

Department of Chemistry

Research Area : Structural Chemistry

(URL: http://chem.okayama-u.ac.jp/~solid/index_e.html)

Hiroyuki ISHIDA, Professor

Kazuma GOTOH, Associate Professor

Research Themes :

- » Crystal engineering by use of intermolecular interactions
- » Structure and properties of porous solids and battery materials using nuclear magnetic resonance
- » Research and development of porous carbon materials

Representative Publication :

- R. Morita, K. Gotoh, M. Fukunishi, K. Kubota, S. Komaba, T. Yumura, N. Nishimura, K. Deguchi, S. Ohki, T. Shimizu and H. Ishida
Combination of solid state NMR and DFT calculation to elucidate the state of sodium in hard carbon electrodes, *J. Mater. Chem. A*, **4**, 13183-13193 (2016).
- K. Gotoh, H. Maruyama, T. Miyatou, M. Mizuno, K. Urita, and H. Ishida
Structure and Dynamic Behavior of Na-Diglyme Complex in the Graphite Anode of Sodium Ion Battery by ²H Nuclear Magnetic Resonance, *J. Phys. Chem. C*, **120**, 28152-28156 (2016).
- K. Gotoh and H. Ishida
Hydrogen-bonded structures of the 1:1 and 1:2 compounds of chloranilic acid with pyrrolidin-2-one and piperidin-2-one, *Acta Cryst. C* **67**, o500–o504 (2011).

Research Area : Molecular Spectroscopy

(URL: http://chem1.chem.okayama-u.ac.jp/~spectro/home_en3.htm)

Jian TANG, Professor

Research Themes:

- » High-resolution spectroscopy of free radicals and molecular ions
- » Infrared spectroscopy of molecular clusters
- » Spectroscopic and reaction dynamics studies of interstellar molecules
- » Non-linear Spectroscopy

Representative Publication:

- K. Kawaguchi, R. Fujimori, J. Tang, and T. Ishiwata
FTIR Spectroscopy of NO₃ : Perturbation Analysis of the $\nu_3+\nu_4$ State, *J. Phys. Chem. A* **117**, 13732–13742 (2013).
- Y. Miyamoto, H. Ooe, S. Kuma, K. Kawaguchi, K. Nakajima, I. Nakano, N. Sasao, J. Tang, T. Taniguchi, and M. Yoshimura
Spectroscopy of HF and HF containing clusters in solid parahydrogen, *J. Phys. Chem. A* **115**, 14254–14261 (2011).
- H. Ooe, Y. Miyamoto, S. Kuma, K. Kawaguchi, K. Nakajima, I. Nakano, N. Sasao, J. Tang, T. Taniguchi, M. Yoshimura
Diffusion of hydrogen fluoride in solid parahydrogen, *J. Chem. Phys.* **138**, 214309-1-6 (2013).

Research Area : Synthetic and Physical Organic Chemistry

(URL: <http://chem.okayama-u.ac.jp/~spoc/index.html>)

Hideki OKAMOTO, Associate Professor

Research Themes :

- » Photochemical reactions and photophysical properties of cyclophanes
- » Synthesis of polycyclic aromatic compounds and their application to organic electronics
- » Development and photophysical properties of luminescent probes

Representative Publication :

- H. Okamoto, H. Takahashi, T. Takane, Y. Nishiyama, K. Kakiuchi, S. Gohda, and M. Yamaji, Convenient phenacene synthesis by sequentially performed Wittig reaction and Mallory photocyclization using continuous flow technique, *Synthesis*, **49**, pp. 2949–2957 (2017)
- H. Okamoto, T. Kozai, Z. Okabayashi, T. Shinmyozu, H. Ota, K. Amimoto, and K. Satake, Synthesis, structure, and photoreactions of fluorinated 2,11-diaza[3₂]paracyclophane: Photochemical formation of cage-diene type benzene dimer, *J. Phys. Org. Chem.*, **30**, e3726 (2017).
- M. Fujii, M. Namba, M. Yamaji and H. Okamoto, Solvent-induced multicolour fluorescence of amino-substituted 2,3-naphthalimides studied by fluorescence and transient absorption measurements, *Photochem. Photobiol. Sci.*, **15**, pp. 842–850 (2016). (Front cover article)

Research Area : Inorganic Chemistry

(URL: http://chem.okayama-u.ac.jp/~inorganic/index_eng.html)

Yasushige KURODA, Professor

Takahiro OHKUBO, Associate Professor

Research Themes:

