

World Premier International Research Center Initiative (WPI) FY2011 WPI Project Progress Report (Post-Interim Evaluation)

Host Institution	Kyoto University	Host Institution Head	Hiroshi Matsumoto
Research Center	Institute for Integrated Cell-Material Sciences (iCeMS)	Center Director	Norio Nakatsuji

Common instructions:

* Unless otherwise specified, prepare this report from the timeline of 31 March 2012.

* So as to base this fiscal year's follow-up review on the document "Post-interim evaluation revised center project," please prepare this report from the perspective of the revised project.

* Use yen (¥) when writing monetary amounts in the report. If an exchange rate is used to calculate the yen amount, give the rate.

Summary of State of WPI Center Project Progress (write within the space of this page)

1. Conducting research of the highest world level

1) Clarified mission statement: Following extensive internal discussion, in FY 2011 the iCeMS clarified its mission: "to create new cross-disciplinary fields through integration of the cell and material sciences with a focus on *stem cell science and technology* and *mesoscopic science and technology*, bringing about innovations in medicine, pharmaceuticals, the environment, and industry." Meanwhile, the mesoscopic concept has received increasing attention as part of the U.S. Department of Energy's future strategic plans.

2) Publications: In FY 2011, the iCeMS published **204** peer-reviewed papers, **25 (12%)** of which in journals with IF 10 or more, and **92 (45%)** with IF 5 or more. These clearly demonstrate the iCeMS' high level of productivity of influential papers.

2. Advancing fusion of various research fields

1) Strategies: 1. Cross-Disciplinary Research Task Force established; 2. 10 top-priority projects selected; 3. iCeMS exploratory cross-disciplinary grants expanded; 4. the iCeMS Katsura Lab established for collaborative polymer chemists; 5. shared imaging center (CeMI) strengthened.

2) Publications: In FY 2011, over **40** interdisciplinary collaborative projects have been identified, **10** of which have been given top priority. **14** papers resulting from collaborative projects have been published or accepted, **7** of which came out of the 10 top-priority projects.

3. Globalization of the institution

1) New international journal *Biomaterials Science*: Launched in January 2012 in collaboration with the Royal Society of Chemistry (RSC) in the UK, marking an important point of progress for cell-material integration and mesoscopic sciences.

2) Mutual satellite labs: Established at the iCeMS in Kyoto and NCBS-inStem in Bangalore, India.

4. Implementing organizational reforms

The iCeMS has succeeded in implementing numerous organizational reforms. One of these, the cross-disciplinary model, has strongly influenced Kyoto University's plans for research, education, and administration. A blueprint for the future states that "the university should strongly promote multi-disciplinary studies by establishing hubs for such research," a principle that has been incorporated into a 10-year strategic plan for growth.

5. Efforts to secure the center's future development over the mid- to long term

1) Evaluation and reorganization: 1. Appointment renewal (including of PIs) and promotion strictly based on scientific merit; 2. recruitment of new top-level scientists with possible WPI program end in view.

2) Fostering young researchers: 1. Promotion criteria clarified within the iCeMS; 2. young researchers encouraged to teach; 3. Co-Mentor Program established; 4. increase in the Overseas Visit Program for Young Researchers; 5. iCeMS exploratory cross-disciplinary grants expanded.

3) Expanding collaboration with the Center for iPS Cell Research and Application (CiRA): iCeMS-CiRA relations have been clarified, and multiple joint projects are progressing. From June 16, 2012, Prof **Yamanaka** will be employed by the CiRA, while continuing to serve as CiRA Director and as an iCeMS PI, along with 6 of his faculty already employed by the iCeMS.

4) Beyond WPI-iCeMS: In the host institution commitment submitted in 2012, university President Matsumoto described proactive support beyond WPI-iCeMS as follows: a new "global multidisciplinary research hub," which may retain a core of the integrated cell-material sciences while progressively incorporating new research fields, will be supported by the internationally- and human resources-oriented spirit of strategic management brought to maturity at the iCeMS.

- Please concisely describe the progress being made by the WPI center project from the viewpoints described below.
- In addressing the below-listed 1-6 criteria, please place emphasis on the following:
 - (1) Whether research is being carried out at a top world-level (including whether research advances are being made by fusing fields).
 - (2) Whether a proactive effort continues to be made to establish itself as a “truly” world premier international research center.
 - (3) Whether a steadfast effort is being made to secure the center’s future development over the mid-to long term.
- Please prepare this report within 10-20 pages (excluding the attached forms).

1. Conducting research of the highest world level

(1) Clarified mission statement

Following extensive discussions and consultations, the iCeMS in FY2011 clarified its mission as follows. The iCeMS’ mission is “to create **new cross-disciplinary fields through the integration of cell and material sciences** with a focus on *stem cell science and technology* and *mesoscopic science and technology*, bringing about innovations in medicine, pharmaceuticals, the environment, and industry.” Meanwhile, the mesoscopic concept has received increasing attention as part of the U.S. Department of Energy’s future strategic plans.

(2) Peer-reviewed publications

a) Up to FY 2010

By FY 2010, the iCeMS achieved outstanding results in cell biology, chemistry, and physics, resulting in **464** papers, **59 (13%)** of which in journals with an impact factor (IF) of 10 or more.

Most notably: 1) reprogramming and iPS cell research by the **Yamanaka** lab with papers in *Nature* (2009), *Science* (2008, 2008), *Cell* (2007), etc and 2) functional porous materials research by the **Kitagawa** lab with papers in **7** *Nature* journals, **11** in *Angew Chem Int Ed* (IF 12.7, the highest in the field except review journals), etc.

b) Newly in FY 2011

In FY 2011, the iCeMS published **204** peer-reviewed papers, **25 (12%)** of which in journals with IF 10 or more, and **92 (45%)** with IF 5 or more. To draw a comparison, only 2% and 6% of all journals registered in Thomson Reuters *Journal Citation Reports 2010** have IF 10 or more and 5 or more, respectively. These clearly demonstrate the iCeMS’ high level of productivity of influential papers.

*This latest version of the Thomson Reuters database is designed “to critically evaluate the world’s leading journals, with quantifiable, statistical information based on citation data.”

Notable papers from FY 2011, all of which appeared in journals with IF 10 or more, include:

- Direct reprogramming of somatic cells is promoted by maternal transcription factor Glis1 [Yamanaka lab, *Nature*; 2011]
- A DNA-based molecular motor that can navigate a network of tracks [Sugiyama lab, *Nat Nanotechnol*; 2012]
- Gas detection by structural variations of fluorescent guest molecules in a flexible porous coordination polymer [Kitagawa lab, *Nat Mater*; 2011]
- A more efficient method to generate integration-free human iPS cells [Yamanaka lab, *Nat Methods*; 2011]
- A single-molecule platform for investigation of interactions between G-quadruplexes and small-molecule ligands [Sugiyama lab, *Nat Chem*; 2011]
- A Mitochondrial Surface-Specific Fluorescent Probe Activated by Bioconversion [Uesugi lab, *Angew Chem Int Ed*; 2011]
- Carbon Nanotube Wiring of Donor-Acceptor Nanograins by Self-Assembly and Efficient Charge Transport [Imahori lab, *Angew Chem Int Ed*; 2011]
- Giant Negative Thermal Expansion in the Iron Perovskite SrCu₃Fe₄O₁₂ [Takano lab, *Angew Chem Int Ed*; 2011]
- Fusion of Phosphole and 1,1'-Biacenaphthene: Phosphorus(V)-Containing Extended pi-Systems with High Electron Affinity and Electron Mobility [Imahori lab, *Angew Chem Int Ed*; 2011]
- Sequential Functionalization of Porous Coordination Polymer Crystals [Kitagawa lab, *Angew Chem Int Ed*; 2011]
- Confinement of Mobile Histamine in Coordination Nanochannels for Fast Proton Transfer [Kitagawa lab, *Angew Chem Int Ed*; 2011]

- Post-Crystal Engineering of Zinc-Substituted Myoglobin to Construct a Long-Lived Photoinduced Charge-Separation System [**Kitagawa, Tanaka** labs, *Angew Chem Int Ed*, 2011]
- BaFeO₃: A Ferromagnetic Iron Oxide [**Takano** lab, *Angew Chem Int Ed*, 2011]
- Single-Molecule Analysis Using DNA Origami [**Sugiyama** lab, *Angew Chem Int Ed*, 2012]
- Synthesis of Prussian Blue Nanoparticles with a Hollow Interior by Controlled Chemical Etching [**Kitagawa** lab, *Angew Chem Int Ed*, 2012]
- Zinc-Finger Proteins for Site-Specific Protein Positioning on DNA-Origami Structures [**Sugiyama** lab, *Angew Chem Int Ed*, 2012]
- Cellulose Hydrolysis by a New Porous Coordination Polymer Decorated with Sulfonic Acid Functional Groups [**Kitagawa** lab, *Adv Mater*, 2011]
- Hierarchical mesoscale domain organization of the plasma membrane [**Kusumi** lab, **NCBS-inStem Satellite Lab Group**, *Trends Biochem Sci*, 2011]
- Fundamental and functional aspects of mesoscopic architectures with examples in physics, cell biology, and chemistry [**Kalay**, *Crit Rev Biochem Mol Biol*, 2011]

(3) Honors and awards to date and in FY 2011

a) Up to FY 2010

Since 2007, numerous honors and prizes have been awarded, including: Thomson Reuters Citation Laureates (Profs **Kitagawa** and **Yamanaka**, 2010), Lasker Award (Prof **Yamanaka**, 2009), Humboldt Award (Prof **Kitagawa**, 2008), and MEXT National Institute of Science and Technology Policy (NISTEP) Prize (Prof **Imahori**, 2007).

b) Newly in FY 2011

Awards conferred in FY 2011 include: U.S. National Academy of Sciences memberships (Profs **Heuser** and **Yamanaka**, May 2011), Wakayama Prefecture Culture Award (Prof **Nakatsuji**, 2011), ISSCR McEwen Centre Award for Innovation (Prof **Yamanaka**, 2011), Kyoto Newspaper Grand Prize (Prof **Kitagawa**, 2011), Member of the Science Council of Japan (Prof **Kitagawa**, 2011), The Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology, Prize for Science and Technology Research (Prof **Kitagawa**, 2011), and German Innovation Award "Gottfried Wagener Prize 2010" (Prof **Uesugi**, 2011).

(4) Obtained major grants [Grantee, JPY millions/year]

a) Major competitive grants continued in FY 2011

- Cabinet Office's Funding Program for World-Leading Innovative R&D on Science and Technology (FIRST) for iPS cell research and application [Prof **Yamanaka**, 1,225]
- Cabinet Office's Funding Program for Next Generation World-Leading Researchers (NEXT) program [Profs **Harada**, **Kengaku**, **Sengoku**, **Ueno** and **Uesugi**, 56 each on average]
- Ministry of Economy, Trade and Industry's New Energy and Industrial Technology Development Organization (NEDO) programs for stem cells R&D [Prof **Nakatsuji**, 458]
- Japan Science and Technology Agency (JST) program for Development of Systems and Technology for Advanced Measurement and Analysis [Prof **Kusumi**, 53]
- Japan Science and Technology Agency (JST) program for Advanced Low Carbon Technology Research and Development Program(ALCA) [Prof **Imahori**, 74]
- Japan Science and Technology Agency (JST) program for Strategic Basic Research Programs (CREST) [Prof **Tanaka**, 49]

b) Major competitive grants newly obtained in FY 2011

- Ministry of Education, Culture, Sports, Science and Technology project for realization of regenerative medicine [Prof **Yamanaka**, 516]
- Ministry of Economy, Trade and Industry's New Energy and Industrial Technology Development Organization (NEDO) programs for:
 - porous materials R&D [Prof **Kitagawa**, 60]
 - magnetic nanoparticles R&D [Prof **Takano**, 59]
- Japan Science and Technology Agency (JST) program for Nanotechnology Platform [Prof **Tanaka**, 17, Assistant Prof **Hirori**, 18]

c) Grants-in-Aid for Scientific Research newly obtained in FY 2012

- Of 40 Grants-in-Aid for Young Scientist (A) awarded to all of Kyoto University in FY 2012, the iCeMS received 5 (including 2 for overseas researchers). This number ranks first among university departments, together with the Graduate Schools of Engineering and Medicine.

2. Advancing fusion of various research fields

In the recent 5-year interim evaluation, the iCeMS received a rank of A⁻ as well as a firm request to promote interdisciplinary research and produce more highly visible results. In response to this WPI mandate the iCeMS have taken the following initiatives in FY 2011.

