2024 President's Commendation, Kanazawa University

Academic Category

YOSHIDA Isshin

Division of Material Chemistry, Graduate School of Natural Science and Technology [Master's Level Section]

He studied on the mechanistic insights into the self-assembly of the penta-coordinated vanadium-oxygen clusters. Through the rational synthesis, the oxidation state control of the cluster and metal-substitution into the cluster was achieved. He found out that the oxidative catalytic performance toward alcohols, sulfides, and alkene could be controlled by the cluster derivatives. These results provided the novel approach to control the local structures of inorganic materials and to design the reactivity. These works are highly evaluated both in Japan and overseas.

NI SHENGBIN

Division of Material Chemistry, Graduate School of Natural Science and Technology [Doctoral Level Section]

Ni has developed a series of remediation technologies to cadmium- and lead-contaminated soils, including chemical washing with biodegradable chelating agents and surfactants, and stabilization treatment with inorganic salts. He also established a methodological concept called the "best mix of soil remediation treatment" to achieve the optimal purification effect by selecting a combination of remediation technologies according to the properties of the soil and the cause of contamination. His research results are internationally recognized for their cutting-edge and academic quality.

IPPITSU Ryohei

Division of Natural System, Graduate School of Natural Science and Technology [Doctoral Level Section]

He elucidated the mechanical properties and microstructural changes under impact tests. He also developed a new apparatus of impact test suitable for soft materials, and established as a mechanical testing method with high precision over a wide range of the deformation rates. His contribution is highly appreciated for expanding the application of plastics into durable products such as mobility and infrastructure.

OKUDA Takeshi

Division of Medicine, Graduate School of Medical Sciences [Doctoral Program]

Using postmortem human brains, alterations in inhibitory GABA neurons in the prefrontal cortex were compared across schizophrenia, bipolar disorder and major depression. Compared to unaffected healthy individuals, those with these disorders exhibited diagnosis-specific patterns of alterations in GABA neurons, where affected subtypes of GABA neurons differ across the diagnoses. These alterations were not associated with certain clinical features that cross diagnostic categories or other factors, such as psychotropic medications and suicide. Diagnosis-specific alterations in prefrontal GABA neurons may represent a neuronal mechanism underlying cognitive impairments in each of the three disorders, offering potential insights for developing effective treatments.

KAMEYA Narufumi

Division of Medicine, Graduate School of Medical Sciences
[Doctoral Program]

Conventionally, the mechanisms for removing waste products and amyloid ß from the cerebrum has been studied mainly using mice. Instead of mice, he conducted research using the cerebrum of higher mammal ferrets, which has characteristics similar to that of humans, and as a result, he discovered a new mechanism for excreting waste products efficiently from the cerebrum. Furthermore, when he analyzed the human cerebrum, it was suggested that this excretion mechanism also exists in the human cerebrum. Therefore, the results of this research are expected to lead to the elucidation of the pathogenesis of Alzheimer's disease and the establishment of preventive methods, and have received high praise internationally.

XU PINGPING

Division of Medicine, Graduate School of Medical Sciences
[Doctoral Program]

She engaged in the core research theme of the Department of Cellular and Molecular Function Analysis: "Elucidation of the Mechanism of Peripheral Biological Clock Regulation and the Development of Therapeutic Methods for Its Disruption." She played a central role in elucidating how a GLP-1 receptor agonist, which is clinically applied as a diabetes treatment, regulates the peripheral clock and in determining its appropriate use as a peripheral clock regulator. Her findings were highly acclaimed worldwide.

BIAN YUFAN

Division of Medicine, Graduate School of Medical Sciences
[Doctoral Program]

To elucidate neuronal substrate for working memory (WM) dysfunction in schizophrenia, she assessed expression levels of activity-regulated, pyramidal neuron-selective transcripts across the multiple cortical regions in the cortical WM memory network using postmortem human brains. She found that levels of BDNF and NPTX2 mRNAs were lower across all regions and that the regional pattern of deficits in these transcripts was similar to that reported in transcripts of inhibitory GABA neurons. These findings suggest that lower activity of pyramidal neurons expressing BDNF and/or NPTX2 contribute to alterations in GABA neurons across the WM network and possibly to the WM impairments in schizophrenia.

