

# PUBLICATIONS

## DIVISION OF SYNTHETIC CHEMISTRY

### — Organoelement Chemistry —

Jun-i, Y.; Mizuhata, Y.; Tokitoh, N., Template Synthesis of Novel Norcorrole Complexes with a Phenyl-Substituted Phosphorus Center, *Eur. J. Org. Chem.*, **2022(5)**, e202101312 (2022).

Jun-i, Y.; Mizuhata, Y.; Tokitoh, N., Convergent Synthesis of *E*-Disilene by the Reduction of Diastereomerically Separable 1,2-Dichlorodisilanes, *Eur. J. Inorg. Chem.*, **2022(5)**, e202100962 (2022).

Oshiro, T.; Mizuhata, Y.; Tokitoh, N., Reaction of an Overcrowded 1,2-Diaryl-1,2-Dibromodisilene with 1-Vinylcyclohepta-1,3,5-Triene: Isolation of a 2-Vinylsilacyclopropane Derivative and Its Thermal Conversion to a Silacyclopent-3-Ene Derivative, *Heterocycles*, **104**, 389-396 (2022).

Sasamori, T.; Sugahara, T.; Tokitoh, N., Amidinate Bromogermylene Resulting from Carbodiimide Insertion into Ar-GeBr Bond, *Mendeleev Commun.*, **32(1)**, 63-65 (2022).

Noda, N.; Jung, Y.; Ado, G.; Mizuhata, Y.; Higuchi, M.; Ogawa, T.; Ishidate, F.; Sato, S.-I.; Kurata, H.; Tokitoh, N.; Uesugi, M., Glucose as a Protein-Condensing Cellular Solute, *ACS Chem. Biol.*, **17(3)**, 567-575 (2022).

Oshiro, T.; Mizuhata, Y.; Tokitoh, N., 2-Germaazulene: Synthesis and Properties of 2-Heteraazulene Containing a Germanium Atom as a Skeletal Element, *Chem. Lett.*, **51**, 312-316 (2022).

Suzuki, W.; Takahata, R.; Chiga, Y.; Kikkawa, S.; Yamazoe, S.; Mizuhata, Y.; Tokitoh, N.; Teranishi, T., Control over Ligand-Exchange Positions of Thiolate-Protected Gold Nanoclusters Using Steric Repulsion of Protecting Ligands, *J. Am. Chem. Soc.*, **144(27)**, 12310-12320 (2022).

Tsukada, H.; Hisa, T.; Shirai, T.; Oshiki, T.; Mizuhata, Y.; Tokitoh, N.; Fukumoto, H.; Agou, T., Synthesis of Perfluoroalkylene-Vinylene-Arylene Copolymers via the Mizoroki-Heck Copolymerization of 1,4-Divinylperfluorobutane and 1,6-Divinylperfluorohexane with Dihalogenated Arylene Monomers, *J. Fluor. Chem.*, **261-262**, 110033 (2022).

Nakamura, M.; Hyakutake, R.; Morisako, S.; Sasamori, T.; Mizuhata, Y.; Tokitoh, N.; Nakashima, K.; Fukumoto, H.; Agou, T., Boron Complexes of  $\pi$ -Extended Nitroxide Ligands Exhibiting Three-State Redox Processes and Near-Infrared-II (NIR-II) Absorption Properties, *Dalton Trans.*, **51**, 13675-13680 (2022).

Sugahara, T.; Hashizume, D.; Tokitoh, N.; Matsui, H.; Kishi, R.; Nakano, M.; Sasamori, T., Characterization of Resonance Structures in Aromatic Rings of Benzene and Its Heavier-Element Analogues, *Phys. Chem. Chem. Phys.*, **24**, 22557-22561 (2022).

Garcia, J. A.; Yasui, Y.; Yukimoto, M.; Mizuhata, Y.; Tokitoh, N., Synthesis of a Kinetically Stabilized 2,2-Dihydrosilene, *Chem. Lett.*, **51(9)**, 898-901 (2022).

### — Structural Organic Chemistry —

Huang, G.; Hasegawa, S.; Hashikawa, Y.; Ide, Y.; Hirose, T.; Murata, Y., An H<sub>2</sub>O<sub>2</sub> Molecule Stabilized inside Open-Cage C<sub>60</sub> Derivatives by a Hydroxy Stopper, *Chem. Eur. J.*, **28(2)**, e202103836 (2022).

Miki, K.; Dan Zhang, Z.; Kaneko, K.; Kakiuchi, Y.; Kojima, K.; Enomoto, A.; Oe, M.; Nogita, K.; Murata, Y.; Harada, H.; Ohe, K., Amphiphilic  $\gamma$ -Cyclodextrin-Fullerene Complexes with Photodynamic Activity, *Mater. Adv.*, **3**, 312-317 (2022).

Zhang, S.; Hashikawa, Y.; Murata, Y., Cage-Opened C<sub>60</sub> Isomers with Different Reactivities, *Asian J. Org. Chem.*, **11(3)**, e202100676 (2022).

Nakakuki, Y.; Hirose, T.; Matsuda, K., Logical Design of Small HOMO-LUMO Gap: Tetrabenzof[*f,j,k,mn,r*][7]helicene as a Small-Molecule Near-Infrared Emitter, *Org. Lett.*, **24(2)**, 648-652 (2022).

Hashikawa, Y.; Murata, Y., Hydrogenation of Cage-Opened C<sub>60</sub> Derivatives Mediated by Frustrated Lewis Pairs, *Org. Biomol. Chem.*, **20**, 1000-1003 (2022).

Hashikawa, Y.; Kawasaki, H.; Murata, Y.,  $\pi$ -Backbonding on Group 9 Metal Complexes Bearing an  $\eta^2$ -(H<sub>2</sub>O@C<sub>60</sub>) Ligand, *Organometallics*, **41(3)**, 354-359 (2022).

Antol, I.; Glasovac, Z.; Murata, Y.; Hashikawa, Y.; Margetić, D., Consecutive Utilization of Mechanochemical and Microwave Methods for the Synthesis of Boc-2-amino-quinazolin-4(3*H*)-ones and DFT Study of Mechanism  $6\pi$ -Diazaelectrocyclization Process, *ChemistrySelect*, **7(13)**, e202200633 (2022).

Nakakuki, Y.; Hirose, T.; Sotome, H.; Gao, M.; Shimizu, D.; Li, R.; Hasegawa, J.-Y.; Miyasaka, H.; Matsuda, K., Doubly Linked Chiral Phenanthrene Oligomers for Homogeneously  $\pi$ -Extended Helicenes with Large Effective Conjugation Length, *Nat. Commun.*, **13(32)**, 1475 (2022).

Nakakuki, Y.; Hirose, T.; Matsuda, K., Theoretical Investigation on Electron Transport Capabilities of Helically Twisted Molecules Based on Decay Constants of Exchange Interaction, *Chem. Lett.*, **51**, 256-259 (2022).

Hashikawa, Y.; Murata, Y., Aniline-Mediated Imination and Reduction of a Cage-Opened C<sub>60</sub> Derivative, *Asian J. Org. Chem.*, **11(9)**, e202200357 (2022).

Ikariko, I.; Kim, S.; Hiroyasu, Y.; Higashiguchi, K.; Matsuda, K.; Hirose, T.; Sotome, H.; Miyasaka, H.; Yokojima, S.; Irie, M.; Kurihara, S.; Fukaminato, T., All-Visible (>500 nm)-Light-Induced Diarylethene Photochromism Based on Multiplicity Conversion via Intramolecular Energy Transfer, *J. Phys. Chem. Lett.*, **13(32)**, 7429-7436 (2022).

Hashikawa, Y.; Okamoto, S.; Sadai, S.; Murata, Y., Chiral Open-[60]Fullerene Ligands with Giant Dissymmetry Factors, *J. Am. Chem. Soc.*, **144(41)**, 18829-18833 (2022).

Hashikawa, Y.; Sadai, S.; Li, J.; Okamoto, S.; Murata, Y., Selective Addition of Aniline to a Cage-Opened Diketo Anhydride Derivative of C<sub>60</sub>, *Chem. Lett.*, **51**(9), 949-952 (2022).

Hashikawa, Y.; Fujikawa, N.; Okamoto, S.; Murata, Y., Phosphorus Ylides of Cage-Opened Sulphide [60]Fullerene Derivatives, *Dalton Trans.*, **51**, 17804-17808 (2022).

Hashikawa, Y.; Fujikawa, N.; Murata, Y.,  $\pi$ -Extended Fullerenes with a Reactant Inside, *J. Am. Chem. Soc.*, **144**(51), 23292-23296 (2022).

### — Synthetic Organic Chemistry —

Reddy, V. K.; Kan, K.; Sokeirik, Y. S. A.-K.; Yoshida, K.; Hirata, A.; Yamanaka, M.; Ueda, Y.; Kawabata, T., Acylative Kinetic Resolution of 1,1'-Binaphthyl-8,8'-Diamines by Organocatalysis, *Tetrahedron*, **103**, 132539 (2022).

Gondo, N.; Hyakutake, R.; Fujimura, K.; Ueda, Y.; Nakano, K.; Tsutsumi, R.; Yamanaka, M.; Kawabata, T., Catalyst-Dependent Rate-Determining Steps in Regiodivergent Vinylogous Aza-Morita-Baylis-Hillman Reactions with *N*-Ts Imines, *Asian J. Org. Chem.*, **11**(3), e202100533 (2022).

Hashimoto, H.; Ueda, Y.; Takasu, K.; Kawabata, T., Catalytic Substrate-Selective Silylation of Primary Alcohols via Remote Functional-Group Discrimination, *Angew. Chem. Int. Ed.*, **61**(18), e202114118 (2022).

Nakagawa, M.; Matsuki, Y.; Nagao, K.; Ohmiya, H., A Triple Photoredox/Cobalt/Bronsted Acid Catalysis Enabling Markovnikov Hydroalkoxylation of Unactivated Alkenes, *J. Am. Chem. Soc.*, **144**(18), 7953-7959 (2022).

Mukai, M.; Nagao, K.; Yamaguchi, S.; Ohmiya, H., Molecular Field Analysis Using Computational-Screening Data in Asymmetric *N*-Heterocyclic Carbene-Copper Catalysis toward Data-Driven *In Silico* Catalyst Optimization, *Bull. Chem. Soc. Jpn.*, **95**(2), 271-277 (2022).

Kemmochi, M.; Miyamoto, Y.; Sumida, Y.; Ohmiya, H., Direct Photoexcitation of Borate Enabling Minisci Reaction, *Asian J. Org. Chem.*, **11**(1), e202100640 (2022).

Watanabe, K.; Takeda, M.; Nagao, K.; Ohmiya, H., Reductive Cross-Coupling between Arylaldehydes and (Hetero)aryl Electrophiles Using Silylboronate Reductant, *Eur. J. Org. Chem.*, **2022**(8), e202200005 (2022).

Kodo, T.; Nagao, K.; Ohmiya, H., Organophotoredox-Catalyzed Semipinacol Rearrangement via Radical-Polar Crossover, *Nat. Commun.*, **13**, 2684 (2022).

Takemura, N.; Sumida, Y.; Ohmiya, H., Organic Photoredox-Catalyzed Silyl Radical Generation from Silylboronate, *ACS Catal.*, **12**(13), 7804-7810 (2022).

Nakamura, R.; Sumida, Y.; Ohmiya, H., Direct Photoexcitable Iodomethylborate Enabling Cyclopropanation of Reactive Alkenes, *Bull. Chem. Soc. Jpn.*, **95**(7), 1001-1105 (2022).

Hashimoto, H.; Ueda, Y.; Fujimura, K.; Takasu, K.; Kawabata, T., Approach Toward Reversal of Chemoselectivity in Catalytic Silylation of Pyranosides, *Eur. J. Org. Chem.*, **2022**(37), e202200949 (2022).

Matsuo, T.; Nagao, K.; Ohmiya, H., Light-Driven Radical-Polar Crossover Catalysis for Cross-Coupling with Organosilanes, *Tetrahedron Lett.*, **112**, 154231 (2022).

### — Advanced Inorganic Synthesis —

Trinh, T. T.; Kim, J.; Sato, R.; Matsumoto, K.; Teranishi, T., Synthesis of Mesoscopic Particles of Multi-Component Rare Earth Permanent Magnet Compounds, *Journal of the Japan Society of Powder and Powder Metallurgy*, **69**, S84-S98 (2022).

Matsumoto, K.; Sato, R.; Tatetsu, Y.; Takahata, R.; Yamazoe, S.; Yamauchi, M.; Inagaki, Y.; Horibe, Y.; Kudo, M.; Toriyama, T.; Auchi, M.; Haruta, M.; Kurata, H.; Teranishi, T., Inter-Element Miscibility Driven Stabilization of Ordered Pseudo-Binary Alloy, *Nat. Commun.*, **13**, 1047 (2022).