(1) Cross-disciplinary research progress in FY 2011

Over 40 interdisciplinary collaborative projects have been identified, 10 of which have been assigned top priority. 14 papers have been published or accepted, 7 of which came out of the 10 top-priority projects (see below for details and current research status).

a) Progress of the 10 top-priority projects

- Control of gene expression by synthesized chemical transcription factors [**Sugiyama, Yamanaka (Yamada), Uesugi, Nakatsuji** labs]
 - **Published:** Synthetic small molecules for epigenetic activation of pluripotency genes in mouse embryonic fibroblasts [*ChemBioChem*; 2011]
- Small molecule tools for stem cell research/applications [**Uesugi, Yamanaka, Ueda, Nakatsuji, Sugiyama** labs]
 - **Submitted and under revision:** Small molecule-induced clustering of heparan sulfate promotes cell adhesion
 - **Submitted and under revision:** A Chemical Probe Selective for Human Pluripotent Stem Cells
- Chemical inducers for differentiation of ES/iPS cells [**Nakatsuji, Uesugi, Sugiyama, Yamamoto** labs]
 - **Submitted:** A novel small molecule that induces cardiac differentiation of human pluripotent stem cells in defined medium under cytokine-free and xeno-free conditions
- Investigating the effects of meso-scale compartments on kinetics of bimolecular reactions in the plasma membrane, and cell membrane single molecule imaging using synthesized glycan probes [**Kusumi, Kiso, Kalay, Ueda** labs, **CeMI**]
 - **Published:** Membrane molecules mobile even after chemical fixation [*Nat Methods*; 2010]
- Novel probes (diamond particle) for investigating cell architecture dynamics [**Harada, Shirakawa, Nakatsuji** labs]
 - **In manuscript**
- Development of new carriers for targeted drug delivery using carbon nanotubes and liposomes functionalized by peptides and gyco-coating [**Murakami, Hashida, Imahori, Kiso, Takano** labs]
 - **Accepted:** Development of a novel composite material with carbon nanotubes assisted by self-assembled peptides designed in conjunction with β -sheet formation [*J Pharm Sci*; in press]
- Development of light-harvesting functional materials for phototherapy and photoregulation of cell functions [**Murakami, Imahori, Mori, Heuser, Hashida, Kengaku, Nakatsuji** labs]
 - **Published:** Utilization of photoinduced charge-separated state of donor-acceptor-linked molecules for regulation of cell membrane potential and ion transport [*J Am Chem Soc*; 2012]
- Mesoscopic theory of cellular function and supramolecular chemistry [**Kalay, Kusumi, Kitagawa, Nakatsuji** labs]
 - **Published:** Fundamental and functional aspects of mesoscopic architectures with examples in physics, cell biology, and chemistry [*Crit Rev Biochem Mol Biol*; 2011]
 - **Published:** Confining domains lead to reaction bursts: reaction kinetics in the plasma membrane [*PLoS ONE*; 2012]
 - **Published:** Porous coordination polymer hybrid device with quartz oscillator: Effect of crystal size on sorption kinetics [*J Am Chem Soc*; 2011]

b) Other published cross-disciplinary projects

- Chemical Library Screening Identifies a Small Molecule That Downregulates SOD1 Transcription for Drugs to Treat Amyotrophic Lateral Sclerosis [Inoue (CiRA PI), Uesugi, Nakatsuji labs, *J Biomol Screen*; 2011]
- Modification of Porous Protein Crystals in Development of Biohybrid Materials [Tanaka, Ueno (Kitagawa) labs, *Bioconjugate Chem*; 2010]
- A DNA-based molecular motor that can navigate a network of tracks [Sugiyama lab, *Nat Nanotechnol*; 2012]
- A Mitochondrial Surface-Specific Fluorescent Probe Activated by Bioconversion [Uesugi lab, *Angew Chem Int Ed*; 2011]
- Post-Crystal Engineering of Zinc-Substituted Myoglobin to Construct a Long-Lived Photoinduced Charge-Separation System [Kitagawa, Tanaka labs, *Angew Chem Int Ed*; 2011]
- Electrospun nanofibers as a tool for architecture control in engineered cardiac tissue [Agladze, Chen labs, *Biomaterials*, 2011].
- Crystal morphology-directed framework orientation in porous coordination polymer films and freestanding membranes via Langmuir–Blodgett [Kitagawa, Kim labs, *J Mater Chem*; 2012]

(2) Key strategies to promote cross-disciplinary research

a) Cross-Disciplinary Research Task Force led by Deputy Director Kitagawa

Original and innovative cross-disciplinary collaborative projects integrating functional smart materials with living cells including stem cells are now underway via collaboration among the Kitagawa, Imahori, Takano, Kiso, Chen, Kusumi, Ueda, Harada, Heuser, Kengaku, and Nakatsuji Labs. Every month many researchers including PIs and young researchers join to present research updates and to explore new areas for collaboration.

b) Selection of the 10 top-priority projects

See (1) above.

c) iCeMS exploratory cross-disciplinary grants

Small startup grants to initiate cross-disciplinary collaboration are provided to junior faculty and postdocs via “iCeMS Exploratory Grants for Junior Investigators,” while the complementary “iCeMS Cross-Disciplinary Research Promotion Project” aids researchers in other departments of the university to start collaborative work with iCeMS researchers (The latter was expanded beyond the iCeMS as a result of a FY 2009 Site Visit suggestion). Exploratory cross-disciplinary research has been strengthened, with a rigorous evaluation system in place. Increased collaboration with young researchers in other Kyoto University departments and institutes is being actively pursued. iCeMS exploratory cross-disciplinary grants and the iCeMS Cross-Disciplinary Research Promotion Project have supported:

- 13 (2009), 29 (2010), 41 (2011) joint projects within iCeMS
- 19 (2010), 15 (2011) joint projects with other Kyoto University departments

d) Establishment of the Katsura Lab

During the FY 2011 Site Visit, one of the suggestions the iCeMS received was to promote joint research on polymer chemistry. In response, the iCeMS has opened a 220 m² shared-use laboratory at Kyoto University's Katsura campus, where 3 professors of the Graduate School of Engineering are joining as adjunct professors to carry out collaborative research focused on smart polymers, including those with phase transitions (gel to solution) that can be triggered by external stimuli. Such polymers can be combined with PCPs for further enhancement of their functionality and compatibility with living cells.

e) Strengthening the iCeMS Center for Meso-Bio Single-Molecule Imaging (CeMI)

CeMI was established to promote effective collaboration via the shared use of large scale and/or unique equipment among iCeMS researchers and collaborating scientists from other departments and organizations. The present state of CeMI utilization is as follows:

- 1) 16 papers were published by CeMI-affiliated researchers in FY 2011, including (see Appendix 1 for a full list):
 - Extraordinary carrier multiplication gated by a picosecond electric field pulse [Tanaka lab, *Nat Commun*; 2011]

- Hierarchical mesoscale domain organization of the plasma membrane [Kusumi lab, *Trends Biochem Sci*; 2011]
 - Facilitated Intracellular Transport of TrkA by an Interaction with Nerve Growth Factor [Harada lab, *Dev Neurobiol*; 2011]
 - The origins and evolution of freeze-etch electron microscopy [Heuser lab, *J Electron Microsc*; 2011]
- 2) **76** users registered: 48 within the iCeMS, 22 from other Kyoto University departments, 6 from other universities.
 - 3) **7** CeMI seminars were held (as part of the iCeMS Seminar series): 10 leading scientists in their fields were invited, including Dr **Karel Svoboda** of Howard Hughes Medical Institute's Janelia Farm Research Campus, and Prof **Kai Simons** of the Max Planck Institute of Cell Biology and Genetics (Dresden).
 - 4) **28** CeMI training sessions were conducted: approximately 90 researchers attended training sessions on microscopy and imaging technology for a total of 63 days.
 - 5) 3-month sabbatical hosted: University of Otago (New Zealand) Assoc Prof **Istvan Abraham** was resident at the CeMI for a 3-month sabbatical, engaging in a joint research into "single molecule detection of estrogen action on receptor molecules" with the Kusumi Lab.
 - 6) Facilitating technical and scientific interactions: Five core facility staff from the National University of Singapore's **Micheal Sheetz Lab**, and PI **Helge Ewers** of the ETH Zurich (Switzerland) Institute of Biochemistry visited the CeMI in May and September 2011, respectively, in order to discuss and share information on the latest advances in single-molecule technology, super-resolution microscopy, and core facility operations.

(3) Other strategies to promote cross-disciplinary research

a) Annual iCeMS retreats for all research staff

- **2009**: Kyoto Prefectural Seminar House (**74** attended, **39** posters presented)
- **2010**: Awaji Yumebutai International Conference Center (**115** attended, **74** posters presented); featured highly stimulating presentations by researchers who had participated in JSPS-sponsored overseas visit programs.
- **2011**: Yoshino Chikurin-in, Nara (**152** attended, **97** posters presented); featured a plenary lecture by Prof **Toshio Yanagida** of Osaka University's WPI center.

b) Cross-disciplinary seminars

49 Cross-disciplinary seminars conducted in FY 2011 as a core element of regular PI meetings.

c) Young Scientists' Colloquia series initiated by the Kyoto Fellows

In April 2012 the iCeMS is launching a new, cross-disciplinary series of informal scientific talks and social gatherings entitled the "Young Scientists' Colloquia & Happy Hour Series". These will be open to all scientists interested in attending a casual forum for exchanging ideas and getting to know other researchers. The idea for the colloquia was born out of a series of informal Friday happy hours initiated by the iCeMS Kyoto Fellows, which have been taking place at the iCeMS for most of FY 2011.

d) Review papers published

- 1) 3 review papers on mesoscopic sciences **published**
 - Function and regulation of ABCA1-membrane meso-domain organization and reorganization [Ueda lab, *FEBS J*; 2011]
 - Hierarchical mesoscale domain organization of the plasma membrane [Kusumi lab, **NCBS-inStem Satellite Lab** group, *Trends Biochem Sci*; 2011]
 - Fundamental and functional aspects of mesoscopic architectures with examples in physics, cell biology, and chemistry [Kalay lab, *Crit Rev Biochem Mol Biol*; 2011]
- 2) 6 review papers **accepted** for publication in a special issue, resulting from multi-disciplinary partner institute collaboration with Heidelberg

Wiley's *Biotechnology Journal* special issue on the July 2011 Heidelberg-Kyoto multi-disciplinary symposium — "Crossing Boundaries: Stem Cells, Materials, and Mesoscopic Sciences" — is scheduled to be published in June 2012, featuring eleven review articles related to the symposium. Papers authored by iCeMS and CiRA scientists are:

- Methods for iPS cell generation for basic research and clinical applications [CiRA PI **Okita**; in press]
- Reaction kinetics in the plasma membrane [Kyoto Fellow **Kalay**; in press]

- Lipid rafts generate digital-like signal transduction in cell plasma membranes [Assoc Prof **Suzuki** (NCBS-inStem Satellite Lab group); in press]
- Stochastic processes in the development of pluripotency in vivo [Prof **Hiiragi**; in press]
- Programmable genetic switches to control transcriptional machinery of pluripotency [Prof **Sugiyama**; in press]
- Phospholipid nanodisc engineering for drug delivery systems [Kyoto Fellow **Murakami**; in press]

3. Globalization of the institution

Describe what's been accomplished or recognized in the efforts to raise the center's international recognition as a genuine top world-level research institute, along with innovative efforts proactively being taken in accordance with the development stage of the center, including the following points, for example:

- Efforts being developed based on the analysis of number and state of world-leading, frontline researchers; number and state of visiting researchers; exchanges with overseas entities
- Proactive efforts to raise the level of the center's international recognition
- Efforts to make the center into one that attracts excellent young researchers from around the world (such as efforts fostering young researchers and contributing to advancing their career paths)

(1) *Biomaterials Science*, a new international journal launched in collaboration with the UK Royal Society of Chemistry (RSC)

In January 2012, the iCeMS started an important project to contribute to the further development of cell-material integration research as well as mesoscopic sciences by launching a new international journal, *Biomaterials Science*, in collaboration with the RSC.

The official journal description is: "*Biomaterials Science is an international, high impact journal bringing together the molecular and mesoscopic interactions of biomaterials and their potential applications. The journal is a collaborative venture between RSC Publishing and the Institute for Integrated Cell-Material Sciences, Kyoto University, Japan.*"

Prof **Nakatsuji** is presently one of two Co-Editors-in-Chief and Prof **Sugiyama** is one of three Associate Editors, working together with other editors in Europe and the United States.

In June 2012, the journal's first editorial board meeting will convene in Chengdu, China. In March 2013, a kick-off symposium will take place in Kyoto, organized as the core component of an iCeMS international symposium.

(2) World top-level researchers and research environment

a) Number of researchers visited iCeMS

Many active world top-level researchers in iCeMS and high-standard research environment have been attracting researchers from around the world. In FY 2011, total **34**. (details in Appendix 5)

b) Eminent researchers with global impact employed at the iCeMS

- Prof **John Heuser**, an internationally recognized authority on electron microscopy, named a National Academy of Sciences Member in May 2011
- Prof **Hiroshi Imahori**, a recognized leader in photochemistry, whose article was selected as one of the "Top 10 Perspective articles from Organic & Biomolecular Chemistry" in 2012
- Prof **Susumu Kitagawa**, the global leader in functional porous materials, named a Thomson Reuters Citation Laureate in 2010
- Prof **Akihiro Kusumi**, a global leader in single-molecule cell biophysics, elected to the American Society for Cell Biology (ASCB) Council in 2010
- Prof **Norio Nakatsuji**, a pioneer in human ES cell line derivation and utilization, plays key roles in international networks of human ES cell and stem cell research
- Prof **Motonari Uesugi**, a recognized leader in chemical biology, awarded the German Innovation Award "Gottfried Wagener Prize 2010"
- Prof **Shinya Yamanaka**, the pioneer and global leader in reprogramming and iPS cells, named a Thomson Reuters Citation Laureate in 2010, and a National Academy of Sciences Member in May 2011

c) Domestic satellite: the Faculty of Applied Biological Sciences, Gifu University

One domestic satellite laboratory was established at Gifu University in 2008, in order to add a world leader in glyco-chemistry. As an iCeMS PI, Prof **Makoto Kiso** collaborates and interacts with other members of the iCeMS in the area of glyco-technology and its application to cell biology.

