ICR News 2010

Joint Usage/Research Center: Frontier/Interdisciplinary Research Core in ICR for Deepening Investigation and Promoting Cooperation in Chemistry-Oriented Fields

Prof WATANABE, Hiroshi (Vice-Director of ICR)

Institute for Chemical Research (ICR) has been functioning, since April 2010, as the Joint Usage/Research Center (JURC) to deepen the investigation and promote the cooperation in chemistry-oriented fields. 68 joint research subjects have been adopted this year; please see p.67 for details. Several frontier instruments, including 800MHz Multi-purpose Nuclear Magnetic Resonance Spectrometer and Fourier Transform Ion Cyclotron Resonance Mass Spectrometer, have been newly equipped and utilized in the cooperative researches, and a management office for those common-use instruments has been also organized. The activity of JURC/ICR will bring a breakthrough into the global researches in the chemistry-oriented fields.

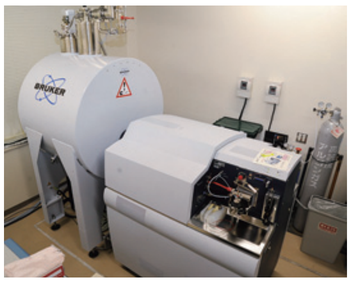
The management office for the common-use instruments

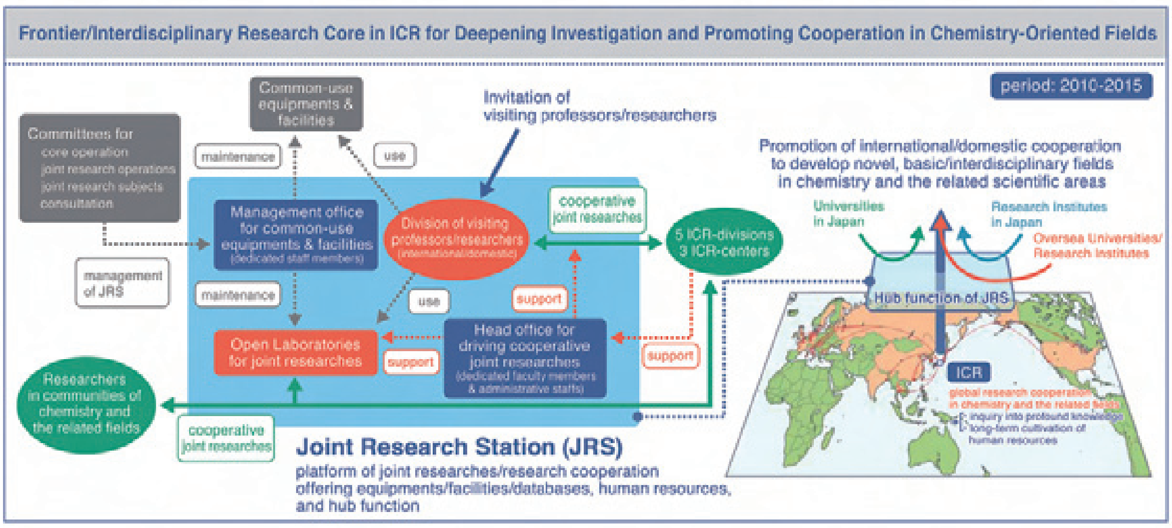
Versatile Super-High Field Nuclear Magnetic Resonance (NMR)

This 800 MHz NMR can be used both for solution- and solid-state measurements. 5 mmϕ multinuclear double-resonance probe, 5 mmϕ inverse detection triple-resonance probe, 10 mmϕ multinuclear double-resonance probe, triple-resonance CP/MAS probe, and high spinning speed CP/MAS probe are available.

Fourier Transform Ion Cyclotron Resonance Mass Spectrometer with 7.05 T Super Conducting Magnet (FT-ICR-Mass)

A Bruker Daltonics SolariX Qq-FT-ICR Mass Spectrometer, equipped with ESI, APCI, and MALDI ion sources with CID, ECD, and ETD fragmentation, enables ultra-high resolution (FWHM max >1,000,000) and ultra-high sensitivity (100 atmol) mass spectrometry measurements.

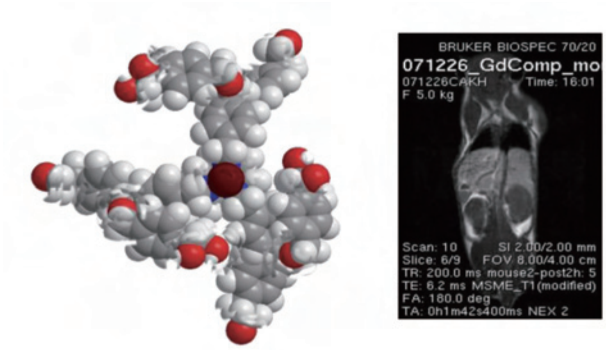




Division of Multidisciplinary Chemistry, Interdisciplinary Chemistry for Innovation (1 December 2010~)

Prof TOSHIMITSU, Akio

I feel it happy to come back to ICR, where I had been engaged in the research work for 30 years in the field of synthetic organic chemistry as an undergraduate and graduate student and as a researcher. I had been interested in asymmetric synthesis. In 2002, I moved to International Innovation Center to serve Kyoto University in the coordination of Industry-Academia partnership and in the application and license of intellectual properties. Recently my research interest has shifted to the design and synthesis of organic compounds which are attractive to industrial society from the viewpoint of innovation. The examples include pyrene derivatives used in light-emitting field-effect transistors, sugar-fullerene linked compounds used in photodynamic therapy of cancers, and gadolinium complex of chiral dendrimers used in magnetic resonance imaging of cancers (shown in the figure).



Gadolinium complex of chiral dendrimer (left) used in magnetic resonance imaging of cancer in mouse (right)

MEXT Project of Integrated Research on Chemical Synthesis (2010-2016)

Prof OZAWA, Fumiyuki (Director of IRCELS)

Organization

Elements Chemistry Research Station:
Institute for Chemical Research, Kyoto University

Molecular Chemistry Research Station:
Research Center for Materials Science, Nagoya University

Assembly Chemistry Research Station:
Institute for Materials Chemistry and Engineering, Kyushu University

Catalysis Chemistry Research Station:
Catalysis Research Center, Hokkaido University

The 1st Symposium on Material Synthesis
(3-4 December 2010, at Kyoto University)

A strong cooperative and collaborative research program will facilitate future advances in chemical synthesis. Our society expects innovative and highly functional materials. In order to respond to these demands, the education and training of young scientists would also benefit from a research environment that exposes them to different branches of materials chemistry. The purpose of this joint research program is to develop novel synthetic chemistry for production of new materials through the intimate cooperation of four highly recognized research groups. Examples of new materials and technologies that could arise from this research include: supramolecular organic electronics devices, metallic oxide nanoparticles, hydrogen production catalysts, electronic display device materials driven by structural control macromolecules, and hetero-atom conjugated materials with novel optical and electronic properties. These novel materials are expected to contribute to nano-science and materials science.

http://jointproject-cscri.rcms.nagoya-u.ac.jp/english/index.html