenge for chemists in contributing to a sustainable society. We approach these problems using transition metal clusters, of which multiple metal atoms work together as catalysts and functional materials. Our laboratory focuses explicitly on creating a new method to synthesize the clusters with atomic precision and applying the obtained clusters to difficult chemical conversions, such as the reduction of CO_2 and N_2.

KEYWORDS

Transition Metal Clusters
Homogeneous Catalysis
Nitrogen Fixation
Bioinorganic Chemistry



Recent Selected Publications

Higaki, T.; Tanaka, K.; Izu, H.; Oishi, S.; Kawamoto, K.; Tada, M.; Sameera, W. M. C.; Takahata, R.; Teranishi, T.; Kikkawa, S.; Yamazoe, S.; Shiga, T.; Nihei, M.; Kato, T.; Cramer, R. E.; Zhang, Z.; Meyer, K.; Ohki, Y., An Icosahedral 55-Atom Iron Hydride Cluster Protected by Tri-*Tert*-Butylphosphines, *J. Am. Chem. Soc.*, **147(4),** 3215-3222 (2025).

Matsuoka, Y.; Sakai, Y.; Izu, H.; Shimoyama, S.; Fujisawa, M.; Tada, M.; Lakshan, N. M.; Sameera, W. M. C.; Tanifuji, K.; Ohki, Y., Silylation of N_2 Catalyzed by Cubic [Mo_3S_4Ni] Clusters Bearing Mo-Bound Cyclopentadienyl Ligands, *Coord. Chem. Res.*, **1,** 100001 (2025).

Izu, H.; Shimoyama, S.; Tanifuji, K.; Ohki, Y., Synthesis of Cubic [Mo_3S_4M] (M = Rh, Ir) Clusters for Borylation of C–H Bonds in Aromatic Compounds, *Organometallics*, **43(24),** 3251-3257 (2024).

Izu, H.; Bhave, D. G.; Matsuoka, Y.; Sameera, W. M. C.; Tanifuji, K.; Ohki, Y., Synthesis, Characterization, and Catalytic Activity of a Cubic [Mo_3S_4Pd] Cluster Bearing Bulky Cyclopentadienyl Ligands, *Eur. J. Inorg. Chem.*, **26(29),** e202300399 (2023).

Ohki, Y.; Munakata, K.; Matsuoka, Y.; Hara, R.; Kachi, M.; Uchida, K.; Tada, M.; Cramer, R. E.; Sameera, W. M. C.; Takayama, T.; Sakai, Y.; Kuriyama, S.; Nishibayashi, Y.; Tanifuji, K., Nitrogen Reduction by the Fe Sites of Synthetic [Mo_3S_4Fe] Cubes, *Nature,* **607,** 86-90 (2022).

International Research Center for Elements Science – Optical Materials Science –

https://physics.kuicr.kyoto-u.ac.jp/

Prof.
HIRORI, Hideki
(D. Sc.)

Specially Appointed Assoc. Prof.
WATANABE, Hiroshi
(D. Sc.)

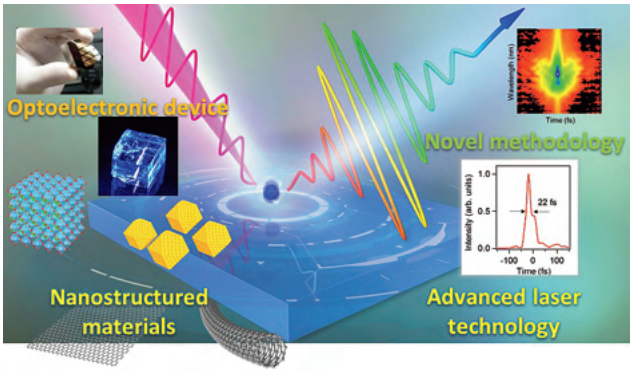
Program-Specific Res.
ZHANG, Zhenya
(D. Sc.)

Students

UMETANI, Hiroto (M2)
WATANABE, Yuichi (M2)
TAGUCHI, Outa (M1)

Scope of Research

Our research interest is to understand optical and quantum properties of nanometer-structured materials and to establish opto-nanoscience for creation of innovative functional materials. Space- and time-resolved laser spectroscopy is used to study optical properties of semiconductor quantum nanostructures and strongly correlated electron systems in low-dimensional materials. The main subjects are as follows: 1) investigation of optical properties of single nanostructures through the development of a high-resolution optical microscope, 2) ultrafast optical spectroscopy of excited states of semiconductor nanostructures, 3) photophysics of solar cell materials, and 4) engineering material properties with lights.



KEYWORDS

Femtosecond Laser Spectroscopy
Quantum Dots
High Harmonic Generation
Single Photon Spectroscopy
Perovskites

Recent Selected Publications

Zhang, Z.; Shiota, Y.; Karube, S.; Watanabe, Y.; Ono, T.; Hirori, H., Ultrafast Modulation of the Anomalous Hall Conductivity by Coherent Magnetization Precession in Co-Pt Thin Films, *Phys. Rev. Applied,* **24(4),** 044079 (2025).

Tachizaki, T.; Kanemitsu, Y.; Hirori, H., Time Resolution of Terahertz Scanning Tunneling Microscopy Measurements Inside a Superconducting Magnet Using a Hollow Waveguide, *Rev. Sci. Instrum*., **96(4),** 043004 (2025).

Zhang, Z.; Kanega, M.; Maruyama, K.; Kurihara, T.; Nakajima, M.; Tachizaki, T.; Sato, M.; Kanemitsu, Y.; Hirori, H., Spin Switching in $Sm0.7Er_{0.3}FeO_3$ Triggered by Terahertz Magnetic-Field Pulses, *Nature Mater.,* **24(2),** 219-225 (2025).

Sekiguchi, F.; Narita, H.; Hirori, H.; Ono, T.; Kanemitsu, Y., Anomalous Behavior of Critical Current in a Superconducting Film Triggered by DC Plus Terahertz Current, *Nat. Commun.,* **15(1),** 4435 (2024).

Nakagawa, K.; Hirori, H.; Sato, S. A.; Tahara, H.; Sekiguchi, F.; Yumoto, G.; Saruyama, M.; Sato, R.; Teranishi, T.; Kanemitsu, Y., Size-controlled Quantum Dots Reveal the Impact of Intraband Transitions on High-order Harmonic Generation in Solids, *Nat. Phys.,* **18(8),** 874-878 (2022).

Bioinformatics Center
– Chemical Life Science –

https://cls.kuicr.kyoto-u.ac.jp/en/

Prof.
OGATA, Hiroyuki
(D. Sc.)

Assoc. Prof.
ENDO, Hisashi
(D. Environmental Sc.)

Assist. Prof.
OKAZAKI, Yusuke
(D. Sc.)

Specially Appointed Assist. Prof.
MENG, Lingjie
(D. Sc.)

Program-Specific Res.
SATO, Takuya
(D. Agr.)

Program-Specific Res.
JIANG, Siyu
(Ph. D.)

Program-Specific Res.
ZHANG, Ruixuan
(D. Sc.)

P. D.*
KIM, Suhyun
(Ph. D.)

* JSPS Postdoctoral Fellowships for Research in Japan

Proj. Res.

OKUDA, Shiho　　YAMAGISHI, Yuki

Guest Scholars

GAIA, Morgan (Ph. D.)
CEA - Genoscope, Evry, France,
12 March 2025–26 March 2025
PELLETIER, Eric (Ph. D.)
CEA - Genoscope, Evry, France,
31 October 2025–21 November 2025

Students

YANG, Qingwei (D3)
LIU, Wenwen (D3)
WU, Junyi (D3)
CHEN, Jingjie (D2)
ZHANG, Liwen (D2)
WATANABE, Honoka (D1)
ZHAO, Hongda (D1)
TANG, Wei (M2)
SASAKI, Hiroto (M2)
YU, Zhaoxi (M1)
SHENBAGAN, Shaanaav Daniel (M1)
OUYANG, Chengzhou (R. S.)
IYANAGA, Kyoka (U. G.)
NAKAZAWA, Yuki (U. G.)

Scope of Research

We are interested in understanding the functioning and evolution of biological systems at varying scales from tiny microbes up to the Earth's environment, by leveraging rapidly accumulating big data in life science and bioinformatics approaches. We currently focus on 1) the evolution of viruses and their links to the origin of life, 2) microbial ecology in different ecosystems, and 3) the development of bioinformatics methods and biological knowledge resources for biomedical and industrial applications. To fuel these research activities, we take part in environmental sampling campaigns such as *Tara* Oceans. Our resources and developed tools are accessible through GenomeNet (www.genome.jp) to scientific communities and the public.

KEYWORDS　GenomeNet　Bioinformatics　Environmental Genomics　Virology　Molecular Evolution

Recent Selected Publications

Medvedeva, S.; Guyet, U.; Pelletier, E.; Ruscheweyh, H.-J.; Sunagawa, S.; Ogata, H.; Aylward, F. O.; Gaïa, M.; Yutin, N.; Koonin, E. V.; Krupovic, M.; Delmont, T. O., Widespread and Intron-Rich Mirusviruses Are Predicted to Reproduce in Nuclei of Unicellular Eukaryotes, *Nat. Microbiol.*, **11,** 228-239 (2026).

Liu, W.; Nagasaka, K.; Wu, J.; Ban, H.; Mimick, E.; Meng, L.; Neches, R.Y.; Moniruzzaman, M.; Yoshida, T.; Nishimura, Y.; Endo, H.; Okazaki, Y.; Ogata, H., Giant Viruses Specific to Deep Oceans Show Persistent Presence and Activity, *mSystems*, **12,** e0093225 (2025).

Endo, H.; Yamagishi, Y.; Nguyen, T. T.; Ogata, H., Extracellular rRNA Profiling Reveals the Sinking and Cell Lysis Dynamics of Marine Microeukaryotes, *Environ. Microbiol.*, **27(8),** e70164 (2025).

Okazaki, Y.; Nishikawa, Y.; Wagatsuma, R.; Takeyama, H.; Nakano, S-I., Contrasting Defense Strategies of Oligotrophs and Copiotrophs Revealed by Single-Cell-Resolved Virus–Host Pairing of Freshwater Bacteria, *ISME Commun.*, **5(1),** ycaf086 (2025).

Chen, J.; Ogata, H.; Hikida, H., Sputnik Virophage Disrupts the Transcriptional Regulation of Its Host Giant Virus, *J. Virol.*, **99(4),** e0019225 (2025).

Yang, Q.; Yang, Y.; Xia, J.; Fukuda, H.; Okazaki, Y.; Nagata, T.; Ogata, H.; Endo, H., Taxon-Specific Contributions of Microeukaryotes to Biological Carbon Pump in the Oyashio Region, *ISME Commun.*, **4(1),** ycae136 (2024).

Bioinformatics Center
– Mathematical Bioinformatics –

https://www.bic.kyoto-u.ac.jp/takutsu/index.html

Prof.
AKUTSU, Tatsuya
(D. Eng.)

Assoc. Prof.
TAMURA, Takeyuki
(D. Inf.)

Assist. Prof.
MATSUI, Motomu
(Ph. D.)

Program-Specific Res.
ZAI, Yinghan
(D. Eng.)

Program-Specific Res.
NECHES, Russell Young
(Ph. D.)

Guest Scholar *[1]
ZHANG, Han
(Ph. D.)

Guest Res. Assoc.*[2]
SUN, Liangjie
(Ph. D.)

*[1] Nankai University, China, P. R., 15 July 2024–14 January 2025
*[2] JSPS Postdoctoral Fellowships for Research in Japan, China, P. R., 1 November 2023–31 August 2025

Students

TAKAGI, Motoshige (D3)
NAKASHIMA, Shogo (D3)
MU, Lixuan (D3)
LIU, Chunting (D3)
MA, Yier (D3)
FUJITA, Satoki (D3)
GHAFOOR, Mamoona (D3)
YANG, Ziwei (D3)
WU, Chenyao (D3)
WEIREN, Zhao (D1)
WEI, Tianfang (M1)
KUANG, Jinxiang (R. S.)

Guest Res. Assoc.

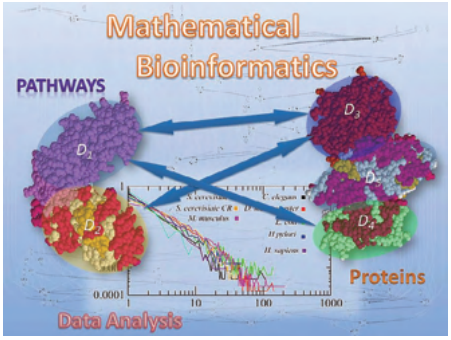
FOK, Christopher (M. Sc.) The University of Hong Kong, China, P. R., 2 June 2025–20 August 2025
GE, Xingyu (B. Math) Zhejiang Normal University, China, P. R., 15 July 2025–15 October 2025

Scope of Research

Due to the rapid progress of genome sequencing technology, whole genome sequences of organisms ranging from bacteria to human have become available. In order to understand the meaning behind the genetic code, we have been developing algorithms and software tools for analyzing biological data based on advanced information technologies such as theory of algorithms, artificial intelligence, and machine learning. We are currently studying the following topics: systems biology, scale-free networks, metabolic networks, phylogenetic trees, neural networks, chemo-informatics, and discrete and stochastic methods for bioinformatics.

KEYWORDS

Complex Networks
Boolean Networks
Neural Networks
Metabolic Networks
Phylogenetic Trees



Recent Selected Publications

Akutsu, T.; Melkman, A. A., On the Size and Width of the Decoder of a Boolean Threshold Autoencoder, *IEEE Trans. Neural Networks Learn. Syst.*, **36(2),** 3855-3862 (2025).
Sun, L.; Wu, C.; Ching, W.-K.; Akutsu, T., On the Compressive Power of Autoencoders with Linear and ReLU Activation Functions, *Neural Comput.*, **37(2),** 235-259 (2025).
Liu, C.; Cai, S.; Pan, T.; Ogata, H.; Song, J.; Akutsu, T., SFM-Net: Selective Fusion of Multiway Protein Feature Network for Predicting Binding Affinity Changes upon Mutations, *J. Chem. Inf. Model.,* **65(7),** 3854-3865 (2025).
Yang, Z.; Tamura, T., DeepGDel: Deep Learning-Based Gene Deletion Prediction Framework for Growth-Coupled Production in Genome-Scale Metabolic Models, *IEEE Trans. Comput. Biol. Bioinform.*, **22(5),** 2252-2266 (2025).
Fujiyoshi, M.; Suzuki, T. K.; Iwasaki, W.; Furusawa, C.; Matsui, M., Bac2Feature: An Easy-to-Use Interface to Predict Prokaryotic Traits from 16S rRNA Gene Sequences, *Bioinform. Adv.*, **5,** vbaf136 (2025).

Bioinformatics Center
– Bio-knowledge Engineering –

https://www.bic.kyoto-u.ac.jp/pathway/index.html

Prof.
MAMITSUKA, Hiroshi
(D. Sc.)

Senior Lect.
NGUYEN, Hao Canh
(D Knowledge Science)

Program-Specific Res.
WIMALAWARNE, Kishan
(D. Eng.)

Students

LEE, John Christer Jun Rong (D1)
JIANG, Zhiqian (M2)

Guest Scholar

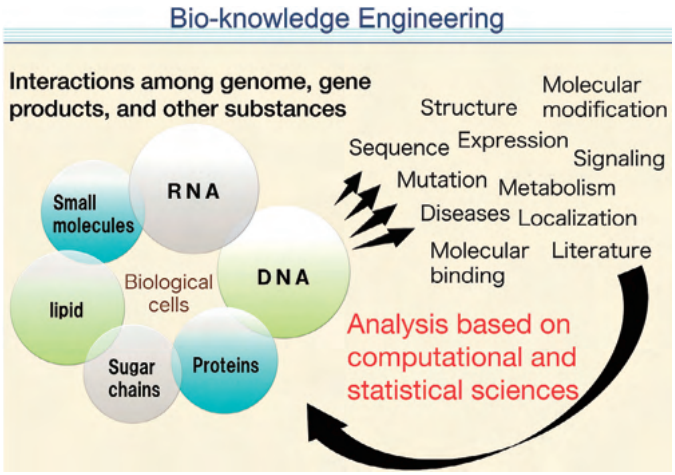
NGUYEN, Hoa Mi (Ph. D.) Vietnam National University, Vietnam, 15 November 2025–7 December 2025

Guest Res. Assoc.

PETSCHNER, Peter (Ph. D.) Semmelweis University, Hungary, 16 November 2025–14 December 2025
BLANC-MATHIEU, Romain (Ph. D.) Laboratoire Physiologie Cellulaire & Végétale CEA Grenoble, France, 20 October 2025–15 April 2026

Scope of Research

We are interested in graphs and networks in biology, chemistry, and medical sciences, including metabolic networks, protein-protein interactions and chemical compounds. We have developed original techniques in machine learning and data mining for analyzing these graphs and networks, occasionally combining with table-format datasets, such as gene expression and chemical properties. We have applied the techniques developed to real data to demonstrate the performance of the methods and find new scientific insights.



KEYWORDS

Bioinformatics Machine Learning
Data Mining Artificial Intelligence Systems Biology

Recent Selected Publications

Lee, J.; Nguyen, C. H.; Mamitsuka, H., Beyond Rigid Docking: Deep Learning Approaches for Fully Flexible Protein-Ligand Interactions, *Brief. Bioinform.*, **26 (5),** bbaf454 (2025).

Nguyen, D. H.; Mamitsuka, H.; Nakamura, A., Multiple Wasserstein Gradient Descent Algorithm for Multi-Objective Distributional Optimization, *Proceedings of the 41st Conference on Uncertainty in Artificial Intelligence (UAI 2025) (Proceedings of Machine Learning Research (PMLR))*, **286,** 3182-3199 (2025).

Nguyen, D. A.; Nguyen, C. H.; Petschner, P.; Mamitsuka, H., SPARSE: A Sparse Hypergraph Neural Network for Learning Multiple Types of Latent Combinations to Accurately Predict Drug-drug Interactions, *Bioinformatics (Proceedings of the 30th International Conference on Intelligent Systems for Molecular Biology (ISMB 2022))*, **38(Supplement 1),** i333-i341 (2022).