(3) World-class environment to attract and nurture global, young talent

The iCeMS has established a top-level research environment nurturing global, talented young researchers. Results achieved in FY 2011 are as follows.

a) The Cabinet Office's Funding Program for Next Generation World-Leading Researchers (NEXT) program

5 projects selected (Profs **Harada** and **Uesugi**, and Assoc Profs **Kengaku**, **Sengoku**, and **Ueno**), ranked 5th out of **209** recipient departments across Japan, next only to the graduate schools of engineering at the *University of Tokyo* (9 projects), *Tohoku University* (8), *Osaka University* (6), and the *Tokyo Institute of Technology* (6).

b) High rate of external grants awarded to young researchers

Successful recipients of the FY 2011 Grants-in-Aid for Scientific Research specifically for young scientists (Wakate A and Wakate B) are as follows.

Wakate A: 5 projects newly selected, including **2** overseas researchers (iCeMS Kyoto Fellows **Carlton** and **Kim**), in addition to one continuing project.

Wakate B: 8 projects newly selected, in addition to continuing 8 projects.

c) Awards received by young scientists

- Dr **Namasivayam**, awarded "AAAS Science Days of Molecular Medicine 2011 Best Abstract and Young Investigator Award" in 2011.
- Assoc Prof **Ando**, awarded the "Japan Society for Bioscience, Biotechnology, and Agrochemistry Award for the Encouragement of Young Scientists" in 2012.

d) Career advancement from the iCeMS to prominent institutions (details in Appendix 3)

- An iCeMS associate professor became a full professor at the Graduate School of Bioscience and Biotechnology, Tokyo Institute of Technology.
- An iCeMS assistant professor became a senior lecturer at the Faculty of Education, Shiga University.

(4) Partner institutions

The iCeMS has formed linkages with the following high-level institutions, based on two overall objectives. The first aim is to enhance the academic exchange and traffic of researchers, including postdoctoral and graduate students, with these partners. This point is extremely important in order to position the institute in the global flow of young researcher career paths. The second objective is to enhance the scientific output at the institute and at partner institutions by complementing each other's research expertise and excellence.

a) Partner institution relations in FY 2011

The number of iCeMS' partner institutions as of the end of FY 2010 was **10**. Memoranda of Understanding (MoUs) have been exchanged with most of these institutions.

In FY 2011, the iCeMS newly exchanged MoUs with the following 3 institutions:

- Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), India: MoU exchanged on April 18, 2011; joint symposium held concurrently.
- NIH Center for Regenerative Medicine, National Institutes of Health (NIH CRM), USA: MoU exchanged on November 21, 2011.
- Division of Advanced Materials Science, Pohang University of Science and Technology (POSTECH AMS), Korea: MoU exchanged on November 16, 2011; joint symposium held concurrently.

In addition, in April 2012 the institute is planning to exchange an MoU and hold a joint symposium in Beijing with the following institution, aiming at future collaboration not only in stem cell biology but also biomaterials sciences:

- Center for Life Sciences (CLS) of Peking University and Tsinghua University

b) Notable progress in FY 2011

Among numerous collaborative projects underway with the preceding institutions, four are described in detail below.

1) National Centre for Biological Sciences (NCBS) and the Institute for Stem Cell Biology and Regenerative Medicine (inStem) in Bangalore, India

Based on the MoU, satellite labs established at both the iCeMS and the NCBS-inStem enable long term researcher exchanges and collaboration. The NCBS-inStem Satellite at the iCeMS opened on December 17, 2010. The iCeMS satellite lab in Bangalore on stem cell research and single molecule imaging has been established in the NCBS's new building, which will be completed in Spring 2012. Assoc Prof **Kenichi Suzuki** for single molecule imaging and Senior Lecturer **Kouichi Hasegawa** for stem cell research conduct research activities at the iCeMS' satellite lab in Bangalore as group leaders. Their primary appointments are as faculty members of the iCeMS, while also being appointed respectively as visiting Associate and Assistant Professors of the NCBS from April 17, 2011. Several younger researchers will soon join the laboratory. In Bangalore, research space, facilities, as well as research funds are being provided by NCBS-inStem.

2) Heidelberg University

The Heidelberg-Kyoto joint symposium "Crossing Boundaries: Stem Cells, Materials, and Mesoscopic Sciences" was held in Heidelberg in July 2011. A Total of 296 researchers participated, including 38 from the iCeMS, 3 from CIRA, 6 from other departments and offices of Kyoto University, and the WPI Program Officer from Tokyo. The conference covered all major areas of study being pursued at the iCeMS and at the University of Heidelberg's Collaborative Research Center SFB 873. Over three days, a total of 33 leading researchers (including 10 iCeMS and 1 CIRA scientists) gave presentations, accompanied by 47 poster presenters. A special issue of *Biotechnology Journal*, based on this symposium and with special editors Prof **Nakatsuji** and Prof **Anthony Ho** of SFB 873, will be published in June 2012 featuring 11 review articles. On March 30, 2012, Profs **Nakatsuji** and **Ho** continued their collaboration by co-organizing a session of the 2nd Japanese-German Presidents' Conference (German-Japanese HeKKSAGOn Universities Consortium) hosted by Kyoto University.

3) NIH Center for Regenerative Medicine, National Institutes of Health (NIH-CRM, USA)

The iCeMS and the NIH-CRM signed a Memorandum of Understanding (MoU) in November 2011 aiming at collaboration in stem cell research and related medical applications. A Kyoto University delegation led by Prof **Nakatsuji** paid a visit to the NIH-CRM on March 13 to meet with Dr **Mahendra Rao**, Director of NIH-CRM, and other NIH investigators in order to identify promising directions for collaboration. Prof **Nakatsuji** delivered a talk on ongoing cell-material integration research at the iCeMS, attracting an audience of about 70 from the NIH and elsewhere. Dr **Rao** has pointed out that the collaboration with other countries, especially with Japan, is important in order to strengthen the global network of stem cell research.

4) Center for Life Sciences (CLS), Peking University and Tsinghua University

The iCeMS is planning to exchange an MoU and hold a joint symposium entitled "Crossing Boundaries: Stem cells, Materials, Mesoscopic Sciences and Beyond" in Beijing with the CLS in April 2012, aiming at future collaboration related to stem cell biology as well as biomaterials sciences. Prof **Nakatsuji**, Assoc Prof **Sengoku**, and Kyoto University's senior administrators visited Peking Univ in November 2011 to discuss future collaboration between the iCeMS and CLS. Additionally, Kyoto University will host a "Kyoto University Day" at Peking University in the autumn of 2012. Hence the iCeMS-CLS partnership is the spearhead of collaboration between Kyoto and Beijing.

c) Future prioritized plans

The iCeMS intends to achieve even more substantial collaboration through such measures as joint research paper publication in highly ranked journals, and more frequent and longer-term exchanges of young researchers. In order to attain these goals, the institute will prioritize and weight the allocation of personnel and budgets to partner institutions in accordance to their relevance to the iCeMS' research, host institution policies related to internationalization, and other criteria.

(5) Raising international visibility

a) Global advertising strategies

Job and symposium advertisements were placed in *Nature*, *Science*, and German quarterly magazine *Wissenschaft und Forschung Japan* (Science and Research Japan), as well as in program books at large-scale conferences, such as The Federation of European Biochemical Societies (FEBS) special meeting in March 2012.

b) Web traffic analysis

The iCeMS website has marked its fourth consecutive year of growth in traffic, **up 357%** from 3,313 visits per month in 2008 to 11,813 in 2011 (see chart 1).

- Access from overseas has increased for four straight years, **up 525%** from 337 visits per month in 2008 to 1,769 in 2011 (see chart 2).

- The proportion of access from overseas has also risen four years in a row, from 10% in 2008 to 15% in 2011 (see chart 3).



c) Social media utilization

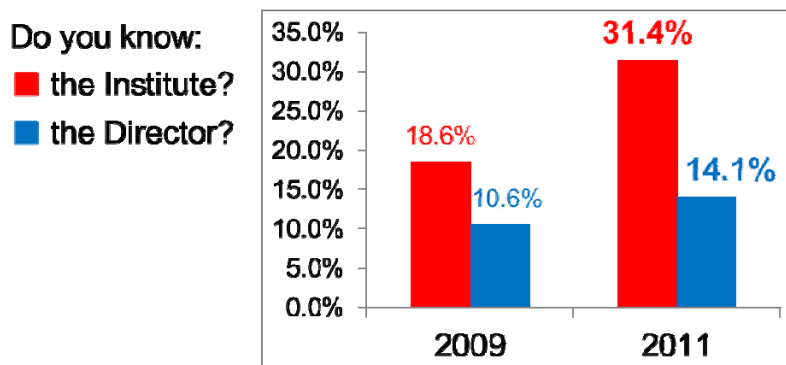
To engage “with” a wider audience across the globe — younger generations of scientists in particular — the iCeMS is also committed to the utilization of social media, such as Twitter (implemented in March 2011), YouTube (December 2011), and Facebook (March 2012).

d) Supporting the WPI program’s AAAS debut

MEXT asked the iCeMS to take a lead role in planning and exhibiting a WPI booth, along with other WPI centers, at the 2012 AAAS annual meeting in Vancouver, Canada. The iCeMS public relations team’s contribution to attracting 2,700 visitors to the booth was especially appreciated at a WPI outreach officers meeting held at JSPS in March 2012.

e) Name recognition survey results improved

Surveys conducted by JSPS in 2009 and 2011 showed that both the iCeMS and its director were increasingly recognized in the scientific community, up 169% from 18.6% to 31.4% for the institute, and up 133% from 10.6% to 14.1% for the director (see chart below).



JSPS survey on WPI name recognition, conducted in 2009 and 2011

(6) Strategic plan to provide a truly international environment

- Overseas researchers account for **33%** (58 out of 177 total).
- **3** out of **5** iCeMS Kyoto Fellows (junior PIs) are from overseas, which brings the ratio of foreign PIs and equivalent to **26%** (6 out of 23).
- Strong support for overseas researchers: 1) Overseas Researchers Support Office established; 2) workshops on obtaining grants held in English.
- **58%** of administrators are bilingual; English-only work practices established.

(7) Global initiatives to attract young scientists

a) Hiring iCeMS Kyoto Fellows

The **iCeMS Kyoto Fellow** position was established to help make the institute an attractive place for the brightest young scientists to develop their careers, with each fellow receiving a total annual budget of 20–30 million yen (including their own salary) and an opportunity to establish an independent lab group. These fellows, PI-level researchers with titles of Assistant Professor or Research Associate, have access to all of the research instruments within the institute. After their 5-year head-start at the iCeMS, they are expected to continue on a further international scientific career, or be promoted at Kyoto University. Such a process will help establish the iCeMS as a prominent hub for building a global scientific career. There are presently 5 fellows (including 3 from overseas), and several more may will be hired in FY2012.

b) Increasing visibility of the iCeMS via the iCeMS-JSPS Overseas Visit Program for Young Researchers

The iCeMS-JSPS Overseas Visit Program for Young Researchers has been implemented since FY 2010 with aims to 1) provide opportunities for young iCeMS researchers to conduct research at overseas institutes, 2) to strengthen participants' international competitiveness, and 3) to enhance the iCeMS' role as an international hub for researchers in related fields. A total of 26 (FY 2009: 1, FY 2010: 10, FY 2011: 15) researchers thus far have earned opportunities to visit world-class institutions, opening the door to further international collaborations and careers.

The iCeMS-JSPS Overseas Visit Program for Young Researchers will be terminated in FY2012 due to an end to financial support from the JSPS. The iCeMS will launch a successor program for young researchers for FY 2013.

c) International symposia

The iCeMS has held many international symposia not only as a main organizer but also as a co-organizer and a sponsor. These attracted many young scientists from across the globe, as well as senior scientists interested in the new and interdisciplinary research being conducted at the iCeMS. Symposia held in FY 2011 are as follows.

- 1) Heidelberg-Kyoto Joint Symposium (and 10th iCeMS International Symposium) "Crossing Boundaries: Stem Cells, Materials, and Mesoscopic Sciences": July 21–23, 2011 in Heidelberg
- 2) MRC-CRM and iCeMS joint symposium "Next Generation Stem Cells: Tools and Technologies Symposium": July 25, 2011 in Edinburgh
- 3) iCeMS Joint International Symposium/Kakenhi Kiban Kenkyu (S) "ABC 2011 in Kyoto": November 16–17, 2011 in Kyoto
- 4) 5th Annual Symposium on Nanobiotechnology "Seoul Nanohealth 2011": November 17–18, 2011 in Seoul
- 5) 11th iCeMS International Symposium "Chemical Control of Cells": December 6, 2011 in Kyoto
- 6) iCeMS-ERATO Symposium: "Porous Coordination Polymers/Metal-Organic Frameworks Towards Controlling Mesoscopic Domains and Functions": March 23, 2012 in Kyoto
- 7) 2nd Japanese-German Presidents' Conference, German-Japanese HeKKSAGOn Universities Consortium Group B (I): Life Sciences "Life and Natural Science Fusion/Crossing the Border": March 30, 2012 in Kyoto

4. Implementing organizational reforms

* If innovated system reforms generated by the center have had a ripple effect on other departments of the host institutions or on other research institutions, clearly describe in what ways.

(1) iCeMS organizational reforms

- Director-led executive decision making in research strategies and management.
- Merit-based annual salary system, including compensation in the form of a bonus (awarded up to 300,000 yen per month).
- Open offices and common labs designed to encourage interaction.
- Strong support for overseas/female researchers.

(2) Positive, multi-layered impact on the host institution

The iCeMS is having a broad and deep impact on Kyoto University, such as in its handling of international public relations, organizational reforms, personnel systems, overseas researcher support, and international collaborations.

a) The existence of iCeMS-like institutions is increasingly recognized as a means to foster multi-disciplinary research

At the time of its establishment in FY 2007, many at Kyoto University expressed doubt regarding the necessity of an iCeMS-like institution. However, in the years since, the iCeMS' unprecedented efforts to create new cross-disciplinary research fields and success in reforming existing research structures have been increasingly well received. Such a shift in attitudes can be seen in the iCeMS' enhanced standing within the university.