Nakagawa, F.; Saruyama, M.; Takahata, R.; Sato, R.; Matsumoto, K.; Teranishi, T., *In Situ* Control of Crystallinity of 3D Colloidal Crystals by Tuning the Growth Kinetics of Nanoparticle Building Blocks, *J. Am. Chem. Soc.*, **144**(13), 5871-5877 (2022).

Saruyama, M.; Pelicano, C. M.; Teranishi, T., Bridging Electrocatalyst and Cocatalyst Studies for Solar Hydrogen Production via Water Splitting, *Chem. Sci.*, **13**, 2824-2840 (2022).

Li, H.; Shibuta, M.; Yamada, T.; Hojo, H.; Kato, H. S.; Teranishi, T.; Sakamoto, M., Band Engineering-Tuned Localized Surface Plasmon Resonance in Diverse-Phased Cu<sub>2-x</sub>S<sub>y</sub>Se<sub>1-y</sub> Nanocrystals, *J. Phys. Chem. C*, **126**(18), 8107-8112 (2022).

Pelicano, C. M.; Saruyama, M.; Takahata, R.; Sato, R.; Kitahama, Y.; Matsuzaki, H.; Yamada, T.; Hisatomi, T.; Domen, K.; Teranishi, T., Bimetallic Synergy in Ultrafine Cocatalyst Alloy Nanoparticles for Efficient Photocatalytic Water Splitting, *Adv. Funct. Mater.*, **32**(31), 2202987 (2022).

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**, 874-878 (2022).

Suzuki, W.; Takahata, R.; Chiga, Y.; Kikkawa, S.; Yamazoe, S.; Mizuhata, Y.; Tokitoh, N.; Teranishi, T., Control over Ligand-Exchange Positions of Thiolate-Protected Gold Nanoclusters Using Steric Repulsion of Protecting Ligands, *J. Am. Chem. Soc.*, **144**(27), 12310-12320 (2022).

Zhang, J.; Chiga, Y.; Kouno, H.; Yanai, N.; Kimizuka, N.; Teranishi, T.; Sakamoto, M., Exciton Recycling in Triplet Energy Transfer from a Defect-Rich Quantum Dot to an Organic Molecule, *J. Phys. Chem. C*, **126**(28), 11674-11679 (2022).

Kikkawa, S.; Fukuda, S.; Hirayama, J.; Shirai, N.; Takahata, R.; Suzuki, K.; Yamaguchi, K.; Teranishi, T.; Yamazoe, S., Dual Functional Catalysis of [Nb<sub>6</sub>O<sub>19</sub>]<sup>8-</sup>-Modified Au/Al<sub>2</sub>O<sub>3</sub>, *Chem. Commun.*, **58**, 9018-9021 (2022).

Lian, Z.; Wu, F.; Zhong, Y.; Zi, J.; Li, Z.; Wang, X.; Nakagawa, T.; Li, H.; Sakamoto, M., Tuning Plasmonic p-n Junction for Efficient Infrared-Light-Responsive Hydrogen Evolution, *Applied Catalysis B: Environmental*, **318**, 121860 (2022).

Liu, M.; Abodya, M.; Dai, W.; Kawawaki, T.; Shimazaki, A.; Sato, R.; Saruyama, M.; Teranishi, T.; Wakamiya, A.; Tachibana, Y., Photo-Induced Charge Carrier Dynamics of Metal Halide Perovskite, *The 29th International Workshop on Active-Matrix Flatpanel Displays and Devices (AM-FPD22)*, 13-16 (2022).

Cho, K.; Tahara, H.; Yamada, T.; Suzuura, H.; Tadano, T.; Sato, R.; Saruyama, M.; Hirori, H.; Teranishi, T.; Kanemitsu, Y., Exciton-Phonon and Trion-Phonon Couplings Revealed by Photoluminescence Spectroscopy of Single CsPbBr<sub>3</sub> Perovskite Nanocrystals, *Nano Lett.*, **22**(18), 7674-7681 (2022).

Chudatemiya, V.; Kikkawa, S.; Hirayama, J.; Takahata, R.; Teranishi, T.; Tamura, M.; Yamazoe, S., Bifunctional Platinum-Incorporated Polyoxoniobate Derived Catalyst for *N*-Formylation of Piperidine Using CO<sub>2</sub>, *Asian J. Org. Chem.*, doi: 10.1002/ajoc.202200521 (2022).

Lian, Z.; Kobayashi, Y.; Vequizo, J. J. M.; Ranasinghe, C. S. K.; Yamakata, A.; Nagai, T.; Kimoto, K.; Kobayashi, K.; Tanaka, K.; Teranishi, T.; Sakamoto, M., Harnessing Infrared Solar Energy with Plasmonic Energy Upconversion, *Nat. Sustain.*, **5**, 1092-1099 (2022).

## DIVISION OF MATERIALS CHEMISTRY

### — Chemistry of Polymer Materials —

Kinose, Y.; Sakakibara, K.; Tsujii, Y., Conformational Characteristics of Regioselectively PEG/PS-Grafted Cellulosic Bottlebrushes in Solution: Cross-Sectional Structure and Main-Chain Stiffness, *Polym. J.*, **54**, 503-513 (2022).

Vlădescu, S.-C.; Tadokoro, C.; Miyazaki, M.; Reddyhoff, T.; Nagamine, T.; Nakano, K.; Sasaki, S.; Tsujii, Y., Exploiting the Synergy between Concentrated Polymer Brushes and Laser Surface Texturing to Achieve Durable Superlubricity, *ACS Appl. Mater. Interfaces*, **14**(13), 15818-15829 (2022).

Tadokoro, C.; Kitafuji, D.; Nagamine, T.; Nakano, K.; Sasaki, S.; Sato, T.; Sakakibara, K.; Tsujii, Y., Concentrated Polymer Brush in Reciprocating Seal Improves Sealing Performance with Low Friction Even for Rough Surfaces and Immiscible Fluids, *Tribol. Lett.*, **70**, 106 (2022).

Safaie, N.; Smak, J.; DeJonge, D.; Cheng, S.; Zuo, X.; Ohno, K.; Ferrier, R. C., Facile Synthesis of Epoxide-Co-Propylene Sulfide Polymers with Compositional and Architectural Control, *Polym. Chem.*, **13**, 2803-2812 (2022).

Maguire, S. M.; Demaree, J. D.; Boyle, M. J.; Keller, A. W.; Bilchak, C. R.; Kagan, C. R.; Murray, C. B.; Ohno, K.; Composto, R. J., Surface Enrichment of Polymer-Grafted Nanoparticles in a Miscible Polymer Nanocomposite, *Macromolecules*, **55**(17), 7724-7731 (2022).

Bouad, V.; Ohno, K.; Addad, A.; Marin, A.; Donzel, N.; Barrau, S.; Lyskawa, J.; Ladmiral, V., Surface-Initiated Reversible Addition Fragmentation Chain Transfer of Fluoromonomers: An Efficient Tool to Improve Interfacial Adhesion in Piezoelectric Composites, *Polym. Chem.*, **13**, 6061-6072 (2022).

### — Polymer Controlled Synthesis —

Tosaka, M.; Maruyama, T., Material Transportation during Strain-Induced Crystallization of Vulcanized Natural Rubber Filled with Carbon Black, *Journal of the Society of Rubber Science and Technology, Japan*, **95**(7), 207-211 (2022).

Tosaka, M., Temperature Dependence of Rate of Strain-Induced Crystallization in Natural Rubber, *SPring-8/SACLA Research Report*, **10**(1), 16-19 (2022).

Tosaka, M., Thermodynamic Study on the Melting of Strain-Induced Crystals of Natural Rubber, *SPring-8/SACLA Research Report*, **10**(2), 153-156 (2022).

Rattanakawin, P.; Yoshimoto, K.; Hikima, Y.; Nagamine, S.; Jiang, Y.; Tosaka, M.; Yamago, S.; Ohshima, M., Control of the Cell Structure of UV-Induced Chemically Blown Nanocellular Foams by Self-Assembled Block Copolymer Morphology, *Macromolecules*, **55**(12), 5176-5187 (2022).

Yoshigoe, Y.; Tanji, Y.; Hata, Y.; Osakada, K.; Saito, S.; Kayahara, E.; Yamago, S.; Tsuchido, Y.; Kawai, H., Dynamic Au-C  $\sigma$ -Bonds Leading to an Efficient Synthesis of [*n*]Cycloparaphenylenes (*n* = 9-15) by Self-Assembly, *J. Am. Chem. Soc.*, **2**(8), 1857-1868 (2022).

Kojima, H.; Imamura, Y.; Lu, Y.; Yamago, S.; Koga, T., Experimental and Theoretical Studies on the Phase Behavior of Aqueous Solutions of Structurally Controlled Hyperbranched Poly(*N*-isopropylacrylamide)s, *Macromolecules*, **55**(17), 7932-7944 (2022).

Jiang, Y.; Fan, W.; Tosaka, M.; Yamago, S., Controlled Synthesis of High-Molecular-Weight Polystyrene and Its Block Copolymers by Emulsion Organotellurium-Mediated Radical Polymerization, *ACS Macro Lett.*, **11**, 1331-1335 (2022).

[Others]

Tosaka, M., Thermodynamic Study on the Melting of Strain-Induced Crystals of Natural Rubber, *Journal of the Society of Rubber Science and Technology, Japan*, **95**(9), 289-292 (2022).

### — Inorganic Photonics Materials —

Kawase, R.; Kawashima, H.; Kato, H.; Tokuda, N.; Yamasaki, S.; Ogura, M.; Makino, T.; Mizuochi, N., *n*-Type Diamond Synthesized with *tert*-Butylphosphine for Long Spin Coherence Times of Perfectly Aligned NV Centers, *J. Appl. Phys.*, **132**, 174504 (2022).

Nishikawa, T.; Morioka, N.; Abe, H.; Morishita, H.; Ohshima, T.; Mizuochi, N., Electrical Detection of Nuclear Spin via Silicon Vacancy in Silicon Carbide at Room Temperature, *Appl. Phys. Lett.*, **121**, 184005 (2022).

Terada, D.; So, F. T.; Hattendorf, B.; Yanagi, T.; Osawa, E.; Mizuochi, N.; Shirakawa, M.; Igarashi, R.; Segawa, T. F., A Simple and Soft Chemical Deaggregation Method Producing Single-Digit Detonation Nanodiamonds, *Nanoscale Adv.*, **4**, 2268-2277 (2022).

So, F. T.-K.; Shames, A. I.; Terada, D.; Genjo, T.; Morishita, H.; Ohki, I.; Ohshima, T.; Onoda, S.; Takashima, H.; Takeuchi, S.; Mizuochi, N.; Igarashi, R.; Shirakawa, M.; Segawa, T. F., Anomalous Formation of Irradiation-Induced Nitrogen-Vacancy Centers in 5 nm-Sized Detonation Nanodiamonds, *J. Phys. Chem. C*, **126**(11), 5206-5217 (2022).

Fujiwara, M.; Uchida, G.; Ohki, I.; Liu, M.; Tsurui, A.; Yoshikawa, T.; Nishikawa, M.; Mizuochi, N., All-Optical Nanoscale Thermometry Based on Silicon-Vacancy Centers in Detonation Nanodiamonds, *Carbon*, **198**(15), 57-62 (2022).

Mizuochi, N., Magnetometry Goes Nuclear, *Nat. Phys.*, **18**, 1280-1281 (2022).

Herbschleb, E. D.; Ohki, I.; Morita, K.; Yoshii, Y.; Kato, H.; Makino, T.; Yamasaki, S.; Mizuochi, N., Low-Frequency Quantum Sensing, *Phys. Rev. Appl.*, **18**(3), 034058 (2022).

Mahana, Y.; Ohki, I.; Walinda, E.; Morimoto, D.; Sugase, K.; Shirakawa, M., Structural Insights into Methylated DNA Recognition by the Methyl-CpG Binding Domain of MBD6 from *Arabidopsis thaliana*, *ACS Omega*, **7**(4), 3212-3221 (2022).

Babin, C.; Stöhr, R.; Morioka, N.; Linkewitz, T.; Steidl, T.; Wörnle, R.; Liu, D.; Hesselmeier, E.; Vorobyov, V.; Denisenko, A.; Hentschel, M.; Gobert, C.; Berwian, P.; Astakhov, G. V.; Knolle, W.; Majety, S.; Saha, P.; Radulaski, M.; Son, N. T.; Ul-Hassan, J.; Kaiser, F.; Wrachtrup, J., Fabrication and Nanophotonic Waveguide Integration of Silicon Carbide Colour Centres with Preserved Spin-Optical Coherence, *Nat. Mater.*, **21**, 67-73 (2022).