Nguyen, C. H.; Mamitsuka, H., Learning on Hypergraphs with Sparsity, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, **43(8),** 2710-2722 (2021).

Nguyen, D. H.; Nguyen, C. H.; Mamitsuka, H., ADAPTIVE: leArning DAta-dePendenT, concIse molecular VEctors for fast, Accurate Metabolite Identification from Tandem Mass Spectra, *Bioinformatics (Proceedings of the 27th International Conference on Intelligent Systems for Molecular Biology (ISMB/ECCB 2019))*, **35(14),** i164-i172 (2019).

ACTIVITIES OF INTERNATIONAL JOINT USAGE/RESEARCH CENTER

iJURC Cooperative Research Projects

(1 April 2025 ~ 31 March 2026)

FIELD-SPECIFIC RESEARCH
Field-specific research is jointly conducted with ICR researcher(s) in fields specified by ICR.

— EXPLORATORY —
Domestic 24, International 8

— ADVANCED —
Domestic 20, International 37

PROPOSAL-BASED RESEARCH
This category invites proposals from either chemists from multi-disciplinary research areas in the above field-specific research fields or other research fields.

— EXPLORATORY —
Domestic 8, International 4

— ADVANCED —
Domestic 9, International 21

PROMOTION OF COLLABORATIVE AND MULTIDISCIPLINARY RESEARCH
This category is primarily aimed at strengthening collaborations in chemistry and related fields between researchers in Japan and those around the world. This category accepts proposals in which the principle investigator will seek international research collaborations with foreign institutes that have signed a General Memorandum for Academic Cooperation and Exchange with the ICR.

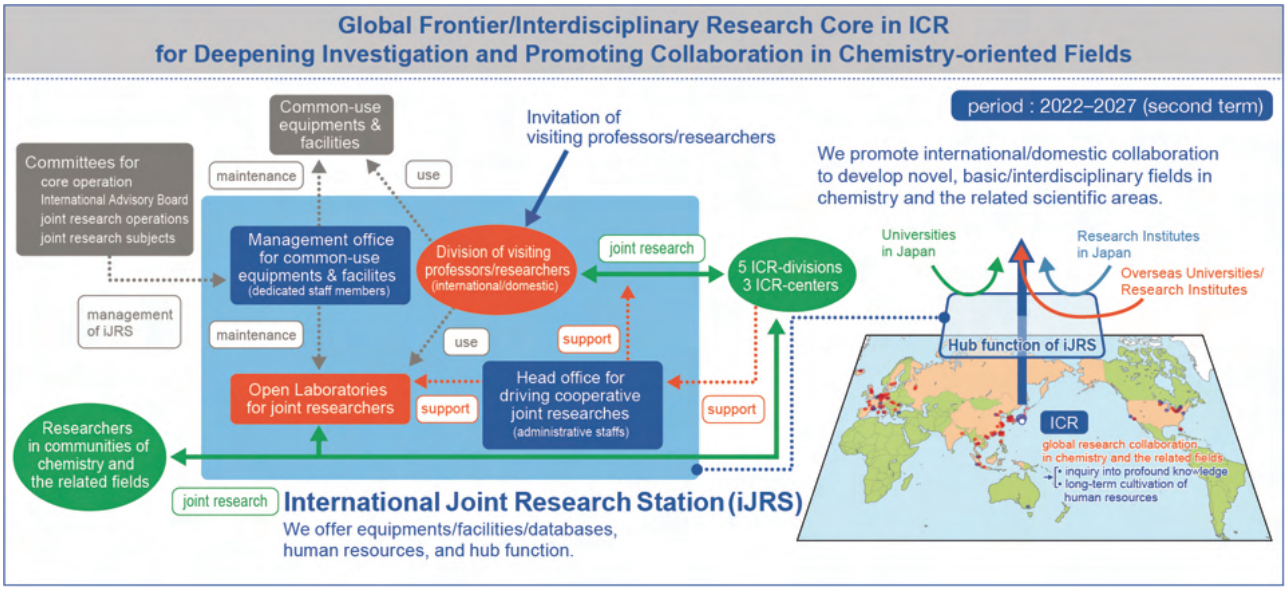
Domestic 0, International 1

FACILITIES AND EQUIPMENT USE
Facilities and equipment use projects are collaborative research that are mainly aimed at using ICR's shared facilities, equipment, and resources.

Domestic 5, International 4

Number of Applications 237
Adopted Research Projects 141 (Domestic 66, International 75)

For more details
https://www.icr-ijurc.jp/en/



VISITING PROFESSORS' ACTIVITIES IN ICR

Vis. Prof.
SHINOKUBO, Hiroshi
(D. Eng.)

Laboratory of Organoelement Chemistry

Professor, Graduate School of Engineering, Nagoya University

Lecture at *ICR*
New Synthetic Chemistry and Functional Exploration of Porphyrins: The Chemistry of Antiaromatic Norcorroles

Vis. Prof.
SUZUKI, Takanori
(D. Sc.)

Laboratory of Molecular Aggregates

Professor, Department of Chemistgry, Hokkaido University

Lecture at *ICR*
Studies on the Longest C-C Bond to Discover the One-Electron Covalent Bond

Vis. Assoc. Prof.
ONODA, Shinobu
(D. Eng.)

Laboratory of Inorganic Photonics Materials

Group leader, Takasaki Institute for Advanced Quantum Science, The National Institutes for Quantum Science and Technology (QST)

Lecture at *ICR*
Technology for the Creation of Quantum Defects in Diamond Using Quantum Beams

Vis. Assoc. Prof.
YAMAGUCHI, Yoshitaka
(D. Sc.)

Laboratory of Particle Beam Science

Senior Technical Scientist, RIKEN Nishina Center for Accelerator-Based Science

Lecture at *ICR*
Precision Mass Measurements of Rare Radioactive Ions Using a Heavy Ion Storage Ring

Vis. Prof.
WOODWARD, Patrick Marvin (Ph. D.)

Laboratory of Advanced Solid State Chemistry

Professor, Department of Chemistry and Biochemistry, Ohio State University, the U. S.

Lecture at *ICR*
Symmetry Analysis of Perovskite Oxides

Prof. Em. /Specially Appointed Prof.
KANEMITSU, Yoshihiko (D. Eng.)

Vis. Prof.
SEO, Mitsunori
(D. Sc.)

Laboratory of Chemistry of Molecular Biocatalysts

Professor, Tropical Biosphere Research Center, University of the Ryukyus

Lecture at *ICR*
Plant Hormone Transporters - Connection Between Their Bioactivity and Distribution

Vis. Prof.
YANAI, Nobuhiro
(Ph. D.)

Laboratory of Organometallic Chemistry

Professor, Department of Chemistry, Graduate School of Science, The University of Tokyo

Lecture at *ICR*
Quantum Life Science: Bridging Quantum Phenomena and Life through Chemistry

Vis. Assoc. Prof.
MIZUGUCHI, Tomoko
(D. Sc.)

Laboratory of Chemistry for Functionalized Surfaces

Associate Professor, Faculty of Materials Science and Engineering, Kyoto Institute of Technology

Lecture at *ICR*
Study on the Aggregate Structure of Perfluoroalkyl Groups Using Molecular Dynamics Simulations

Vis. Assoc. Prof.
NAKATO, Ryuichiro
(D. Inf.)

Laboratory of Mathematical Bioinformatics

Associate Professor, Institute for Quantitative Biosciences, The University of Tokyo

Lecture at *ICR*
Data-Driven Analysis of Multi-Omics for A Systematic Understanding of Genome Regulatory Mechanisms

Vis. Prof.
LACÔTE, Emmanuel
(Ph. D.)

Laboratory of Polymer Controlled Synthesis

Head/Professor, CNRS/Chimie ParisTech-PSL, France

Lecture at *ICR*
Development of New Polymer Materials Based on New Synthetic Reactions

Prof. Em. /Specially Appointed Prof.
KANEHISA, Minoru (D. Sc.)

PERSONAL

Retirement

Professor Tsujii, Yoshinobu
Division of Materials Chemistry
– Chemistry of Polymer Materials –

On March 31, 2026, Dr. Tsujii Yoshinobu retired from Kyoto University and was honored with the title of Professor Emeritus of Kyoto University.

Dr. Tsujii graduated from the Faculty of Engineering, Kyoto University in 1983. He received his master's degree from the Graduate School of Engineering in 1985 and his Doctor of Engineering in 1991, both from Kyoto University. He joined the Institute for Chemical Research (ICR), Kyoto University, as a Research Associate in 1989 and subsequently spent one and a half year (1993–1994) in Germany as a Postdoctoral Associate at the Max Planck Institute for Polymer Research. He was promoted to Associate Professor in 2001 and to Full Professor in 2008, both at ICR. He also served as Vice Director (2012–2016) and Director (2018–2022) of ICR, as Vice Director of Kyoto University (2020–2022), and as Director of the Kyoto University Research Coordination Alliance (2022–2025).

Dr. Tsujii has made significant contributions to polymer science, particularly in the area of functionalization of solid surface via precision polymerization. His major achievements include: (1) establishment of the concentrated polymer brush (CPB) system based on surface-initiated living radical polymerization (SI-LRP); (2) discovery of fascinating interfacial properties (high elasticity, ultralow friction, unique size exclusion, etc.) of CPB owing to highly ordered architecture; (3) development of polymeric soft tribological materials via thickening CPB layers using polymerization kinetics; and (4) elucidation of wear mechanisms and improvement of resiliency of CPB systems.

Dr. Tsujii is best known for achievements (1) and their wide range of applications based on (2). His pioneering research opened new frontiers in surface modification and significantly advanced surface science. Motivated by his deep expertise in polymerization kinetics and physical chemistry, he discovered that densely grafted CPB structures universally exhibit ultralow friction, fundamentally distinct from swollen polymer gels, owing to entropy-driven uniaxial elongation of the grafted chains.

Dr. Tsujii also emphasized the social implementation of CPB-based tribological materials. The first challenge for macroscopic-scale application was durability of CPB layers. Thin CPB layer (~100 nm) suffered damage due to localized load from asperity of counter surfaces. He overcame this problem by establishing a high-pressure synthesis method of CPB layer with ultra-large thicknesses (exceeding micrometers), far greater than above-mentioned asperities. Thickening not only improved durability but also enabled the use of various spectroscopic and characterization techniques, leading to a deeper understanding of the correlation between CPB microstructures and macroscopic properties. Building on this, he focused on the molecular architecture and potential of highly branched bottlebrush polymer (BBP), demonstrating that CPB-like functionality could be achieved simply via coating. Currently, CPB/BBP coatings are applied in various fields, including mechanical seals, anti-icing and anti-biofouling surfaces, flow-resistance reduction, and liquid crystal displays.

He has published more than 200 research papers and holds more than 60 granted patents. His contributions have been recognized through several awards, including the Cellulose Society of Japan Award (2015), the Society of Fiber Science and Technology Award (2005), and the Wiley Award of the Society of Polymer Science, Japan (2003). He has served as Principal Investigator of major competitive research programs such as ACCEL and CREST of Japan Science and Technology Agency (JST). He has proposed the concept of Soft and Resilient Tribology (SRT) and organized the SRT Industry-Academia Consortium, bringing together five universities/institutions and six companies to accelerate the implementation of CPB technologies. He has also held key positions in various related academic societies, including director, council member, and auditor; he has been President of the Cellulose Society of Japan since 2023 and of the Society of Fiber Science and Technology, Japan since 2024. Internationally, he has played influential roles, including Chair for the International Symposium on Fiber Science and Technology in 2024, Executive Committee Member and Co-Organizer (Japanese Representative) for the 6th, 8th, and 9th International Polysaccharide Conferences of the European Polysaccharide Network of Excellence, and a member of the Advisory Board for Polymer Chemistry.

His contributions to Kyoto University and the Institute for Chemical Research through his scientific, teaching, and administrative activities are greatly appreciated. His warm and sincere personality will remain in the hearts of his colleagues and students.

AWARDS

PUBLICATIONS

INTERNATIONAL RESEARCH COLLABORATIONS

GRANTS

THESES

AWARDS

FACULTY MEMBERS
— AWARDS —

TAMAO, Kohei
FY2025 MEXT Awards for Science and Technology (Public Understanding Promotion Category)
The Ministry of Education, Culture, Sports, Science and Technology
15 April 2025

KANEHISA, Minoru
Highly Cited Researcher 2025
Clarivate Analytics
12 November 2025

KANEMITSU, Yoshihiko
The 25th (2024) JSAP Outstanding Achievement Award (Research Achievement)
The Japan Society of Applied Physics
14 March 2025

YAMADA, Hiroko
Nagase Research Promotion Award 2025
NAGASE Science Technology Foundation
25 April 2025

YAMAUCHI, Mitsuaki
The Japanese Photochemistry Association Award for Young Scientist for 2025
The Japanese Photochemistry Association
5 September 2025

ISHIDA, Koichiro
Oral Presentation Award for Young Scientist
The 76th Divisional Meeting of Division of Colloid and Surface Chemistry, the Division of Colloid and Surface Chemistry, CSJ
3 October 2025

SHIGEMATSU, Ei
JSAP Young Scientist Presentation Award
The Japan Society of Applied Physics
31 May 2025

SO, Frederick Tze Kkit
2025 Excellent Young Researcher Award
The Quantum Life Science Society
29 May 2025

ONO, Teruo
2024 AUMS Award
Asian Union of Magnetics Societies (AUMS)
21 April 2025

SHIOTA, Yoichi
2024 AUMS Young Researcher Award
Asian Union of Magnetics Societies (AUMS)
21 April 2025

KARUBE, Shutaro
2025 JIMM Young Leaders International Scholar Award
The Minerals, Metals & Materials Society
26 March 2025

FUTAKI, Shiroh
The 56th Naito Memorial Science Promotion Award
The Naito Foundation
14 March 2025

YAMAGUCHI, Shinjiro
Highly Cited Researcher 2025
Clarivate Analytics
12 November 2025

OGAWA, Hiroki
The 12th Horie Award
Consortium of the Frontier Soft-Material Beamline
7 March 2025

SATO, Takuya
Excellent Prize
Aquatic Virus Workshop 12
8 May 2025

AKUTSU, Tatsuya
JSAI Incentive Award
The Japanese Society for Artificial Intelligence
24 June 2025

—PAPER AWARDS —

HISATOMI, Ryusuke, MATSUMOTO, Hiroki, NARITA, Hideki, KARUBE, Shutaro, SHIOTA, Yoichi and ONO, Teruo
2025 MSJ Distinguished Paper Award
The Magnetic Society of Japan (MSJ)
17 September 2025

TAKENAKA, Mikihito and NAKANISHI, Yohei
The 72nd The Best Paper Award
The Society of Rubber Science And Technology, Japan
19 May 2025

—POSTER AWARDS —

KAWAGUCHI, Yoshimasa
ACS Publications Medicinal Chemistry Award
The 42nd Medicinal Chemistry Symposium
20 November 2025

STUDENTS
— AWARDS —

REN, Zhe
CSJ Student Presentation Award at the 105th CSJ Annual Meeting (2025)
The Chemical Society of Japan
18 April 2025

LEE, Hyunji
Young Scientist Presentation Award
The 86th JSAP Autumn Meeting 2025
28 November 2025

OKAJIMA, Kazuki
Mazume Research Encouragement Award
Graduate School of Engineering, Kyoto University
8 July 2025

KIYOKAWA, Megumi
Student Outstanding Presentation Award (Oral Presentation Category)
The 145th Annual Meeting of the Pharmaceutical Society of Japan
25 April 2025

KIKKAWA, Ayumi
Presentation Award
The 71st Kinki Branch Meeting of the Japanese Biochemical Society
24 May 2025

YAMASAKI, Daisuke
Presentation Award
The 71st Kinki Branch Meeting of the Japanese Biochemical Society
24 May 2025

YAMASAKI, Daisuke
Presentation Award
The 98th Annual Meeting of the Japanese Biochemical Society
5 November 2025

CHAN, Cheuk-Yin
Oceanochemistry Encouragement Prize
Research Institute for Oceanochemistry Foundation
26 April 2025

OKA, Takayuki
Student Presentation Award
The 105th Annual Meeting of the Chemical Society of Japan (2025)
18 April 2025

INOUE, Hiromu
Hot Topics Award
The 2025 Annual Meeting of Japan Society for Bioscience, Biotechnology, and Agrochemistry
5 March 2025

INOUE, Hiromu
Outstanding Debate Award
Summer Seminar 2025, Young Researchers' Committee for Biotechnology
5 July 2025

INOUE, Hiromu
Student Excellent Presentation Award
The 77th Annual Meeting of the Society for Biotechonology
6 October 2025

HARATA, Fuyuki
The 58th Japan Society of Applied Physics Spring Meeting, Young Scientist Presentation Award
JSAP EXPO Spring 2024
7 September 2025

FUJI, Souta
Student Presentation Award
Spring Meeting 2025 in Journal of the Japan Society of Powder and Powder Metallurgy
30 May 2025

SHENBAGAN, Shaanaav Daniel
Excellent Presentation Award
The 38th Annual Meeting of the Japanese Society of Microbial Ecology, Tokyo
16 September 2025

ZHANG, Liwen
Best Oral Presentation Award
Symposium on Aquatic Microbial Ecology 18th (SAME18)
3 October 2025

WU, Chenyao
JSAI Incentive Award
The Japanese Society for Artificial Intelligence
24 June 2025

— PAPER AWARD —

MANDOKORO, Tetsuma
MSJ Encouragement Award
The Magnetic Society of Japan (MSJ)
24 July 2025

TAGA, Kotaro and KOMIYAMA, Haruka
2025 MSJ Distinguished Paper Award
The Magnetic Society of Japan (MSJ)
17 September 2025

TOKORO, Fugo
MSJ Encouragement Award
The Magnetic Society of Japan (MSJ)
21 November 2025

ARAKI, Taisuke
Best-Paper Award
Analytical Sciences
21 March 2025

SAWADA, Satoshi
The 72nd The Best Paper Award
The Society of Rubber Science And Technology, Japan
19 May 2025