TAKEMOTO Seiya

Division of Pharmacy, Graduate School of Medical Sciences
[Doctoral Program]

He clarified the pharmacokinetic and physiological significance of methylation of adenosine on RNA (m^6A modification) by demonstrating that m^6A modification regulates the expression of CES2, an enzyme metabolizing drug and lipid in the liver. These findings are expected to provide a foundation for understanding pharmacokinetics and drug-drug interactions, as well as for the development of personalized medicine.

KUROSAWA Kiamu

Division of Pharmaceutical Sciences, Graduate School of Medical Sciences [Doctoral Level Section]

He showed that the ncBAF complex, which controls chromatin structure, regulates transactivation by the nuclear receptor PXR, which plays an important role in regulating xenobiotic metabolism, gluconeogenesis, and lipid synthesis in the liver. The activation of PXR by drugs has potential to increase the risk of drug-drug interactions and adverse effects such as hepatic steatosis, but no practical PXR inhibitors had been identified for clinical, and this study revealed that ncBAF inhibitors may be useful in reducing the risk of adverse effects associated with PXR activation.

MAEDA Tatsuya

Division of Health Sciences, Graduate School of Medical Sciences [Doctoral Level Section]

As a collaborative research with a company, he carried out the development of medical X-ray shielding. Starting with basic theoretical research, simulations and the creation and evaluation of prototypes, he constructed a path to product development. His energetic research led to the successful development of many new products with a scientifically correct approach. He also conducted energetic basic research into X-ray exposure dose measurement, resulting in many collaborative research projects between Kanazawa University, hospitals, and other universities.

TERANISHI Aki

Division of Nano Life Science, Graduate School of Frontier Science Initiative [Master's Level Section]

He elucidated the unidirectional control mechanism of morphogenesis, which is one of the fundamental principles of organogenesis. To achieve this, he developed a device capable of measuring the elasto-plastic properties of three-dimensional tissues—something previously considered impossible—and applied it to cultured cells, organoids, and embryonic tissues. As a result, he discovered that epithelial tissue can sense both the duration and magnitude of applied deformation and switch between elastic and plastic responses accordingly, much like a toggle switch. This breakthrough provides a novel explanation for the unidirectionality of morphogenesis, a long-standing mystery in developmental biology, and has been highly regarded on an international scale.

ECHIZEN Kensuke

Division of Nano Life Science, Graduate School of Frontier Science Initiative [Doctoral Level Section]

He developed a novel method for living polymerization of phenylacetylene derivatives in water. This method enabled the synthesis of water-soluble poly(phenylacetylene) derivatives having diverse functional groups at both chain ends in water. In addition, he successfully synthesized novel conjugated polyene derivatives with axial chirality, demonstrating their application as circularly polarized luminescent materials. These achievements are not only highly evaluated academically, but are expected to lead to the development of new functional materials.

MOHAMMAD SHAHIDUL ALAM

Division of Nano Life Science, Graduate School of Frontier Science Initiative [Doctoral Level Section]

To establish the Nanoendoscopy AFM (NE-AFM) technique that enables direct observation of the inside of living cells, he established a needle probe fabrication method and optimized the conditions for its insertion into living cells. Furthermore, these techniques enabled direct observation of focal adhesions' growth and decay processes in living cells. In addition, he fabricated a 3D model structure composed of carbon nanotubes and compared its 3D-AFM observation results with simulations to clarify why NE-AFM can visualize intracellular 3D structures. These results have been published in internationally renowned journals and conferences and are highly evaluated domestically and internationally.

Social Activities Category

KITAMURA Jin

School of Teacher Education, College of Human and Social Sciences

He rescued a driver, who was unconscious in a car that had stopped in the roadside grass after a single-car accident. Since the driver was not breathing, he performed a cardiac massage and prepared an AED until the ambulance arrived. The driver recovered to the point where he was able to breathe spontaneously and was taken to the hospital by ambulance. For this action, which contributed to saving a life through appropriate measures, he was awarded the "Fire Department Cooperation Award" by the Kanazawa City Fire Department.