Morioka, N.; Liu, D.; Soykal, Ö. O.; Gediz, I.; Babin, C.; Stöhr, R.; Ohshima, T.; Son, N. T.; Ul-Hassan, J.; Kaiser, F.; Wrachtrup, J., Spin-Optical Dynamics and Quantum Efficiency of a Single V1 Center in Silicon Carbide, *Phys. Rev. Appl.*, **17**(5), 054005 (2022).

Takemura, Y.; Hayashi, K.; Yoshii, Y.; Saito, M.; Onoda, S.; Abe, H.; Ohshima, T.; Taniguchi, T.; Fujiwara, M.; Morishita, H.; Ohki, I.; Mizuochi, N., Broadband Microwave Antenna for Uniform Manipulation of Millimeter-Scale Volumes of Diamond Quantum Sensors, *J. Appl. Phys.*, **132**, 224501 (2022).

#### — Nanospintronics —

Seki, S.; Suzuki, M.; Ishibashi, M.; Takagi, R.; Khanh, N. D.; Shiota, Y.; Shibata, K.; Koshibae, W.; Tokura, Y.; Ono, T., Direct Visualization of the Three-Dimensional Shape of Skyrmion Strings in a Noncentrosymmetric Magnet, *Nat. Mater.*, **21**(2), 181-187 (2022).

Arakawa, T.; Shiota, Y.; Yamada, K.; Ono, T.; Kon, S., Magnetic Polarization Selective Spectroscopy of Magnetic Thin Films Probed by Wideband Crossed Microstrip Circuit in GHz Regime, *Rev. Sci. Instrum.*, **93**, 013901 (2022).

Kim, S. K.; Beach, G. S. D.; Lee, K.-J.; Ono, T.; Rasing, T.; Yang, H., Ferrimagnetic Spintronics, *Nat. Mater.*, **21**, 24-34 (2022).

Ikebuchi, T.; Shiota, Y.; Ono, T.; Nakamura, K.; Moriyama, T., Crystal Orientation Dependence of Spin Hall Angle in Epitaxial Pt/FeNi Systems, *Appl. Phys. Lett.*, **120**, 072406 (2022).

Kan, D.; Moriyama, T.; Aso, R.; Horai, S.; Shimakawa, Y., Triaxial Magnetic Anisotropy and Morin Transition in  $\alpha$ -Fe<sub>2</sub>O<sub>3</sub> epitaxial Films Characterized by Spin Hall Magnetoresistance, *Appl. Phys. Lett.*, **120**, 112403 (2022).

Narita, H.; Ishizuka, J.; Kawarazaki, R.; Kan, D.; Shiota, Y.; Moriyama, T.; Shimakawa, Y.; Ognev, A. V.; Samardak, A. S.; Yanase, Y.; Ono, T., Field-Free Superconducting Diode Effect in Noncentrosymmetric Superconductor/Ferromagnet Multilayers, *Nat. Nanotechnol.*, **17**, 823-828 (2022).

Shiota, Y.; Arakawa, T.; Hisatomi, R.; Moriyama, T.; Ono, T., Polarization-Selective Excitation of Antiferromagnetic Resonance in Perpendicularly Magnetized Synthetic Antiferromagnets, *Phys. Rev. Appl.*, **18**, 014032 (2022).

Kobayashi, Y.; Kimata, M.; Kan, D.; Ikebuchi, T.; Shiota, Y.; Kohno, H.; Shimakawa, Y.; Ono, T.; Moriyama, T., Extrinsic Contribution to Anomalous Hall Effect in Chiral Antiferromagnetic (111)-Oriented L1<sub>2</sub>-Mn<sub>3</sub>Ir Films, *Jpn. J. Appl. Phys.*, **61**(10), 070912 (2022).

Funada, S.; Kan, D.; Kuwano, K.; Shiota, Y.; Hisatomi, R.; Moriyama, T.; Shimakawa, Y.; Ono, T., Low Ferrimagnetic Damping in Gd<sub>3</sub>Fe<sub>5</sub>O<sub>12</sub> Epitaxial Films Grown Using Pulsed Laser Deposition, *Appl. Phys. Lett.*, **121**, 092402 (2022).

Mizuno, H.; Moriyama, T.; Tanaka, K.; Kawaguchi, M.; Koyama, T.; Chiba, D.; Ono, T., Electric Field Effect on Spectroscopic g-Factor and Magnetic Anisotropy in a Pt/Co/MgO Ultrathin Film, *Jpn. J. Appl. Phys.*, **61**, 103001 (2022).

Kawarazaki, R.; Narita, H.; Miyasaka, Y.; Ikeda, Y.; Hisatomi, R.; Daido, A.; Shiota, Y.; Moriyama, T.; Yanase, Y.; Ognev, A. V.; Samardak, A. S.; Ono, T., Magnetic-Field-Induced Polarity Oscillation of Superconducting Diode Effect, *Appl. Phys. Express*, **15**, 113001 (2022).

#### DIVISION OF BIOCHEMISTRY

##### — Biofunctional Design-Chemistry —

Okuda, A.; Futaki, S., Protein Delivery to Cytosol by Cell-Penetrating Peptide Bearing Tandem Repeat Penetration-Accelerating Sequence, *Methods Mol. Biol.*, **2383**, 265-273 (2022).

Nagano, Y.; Arafiles, J. V. V.; Kuwata, K.; Kawaguchi, Y.; Imanishi, M.; Hirose, H.; Futaki, S., Grafting Hydrophobic Amino Acids Critical for Inhibition of Protein-Protein Interactions on a Cell-Penetrating Peptide Scaffold, *Mol. Pharm.*, **19**(2), 558-567 (2022).

Yoshida, A.; Oyoshi, T.; Suda, A.; Futaki, S.; Imanishi, M., Recognition of G-Quadruplex RNA by a Crucial RNA Methyltransferase Component, METTL14, *Nucleic Acids Res.*, **50**(1), 449-457 (2022).

Sakamoto, K.; Furukawa, H.; Arafiles, J. V. V.; Imanishi, M.; Matsuura, K.; Futaki, S., Artificial Nanocage Formed via Self-Assembly of  $\beta$ -Annulus Peptide for Delivering Biofunctional Proteins into Cell Interiors, *Bioconjug. Chem.*, **33**, 311-320 (2022).

Yamagami, A.; Kiyotaki, K.; Wakabayashi, S.; Egami, N.; Kawano, K.; Futaki, S.; Imayoshi, A.; Tsubaki, K., Synthesis and Properties of V-Shaped Xanthene Dyes with Tunable and Predictable Absorption and Emission Wavelengths, *J. Org. Chem.*, **87**(5), 2336-2344 (2022).

Shinga, K.; Iwata, T.; Murata, K.; Daitoku, Y.; Michibata, J.; Arafiles, J. V. V.; Sakamoto, K.; Akishiba, M.; Takatani-Nakase, T.; Mizuno, S.; Sugiyama, F.; Imanishi, M.; Futaki, S., L17ER4: A Cell-Permeable Attenuated Cationic Amphiphilic Lytic Peptide, *Bioorg. Med. Chem.*, **61**(1), 116728 (2022).

Hirase, S.; Aoki, A.; Hattori, Y.; Morimoto, K.; Noguchi, K.; Fujii, I.; Takatani-Nakase, T.; Futaki, S.; Kirihata, M.; Nakase, I., Dodecaborate-Encapsulated Extracellular Vesicles with Modification of Cell-Penetrating Peptides for Enhancing Macropinocytotic Cellular Uptake and Biological Activity in Boron Neutron Capture Therapy, *Mol. Pharm.*, **19**(4), 1135-1145 (2022).

Kuriyama, M.; Hirose, H.; Masuda, T.; Shudou, M.; Arafiles, J. V.; Imanishi, M.; Maekawa, M.; Hara, Y.; Futaki, S., Piezo1 Activation Using Yoda1 Inhibits Macropinocytosis in A431 Human Epidermoid Carcinoma Cells, *Sci. Rep.*, **12**, 6322 (2022).

Nakagawa, Y.; Arafiles, J. V. V.; Kawaguchi, Y.; Nakase, I.; Hirose, H.; Futaki, S., Stearylated Macropinocytosis-Inducing Peptides Facilitating the Cellular Uptake of Small Extracellular Vesicles, *Bioconjug. Chem.*, **33**(5), 869-880 (2022).

Futaki, S., Peptide-Mediated Strategies for Intracellular Protein Delivery, *Aldrichimica Acta*, **55(1)**, 3-8 (2022).

Imanishi, M., Mechanisms and Strategies for Determining m<sup>6</sup>A RNA Modification Sites by Natural and Engineered m<sup>6</sup>A Effector Proteins, *Chem. Asian J.*, **17(16)**, e202200367 (2022).

Okano, S.; Kawaguchi, Y.; Kawano, K.; Hirose, H.; Imanishi, M.; Futaki, S., Split Luciferase-Based Estimation of Cytosolic Cargo Concentration Delivered Intracellularly via Attenuated Cationic Amphiphilic Lytic Peptides, *Bioorg. Med. Chem. Lett.*, **72**, 128875 (2022).

Negi, S.; Hamori, M.; Kawahara-Nakagawa, Y.; Imanishi, M.; Kurehara, M.; Kitada, C.; Kawahito, Y.; Kishi, K.; Manabe, T.; Kawamura, N.; Kitagishi, H.; Mashimo, M.; Shibata, N.; Sugiura, Y., Importance of Two-Dimensional Cation Clusters Induced by Protein Folding in Intrinsic Intracellular Membrane Permeability, *RSC Chem. Biol.*, **3**, 1076-1084 (2022).

Nomura, K.; Kawano, K.; Kawaguchi, Y.; Kawamura, Y.; Michibata, J.; Kuwata, K.; Sugiyama, K.; Kusumoto, K.; Futaki, S., Hemopexin as a Potential Binding Partner of Arginine-Rich Cell-Penetrating Peptides in Serum, *ACS Pharmacol. Transl. Sci.*, **5(8)**, 603-615 (2022).

Hirose, H.; Hirai, Y.; Sasaki, M.; Sawa, H.; Futaki, S., Quantitative Analysis of Extracellular Vesicle Uptake and Fusion with Recipient Cells, *Bioconjug. Chem.*, **33(10)**, 1852-1859 (2022).

Hirose, H.; Maekawa, M.; Ida, H.; Kuriyama, M.; Takahashi, Y.; Futaki, S., A Noncanonical Endocytic Pathway is Involved in the Internalization of 3  $\mu$ m Polystyrene Beads into HeLa Cells, *Biomater. Sci.*, **10(24)**, 7093-7102 (2022).

Nakase, I.; Miyai, M.; Noguchi, K.; Tamura, M.; Yamamoto, Y.; Nishimura, Y.; Omura, M.; Hayashi, K.; Futaki, S.; Tokonami, S.; Iida, T., Light-Induced Condensation of Biofunctional Molecules around Targeted Living Cells to Accelerate Cytosolic Delivery, *Nano Lett.*, **22(24)**, 9805-9814 (2022).

#### — Chemistry of Molecular Biocatalysts —

Kodama, K.; Rich, M. K.; Yoda, A.; Shimazaki, S.; Xie, X.; Akiyama, K.; Mizuno, Y.; Komatsu, A.; Luo, Y.; Suzuki, H.; Kameoka, H.; Libourel, C.; Keller, J.; Sakakibara, K.; Nishiyama, T.; Nakagawa, T.; Mashiguchi, K.; Uchida, K.; Yoneyama, K.; Tanaka, Y.; Yamaguchi, S.; Shimamura, M., An Ancestral Function of Strigolactones as Symbiotic Rhizosphere Signals, *Nat. Commun.*, **13**, 3974 (2022).

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 Carboxylate 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).

Akiyama, R.; Watanabe, B.; Kato, J.; Nakayasu, M.; Lee, H. J.; Umemoto, N.; Muranaka, T.; Saito, K.; Sugimoto, Y.; Mizutani, M., Tandem Gene Duplication of Dioxygenases Drives the Structural Diversity of Steroidal Glycoalkaloids in the Tomato Clade, *Plant Cell Physiol.*, **63(7)**, 981-990 (2022).

#### — Molecular Biology —

Watari, M.; Kato, M.; Blanc-Mathieu, R.; Tsuge, T.; Ogata, H.; Aoyama, T., Functional Differentiation among the *Arabidopsis* Phosphatidylinositol 4-Phosphate 5-Kinase Genes *PIP5K1*, *PIP5K2* and *PIP5K3*, *Plant Cell Physiol.*, **63(5)**, 635-648 (2022).