- » Unprecedented states of metal-ions encapsulated in solid-inorganic compounds with nano-sized pores
- » Specific adsorption feature of metal-ion-exchanged zeolites
- » Confined structure of molecules and ions in carbon nanospace
- » New reactions using nano-carbons

Representative Publication:

- A. Oda, T. Ohkubo, T. Yumura, H. Kobayashi, and Y. Kuroda
Identification of stable Zn^{II}-oxyl species enforced by MFI and its reversible reactivity with O₂ at RT, *Angew. Chem. Int. Ed.*, **56**, 9715-9718 (2017).
- A. Oda, T. Ohkubo, T. Yumura, H. Kobayashi, and Y. Kuroda
Why do zeolites induce unprecedented electronic state on exchanged metal ions?
Phys. Chem. Chem. Phys., **19**, 25105-25114 (2017).
- M. Nishi, T. Ohkubo, M. Yamasaki, H. Takagi, and Y. Kuroda
Surplus adsorption of bromide ion into p-conjugated carbon nanospaces assisted by proton coadsorption, *J. Colloid Interface Sci.*, **508**, 415-418 (2017).

Research Area : Coordination Chemistry

(URL: <http://chem.okayama-u.ac.jp/~complex/Coord.Chem.Eng/Home.html>)

Takayoshi SUZUKI, Professor

Yukinari SUNATSUKI, Assistant Professor



Research Themes:

- » Synthesis of novel coordination compounds and control of their structures and functionalities
- » Complete spontaneous resolution of metal complexes
- » Synthesis and magnetic property of novel metal complexes

Representative Publication:

- A. Mori, T. Suzuki, Y. Nakatani, Y. Sunatsuki, M. Kojima and K. Nakajima
Palladium(II) mononuclear and palladium(II)/ruthenium(II) heterodinuclear complexes containing 2-quinolyl-substituted (pyridine- 2-carbonyl)hydrazone *Dalton Trans.* **44**, 15757–15760 (2015).
- A. Kashima, M. Sakate, H. Ota, A. Fuyuhiko, Y. Sunatsuki and T. Suzuki
Thymine(2-)-bridged cyclic tetranuclear rhodium(III) complexes formed by a template of a sodium, calcium or lanthanoid ion
Chem. Commun. **51**, 1889–1892. (2015).
- T. Ueno, Y. Ii, T. Fujinami, N. Matsumoto, S. Iijima, and Y. Sunatsuki
Polymorphs of spin-crossover iron(II) complex *fac*-[Fe^{II}(HL^{n-Pr})₃]Cl PF₆ (HL^{n-Pr} = 2-methylimidazol-4-yl-methylideneamino-*n*-propyl): Assembly structures and scan rate dependent spin-crossover properties with thermal hysteresis *Polyhedron* **136**, 13–22 (2017).

Research Area : Molecular Surface Science

(URL:<http://interfa.rlss.okayama-u.ac.jp/index.html>)

Yoshihiro KUBOZONO, Professor
Hidenori GOTO, Associate Professor
Ritsuko EGUCHI, Assistant Professor

Research Themes :

- 》 Fabrication and characterization of superconductors of carbon-based materials and two-dimensional layered materials
- 》 Electronic devices (transistors) based on organic molecules and two-dimensional layered materials
- 》 Study on electronic properties of graphene and topological materials
- 》 Nanoscale science in light element materials

Representative Publication :

- R. Mitsuhashi, Y. Suzuki, Y. Yamanari, H. Mitamura, T. Kambe, N. Ikeda, H. Okamoto, A. Fujiwara, M. Yamaji, N. Kawasaki, Y. Maniwa, and Y. Kubozono, Superconductivity in alkali-metal-doped picene, *Nature* **464**, 76 (2010).
- H. Goto, E. Uesugi, R. Eguchi, A. Fujiwara, and Y. Kubozono, Edge-Dependent Transport Properties in Graphene, *Nano Lett.* **13**, 1126 (2013).
- M. Izumi, L. Zheng, Y. Sakai, H. Goto, M. Sakata, Y. Nakamoto, H. L. T. Nguyen, T. Kagayama, K. Shimizu, S. Araki, T. C. Kobayashi, T. Kambe, D. Gu, J. Guo, J. Liu, Y. Li, L. Sun, K. Prassides, and Y. Kubozono, Emergence of double-dome superconductivity in ammoniated metal-doped FeSe, *Sci. Rep.* **5**, 9477 (2015).

