Preface

It is a great pleasure to publish the 30th volume of the Institute for Chemical Research (ICR) Annual Report. ICR was established as the first research institute of Kyoto University in 1926, with the founding philosophy "To Excel in the Investigation of Basic Principles of Chemistry and Their Applications." Since 1994, ICR Annual Report has been published annually to disseminate ICR's current activities worldwide. We currently have 120 faculty members, 200 graduate students, including 50 from abroad, and 60 researchers. These scientists are grouped into 30 laboratories divided into five research divisions—Synthetic Chemistry, Materials Chemistry, Biochemistry, Environmental Chemistry, and Multidisciplinary Chemistry—and three research centers—Advanced Research Center for Beam Science, International Research Center for Elements Science, and Bioinformatics Center. The laboratories are diversely affiliated with the graduate schools of science, engineering, agriculture, pharmaceutical sciences, medicine, and informatics.

The research of ICR encompasses a wide range of scientific disciplines, including physics, biology, and informatics as well as chemistry. ICR members conduct cutting-edge research not only in fields of their own specific disciplines but also in interdisciplinary and innovative fields. Some of outstanding research achievements in 2023 are as follows: *1) Unusual Nuclear Exchange within a Germanium-Containing Aromatic Ring that Results in Germanium Atom Transfer; 2)Synthesis of Tertiary Alkylphosphonate Oligonucleotides through Light-Driven Radical-Polar Crossover Reactions; 3) Location-Selective Immobilisation of Single-Atom Catalysts on the Surface or within the Interior of Ionic Nanocrystals Using Coordination Chemistry; 4) Magnetization Control of Zero-Field Intrinsic Superconducting Diode Effect; 5) Synergistic Surface Modification of Tin–Lead Perovskite Solar Cells; 6) Generation of Third-Harmonic Spin Oscillation from Strong Spin Precession Induced by Terahertz Magnetic Near Fields; 7) Genomic Adaptation of Giant Viruses in Polar Oceans.* Other distinctive achievements were presented also in the 123rd ICR Annual Symposium on December 1, 2023.

ICR collaborates with other research institutions on projects including MEXT Inter-University Collaborative Project "Integrated Consortium on Chemical Synthesis", MEXT Large-scale Scientific Research Project "Spintronics Research Network of Japan", and Research Unit for Realization of Sustainable Society in the Kyoto University Research Coordination Alliance. We have also been engaged in over 60 international collaborations with overseas universities and research institutions. In 2018, based on our strong global activity in chemistry-oriented fields, ICR was certified by MEXT as an International Joint Usage/Research Center. To encourage young researchers we have established several programs to support research and postgraduate education, including an in-house annual grant system, "ICR Grant for Promoting Integrated Research." These collaborative achievements underline our commitment to promoting ICR as a global research hub in chemistry-related fields.

The world around us is undergoing a wave of changes. The growing economy has exposed various global problems including climate change and social inequity. For a just and sustainable society, science and technology must become a credible beacon of light. ICR contributes to this goal by providing leadership and expertise in scientific research, fostering multidisciplinary, chemistry-related communities, and developing new and technologically significant innovations. We hope this Annual Report will serve to update you on the progress of our research activities and globalization. We appreciate your continued encouragement and support.

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Director