Zhang, X.; Nomoto, M.; Garcia-León, M.; Takahashi, N.; Kato, M.; Yura, K.; Umeda, M.; Rubio, V.; Tada, Y.; Furumoto, T.; Aoyama, T.; Tsuge, T., CFI 25 Subunit of Cleavage Factor I is Important for Maintaining the Diversity of 3' UTR Lengths in *Arabidopsis thaliana* (L.) Heynh., *Plant Cell Physiol.*, **63(3)**, 369-383 (2022).

#### — Chemical Biology —

Mendoza, A.; Takemoto, Y.; Cruzado, K. T.; Masoud, S. S.; Nagata, A.; Tantipanjaporn, A.; Okuda, S.; Kawagoe, F.; Sakamoto, R.; Odagi, M.; Mototani, S.; Togashi, M.; Kawatani, M.; Aono, H.; Osada, H.; Nakagawa, H.; Higashi, T.; Kittaka, A.; Nagasawa, K.; Uesugi, M., Controlled Lipid  $\beta$ -Oxidation and Carnitine Biosynthesis by a Vitamin D Metabolite, *Cell Chem. Biol.*, **29**, 660-669.e12 (2022).

Noda, N.; Jung, Y.; Ado, G.; Mizuhata, Y.; Higuchi, M.; Ogawa, T.; Ishidate, F.; Sato, S.-I.; Kurata, H.; Tokitoh, N.; Uesugi, M., Glucose as a Protein-Condensing Cellular Solute, *ACS Chem. Biol.*, **17(3)**, 567-575 (2022).

Ado, G.; Noda, N.; Vu, H. T.; Perron, A.; Mahapatra, A. D.; Arista, K. P.; Yoshimura, H.; Packwood, D. M.; Ishidate, F.; Sato, S.-I.; Ozawa, T.; Uesugi, M., Discovery of a Phase-Separating Small Molecule that Selectively Sequesters Tubulin in Cells, *Chem. Sci.*, **13**, 5760-5766 (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).

Katsuda, Y.; Sato, S.-I.; Inoue, M.; Tsugawa, H.; Kamura, T.; Kida, T.; Matsumoto, R.; Asamitsu, S.; Shioda, N.; Shioto, S.; Oosawatsu, Y.; Yatsuzuka, K.; Kitamura, Y.; Hagihara, M.; Ihara, T.; Uesugi, M., Small Molecule-Based Detection of Non-Canonical RNA G-Quadruplex Structures that Modulate Protein Translation, *Nucleic Acids Res.*, **50(14)**, 8143-8153 (2022).

Jung, Y.; Noda, N.; Takaya, J.; Abo, M.; Toh, K.; Tajiri, K.; Cui, C.; Zhou, L.; Sato, S.-I.; Uesugi, M., Discovery of Non-Cysteine-Targeting Covalent Inhibitors by Activity-Based Proteomic Screening with a Cysteine-Reactive Probe, *ACS Chem. Biol.*, **17(2)**, 340-347 (2022).

Toh, K.; Nishio, K.; Nakagawa, R.; Egoshi, S.; Abo, M.; Perron, A.; Sato, S.-I.; 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).

Jin, S.; Zhuo, S.-H.; Takemoto, Y.; Li, Y.-M.; Uesugi, M., Self-Assembling Small-Molecule Adjuvants as Antigen Nano-Carriers, *Chem. Commun.*, **58**, 12228-12231 (2022).

Kawamura, S.; Matsushita, Y.; Kurosaki, S.; Tange, M.; Fujiwara, N.; Hayata, Y.; Hayakawa, Y.; Suzuki, N.; Hata, M.; Tsuboi, M.; Kishikawa, T.; Kinoshita, H.; Nakatsuka, T.; Sato, M.; Kudo, Y.; Hoshida, Y.; Umemura, A.; Eguchi, A.; Ikenoue, T.; Hirata, Y.; Uesugi, M.; Tateishi, R.; Tateishi, K.; Fujishiro, M.; Koike, K.; Nakagawa, H., Inhibiting SCAP/SREBP Exacerbates Liver Injury and Carcinogenesis in Murine Nonalcoholic Steatohepatitis, *J. Clin. Invest.*, **132**, e151895 (2022).

Takada, K.; Hagiwara, Y.; Togashi, M.; Kittaka, A.; Kawagoe, F.; Uesugi, M.; Nishimoto-Kusunose, S.; Higashi, T., 23,25-Dihydroxyvitamin D<sub>3</sub> is Liberated as a Major Vitamin D<sub>3</sub> Metabolite in Human Urine after Treatment with  $\beta$ -Glucuronidase: Quantitative Comparison with 24,25-Dihydroxyvitamin D<sub>3</sub> by LC/MS/MS, *J. Steroid. Biochem. Mol. Biol.*, **223**, 106133 (2022).

## DIVISION OF ENVIRONMENTAL CHEMISTRY

### — Molecular Materials Chemistry —

Zhang, Y.; Murai, S.; Maeno, A.; Kaji, H.; Shimizu, M.; Shimotsuma, Y.; Ma, Z.; Qiu, J.; Tanaka, K., Microstructure and Faraday Effect of Tb<sub>2</sub>O<sub>3</sub>-Al<sub>2</sub>O<sub>3</sub>-SiO<sub>2</sub>-B<sub>2</sub>O<sub>3</sub> Glasses for Fiber-Based Magneto-Optical Applications, *J. Am. Ceram. Soc.*, **105**(2), 1198-1209 (2022).

Ghosh, S.; Tsutsui, Y.; Kawaguchi, T.; Matsuda, W.; Nagano, S.; Suzuki, K.; Kaji, H.; Seki, S., Band-Like Transport of Charge Carriers in Oriented Two-Dimensional Conjugated Covalent Organic Frameworks, *Chem. Mater.*, **34**(2), 736-745 (2022).

Kumar, S.; Koo, Y. H.; Higashino, T.; Matsuda, W.; Ghosh, S.; Tsutsui, Y.; Suda, M.; Imahori, H.; Suzuki, K.; Kaji, H.; Seki, S., Truxenone Triimide: Two-Dimensional Molecular Arrangements of Triangular Molecules for Air Stable n-Type Semiconductors, *Adv. Electron. Mater.*, **8**(7), 2101390 (2022).

Zhang, D.; Wada, Y.; Wang, Q.; Dai, H.; Fan, T.; Meng, G.; Wei, J.; Zhang, Y.; Suzuki, K.; Li, G.; Duan, L.; Kaji, H., Highly Efficient and Stable Blue Organic Light-Emitting Diodes based on Thermally Activated Delayed Fluorophor with Donor-Void-Acceptor Motif, *Adv. Sci.*, **9**(12), 2106018 (2022).

Shizu, K.; Kaji, H., Comprehensive Understanding of Multiple Resonance Thermally Activated Delayed Fluorescence through Quantum Chemistry Calculations, *Commun. Chem.*, **5**, 53 (2022).

Kusakabe, Y.; Wada, Y.; Misono, T.; Suzuki, K.; Shizu, K.; Kaji, H., Imidazole Acceptor for Both Vacuum-Processable and Solution-Processable Efficient Blue Thermally Activated Delayed Fluorescence, *ACS Omega*, **7**(19), 16740-16745 (2022).

Nagamura, N.; Sasabe, H.; Sato, H.; Kamata, T.; Ito, N.; Araki, S.; Abe, S.; Sukegawa, Y.; Yokoyama, D.; Kaji, H.; Kido, J., A Multifunctional Hole-Transporter for High-Performance TADF OLEDs and Clarification of Factors Governing the Transport Property by Multiscale Simulation, *J. Mater. Chem. A*, **10**, 8694-8701 (2022).

Ren, Y.; Nakagawa, H.; Suzuki, K.; Hu, W.; Kaji, H., Near-Infrared-Red-Orange Thermally Activated Delayed Fluorescence Emitters Using a Strong Tetracoordinated Difluoroboronated Acceptor, *Jpn. J. Appl. Phys.*, **61**, 81001 (2022).

Nagamura, N.; Sasabe, H.; Sato, H.; Ito, N.; Abe, S.; Sukegawa, Y.; Yokoyama, D.; Kaji, H.; Kido, J., Robust Spirobifluorene Core Based Hole Transporters with High Mobility for Long-Life Green Phosphorescent Organic Light-Emitting Devices, *Chem. Eur. J.*, e202202636 (2022).

### — Hydrospheric Environment Analytical Chemistry —

Sohrin, Y., Geochemical Study of Trace Metals in the Hydrosphere Based on Stoichiometry and Stable Isotope Ratios, *Chikyukagaku*, **56**, 21-28 (2022).

Nakaguchi, Y.; Sakamoto, A.; Asatani, T.; Minami, T.; Shitashima, K.; Zheng, L.; Sohrin, Y., Distribution and Stoichiometry of Al, Mn, Fe, Co, Ni, Cu, Zn, Cd, and Pb in the Seas of Japan and Okhotsk, *Mar. Chem.*, **241**, 104108 (2022).

Takano, S.; Liao, W.-H.; Ho, T.-Y.; Sohrin, Y., Isotopic Evolution of Dissolved Ni, Cu, and Zn along the Kuroshio through the East China Sea, *Mar. Chem.*, **243**, 104135 (2022).

Alam, M.; Tripti, M.; Gurumurthy, G. P.; Sohrin, Y.; Tsujisaka, M.; Singh, A. D.; Takano, S.; Verma, K., Palaeoredox Reconstruction in the Eastern Arabian Sea Since the Late Miocene: Insights from Trace Elements and Stable Isotopes of Molybdenum ( $\delta^{98/95}\text{Mo}$ ) and Tungsten ( $\delta^{186/184}\text{W}$ ) at IODP Site U1457 of Laxmi Basin, *Palaeogeogr. Palaeoclimatol. Palaeoecol.*, **587**, 110790 (2022).

Zheng, L.; Minami, T.; Takano, S.; Sohrin, Y., Distributions of Aluminum, Manganese, Cobalt, and Lead in the Western South Pacific: Interplay between the South and North Pacific, *Geochim. Cosmochim. Acta*, **338**, 105-120 (2022).

### — Chemistry for Functionalized Surfaces —

Shioya, N.; Yoshida, M.; Fujii, M.; Shimoaka, T.; Miura, R.; Maruyama, S.; Hasegawa, T., Conformational Change of Alkyl Chains at Phase Transitions in Thin Films of an Asymmetric Benzothienothiophene Derivative, *J. Phys. Chem. Lett.*, **13**, 11918-11924 (2022).

Shioya, N.; Fujii, M.; Shimoaka, T.; Eda, K.; Hasegawa, T., Stereoisomer-Dependent Conversion of Dinaphthothienothiophene Precursor Films, *Sci. Rep.*, **12**, 4448 (2022).

Shimoaka, T.; Fukumi, A.; Shioya, N.; Hasegawa, T., Perfluoroalkanes Remain on Water Surface even after Volatilization: Affinity Analysis of Fluorinated Solvent with Water Surface, *J. Colloid Interface Sci.*, **611**, 390-396 (2022).

Tomita, K.; Shioya, N.; Shimoaka, T.; Wakioka, M.; Hasegawa, T., Control of Supramolecular Organizations by Coordination Bonding in Tetrapyrrolylporphyrin Thin Films, *Chem. Commun.*, **58**, 2116-2119 (2022).

Hasegawa, T., Celebrate the Renewal of *Analytical Sciences*, *Anal. Sci.*, **38**, 9 (2022).

Shimoaka, T., Chemometric Analysis of Mixtures in Molecular Aggregated Systems, *Anal. Sci.*, **38**, 919-920 (2022).

Wang, C.; Zhou, Y.; Ewuola, C.; Akinleye, T.; Hasegawa, T.; Leblanc, R. M., Determine Both the Conformation and Orientation of a Specific Residue in  $\alpha$ -Synuclein(61-95) even in Monolayer by <sup>13</sup>C Isotopic Label and p-Polarized Multiple-Angle Incidence Resolution Spectrometry (pMAIRS), *Anal. Sci.*, **38**, 935-940 (2022).

— Molecular Microbial Science —

Di Guida, R.; Casillo, A.; Stellavato, A.; Kawai, S.; Ogawa, T.; Di Meo, C.; Kawamoto, J.; Kurihara, T.; Schiraldi, C.; Corsaro, M. M., Capsular Polysaccharide from a Fish-Gut Bacterium Induces/Promotes Apoptosis of Colon Cancer Cells *in vitro* through Caspases' Pathway Activation, *Carbohydr. Polym.*, **278**, 118908 (2022).