Research Area : Theoretical Physical Chemistry

(URL: <http://phys.chem.okayama-u.ac.jp/english/index.html>)

Kenichiro KOGA, Professor
Tomonari SUMI, Associate Professor

Research Themes:

- 》 Structure and phase transitions of liquids, liquid mixtures, and fluid interfaces
- 》 Hydrophobic effect
- 》 Development of density-functional theory for liquids and its application to thermodynamic stability of proteins
- 》 Stochastic modeling of molecular motors and biomolecular machines

Representative Publication:

- K. Koga, Osmotic Second Virial Coefficient of Methane in Water, *J. Phys. Chem. B* **117**, 12619 (2013).
- K. Mochizuki and K. Koga, Solid-liquid critical behavior of water in nanopores, *Proc. Natl. Acad. Sci. U.S.A.* **112**, 8221 (2015).
- I. Hatano, K. Mochizuki, T. Sumi, and K. Koga, Hydrophobic Polymer Chain in Water That Undergoes a Coil-to-Globule Transition Near Room Temperature, *J. Phys. Chem. B* **120**, 12127 (2016).
- T. Sumi, Y. Maruyama, A. Mitsutake, K. Mochizuki, and K. Koga, Application of reference-modified density functional theory: Temperature and pressure dependences of solvation free energy, *J. Comput. Chem.* **39**, 202 (2018).
- T. Sumi, Design principles governing chemomechanical coupling of kinesin, *Sci. Rep.* **7**, 1163 (2017).

Research Area : Physical Chemistry

(URL: <http://chem.okayama-u.ac.jp/english/staff/detail/yoshimi-sueishi.html>)

Yoshimi SUEISHI, Professor

Research Themes:

- 》 Multiple free-radical scavenging capacity of antioxidants in food, cosmetics and pharmaceuticals
- 》 Function control of inclusion materials based on complexation mechanism and its applications

Representative Publication:

- Y. Sueishi, E. Kamogawa, A. Kimura, G. Kitahara, H. Satoh, T. Asanuma, and S. Oowada Multiple free-radical scavenging (MULTIS) capacity in cattle serum *J. Clin. Biochem. Nutr.*, **60**, 76–80 (2017).
- Y. Sueishi, Y. Honda, S. Fujitani, N. Inazumi, and T. Hanaya Investigation of inclusion complexation of imidazolium and pyrrolidinium chlorides with water-soluble, *p*-sulfonatocalix[6]arene: characteristic effects of external pressure, temperature, and substituents, *J. Incl. Phenom. Macrocycl. Chem.*, **86**, 255–261 (2016).

Research Area : Theoretical Chemistry

(URL: <http://theochem.chem.okayama-u.ac.jp/english/index.html>)

Hideki TANAKA, Professor

Masakazu MATSUMOTO, Associate Professor

Research Themes :

- 》 Aquomics: a comprehensive study of water and hydrates
- 》 Theoretical study of the phase transitions and critical phenomena of water and hydrates
- 》 Crystal structure prediction of ices and hydrates
- 》 Structure and property of water and aqueous solutions in confined geometry

Representative Publication :

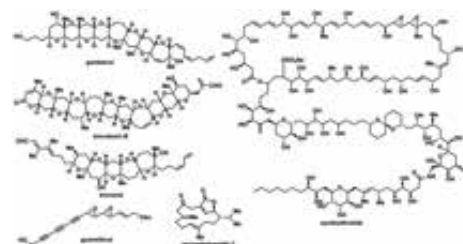
- K. Himoto, M. Matsumoto, and H. Tanaka, Yet another criticality of water, *Phys. Chem. Chem. Phys.* in press (2014). doi:10.1039/c3cp54726d.
- K. Mochizuki, M. Matsumoto, and I. Ohmine, Defect pair separation as the controlling step in homogeneous ice melting, *Nature* **498**, 350–354 (2013).
- H. Tanaka and M. Matsumoto, Statistical Mechanical Approach to the Thermodynamic Stability of Clathrate Hydrates, *Adv. Chem. Phys.* **152**, 421–462 (2013).