UETA, Isshin
Student Presentation Award of the Physical Society of Japan
The Physical Society of Japan
17 September 2025

ZHAO, Hongda
Bioinformatics Japan Student Award
NPO Bioinformatics Japan
27 November 2025

— POSTER AWARDS —

UCHIDA, Daichi
TCI Poster Prize at the 35th Symposium on Physical Organic Chemistry
The Society of Physical Organic Chemistry, Japan
11 September 2025

HATAKENAKA, Ryoji
IRP Student Poster Award at the Exploring Chiral Field-Matter Interaction Through Spacio-Temporal Phenomena
Core-to-Core ChiFxM
19 November 2025

NAGAI, Nao
Poster Award
The 76th Divisional Meeting of Division of Colloid and Surface Chemistry
23 September 2025

KISHIDA, Takaki
Poster Award
The 53rd Summer Seminar, The Society of Fiber Science and Technology, Japan
5 September 2025

YOSHIGAI, Toshiya
Poster Award
The 53rd Summer Seminar, The Society of Fiber Science and Technology, Japan
5 September 2025

TONG, Tianxiang
Poster Presentation Award
KIPS International Symposium
26 September 2025

KONDO, Kazuki
Best Poster Presentation Award
The Quantum Life Science Society
29 May 2025

KONDO, Kazuki
Poster Excellence Award
Frontier of Spin Life Scienses
2 September 2025

KOMIYAMA, Haruka
ICR Poster Award
ICR Graduate Student Presentations AY2024
14 February 2025

KURIYAMA, Masashi
ICR Poster Award
ICR Graduate Student Presentations AY2024
14 February 2025

YAMASAKI, Daisuke
ICR Poster Award
ICR Graduate Student Presentations AY2024
14 February 2025

TANAKA, Kamui
Royal Society of Chemistry Poster Prize
The 21st RSC Nucleic Acid Forum
11 July 2025

YASUDA, Yuka
ICR Poster Award
ICR Graduate Student Presentations AY2024
14 February 2025

ARAKI, Taisuke
Young Poster Award
The Annual Meeting of the Spectroscopical Society of Japan 2025
20 June 2025

OONUKI, Tomoya
Excellent Poster Award
The 19th JSAC Kinki Branch Summer Seminar
5 August 2025

OONUKI, Tomoya
Young Poster Award
The 74th Annual Meeting of the Japan Society for Analytical Chemistry
26 September 2025

YANG, Yuanzheng
(EACE) Presentation Award 2025
1st East Asia Conference on Extremophiles
6 November 2025

HARATA, Fuyuki
Best Poster Presentation Award
Asia-Pacific International Conference on Perovskite, Organic Photovoltaics and Optoelectronics (IPEROP25)
21 January 2025

ADACHI, Yuta
ICR Poster Award
ICR Graduate Student Presentations AY2024
14 February 2025

HIRA, Shota
The 7th Frontier Solar Cell Seminar Poster Prize
The Executive Committee of the Frontier Solar Cell Seminar
10 October 2025

TAKEUCHI, Soshi
ACS Publications Outstanding Poster Award
The 23rd Conference of The Society of Nano Science and Technology
16 May 2025

ZHANG, Hao
Poster Prize
The 71st Symposium on Organometallic Chemistry
19 September 2025

ITO, Mayuri
Outstanding Poster Award
Annual Meeting 2025 in the Ceramic Society of Japan
19 May 2025

IIHOSHI, Makoto
ICR Poster Award
ICR Graduate Student Presentations AY2024
14 February 2025

TANAKA, Kanata
BCSJ Award for Poster Presentation
The 57th Summer School of the Young Researchers' Meeting in Organometallic Chemistry
3 July 2025

MATSUOKA, Yuto
Chemistry Letters Young Researcher Award
The 57th Summer School of the Young Researchers' Meeting in Organometallic Chemistry
3 July 2025

MATSUOKA, Yuto
Poster Award
The 75th Conference of Japan Society of Coordination Chemistry
15 September 2025

CHEN, Jingjie
Poster Presentation
Aquatic Virus Workshop 12
8 May 2025

WATANABE, Honoka
Excellence Award, Kyoto University Bio Award
Autumn Research Exchange Meeting
4 October 2025

PUBLICATIONS

DIVISION OF SYNTHETIC CHEMISTRY
— Organoelement Chemistry —

Tajima, K.; Moribe, T.; Matsuo, K.; Yamada, H.; Seki, S.; Yokokura, S.; Shimada, T.; Fukui, N.; Shinokubo, H., Synthesis and Electron-Transporting Properties of Phenazine Bisimides, *J. Mater. Chem. C*, **13(2),** 655-662 (2025).

Manoj Lena, A.; Yamauchi, M.; Murakami, H.; Kubo, N.; Masuo, S.; Aratani, N.; Yamada, H., Photoinduced Electron Transfer System from Cesium Lead Bromide Quantum Dots to Naphthalenediimide Supramolecular Polymers, *Chem. Asian J.*, **20(3),** e202401299 (2025).

Manoj Lena, A.; Yamauchi, M.; Murakami, H.; Kubo, N.; Masuo, S.; Matsuo, K.; Hayashi, H.; Aratani, N.; Yamada, H., Orderly Arranged Cubic Quantum Dots along Supramolecular Templates of Naphthalenediimide Aggregates, *Angew. Chem. Int. Ed.*, **64(13),** e202423912 (2025).

Hatakenaka, R.; Urabe, K.; Ueno, S.; Yamauchi, M.; Mizuhata, Y.; Yamada, H.; Mikata, Y.; Kamijo, S.; Tani, F.; Murafuji, T., Doubly Linked Azulene Dimer: A Novel Non-Benzenoid Isomer of Perylene, *Chem. Eur. J.*, **31(13),** e202404679 (2025).

Miyazaki, K.; Yamamoto, K.; Yamauchi, M.; Mizuhata, Y.; Matsuda, H.; Shioya, N.; Hasegawa, T.; Aratani, N.; Yamada, H., OFET Performance of Low-Symmetric 5-TIPS-Ethynyl-15-TMS-Ethynyl-Tetrabenzoporphyrins in the Single Crystal States, *J. Porphyr. Phthalocyanines*, **29(01n02),** 213-220 (2025).

Kubo, N.; Yamauchi, M.; Aratani, N.; Yamada, H.; Masuo, S., Hierarchical Coaggregation of Perovskite Nanocrystals and Dye Supramolecular Aggregates into a High-Order Heterostructure, *Adv. Opt. Mater.*, **13(15),** 2403567 (2025).

Fujita, R.; Hirakawa, M.; Oyama, R.; Matsuo, K.; Hayashi, H.; Yamauchi, M.; Yamada, H.; Aratani, N., One-Step Synthesis of a 2,2'-Directly-Linked Perylene Dimer from a 2,5,8,11-Tetraborylated Perylene, *Eur. J. Org. Chem.*, **28(17),** e202500042 (2025).

Mourot, B.; Mizuhata, Y.; Aratani, N.; Yamada, H., Design and Properties of Azaacene-Fused Porphyrins: Extending π-Systems for NIR-II Absorption, *Chem. Eur. J.*, **31(21),** e202500202 (2025).

Miyazaki, K.; Teranishi, K.; Matsuda, H.; Matsuo, K.; Yamauchi, M.; Mizuhata, Y.; Shioya, N.; Hasegawa, T.; Yamada, H., Single-Crystal Organic Field-Effect Transistors Based on 5,15-Bisaryl-Tetrabenzoporphyrins: Synthesis, Structure, and Charge Transport Properties, *Adv. Mater. Interfaces*, **12(20),** 2400946 (2025).

Kasahara, S.; Hayashi, H.; Okumura, T.; Matsumoto, M.; Yamauchi, M.; Mizuhata, Y.; Aratani, N.; Yamada, H., Shape-Persistent Anthracene-Based Macrocycles Prepared by Reversible Boronic Ester Formation: Crystallization and Structural Analysis, *ChemPlusChem*, **90(5),** e202500014 (2025).

Ie, Y.; Yamada, H., Recent Research Trends toward High-Efficiency OPVs, *J. Photochem. Photobiol. C*, **63,** 100690 (2025).

Ueno, S.; Yamauchi, M.; Shioya, N.; Matsuda, H.; Hasegawa, T.; Yamamoto, K.; Mizuhata, Y.; Yamada, H., Hydrogen-Bond-Directed Supramolecular Organic Semiconductor Thin Films Realized via Thermal Precursor Approach, *Angew. Chem. Int. Ed.*, **64(31),** e202425188 (2025).

Matsunaga, K.; Inoue, I.; Koyama, S.; Yamaguchi, T.; Yamauchi, M.; Masuo, S., Energy Transfer from a Perovskite Nanocrystal to Cyanine Dyes Depending on Spectral Overlap Revealed by a Single-Particle Spectroscopy, *Nano Lett.*, **25(15),** 6145-6151 (2025).

Mourot, B.; Mizuhata, Y.; Yamada, H., From Nitrogen to Sulfur: Investigating the Effect of Core Modification within Azaacene-Fused 21,23-Dithiaporphyrins, *Org. Lett.*, **27(15),** 4046-4051 (2025).

Yamada, H.; Yamakoshi, Y., Carbon-Rich Materials: from Polyaromatic Molecules to Fullerenes and Other Carbon Allotropes, *Beilstein J. Org. Chem.*, **21,** 798-799 (2025).

Teranishi, K.; Yamamoto, K.; Miyazaki, K.; Matsuo, K.; Yamauchi, M.; Mizuhata, Y.; Shioya, N.; Matsuda, H.; Hasegawa, T.; Yamada, H., Tetrabenzo-10-Heterocorroles as π-Extended Porphyrinoid Semiconductors: Synthesis, Properties, Structure, and OFET Performance, *Asian J. Org. Chem.*, **14(8),** e00337 (2025).

Hayashi, H.; Tsunoda, N.; Kasahara, S.; Negoro, C.; Chan, Y. S.; Aratani, N.; Yamada, H., Photochemical Synthesis of 2,6-Linked Anthracene Oligomers without Introducing Extra Substituents, *Eur. J. Org. Chem.*, **28(31),** e202500490 (2025).

Hayashi, H.; Yamada, H., Exploring the Chemistry of Higher Acenes: from Synthesis to Applications, *Chem. Sci.*, **16(25),** 11204-11231 (2025).

Miura, T.; Kitao, T.; Yamada, K. E.; Chan, Y. S.; Hayashi, H.; Yamada, H.; Uemura, T., Accessing Single-Molecule Properties of Heptacene Using a Metal-Organic Framework, *Chem. Eur. J.*, **31(39),** e202501787 (2025).

Uchida, D.; Yukimoto, M.; Tokitoh, N.; Yamauchi, M.; Yamada, H.; Mizuhata, Y., Reactivity of a Methylene-Bridged 1,3-Bis(germylene) in Dynamic Equilibrium with Its Dimer, *Angew. Chem. Int. Ed.*, **64(34),** e202508927 (2025).

Sakamoto, M.; Mizuhata, Y.; Ota, W.; Konishi, T.; Tahara, H.; Kamada, K.; Sato, T., Orbital Hybridization of π-Conjugated Ligands with Atomically Precise Metal Clusters for Enhanced Two-Photon Absorption, *J. Am. Chem. Soc.*, **147(27),** 23451-23457 (2025).

Murakami, H.; Yamauchi, M.; Fujita, T.; Yamada, H., Retro-Diels-Alder-Triggered Supramolecular Polymerization of Tetrabenzoporphyrin into Pyramidal Aggregates, *Angew. Chem. Int. Ed.*, **64(40),** e202507402 (2025).

Yamamoto, K.; Yamauchi, M.; Yamada, H., Tetrabenzoporphyrins as Organic Semiconductors for High-Performance Organic Field-Effect Transistors: a Structure-Property Perspective, *Can. J. Chem.*, 10.1139/cjc-2025-0086 (2025).

Kawase, Y.; Ota, K.; Ikoma, S.; Sugahara, K.; Nakahodo, T.; Mizuhata, Y.; Matsuo, T., Organoantimony(I) Compounds Incorporating the Bulky Rind Groups: Selective Synthesis and Characterization of Distibene and Cyclotetrastibane, *Organometallics*, **44(19),** 2240-2249 (2025).

Mizuhata, Y., The Chemistry of Aryl Anions with Core Substitution by Heavy Group 14 Elements, *J. Synth. Org. Chem., Jpn.*, **83(10),** 898-908 (2025).

Tanaka, S.; Oyama, R.; Suzuki, M.; Hayashi, H.; Yamada, H.; Aratani, N., Planar Versus Twist: Two Conformers of a 5,7,12,14-Tetrakis(Triisopropylsilylethynyl)pentacene in the Solid State, *Org. Lett.*, **27(44),** 12255-12258 (2025).

Hwang, J. H.; Bassi, N.; Fadel, M.; Braun, O.; Dumslaff, T.; Pignedoli, C. A.; Stiefel, M.; Furrer, R.; Hayashi, H.; Yamada, H.; Narita, A.; Müllen, K.; Calame, M.; Perrin, M.; Fasel, R.; Ruffieux, P.; Meunier, V.; Barin, G. B., Optimized Synthesis and Device Integration of Long 17-Atom-Wide Armchair Graphene Nanoribbons, *ACS Nano*, **19(42),** 37230-37240 (2025).

Uchida, D.; Yamada, H.; Mizuhata, Y., A Neutral Homoaromatic Heavy Allene as a Platform for Selective Conversion to a Germylene-Coordinated Digermavinylidene, *Chem. Sci.*, **16(47),** 22597-22602 (2025).

Wei, Y.; Zhou, Y.; Zhang, Z.; Liu, S.; Ye, T.; Zhao, X.; Wang, Y.; Feng, R.; Sun, Z.; Tkachenko, N. V.; Qiu, F.; Yamada, H.; Xue, S., Synthesis of an Oxo-Bridged Fe(III) Porphyrin(2.1.2.1) Dimer and Its Enhanced Electrocatalytic Oxygen Evolution, *Inorg. Chem.*, **64(45),** 22262-22268 (2025).

Marqués, P. S.; Okba, A.; Bréfuel, N.; Ueno, S.; Saffon-Merceron, N.; Ratel-Ramond, N.; Matsuo, K.; Rapenne, G.; Aratani, N.; Kammerer, C.; Yamada, H., Light-Induced SO Extrusion from Tribenzothiepine S-Oxides: a Precursor Approach to the Triphenylene Core, *Chem. Eur. J.*, e02655 (2025).

Ueno, S.; Yamauchi, M.; Matsuda, H.; Shioya, N.; Yamamoto, K.; Mizuhata, Y.; Hasegawa, T.; Yamada, H., Fabrication of Tetrabenzoporphyrin Thin-film Transistors with Hydrogen-bonding Networks *via* a Thermal Precursor Approach and Effect of the Amide-group Position, *J. Mater. Chem. C*, **13(48),** 23766-23771 (2025).

Yoshida, S.; Kasakura, N.; Hirakawa, M.; Morimoto, H.; Matsuo, K.; Hayashi, H.; Yamauchi, M.; Kanamori, R.; Shimizu, S.; Yamada, H.; Aratani, N., Well-Structured Narrow Near-Infrared Absorption Based on Nonaggregated Hexarylene-Bisimide toward a Colorless Dye, *J. Org. Chem.*, **90(44),** 15489-15494 (2025).

Jiang, T.; Zhou, Y.; Ye, T.; Liu, S.; Li, K.; Zhao, X.; Sun, Z.; Aratani, N.; Yamada, H.; Qiu, F.; Pan, J.; Teranishi, T.; Xue, S., Synthesis of Wave-shaped Cu(II) Porphyrin Arrays and Their Electrocatalytic Hydrogen Evolution Activity, *Chem. Sci*., **16(47),** 22498-22503 (2025).

Xue, S.; Jiang, T.; Kim, D.; Kim, M.; Lim, J. M.; Oh, J.; Kim, J.; Wang, Y.; Qiu, F.; Ren, Z.; Yamada, H.; Wu, F.; Pan, J., Synthesis of a Face-to-Face Porphyrin Nanoring, *Org. Lett.*, **27(38),** 10868-10873 (2025).

— Structural Organic Chemistry —

Zhang, X.; Ma, H.; Yin, Q.; Bai, F.; Hashikawa, Y.; Chaolumen, π-Extended 1,1′-Binaphthyl with Fused Pentagons, *Org. Lett.*, **27(32),** 8969-8973 (2025).

Hashikawa, Y.; Zhang, S.; Murata, Y., Synthesis of $C_{62}N$ Containing a Heptagon, *Org. Lett.*, **27(31),** 8685-8689 (2025).

Meng, S.; Xu, Y.; Zhang, Z.; Han, S.; Hashikawa, Y.; Chaolumen, A 2 nm Molecular Ladder with a Twisted Backbone, *Org. Lett.*, **27(30),** 8365-8369 (2025).

Meng, H.; Zhang, T.; Xu, Z.; Han, S.; Baigude, H.; Hashikawa, Y.; Chaolumen, π-Truncation of a Parent Nanographene: Chirally Twisted Green Fluorophores, *Org. Lett.*, **27(26),** 7009-7013 (2025).

Zhang, Z.; Xu, Z.; Zhang, A.; Bai, F.; Hashikawa, Y.; Chaolumen, Synthesis of a Twisted Azananographene Featuring a Diquinoxaline-Fused Pyrene, *Chem. Commun.*, **61,** 11401-11404 (2025).

Hashikawa, Y.; Murata, Y., A Rigid Chiral Nanocarbon Host: Are Its Properties Perturbed by a Guest?, *Carbon*, **240,** 120366 (2025).

Zhang, Z.; Liu, Z.; Hirose, T., Pyrazine-Linked End-Functionalized Helicenes: Impact of π-Extension on Frontier Orbital Localization and Chiroptical Properties, *Org. Lett.*, **27(40),** 11313-11318 (2025).

Saito, T.; Inoue, D.; Kitamoto, Y.; Hanayama, H.; Fujita, T.; Watanabe, Y.; Suda, M.; Hirose, T.; Kajitani, T.; Yagai, S., Inversion of Supramolecular Chirality by Photo-Enhanced Secondary Nucleation, *Nat. Nanotechnol.*, **20(6),** 825-834 (2025).