Casillo, A.; Di Guida, R.; Cavasso, D.; Stellavato, A.; Rai, D.; Yokoyama, F.; Kamasaka, K.; Kawamoto, J.; Kurihara, T.; Schiraldi, C.; Kulkarni, S.; Paduano, L.; Corsaro, M. M., Polysaccharide Corona: The Acetyl-Rich Envelope Wraps the Extracellular Membrane Vesicles and the Cells of *Shewanella vesiculosa* Providing Adhesiveness, *Carbohydr. Polym.*, **297**, 120036 (2022).

Kawamoto, J.; Kurihara, T., Membrane Vesicles Produced by *Shewanella vesiculosa* HM13 as a Prospective Platform for Secretory Production of Heterologous Proteins at Low Temperatures, *Methods Mol. Biol.*, **2414**, 191-205 (2022).

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).

Imai, T.; Tobe, R.; Honda, K.; Tanaka, M.; Kawamoto, J.; Mihara, H., Group II Truncated Haemoglobin Yjbl Prevents Reactive Oxygen Species-Induced Protein Aggregation in *Bacillus subtilis*, *eLife*, **11**, e70467 (2022).

DIVISION OF MULTIDISCIPLINARY CHEMISTRY

— Polymer Materials Science —

Lazim, N. H.; Hidzir, N. M.; Hamzah, N. S.; Mikihiro, T.; Shamsudin, S. A., The Effects of the Cross-Linking Mechanism of Low Doses of Gamma Irradiation on the Mechanical, Thermal, and Viscoelastic Properties of the Natural Rubber Latex/poly(styrene-*block*-isoprene-*block*-styrene) Block Copolymer Blend, *Polym. Eng. Sci.*, **62(1)**, 185-200 (2022).

Arakawa, M.; Kishimoto, M.; Nakanishi, Y.; Mita, K.; Takenaka, M., Spatial Inhomogeneity of Chain Orientation Associated with Strain-Induced Density Fluctuations in Polyethylene, *Polym. J.*, **54**, 243-248 (2022).

Nakanishi, Y.; Uchida, K.; Mita, K.; Kamitani, K.; Kojio, K.; Takahara, A., Morphological Study of Isotactic Polypropylene Thin Films on Different Substrates Using Grazing Incidence Wide-Angle X-Ray Diffraction, *Polymer*, **245**, 124665 (2022).

Ogawa, H., Measurement and Analysis of Nanostructures in Polymer Thin Films by GISAXS Method, *Journal of Fiber Science and Technology*, **78(4)**, 176-180 (2022).

Takenaka, M., Special Issue on Studies by the Members of Advanced Fiber Materials Research Committee, *Journal of Fiber Science and Technology*, **78(4)**, P150-P151 (2022).

Ogawa, H.; Aoki, M.; Ono, S.; Watanabe, Y.; Yamamoto, S.; Tanaka, K.; Takenaka, M., Spatial Distribution of the Network Structure in Epoxy Resin via the MAXS-CT Method, *Langmuir*, **38(37)**, 11432-11439 (2022).

Jeon, J.; Doi, K.; Kim, H. D.; Ogawa, H.; Takenaka, M.; Ohkita, H., Correlating the Structures and Photovoltaic Properties in Phase-Separated Blends of Conjugated Donor Polymers and Acceptors, *Polym. J.*, **1**, 1-11 (2022).

Shimokita, K.; Yamamoto, K.; Miyata, N.; Arima-Osonoi, H.; Nakanishi, Y.; Takenaka, M.; Shibata, M.; Yamada, N. L.; Seto, H.; Aoki, H.; Miyazaki, T., Neutron Reflectivity Study on the Suppression of Interfacial Water Accumulation between a Polypropylene Thin Film and Si Substrate Using a Silane-Coupling Agent, *Langmuir*, **38(41)**, 12457-12465 (2022).

Imai, S.; Arakawa, M.; Nakanishi, Y.; Takenaka, M.; Aoki, H.; Ouchi, M.; Terashima, T., Water-Assisted Microphase Separation of Cationic Random Copolymers into Sub-5 nm Lamellar Materials and Thin Films, *Macromolecules*, **55(20)**, 9113-9125 (2022).

Kishimoto, M.; Takenaka, M.; Iwabuki, H., Spatial Distribution of the Amorphous Region Constrained by Polymer Crystallites, *Macromolecules*, **56**, 207-214 (2022).

— Molecular Rheology —

Sato, T., Modeling Techniques for the Rheology of Wormlike Micellar Solutions, *Nihon Reoroji Gakkaishi*, **50(1)**, 9-13 (2022).

Sato, T.; Larson, R. G., Nonlinear Rheology of Entangled Wormlike Micellar Solutions Predicted by a Micelle-Slip-Spring Model, *J. Rheol.*, **66**, 639-656 (2022).

Sato, T.; Matsumiya, Y.; Watanabe, H., Rheo-Dielectrics and Diffusion of Type-A Rouse Chain under Fast Shear Flow: Method of Evaluation of Non-Equilibrium Parameters for FENE, Friction-Reduction, and Brownian Force Intensity Variation, *Nihon Reoroji Gakkaishi*, **50(2)**, 253-268 (2022).

Sato, T.; Matsumiya, Y.; Watanabe, H., Experimental Study of Phase Separation in Dynamically Asymmetric Unentangled Polymer Blend, *J. Chem. Phys.*, **157**, 224908 (2022).

Wu, S.; Cao, X.; Zhang, Z.; Chen, Q.; Matsumiya, Y.; Watanabe, H., Molecular Design of Highly Stretchable Ionomers, *Macromolecules*, **55(19)**, 8972-8973 (2022).

Matsumiya, Y.; Sato, T.; Chen, Q.; Watanabe, H., Rheo-Dielectric Behavior of Unentangled Poly(butylene Oxide): Preliminary Evaluation of Non-Equilibrium Parameters at the Onset of Nonlinearity, *Nihon Reoroji Gakkaishi (Journal of the Society of Rheology, Japan)*, **50(5)**, 371-385 (2022).

[Others]

Watanabe, H.; Hassager, O.; Matsumiya, Y.; Huang, Q., Extensional Rheology of Unentangled Linear Polymer Melts, *Recent Advances in Rheology*, pp. 1-1-1-40 (2022).

— Molecular Aggregation Analysis —

Jegorovè, A.; Truong, M. A.; Murdey, R.; Daskeviciene, M.; Malinauskas, T.; Kantminiene, K.; Jankauskas, V.; Getautis, V.; Wakamiya, A., Starburst Carbazole Derivatives as Efficient Hole Transporting Materials for Perovskite Solar Cells, *Sol. RRL*, **6(1)**, 2100877 (2022).

Kajino, Y.; Otake, S.; Yamada, T.; Kojima, K.; Nakamura, T.; Wakamiya, A.; Kanemitsu, Y.; Yamada, Y., Anti-Stokes Photoluminescence from CsPbBr<sub>3</sub> Nanostructures Embedded in a Cs<sub>4</sub>PbBr<sub>6</sub> Crystal, *Phys. Rev. Mater.*, **6**, L043001 (2022).

Hu, S.; Otsuka, K.; Murdey, R.; Nakamura, T.; Truong, M. A.; Yamada, T.; Handa, T.; Matsuda, K.; Nakano, K.; Sato, A.; Marumoto, K.; Tajima, K.; Kanemitsu, Y.; Wakamiya, A., Optimized Carrier Extraction at Interfaces for 23.6% Efficient Tin-Lead Perovskite Solar Cells, *Energy Environ. Sci.*, **15**, 2096-2107 (2022).

Nakanishi, E.; Nishikubo, R.; Ishiwari, F.; Nakamura, T.; Wakamiya, A.; Saeki, A., Multivariate Analysis of Mixed Ternary and Quaternary A-Site Organic Cations in Tin Iodide Perovskite Solar Cells, *ACS Mater. Lett.*, **4**(6), 1124-1131 (2022).

Ohdaira, K.; Thi Cam Tu, H.; Shimazaki, A.; Kaneko, R.; Sumai, Y.; Shahiduzzaman, M.; Taima, T.; Wakamiya, A., Carrier Lifetime Measurement of Perovskite Films by Differential Microwave Photoconductivity Decay, *Jpn. J. Appl. Phys.*, **61**, 068001 (2022).

Handa, T.; Hashimoto, R.; Yumoto, G.; Nakamura, T.; Wakamiya, A.; Kanemitsu, Y., Metal-Free Ferroelectric Halide Perovskite Exhibits Visible Photoluminescence Correlated with Local Ferroelectricity, *Sci. Adv.*, **8**(25), eab01621 (2022).

Murdey, R.; Ishikura, Y.; Matsushige, Y.; Hu, S.; Pascual, J.; Truong, M. A.; Nakamura, T.; Wakamiya, A., Operational Stability, Low Light Performance, and Long-Lived Transients in Mixed-Halide Perovskite Solar Cells with a Monolayer-Based Hole Extraction Layer, *Sol. Energy Mater. Sol. Cells*, **245**(15), 111885 (2022).

Yumoto, G.; Sekiguchi, F.; Hashimoto, R.; Nakamura, T.; Wakamiya, A.; Kanemitsu, Y., Rapidly Expanding Spin-Polarized Exciton Halo in a Two-Dimensional Halide Perovskite at Room Temperature, *Sci. Adv.*, **8**(30), eabp8135 (2022).

Vaitukaityte, D.; Truong, M. A.; Rakstys, K.; Murdey, R.; Funasaki, T.; Yamada, T.; Kanemitsu, Y.; Jankauskas, V.; Getautis, V.; Wakamiya, A., Molecular Engineering of Enamine-Based Hole-Transporting Materials for High-Performing Perovskite Solar Cells: Influence of the Central Heteroatom, *Sol. RRL*, **6**(11), 2200590 (2022).

Wakamiya, A.; Hu, S.; Nakamura, T.; Handa, T.; Yamada, T.; Truong, M. A.; Murdey, R.; Kanemitsu, Y., Materials to Improve the Performance of Sn-Based Perovskite Solar Cells, *The 29th International Workshop on Active-Matrix Flatpanel Displays and Devices (AM-FPD22)*, 10-11 (2022).

Liu, M.; Abodya, M.; Dai, W.; Kawawaki, T.; Shimazaki, A.; Sato, R.; Saruyama, M.; Teranishi, T.; Wakamiya, A.; Tachibana, Y., Photo-Induced Charge Carrier Dynamics of Metal Halide Perovskite, *The 29th International Workshop on Active-Matrix Flatpanel Displays and Devices (AM-FPD22)*, 13-16 (2022).

Nakamura, T.; Otsuka, K.; Hu, S.; Hashimoto, R.; Morishita, T.; Handa, T.; Yamada, T.; Truong, M. A.; Murdey, R.; Kanemitsu, Y.; Wakamiya, A., Composition-Property Mapping in Bromide-Containing Tin Perovskite Using High-Purity Starting Materials, *ACS Appl. Energy Mater.*, **5**, 14789-14798 (2022).

Hu, S.; Pascual, J.; Liu, W.; Funasaki, T.; Truong, M. A.; Hira, S.; Hashimoto, R.; Morishita, T.; Nakano, K.; Tajima, K.; Murdey, R.; Nakamura, T.; Wakamiya, A., A Universal Surface Treatment for p-i-n Perovskite Solar Cells, *ACS Appl. Mater. Interfaces*, **14**, 56290-56297 (2022).

## ADVANCED RESEARCH CENTER FOR BEAM SCIENCE — Particle Beam Science —

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).

Kawamura, I.; Kawamoto, H.; Kimura, H.; Komiya, H.; Fujimoto, Y.; Koshimizu, M.; Okada, G.; Koba, Y.; Ogawara, R.; Suda, M.; Wakabayashi, G.; Yanagida, T.; Asai, K., Neutron Detection via Thermoluminescence of Ce<sup>3+</sup>-Doped CaO–Al<sub>2</sub>O<sub>3</sub>–B<sub>2</sub>O<sub>3</sub> Glass, *Mater. Technol.*, **37**, 2063-2072 (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).

## — Laser Matter Interaction Science —

Sakabe, S.; Hashida, M.; Inoue, S., Generation of Intense Short Electron Pulses Using High-Intensity Lasers, *IEEE Transactions on Electrical and Electronic Engineering*, **17**(1), 6-12 (2022).

Goya, K.; Koyama, Y.; Nishijima, Y.; Tokita, S.; Yasuhara, R.; Uehara, H., A Fluoride Fiber Optics In-Line Sensor for Mid-IR Spectroscopy Based on a Side-Polished Structure, *Sens. Actuators. B Chem.*, **351**, 130904 (2022).

Ogawa, I.; Kawashima, Y.; Hiraiwa, T.; Tozawa, M.; Niki, H.; Tokita, S.; Han, B.; Okuda, H.; Miyanaga, N.; Umehara, S.; Masuoka, K.; Yoshida, S., Development of the Laser Isotope Separation Method to Study for the Neutrino-Less Double Beta Decay of <sup>48</sup>Ca, *J. Phys. Conf. Ser.*, **2147**, 12012 (2022).