Research Area : Organic Chemistry

(URL: <http://chem.okayama-u.ac.jp/~organic/homeE.html>)

Isao KADOTA, Professor

Hiroyoshi TAKAMURA, Associate Professor



Research Themes:

- 》 Total synthesis of biologically active natural products
- 》 Development of new synthetic strategy and reaction
- 》 Structural elucidation of complex natural products based on chemical synthesis

Representative Publication:

- T. Tanaka, H. Asakura, R. Fujiwara, K. Kumamoto, H. Izuka, K. Shiroma, H. Takamura, and I. Kadota, Improved Synthesis of the A–E Ring Segment of Ciguatoxin CTX3C by Using Intramolecular Allylations, *Bull. Chem. Soc. Jpn.* doi:10.1246/bcsj.20170390 (2018).
- H. Takamura, T. Ohashi, T. Kikuchi, N. Endo, Y. Fukuda, and I. Kadota, Late-Stage Divergent Synthesis and Antifouling Activity of Geraniol–Butenolide Hybrid Molecules, *Org. Biomol. Chem.* **15**, pp. 5549–5555 (2017).
- H. Takamura, T. Fujiwara, Y. Kawakubo, I. Kadota, and D. Uemura, Stereodivergent Synthesis and Stereochemical Reassignment of the C79–C104 Fragment of Symbiodinolide, *Chem. Eur. J.* **22**, pp. 1984–1996 (2016).

Research Area : Organic Synthetic Chemistry

(URL: <http://chem.okayama-u.ac.jp/~orgsynth/index.html>)

Tadashi HANAYA, Professor

Research Themes:

- 》 Synthetic studies on natural pterin glycosides
- 》 Synthetic studies on sugar analogs having phosphorus in the ring and the related organophosphorus compounds

Representative Publication:

- T. Hanaya, K. Iwasaki, K. Saeki, and T. Hattori, Efficient Total Syntheses of Natural Neopterin Glycosides: Neopterin Glucuronide and Solfapterin, *Heterocycles*, **95**, 390–409 (2017).

Research Area : Functional Organic Chemistry

(URL: <http://chem.okayama-u.ac.jp/~funcchem/english/index.html>)

Yasushi NISHIHARA, Professor
Masayuki IWASAKI, Assistant Professor
Hiroki MORI, Assistant Professor



Research Themes :

- » Synthesis of functional polycyclic aromatic compounds and its application to organic field-effect transistors
- » Development of the transition-metal catalyzed direct sulfurization reactions of the carbon-hydrogen bonds
- » The elucidation of reaction mechanisms using quantum chemical calculations
- » Synthesis of π -conjugated organic molecules directed towards organic thin film solar cells

Representative Publication :

- H. Mori, S. Hara, S. Nishinaga, and Y. Nishihara, Solar Cell Performance of Phenanthrodithiophene-Isoindigo Copolymers Depends on Their Thin-Film Structure and Molecular Weight, *Macromolecules* **50**, pp. 4639-4648 (2017).
- Y. Kubozono, K. Hyodo, S. Hamao, Y. Shimo, H. Mori, and Y. Nishihara, Transistor Properties of 2,7-Dialkyl-Substituted Phenanthro[2,1-b:7,8-b']dithiophene, *Sci. Rep.* **6**, 38535 (2016).
- M. Iwasaki, T. Fujii, K. Nakajima, and Y. Nishihara, Iron-Induced Regio- and Stereoselective Addition of Sulfenyl Chlorides to Alkynes via a Radical Pathway, *Angew. Chem. Int. Ed.* **53**, pp. 13880-13884 (2014).

Research Area : Analytical Chemistry

(URL: http://chem.okayama-u.ac.jp/~analytical/home_e.html)

Takashi KANETA, Professor
Nobuyuki TAKEYASU, Associate Professor

Research Themes :

- » Analysis of single cells and single molecules
- » Development of nanomaterials and their application to analytical science

Representative Publication :

- K. Yamaguchi, N. Takeyasu and T. Kaneta, Determination of association constants between 5'-guanosine monophosphate gel and aromatic compounds by capillary electrophoresis, *Journal of Chromatography A*, **1288**, 149-154 (2013).
- G. Inoue, T. Kaneta, T. Takayanagi, J. Kakehi, H. Motose and T. Takahashi, Determination of polyamines in *Arabidopsis thaliana* by capillary electrophoresis using salicylaldehyde-5-sulfonate as a derivatizing reagent, *Analytical Methods* **5**, 2854-2859 (2013).
- A. Tabara and T. Kaneta. Discrimination of glycoproteins via two-color laser-induced fluorescence detection coupled with postcolumn derivatization in capillary electrophoresis. *Electrophoresis* **34**, 2316-2322 (2013).