The university has raised the iCeMS' profile in its organizational structure, as well as on its website. Additionally, the iCeMS' success in a relatively short period has served as one of the triggers for Kyoto University's overall reform effort, as described in section (3).

b) A showcase of the university's cutting-edge, cross-disciplinary research

As an illustration of the iCeMS' significant impact on multi-disciplinary research at the university, *Kyoto University Research Activities* (issued in July and November 2011 and March 2012), a quarterly publication spotlighting the university's latest developments in a wide array of fields of study, has prominently featured the iCeMS in each issue, with more pages assigned to the institute than to any other department.

c) Promoting university level collaboration between Kyoto University and partner institutions

The iCeMS blazes a trail in collaboration between Kyoto University and overseas institutions.

1) Underpinning Heidelberg-Kyoto ties

In July 2010 the Universities of Heidelberg and Kyoto joined with Karlsruhe Institute of Technology (KIT), Göttingen University, Tohoku University, and Osaka University to sign an agreement forming a six university consortium, further strengthening existing Heidelberg-Kyoto ties. In July 2011, Heidelberg University's Collaborative Research Center SFB 873 and the iCeMS jointly organized a three-day symposium in Heidelberg. Maintaining this momentum, the six-university consortium held its second conference in March 2012 at Kyoto University, focusing on strategic deliberations among the universities' senior administrators. The two-day conference also featured topical meetings, including one organized by Prof **Nakatsuji** and SFB 873 director Prof **Anthony Ho** on the fusion of the life and materials sciences, inviting distinguished researchers in the field from within the six-university framework. Throughout its existence, the iCeMS has played a pivotal role in the development of this six university consortium.

2) Promoting university-level collaboration among Kyoto University, Peking University, and Tsinghua University

Kyoto University will host "Kyoto University Day 2012 at Peking University" in Beijing in November 2012, introducing both universities' research activities and study abroad programs. The iCeMS is taking the initiative in this collaboration between Kyoto and Beijing, holding joint symposium in April 2012 with the Center for Life Sciences jointly established by Peking University and Tsinghua University.

d) Strengthening international public relations and international planning

The iCeMS international public relations and overseas affairs and planning sections, supported by the Innovation Managing Group (IMG) and Science Communication Group (SCG), have played key roles in promoting internationalization of the institute. The activities and personnel management initiatives of both sections have been rated highly, and are being adopted by Kyoto University's administrative headquarters to increase global competitiveness on a university-wide level.

(3) Kyoto University overall reform triggered by WPI-iCeMS

As mentioned above, the iCeMS has made numerous contributions to a wide range of areas within Kyoto University, including in research, education, and administration. As a result of these changes, in FY 2011 Kyoto University enacted the following initiatives seeking to substantially reengineer its research, educational, as well as administrative systems as part of a plan to maintain the university's standing as one of the top research universities in the world.

a) Kyoto University overall administrative reform

Since its establishment in 2007, the new administrative paradigm created by the iCeMS has strongly influenced the future plans for Kyoto University's administration: the use of English as an official language, the hiring bilingual administrative staff (50% or more), and the strengthening of support for overseas researchers. In line with the iCeMS' experiences, Kyoto University is now undertaking substantial administrative reform, such as relocation and centralization of staff, new positions for supporting education and research, and implementation of rigorous evaluation and training systems to increase the efficiency of administration.

1) Employing highly-skilled/experienced staff

Since administration staff are expected to work in close cooperation with faculty, in April 2010 Kyoto University began hiring highly-skilled and experienced staff who act in such a bridge role.

2) Introduction of a merit-based personnel system

Abolishing the rule of promotion by seniority, Kyoto University has adopted a merit-based personnel and salary system. Interviews are now compulsory for promotion.

3) 10-year English training program for staff

Kyoto University initiated a 10-years English training program in FY 2009. All staff (including administrative division heads) must take English courses to develop their language skills to promote internationalization.

b) Kyoto University overall research and educational reform

The iCeMS' cross-disciplinary research model has also strongly influenced future plans for Kyoto University's research and education systems: a future strategy task force recommendation, stating that **the university should strongly promote multi-disciplinary studies by establishing hubs for such research**, was submitted to the university's Deans and Directors on March 8, 2011. Following this recommendation, the President and Executive Directors enacted a "10 Year Plan for Research and Educational Structural Reform Supporting Kyoto University's Growth" (December 6, 2011) and in March 2012 announced a series of procedures to realize this plan.

While it is anticipated that several more years will be necessary in order to reach an overall consensus at the Kyoto University level, the university is committed to use the institute as a role model of a highest world-standard scientific research institution, incorporating the iCeMS' extensive body of knowledge and experience into deliberations defining a future reformed and revitalized Kyoto University.

5. Efforts to secure the center's future development over the mid- to long term

* Please address the following items, which are essential to mid- to long-term center development:

- Future Prospects with regard to the research plan, research organization and PI composition; prospects for the fostering and securing of next-generation researchers
- Prospects for securing resources such as permanent positions and revenues; plan and/or implementation for defining the center's role and/or positioning the center within the host institution's institutional structure
- Measures to sustain the center as a world premier international research center after program funding ends (including measures of support by the host institution)

(1) Research prospects, reorganization of research groups, and fostering next-generation scientists

a) Personnel management and PI contract renewal

Appointment renewal, incorporating a thorough review process with objective, scientific merit-based evaluation, followed by strategic recruitment of new PIs and researchers in order to further advance the iCeMS' aims.

1) Clarification of the appointment renewal process and evaluation criteria

Researchers, including PIs, who have achieved significant scientific progress and are regarded as playing an integral role in the institute will be reappointed according to clearly defined evaluation procedures and rules regarding contract renewal, as follows.

- Results of research conducted at the iCeMS (including originality, applicability, interdisciplinarity, and potential impact on related fields)
- Relevance of research to the iCeMS' overall objectives (in particular, explaining the relevance of their work to cell-material integration)
- Success in acquisition of external grants
- Contributions to external and international organizations (including academic societies, collaboration initiatives involving academia, industry, and government, etc)
- Future research plans

2) In FY 2011, 3 PIs reaching the ends of their 5-year contract terms applied for renewal: one PI's contract was renewed for 5 years, one not renewed, and one renewed for 2 years as a specially-appointed professor.

3) Plans for FY 2012 onward: The iCeMS continuously evaluates PIs and other researchers seeking contract renewal, while also continuing recruitment of new scientists and research groups with potential to contribute substantially to the goals of the institute.

b) Fostering young researchers

1) Promotion criteria clarified within the iCeMS

The criteria and process of career advancement for junior faculty members have been clarified, providing them with adequate opportunities for promotion and encouraging those making significant contributions to the institute.

2) Encouraging young researcher's participation in education

Young researchers' participation in teaching is meaningful for the development of their carriers. 16 young researchers have already taken charge of teaching courses for undergraduate and graduate students at Kyoto University. Additionally, 2 new teaching courses for undergraduates both with participation from several young iCeMS researchers will start in FY 2012. These are introductory and liberal arts courses for undergraduate students in their first and second year. Course titles are registered as Multidisciplinary and Multinational Seminars/Lectures on Cell-Material Sciences.

3) Co-Mentor Program launched

iCeMS PIs officially affiliated with Graduate Schools and supervising graduate students may choose to assign other faculty members (including iCeMS Kyoto Fellows) as Co-Mentors to provide additional advice and teaching. In order to promote cross-disciplinary research, graduate students are strongly encouraged to seek multidisciplinary advice from their Co-Mentors. In addition, such Co-Mentors can obtain significant experience and expertise in teaching graduate students, which is important for their career development.

4) Overseas Visit Program for Young Researchers (see P.11 for details)

5) iCeMS exploratory cross-disciplinary grants (see P. 5 for details)

(2) Advancing Collaboration with the Center for iPS Cell Research and Application (CiRA)

a) Organizational relationship and differentiation between the iCeMS and the CiRA

The relationship between the iCeMS and the CiRA has also been an important topic at Program Committee meetings, paying special attention to organizational differentiation between the two institutions. As a result of careful discussion and re-examination, the relationship between the two institutions is described as follows:

The CiRA, established on April 1, 2010, is empowered to freely develop clinical applications while maintaining its basic research arm within the iCeMS. Namely, Prof Yamanaka continues his basic research on iPS cells as one of the iCeMS PIs while concurrently managing the CiRA as its director. Overall, the iCeMS and the CiRA collaborate closely as sister institutes.

At present, there are six Yamanaka Lab researchers affiliated with the iCeMS, who are simultaneously employed as adjunct researchers at the CiRA. Of four research divisions at the CiRA, the Division of Reprogramming Science includes these six iCeMS researchers (together with five others fully employed by the CiRA). Their dual affiliations are differentiated in that their iCeMS work is related to the integration of cell and material sciences.

With the clarification of the main mission of the iCeMS as being **cell-material integration**, the iCeMS' main contribution to the CiRA and iPS cell research is now focused on "**cell-material integration research for stem cell science and technology**." For example, the iCeMS has already achieved success, often in collaboration with CiRA scientists, in the creation and development of novel tools and probes for stem cell research and application, which will be utilized for iPS cell research at the CiRA. The iCeMS will further advance and expand such cross-disciplinary research in collaboration with the Yamanaka Lab and other CiRA researchers.

b) Organizational cooperation between the iCeMS and the CiRA

Recent examples of iCeMS-CiRA organizational cooperation include:

- 1) **6** faculty members, including Prof **Shinya Yamanaka**, Prof **Yasuhiro Yamada**, and Asst Prof **Takuya Yamamoto** (appointed as one of the five iCeMS Kyoto Fellows) are employed at the iCeMS while also having affiliations with CiRA.

(In 2012, the MEXT allocated 5 new faculty positions to the CiRA. From June 16, 2012, Prof Yamanaka will thus be employed by the CiRA in one of these positions, acting as CiRA Director. However, as before, he will continue serving as an iCeMS PI.)

- 2) Prof **Yasuhiro Yamada** and Asst Prof **Yamamoto** participate in monthly iCeMS PI meetings, contributing to the management and research work of the institute.
- 3) Participation of **12** members from the CiRA, including **5 CiRA PIs**, at the 2011 iCeMS Retreat.
- 4) Participation of CiRA Senior Lecturer **Keisuke Okita** as a speaker in the July 2011 Heidelberg-Kyoto Joint Symposium in Germany.

5) Joint planning and hosting of iCeMS/CiRA stem cell classroom events for high school students and their teachers.

c) Joint research undertaken and advancing

- iCeMS and CiRA PIs (**Yamanaka, Sakurai, Inoue, Osafune** from the CiRA) are using **Uesugi's** chemical libraries and chemical compounds in their collaborations.

[Published] Chemical Library Screening Identifies a Small Molecule That Downregulates SOD1 Transcription for Drugs to Treat Amyotrophic Lateral Sclerosis. Murakami, Inoue, Tsukita, Asai, Amagai, Aiba, Shimogawa, Uesugi, Nakatsuji, Takahashi. *Journal of Biomolecular Screening* (2011)

- Differentiation of ES/iPS cells using synthetic chemical compounds [**Nakatsuji, Uesugi**, iCeMS Kyoto Fellow and CiRA PI **Yamamoto**]

[Submitted for publication] A novel small molecule that induces cardiac differentiation of human pluripotent stem cells in defined medium under cytokine-free and xeno-free conditions. Minami, Yamada, Otsuji, Yamamoto, Otsuka, Barve, Kadota, Asai, Uesugi, Aiba, Nakatsuji.

- Development of small molecules as stem cell probes and as synthetic cell adhesion factors [**Uesugi**, iCeMS PI and CiRA Director **Yamanaka, Ueda, Nakatsuji**]

[Submitted and under revision] A Chemical Probe Selective for Human Pluripotent Stem Cells. Hirata, Nakagawa, Fujibayashi, Yamauchi, Murata, Minami, Kondo, Inoue, Sato, Ando, Kawazoe, Aiba, Kawase, Chang, Suemori, Nakatsuji, Ueda, Yamanaka, Uesugi.

[In progress] Applications to stem cell research of the cell adhesion-promoting chemical compound Adhesamine (A Dumbbell-Shaped Small Molecule that Promotes Cell Adhesion and Growth. *Chemistry & Biology* 16, 773–782, 2009)

- Synthetic chemical compounds for activation of pluripotency genes and reprogramming [**Sugiyama**, iCeMS Prof and CiRA PI **Yamada**]

[Published] Synthetic Small Molecules for Epigenetic Activation of Pluripotency Genes In Mouse Embryonic Fibroblasts. Pandian, Shinohara, Ohtsuki, Nakano, Masafumi, Bando, Nagase, Yamada, Watanabe, Terada, Sato, Morinaga, Sugiyama. *ChemBioChem* 12, 2822-2828 (2011)

- Creation of neurodegenerative disease models by genetic modification of ES/iPS cells. [**Nakatsuji**, CiRA PI **Inoue**]

[Published] Amyotrophic lateral sclerosis model derived from human embryonic stem cells overexpressing mutant SOD1. Wada, Goparaju, Tooi, Inoue, Takahashi, Nakatsuji, Aiba. *Stem Cells Translational Medicine*, advanced online publication (2012)

(3) Support for center management by host institution

To secure resources for center operation and research activities, the university takes the following measures:

- 1) As a necessary financial measure for the center's operation, the university fully provides indirect costs associated with competitive grants to iCeMS.
- 2) The university provides five positions and expenses for principal investigator-class personnel.
- 3) The university provides a special scheme for concurrent employment of PIs in order to enable Kyoto University's world-leading researchers to conduct academic research at the center while cooperating with their original departments.
- 4) For the administration, the university provides nine full-time administrative staff and necessary personnel expenses in order to establish an independent administrative organization.
- 5) Aiming to maintain a world-class institute with global visibility, Kyoto University provides a high-quality research environment with a total area of about 12,000 m² including exclusive-use facilities with fully equipped infrastructure.
- 6) Given the iCeMS' mandate to fulfill a role as an international research hub, the university supports the institute's international publicity and linkage efforts via measures including the issuance of publications such as pamphlets and press releases. Previously divided among various research and overseas-related offices, university-level support in this area was consolidated into the Research and International Affairs Division beginning in FY2011.