Takenaka, K.; Hashida, M.; Furukawa, Y.; Sato, Y.; Tsukamoto, M., Suppressed Ablation Rate of Titanium Surface by Two-Color Double Pulse Femtosecond Laser, *Laser Applications in Microelectronic and Optoelectronic Manufacturing (LAMOM) XXVII*, **11988** (2022).

Morace, A.; Abe, Y.; Honrubia, J. J.; Iwata, N.; Arikawa, Y.; Nakata, Y.; Johzaki, T.; Yogo, A.; Sentoku, Y.; Mima, K.; Ma, T.; Mariscal, D.; Sakagami, H.; Norimatsu, T.; Tsubakimoto, K.; Kawanaka, J.; Tokita, S.; Miyanaga, N.; Shiraga, H.; Sakawa, Y.; Nakai, M.; Azechi, H.; Fujioka, S.; Kodama, R., Super-Strong Magnetic Field-Dominated Ion Beam Dynamics in Focusing Plasma Devices, *Sci. Rep.*, **12**, 6876 (2022).

Takenaka, K.; Hashida, M.; Sakagami, H.; Masuno, S.-I.; Kusaba, M.; Yamaguchi, S.; Iwamori, S.; Sato, Y.; Tsukamoto, M., Uniformity Evaluation of Laser-Induced Periodic Surface Structures Formed by Two-Color Double-Pulse Femtosecond Laser Irradiation, *Rev. Sci. Instrum.*, **93**, 093001 (2022).



Yokoyama, N.; Morioka, Y.; Murata, T.; Honda, H.; Serita, K.; Murakami, H.; Tonouchi, M.; Tokita, S.; Ichikawa, S.; Fujiwara, Y.; Hikosaka, T.; Uemukai, M.; Tanikawa, T.; Katayama, R., Second Harmonic Generation in GaN Transverse Quasi-Phase-Matched Waveguide Pumped with Femtosecond Laser, *Appl. Phys. Express*, **15**, 112002 (2022).

Ogino, J.; Tokita, S.; Kitajima, S.; Yoshida, H.; Li, Z.; Motokoshi, S.; Morio, N.; Tsubakimoto, K.; Fujioka, K.; Kodama, R.; Kawanaka, J., A 10-J, 100-Hz Conduction-Cooled Active-Mirror Laser, *Opt. Contin.*, **1(5)**, 1270 (2022).

Sekine, T.; Kurita, T.; Hatano, Y.; Muramatsu, Y.; Kurata, M.; Morita, T.; Watari, T.; Iguchi, T.; Yoshimura, R.; Tamaoki, Y.; Takeuchi, Y.; Kawai, K.; Zheng, Y.; Kato, Y.; Kurita, N.; Kawashima, T.; Tokita, S.; Kawanaka, J.; Kodama, R., 253 J at 0.2 Hz, LD Pumped Cryogenic Helium Gas Cooled Yb:YAG Ceramics Laser, *Opt. Express*, **30(25)**, 44385-44394 (2022).

Miyagawa, R.; Kamibayashi, D.; Nakamura, H.; Hashida, M.; Zen, H.; Somekawa, T.; Matsuoka, T.; Ogura, H.; Sagae, D.; Seto, Y.; Shobu, T.; Tominaga, A.; Eryu, O.; Ozaki, N., Crystallinity in Periodic Nanostructure Surface on Si Substrates Induced by Near- and Mid-Infrared Femtosecond Laser Irradiation, *Sci. Rep.*, **12**, 20955 (2022).

Kirita, Y.; Hasada, T.; Hashida, M.; Hirahara, Y.; Homma, K.; Inoue, S.; Ishibashi, F.; Nakamiya, Y.; Neagu, L.; Nobuhiro, A.; Ozaki, T.; Rosu, M.-M.; Sakabe, S.; Tesileanu, O., Search for Sub-eV Axion-like Particles in a Stimulated Resonant Photon-Photon Collider with Two Laser Beams Based on a Novel Method to Discriminate Pressure-Independent Components, *J. High Energy Phys.*, **2022**, 176 (2022).

#### — Electron Microscopy and Crystal Chemistry —

Noda, N.; Jung, Y.; Ado, G.; Mizuhata, Y.; Higuchi, M.; Ogawa, T.; Ishidate, F.; Sato, S.-I.; Kurata, H.; Tokitoh, N.; Uesugi, M., Glucose as a Protein-Condensing Cellular Solute, *ACS Chem. Biol.*, **17(3)**, 567-575 (2022).

Matsumoto, K.; Sato, R.; Tatetsu, Y.; Takahata, R.; Yamazoe, S.; Yamauchi, M.; Inagaki, Y.; Horibe, Y.; Kudo, M.; Toriyama, T.; Auchi, M.; Haruta, M.; Kurata, H.; Teranishi, T., Inter-Element Miscibility Driven Stabilization of Ordered Pseudo-Binary Alloy, *Nat. Commun.*, **13**, 1047 (2022).

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 (2022).

Ratsameetammajak, N.; Autthawong, T.; Chairuang Sri, T.; Kurata, H.; Yu, A.-S.; Sarakonsri, T., Rice Husk-Derived Nano-SiO<sub>2</sub> Assembled on Reduced Graphene Oxide Distributed on Conductive Flexible Polyaniline Frameworks towards High-Performance Lithium-Ion Batteries, *RSC Adv.*, **12**, 14621-14630 (2022).

#### INTERNATIONAL RESEARCH CENTER FOR ELEMENTS SCIENCE

##### — Synthetic Organotransformation —

Ueda, M.; Kimura, M.; Miyagawa, S.; Naito, M.; Takaya, H.; Tokunaga, Y., Four- and Two-Armed Hetero Porphyrin Dimers: Their Specific Recognition and Self-Sorting Behaviours, *Org. Biomol. Chem.*, **20(2)**, 387-395 (2022).

Negi, S.; Hamori, M.; Kawahara-Nakagawa, Y.; Imanishi, M.; Kurehara, M.; Kitada, C.; Kawahito, Y.; Kishi, K.; Manabe, T.; Kawamura, N.; Kitagishi, H.; Mashimo, M.; Shibata, N.; Sugiura, Y., Importance of Two-Dimensional Cation Clusters Induced by Protein Folding in Intrinsic Intracellular Membrane Permeability, *RSC Chem. Biol.*, **3(8)**, 1076-1084 (2022).

[Others]

Negi, S.; Hamori, M.; Hashimoto, R.; Nakagawa-Kawahara, Y.; Kitagishi, H.; Sugiura, Y., Involvement of Trace Metals in the Reduction of Disulfide Bonds by Glutathione, *The Harris Science Review of Doshisha University*, **63**, 1 (2022).

##### — Advanced Solid State Chemistry —

Guo, H.; Patino, M. A.; Ichikawa, N.; Saito, T.; Watanabe, R.; Goto, M.; Yang, M.; Kan, D.; Shimakawa, Y., Oxygen Release and Incorporation Behaviors Influenced by A-Site Cation Order/Disorder in LaCa<sub>2</sub>Fe<sub>3</sub>O<sub>9</sub> with Unusually High Valence Fe<sup>3.67+</sup>, *Chem. Mater.*, **34(1)**, 345-350 (2022).

Isoda, Y.; Kan, D.; Ogura, Y.; Majima, T.; Tsuchiya, T.; Shimakawa, Y., Electrochemical Control and Protonation of the Strontium Iron Oxide SrFeOy<sub>b</sub> Using Proton-Conducting Electrolyte, *Appl. Phys. Lett.*, **120(9)**, 91601 (2022).

Takegami, D.; Kuo, C.-Y.; Kasebayashi, K.; Kim, J.-G.; Chang, C. F.; Liu, C. E.; Wu, C. N.; Kasinathan, D.; Altendorf, S. G.; Hofer, K.; Meneghin, F.; Marino, A.; Liao, Y. F.; Tsuei, K. D.; Chen, C. T.; Ko, K.-T.; Günther, A.; Ebbinghaus, S. G.; Seo, J. W.; Lee, D. H.; Ryu, G.; Komarek, A. C.; Sugano, S.; Shimakawa, Y.; Tanaka, A.; Mizokawa, T.; Kuneš, J.; Tjeng, L. H.; Hariki, A., CaCu<sub>3</sub>Ru<sub>4</sub>O<sub>12</sub>: A High-Kondo-Temperature Transition-Metal Oxide, *Phys. Rev. X*, **12(1)**, 11017 (2022).

Kan, D.; Moriyama, T.; Aso, R.; Horai, S.; Shimakawa, Y., Triaxial Magnetic Anisotropy and Morin Transition in  $\alpha$ -Fe<sub>2</sub>O<sub>3</sub> Epitaxial Films Characterized by Spin Hall Magnetoresistance, *Appl. Phys. Lett.*, **120(11)**, 112403 (2022).

Shimakawa, Y.; Goto, M.; Patino, M. A., Topotactic Oxygen Release and Incorporation in A FeO<sub>3</sub> with Fe<sup>4+</sup>, AFeO<sub>2.5</sub> with Fe<sup>3+</sup>, and AFeO<sub>2</sub> with Fe<sup>2+</sup> (A = Ca and Sr): Dedicated to the Occasion of the 100th Birthday of Prof. John B. Goodenough, *ECS J. Solid State Sci. Technol.*, **11**, 43004 (2022).

Tan, Z.; Lussier, J. A.; Yamada, T.; Xu, Y.; Saito, T.; Goto, M.; Kosugi, Y.; Vrublevskiy, D.; Kanemitsu, Y.; Bieringer, M.; Shimakawa, Y., LiNbO<sub>3</sub>-Type Polar Antiferromagnet InVO<sub>3</sub> Synthesized under High-Pressure Conditions, *Angew. Chem. Int. Ed.*, **61(25)**, e202203669 (2022).

Ji, K.; Solana-Madruga, E.; Patino, M. A.; Shimakawa, Y.; Atfield, J. P., A New Cation-Ordered Structure Type with Multiple Thermal Redistributions in Co<sub>2</sub>InSbO<sub>6</sub>, *Angew. Chem. Int. Ed.*, **61(27)**, e202203062 (2022).

Wada, T.; Namiki, W.; Tsuchiya, T.; Kan, D.; Shimakawa, Y.; Higuchi, T.; Terabe, K., In Situ Manipulation of Perpendicular Magnetic Anisotropy in Half-Metallic NiCo<sub>2</sub>O<sub>4</sub> Thin Film by Proton Insertion, *Jpn. J. Appl. Phys.*, **61**, SM1002 (2022).

Kan, D.; Shiraki, H.; Horai, S.; Shimakawa, Y., Film Growth Mechanism of Mist-Chemical-Vapor-Deposited Magnetite, *Jpn. J. Appl. Phys.*, **61**, 65505 (2022).

Narita, H.; Ishizuka, J.; Kawarazaki, R.; Kan, D.; Shiota, Y.; Moriyama, T.; Shimakawa, Y.; Ognev, A. V.; Samardak, A. S.; Yanase, Y.; Ono, T., Field-Free Superconducting Diode Effect in Noncentrosymmetric Superconductor/Ferromagnet Multilayers, *Nat. Nanotechnol.*, **17**, 823-828 (2022).

Kobayashi, Y.; Kimata, M.; Kan, D.; Ikebuchi, T.; Shiota, Y.; Kohno, H.; Shimakawa, Y.; Ono, T.; Moriyama, T., Extrinsic Contribution to Anomalous Hall Effect in Chiral Antiferromagnetic (111)-Oriented  $L_{1-2}Mn_3Ir$  Films, *Jpn. J. Appl. Phys.*, **61**, 70912 (2022).

Amano Patino, M.; Denis Romero, F.; Koo, H.-J.; Avdeev, M.; Injac, S. D. A.; Goto, M.; Whangbo, M.-H.; Shimakawa, Y., Orthogonal Antiferromagnetism to Canted Ferromagnetism in  $CaCo_3Ti_4O_{12}$  Quadruple Perovskite Driven by Underlying Kagome Lattices, *Commun. Mater.*, **3**, 51 (2022).

Funada, S.; Kan, D.; Kuwano, K.; Shiota, Y.; Hisatomi, R.; Moriyama, T.; Shimakawa, Y.; Ono, T., Low Ferrimagnetic Damping in  $Gd_3Fe_5O_{12}$  Epitaxial Films Grown Using Pulsed Laser Deposition, *Appl. Phys. Lett.*, **121**, 92402 (2022).