Department of Biological Sciences

Research Area : Molecular Genetics

(URL: <https://sites.google.com/view/nakagoshi-lab-hp/home>)

(URL: <http://www.biol.okayama-u.ac.jp/kutukake/nadyn.html>)

(URL: <https://sites.google.com/view/molecularmicrobelab/home>)

Hideki NAKAGOSHI, Professor

Tatsuhiko ABO, Associate Professor

Akira TOMINAGA, Associate Professor

Research Themes :

- 》 Regulatory mechanisms of sexual differentiation and fertility in *Drosophila*
- 》 Ribosome rescue in *Escherichia coli*
- 》 Structural analysis of ribosome rescue factors
- 》 DNA inversion system in bacteria, flagellotropic bacteriophage χ

Representative Publication :

- T. Abo, and Y. Chadani, The fail-safe system to rescue the stalled ribosomes in *Escherichia coli*. *Front. Microbiol.* 5: 156 (2014)
- R. Minami, M. Wakabayashi, S. Sugimori, K. Taniguchi, A. Kokuryo, T. Imano, T. Adachi-Yamada, N. Watanabe, and H. Nakagoshi, The homeodomain protein Defective proventriculus is essential for male accessory gland development to enhance fecundity in *Drosophila*. *PLoS One* 7: e32302 (2012)

Research Area : Molecular Physiology

(URL: http://www.biol.okayama-u.ac.jp/takahashi_y/index.htm)

Yuichiro TAKAHASHI, Professor

Miho NISHIMURA, Assistant Professor

Research Themes :

- 》 Study on the structure, function, and assembly of Photosystem I
- 》 Study on the structure and function of oxygen-evolution of Photosystem II
- 》 Study on the quality control of Photosystem II

Representative Publication :

- S. Bujaldon, N. Kodama, F. Rappaport, R. Subramanyam, C. de Vitry, Y. Takahashi, and F.-A. Wollman, The functional accumulation of antenna proteins in chlorophyll b-less mutants of *Chlamydomonas reinhardtii*. *Molecular Plant* 10: 115-130 (2017)
- Y. Kato, S. Ozawa, Y. Takahashi, and W. Sakamoto, D1 fragmentation in photosystem II repair caused by photo-damage of a two-step model, *Photosynthesis Res.* 126: 409-416 (2015)
- H. Takahashi, A. Okamuro, J. Minagawa, and Y. Takahashi, Biochemical Characterization of Photosystem I-Associated Light-Harvesting Complexes I and II Isolated from State 2 Cells of *Chlamydomonas reinhardtii*, *Plant Cell Physiol.* 55: 1437-1449 (2014)
- S. Takahashi, M. Yoshioka-Nishimura, D. Nanba, and M. R. Badger, Thermal acclimation of the symbiotic alga *Symbiodinium* spp. alleviates photobleaching under heat stress, *Plant Physiology* 161: 477-85 (2013)

Research Area : Molecular Cell Biology

(URL: <https://sites.google.com/view/taga-lab>)

Masatoki TAGA, Professor

Kiyoshi NAKAHORI, Assistant Professor

Research Themes :

- 》 Molecular cytogenetics of filamentous fungi
- 》 Photomorphogenesis of agaricomycete *Coprinopsis cinerea*

Representative Publication :

- M. Taga., K. Tanaka, S. Kato, and Y. Kubo, Cytological analyses of the karyotypes and chromosomes of three *Colletotrichum* species, *C. orbiculare*, *C. graminicola* and *C. Higginsianum*, Fungal Genet. Biol. 82:238-250 (2015)
- H. S. Garmaroodi and M. Taga, Meiotic inheritance of a fungal supernumerary chromosome and its effect on sexual fertility in *Nectria haematococca*, Fungal Biol. 119: 929-939 (2015)
- T. Nakazawa, Y. Ando, T. Hata, and K. Nakahori, A mutation in the *Cc.arp9* gene encoding a putative actin-related protein causes defects in fruiting initiation and asexual development in the agaricomycete *Coprinopsis cinerea*, Curr. Genet. 62: 565-74 (2016)

Research Area : Structural Biology

(URL: <http://www.biol.okayama-u.ac.jp/shen2/%E3%83%88%E3%83%83%E3%83%97.htm>)

Jian-Ren SHEN, Professor

Michihiro SUGA, Associate Professor

Fusamichi AKITA, Associate Professor

Research Themes :

- 》 Mechanism of photosynthetic water-splitting
- 》 High-resolution structural analysis of membrane proteins
- 》 Expression, purification and structural studies of plant transporters

Representative Publication :