Zhang, Z.; Hu, W.; Liu, Z.; Tsutsui, Y.; Murata, Y.; Seki, S.; Hirose, T., Face-to-Face Helical Columns with Permanent Polarity Consisting of Homochiral End-Functionalized Helicenes, *J. Am. Chem. Soc.*, **147(29),** 25978-25989 (2025).

Nagase, M.; Yoshida, R.; Nakano, S.; Hirose, T.; Segawa, Y., Synthesis, Structure, and Properties of Twisted π-Conjugated Molecules Featuring Three-Dimensional π-π Interactions in Solid States, *Chem. Commun.*, **61(60),** 11187-11190 (2025).

Sadai, S.; Hashikawa, Y.; Murata, Y., $GeCl_2$-Mediated Ring Contraction toward Endofullerenes, *J. Org. Chem.*, **90(14),** 4993-4999 (2025).

Xu, Z.; Meng, S.; Zhang, Z.; Han, S.; Bai, F.; Dong, Y.; Hashikawa, Y.; Chaolumen, Synthesis of Alternatively-Twisted Nanographenes by Semi-Deprotection-Induced Cyclization, *Precis. Chem.*, **3(5),** 289-294 (2025).

Sadai, S.; Hashikawa, Y.; Murata, Y., A Small Aperture Enabling the Encapsulation of HF in [60]fullerene, *Carbon Rep.*, **4(1),** 89-94 (2025).

Nishino, F.; Fukutani, K.; Brandhoff, J.; Gruenewald, M.; Fuerch, E.; Schaal, M.; Otto, F.; Stelter, D.; Forker, R.; Zhang, Z.; Hirose, T.; Fritz, T.; Kera, S., Enantiospecific Mirror-Imaged Growth in Overlayers of Enantiopure Thiadiazole-[9]Helicene on Au(111) without Commensurability, *Appl. Phys. Express*, **18(1),** 15502 (2025).

Shimizu, A.; Misaki, Y.; Kondo, C.; Kayama, A.; Hirose, T.; Sato, H.; Shintani, R., Multiple Near-Infrared Chromisms of a Heteromerous Overcrowded Ethylene with Large Permanent Dipole Moment, *Angew. Chem. Int. Ed.*, **64(13),** e202422448 (2025).

— Advanced Inorganic Synthesis —

Zhu, L.; Nagai, N.; Xia, Y.; Muto, M.; Teranishi, T.; Saruyama, M., Direct Synthesis of Three-Dimensional Ag Nanocrystal Superlattices and Their Superhydrophobic Films for a Potential Surface-Enhanced Raman Scattering Substrate, *Nanoscale*, **17(40),** 23416-23424 (2025).

Matsumoto, K.; Kudo, M.; Tatetsu, Y.; Sato, R.; Takahata, R.; Teranishi, T., Atomic Diffusion Barriers and Inter-Element Miscibility Guide the Development of Unexplored Crystal Phases, *Chem. Sci.*, **16(40),** 18705-18712 (2025).

Qian, L.; Zhu, Y.; Yin, Y.; Xue, S.; Dai, Y.; Zhang, T.; Yang, D.; Teranishi, T.; Qiu, F., Construction of Functionalized Catalysts for Efficient Urea-Assisted Hydrogen Evolution Reaction in Alkaline Media *via* a Partial Sulfidation Strategy on a Nickel-Iron Spinel Compound, *Chem. Commun.*, **61(69),** 12968-12971 (2025).

Gao, Y.; Kumar, M.; Thakur, N.; Cao, W.; Watanabe, T.; Tominaka, S.; Sonobe, K.; Machida, A.; Sato, R.; Teranishi, T.; Matsumoto, M.; Imai, H.; Uruga, T.; Sakurai, Y.; Uchimoto, Y., Structure-Activity Relationship in PtCo L10 Ordered Phase ORR Catalysts: Pt-Rich Shell Having Anisotropic Lattice Distortion Revealed by PDF and XAS Analysis, *ACS Appl. Mater. Interfaces*, **17(21),** 30825-30838 (2025).

Tatetsu, Y.; Matsumoto, K.; Sato, R.; Teranishi, T., First-Principles Study of Structural Stability and Magnetic Properties in Fe–Pd–In Alloys, *J. Magn. Magn. Mater.*, **636,** 173649 (2025).

Suzuki, W.; Teranishi, T., Mechanistic Insights into Reactions between Gold-Based Materials and Dioxygen, *ChemPlusChem*, **90(8),** e2500244 (2025).

Yamada, K.; Suzuki, W.; Kubota, M.; Inamoto, J.; Kondo, M.; Koganezawa, T.; Chiga, Y.; Takahata, R.; Teranishi, T.; Imahori, H.; Umeyama, T., Effects of Non-Fused and Fused Substituents in Quinoxaline-Based Central Units on Conformation, Aggregation, and Photovoltaic Properties of Non-Fused Ring Electron Acceptors, *J. Mater. Chem. C*, **13(16),** 7984-7995 (2025).

Cao, W.; Thakur, N.; Kumar, M.; Matsumoto, M.; Sato, R.; Teranishi, T.; Imai, H.; Uchimoto, Y., Structural Control of PtNi Catalysts through Precise Synthesis Conditions and Elucidation of Property Determinants by *Operando* XAS Analysis, *Electrochemistry*, **93(3),** 037001 (2025).

Saruyama, M.; Nagai, N.; Xia, Y.; Teranishi, T., One-Step Preparation of Three-Dimensional Superlattices during Nanoparticle Synthesis, *Nano Res.*, **18(7),** 94907284 (2025).

Higaki, T.; Tanaka, K.; Izu, H.; Oishi, S.; Kawamoto, K.; Tada, M.; Sameera, W. M. C.; Takahata, R.; Teranishi, T.; Kikkawa, S.; Yamazoe, S.; Shiga, T.; Nihei, M.; Kato, T.; Cramer, R. E.; Zhang, Z.; Meyer, K.; Ohki, Y., An Icosahedral 55-Atom Iron Hydride Cluster Protected by Tri-*tert*-butylphosphines, *J. Am. Chem. Soc.*, **147(4),** 3215-3222 (2025).

Lv, X.; Dong, Y.; Huang, H.; Szczepanik, D. W.; Aratani, N.; Ikeue, T.; Chem, F.; Zhang, T.; Qui, F.; Teranishi, T.; Xue, S., Local Aromatic Ring Cleaves the Global Aromatic Ring in Hexaphyrin(2.1.2.1.2.1), *Chin. Chem. Lett.*, **36(7),** 110435 (2025).

DIVISION OF MATERIALS CHEMISTRY

— Chemistry of Polymer Materials —

Tamamoto, K.; Kinose, Y.; Okubo, H.; Nakano, K.; Tsujii, Y., Anti-Icing Properties of Nonionic/Hydrophilic Concentrated Polymer Brushes and Mechanistic Insights via Their Swollen-State Analysis, *Commun. Mater.*, **6,** 20/1-9 (2025).

Kinose, Y.; Nakasugi, S.; Watanabe, J.; Tsujii, Y.; Sato, O., An Unprecedented Impulse-Type Response of Ferroelectric Nematic Liquid Crystals under In-Plane Switching, *Adv. Electron. Mater.*, **11(14),** 2500153 (2025).

Takeuchi, T.; Kagiwata, D.; Okubo, H.; Ohno, K.; Tsujii, Y.; Nakano, K., Relationship between Layered Structure and Wear Behavior of Concentrated Polymer Brushes, *Wear*, **578-579,** 206223 (2025).

Kinose, Y.; Fujimoto, S.; Sakakibara, K.; Tsujii, Y., Synthesis and Two-Dimensional Ordering of Asymmetrically Polymer–Brush–Decorated Cellulose Nanocrystals, *Polym. J.*, **57(3),** 269-277 (2025).

Okubo, H.; Kagiwata, D.; Nakamura, R.; Takeuchi, T.; Nakano, K.; Tsujii,Y., Time and Spatially Resolved Raman Spectroscopic Observation for Superlubricious Frictional Interfaces of Concentrated Polymer Brushes, *Tribol. Lett.*, **73(79),** 1-15 (2025).

— Polymer Controlled Synthesis —

Ikemoto, K.; Akiyoshi, M.; Kobayashi, A.; Kita, H.; Taka, H.; Isobe, H., Optimising Reaction Conditions in Flasks for Performances in Organic Light-Emitting Devices, *Chem. Sci.*, **16(7),** 3045-3050 (2025).

Tong, T.; Kibune, M.; Tosaka, M.; Matsumiya, Y.; Watanabe, H.; Yamago, S., Melt Rheology of Dendritic Hyperbranched Polyacrylates Synthesized by Controlled Radical Polymerization: Evidence of Self-Similar Branch Structure Formation, *J. Am. Chem. Soc.*, **147(29),** 25652-25661 (2025).

Kayahara, E.; Okahara, R.; Shibata, A.; Abe, M.; Yamago, S., Synthesis and Physical Properties of [*n*]Cycloparaphenylene Ketone (*n* = 6, 7, 8, and 10), *Angew. Chem. Int. Ed.*, **64(33),** e202509754 (2025).

Ren, Y.; Shang, W.; Sun, H.; Liang, Q.; Kayahara, E.; Yamago, S.; Li, Y.; Zhang, D., Synthesis of Octatrimethylsilyl-[8]Cycloparaphenylene for Multifunctionalized Cycloparaphenylene, *J. Org. Chem.*, **90(26),** 8959-8965 (2025).

Yamin, N.; Tosaka, M.; Yamago, S., Elucidation of the Termination Mechanism of the Radical Polymerization of Isoprene, *Macromolecules*, **58(9),** 4665-4672 (2025).

Kayahara, E.; Hirata, S.; Mizuhata, Y.; Yasuda, Y.; Kusakabe, Y.; Kaji, H.; Yamago, S., Synthesis of π-Extended [1.1]Paracyclophanes, [1.1][*n*]PCP (*n* = 2, 3, and 4), and Their Through-Space Conjugation, *Chem. Eur. J.*, **31(1),** e202402225 (2025).

Yamago, S.; Tong, T.; Tosaka, M.; Morimitsu, Y.; Tanaka, K., Atomic Force Microscopy Visualization of Branches in Dendritic Hyperbranched Polymers Synthesized by One-Step Radical Polymerization, *Small,* **21(45),** e08975 (2025).

— Inorganic Photonics Materials —

Deguchi, H.; Hayashi, T.; Saito, H.; Nishibayashi, Y.; Teramoto, M.; Fujiwara, M.; Morishita, H.; Mizuochi, N.; Tatsumi, N., Compact and Portable Pulsed Measurement Module Using Diamond NV Centers, *Jpn. J. Appl. Phys.*, **64(7),** 70903 (2025).

Fujiwara, M.; Ohori, M.; So, F. T. K.; Makino, Y.; Morioka, N.; Ohki, I.; Igarashi, R.; Nishikawa, M.; Mizuochi, N., Single Tin-Vacancy Center in Nanoscale Diamond, *Discov. Nano*, **20,** 81 (2025).

Chigusa, S.; Hazumi, M.; Herbschleb, E. D.; Matsuzaki, Y.; Mizuochi, N.; Nakayama, K., Nuclear Spin Metrology with Nitrogen Vacancy Center in Diamond for Axion Dark Matter Detection, *Phys. Rev. D*, **111,** 075028 (2025).

Nishikawa, T.; Morioka, N.; Abe, H.; Murata, K.; Okajima, K.; Ohshima, T.; Tsuchida, H.; Mizuochi, N., Coherent Photoelectrical Readout of Single Spins in Silicon Carbide at Room Temperature, *Nat. Commun.*, **16,** 3405 (2025).

Sichanugrist, T.; Fukuda, H.; Moroi, T.; Nakayama, K.; Chigusa, S.; Mizuochi, N.; Hazumi, M.; Matsuzaki, Y., Entanglement-Enhanced AC Magnetometry in the Presence of Markovian Noise, *Phys. Rev. A*, **111,** 042605 (2025).

Chigusa, S.; Hazumi, M.; Herbschleb, E. D.; Mizuochi, N.; Nakayama, K., Light Dark Matter Search with Nitrogen-Vacancy Centers in Diamonds, *J. High Energy Phys.*, **2025,** 83 (2025).

Kawase, R.; Kawashima, H.; Kato, H.; Tokuda, N.; Yamasaki, S.; Ogura, M.; Makino, T.; Morioka, N.; Mizuochi, N., Control of Impurity Incorporation into CVD Diamond Synthesized with *Tert*-Butylphosphine for Quantum Applications, *Appl. Phys. Lett.*, **126,** 074002 (2025).

— Nanospintronics —

Ye, F.; Jang, H.; Shiota, Y.; Narita, H.; Hisatomi, R.; Karube, S.; Sugimoto, S.; Kasai, S.; Ono, T., Data-Writing and Shifting Processes Toward a Vertical Domain Wall Motion Memory, *IEEE Trans. Magn.*, **61(6),** 3401004 (2025).

Tseng, C.-H.; Karube, S.; Shiota, Y.; Hisatomi, R.; Kan, D.; Shimakawa, Y.; Ono, T., Epitaxial Growth of Altermagnet CrSb via Magnetron Sputtering, *Cryst. Growth Des.*, **25(21),** 9171-9177 (2025).

Tokuda, M.; Matsumoto, F.; Maeda, N.; Higashihara, T.; Nakao, M.; Watanabe, M.; Lee, S.; Nakamura, R.; Maeda, M.; Jiang, N.; Yue, D.; Narita, H.; Aoyama, K.; Mizushima, T.; Ohe, J.; Ono, T.; Jin, X.; Kobayashi, K.; Niimi, Y., Observation of the Crossover from Quantum Fluxoid to Half-Quantum Fluxoid in a Chiral Superconducting Device, *Sci. Adv.*, **11(36),** eadw6625 (2025).

Mandokoro, T.; Shiota, Y.; Sugiura, I.; Hisatomi, R.; Karube, S.; Ono, T., Atomistic Spin Simulation of Néel Vector Rotation by Spin-Orbit Torque in Spin-Flopped Ferrimagnetic Thin Films, *J. Magn. Soc. Jpn.*, **49(4),** 58-61 (2025).

Mandokoro, T.; Shiota, Y.; Itoh, T.; Matsumoto, H.; Narita, H.; Hisatomi, R.; Karube, S.; Ono, T., Néel Vector Rotation Driven by Spin-Orbit Torque in Amorphous Ferrimagnetic GdCo, *Appl. Phys. Lett.*, **126(23),** 232406 (2025).

Kawana, R.; Oguchi, N.; Oshima, D.; Yoshida, M.; Sugiura, T.; Saito, M.; Homma, T.; Kato, T.; Ono, T.; Shima, M.; Yamada, K., Artificial Control of Layer Thickness in Co-Pt Alloy Multilayer Nanowires Fabricated by Dual-Bath Electrodeposition in Nanoporous Polycarbonate Membranes, *Appl. Phys. Express*, **18(3),** 033002 (2025).

Taga, K.; Hisatomi, R.; Sasaki, R.; Komiyama, H.; Matsumoto, H.; Narita, H.; Karube, S.; Shiota, Y.; Ono, T., Generation of Phonons with Out-of-Plane Angular Momentum by Superposition of Longitudinal Surface Acoustic Phonons, *J. Magn. Soc. Jpn.*, **49(1),** 17-20 (2025).

Komiyama, H.; Hisatomi, R.; Taga, K.; Matsumoto, H.; Narita, H.; Karube, S.; Shiota, Y.; Ono, T., Spin Wave Nonreciprocity Due to Asymmetry of Propagation Length, *J. Magn. Soc. Jpn.*, **49(1),** 13-16 (2025).

Hayashi, D.; Shiota, Y.; You, M.; Park, A. M. G.; Kim, K.-J.; Narita, H.; Hisatomi, R.; Karube, S.; Ono, T., Nonlinear Response of Hybrid Magnons in Synthetic Antiferromagnets, *Appl. Phys. Lett.*, **126(8),** 082401 (2025).

Jang, H.; Ye, F.; Shiota, Y.; Karube, S.; Hisatomi, R.; Ono, T., Non-Destructive Readout Method for 3D Magnetic Memory, *J. Magn. Soc. Jpn.*, **49(1),** 9-12 (2025).

Matsuki, H.; Hijano, A.; Mazur, G. P.; Ilić, S.; Wang, B.; Alekhina, I.; Ohnishi, K.; Komori, S.; Li, Y.; Stelmashenko, N.; Banerjee, N.; Cohen, L. F.; McConb, D. W.; Bergeret, F. S.; Yang, G.; Robinson, J. W. A., Realisation of de Gennes' Absolute Superconducting Switch with a Heavy Metal Interface, *Nat. Commun.*, **16(1),** 5674 (2025).

Wu, Z.; Long, M.; Chen, H.; Paul, S.; Matsuki, H.; Zheliuk, O.; Zeitler, U.; Li, G.; Zhou, R.; Zhu, Z.; Graf, D.; Weinberger, T. I.; Grosche, F. M.; Maeno, Y.; Eaton, A. G., Fermi Surface of RuO2 Measured by Quantum Oscillations, *Phys. Rev. X*, **15,** 031044 (2025).

DIVISION OF BIOCHEMISTRY
— Biofunctional Design-Chemistry —

Endoh, T.; Ling, Y.; Okuda, S.; Imanishi, M., Identification of Endogenous Sequences Interacting with METTL3/METTL14 RNA Methyltransferase, *ChemBioChem*, **26(11),** e202500006 (2025).

Otonari, K.; Asami, Y.; Ogata, K.; Ishihama, Y.; Futaki, S.; Imanishi, M., Highly Sequence-Specific, Timing-Controllable m^6A Demethylation by Modulating RNA-Binding Affinity of m^6A Erasers, *Chem. Commun.*, **61(1),** 69-72 (2025).

Kawaguchi, Y.; Tamemoto, N.; Uehata, Y.; Miyazaki, Y.; Shinoda, W.; Futaki, S., A Melittin-Derived Peptide with Improved Cytosolic Delivery Efficiency through Caveolae- and Actin-Mediated Endocytosis, *Chem. Pharm. Bull.*, **73(9),** 896-906 (2025).