(4) Beyond WPI-iCeMS, proactive support related to the establishment of a world class research institute (including support from the host institution)

In the commitment from the host institution submitted to the WPI in January 2012, Kyoto University President Matsumoto described proactive support beyond WPI-iCeMS as follows:

Given present economic uncertainties in Japan, at a minimum, any plans for a new research organization at Kyoto University must be leading-edge and multidisciplinary, with a future-oriented research vision and solid financial footing based on funding from competitive sources. To date, the iCeMS has succeeded in establishing a new research field based on the integration of the cell and material sciences, as well as in securing substantial sources of external funding. If able to continue this progress toward scientific as well as financial self-sustainability over the next 5 years, based in large part upon continued strong scientific output, the path toward establishment as a new organization will be secure.

Such a new "global multidisciplinary research hub" in a post-WPI stage may retain the integrated cell-material sciences at its core, while progressively incorporating new fields of research. This hub will be supported by the internationally- and human resources-oriented spirit of strategic management brought to maturity at the iCeMS.

Kyoto University, for its part, will lend full support to efforts to establish such an expanded organization for international multidisciplinary research based on the founding principles of the WPI program. Additionally, as part of ongoing educational and research organization reform efforts, the university anticipates that the iCeMS will serve as a role model in the creation of new world-leading scientific research institutions.

6. Others

* In addition to the above 1-5 evaluation items, only if there is anything else that deserves mention regarding the center project's progress, please note it.

(1) Public outreach by the Science Communication Group (SCG)

- The SCG, established in 2007 and led by Adj Assoc Prof **Kazuto Kato**, implemented numerous outreach efforts in FY 2011, such as science cafés (twice in June 2011, twice in February 2012), hands-on iCeMS-CiRA joint stem cell classrooms (once in October, three times in November 2011), hands-on exhibitions at science festivals hosted by the Cabinet Office (two days in December 2011), and lectures for middle and high school students (over 10 times throughout FY 2011).
- The SCG offered a "Dialogue Skills Training Program" for young scientists within iCeMS (once in September in 2011, once in February in 2012).

(2) Industry-government-academia collaboration management by the Innovation Management Group (IMG)

- The Innovation Management Group (IMG), led by Assoc Prof **Shintaro Sengoku**, is exploring novel modes, models, and methods for progress in innovation management.
- The IMG promoted research on management science for international, interdisciplinary, and industrial collaborations (JSPS Grant-in-Aid, Basal (C) in 2010) to understand the initiation and formation process of interdisciplinary research projects, and identify key success factors for institutional research management.
- The IMG currently proceeds with integrative innovation management research, human resources development, and support for the stem cell science and technology sphere (NEXT Program, 2010–13) to develop a standard approach of innovation management science based on studies of scientific linkages, industry clusters, and business modeling, with a particular focus on stem cells.
- The IMG is endorsing a social experiment for improved cross-sector partnership by designing new and better collaboration systems with the public and private sectors, and utilizing Kyoto SMI (Smart Materials & Innovation), a satellite NPO as an intermediate vehicle of the iCeMS and Kyoto University.
- Kyoto SMI sponsored a multi-sector seminar in Tokyo on business applications of smart materials in FY 2011. The event attracted approximately 60 attendees including many key figures in industry, government, and academia.
- The IMG is also in charge of human resource and talent development in collaboration with the Graduate School of Life Sciences, focusing on recruitment, education, and training of next-generation PhD holders seeking careers in innovation management.

7. Center's response to interim evaluation

Transcribe each item from the "Actions Required and Recommendations" section and note how the center has responded to them. However, if you have already provided this information, please indicate where in the report.

(1) Response on scopes and aims of iCeMS. "1) iCeMS's identity is seen as being diverse and ambiguous. There seems to be three pillars for research subjects at iCeMS, i.e. cell-material integration, meso-scale control in cell, and ES/iPS cells. A clear mission statement for integrating these important subjects is needed. 2) Integration of cells and materials should be given high priority as a subject to be studied."

a) Criticisms of the iCeMS' identity

The ambiguity of the iCeMS' identity is mainly due to persistent emphasis of the term "meso" to describe the iCeMS' research domains, and thus apparently giving the unbalanced impression that it is the main direction of all of the research. After subsequent and continuing discussions, the iCeMS' board members agreed that the primary identity should be the "integration of cell and material sciences" and the "meso" theme is also important to the iCeMS' identity because it is in these mesoscopic domains that molecules and materials become capable of the complexity involved in generation and function as living systems.

b) Clarified iCeMS' identity and two key concepts

The iCeMS wish to clarify that main identity of the iCeMS is **to create new cross-disciplinary fields through the integration of cell and material sciences**. And particular research emphasis is focused on the two key concepts of stem cell science and technology and mesoscopic science and technology. Both of them are closely connected to the main identity of iCeMS. By investigating the control mechanisms of multi-molecular structures within cells on the one hand, and artificial materials on the other, as well as the fusion of the two, the iCeMS will pursue pioneering work in these research areas, which will bring about innovations in medicine, pharmaceuticals, the environment, and industry.

c) Launching of a new international journal in cooperation with the RSC

The iCeMS is now starting an important project to contribute to the further establishment and promotion of our research field by launching a new international journal, *Biomaterials Science*, in collaboration with the UK Royal Society of Chemistry. The iCeMS will host the Asia-Pacific editorial office of the RSC, with two PIs acting as a Co-Editor-in-Chief and an Associate Editor, who will work together with other editors in Europe and USA.

d) Emerging interest in mesoscopic science

In 2011, the United States Department of Energy (DOE) asked its Basic Energy Science Advisory Committee (BESAC) to identify mesoscale science directions most promising to advance the DOE's mission. Mesoscopic (scale) science is gradually being recognized as an important future research area.

(2) Response to the comment "3) In order for iCeMS to better establish itself as a WPI institute, it will be essential for all its members to understand and implement its mission."

a) Many efforts undertaken so far to deliver the message of the iCeMS' mission

Prof Nakatsuji has made many efforts to deliver and explain the mission and scope of iCeMS to all faculty and staff by utilizing the opportunities of PI meetings, annual retreats, and email messages from Director to iCeMS members. Also, Prof Nakatsuji has made and will continue to make large efforts to speak directly with each PI and other key institute members to make them understand and implement our mission. The interim evaluation result was shared with all iCeMS members to emphasize the need to continue and further expand our cross-disciplinary research projects related to cell-material integration. Accordingly, one example of the outcomes is that iCeMS Kyoto Fellows autonomously initiated "Young scientists' Colloquia" in FY2012. (see P. 6 for details)

b) Evaluation of researchers in terms of their cross-disciplinary research

The iCeMS has opportunities to evaluate critically how PIs and faculty members have succeeded in their research activities and also how actively they are making progress in the main objective of **cell-material integration**. The iCeMS is going to use these evaluations (assessments of each researcher's relation to the iCeMS' core identity), in addition to grading scientific excellence. Thus, the iCeMS will make their scientists keenly aware of our mission and encourage them to work together toward its realization.

(3) Response to the comment, "4) Environments for the active participation of young researchers should be created," and related points including their career development.

a) Participation in PI meetings by iCeMS Kyoto Fellows and group leaders

The iCeMS holds PI meetings monthly, including the iCeMS Kyoto Fellows and specialized research group leaders. These young researchers are encouraged to participate in the discussions on the iCeMS' research policy and management.

b) Young researchers' participation in discussions for cross-disciplinary research

The iCeMS created a special task force charged with identifying and accelerating cross-disciplinary collaboration projects among research groups, and intentionally invites young faculty members to participate in the intensive and practical discussion of how to plan and carry out such cross-disciplinary collaboration projects.

c) Promotion of young researchers within the iCeMS

The iCeMS is planning to evaluate young scientists who have made significant progress in their research for possible promotion to faculty positions or as iCeMS Kyoto Fellows, in recognition and encouragement of their successful efforts.

d) Promotion of young researchers' experience and training in teaching

The iCeMS is also making opportunities for young faculty members to participate in undergraduate teaching in a newly starting lecture series and seminar series provided by the iCeMS. The iCeMS also makes new arrangements for their participation in teaching graduate students by creation of a "co-mentor" system at the iCeMS. The aim is to give teaching experience to young faculty members for their career development and future application to academic positions.

(4) Response on planning next 5 years. "5) Future prospects for the next five years should be clearly stipulated. The ongoing research subjects should be critically reviewed over the next 2 years."

A description of the iCeMS' future direction follows, emphasizing the institute's scope and research direction over the next five years, the turnover system for researchers and research projects, and also the strengthening of fruitful collaboration with the CiRA.

a) Scope and research direction of the iCeMS over the next five years

The iCeMS' primary goal is to expand the frontiers of science and technology over the next five years, employing tools and methods developed in the first five years at the iCeMS by integrating the cell and material sciences. The iCeMS has already succeeded in developing many new methods and approaches through productive collaboration between cell and material scientists. The iCeMS is now ready and prepared to aim to advance the biological and material sciences by applying such novel methods and approaches. Particular emphasis is placed on: advancement of stem cell science and technologies, investigation of cellular mesoscopic architectures and functions, and creation of smart materials inspired by cellular mesoscopic architectures and functions. The iCeMS anticipates that the results of such cross-disciplinary projects will be published in many research papers in high quality international journals.

b) Fostering of global scientific cell-material integration community

The iCeMS also seeks to play a leading role in the formation of a global scientific community integrating the cell-material sciences in the mesoscopic domain, through the hosting of international symposia at home and abroad, launching the new journal in collaboration with the UK Royal Society of Chemistry, and other measures. As for stem cell research, the iCeMS will advance cross-disciplinary stem cell science and technologies by further strengthening collaborations with the CiRA and with other stem cell related labs within Kyoto University and with other research institutions worldwide, such as NCBS/inStem in India, Edinburgh University MRC-CRM in the UK, as well as the NIH Center for Regenerative Medicine in the United States.

c) Turnover system for researchers

It is possible for the iCeMS to rehire PIs and other faculty for an additional five years if they have demonstrated outstanding accomplishments. The faculty evaluation committee conducts an assessment of candidates and determines eligibility for renewal one year before their contracts expire. An iCeMS regulation stipulates these conditions and has been distributed to all PIs.

d) Encouragement of cross-disciplinary research based on strict evaluation

As an important initiative of the director, the iCeMS is providing start-up funds for numerous cross-disciplinary collaboration projects proposed by iCeMS researchers. In addition, 10 top-priority projects have been identified by the task force for **cell-material integration** and given priority support, including the hiring of an associate professor and an assistant professor by one project. These efforts are constantly examined and evaluated, and accelerated as much as possible.

Over the next five years, the iCeMS will continuously evaluate and examine research progress, and start new projects and/or research groups when deemed important and necessary, with due consideration given to available resources. In addition, among global partner institutions, the iCeMS will select the most significant and promising partners and expand these relationships with exchanges of scientists and collaborative research projects.

e) **Collaboration with the Center for iPS Cell Research and Application (CiRA)** (see P. 14 for details)

8. Center's response to the site-visit report used in the interim evaluation

Transcribe each item from the "7. Actions Required and Recommendations" section and note how the center has responded to them. However, if you have already provided this information, please indicate where in the report.

(1) Requirements 1 and 3

Future prospects for the next five years should be clearly demonstrated. The ongoing research subjects should be critically reviewed in the next 2 years. Many reviewers (WG members) are not simply optimistic about the quality of interdisciplinary projects. If they cannot publish works in high quality journals, they should re-orient their organizations including the directorship.

The contribution of material science to the interdisciplinary field between cell biology and material science is very important for the success of this institute.

The iCeMS is actively taking the following initiatives in response to the stated requirements. Please refer to each relevant page.

- Interdisciplinary research task force led by Deputy Director **Kitagawa** (see P. 5)
- 10 top-priority projects selected for spearheaded research collaboration and publication (P. 4)
- Launch of new international journal, *Biomaterials Science*, jointly with the RSC (P. 7)
- Katsura Lab for collaborative work on polymer chemistry and more (P. 5)
- Young Scientists' Colloquia initiated (P. 6)

(2) Requirement 2

There seems no clear opportunity for fellows to compete for faculty positions, and thus the advantage that iCeMS derives from the fellows does not include using the fellow period to serve as a proving ground so that the best scientists are kept while others are allowed to leave.

Hiring for all faculty positions at Kyoto University (as well as at most other universities) is strictly based on open competition, which enables iCeMS Kyoto Fellows as well as others to compete for these positions. In addition, the iCeMS has drafted clarified procedures and rules regarding the promotion of young faculty members. See also P. 13 "Fostering young researchers".

(3) Requirement 4

Presentations need to be more carefully prepared, so that researchers at both sides can understand the message. As judged by the presentations made for the interim evaluation meeting, some presentations were confusing with too many slides and unfocused message. The presenters are expected to clarify what the "originality in their research" is.