- M. Suga, F. Akita, K. Hirata, G. Ueno, H. Murakami, Y. Nakajima, T. Shimizu, K. Yamashita, M. Yamamoto, H. Ago, and J.-R. Shen, Native structure of photosystem II at 1.95 Å resolution viewed by femtosecond X-ray pulses. Nature 517: 99-103 (2015)
- X. Qin, M. Suga, T. Kuang, and J.-R. Shen, Structural basis for the energy transfer pathways in plant PSI-LHCI super-complex. Science 348: 989-995 (2015)
- M. Suga et al., Light-induced structural changes and the site of O=O bond formation in PSII caught by XFEL. Nature 543: 131-135 (2017)
- L.-J. Yu, M. Suga, Z.-Y. Wang-Otomo, J.-R. Shen, Structure of photosynthetic LHI-RC super-complex at 1.9 Å resolution. Nature 556: 209-213 (2018)

Research Area : Neural Control of Behavior

(URL: <http://www.science.okayama-u.ac.jp/~rinkai/en/index.html>)

(URL: <https://sites.google.com/view/molecular-ethology-laboratory/english>)

Hiroataka SAKAMOTO, Associate Professor

Hideaki TAKEUCHI, Associate Professor

Research Themes :

- 》 Studies on neuroendocrinological regulation of behavior in vertebrates
- 》 Evolutional origin of the hormone-receptor system
- 》 Exploring the neural geography of the social brain using medaka fish
- 》 Investigation of behavioral rules underlying emergence of social structure

Representative Publication :

- H. Sakamoto, K.I. Matsuda, D.G. Zuloaga, H. Hongu, E. Wada, K. Wada, C.L. Jordan, S.M. Breedlove, and M. Kawata, Sexually dimorphic gastrin releasing peptide system in the spinal cord controls male reproductive functions, Nat. Neurosci. 11: 634-636 (2008)
- T. Okuyama, S. Yokoi, H. Abe, Y. Isoe, Y. Suehiro, H. Imada, M. Tanaka, T. Kawasaki, S. Yuba, Y. Taniguchi, Y. Kamei, K. Okubo, A. Shimada, K. Naruse, H. Takeda, Y. Oka, T. Kubo, and H. Takeuchi, A neural mechanism underlying mating preferences for familiar individuals in medaka fish, Science 343:91-94 (2014)

Research Area : Environmental Biology and Chronobiology

(URL: <https://sites.google.com/site/chronobiologyokayamauni/>)

Kenji TOMIOKA, Professor

Taishi YOSHII, Associate Professor

Research Themes :

- 》 Molecular oscillatory mechanism and photic entrainment mechanism of the circadian clock in hemimetabolous insects
- 》 Molecular physiological analysis of the insect photoperiodic time-measurement mechanism
- 》 Neuronal circuits underlying the circadian clock in *Drosophila melanogaster*
- 》 Functional analysis of neuropeptides involved in the *Drosophila* circadian clock

Representative Publication :

- A. Tokuoka, T.Q. Itoh, S. Hori, O. Uryu, Y. Danbara, M. Nose, T. Bando, T. Tanimura, and K. Tomioka, *cryptochromes* form an oscillatory loop that can operate independent of the *per/tim* loop in the circadian clockwork of the cricket *Gryllus bimaculatus*. *Zoological Lett.* 3: 5 (2017)
- K. Tomioka, and A. Matsumoto, Circadian molecular clockworks in non-model insects. *Curr. Opin. Insect Sci.* 7: 58-64 (2015)
- T. Yoshii, C. Hermann-Luibl, C. Kistenpennig, B. Schmid, K. Tomioka, and C. Helfrich-Förster, Cryptochrome-dependent and -independent circadian entrainment circuits in *Drosophila*. *J. Neurosci.* 35: 6131-6141 (2015)
- C. Hermann-Luibl, T. Yoshii, P.R. Senthilan, H. Dirksen, C. Helfrich-Förster, The ion transport peptide is a new functional clock neuropeptide in the fruit fly *Drosophila melanogaster*. *J. Neurosci.* 34: 9522-9536 (2014)

Research Area : Chemical Correlation and Control

(URL: <http://www.science.okayama-u.ac.jp/~rinkai/en/index.html>)

(URL: <http://www.biol.okayama-u.ac.jp/ccerg/index.html>)

Tatsuya SAKAMOTO, Professor

Sumio TAKAHASHI, Professor

Sakae TAKEUCHI, Professor

Tadashi AKIYAMA, Assistant Professor

Maho OGOSHI, Assistant Professor

Research Themes :

- 》 Regulatory mechanism of anterior pituitary functions and reproductive functions
- 》 Functional evolution of adrenomedullin family in vertebrates
- 》 Physiological role and mechanism of action of pituitary hormones expressed in extra-pituitary tissues in vertebrates
- 》 Environmental Adaptation
- 》 Diversity of Marine Animals