Kawaguchi, Y.; Kiyokawa, M.; Furuyama, Y.; Futaki, S., e3MPH16: A D-Glutamic Acid-Substituted Peptide for Efficient and Low-Cytotoxicity Cytosolic Delivery of Macromolecules, *Chem. Pharm. Bull.*, **73(9),** 907-913 (2025).

Kuriyama, M.; Kawaguchi, Y.; Ito, S.; Satoh, J.; Hirose, H.; Futaki, S., Membrane Repair Proteins as Negative Regulators of Cytosolic Delivery Using Attenuated Cationic Lytic Peptide L17E and Cell-Penetrating Peptides: Differences and Similarities, *Bioconjug. Chem.*, **36(8),** 1683-1697 (2025).

Michibata, J.; Kawaguchi, Y.; Furuyama, Y.; Sasaki, Y.; Akiyoshi, K.; Futaki, S., Addition of Oligoarginine to a Membrane Permeabilizing Peptide M-Lycotoxin Facilitates Intracellular Antibody Infusion from Microcondensate, *Bioconjug. Chem.*, **36(7),** 1494-1503 (2025).

Takemoto, M.; Delghandi, S.; Abo, M.; Yurimoto, K.; Odagi, M.; Singh, V. P.; Wang, J.; Nakagawa, R.; Sato, S.; Takemoto, Y.; Farrag, A. M. A. S.; Kawaguchi, Y.; Nagasawa, K.; Honjo, T.; Chamoto, K.; Uesugi, M., Covalent Plant Natural Product that Potentiates Antitumor Immunity, *J. Am. Chem. Soc.*, **147(3),** 2902-2912 (2025).

Kuriyama, M.; Hirose, H.; Kawaguchi, Y.; Michibata, J.; Maekawa, M.; Futaki, S., *KCNN4* as a Genomic Determinant of Cytosolic Delivery by the Attenuated Cationic Lytic Peptide L17E, *Mol. Ther.*, **33(2),** 595-614 (2025).

Obata, K.; Tanaka, K.; Futaki, S.; Imanishi, M., Structural Control of RNA Demethylation: G-Quadruplex Proximity Suppresses ALKBH5 Activity, *Chem. Eur. J.*, **31(71),** e01788 (2025).

— Chemistry of Molecular Biocatalysts —

Ishida, T.; Zhang, Y.; Zhu, H.; Fudano, S.; Peng, Y.; Seto, Y.; Mashiguchi, K.; Liu, J.; He, Z.; Zhang, S.; Yamaguchi, S., Stepwise Deactivation of Gibberellins During Rice Internode Elongation, *Proc. Natl. Acad. Sci. USA*, **122(23),** e2415835122 (2025).

— Molecular Biology —

Koeduka, T.; Ito, K.; Yamamoto, S.-N.; Ozaki, S.-I.; Tsuge, T.; Kitajima, S., Biochemical Characterization of Benzaldehyde Dehydrogenases from Petunia, *Plant Mol. Biol.*, **115(3),** 70 (2025).

Szewc, L.; Zhang, X.; Bajczyk, M.; Bielewicz, D.; Zimna, M.; Yura, K.; Kato, M.; Nomoto, M.; Garcia-León, M.; Rubio, V.; Tada, Y.; Furumoto, T.; Aoyama, T.; Szweykowska-Kulinska, Z.; Staiger, D.; Jarmolowski, A.; Tsuge, T., The Plant Cleavage Factor I Complex Is Essential for Precise Cleavage and Polyadenylation Site Determination, *Plant Physiol.*, **199(3),** kiaf483 (2025).

Haghir, S.; Yamada, K.; Kato, M.; Tsuge, T.; Wada, T.; Tominaga, R.; Ohashi, Y.; Aoyama, T., The *Arabidopsis* Basic-Helix-Loop-Helix Transcription Factor LRL1 Activates Cell Wall-Related Genes During Root Hair Development, *Plant Cell Physiol.*, **66(3),** 384-399 (2025).

— Chemical Biology —

Farrag, A. M. A. S.; Ota, K.; Yoshimura, H.; Takemoto, M.; Mitarai, T.; Kamikawa, T.; Abo, M.; Singh, V. P.; Cui, C.; Zhou, L.; Ishidate, F.; Fujiwara, T.; Sato, S.; Hori, Y.; Ozawa, T.; Kikuchi, K.; Uesugi, M., Live-Cell Monitoring and Omics Analysis of Liquid-Solid Transitions of Biomolecular Condensates, *J. Am. Chem. Soc.*, **147(41),** 37056-37064 (2025).

Shuai, T.; Zhang, R.; Yuan, Z.; Zhang, M.; Fan, Z.; Ruan, X.; Qi, Z.; Xie, W.; Liu, P.; Uesugi, M.; Li, Q.; Qu, Z.; Tan, M.; Su, H.; Zhou, L., Expanding the Chemistry of Acyl Diazo Electrophile as a Tunable Warhead for Covalent Targeting of KRAS (G12D) Mutant, *J. Med. Chem.*, **68(20),** 21427-21440 (2025).

Takemoto, Y.; Tserendagva, M.; Uesugi, M., Suppression of SREBP by a Transmembrane Protein Mutated in Cardiomyopathy, *J. Biol. Chem.*, **301(10),** 110644 (2025).

Takemoto, M.; Delghandi, S.; Abo, M.; Yurimoto, K.; Odagi, M.; Singh, V. P.; Wang, J.; Nakagawa, R.; Sato, S.; Takemoto, Y.; Farrag, A. M. A. S.; Kawaguchi, Y.; Nagasawa, K.; Honjo, T.; Chamoto, K.; Uesugi, M., Covalent Plant Natural Product that Potentiates Antitumor Immunity, *J. Am. Chem. Soc.*, **147(3),** 2902-2912 (2025).

DIVISION OF ENVIROMENTAL CHEMISTRY
— Molecular Materials Chemistry —

Yoneda, H.; Yasuda, Y.; Okumura, R.; Ito, S.; Miyasaka, H.; Kaji, H.; Sotome, H., Spin-Dependent Exciton Transport and Effective Negative Diffusion in Thermally Activated Delayed Fluorescence Crystals, *J. Phys. Chem. Lett.*, **16(42),** 11074-11080 (2025).

Tamai, Y.; Akiyama, M.; Vallan, L.; Sasada, D.; Suzuki, K.; Kaji, H.; Urakami, T.; Sato, H.; Higashi, M.; Izawa, S.; Kubota, M.; Umeyama, T.; Imahori, H., Energy Migration, Charge Transfer, and Charge Dissociation in Self-Assembling Nonfullerene Acceptor Aggregates with Zincporphyrin-Nonfullerene Acceptor Dyads, *Chem. Sci.*, **16(34),** 15378-15386 (2025).

Yamane, M.; Umeda, H.; Toyobe, M.; Iwai, A.; Ishihara, K.; Kudo, G.; Mitsunuma, H.; Hori, Y.; Tomita, T.; Mizuguchi, M.; Okada, M.; Ueda, M.; Ando, Y.; Kawashima, S. A.; Sohma, Y.; Kaji, H.; Hirokawa, T.; Yamanaka, K.; Kanai, M., Catalytic Photooxygenation Demonstrates Therapeutic Efficacy in Transthyretin Amyloidosis, *J. Am. Chem. Soc.*, **147(32),** 28860-28874 (2025).

Nakamura, R.; Maeno, A.; Kaji, H.; Negoro, M.; Morisato, K.; Kanamori, K.; Schaller, J., Silicon Mobilization by Leaf Mass Loss: Patterns with Silicon Condensation State, *Soil Adv.*, **4,** 100072 (2025).

Nguyen, Q. T.; Luu, Q. S.; Suzuki, K.; Choi, J.; Yun, S.; Yang, S.; Do, U. T.; Shim, J. H.; Kaji, H.; Lee, Y., Enhancing ^{29}Si Hyperpolarization Efficiency in Silica Nanoparticles *via* Multishell Design with Selective ^{29}Si-Isotope and Radical Enrichment, *Anal. Chem.*, **97(30),** 16183-16193 (2025).

Yasuda, Y.; Shizu, K.; Tanaka, H.; Kaji, H., Enhanced Luminance of Pentaazaphenalene-Based Delayed Fluorescence Emitters by Breaking Forbidden Transition, *Angew. Chem. Int. Ed.*, **64(24),** e202504390 (2025).

Nakada, A.; Asai, S.; Zhang, C.; Ishihara, K.; Suzuki, H.; Tomita, O.; Suzuki, K.; Kaji, H.; Saeki, A.; Abe, R., Strong Impacts of Inter-π-Chain Charge Transfer Accelerating CO_2 Reduction Photocatalysis of Carbazole-Diimine-Based Linear Conjugated Polymer/Ru Complex Hybrids, *Sustainable Energy Fuels*, **9(11),** 2941-2950 (2025).

Ishihara, K.; Kaji, H., Predictions of Molecular Orientation and Charge Mobility in Organic Vacuum-Deposited Thin Films by Multiscale Simulation, *Commun. Mater.*, **6(1),** 116 (2025).

Wang, J.; Yasuda, Y.; Ren, Y.; Kondo, R.; Cordes, D. B.; Kaji, H.; Zysman-Colman, E., A Multi-Resonant Thermally Activated Delayed Fluorescence Emitter with a Twisted Second-Generation Carbazole Dendron Showing Suppressed Concentration Quenching and Its Use in Solution-Processed Organic Light-Emitting Diodes, *Org. Chem. Front.*, **12(10),** 3279-3287 (2025).

Sato, H.; Kanda, S.; Kaji, H., Elucidation of Molecular-Level Charge Transport in an Organic Amorphous System, *npj Comput. Mater.*, **11(1),** 39 (2025).

Suzuki, K.; Sakuda, E.; Tani, Y.; Akiyama, M.; Albrecht, K.; Aizawa, N.; Izawa, S.; Kaji, H., Dynamic Excitons in Organic Light-Emitting Systems, *J. Chem. Phys.*, **162,** 061001 (2025).

Kayahara, E.; Hirata, S.; Mizuhata, Y.; Yasuda, Y.; Kusakabe, Y.; Kaji, H.; Yamago, S., Synthesis of π-Extended [1.1]Paracyclophanes, [1.1][*n*]PCP (*n* = 2, 3, and 4), and Their Through-Space Conjugation, *Chem. Eur. J.*, **31(1),** e202402225 (2025).

— Hydrospheric Environment Analytical Chemistry —

Matsuoka, K.; Takano, S.; Kawagucci, S.; Toki, T.; Sohrin, Y., Concentrations and Isotope Ratios of Mo and W in Okinawa Trough Hydrothermal Fluids: Novel Probes for Hydrothermal Processes in a Back-Arc Basin, *Geochem. J.*, **59(6),** 283-298 (2025).

Sohrin, Y.; Zheng, L.; Chan, C.-Y.; Nakaguchi, Y.; Takano, S.; Sohrin, R.; Liao, W.-H.; Ho, T.-Y., Acid-Leachability of Metals from Suspended Particles in the Pacific Ocean, *Mar. Chem.*, **273,** 104571 (2025).

Zheng, L., Study on the Biogeochemical Cycling Processes of Trace Metals in the Pacific Ocean Based on Multi-Element Analysis (Award-Winning Paper of the Okada Prize of the Oceanographic Society of Japan), *Oceanography in Japan*, **34(6),** 185-202 (2025).

Sakata, K.; Takano, S.; Matsuki, A.; Takeichi, Y.; Tanimoto, H.; Sakaguchi, A.; Kurisu, M.; Takahashi, Y., Atmospheric Chemistry in East Asia Determines the Iron Solubility of Aerosol Particles Supplied to the North Pacific Ocean, *Atmos. Chem. Phys.*, **25(18),** 11087-11107 (2025).

Chan, C.-Y.; Zheng, L.; Sohrin, Y., The Behaviour of Nickel, Copper, Zinc, and Cadmium in the Subarctic Pacific Ocean: East-West Differences, *J. Oceanogr.*, **81,** 149-162 (2025).

— Chemistry for Functionalized Surfaces —

Ueno, S.; Yamauchi, M.; Matsuda, H.; Shioya, N.; Yamamoto, K.; Mizuhata, Y.; Hasegawa, T.; Yamada, H., Fabrication of Tetrabenzoporphyrin Thin-Film Transistors with Hydrogen-Bonding Networks via Thermal Precursor Approach and Effect of the Amide-Group Position, *J. Mater. Chem. C*, **13(48),** 23766-23771 (2025).

Takagawa, Y.; Miura, R.; Shimizu, M.; Abe, R.; Tanaka, S.; Maruyama, S.; Miyadera, T.; Koganezawa, T.; Shioya, N.; Shimoaka, T.; Kaminaga, K.; Hasegawa, T.; Matsumoto, Y., In Situ Study of Liquid Crystal Phase Mediated Crystal Growth in Vacuum-Deposited Thin Films of an Alkyl Perylene Diimide, *Cryst. Growth Des.*, **25(21),** 9125-9136 (2025).

Ishii, M.; Nakai, Y.; Yamashita, Y.; Onishi, K.; Shi, T.-H.; Shioya, N.; Sakai, H.; Hasegawa, T.; Ogoshi, T.; Ariga, K.; Mori, T., Pseudorotaxane Monolayers of Pillar[5]arene and Linear Fatty Acids at the Air-Water Interface, *Chem. Commun.*, **61(55),** 10138-10141 (2025).

Shimoaka, T.; Ootsuki, M.; Yamaguchi, Y.; Shioya, N.; Hasegawa, T., Molecular Orientation Analysis of Perfluoroalkyl Groups in the Solid Surface by Backscattering Raman Spectrometry, *Anal. Sci.*, **41(8),** 1355-1364 (2025).

Li, Y.; Fukuyama, M.; Hasegawa, T.; Kasuya, M.; Hibara, A., High Perfluorooctanoic Acid Adsorption Performance of Sub-Monolayer Fluoroalkylsilane on Silicon Wafers, *Langmuir*, **41(27),** 17566-17572 (2025).

Teranishi, K.; Yamamoto, K.; Miyazaki, K.; Matsuo, K.; Yamauchi, M.; Mizuhata, Y.; Shioya, N.; Matsuda, H.; Hasegawa, T.; Yamada, H., Tetrabenzo-10-Heterocorroles as π-Extended Porphyrinoid Semiconductors: Synthesis, Properties, Structure, and OFET Performance, *Asian J. Org. Chem.*, **14(8),** e00337 (2025).

Oonuki, T.; Araki, T.; Oka, T.; Matsuda, H.; Shioya, N.; Kano, J.; Hibara, A.; Hasegawa, T., Molecular Disaggregation Process of PTFE Using Sodium Chloride: A Study by Infrared Spectroscopy, *J. Phys. Chem. B*, **129(17),** 4249-4255 (2025).

Nishimura, S.; Li, Y.; Semba, Y.; Hibara, A.; Oonuki, T.; Hasegawa, T.; Kano, J., Mechanochemical Processing of Polytetrafluoroethylene with NaCl Crystals, *Bull. Chem. Soc. Jpn.*, **98(4),** uoaf029 (2025).

Ueno, S.; Yamauchi, M.; Shioya, N.; Matsuda, H.; Hasegawa, T.; Yamamoto, K.; Mizuhata, Y.; Yamada, H., Hydrogen-Bond-Directed Supramolecular Organic Semiconductor Thin Films Realized via Thermal Precursor Approach, *Angew. Chem. Int. Ed.*, **137(31),** e202425188 (2025).

Miyazaki, K.; Teranishi, K.; Matsuda, H.; Matsuo, K.; Yamauchi, M.; Mizuhata, Y.; Shioya, N.; Hasegawa, T.; Yamada, H., Single-Crystal Organic Field-Effect Transistors Based on 5,15-Bisaryl-Tetrabenzoporphyrins: Synthesis, Structure, and Charge Transport Properties, *Adv. Mater. Interfaces*, **12(20),** 2400946 (2025).

Oka, T.; Shioya, N.; Abe, R.; Maruyama, S.; Hasegawa, T., Suppression of Molecular Disordering in Liquid Crystalline Thin Films by Side-Chain Engineering, *J. Phys. Chem. C*, **129(9),** 4806-4813 (2025).

Fujita, R.; Matsuo, M.; Mori, T.; Hasegawa, T.; Nakata, S., Self-Propulsion of a Benzoic Acid Disk Reflecting the Mesoscopic State of an Amphiphilic Molecular Layer, *ChemSystemsChem*, **7(4),** e202400088 (2025).

Miyazaki, K.; Yamamoto, K.; Yamauchi, M.; Mizuhata, Y.; Matsuda, H.; Shioya, N.; Hasegawa, T.; Aratani, N.; Yamada, H., OFET Performance of Low-Symmetric 5-TIPS-Ethynyl-15-TMS-Ethynyl-Tetrabenzoporphyrins in the Single Crystal States, *J. Porphyr. Phthalocyanines*, **29(01n02),** 213-220 (2025).

— Molecular Microbial Science —

Suwanawat, N.; Ogawa, T.; Toyotake, Y.; Kawamoto, J.; Kurihara, T., Biochemical Characterization and Mutational Analysis of Lysophosphatidic Acid Acyltransferases of *Escherichia coli* Highlighting Their Involvement in the Generation of Membrane Phospholipid Diversity, *J. Biochem.*, **177(4),** 259-272 (2025).

Hata, A.; Ito, T.; Mori, H.; Ogawa, T.; Kurihara, T.; Hemmi, H.; Yoshimura, T., Suicide Substrate Reaction-Like Modification of Mouse Serine Racemase with L-Serine, *J. Biochem.*, **177(6),** 437-445 (2025).

Inoue, H.; Kawano, K.; Kawamoto, J.; Ogawa, T.; Kurihara, T., Rapid Screening and Identification of Genes Involved in Bacterial Extracellular Membrane Vesicle Production Using a Curvature-Sensing Peptide, *J. Bacteriol.*, **207(5),** e0049724 (2025).