Goto, M.; Okazaki, M.; Shimakawa, Y., Charge Transfer between Fe and Ti Induced by  $Ln$  Substitution and Temperature in the  $B$ -Site-Disordered Perovskites  $Ln_2(FeTi)O_6$  ( $Ln = La, Pr, \text{ and } Nd$ ), *Bull. Chem. Soc. Jpn.*, **95**, 1011-1015 (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**, 16720-16725 (2022).

Fukuma, R.; Harada, M.; Zhao, W.; Sawamura, M.; Noda, Y.; Nakayama, M.; Goto, M.; Kan, D.; Shimakawa, Y.; Yonemura, M.; Ikeda, N.; Watanuki, R.; Andersen, H. L.; D'Angelo, A. M.; Sharma, N.; Park, J.; Byon, H. R.; Fukuyama, S.; Han, Z.; Fukumitsu, H.; Schulz-Dobrick, M.; Yamanaka, K.; Yamagishi, H.; Ohta, T.; Yabuuchi, N., Unexpectedly Large Contribution of Oxygen to Charge Compensation Triggered by Structural Disorder: Detailed Experimental and Theoretical Study on a  $Li_3NbO_4$ - $NiO$  Binary System, *ACS Cent. Sci.*, **8(6)**, 775-794 (2022).

Xu, Y.; Tan, Z.; Chen, W.-T.; Chang, C.-K.; Chuang, Y.-C.; Goto, M.; Shimakawa, Y., High-Pressure Synthesized Perovskite  $CdMnO_3$  with C-Type Antiferromagnetic Spin Configuration, *Inorg. Chem.*, **61(51)**, 21011-21015 (2022).

#### — Organometallic Chemistry —

Lee, C. C.; Kang, W.; Jasniowski, A. J.; Stiebritz, M. T.; Tanifuji, K.; Ribbe, M. W.; Hu, Y., Evidence of Substrate Binding and Product Release via Belt-Sulfur Mobilization of the Nitrogenase Cofactor, *Nat. Catal.*, **5**, 443-454 (2022).

Tanifuji, K.; Sakai, Y.; Matsuoka, Y.; Tada, M.; Sameera, W. M. C.; Ohki, Y., CO Binding onto Heterometals of  $[Mo_3S_4M]$  ( $M = Fe, Co, Ni$ ) Cubes, *Bull. Chem. Soc. Jpn.*, **95(8)**, 1190-1195 (2022).

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).

Solomon, J. B.; Tanifuji, K.; Lee, C. C.; Jasniowski, A. J.; Hedman, B.; Hodgson, K. O.; Hu, Y.; Ribbe, M. W., Characterization of a Nitrogenase Iron Protein Substituted with a Synthetic  $[Fe_4Se_4]$  Cluster, *Angew. Chem. Int. Ed.*, **61**, e202202271 (2022).

Tanifuji, K.; Jasniowski, A. J.; Lee, C. C.; Solomon, J. B.; Nagasawa, T.; Ohki, Y.; Tatsumi, K.; Hedman, B.; Hodgson, K. O.; Hu, Y.; Ribbe, M. W., Incorporation of an Asymmetric Mo-Fe-S Cluster as an Artificial Cofactor into Nitrogenase, *ChemBioChem*, **23**, e202200384 (2022).

Tanifuji, K.; Ohki, Y.; Seino, H., Metal-Sulfur Clusters with Relevance to Organometallic Chemistry for Small Molecule Activation and Transformation, *Yuki Gosei Kagaku Kyokaiishi*, **80**, 854-867 (2022).

Masaoka, K.; Ohkubo, M.; Taue, H.; Wakioka, M.; Ohki, Y.; Ogasawara, M., Synthesis of Monophosphaferrocenes Revisited, *ChemistrySelect*, **7**, e202104472 (2022).

Nishimoto, K.; Taue, H.; Ohji, T.; Funakoshi, S.; Ohki, Y.; Ogasawara, M., Diastereo- and Enantioselective Metathesis Dimerization/Kinetic Resolution of Racemic Planar-Chiral Vinylferrocenes, *Org. Lett.*, **24**, 7355-7360 (2022).

Sameera, W. M. C.; Takeda, Y.; Ohki, Y., Transition Metal Catalyzed Cross-Coupling and Nitrogen Reduction Reactions: Lessons from Computational Studies, *Adv. Organomet. Chem.*, **78**, 35-78 (2022).

#### — Nanophotonics —

Tan, Z.; Lussier, J. A.; Yamada, T.; Xu, Y.; Saito, T.; Goto, M.; Kosugi, Y.; Vrublevskiy, D.; Kanemitsu, Y.; Bieringer, M.; Shimakawa, Y.,  $LiNbO_3$ -Type Polar Antiferromagnet  $INVO_3$  Synthesized under High-Pressure Conditions, *Angew. Chem. Int. Ed.*, **61(25)**, e202203669 (2022).

Kajino, Y.; Otake, S.; Yamada, T.; Kojima, K.; Nakamura, T.; Wakamiya, A.; Kanemitsu, Y.; Yamada, Y., Anti-Stokes Photoluminescence from  $CsPbBr_3$  Nanostructures Embedded in a  $Cs_4PbBr_6$  Crystal, *Phys. Rev. Mater.*, **6(4)**, L043001 (2022).

Hu, S.; Otsuka, K.; Murdey, R.; Nakamura, T.; Truong, M. A.; Yamada, T.; Handa, T.; Matsuda, K.; Nakano, K.; Sato, A.; Marumoto, K.; Tajima, K.; Kanemitsu, Y.; Wakamiya, A., Optimized Carrier Extraction at Interfaces for 23.6% Efficient Tin-Lead Perovskite Solar Cells, *Energy Environ. Sci.*, **15(5)**, 2096-2107 (2022).

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**, 874-878 (2022).

Handa, T.; Hashimoto, R.; Yumoto, G.; Nakamura, T.; Wakamiya, A.; Kanemitsu, Y., Metal-Free Ferroelectric Halide Perovskite Exhibits Visible Photoluminescence Correlated with Local Ferroelectricity, *Sci. Adv.*, **8(25)**, eabo1621 (2022).

Yamada, Y.; Kanemitsu, Y., Electron-Phonon Interactions in Halide Perovskites, *NPG Asia Mater.*, **14**, 48 (2022).

Yumoto, G.; Sekiguchi, F.; Hashimoto, R.; Nakamura, T.; Wakamiya, A.; Kanemitsu, Y., Rapidly Expanding Spin-Polarized Exciton Halo in a Two-Dimensional Halide Perovskite at Room Temperature, *Sci. Adv.*, **8(30)**, eabp8135 (2022).

Kanemitsu, Y., Halide Perovskite Nanocrystals: Unique Luminescence Materials, *J. Lumin.*, **251**, 119207 (2022).

Vaitukaityte, D.; Truong, M. A.; Rakstys, K.; Murdey, R.; Funasaki, T.; Yamada, T.; Kanemitsu, Y.; Jankauskas, V.; Getautis, V.; Wakamiya, A., Molecular Engineering of Enamine-Based Hole-Transporting Materials for High-Performing Perovskite Solar Cells: Influence of the Central Heteroatom, *Sol. RRL*, **6(11)**, 2200590 (2022).

Handa, T.; Yamada, T.; Kanemitsu, Y., A Convenient Method for Assessing Steady-State Carrier Density and Lifetime in Solar Cell Materials Using Pulse Excitation Measurements, *J. Chem. Phys.*, **157(8)**, 084201 (2022).

Yumoto, G.; Kanemitsu, Y., Biexciton Dynamics in Halide Perovskite Nanocrystals, *Phys. Chem. Chem. Phys.*, **24(37)**, 22405-22425 (2022).

Cho, K.; Tahara, H.; Yamada, T.; Suzuura, H.; Tadano, T.; Sato, R.; Saruyama, M.; Hirori, H.; Teranishi, T.; Kanemitsu, Y., Exciton-Phonon and Trion-Phonon Couplings Revealed by Photoluminescence Spectroscopy of Single CsPbBr<sub>3</sub> Perovskite Nanocrystals, *Nano Lett.*, **22(18)**, 7674-7681 (2022).

Nakamura, T.; Otsuka, K.; Hu, S.; Hashimoto, R.; Morishita, T.; Handa, T.; Yamada, T.; Truong, M. A.; Murdey, R.; Kanemitsu, Y.; Wakamiya, A., Composition-Property Mapping in Bromide-Containing Tin Perovskite Using High-Purity Starting Materials, *ACS Appl. Energy Mater.*, **5**, 14789-14798 (2022).

Sekiguchi, F.; Yumoto, G.; Hirori, H.; Kanemitsu, Y., Polarization Anomaly in High Harmonics in the Crossover Region between Perturbative and Extreme Nonlinearity in GaAs, *Phys. Rev. B*, **106**, L241201 (2022).

## BIOINFORMATICS CENTER

### — Chemical Life Science —

Dominguez-Huerta, G.; Zayed, A. A.; Wainaina, J. M.; Guo, J.; Tian, F.; Pratama, A. A.; Bolduc, B.; Mohssen, M.; Zablocki, O.; Pelletier, E.; Delage, E.; Alberti, A.; Aury, J.-M.; Carradec, Q.; da Silva, C.; Labadie, K.; Poulain, J.; Bowler, C.; Eveillard, D.; Guidi, L.; Karsenti, E.; Kuhn, J. H.; Ogata, H.; Wincker, P.; Culley, A.; Chaffron, S.; Sullivan, M. B., Diversity and Ecological Footprint of Global Ocean RNA Viruses, *Science*, **376(6598)**, 1202-1208 (2022).

Vernette, C.; Lecubin, J.; Sánchez, P.; Acinas, S. G.; Babin, M.; Bork, P.; Boss, E.; Bowler, C.; Cochrane, G.; De Vargas, C.; Gorsky, G.; Guidi, L.; Grimsley, N.; Hingamp, P.; Iudicone, D.; Jaillon, O.; Kandels-Lewis, S.; Karp-Boss, L.; Karsenti, E.; Not, F.; Ogata, H.; Poulton, N.; Pesant, S.; Sardet, C.; Speich, S.; Stemmann, L.; Sullivan, M. B.; Sunagawa, S.; Wincker, P.; Sunagawa, S.; Delmont, T. O.; Acinas, S. G.; Pelletier, E.; Hingamp, P.; Lescot, M., The Ocean Gene Atlas v2.0: Online Exploration of the Biogeography and Phylogeny of Plankton Genes, *Nucleic Acids Res.*, **50(W1)**, W516-W526 (2022).

Chiriach, M.-C.; Bulzu, P.-A.; Andrei, A.-S.; Okazaki, Y.; Nakano, S.-I.; Haber, M.; Kavagutti, V. S.; Layoun, P.; Ghai, R.; Salcher, M. M., Ecogenomics Sheds Light on Diverse Lifestyle Strategies in Freshwater CPR, *Microbiome*, **10**, 84 (2022).

Okazaki, Y.; Nakano, S.-I.; Toyoda, A.; Tamaki, H., Long-Read-Resolved, Ecosystem-Wide Exploration of Nucleotide and Structural Microdiversity of Lake Bacterioplankton Genomes, *mSystems*, **7(4)**, e00433-22 (2022).

Sakurai, T.; De Velasco, M. A.; Sakai, K.; Nagai, T.; Nishiyama, H.; Hashimoto, K.; Uemura, H.; Kawakami, H.; Nakagawa, K.; Ogata, H.; Nishio, K.; Kudo, M., Integrative Analysis of Gut Microbiome and Host Transcriptomes Reveals Associations between Treatment Outcomes and Immunotherapy-Induced Colitis, *Mol. Oncol.*, **16(7)**, 1493-1507 (2022).

Da Cunha, V.; Gaia, M.; Ogata, H.; Jaillon, O.; Delmont, T. O.; Forterre, P., Giant Viruses Encode Actin-Related Proteins, *Mol. Biol. Evol.*, **39(2)**, msac022 (2022).

Prodinger, F.; Endo, H.; Takano, Y.; Li, Y.; Tominaga, K.; Isozaki, T.; Blanc-Mathieu, R.; Gotoh, Y.; Hayashi, T.; Taniguchi, E.; Nagasaki, K.; Yoshida, T.; Ogata, H., Year-Round Dynamics of Amplicon Sequence Variant Communities Differ among Eukaryotes, *Imitervirales* and Prokaryotes in a Coastal Ecosystem, *FEMS Microbiol. Ecol.*, **97(12)**, fiab167 (2022).

Xia, J.; Kameyama, S.; Prodinger, F.; Yoshida, T.; Cho, K.-H.; Jung, J.; Kang, S.-H.; Yang, E.-J.; Ogata, H.; Endo, H., Tight Association between Microbial Eukaryote and Giant Virus Communities in the Arctic Ocean, *Limnol. Oceanogr.*, **67(6)**, 1343-1356 (2022).