Representative Publication :

- Y. Manabe, M. Tochigi, A. Moriwaki, S. Takeuchi, and S. Takahashi, Insulin-like growth factor 1(IGF1) mRNA expression in the uterus of streptozotocin (STZ)-treated diabetic mice. *J. Reprod. Dev.* 59: 398-404 (2013)
- Y. Takei, M. Ogoshi, and S. Nobata, Exploring new CGRP family peptides and their receptors in vertebrates, *Curr. Prot. Pept. Sci.* 14: 282-93 (2013)
- T. Sakamoto, S. Ogawa, Y. Nishiyama, C. Akada, H. Takahashi, T. Watanabe, H. Minakata, and H. Sakamoto, Osmotic/ionic status of body fluids in the euryhaline cephalopod suggest possible parallel evolution of osmoregulation, *Sci Rep.* 5: 14469 (2015)
- E. Oribe, A. Fukao, C. Yoshihara, M. Mendori, K. G. Rosal, S. Takahashi, and S. Takeuchi, Conserved distal promoter of the agouti signaling protein (ASIP) gene controls sexual dichromatism in chickens, *Gen. Comp. Endocrinol.* 177: 231-237 (2012)

Research Area : Developmental Biology

(URL: <https://sites.google.com/view/uedalabinokayamauniv/home>)

(URL: <http://www.biol.okayama-u.ac.jp/takahashiTaku/T-Takahashi.html>)

(URL: <https://organregeneration.jimdo.com/english-version/>)

Hitoshi UEDA, Professor

Taku TAKAHASHI, Professor

Hiroyasu MOTOSE, Associate Professor

Akira SATOH, Associate Professor

Takashi OKAMOTO, Assistant Professor

Research Themes :

- » Regulation mechanism of time control (biological timer) during the development of insects, gene expression and development by insect hormones
- » Molecular functions of thermospermine in plant development
- » Molecular mechanism and evolution of directional growth in plants
- » Novel physiological functions of phytohormones
- » Organ regeneration in vertebrates

Representative Publication :

- K. Akagi, M. Sarhan, A.-R. Sultan, H. Nishida, A. Koie, T. Nakayama, and H. Ueda, A biological timer in the fat body comprised of Blimp-1, β FTZ-F1 and Shade regulates pupation timing in *Drosophila melanogaster*. *Development* 143: 2410-2416 (2016)
- Y. Ohhara, Y. Shimada-Niwa, R. Niwa, Y. Kayashima, Y. Hayashi, K. Akagi, H. Ueda, K. Yamakawa-Kobayashi, and S. Kobayashi, Autocrine regulation of ecdysone synthesis by β 3-octopamine receptor in the prothoracic gland is essential for *Drosophila* metamorphosis. *Proc. Natl. Acad. Sci. USA*. 112: 1452-1457 (2015)
- K. Yoshimoto, Y. H. Takamura, I. Kadota, H. Motose, and T. Takahashi, Chemical control of xylem differentiation by thermospermine, xylemin, and auxin. *Sci. Rep.* 6: e21487 (2016)
- S. Takatani, S. Ozawa, N. Yagi, T. Hotta, T. Hashimoto, Y. Takahashi, T. Takahashi, and H. Motose, Directional cell expansion requires NIMA-related kinase 6 (NEK6)-mediated cortical microtubule destabilization., *Sci. Rep.* 7: e7826 (2017)
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Department of Earth System Science

Research Area : Dynamic Geology

(URL: <http://earth.desc.okayama-u.ac.jp/en/research/research.html>)

Shigeyuki SUZUKI, Professor

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Toshio NOZAKA, Associate Professor

Junji YAMAKAWA, Assistant Professor

Research Themes :

- 》 Structural development of island arc [Suzuki]
- 》 Deciphering of evolutionary history of orogenic belts from the petrological study of ultrahigh-pressure metamorphic rocks [Nakamura]
- 》 Petrology of oceanic lithosphere and ophiolites [Nozaka]
- 》 Estimation of the spatial statistical distributions of the chemical and physical properties of minerals by geostatistics [Yamakawa]

Representative Publication :

- Walia, M., Knittel, U., Suzuki, S., Chung, S-L., Pena, R.E., Yang, T.F., No Paleozoic metamorphics in Palawan (the Philippines)? Evidence from single grain U-Pb dating of detrital zircons., *Journal of Asian Earth Sciences* 52, 134-145. (2012)
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- Nozaka, T., Metasomatic hydration of the Oeyama forearc peridotites: Tectonic implications., *Lithos* 184-187, 346-360. (2014)
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Research Area : Physics of the Earth and Planetary Interior