Kawano, K.; Hosokawa, K.; Taniguchi, A.; Oosugi, Y.; Soga, A.; Kawamoto, J.; Kuzuma, Y.; Matsuzaki, K., Curvature-Sensing Peptide Functions as a *Membrane Interfactant* That Glues Small Extracellular Vesicles to Cell Membranes and Enhances Vesicle Cellular Uptake, *ACS Appl. Bio Mater.*, **8(12),** 10839-10854 (2025).

[Others]

Kawamoto, J.; Ishibashi, Y., Structure and Physiological Function of Unsaturated Fatty Acids: Characteristic Molecular Behaviors of Unsaturated Fatty Acids, *KAGAKU TO SEIBUTSU*, **63(9),** 423-430 (2025).

DIVISION OF MULTIDISCIPLINARY CHEMISTRY
— Polymer Materials Science —

Ogawa, H.; Tobita, N.; Ono, S.; Wang, P.; Kubozono, T.; Yoshihara, D.; Yamada, S.; Arakawa, M.; Yamamoto, S.; Tanaka, K.; Takenaka, M., Nondestructive Evaluation of the Spatial Distribution of Nanofillers and Network Structures in Buried Epoxy Resins under Adhesion Conditions, *ACS Appl. Polym. Mater.*, **7(15),** 10051-10061 (2025).

Ogawa, H.; Mashita, R.; Kishimoto, H.; Ono, S.; Yashiro, W.; Kabe, T.; Masunaga, H.; Takenaka, M., New Insights into the Fracture Precursors of Rubber Reinforced with a Nanofiller, *Small Struct.*, **6(9),** 2500257 (2025).

Kishimoto, M.; Mita, K.; Ogawa, H.; Shibasaki, K.; Arakawa, M.; Takenaka, M., Strain-Induced Density Fluctuations in Linear Low-Density Polyethylene, *J. Appl. Crystallogr.*, **58(3),** 879-885 (2025).

Shibata, M.; Takenaka, M.; Motokawa, R.; Kumada, T.; Ueda, Y.; Miyazaki, T.; Nakanishi, Y.; Abe, J.; Iwase, H.; Shibayama, M.; Arima-Osonoi, H.; Takata, S.-I.; Yamamoto, K., Phase Diagram of the Polystyrene/Near-Critical Water System, *Polymer*, **340(5),** 129203 (2025).

Watanabe, Y.; Kumagawa, D.; Karitani, S.; Inoue, T.; Iwabuki, H.; Nakanishi, Y.; Shibata, M.; Motokawa, R.; Sugita, T.; Ueda, Y.; Kumada, T.; Yamamoto, K.; Mita, K.; Miyazaki, T.; Takenaka, M., Effects of the Size of Fillers on Viscoelasticity in the Glassy State of Poly(styrene-*co*-butadiene) Reinforced by Carbon Black, *Macromolecules*, **58(16),** 8641-8648 (2025).

Tamura, Y.; Arakawa, M.; Takenaka, M.; Nakanishi, Y.; Fujinami, S.; Shibata, M.; Yamamoto, K.; Miyata, N.; Yamada, M.; Seto, H.; Yamada, N. L.; Aoki, H.; Miyazaki, T., Modeling the Extraction of Bound Rubber from Silica-Filled Styrene-Butadiene Rubber with Toluene, *Polymer*, **333,** 128662 (2025).

Arakawa, M.; Kabe, T.; Iwata, T.; Takenaka, M., Differences in Hierarchical Structural Changes between Unoriented P(3HB) and P(3HB-*co*-3HH) under Stretching, *J. Appl. Crystallogr.*, **58(3),** 886-896 (2025).

Shibasaki, K.; Ogawa, H.; Takenaka, M., Submicron Scale Dispersion of Lignin Achieved by Green-Solvent Casting Blending Enables Carbon Black Level Reinforcement in SBR Composites, *Macromol. Rapid Commun.*, 10.1002/marc.202500709, e00709 (2025).

— Molecular Rheology —

Tong, T.; Kibune, M.; Tosaka, M.; Matsumiya, Y.; Watanabe, H.; Yamago, S., Melt Rheology of Dendritic Hyperbranched Polyacrylates Synthesized by Controlled Radical Polymerization: Evidence of Self-Similar Branch Structure Formation, *J. Am. Chem. Soc.*, **147(29),** 25652-25661 (2025).

Chen, H.; Chen, Q.; Matsumiya, Y.; Watanabe, H., Mechanism of Nonlinear Energy Dissipation in Styrene-Isoprene-Styrene Triblock Elastomer Containing an Associative Network, *Macromolecules*, **58(13),** 6590-6606 (2025).

Pei, Y.; Chen, Q.; Matsumiya, Y.; Watanabe, H., Nonlinear Relaxation of Unentangled Associative Polymers: Strain-Induced Hardening and Softening, *Macromolecules*, **58(2),** 953-967 (2025).

— Molecular Aggregates —

Harata, F.; Kaneko, R.; Hu, S.; Ohashi, N.; Nakamura, T.; Truong, M. A.; Murdey, R.; Wakamiya, A., Substrate-Independent and Antisolvent-Free Fabrication Method for Tin Perovskite Films via Imidazole-Complexed Intermediates, *ACS Energy Lett.*, **10(10),** 5047-5056 (2025).

Hasegawa, A.; Chen, C.-Y.; Nakamura, T.; Truong, M. A.; Murdey, R.; Wakamiya, A., Solution-Processable Chlorostannylene Complexes as Surface Modifiers for Tin Halide Perovskite Solar Cells, *Chem. Mater.*, **37(16),** 6246-6255 (2025).

Wang, J.; Hu, S.; Chen, Z.; Yuan, Z.; Zhao, P.; Dasgupta, A.; Yang, F.; Yao, J.; Truong, M. A.; Kusch, G.; Hung, E. Y.-H.; Schipper, N. R. M.; Bellini, L.; Aalbers, G. J. W.; Liu, Z.; Oliver, R. A.; Wakamiya, A.; Janssen, R. A. J.; Snaith, H. J., Exposing Binding-Favourable Facets of Perovskites for Tandem Solar Cells, *Energy Environ. Sci.*, **18(15),** 7680-7694 (2025).

Petrulevicius, J.; Truong, M. A.; Daskeviciene, M.; Bubniene, G.; Hira, S.; Iwasaki, Y.; Malinauskas, T.; Wakamiya, A.; Getautis, V., Asymmetric Perinone-Based Electron-Collecting Monolayer Materials for n-i-p Perovskite Solar Cells, *J. Mater. Chem. C*, **13(29),** 14991-15001 (2025).

Sekiguchi, N.; Tsuji, Y.; Truong, M. A.; Wakamiya, A.; Iikubo, S., Optimization of Band Alignment by Organic Molecules for Perovskite Solar Cells, *J. Phys. Chem. C*, **129(18),** 8500-8508 (2025).

Nguyen, D.-T.; Bui, A. D.; Walter, D.; Nguyen, K.; Zhan, H.; Ta, X. M. C.; Tabi, G. D.; Trần-Phú, T.; Chang, L.-C.; Huang, K.; Truong, M. A.; Wakamiya, A.; Adhikari, S. G.; Nguyen, H.; Haggren, A.; Ahmad, V.; Duong, T.-T.; Nguyen, D. C.; Shen, H.; Catchpole, K.; Weber, K.; White, T.; Duong, T., Universal Buried Interface Modification with Lead Iodide for Efficient and Stable Perovskite Solar Cells, *J. Mater. Chem. A*, **13(19),** 14055-14063 (2025).

Nakamura, T.; Nagai, T.; Miyake, Y.; Yamada, T.; Miura, M.; Yoshida, H.; Kanemitsu, Y.; Truong, M. A.; Murdey, R.; Wakamiya, A., Single-Isomer Bis(Pyrrolidino)Fullerenes as Electron-Transporting Materials for Tin Halide Perovskite Solar Cells, *Chem. Sci.*, **16(5),** 2265-2272 (2025).

Mitsudo, K.; Maekawa, N.; Magata, R.; Sato, E.; Nakamura, T.; Wakamiya, A.; Suga, S., Synthesis of *N,O*-Bidentate Difluoroboron Complexes via Iodide-Promoted Demethylative Borylation, *Org. Lett.*, **27(38),** 10636-10641 (2025).

Hu, S.; Sun, X.; Liu, W.; Gregori, L.; Zhao, P.; Pascual, J.; Dallmann, A.; Dasgupta, A.; Yang, F.; Li, G.; Aldamasy, M.; Turren-Cruz, S.-H.; Flatken, M. A.; Fu, S.; Iwasaki, Y.; Murdey, R.; Hoell, A.; Schorr, S.; Albrecht, S.; Yang, S.; Abate, A.; Wakamiya, A.; De Angelis, F.; Li, M.; Snaith, H. J., Accessing Metal-Containing Species in Tin-Lead Perovskite Precursor Solutions via Molecular Strategies Guided by the Hard-Soft Acid-Base Principle, *Angew. Chem. Int. Ed.*, **64(41),** e202514010 (2025).

Xu, Y.; Wang, C.; Amornkitbamrung, U.; Jeong, H. J.; Rhee, R. J. K.; In, Y.; Gibson, A.; Nakamura, T.; Truong, M. A.; Wakamiya, A.; Shin, H., Molecular Bridge on Buried Interface for Energy Level Alignment in Inverted Perovskite Solar Cell with Efficiency over 25%, *ACS Energy Lett.*, **10(7),** 3407-3414 (2025).

Sato, A.; Yamaguchi, S.; Hasegawa, A.; Shimoi, Y.; Nakamura, T.; Wakamiya, A.; Marumoto, K., Electron Diffusion at Sn Perovskite/Fullerene Derivative Interfaces and Its Influence on Open-Circuit Voltage, *npj Flex. Electron.*, **9(1),** 47 (2025).

Tan, T.; Murdey, R.; Sumitomo, S.; Sato, K.; Abe, T.; Wakamiya, A., Tailored 3-Alkoxy-*N,N,N* ,2,2-Pentamethylpropan-1-Ammonium *Bis*(trifluoromethylsulfonyl)Imide Ionic Liquids for Room-Temperature Fluoride-Ion Batteries, *Angew. Chem. Int. Ed.*, **64(23),** e202422299 (2025).

Dai, W.; Xue, D.; Kimata, H.; Zou, X.; Nakamura, T.; Wakamiya, A.; Marumoto, K., Performance Improvement Mechanism of Perovskite Solar Cells by Device Interface Control, *Sol. RRL.*, **9(10),** 2500183 (2025).

Tan, T.; Murdey, R.; Sumitomo, S.; Wakamiya, A., Design and Synthesis of Asymmetric Anhydrous Quaternary Ammonium Fluoride Electrolytes for Fluoride Ion Batteries, *Sustainable Energy & Fuels*, **9(6),** 1525-1533 (2025).

Liu, T.; Cho, S.; Nishikubo, R.; Pylnev, M.; Ishiwari, F.; Wakamiya, A.; Saeki, A., Mechanochemical Pretreatment of Tin Iodide Perovskite Precursors: Effects of Grinding Temperature and Time on Solar Cell Performance, *EES Solar*, **1(1),** 78-88 (2025).

Hira, S.; Truong, M. A.; Matsushige, Y.; Iwasaki, Y.; Murdey, R.; Nakamura, T.; Yamada, T.; Kanemitsu, Y.; Wakamiya, A., Squaric Acid-Containing Hole-Collecting Monolayer Materials for p-i-n Perovskite Solar Cells, *ACS Appl. Mater. Interfaces*, **17(5),** 8095-8106 (2025).

Miyake, Y.; Nakamura, T.; Truong, M. A.; Murdey, R.; Wakamiya, A., Thiazolidinone-Based Electron-Collecting Monolayers for n-i-p Perovskite Solar Cells, *Chem. Asian J.*, **20(6),** e202401344 (2025).

Truong, M. A.; Funasaki, T.; Adachi, Y.; Hira, S.; Tan, T.; Akatsuka, A.; Yamada, T.; Iwasaki, Y.; Matsushige, Y.; Kaneko, R.; Asahara, C.; Nakamura, T.; Murdey, R.; Yoshida, H.; Kanemitsu, Y.; Wakamiya, A., Molecular Design of Hole-Collecting Materials for Co-Deposition Processed Perovskite Solar Cells: A Tripodal Triazatruxene Derivative with Carboxylic Acid Groups, *J. Am. Chem. Soc.*, **147(3),** 2797-2808 (2025).

Matsuda, W.; Goshima, K.; Noh, I.; Kim, H. D.; Shimazaki, A.; Murdey, R.; Toyoda, M.; Wakamiya, A.; Ohkita, H.; Seki, S.; Tachibana, Y., Impact of Spin-Coating Temperature on Morphology of Pb-Based Mixed Ion Perovskite Films and Their Solar Cell Performance, *ACS Appl. Energy Mater.*, **8(3),** 1437-1445 (2025).

Wang, J.; Branco, B.; Remmerswaal, W. H. M.; Hu, S.; Schipper, N. R. M.; Zardetto, V.; Bellini, L.; Daub, N.; Wienk, M. M.; Wakamiya, A.; Snaith, H. J.; Janssen, R. A. J., Performance and Stability Analysis of All-Perovskite Tandem Photovoltaics in Light-Driven Electrochemical Water Splitting, *Nat. Commun.*, **16(1),** 174 (2025).

Hu, S.; Wang, J.; Zhao, P.; Pascual, J.; Wang, J.; Rombach, F.; Dasgupta, A.; Liu, W.; Truong, M. A.; Zhu, H.; Kober-Czerny, M.; Drysdale, J. N.; Smith, J. A.; Yuan, Z.; Aalbers, G. J. W.; Schipper, N. R. M.; Yao, J.; Nakano, K.; Turren-Cruz, S.-H.; Dallmann, A.; Christoforo, M. G.; Ball, J. M.; McMeekin, D. P.; Zaininger, K.-A.; Liu, Z.; Noel, N. K.; Tajima, K.; Chen, W.; Ehara, M.; Janssen, R. A. J.; Wakamiya, A.; Snaith, H. J., Steering Perovskite Precursor Solutions for Multijunction Photovoltaics, *Nature*, **639(8053),** 93-101 (2025).

Wang, J.; Hu, S.; Zhu, H.; Liu, S.; Zhang, Z.; Chen, R.; Wang, J.; Shi, C.; Zhang, J.; Liu, W.; Lei, X.; Liu, B.; Pan, Y.; Ren, F.; Raza, H.; Zhou, Q.; Li, S.; Qiu, L.; Zheng, G.; Qin, X.; Zhao, Z.; Yang, S.; Li, N.; Li, J.; Wakamiya, A.; Liu, Z.; Snaith, H. J.; Chen, W., Mercapto-Functionalized Scaffold Improves Perovskite Buried Interfaces for Tandem Photovoltaics, *Nat. Commun.*, **16(1),** 4917 (2025).

[Others]

Wakamiya, A.; Murdey, R., High-Performance Polymers for Perovskite Photovoltaics, *Nat. Mater.*, **24,** 1331-1332 (2025).

Wakamiya, A.; Park, N.-G., Synthesis and Purification of Materials for Scalable Perovskite Solar Cells, *Nat. Synth.*, **4,** 1033-1035 (2025).

ADVANCED RESEARCH CENTER FOR BEAM SCIENCE
— Laser Matter Interaction Science —

Ishida, G.; Sugimoto, M.; Uehara, H.; Tokita, S.; Nishijima, Y.; Goya, K., Fiber-in-Line Infrared Spectrometer Fabricated by Femtosecond Laser Structuring of Microchannels in Fluoride Glass Fiber, *Opt. Express*, **33(17),** 35550-35559 (2025).

Yu, L.; Okazaki, D.; Kirita, Y.; Tokita, S.; Uehara, H.; Yasuhara, R., Numerical Investigation of Fe-Doped Chalcogenide Chirped Pulse Amplifier, *Opt. Express*, **33(16),** 33435-33445 (2025).

Kirita, Y.; Kodama, A.; Homma, K.; Chiochiu, C.; Cuciuc, M.; Giubega, G.; Hasada, T.; Hashida, M.; Masuno, S.; Nakamiya, Y.; Neagu, L.; Phung, V. L. J.; Rosu, M.-M.; Sakabe, S.; Tazlauanu, S. V.; Tesileanu, O.; Tokita, S., Search for Sub-eV Axion-Like Particles in a Quasi-Parallel Stimulated Resonant Photon-Photon Collider with "Coronagraphy", *J. High Energy Phys.*, **2025,** 138 (2025).

Fujioka, K.; Matsumoto, Y.; Tamaru, Y.; Yoshida, H.; Ogino, J.; Tokita, S.; Tsubakimoto, K.; Yamamoto, K.; Yogo, A.; Kawanaka, J.; Miyanaga, N., Fabrication, Spectroscopic Characteristics, and Lasing Performance of Nd,La:CaF_2 Transparent Ceramics, *Opt. Mater. Express*, **15(4),** 890-902 (2025).

Goya, K.; Noda, S.; Ishida, G.; Tachibana, K.; Uehara, H.; Tokita, S., Mid-Infrared Refractometer Based on Side-Polished Indium Fluoride Fiber for Monitoring Relative Humidity, *Appl. Phys. Express*, **18(3),** 032003 (2025).

Zhang, Z.; Bu, X.; Okazaki, D.; Song, W.; Morichika, I.; Ashihara, S., Tunable Mode-Locked Laser in the 2.0–2.6 μm Range with GHz-Level Spectral Width and Sub-Nanosecond Pulse Duration, *Appl. Phys. Lett.*, **126,** 051104 (2025).

[Others]

Okazaki, D.; Aghakasiri, M.; Steinleitner, P.; Schweinberger, W.; Potamianos, D.; Gui, Y.; Sebesta, A.; Jahedi, B. A.; Tokita, S.; Krausz, F.; Weigel, A., Time-Domain Terahertz Spectrometer with 1-18 THz Spectral Coverage Based on a Cr:ZnS Oscillator, *2025 Conference on Lasers and Electro-Optics Europe & European Quantum Electronics Conference (CLEO/Europe-EQEC)*, 1 (2025).