The iCeMS has held multiple practice sessions preceding Site Visits and Program Committee meetings, where all PI meeting members and poster presenters join together to discuss and exchange opinions as well as focus their presentations. In addition, standardized poster and briefing slide templates have been prepared, helping clarify presenters' research objectives, spotlight originality, and focus audience attention on research results. Naturally, the best way to improve presentation technique is through practice and repetition, which is something every researcher (including every PI) is being asked to do.

List of Center's Research Results and Main Awards

A. Published Papers

- List in order of most recent the Center's papers published in refereed journals during FY2011.
- For each, write the paper title; author name(s); journal name, volume, page(s); and publication date. If there are a few authors, underline those affiliated with the Center. (Any order may be used as long as format is the same.)
- If there are many authors, show and underline those affiliated with the Center, cutting out the names of other authors as deemed appropriate.
- For the most important papers, shade in the number block. For papers giving the results of fusion research, underline the number in the block.
- If the list exceeds this form, please add extra pages.

No.	Author names and details
<u>1</u>	<u>Abe, Satoshi</u> ; <u>Tsujimoto, Masahiko</u> ; Yoneda, Ko; <u>Ohba, Masaaki</u> ; Hikage, Tatsuo; <u>Takano, Mikio</u> ; <u>Kitagawa, Susumu</u> ; <u>Ueno, Takafumi</u> ; Porous Protein Crystals as Reaction Vessels for Controlling Magnetic Properties of Nanoparticles; <i>Small</i> 8 , 1314-1319 (2012)
2	Umeyama, Tomokazu; Douvogianni, Evgenia; <u>Imahori, Hiroshi</u> ; Synthesis and Photovoltaic Properties of Conjugated Polymer Based on 1,3,4-Thiadiazole Unit; <i>Chem. Lett.</i> 41 , 354-356 (2012)
3	Rajendran, Arivazhagan; <u>Endo, Masayuki</u> ; <u>Sugiyama, Hiroshi</u> ; DNA Origami: Synthesis and Self-Assembly; <i>Curr. Protoc. Nucleic Acid Chem.</i> 48 , 12.9.1-12.9.18 (2012)
<u>4</u>	<u>Kalay, Ziya</u> ; <u>Fujiwara, Takahiro K.</u> ; <u>Kusumi, Akihiro</u> ; Confining Domains Lead to Reaction Bursts: Reaction Kinetics in the Plasma Membrane; <i>PLoS One</i> 7 , e32948 (2012)
5	Meer, Elliott J.; <u>Wang, Dan Ohtan</u> ; Kim, Sangmok; Barr, Ian; Guo, Feng; Martin, Kelsey C.; Identification of a cis-acting element that localizes mRNA to synapses; <i>Proc. Natl. Acad. Sci. U. S. A.</i> 109 , 4639-4644 (2012)
6	<u>Nagao, Kohjiro</u> ; Kimura, Yasuhisa; <u>Ueda, Kazumitsu</u> ; Lysine residues of ABCA1 are required for the interaction with apoA-I; <i>Biochim. Biophys. Acta Mol. Cell Biol. Lipids</i> 1821 , 530-535 (2012)
7	Alberto Rodriguez-Velamazán, J.; Gonzalez, Miguel A.; Real, Jose A.; Castro, Miguel; Carmen Munoz, M.; Gaspar, Ana B.; Ohtani, Ryo; <u>Ohba, Masaaki</u> ; Yoneda, Ko; Hijikata, Yuh; Yanai, Nobuhiro; Mizuno, Motohiro; Ando, Hideo; <u>Kitagawa, Susumu</u> ; A Switchable Molecular Rotator: Neutron Spectroscopy Study on a Polymeric Spin-Crossover Compound; <i>J. Am. Chem. Soc.</i> 134 , 5083-5089 (2012)
8	Umeyama, Tomokazu; Mihara, Junya; Tezuka, Noriyasu; Matano, Yoshihiro; Stranius, Kati; Chukharev, Vladimir; Tkachenko, Nikolai V.; Lemmetyinen, Helge; Noda, Kei; Matsushige, Kazumi; Shishido, Tetsuya; Liu, Zheng; Hirose-Takai, Kaori; Suenaga, Kazu; <u>Imahori, Hiroshi</u> ; Preparation and Photophysical and Photoelectrochemical Properties of a Covalently Fixed Porphyrin-Chemically Converted Graphene Composite; <i>Chem.-Eur. J.</i> 18 , 4250-4257 (2012)
9	<u>Kalay, Ziya</u> ; Reaction kinetics in the plasma membrane; <i>Biotechnol. J.</i> 7 (2012)
<u>10</u>	Sekiyama, Naotaka; Jee, JunGoo; Isogai, Shin; Akagi, Ken-ichi; Huang, Tai-huang; <u>Ariyoshi, Mariko</u> ; Tochio, Hidehito; <u>Shirakawa, Masahiro</u> ; NMR analysis of Lys63-linked polyubiquitin recognition by the tandem ubiquitin-interacting motifs of Rap80; <i>J. Biomol. NMR</i> 52 , 339-350 (2012)

11	<u>Manuel Tsotsalas</u> , <u>Ayako Umemura</u> , <u>Franklin Kim</u> , <u>Yoko Sakata</u> , <u>Julien Reboul</u> , <u>Susumu Kitagawa</u> , <u>Shuhei Furukawa</u> ; Crystal morphology-directed framework orientation in porous coordination polymer films and freestanding membranes via Langmuir–Blodgett; <i>J. Mater. Chem.</i> 22 , 10159-10165 (2012)
12	<u>Pandian, Ganesh N.</u> ; <u>Ohtsuki, Akimichi</u> ; <u>Bando, Toshikazu</u> ; <u>Sato, Shinsuke</u> ; <u>Hashiya, Kaori</u> ; <u>Sugiyama, Hiroshi</u> ; Development of programmable small DNA-binding molecules with epigenetic activity for induction of core pluripotency genes; <i>Bioorg. Med. Chem.</i> 20 , 2656-2660 (2012)
13	<u>Sannohe, Yuta</u> ; <u>Sugiyama, Hiroshi</u> ; Single strand DNA catenane synthesis using the formation of G-quadruplex structure; <i>Bioorg. Med. Chem.</i> 20 , 2030-2034 (2012)
14	<u>Yoshidome, Tomofumi</u> ; <u>Endo, Masayuki</u> ; <u>Kashiwazaki, Gengo</u> ; <u>Hidaka, kumi</u> ; <u>Bando, Toshikazu</u> ; <u>Sugiyama, Hiroshi</u> ; Sequence-Selective Single-Molecule Alkylation with a Pyrrole-Imidazole Polyamide Visualized in a DNA Nanoscaffold; <i>J. Am. Chem. Soc.</i> 134 , 4654-4660 (2012)
15	<u>Kashiwazaki, Gengo</u> ; <u>Bando, Toshikazu</u> ; <u>Yoshidome, Tomofumi</u> ; <u>Masui, Seiji</u> ; <u>Takagaki, Toshiki</u> ; <u>Haushiya, Kaori</u> ; <u>Pandian, Ganesh N.</u> ; <u>Yasuoka, Junichi</u> ; <u>Akiyoshi, Kazunari</u> ; <u>Sugiyama, Hiroshi</u> ; Synthesis and Biological Properties of Highly Sequence-Specific-Alkylating N-Methylpyrrole-N-Methylimidazole Polyamide Conjugates; <i>J. Med. Chem.</i> 55 , 2057-2066 (2012)
16	<u>Katayama, I.</u> ; <u>Aoki, H.</u> ; <u>Takeda, J.</u> ; <u>Shimosato, H.</u> ; <u>Ashida, M.</u> ; <u>Kinjo, R.</u> ; <u>Kawayama, I.</u> ; <u>Tonouchi, M.</u> ; <u>Nagai, M.</u> ; <u>Tanaka, K.</u> ; Ferroelectric Soft Mode in a SrTiO ₃ Thin Film Impulsively Driven to the Anharmonic Regime Using Intense Picosecond Terahertz Pulses; <i>Phys. Rev. Lett.</i> 108 , 97401 (2012)
17	<u>Imahori, Hiroshi</u> ; <u>Kitaura, Shinji</u> ; <u>Kira, Aiko</u> ; <u>Hayashi, Hironobu</u> ; <u>Nishi, Masayuki</u> ; <u>Hirao, Kazuyuki</u> ; <u>Isoda, Seiji</u> ; <u>Tsujimoto, Masahiko</u> ; <u>Takano, Mikio</u> ; <u>Zhe, Zhang</u> ; <u>Miyato, Yuji</u> ; <u>Noda, Kei</u> ; <u>Matsushige, Kazumi</u> ; <u>Stranius, Kati</u> ; <u>Tkachenko, Nikolai V.</u> ; <u>Lemmetyinen, Helge</u> ; <u>Qin, Lidong</u> ; <u>Hurst, Sarah J.</u> ; <u>Mirkin, Chad A.</u> ; A Photoconductive, Thiophene-Fullerene Double-Cable Polymer, Nanorod Device; <i>J. Phys. Chem. Lett.</i> 3 , 478-481 (2012)
18	<u>Hu, Ming</u> ; <u>Reboul, Julien</u> ; <u>Furukawa, Shuhei</u> ; <u>Torad, Nagy L.</u> ; <u>Ji, Qingmin</u> ; <u>Srinivasu, Pavuluri</u> ; <u>Ariga, Katsuhiko</u> ; <u>Kitagawa, Susumu</u> ; <u>Yamauchi, Yusuke</u> ; Direct Carbonization of Al-Based Porous Coordination Polymer for Synthesis of Nanoporous Carbon; <i>J. Am. Chem. Soc.</i> 134 , 2864-2867 (2012)
19	<u>Aoki, Hitomi</u> ; <u>Hara, Akira</u> ; <u>Era, Takumi</u> ; <u>Kunisada, Takahiro</u> ; <u>Yamada, Yasuhiro</u> ; Genetic ablation of Rest leads to in vitro-specific derepression of neuronal genes during neurogenesis; <i>Development</i> 139 , 667-677 (2012)
20	<u>Kohira, Masahiro I.</u> ; <u>Kitahata, Hiroyuki</u> ; <u>Magome, Nobuyuki</u> ; <u>Yoshikawa, Kenichi</u> ; Plastic bottle oscillator as an on-off-type oscillator: Experiments, modeling, and stability analyses of single and coupled systems; <i>Phys. Rev. E</i> 85 , 26204 (2012)
21	<u>Kadota, S.</u> ; <u>Kay, M. W.</u> ; <u>Magome, N.</u> ; <u>Agladze, K.</u> ; Curvature-Dependent Excitation Propagation in Cultured Cardiac Tissue; <i>Jetp Lett.</i> 94 , 824-830 (2012)
22	<u>Aizawa, Emi</u> ; <u>Hirabayashi, Yuka</u> ; <u>Iwanaga, Yuzuru</u> ; <u>Suzuki, Keiichiro</u> ; <u>Sakurai, Kenji</u> ; <u>Shimoji, Miho</u> ; <u>Aiba, Kazuhiro</u> ; <u>Wada, Tamaki</u> ; <u>Tooi, Norie</u> ; <u>Kawase, Eihachiro</u> ; <u>Suemori, Hirofumi</u> ; <u>Nakatsuji, Norio</u> ; <u>Mitani, Kohnosuke</u> ; Efficient and Accurate Homologous Recombination in hESCs and hiPSCs Using Helper-dependent Adenoviral Vectors; <i>Mol. Ther.</i> 20 , 424-431 (2012)
23	<u>Zheng, Yunlong</u> ; <u>Nishikawa, Makiya</u> ; <u>Ikemura, Mai</u> ; <u>Yamashita, Fumiyoshi</u> ; <u>Hashida, Mitsuru</u> ; Development of bone-targeted catalase derivatives for inhibition of bone metastasis of tumor cells in mice; <i>J. Pharm. Sci.</i> 101 , 552-557 (2012)
24	<u>Nakata, Eiji</u> ; <u>Liew, Fong Fong</u> ; <u>Uwatoko, Chisana</u> ; <u>Kiyonaka, Shigeki</u> ; <u>Mori, Yasuo</u> ; <u>Katsuda, Yousuke</u> ; <u>Endo, Masayuki</u> ; <u>Sugiyama, Hiroshi</u> ; <u>Morii, Takashi</u> ; Zinc-Finger Proteins for Site-Specific Protein Positioning on DNA-Origami Structures; <i>Angew. Chem.-Int. Edit.</i> 51 ,