Xu, Z.; Cheung, S.; Endo, H.; Xia, X.; Wu, W.; Chen, B.; Ho, N. H. E.; Suzuki, K.; Li, M.; Liu, H., Disentangling the Ecological Processes Shaping the Latitudinal Pattern of Phytoplankton Communities in the Pacific Ocean, *mSystems*, **7(1)**, e01203-21 (2022).

Watari, M.; Kato, M.; Blanc-Mathieu, R.; Tsuge, T.; Ogata, H.; Aoyama, T., Functional Differentiation among the *Arabidopsis* Phosphatidylinositol 4-Phosphate 5-Kinase Genes *PIP5K1*, *PIP5K2* and *PIP5K3*, *Plant Cell Physiol.*, **63(5)**, 635-648 (2022).

Hikida, H.; Katsuma, S., KaicoTracker: A Robust and Automated Locomotory Analysis for Baculovirus-Infected Silkworm Larvae, *J. Insect Biotechnol. Sericology*, **91(2)**, 2\_021-2\_026 (2022).

Endo, H.; Umezawa, Y.; Takeda, S.; Suzuki, K., Haptophyte Communities along the Kuroshio Current Reveal their Geographical Sources and Ecological Traits, *Mol. Ecol.*, **32(1)**, 110-123 (2022).

Delmont, T. O.; Gaia, M.; Hingsinger, D. D.; Frémont, P.; Vanni, C.; Fernandez-Guerra, A.; Eren, A. M.; Kourlaiev, A.; d'Agata, L.; Clayssen, Q.; Villar, E.; Labadie, K.; Cruaud, C.; Poulain, J.; Da Silva, C.; Wessner, M.; Noel, B.; Aury, J.-M.; de Vargas, C.; Bowler, C.; Karsenti, E.; Pelletier, E.; Wincker, P.; Jaillon, O.; Sunagawa, S.; Acinas, S. G.; Bork, P.; Karsenti, E.; Bowler, C.; Sardet, C.; Stemmann, L.; de Vargas, C.; Wincker, P.; Lescot, M.; Babin, M.; Gorsky, G.; Grimsley, N.; Guidi, L.; Hingamp, P.; Jaillon, O.; Kandels, S.; Iudicone, D.; Ogata, H.; Pesant, S.; Sullivan, M. B.; Not, F.; Lee, K.-B.; Boss, E.; Cochrane, G.; Follows, M.; Poulton, N.; Raes, J.; Sieracki, M.; Speich, S., Functional Repertoire Convergence of Distantly Related Eukaryotic Plankton Lineages Abundant in the Sunlit Ocean, *Cell Genom.*, **2(5)**, 100123 (2022).

Richter, D. J.; Watteaux, R.; Vannier, T.; Leconte, J.; Frémont, P.; Reygondeau, G.; Maillat, N.; Henry, N.; Benoit, G.; Da Silva, O.; Delmont, T. O.; Fernández-Guerra, A.; Suweis, S.; Narci, R.; Berney, C.; Eveillard, D.; Gavory, F.; Guidi, L.; Labadie, K.; Mahieu, E.; Poulain, J.; Romac, S.; Roux, S.; Dimier, C.; Kandels, S.; Picheral, M.; Searson, S.; Pesant, S.; Aury, J.-M.; Brum, J. R.; Lemaitre, C.; Pelletier, E.; Bork, P.; Sunagawa, S.; Lombard, F.; Karp-Boss, L.; Bowler, C.; Sullivan, M. B.; Karsenti, E.; Mariadassou, M.; Probert, I.; Peterlongo, P.; Wincker, P.; de Vargas, C.; d'Alcalá, M. R.; Iudicone, D.; Jaillon, O., Genomic Evidence for Global Ocean Plankton Biogeography Shaped by Large-Scale Current Systems, *eLife*, **11**, e78129 (2022).

Zayed, A. A.; Wainaina, J. M.; Dominguez-Huerta, G.; Pelletier, E.; Guo, J.; Mohssen, M.; Tian, F.; Pratama, A. A.; Bolduc, B.; Zablocki, O.; Cronin, D.; Solden, L.; Delage, E.; Alberti, A.; Aury, J.-M.; Carradec, Q.; da Silva, C.; Labadie, K.; Poulain, J.; Ruscheweyh, H.-J.; Salazar, G.; Shatoff, E.; Bundschuh, R.; Fredrick, K.; Kubatko, L. S.; Chaffron, S.; Culley, A. I.; Sunagawa, S.; Kuhn, J. H.; Wincker, P.; Sullivan, M. B.; Acinas, S. G.; Babin, M.; Bork, P.; Boss, E.; Bowler, C.; Cochrane, G.; de Vargas, C.; Gorsky, G.; Guidi, L.; Grimsley, N.; Hingamp, P.; Iudicone, D.; Jaillon, O.; Kandels, S.; Karp-Boss, L.; Karsenti, E.; Not, F.; Ogata, H.; Poulton, N.; Pesant, S.; Sardet, C.; Speich, S.; Stemmann, L.; Sullivan, M. B.; Sungawa, S.; Wincker, P., Cryptic and Abundant Marine Viruses at the Evolutionary Origins of Earth's RNA Virome, *Science*, **376(6589)**, 156-162 (2022).

Liu, C.; Song, J.; Ogata, H.; Akutsu, T., MSNet-4mC: Learning Effective Multi-Scale Representations for Identifying DNA N4-Methylcytosine Sites, *Bioinformatics*, **38(23)**, 5160-5167 (2022).

[Others]

Zhang, L.; Fang, Y.; Ogata, H.; Okazaki, H., Spatio-Temporal Community Genome Dynamics of Giant Viruses in a Deep Lake Uncovered by Long-Read Metagenomics, *The 35th JSME Annual Meeting [November 1-2, 2022, Sapporo, Japan, Poster Presentation by Zhang L.]* (2022).

#### — Mathematical Bioinformatics —

Liu, C.; Song, J.; Ogata, H.; Akutsu, T., MSNet-4mC: Learning Effective Multi-Scale Representations for Identifying DNA N4-methylcytosine Sites, *Bioinformatics*, **38(23)**, 5160-5167 (2022).

Zhang, F.; Zhu, J.; Chiewvanichakorn, R.; Shurbevski, A.; Nagamochi, H.; Akutsu, T., A New Approach to the Design of Acyclic Chemical Compounds Using Skeleton Trees and Integer Linear Programming, *Appl. Intell.*, **52(15)**, 17058-17072 (2022).

Akutsu, T.; Mori, T.; Nakamura, N.; Kozawa, S.; Ueno, Y.; Sato, T. N., On the Complexity of Tree Edit Distance with Variables, *Proc. 33rd International Symposium on Algorithms and Computation (ISAAC 2022)*, [44-1]-[44-14] (2022).

Wang, F.; Chen, Y.-T.; Yang, J.-M.; Akutsu, T., A Novel Graph Convolutional Neural Network for Predicting Interaction Sites on Protein Kinase Inhibitors in Phosphorylation, *Sci. Rep.*, **12**, 1-11 (2022).

Zhang, M.; Jia, C.; Li, F.; Li, C.; Zhu, Y.; Akutsu, T.; Webb, G. I.; Zou, Q.; Coin, L. J. M.; Song, J., Critical Assessment of Computational Tools for Prokaryotic and Eukaryotic Promoter Prediction, *Brief. Bioinform.*, **23(2)**, 1-25 (2022).

Zhu, J.; Azam, N. A.; Haraguchi, K.; Zhao, L.; Nagamochi, H.; Akutsu, T., An Inverse QSAR Method Based on Linear Regression and Integer Programming, *Front. Biosci.*, **27(6)**, 1-14 (2022).

Li, R.; Lee, J.-Y.; Yang, J.-M.; Akutsu, T., Densest Subgraph-Based Methods for Protein-Protein Interaction Hot Spot Prediction, *BMC Bioinformatics*, **23**, 1-12 (2022).

Guo, S.; Liu, P.; Ching, W.-K.; Akutsu, T., On the Distribution of Successor States in Boolean Threshold Networks, *IEEE Trans. Neural. Netw. Learn. Syst.*, **33(9)**, 4147-4159 (2022).

Münzner, U.; Mori, T.; Krantz, M.; Klipp, E.; Akutsu, T., Identification of Periodic Attractors in Boolean Networks Using *A Priori* Information, *PLoS Comput. Biol.*, **18**, e1009702 (2022).

Zhu, J.; Azam, N. A.; Haraguchi, K.; Zhao, L.; Nagamochi, H.; Akutsu, T., A Method for Molecular Design Based on Linear Regression and Integer Programming, *ACM International Conference Proceeding Series*, 21-28 (2022).

Kumano, S.; Akutsu, T., Comparison of the Representational Power of Random Forests, Binary Decision Diagrams, and Neural Networks, *Neural. Comput.*, **34(4)**, 1019-1044 (2022).

Van Giang, T.; Akutsu, T.; Hiraishi, K., An FVS-Based Approach to Attractor Detection in Asynchronous Random Boolean Networks, *IEEE/ACM Trans. Comput. Biol. Bioinform.*, **19(2)**, 806-818 (2022).

Chen, Z.; Liu, X.; Li, F.; Li, C.; Marquez-Lago, T.; Leier, A.; Webb, G. I.; Xu, D.; Akutsu, T.; Song, J., Systematic Characterization of Lysine Post-Translational Modification Sites Using MUseADEL, *Methods Mol. Biol.*, **2499**, 205-219 (2022).

Mori, T.; Akutsu, T., Attractor Detection and Enumeration Algorithms for Boolean Networks, *Comput. Struct. Biotechnol. J.*, **20**, 2512-2520 (2022).

Chen, Z.; Liu, X.; Zhao, P.; Li, C.; Wang, Y.; Li, F.; Akutsu, T.; Bain, C.; Gasser, R. B.; Li, J.; Yang, Z.; Gao, X.; Kurgan, L.; Song, J., *iFeatureOmega*: An Integrative Platform for Engineering, Visualization and Analysis of Features from Molecular Sequences, Structural and Ligand Data Sets, *Nucleic Acids Res.*, **50(W1)**, W434-W447 (2022).

Iqbal, S.; Ge, F.; Li, F.; Akutsu, T.; Zheng, Y.; Gasser, R. B.; Yu, D.-J.; Webb, G. I.; Song, J., PROST: AlphaFold2-aware Sequence-Based Predictor to Estimate Protein Stability Changes upon Missense Mutations, *J. Chem. Inf. Model.*, **62**, 4270-4282 (2022).

Li, R.; Lee, J.-Y.; Yang, J.-M.; Akutsu, T., Densest Subgraph-Based Methods for Protein-Protein Interaction Hot Spot Prediction, *BMC Bioinformatics*, **23**, 451 (2022).

Zhu, J.; Haraguchi, K.; Nagamochi, H.; Akutsu, T., Adjustive Linear Regression and Its Application to the Inverse QSAR, *The 15th International Joint Conference on Biomedical Engineering Systems and Technologies (BIOINFORMATICS)*, **3**, 144-151 (2022).

Sugihara, R.; Kato, Y.; Mori, T.; Kawahara, Y., Alignment of Single-Cell Trajectory Trees with CAPITAL, *Nat. Commun.*, **13(1)**, 5972 (2022).

#### — Bio-knowledge Engineering —

Liu, L.; Mamitsuka, H.; Zhu, S., HPODnets: Deep Graph Convolutional Networks for Predicting Human Protein-Phenotype Associations, *Bioinformatics*, **38(3)**, 799-808 (2022).

You, R.; Qu, W.; Mamitsuka, H.; Zhu, S., DeepMHCII: A Novel Binding Core-Aware Deep Interaction Model for Accurate MHC-II Peptide Binding Affinity Prediction, *Bioinformatics*, **38(1)**, i220-i228 (2022).

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*, **38(1)**, i333-i341 (2022).

Paltun, B. G.; Kaski, S.; Mamitsuka, H., DIVERSE: Bayesian Data IntegratiVE Learning for Precise Drug ResponSE Prediction, *IEEE/ACM Trans. Comput. Biol. Bioinform.*, **19(4)**, 2197-2207 (2022).

#### **HAKUBI PROJECT**

— **Optoelectronic Energy Recycling and Quantum Cooperative Effects in Semiconductor Nanostructures** —

Cho, K.; Tahara, H.; Yamada, T.; Suzuura, H.; Tadano, T.; Sato, R.; Saruyama, M.; Hirori, H.; Teranishi, T.; Kanemitsu, Y., Exciton-Phonon and Trion-Phonon Couplings Revealed by Photoluminescence Spectroscopy of Single CsPbBr<sub>3</sub> Perovskite Nanocrystals, *Nano Lett.*, **22**, 7674-7681 (2022).