Tokita, S.; Masuno, S.; Okazaki, D.; Kirita, Y.; Hashida, M., Remote Control and Monitoring System of Kyoto University's High-Intensity Laser Facility, *The Review of Laser Engineering*, **53(7),** 357-361 (2025).

Tokita, S.; Okazaki, D.; Kirita, Y.; Yasuhara, R., High-Power Mid-Infrared Laser Technology and It's Applications, *The Review of Laser Engineering*, **53(8),** 424-428 (2025).

— Electron Microscopy and Crystal Chemistry —

Fuji, S.; Isoda, Y.; Xie, L.; Haruta, M.; Majima, T.; Shimakawa, Y.; Kan, D., Correlation between Structural Properties and Electrochemical Proton Insertion in (001) VO_2 Epitaxial Films, *Appl. Phys. Express*, **18(4),** [045501-1]-[045501-5] (2025).

Iwashimizu, C.; Haruta, M.; Kurata, H., Anisotropic Atomic Contrast by Final-State Selection in Electron Energy-Loss Spectroscopy, *Phys. Rev. B*, **111(15),** [155147-1]-[155147-8] (2025).

Namsar, O.; Autthawong, T.; Yodbunork, C.; Yodying, W.; Mahamai, N.; Kunniyom, K.; Haruta, M.; Sarakonsri, T., Towards High Performance Lithium Storage Anodes: Design Strategy for Carbon Coated SnS-SnO_2/rGO Nanocomposites, *Radiat. Phys. Chem.*, **235,** [112821-1]-[112821-15] (2025).

Haruta, M.; Lin, I-C.; Nemoto, T.; Kurata, H., Impact of Atomic Thermal Motion on the Ti $L_{2,3}$-Edge Fine Structure, *Microscopy*, dfaf042 (2025).

INTERNATIONAL RESEARCH CENTER FOR ELEMENTS SCIENCE
— Synthetic Organotransformation —

Ueda, K.; Saito, R.; Iseri, K.; Sekiya, S.; Nakamura, M.; Isozaki, K., Accelerated Catalysis of Atomically Precise Thiolate-Protected Gold Nanoclusters by Supramolecular Ligand Engineering, *ACS Catal.*, **15(14),** 12260-12268 (2025).

Mineo, K., A Cognitive Framework for the Interaction between Human and Forests: Punctuated Equilibrium of Forests as Social-Ecological-Technological Systems (SETS), *Applied Forest Science*, **33(Special),** 37-40 (2025).

Wu, D.; Doba, T.; Nakamura, M., Iron-Catalyzed C–N Coupling Using Polycyclic Aromatic Hydrocarbon as a Redox Mediator, *Org. Lett.*, **27(49),** 13643-13648 (2025).

Matsuda, H.; Hong, S. H.; Ahn, S.; Avena, R. F.; Jeong, Y.; Hwang, K. M.; Son, E.; Kang, S.; Ko, S.-B.; Kim, T.; Nakamura, M., Sustainable Iron-Catalyzed Carbazole Dimerization for High Triplet Host/Electron Blocking Materials of Efficient Deep Blue OLEDs, *Commun. Mater.*, **6(1),** 248 (2025).

Lu, S.; Agata, R.; Nomura, S.; Matsuda, H.; Isozaki, K.; Nakamura, M., Regioselective Propargylic Suzuki–Miyaura Coupling by SciPROP-Iron Catalyst, *J. Org. Chem.*, **89(12),** 8385-8396 (2025).

— Advanced Solid State Chemistry —

Fuji, S.; Isoda, Y.; Lingling, X.; Haruta, M.; Majima, T.; Shimakawa, Y.; Kan, D., Correlation between Structural Properties and Electrochemical Proton Insertion in (001) VO_2 Epitaxial Films, *Appl. Phys. Express*, **18(4),** 045501 (2025).

Goto, M.; Sato, K.; Chen, W.-T.; Huang, W.-H.; Shimakawa, Y., Robust Unusually High Valence Fe^{5+} State and Large Magnetic Interaction Change in the Double Perovskites $La_{2-x}Ca_xLiFeO_{6-0.5x}$, *Chem. Mater.*, **37(5),** 2008-2013 (2025).

Shen, Y.; Ooe, K.; Shitara, K.; Kobayashi, S.; Yoshimura, T.; Yamada, T.; Xie, L.; Shimakawa, Y.; Kan, D., Ultrathin Freestanding Membranes of ZrO_2 with Metastable Structures and Strain-Dependent Electrical Properties, *Phys. Rev. Mater.*, **9(2),** 024411/1-9 (2025).

Chen, W.-T.; Nishikubo, T.; Sakai, Y.; Das, H.; Fukuda, M.; Pan, Z.; Ishimatsu, N.; Mizumaki, M.; Kawamura, N.; Kawaguchi, S. I.; Smirnova, O.; Tucker, M. G.; Watanuki, T.; Machida, A.; Takajo, S.; Uwatoko, Y.; Shimakawa, Y.; Takano, M.; Azuma, M.; Attfield, J. P., Pressure-Induced Charge Amorphisation in $BiNiO_3$, *Nat. Commun.*, **16(1),** 2128 (2025).

Xie, L.; Isoda, Y.; Nakamizo, S.; Shen, Y.; Fuji, S.; Majima, T.; Shimakawa, Y.; Kan, D., Effect of Substrate-Induced Compressive Strain on Protonation of $SrCoO_{2.5}$ Epitaxial Films, *Jpn. J. Appl. Phys.*, **64(2),** 025501 (2025).

Isoda, Y.; Pham, T. N.; Aso, R.; Nakamizo, S.; Majima, T.; Hosokawa, S.; Nitta, K.; Morikawa, Y.; Shimakawa, Y.; Kan, D., Stabilization of Oxygen Vacancy Ordering and Electrochemical-Proton-Insertion-and-Extraction-Induced Large Resistance Modulation in Strontium Iron Cobalt Oxides Sr(Fe,Co)O_y, *Nat. Commun.*, **16(1),** 56/1-9 (2025).

— Organometallic Chemistry —

Higaki, T.; Tanaka, K.; Izu, H.; Oishi, S.; Kawamoto, K.; Tada, M.; Sameera, W. M. C.; Takahata, R.; Teranishi, T.; Kikkawa, S.; Yamazoe, S.; Shiga, T.; Nihei, M.; Kato, T.; Cramer, R. E.; Zhang, Z.; Meyer, K.; Ohki, Y., An Icosahedral 55-Atom Iron Hydride Cluster Protected by Tri-*Tert*-Butylphosphines, *J. Am. Chem. Soc.*, **147(4),** 3215-3222 (2025).

Münster, K.; Kudo, S.; Kuwabara, T.; Shimamura, E.; Furukawa, S.; Yoshida, Y.; Ishida, S.; Iwamoto, T.; Tanifuji, K.; Ohki, Y.; Minoura, M.; Saito, M., Synthesis of a Dilithiobutadiene Bearing Extremely Bulky Silyl Substituents and Its Reactivity toward Functionalized Silanes, *Dalton Trans.*, **54(10),** 4030-4038 (2025).

— Optical Materials Science —

Zhang, Z.; Watanabe, H.; Hirori, H., Reaching the Nonlinear Spin-Dynamics Regime in Antiferromagnets Using Terahertz Pulses, *J. Phys. Soc. Jpn.*, **94,** 111006 (2025).

Tachizaki, T.; Kanemitsu, Y.; Hirori, H., Time Resolution of Terahertz Scanning Tunneling Microscopy Measurements inside a Superconducting Magnet Using a Hollow Waveguide, *Rev. Sci. Instrum.*, **96(4),** 043004 (2025).

Zhang, Z.; Shiota, Y.; Karube, S.; Watanabe, Y.; Ono, T.; Hirori, H., Ultrafast Modulation of the Anomalous Hall Conductivity by Coherent Magnetization Precession in Co-Pt Thin Films, *Phys. Rev. Appl.*, **24(4),** 044079 (2025).

Zhang, Z.; Kanega, M.; Maruyama, K.; Kurihara, T.; Nakajima, M.; Tachizaki, T.; Sato, M.; Kanemitsu, Y.; Hirori, H., Spin Switching in $Sm0.7Er_{0.3}FeO_3$ Triggered by Terahertz Magnetic-Field Pulses, *Nat. Mater.*, **24(2),** 219-225 (2025).

BIOINFORMATICS CENTER
— Chemical Life Science —

Demory, D.; Endo, H.; Baudoux, A.-C.; Bigeard, E.; Grimsley, N.; Simon, N.; Ogata, H.; Weitz, J. S., Temperature-Driven Biogeography of Marine Giant Viruses Infecting Picoeukaryotes Micromonas, *ISME Commun.*, **5(1),** ycaf137 (2025).

Endo, H.; Yamagishi, Y.; Nguyen, T. T.; Ogata, H., Extracellular rRNA Profiling Reveals the Sinking and Cell Lysis Dynamics of Marine Microeukaryotes, *Environ. Microbiol.*, **27(8),** e70164 (2025).

Qin, H.; Endo, H.; Ebihara, A.; Fujiwara, A.; Onodera, J.; Yamada, Y.; Fukuda, H.; Nagata, T.; Shiozaki, T., Microorganisms Contributing to the Biological Pump in the Western Arctic Ocean During Late Summer, *J. Geophys. Res. Biogeosci.*, **130(7),** e2024JG008568 (2025).

Hikida, H.; Ogata, H., Generation of a Recombinant Mimivirus by Homologous Recombination Using Direct Transfection of a PCR Amplicon, *J. Mol. Biol.*, **437(21),** 169404 (2025).

Chen, J.; Ogata, H.; Hikida, H., Sputnik Virophage Disrupts the Transcriptional Regulation of Its Host Giant Virus, *J. Virol.*, **99(4),** e0019225 (2025).

Fernandes, C.; Haber, M.; Layoun, P.; Chiriac, M.-C.; Bulzu, P.-A.; Ghai, R.; Kasalicky, V.; Shabarova, T.; Grossart, H.-P.; Woodhouse, J.; Piwosz, K.; Alonso, C.; Zanetti, J.; Hamilton, D. P.; Ngochera, M.; Nakano, S.-I.; Okazaki, Y.; Salcher, M. M., Ecophysiology and Global Dispersal of the Freshwater SAR11-IIIb Genus *Fontibacterium*, *Nat. Microbiol.*, **10(9),** 2194-2206 (2025).

Okazaki, Y.; Nishikawa, Y.; Wagatsuma, R.; Takeyama, H.; Nakano, S.-I., Contrasting Defense Strategies of Oligotrophs and Copiotrophs Revealed by Single-Cell-Resolved Virus-Host Pairing of Freshwater Bacteria, *ISME Commun.*, **5(1),** ycaf086 (2025).

Wang, H.; Meng, L.; Otaegi-Ugartemendia, S.; Condezo, G. N.; Blanc-Mathieu, R.; Stokke, R.; Langvad, M. R.; Brandt, D.; Kalinowski, J.; Dahle, H.; Martin, C. S.; Ogata, H.; Sandaa, R.-A., Haptophyte-Infecting Viruses Change the Genome Condensing Proteins of Dinoflagellates, *Commun. Biol.*, **8(1),** 510 (2025).

Fang, Y.; Meng, L.; Xia, J.; Gotoh, Y.; Hayashi, T.; Nagasaki, K.; Endo, H.; Okazaki, Y.; Ogata, H., Genome-Resolved Year-Round Dynamics Reveal a Broad Range of Giant Virus Microdiversity, *mSystems*, **10(1),** e0116824 (2025).

Liu, W.; Nagasaka, K.; Wu, J.; Ban, H.; Mimick, E.; Meng, L.; Neches, R. Y.; Moniruzzaman, M.; Yoshida, T.; Nishimura, Y.; Endo, H.; Okazaki, Y.; Ogata, H., Giant Viruses Specific to Deep Oceans Show Persistent Presence and Activity. *mSystems,* **12,** e0093225 (2025).

— Mathematical Bioinformatics —

Yang, Z.; Tamura, T., DeepGDel: Deep Learning-Based Gene Deletion Prediction Framework for Growth-Coupled Production in Genome-Scale Metabolic Models, *IEEE Trans. Comput. Biol. Bioinform.*, **22(5),** 2252-2266 (2025).

Fujita, S.; Akutsu, T., Enhancing Epidemic Forecasting with a Physics-Informed Spatial Identity Neural Network, *PLoS One*, **20(9),** e0331611 (2025).

Ido, R.; Azam, N. A.; Zhu, J.; Nagamochi, H.; Akutsu, T., A Dynamic Programming Algorithm for Generating Chemical Isomers Based on Frequency Vectors, *Sci. Rep.*, **15(1),** 22214 (2025).

Nakashima, S.; Mori, T.; Li, R.; Akutsu, T., A Method for Computing the Minimum Common Feedback Set for a Multilayer Network and Its Application to Analysis of Biological Data, *Journal of Information Processing*, **33,** 345-356 (2025).

Liu, C.; Cai, S.; Pan, T.; Ogata, H.; Song, J.; Akutsu, T., SFM-Net: Selective Fusion of Multiway Protein Feature Network for Predicting Binding Affinity Changes upon Mutations, *J. Chem. Inf. Model.*, **65(7),** 3854-3865 (2025).

Fujiyoshi, M.; Suzuki, T. K.; Iwasaki, W.; Furusawa, C.; Matsui, M., Bac2Feature: An Easy-to-Use Interface to Predict Prokaryotic Traits from 16S rRNA Gene Sequences, *Bioinform. Adv.*, **5,** vbaf136 (2025).

Sun, L.; Wu, C.; Ching, W.-K.; Akutsu, T., On the Compressive Power of Autoencoders with Linear and ReLU Activation Functions, *Neural Comput.*, **37(2),** 235-259 (2025).

Batool, M.; Azam, N. A.; Zhu, J.; Haraguchi, K.; Zhao, L.; Akutsu, T., A Unified Approach to Inferring Chemical Compounds with the Desired Aqueous Solubility, *J. Cheminform.*, **17(1),** 37 (2025).

Zhu, J.; Azam, N. A.; Cao, S.; Ido, R.; Haraguchi, K.; Zhao, L.; Nagamochi, H.; Akutsu, T., Quadratic Descriptors and Reduction Methods in a Two-Layered Model for Compound Inference, *Front. Genet.*, **15,** 1483490 (2025).

Akutsu, T.; Melkman, A. A., On the Size and Width of the Decoder of a Boolean Threshold Autoencoder, *IEEE Trans. Neural Netw. Learn. Syst.*, **36(2),** 3855-3862 (2025).

Zhang, B.; Zhang, Y.; Li, J.; Chen, J.; Akutsu, T.; Cheung, Y.-M.; Cai, H., Unsupervised Dual Deep Hashing with Semantic-Index and Content-Code for Cross-Modal Retrieval, *IEEE Trans. Pattern Anal. Mach. Intell.*, **47(1),** 387-399 (2025).

Song, B.; Zhu, J.; Azam, N. A.; Haraguchi, K.; Zhao, L.; Akutsu, T., Cycle-Configuration Descriptors: A Novel Graph-Theoretic Approach to Enhancing Molecular Inference, *J. Cheminform.*, **17(1),** 125 (2025).

Yang, Z.; Tamura, T., DBgDel: Database-Enhanced Gene Deletion Framework for Growth-Coupled Production in Genome-Scale Metabolic Models, *IEEE Trans. Comput. Biol. Bioinform.*, **22(4),** 1415-1427 (2025).

Ma, Y.; Tamura, T., RatGene: Gene Deletion-Addition Algorithms Using Growth to Production Ratio for Growth-Coupled Production in Constraint-Based Metabolic Networks, *IEEE Trans. Comput. Biol. Bioinform.*, **22(3),** 1128-1140 (2025).

Zhu, J.; Takekida, M.; Azam, N. A.; Haraguchi, K.; Zhao, L.; Akutsu, T., Toward Environment-Sensitive Molecular Inference via Mixed Integer Linear Programming, *ACS Omega*, **10(40),** 46467-46481 (2025).

Ohtomo, M.; Takasu, A.; Akutsu, T., Computing Hamming Distance and Levenshtein Distance Using ReLU Neural Networks, *IEEE ACCESS*, **13,** 210089-210101 (2025).

[Others]

Akutsu, T., Discrete Mathematical Models of Genetic Networks, *The Journal of the Institute of Electronics, Information and Communication Engineers*, **108(3),** 243-248 (2025).

— Bio-knowledge Engineering —

Lee, J; Nguyen, C. H.; Mamitsuka, H., Beyond Rigid Docking: Deep Learning Approaches for Fully Flexible Protein-Ligand Interactions, *Brief. Bioinform.*, **26(5),** bbaf454 (2025).

Petschner, P.; Nguyen, D. A.; Nguyen, C. H.; Mamitsuka, H., Machine Learning for Predicting Drug-Drug Interactions: Graph Neural Networks and Beyond, *Curr. Opin. Syst. Biol.*, **42,** 100551 (2025).

Nguyen, D. H.; Mamitsuka, H.; Nakamura, A., Multiple Wasserstein Gradient Descent Algorithm for Multi-Objective Distributional Optimization, *Proceedings of the 41st Conference on Uncertainty in Artificial Intelligence (UAI 2025)*, **286,** 3182-3199 (2025).

Ishikawa, M.; Jiang, Z.; Nguyen, C. H.; Hatsukawa, H.; Hirai, T.; Matsumoto, H.; Saito, E.; Okazaki, K.; Endo, K.; Terada, S.; Mamitsuka, H., Uncovering Key Features for Predicting Comorbid Chronic Eosinophilic Pneumonia in Chronic Rhinosinusitis via Machine Learning, *Int. Forum Allergy Rhinol.*, **15(10),** 1101-1112 (2025).

Petschner, P.; Kumar, S.; Nguyen, D. A.; Torok, D.; Gal, Z.; Baksa, D.; Gecse, K.; Kokonyei, G.; Mamitsuka, H.; Juhasz, G., The Interictal Transcriptomic Map of Migraine without Aura, *J. Headache Pain.*, **26(1),** 109 (2025).

Nguyen, D. H.; Sakurai, T.; Mamitsuka, H., Wasserstein Gradient Flow over Variational Parameter Space for Variational Inference, *Proceedings of the 28th International Conference on Artificial Intelligence and Statistics (AISTATS 2025)*, 1756-1764 (2025).