	2421-2424 (2012)
25	Zhou, Shuwen; Kawakami, Shigeru; Higuchi, Yuriko; Yamashita, Fumiyoshi; <u>Hashida, Mitsuru</u> ; The involvement of NK cell activation following intranasal administration of CpG DNA lipoplex in the prevention of pulmonary metastasis and peritoneal dissemination in mice; <i>Clinical & Experimental Metastasis</i> 29 , 63-70 (2012)
<u>26</u>	<u>Hasegawa, Kouichi</u> ; Yasuda, Shin-ya; Teo, Jia-Ling; Nguyen, Cu; McMillan, Michael; Hsieh, Chih-Lin; Suemori, Hirofumi; <u>Nakatsuji, Norio</u> ; Yamamoto, Masashi; Miyabayashi, Tomoyuki; Lutzko, Carolyn; Pera, Martin F.; Kahn, Michael; Wnt Signaling Orchestration with a Small Molecule DYRK Inhibitor Provides Long-Term Xeno-Free Human Pluripotent Cell Expansion; <i>Stem Cells Translational Medicine</i> 1 , 18-28 (2012)
<u>27</u>	Wickham, Shelley F. J.; Bath, Jonathan; Katsuda, Yousuke; <u>Endo, Masayuki</u> ; Hidaka, kumi; <u>Sugiyama, Hiroshi</u> ; Turberfield, Andrew J.; A DNA-based molecular motor that can navigate a network of tracks; <i>Nat. Nanotechnol.</i> 7 , 169-173 (2012)
28	<u>Endo, Masayuki</u> ; Miyazaki, Ryoji; Emura, Tomoko; Hidaka, kumi; <u>Sugiyama, Hiroshi</u> ; Transcription Regulation System Mediated by Mechanical Operation of a DNA Nanostructure; <i>J. Am. Chem. Soc.</i> 134 , 2852-2855 (2012)
29	Saarenpaa, Hanna; Sariola-Leikas, Essi; Perros, Alexander Pyymaki; Kontio, Juha M.; Efimov, Alexander; Hayashi, Hironobu; Lipsanen, Harri; <u>Imahori, Hiroshi</u> ; Lemmetyinen, Helge; Tkachenko, Nikolai V.; Self-Assembled Porphyrins on Modified Zinc Oxide Nanorods: Development of Model Systems for Inorganic-Organic Semiconductor Interface Studies; <i>J. Phys. Chem. C</i> 116 , 2336-2343 (2012)
30	Matano, Yoshihiro; Matsumoto, Kazuaki; Hayashi, Hironobu; Nakao, Yoshihide; Kumpulainen, Tatu; Chukharev, Vladimir; Tkachenko, Nikolai V.; Lemmetyinen, Helge; Shimizu, Soji; Kobayashi, Nagao; Sakamaki, Daisuke; Ito, Akihiro; Tanaka, Kazuyoshi; <u>Imahori, Hiroshi</u> ; Effects of Carbon-Metal-Carbon Linkages on the Optical, Photophysical, and Electrochemical Properties of Phosphametallacycle-Linked Coplanar Porphyrin Dimers; <i>J. Am. Chem. Soc.</i> 134 , 1825-1839 (2012)
31	Naka, Nobuko; Akimoto, Ikuko; <u>Shirai, Masanobu</u> ; Kan'no, Ken-ichi; Time-resolved cyclotron resonance in cuprous oxide; <i>Phys. Rev. B</i> 85 , 35209 (2012)
32	Umeyama, Tomokazu; Hirose, Kohei; Noda, Kei; Matsushige, Kazumi; Shishido, Tetsuya; Hayashi, Hironobu; Matano, Yoshihiro; Ono, Noboru; <u>Imahori, Hiroshi</u> ; Thermal Conversion of Precursor Polymer to Low Bandgap Conjugated Polymer Containing Isothianaphthene Dimer Subunits; <i>J. Phys. Chem. C</i> 116 , 1256-1264 (2012)
33	Kurosaki, Tomoaki; Higuchi, Norihide; Kawakami, Shigeru; Higuchi, Yuriko; Nakamura, Tadahiro; Kitahara, Takashi; <u>Hashida, Mitsuru</u> ; Sasaki, Hitoshi; Self-assemble gene delivery system for molecular targeting using nucleic acid aptamer; <i>Gene</i> 491 , 205-209 (2012)
34	Matsumura, Shigeru; Hamasaki, Mayumi; <u>Yamamoto, Takuya</u> ; Ebisuya, Miki; Sato, Mizuho; Nishida, Eisuke; Toyoshima, Fumiko; ABL1 regulates spindle orientation in adherent cells and mammalian skin; <i>Nat. Commun.</i> 3 , 626 (2012)
35	Pillai, Ramesh S.; <u>Chuma, Shinichiro</u> ; piRNAs and their involvement in male germline development in mice; <i>Dev. Growth Diff.</i> 54 , 78-92 (2012)
36	Kitada, A.; Tsujimoto, Y.; Yamamoto, T.; Kobayashi, Y.; Narumi, Y.; Kindo, K.; Aczel, A. A.; Luke, G. M.; Uemura, Y. J.; Kiuchi, Y.; Ueda, Y.; Yoshimura, K.; Ajiro, Y.; <u>Kageyama, H.</u> ; Quadruple-layered perovskite (CuCl)Ca(2)NaNb(4)O(13); <i>J. Solid State Chem.</i> 185 , 10-17 (2012)
37	<u>Nagao, Kohjiro</u> ; Takahashi, Kei; Azuma, Yuya; Takada, Mie; Kimura, Yasuhisa; Matsuo, Michinori; Kioka, Noriyuki; <u>Ueda, Kazumitsu</u> ; ATP hydrolysis-dependent conformational changes in the extracellular domain of ABCA1 are associated with apoA-I binding; <i>J. Lipid Res.</i> 53 , 126-136 (2012)

38	<u>Wang, Dan Ohtan</u> ; Matsuno, Hitomi; Ikeda, Shuji; Nakamura, Akiko; Yanagisawa, Hiroyuki; Hayashi, Yasunori; Okamoto, Akimitsu; A quick and simple FISH protocol with hybridization-sensitive fluorescent linear oligodeoxynucleotide probes; <i>RNA-Publ. RNA Soc.</i> 18 , 166-175 (2012)
39	<u>Saitou, Mitinori</u> ; Kagiwada, Saya; Kurimoto, Kazuki; Epigenetic reprogramming in mouse pre-implantation development and primordial germ cells; <i>Development</i> 139 , 15-31 (2012)
40	Numata, Tomohiro; <u>Murakami, Tatsuya</u> ; Kawashima, Fumiaki; <u>Morone, Nobuhiro</u> ; <u>Heuser, John E.</u> ; <u>Takano, Yuta</u> ; Ohkubo, Kei; Fukuzumi, Shunichi; Mori, Yasuo; <u>Imahori, Hiroshi</u> ; Utilization of Photoinduced Charge-Separated State of Donor-Acceptor-Linked Molecules for Regulation of Cell Membrane Potential and Ion Transport; <i>J. Am. Chem. Soc.</i> 134 , 6092-6095 (2012)
41	Yanai, Nobuhiro; Uemura, Takashi; Inoue, Masafumi; <u>Matsuda, Ryotaro</u> ; Fukushima, Tomohiro; <u>Tsujimoto, Masahiko</u> ; <u>Isoda, Seiji</u> ; <u>Kitagawa, Susumu</u> ; Guest-to-Host Transmission of Structural Changes for Stimuli-Responsive Adsorption Property; <i>J. Am. Chem. Soc.</i> 134 , 4501-4504 (2012)
42	Okabe, Kohki; Inada, Noriko; Gota, Chie; <u>Harada, Yoshie</u> ; Funatsu, Takashi; Uchiyama, Seiichi; Intracellular temperature mapping with a fluorescent polymeric thermometer and fluorescence lifetime imaging microscopy; <i>Nat. Commun.</i> 3 , 705 (2012)
43	Munoz Lara, Francisco J.; Gaspar, Ana B.; Aravena, Daniel; Ruiz, Eliseo; Carmen Munoz, M.; <u>Ohba, Masaaki</u> ; Ohtani, Ryo; <u>Kitagawa, Susumu</u> ; Real, Jose A.; Enhanced bistability by guest inclusion in Fe(II) spin crossover porous coordination polymers; <i>Chem. Commun.</i> 48 , 4686-4688 (2012)
44	<u>Imahori, Hiroshi</u> ; Umeyama, Tomokazu; <u>Kurotobi, Kei</u> ; <u>Takano, Yuta</u> ; Self-assembling porphyrins and phthalocyanines for photoinduced charge separation and charge transport; <i>Chem. Commun.</i> 48 , 4032-4045 (2012)
45	Xu, Jiakun; Shoji, Osami; Fujishiro, Takashi; Ohki, Takahiro; <u>Ueno, Takafumi</u> ; Watanabe, Yoshihito; Construction of biocatalysts using the myoglobin scaffold for the synthesis of indigo from indole; <i>Catal. Sci. Technol.</i> 2 , 739-744 (2012)
46	Ohsawa, Shizue; <u>Sugimura, Kaoru</u> ; Takino, Kyoko; Igaki, Tatsushi; Imaging cell competition in drosophila imaginal discs; <i>Methods Enzymol.</i> 506 , 407-413 (2012)
47	Yanai, Nobuhiro; Uemura, Takashi; Kosaka, Wataru; <u>Matsuda, Ryotaro</u> ; Kodani, Tetsuhiro; Koh, Meiten; Kanemura, Takashi; <u>Kitagawa, Susumu</u> ; Inclusion and dielectric properties of a vinylidene fluoride oligomer in coordination nanochannels; <i>Dalton Trans.</i> 41 , 4195-4198 (2012)
48	Sakamoto, Hiroto; <u>Matsuda, Ryotaro</u> ; <u>Kitagawa, Susumu</u> ; Systematic mechanochemical preparation of a series of coordination pillared layer frameworks; <i>Dalton Trans.</i> 41 , 3956-3961 (2012)
49	Hirai, Kenji; Uehara, Hiromitsu; <u>Kitagawa, Susumu</u> ; <u>Furukawa, Shuheji</u> ; Redox reaction in two-dimensional porous coordination polymers based on ferrocenedicarboxylates; <i>Dalton Trans.</i> 41 , 3924-3927 (2012)
50	Tassel, Cedric; <u>Kageyama, Hiroshi</u> ; Square planar coordinate iron oxides; <i>Chem. Soc. Rev.</i> 41 , 2025-2035 (2012)
51	Hu, Ming; <u>Furukawa, Shuheji</u> ; Ohtani, Ryo; Sukegawa, Hiroaki; Nemoto, Yoshihiro; <u>Reboul, Julien</u> ; <u>Kitagawa, Susumu</u> ; Yamauchi, Yusuke; Synthesis of Prussian Blue Nanoparticles with a Hollow Interior by Controlled Chemical Etching; <i>Angew. Chem.-Int. Edit.</i> 51 , 984-988 (2012)
52	Kai, Kazuya; Yoshida, Yukihiro; Kobayashi, Yoji; <u>Kageyama, Hiroshi</u> ; Saito, Gunzi; Preparation and formation mechanism of a n-butylammonium/MnO ₂ layered hybrid via a one-pot synthesis under moderate conditions; <i>Dalton Trans.</i> 41 , 825-830 (2012)

53	Horike, Satoshi; Inubushi, Yasutaka; Hori, Takashi; Fukushima, Tomohiro; <u>Kitagawa, Susumu</u> ; A solid solution approach to 2D coordination polymers for CH(4)/CO(2) and CH(4)/C(2)H(6) gas separation: equilibrium and kinetic studies; <i>Chem. Sci.</i> 3 , 116-120 (2012)
54	Tsuzuki, Akiko; <u>Kano, Kei</u> ; Kusumi, Takashi; Suzuki, Mariko; Cases of Collaboration among Science Communication Practices and Studies in Australia; <i>Japanese Journal of Science Communication</i> 10 , 89-101 (2011)
55	Shirai, Tetsuya; <u>Kato, Kazuto</u> ; A Two-way Communication Activity by the Scientist Community : "Genome Square"; <i>Japanese Journal of Science Communication</i> 10 , 53-64 (2011)
56	<u>Mizumachi, Eri</u> ; Matsuda, Kentaro; <u>Kano, Kei</u> ; Kawakami, Masahiro; <u>Kato, Kazuto</u> ; Scientists' attitudes toward a dialogue with the public: a study using "science cafes"; <i>Journal of Science Communication</i> 10 (2011)
57	Koirala, Deepak; Mashimo, Tomoko; Sannohe, Yuta; Yu, Zhongbo; Mao, Hanbin; <u>Sugiyama, Hiroshi</u> ; Intramolecular folding in three tandem guanine repeats of human telomeric DNA; <i>Chem. Commun.</i> 48 , 2006-2008 (2011)
<u>58</u>	Un, Keita; Kawakami, Shigeru; Higuchi, Yuriko; Suzuki, Ryo; Maruyama, Kazuo; Yamashita, Fumiyoshi; <u>Hashida, Mitsuru</u> ; Involvement of activated transcriptional process in efficient gene transfection using unmodified and mannose-modified bubble lipoplexes with ultrasound exposure; <i>J. Control. Release</i> 156 , 355-363 (2011)
59	Ikeda, Shuji; Kubota, Takeshi; <u>Wang, Dan Ohtan</u> ; Yanagisawa, Hiroyuki; Umemoto, Tadashi; Okamoto, Akimitsu; Design and Synthesis of Caged Fluorescent Nucleotides and Application to Live-cell RNA Imaging; <i>ChemBioChem</i> 12 , 2871-2880 (2011)
60	McNamee, Cathy E.; <u>Yamamoto, Shinpei</u> ; Kappl, Michael; Butt, Hans-Juergen; Higashitani, Ko; Dedinaite, Andra; Claesson, Per M.; Surface and friction forces between grafted polysaccharide layers in the absence and presence of surfactant; <i>J. Colloid Interface Sci.</i> 364 , 351-358 (2011)
<u>61</u>	Chang, Kai-Ling; Higuchi, Yuriko; Kawakami, Shigeru; Yamashita, Fumiyoshi; <u>Hashida, Mitsuru</u> ; Development of lysine-histidine dendron modified chitosan for improving transfection efficiency in HEK293 cells; <i>J. Control. Release</i> 156 , 195-202 (2011)
62	Reuter, Michael; Berninger, Philipp; <u>Chuma, Shinichiro</u> ; Shah, Hardik; <u>Hosokawa, Mihoko</u> ; Funaya, Charlotta; Antony, Claude; Sachidanandam, Ravi; Pillai, Ramesh S.; Miwi catalysis is required for piRNA amplification-independent LINE1 transposon silencing; <i>Nature</i> 480 , 264-U154 (2011)
63	<u>Foo, Maw Lin</u> ; Horike, Satoshi; <u>Kitagawa, Susumu</u> ; Synthesis and Characterization of a 1-D Porous Barium Carboxylate Coordination Polymer, [Ba(HBTB)] (H3BTB = Benzene-1,3,5-trisbenzoic Acid); <i>Inorg. Chem.</i> 50 , 11853-11855 (2011)
64	<u>Hirori, H.</u> ; Shinokita, K.; <u>Shirai, M.</u> ; Tani, S.; Kadoya, Y.; <u>Tanaka, K.</u> ; Extraordinary carrier multiplication gated by a picosecond electric field pulse; <i>Nat. Commun.</i> 2 , 594 (2011)
<u>65</u>	Wang, Li; Liu, Jiaji; Li, Xin; Shi, Jian; Hu, Jie; Cui, Ran; Zhang, Zhi-Ling; Pang, Dai-Wen; <u>Chen, Yong</u> ; Growth propagation of yeast in linear arrays of microfluidic chambers over many generations; <i>Biomicrofluidics</i> 5 , 44118 (2011)
66	Andrews, Peter W.; Miyazaki, Takamichi; Suemori, Hirofumi; Takahashi, Kazutoshi; <u>Nakatsuji, Norio</u> ; <u>Yamanaka, Shinya</u> , et al; Screening ethnically diverse human embryonic stem cells identifies a chromosome 20 minimal amplicon conferring growth advantage; <i>Nat. Biotechnol.</i> 29 , 1132-U113 (2011)
67	<u>Takigawa-Imamura, Hisako</u> ; <u>Motoike, Ikuko N.</u> ; Dendritic gates for signal integration with excitability-dependent responsiveness; <i>Neural Netw.</i> 24 , 1143-1152 (2011)