(URL: https://www.gnst.okayama-u.ac.jp/en/about_us/stafflist_elms_en/)

Hiroshi TAKENAKA, Professor

Satoru URAKAWA, Professor

Takashi KUMAMOTO, Professor

Nobuhisa MATTA, Professor

Koji UNO, Professor

Research Themes :

- 》 Modeling of seismic waves and study on strong motion [Takenaka]
- 》 Evolution of the Earth and planetary interior [Urakawa]
- 》 Mineral physics at high-pressure and temperature [Urakawa]
- 》 Tectonics of the Asian continent from paleomagnetism [Uno]
- 》 Neotectonics and Tectonic geomorphology [Matta]
- 》 Seismic hazard assessment of active faults in Japan [Kumamoto]

Representative Publication :

- H. Takenaka, M. Komatsu, G. Toyokuni, T. Nakamura, and T. Okamoto, Quasi-Cartesian finite-difference computation of seismic wave propagation for a three-dimensional sub-global model, *Earth, Planets and Space*, 69:67, doi:10.1186/s40623-017-0651-1 (2017).
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- K. Uno, K. Furukawa, and Y. Hatanaka, An analysis of apparent polar wander path for southwest Japan suggests no relative movement with respect to Eurasia during the Cretaceous, *Phys. Earth Planet. Inter.* **267**, pp. 19-30 (2017).
- N. Matta, Y. Ota, WS Chen, Y. Nishikawa, M. Ando, LH Chung, Finding of Probable Tsunami Boulders on Jiupeng Coast in Southeastern Taiwan. *Terrestrial, Atmospheric and Oceanic Sciences*, **24**, pp.159-163. (2013).
- T. Kumamoto, K. Oonishi, Y. Futagami and M. W. Stirling, Examination of the correlation between tectonic landforms and shallow subsurface structural datasets for the estimation of seismic source faults. *Earthquake, Tsunami and Nuclear Risk-Beyond the Fukushima Springer*, 3-30. (2016).

Research Area : Geochemistry and Cosmochemistry

(URL: <http://earth.desc.okayama-u.ac.jp/>)

Katsuyuki YAMASHITA, Associate Professor

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Osamu OKANO, Assistant Professor

Research Themes :

- 》 Time-scale on meteorite parent body and planet formation [Yamashita]
- 》 Isotopic study on origin and evolution of solar system materials [Yamashita]
- 》 Reconstruction of paleo-climate and paleo-environments using coral skeletons [Inoue]
- 》 Study of biomineralization of marine biogenic carbonates [Inoue]
- 》 Chemical differentiation processes in the formation of chondrite parental bodies [Okano]
- 》 Geochemical characteristics and petrogenesis of Cenozoic igneous rocks in Southwest Japan [Okano]

Representative Publication :

- Onoue, T, Zonneveld, J-P., Orchard, M. J., Yamashita, M., Yamashita, K. Sato, H. and Kusaka, S., Paleoenvironmental changes across the Carnian/Norian boundary in the Black Bear Ridge section, British Columbia, Canada, *Palaeogeography, Palaeoclimatology, Palaeoecology* 441, 721–733 (2015).
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Research Area : Atmospheric and Hydrospheric Sciences

(URL: https://www.gnst.okayama-u.ac.jp/en/about_us/stafflist_elms_en/)

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Teruo AOKI, Professor

Kuranoshin Kato, Professor

George L. Hashimoto, Associate Professor

Research Themes :

- 》 Mechanism Analysis on Climate Change and Variability [Nozawa]
- 》 Climate Modeling and Global Warming Projection [Nozawa]
- 》 Radiation process in cryosphere [Aoki]
- 》 Satellite Remote Sensing of Snow/ice surface [Aoki]
- 》 Multi-scale Weather and Climate System, Related Extreme Events and Climate Variability in East Asia [Kato]
- 》 Interdisciplinary Research on Climate, its Variability and Cultural Understanding Education [Kato]
- 》 Evolution of Planetary Surface Environment [Hashimoto]
- 》 Planetary Climatology [Hashimoto]

Representative Publication :

- H. Kawase, T. Takemura, and T. Nozawa, Impact of carbonaceous aerosols on precipitation in tropical Africa during the austral summer in the twentieth century, *J. Geophys. Res.*, **116**, D18116, doi:10.1029/2011JD015933 (2011).
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