INTERNATIONAL RESEARCH COLLABORATIONS

[Australia]
Flinders University, Institute of Nanoscale Science and Technology

Monash University, Monash Biomedicine Discovery Institute

RMIT University, School of Engineering

The Australian National University, School of Engineering

University of Sydney, Faculty of Engineering

[China, P. R.]
Chinese Academy of Sciences (CAS), Institute of Plant Physiology and Ecology, CAS Center for Excellence in Molecular Plant Sciences, National Key Laboratory of Plant Molecular Genetics

Fudan University, School of Pharmacy

Fujian Agriculture and Forestry University, Institute of Genetics and Crop Breeding

Guangdong Ocean University, College of Coastal Agricultural Sciences

Huazhong University of Science and Technology (HUST), Wuhan National Laboratory for Optoelectronics

Shanghai Academy of Agricultural Sciences, Horticulture Research Institute, Shanghai Key Laboratory of Protected Horticulture Technology

South China University of Technology, School of Computer Science and Engineering

The University of Hong Kong, Department of Mathematics

[Czech Republic]
The Czech Academy of Sciences, Institute of Hydrobiology

[France]
Centre National de la Recherche Scientifique

The French Alternative Energies and Atomic Energy Commission (CEA), Genoscope

[Germany]
Bielefeld University, Faculty of Biology

European Molecular Biology Laboratory

Friedrich-Alexander-Universität Erlangen-Nürnberg, Department of Chemistry and Pharmacy

Humboldt-Universität zu Berlin, Institut für Chemie

Max Planck Institute for Medical Research

Max Planck Society, Max Planck Institute of Quantum Optics

[Hungary]
Semmelweis University, Faculty of Pharmaceutical Sciences

[Israel]
Ben-Gurion University of the Negev, Department of Computer Science

[Italy]
University of Naples Federico II

[Korea, R.]
Hanyang University, Department of Applied Chemistry, Center for Bionano Intelligence Education and Research

Korea Advanced Institute of Science and Technology, Department of Physics

Pohang University of Science and Technology, Department of Chemistry

Sungkyunkwan University, Nature Inspired Materials Processing Research Center and Department of Energy Science

Ulsan National Institute of Science and Technology, Department of Chemistry

University of Ulsan, Department of Physics

[Lithuania]
Kaunas University of Technology, Department of Organic Chemistry

[Norway]
University of Bergen, Department of Biology

[Pakistan]
Quaid-i-Azam University, Department of Mathematics

[Poland]
Adam Mickiewicz University, Institute of Molecular Biology and Biotechnology

[Spain]
CSIC (Consejo Superior de Investigaciones Científicas), CNB (Centro Nacional de Biotecnología)

Universitat de València, Instituto Universitario de Ciencia de los Materiales (ICMUV)

University of the Basque Country, Polymat

[Sweden]
Chalmers University of Technology, Department of Space, Earth and Environment

[Swizerland]
University of Zurich, Department of Plant and Microbial Biology

[Taiwan]
Academia Sinica, Research Center for Environmental Changes

National Cheng Kung University, Department of Earth Sciences

National Taiwan University, Center for Condensed Matter Sciences

[Thailand]
Chiang Mai University, Faculty of Science

[The Netherlands]
Dutch Institute for Fundamental Energy Research

Eindhoven University of Technology, Institute for Complex Molecular

[The U.K.]
MRC Laboratory of Molecular Biology

University of Oxford, Department of Physics

University of St Andrews, Organic Semiconductor Centre, EaStCHEM School of Chemistry

[The U.S.]
Stanford University, Department of Materials Science & Engineering

University of Hawaii, Department of Chemistry

University of Maryland, Department of Biology

University of Miami, Rosenstiel School of Marine, Atmospheric, and Earth Science

Virginia Tech, Department of Physics

[Vietnam]
Hanoi University of Science and Technology, School of Materials Science and Engineering

*The list shows the institutions with which papers are co-authored.

GRANTS

(1 April 2024 ~ 31 March 2025)

RESEARCH AND EDUCATION FUNDING
/total 3 projects

International Joint Usage / Research Center:Global Frontier and Interdisciplinary Research Core for Deepening Investigation and Promoting Collaboration in Chemistry-oriented Fields

Integrated Research Consortium on Chemical Science

Center for Spintronics Research Network

COMMISSIONED RESEARCH
/total 61 projects

— MEXT —

Quantum Leap Flagship Program (MEXT Q-LEAP)
(3 projects)

Advanced Research Infrastructure for Materials and Nanotechnology in Japan

Initiative to Establish Next-generation Novel Integrated Circuits Centers (X-NICS)

Project for Promoting Public Utilization of Advanced Research Infrastructure

Joint Usage / Research Center Program

— METI —

Go-Tech Project, The Small and Medium Enterprise Agency

— JSPS —

Core-to-Core Program
(2 projects)

Bilateral Programs

— JST —

A-STEP (Adaptable and Seamless Technology Transfer Program through Targetdriven R&D)
(2 projects)

Strategic Basic Research Programs, CREST (Core Research for Evolutional Science and Technology)
(9 projects)

Strategic Basic Research Programs, PRESTO (Precursory Research for Embryonic Science and Technology)
(8 projects)

Strategic Basic Research Programs, ACT-X
(2 projects)

JST-Mirai Program
(2 projects)

Green Technologies of Excellence

FOREST (Fusion Oriented Research for disruptive Science and Technology)
(3 projects)

Database Integration Coordination Program
(2 projects)

ASPIRE (Adopting Sustainable Partnerships for Innovative Research Ecosystem)
(4 projects)

India Young Researchers Invitation Programme

PM Development and Promotion Program

— AMED —

Program on R&D of New Generation Vaccine Including New Modality Application

— NEDO —

Green Innovation Fund Projects

Development of Technologies to Promote Photovoltaic Power Generation as a Primary Power Source

Collaborative Industry-Academia-Government research and development Project for Solving Common Challenges Toward Dramatically Expanded Use of Fuel Cells and Related Equipment

NEDO Feasibility Study Program
(2 projects)

— ERCA —

ERTDF (Environment Research and Technology Development Fund)

SIP (Cross-ministerial Strategic Innovation Promotion Program)

— OTHERS —

total 7 projects

GRANTS-IN-AID FOR SCIENTIFIC RESEARCH
/total 121 projects

Grant-in-Aid for Specially Promoted Research

Grant-in-Aid for Transformative Research Areas (A)
(8 projects)

Grant-in-Aid for Transformative Research Areas (B)

Grant-in-Aid for Scientific Research (S)
(5 projects)

Grant-in-Aid for Scientific Research (A)
(7 projects)

Grant-in-Aid for Scientific Research (B)
(26 projects)

Grant-in-Aid for Scientific Research (C)
(9 projects)

Grant-in-Aid for Challenging Research (Pioneering)
(2 projects)

Grant-in-Aid for Challenging Research (Exploratory)
(8 projects)

Grant-in-Aid for Early-Career Scientists
(19 projects)

Grant-in-Aid for Research Activity Start-up
(5 projects)

Grant-in-Aid for Publication of Scientific Research Results
(Databases)

Grant-in-Aid for JSPS Fellows
(28 projects)

Fund for the Promotion of Joint International Research
(International Collaborative Research)

COLLABORATIVE RESEARCH
/total 44 projects

DONATIONS
/total 46

Abbreviations and Acronyms

AMED: Advanced Research and Development Programs for Medical Innovation
ERCA: Environmental Restoration and Conservation Agency
JSPS: Japan Society for the Promotion of Science
JST: Japan Science and Technology Agency
METI: Ministry of Economy, Trade and Industry
MEXT: Ministry of Education, Culture, Sports, Science and Technology
NEDO: New Energy Development Organization

THESES

TIAN, Wu
D. Sc., Kyoto University
"Synthesis of Pt-Based Ordered Alloy Nanoparticles for Efficient Electrocatalytic Oxygen Reduction Reaction"
Supervisor: Prof. TERANISHI, Toshiharu
25 March 2025

HAYASHI, Daiju
D. Sc., Kyoto University
"Research on Hybrid Magnons in Synthetic Antiferromagnets"
Supervisor: Prof. ONO, Teruo
24 March 2025

TAGA, Kotaro
D. Sc., Kyoto University
"Research on Phonon Angular Momentum Using Surface Acoustic Waves"
Supervisor: Prof. ONO, Teruo
24 March 2025

KOMIYAMA, Haruka
D. Sc., Kyoto University
"Electrical and Optical Measurements of Spin Wave and Elastic Wave Propagation Characteristics Localized on the Surface"
Supervisor: Prof. ONO, Teruo
24 March 2025

KAWARAZAKI, Ryo
D. Sc., Kyoto University
"Polarity Control of the Superconducting Diode Effect and Realization of Rectifying Devices in Artificial Superlattices with Broken Spatial Inversion Symmetry"
Supervisor: Prof. ONO, Teruo
24 March 2025

YE, Feifan
D. Sc., Kyoto University
"Study on Data Writing and Shifting in Nanopillars with Perpendicular Magnetic Anisotropy"
Supervisor: Prof. ONO, Teruo
24 March 2025

JANG, Heechan
D. Sc., Kyoto University
"Research on Novel Operation Methods for Three-Dimensional Magnetic Memory"
Supervisor: Prof. ONO, Teruo
24 March 2025

OTONARI, Kenko
D. Pharm. Sc., Kyoto University
"Development of Sequence-Specific RNA Demethylation Tools"
Supervisor: Prof. FUTAKI, Shiroh
24 March 2025

KURIYAMA, Msashi
D. Pharm. Sc., Kyoto University
"Study on Cellular Factors Affecting the Intracellular Uptake of Biomacromolecules"
Supervisor: Prof. FUTAKI, Shiroh
24 March 2025

MICHIBATA, Junya
D. Pharm. Sc., Kyoto University
"Coacervate Formation and Cytosolic Delivery of Antibodies Using Membrane-Lytic Peptide-Modified Polysaccharides"
Supervisor: Prof. FUTAKI, Shiroh
24 March 2025

ISHIDA, Toshiaki
D. Agr., Kyoto University
"Studies on the Mechanism of Gibberellin Deactivation in the Uppermost Internode of Rice"
Supervisor: Prof. YAMAGUCHI, Shinjiro
24 September 2025

HAGHIR, Shahrzad
D. Sc., Kyoto University
"The *Arabidopsis* Basic-Helix-Loop-Helix Transcription Factor LRL1 Activates Cell Wall-Related Genes during Root Hair Development"
Supervisor: Assoc. Prof. TSUGE, Tomohiko
23 May 2025

CHAN, Cheuk-Yin
D. Sc., Kyoto University
"Marine Geochemistry of Nine Trace Metals (Al, Mn, Fe, Co, Ni, Cu, Zn, Cd and Pb) in the Subarctic North Pacific Ocean"
Supervisor: Prof. SOHRIN, Yoshiki
24 March 2025

SUWANAWAT, Nittikarn
D. Agr., Kyoto University
"Biochemical Characteristics and Physiological Functions of Lysophosphatidic Acid Acyltransferases from *Escherichia coli* and *Thermus thermophilus*"
Supervisor: Prof. KURIHARA, Tatsuo
23 January 2025

TAN, Tiancheng
D. Sc., Kyoto University
"Quaternary Ammonium Fluoride Electrolytes for Fluoride Ion Batteries"
Supervisor: Prof. WAKAMIYA, Atsushi
24 March 2025

IIHOSHI, Makoto
D. Sc., Kyoto University
"Successive Phase Transitions due to Mixed and Unusually High Valence Fe Ions"
Supervisor: Prof. SHIMAKAWA, Yuichi
24 March 2025

ISODA, Yosuke
D. Sc., Kyoto University
"Electrochemical Ion Insertion to and Extraction from Oxygen Deficient Perovskite Structure Metal-Oxide Thin Films and their Physical Properties"
Supervisor: Prof. SHIMAKAWA, Yuichi
24 March 2025

SHEN, Yufan
D. Sc., Kyoto University
"Polymorphs and Functional Properties of Crystalline Membranes of Fluorite Oxides"
Supervisor: Prof. SHIMAKAWA, Yuichi
24 March 2025

XIE, Lingling
D. Sc., Kyoto University
"Investigations of Electrochemical Protonation in Brownmillerite-Structured Strontium Cobaltite Epitaxial Films and their Property Modulations"
Supervisor: Prof. SHIMAKAWA, Yuichi
24 September 2025

YANG, Qingwei
D. Sc., Kyoto University
"Multi-Omics Insight into the Function of Protists on the Biological Carbon Pump"
Supervisor: Prof. OGATA, Hiroyuki
25 November 2025

LIU, Chunting
D. Inf., Kyoto University
"Enhancing Representation Learning for Biological Data Through Tailored Feature Extractors"
Supervisor: Prof. AKUTSU, Tatsuya
23 July 2025

THE 125TH ICR ANNUAL SYMPOSIUM

SEMINARS / MEETINGS AND SYMPOSIA

THE 125TH ICR ANNUAL SYMPOSIUM

— ICR Award for Young Scientist —

MORIOKA, Naoya (Inorganic Photonics Materials)
"Coherent Photoelectrical Readout of Single Spins in Silicon Carbide at Room Temperature"

ZHANG, Ruixuan (Chemical Life Science)
"A Giant Virus Forms a Specialized Subcellular Environment Within Its Amoeba Host for Efficient Translation"

NAKANISHI, Yohei (Polymer Materials Science)
"Time-Resolved AUSAXS at BL28XU at SPring-8"

— ICR Award for Graduate Students —

ZHANG, Zheng (Structural Organic Chemistry)
"Face-to-Face Helical Columns with Permanent Polarity Consisting of Homochiral End-Functionalized Helicenes"

FARRAG, Asmaa Mostafa Abdelbari Soliman (Chemical Biology)
"Live-Cell Monitoring and Omics Analysis of Liquid–Solid Transitions of Biomolecular Condensates"

TONG, Tianxiang (Polymer Controlled Synthesis)
"Melt Rheology of Dendritic Hyperbranched Polyacrylates Synthesized by Controlled Radical Polymerization: Evidence of Self-Similar Branch Structure Formation"

ZHANG, Liwen (Chemical Life Science)
"Spatiotemporal Dynamics of Giant Viruses Within a Deep Freshwater Lake Reveal a Distinct Dark-Water Community"

MATSUOKA, Kohei (Hydrospheric Environment Analytical Chemistry)
"Concentrations and Isotope Ratios of Mo and W in Okinawa Trough Hydrothermal Fluids: Novel Probes for Hydrothermal Processes in a Back-Arc Basin"

— Oral Presentation —

HIROSE, Takashi (Structural Organic Chemistry)
"Synthesis of Helical Molecules and Exploration of Molecular Functions"

— ICR Grants for Promoting Integrated Research —

KARUBE, Shutaro (Nanospintronics)
"Ultrafast Spin-Conversion Phenomenon in Altermagnets"

NAKAGAWA, Yuka (Synthetic Organotransformation)
"Development of Direct and Precise Transformation Reactions of Woody Biomass via Organic Photocatalysis"

SEMINARS / MEETINGS AND SYMPOSIA

SEMINARS

Number of Seminars 57
(Japanese speaker 23, Foreign speaker 34)

MEETINGS AND SYMPOSIA

ACBI Hanoi Meeting 2025
Organized by UESUGI, Motonari
16-21 January 2025 (Hanoi,Vietnam)

The Asia-Pacific International Conference on Perovskite, Organic Photovoltaics and Optoelectronics (IPEROP25)
Organized by WAKAMIYA, Atsushi
20-21 January 2025 (Kyoto, Japan)

International Symposium on Atomic Level Characterizations for New Materials and Devices in Winter 2025 (ALC-W 2025)
Organized by ONO, Teruo
20-24 January 2025 (Furano, Japan)

Symposium of Advanced Inorganic Nanomaterials (SAIN)
Organized by TAKEKUMA, Haruka and TAKAHATA, Ryo
21-22 February 2025 (Kyoto, Japan)

The 6th Japan – Korea Perovskite International Research Collaboration Center (PIRCC) Workshop
Organized by WAKAMIYA, Atsushi
27 February - 1 March 2025 (Kyoto, Japan)

The 1st Interdisciplinary Microbial Studies Society
Organized by MATSUI, Motomu
28 February 2025 (Kyoto, Japan)

The 4th Mid-Infrared Laser Technology Committee Meeting
Organized by TOKITA, Shigeki
3 March 2025 (Fukuoka, Japan)

The 104th Young Polymer Researcher Meeting [Kansai]
Organized by NAKANISHI, Yohei
26-27 July 2025 (Shiga, Japan)

BIC Seminar
Organized by TAMURA, Takeyuki
2 September 2025 (Kyoto, Japan)

BI-Driven Biomanufacturing (Informatics In Biology, Medicine and Pharmacology 2025)
Organized by MATSUI, Motomu
4 September 2025 (Nagoya, Japan)

The 5th Mid-Infrared Laser Technology Committee Meeting
Organized by TOKITA, Shigeki
12 September 2025 (Yamanashi, Japan)

Seminar on the Japan-France Bilateral Joint Research Program
Organized by YAMADA, Hiroko
17 October 2025 (Kyoto, Japan)

The Institute for Chemical Research Organic Chemistry Symposium
Organized by UESUGI, Motonari
22 October 2025 (Kyoto, Japan)

JSCRP 60th Anniversary Symposium
Organized by YAMAGUCHI, Shinjiro
1 November 2025 (Tochigi, Japan)

New Trends in Enzyme and Metabolism Research Driven by Young Researchers
Organized by KURIHARA, Tatsuo
3 November 2025 (Kyoto, Japan)

NIMS Award 2025 Satellite Symposium at Kyoto University
Organized by WAKAMIYA, Atsushi
13 November 2025 (Kyoto, Japan)

Infrared and Raman Seminar of the Infrared and Raman Spectroscopy Division, The Spectroscopical Society of Japan
Organized by HASEGAWA, Takeshi
28 November 2025 (Kyoto, Japan)

Institute for Chemical Research

Kyoto University