68	Thandavarayan, Rajarajan A.; Giridharan, Vijayasree V.; Sari, Flori R.; Arumugam, Somasundaram; Veeraveedu, Punniyakoti T.; <u>Pandian, Ganesh N.</u> ; Palaniyandi, Suresh S.; Ma, Meilei; Suzuki, Kenji; Gurusamy, Narasimman; Watanabe, Kenichi; Depletion of 14-3-3 Protein Exacerbates Cardiac Oxidative Stress, Inflammation and Remodeling Process via Modulation of MAPK/NF-kappa B Signaling Pathways after Streptozotocin-induced Diabetes Mellitus; <i>Cell. Physiol. Biochem.</i> 28 , 911-922 (2011)
69	Minowa, Yosuke; Nagai, Masaya; Tao, Hu; Fan, Kebin; Strikwerda, A. C.; Zhang, Xin; Averitt, Richard D.; <u>Tanaka, Koichiro</u> ; Extremely Thin Metamaterial as Slab Waveguide at Terahertz Frequencies; <i>IEEE Transactions on Terahertz Science and Technology</i> 1 , 441-449 (2011)
70	Rajendran, Arivazhagan; <u>Endo, Masayuki</u> ; <u>Sugiyama, Hiroshi</u> ; Single-Molecule Analysis Using DNA Origami; <i>Angew. Chem.-Int. Edit.</i> 51 , 874-890 (2011)
71	Yamamoto, Takafumi; Kobayashi, Yoji; Okada, Taku; Yagi, Takehiko; Kawakami, Takateru; Tassel, Cedric; Kawasaki, Shota; Abe, Naoyuki; Niwa, Ken; Kikegawa, Takumi; Hirao, Naohisa; <u>Takano, Mikio</u> ; <u>Kageyama, Hiroshi</u> ; B1-to-B2 Structural Transitions in Rock Salt Intergrowth Structures; <i>Inorg. Chem.</i> 50 , 11787-11794 (2011)
72	Nakamura, Maki; Tahara, Yoshio; Ikehara, Yuzuru; <u>Murakami, Tatsuya</u> ; Tsuchida, Kunihiro; Iijima, Sumio; Waga, Iwao; Yudasaka, Masako; Single-walled carbon nanohorns as drug carriers: adsorption of prednisolone and anti-inflammatory effects on arthritis; <i>Nanotechnology</i> 22 , 465102 (2011)
73	<u>Deshmukh, Milind M.</u> ; Bartolotti, Libero J.; Gadre, Shridhar R.; Intramolecular Hydrogen Bond Energy and Cooperative Interactions in alpha-, beta-, and gamma-Cyclodextrin Conformers; <i>J. Comput. Chem.</i> 32 , 2996-3004 (2011)
74	Li, Xin; Zhang, Fan; Shi, Jian; Wang, Li; Tian, Jing-Hua; Zhou, Xiong-Tu; Jiang, Lian-Mei; <u>Liu, Li</u> ; Zhao, Zhen-Jie; He, Pin-Gang; <u>Chen, Yong</u> ; Microfluidic devices with disposable enzyme electrode for electrochemical monitoring of glucose concentrations; <i>Electrophoresis</i> 32 , 3201-3206 (2011)
75	Matano, Yoshihiro; Matsumoto, Kazuaki; Shibano, Tarou; <u>Imahori, Hiroshi</u> ; Porphyrin-appended phosphapalladacycle precatalysts: effects of central metals on the catalytic activity in a high-temperature Heck reaction; <i>J. Porphy. Phthalocyanines</i> 15 , 1172-1182 (2011)
76	Erofeev, I. S.; <u>Magome, N.</u> ; <u>Agladze, K. I.</u> ; Digital photocontrol of the network of live excitable cells; <i>Jetp Lett.</i> 94 , 477-480 (2011)
77	<u>Kusumi, Akihiro</u> ; <u>Suzuki, Kenichi G. N.</u> ; <u>Kasai, Rinshi S.</u> ; Ritchie, Ken; <u>Fujiwara, Takahiro K.</u> ; Hierarchical mesoscale domain organization of the plasma membrane; <i>Trends Biochem.Sci.</i> 36 , 604-615 (2011)
78	Wang, Yu-Chieh; Nakagawa, Masato; Garitaonandia, Ibon; Slavin, Ileana; Altun, Gulsah; Lacharite, Robert M.; Nazor, Kristopher L.; Tran, Ha T.; Lynch, Candace L.; Leonardo, Trevor R.; Liu, Ying; Peterson, Suzanne E.; Laurent, Louise C.; <u>Yamanaka, Shinya</u> ; Loring, Jeanne F.; Specific lectin biomarkers for isolation of human pluripotent stem cells identified through array-based glycomic analysis; <i>Cell Res.</i> 21 , 1551-1563 (2011)
79	<u>Magome, Nobuyuki</u> ; Kanaporis, Giedrius; Moisan, Nicolas; <u>Tanaka, Koichiro</u> ; <u>Agladze, Konstantin</u> ; Photo-Control of Excitation Waves in Cardiomyocyte Tissue Culture; <i>Tissue Eng. Part A</i> 17 , 2703-2711 (2011)
80	Nakamura, Tomonori; Nakagawa, Masato; Ichisaka, Tomoko; Shiota, Arufumi; <u>Yamanaka, Shinya</u> ; Essential Roles of ECAT15-2/Dppa2 in Functional Lung Development; <i>Mol. Cell. Biol.</i> 31 , 4366-4378 (2011)
81	Ohtsuka, Takuma; Neki, Satoshi; Kanai, Tamotsu; <u>Akiyoshi, Kazunari</u> ; Nomura, Shin-ichiro M.; Ohtsuki, Takashi; Synthesis and in situ insertion of a site-specific fluorescently labeled membrane protein into cell-sized liposomes; <i>Anal. Biochem.</i> 418 , 97-101 (2011)

82	<u>Hayashi, Naoaki</u> ; <u>Yamamoto, Takafumi</u> ; <u>Kageyama, Hiroshi</u> ; <u>Nishi, Masakazu</u> ; <u>Watanabe, Yoshitaka</u> ; <u>Kawakami, Takateru</u> ; <u>Matsushita, Yoshitaka</u> ; <u>Fujimori, Atsushi</u> ; <u>Takano, Mikio</u> ; BaFeO ₃ : A Ferromagnetic Iron Oxide; <i>Angew. Chem.-Int. Edit.</i> 50 , 12547-12550 (2011)
83	<u>Wang, Li</u> ; <u>Zhang, Zhi-Ling</u> ; <u>Wdzieczak-Bakala, Joanna</u> ; <u>Pang, Dai-Wen</u> ; <u>Liu, Jianmiao</u> ; <u>Chen, Yong</u> ; Patterning cells and shear flow conditions: Convenient observation of endothelial cell remoulding, enhanced production of angiogenesis factors and drug response; <i>Lab Chip</i> 11 , 4235-4240 (2011)
84	<u>Shimizu, Hiroyo</u> ; <u>Iwayama, Yuki</u> ; <u>Imamura, Akihiro</u> ; <u>Ando, Hiromune</u> ; <u>Ishida, Hideharu</u> ; <u>Kiso, Makoto</u> ; Synthesis of the Disialic Acid-Embedded Glycan Part of Ganglioside HPG-1; <i>Biosci. Biotechnol. Biochem.</i> 75 , 2079-2082 (2011)
85	<u>Kohmoto, Toshiro</u> ; <u>Koyama, Yuka</u> ; <u>Moriyasu, Takeshi</u> ; <u>Okamura, Hidekazu</u> ; <u>Yamada, Yasuhiro</u> ; <u>Tanaka, Koichiro</u> ; Photoinduced Dynamics in Pure and Ca-Doped SrTiO ₃ Studied by Transient Birefringence and Absorption Measurements; <i>J. Phys. Soc. Jpn.</i> 80 , 104605-104605 (2011)
86	<u>Pandian, Ganesh N.</u> ; <u>Shinohara, Ken-ichi</u> ; <u>Ohtsuki, Akimichi</u> ; <u>Nakano, Yusuke</u> ; <u>Masafumi, Minoshima</u> ; <u>Bando, Toshikazu</u> ; <u>Nagase, Hiroki</u> ; <u>Yamada, Yasuhiro</u> ; <u>Watanabe, Akira</u> ; <u>Terada, Naohiro</u> ; <u>Sato, Shinsuke</u> ; <u>Morinaga, Hironobu</u> ; <u>Sugiyama, Hiroshi</u> ; Synthetic Small Molecules for Epigenetic Activation of Pluripotency Genes in Mouse Embryonic Fibroblasts; <i>ChemBioChem</i> 12 , 2822-2828 (2011)
87	<u>Morinaga, Hironobu</u> ; <u>Bando, Toshikazu</u> ; <u>Takagaki, Toshiki</u> ; <u>Yamamoto, Makoto</u> ; <u>Hashiya, Kaori</u> ; <u>Sugiyama, Hiroshi</u> ; Cysteine Cyclic Pyrrole-Imidazole Polyamide for Sequence-Specific Recognition in the DNA Minor Groove; <i>J. Am. Chem. Soc.</i> 133 , 18924-18930 (2011)
88	<u>Kawamura, Yoji</u> ; <u>Nakao, Hiroya</u> ; <u>Kuramoto, Yoshiki</u> ; Collective phase description of globally coupled excitable elements; <i>Phys. Rev. E</i> 84 , 46211 (2011)
89	<u>Okada, Takanori</u> ; <u>Tanaka, Koichiro</u> ; Photo-designed terahertz devices; <i>Sci Rep</i> 1 , 121 (2011)
90	<u>Umemura, Ayako</u> ; <u>Diring, Stephane</u> ; <u>Furukawa, Shuhei</u> ; <u>Uehara, Hiromitsu</u> ; <u>Tsuruoka, Takaaki</u> ; <u>Kitagawa, Susumu</u> ; Morphology Design of Porous Coordination Polymer Crystals by Coordination Modulation; <i>J. Am. Chem. Soc.</i> 133 , 15506-15513 (2011)
91	<u>Watanabe, H.</u> ; <u>Brefuel, N.</u> ; <u>Mouri, S.</u> ; <u>Tuchagues, J. -P.</u> ; <u>Collet, E.</u> ; <u>Tanaka, K.</u> ; Dynamical separation of spin and lattice degrees of freedom in the relaxation process from the photo-induced state; <i>EPL</i> 96 , 17004 (2011)
92	<u>Yanai, Nobuhiro</u> ; <u>Kitayama, Koji</u> ; <u>Hijikata, Yuh</u> ; <u>Sato, Hiroshi</u> ; <u>Matsuda, Ryotaro</u> ; <u>Kubota, Yoshiki</u> ; <u>Takata, Masaki</u> ; <u>Mizuno, Motohiro</u> ; <u>Uemura, Takashi</u> ; <u>Kitagawa, Susumu</u> ; Gas detection by structural variations of fluorescent guest molecules in a flexible porous coordination polymer; <i>Nat. Mater.</i> 10 , 787-793 (2011)
93	<u>Kimori, Yoshitaka</u> ; <u>Katayama, Eisaku</u> ; <u>Morone, Nobuhiro</u> ; <u>Kodama, Takao</u> ; Fractal dimension analysis and mathematical morphology of structural changes in actin filaments imaged by electron microscopy; <i>J. Struct. Biol.</i> 176 , 1-8 (2011)
94	<u>Higuchi, Yuriko</u> ; <u>Wu, Can</u> ; <u>Chang, Kai-Ling</u> ; <u>Irie, Kei</u> ; <u>Kawakami, Shigeru</u> ; <u>Yamashita, Fumiyoshi</u> ; <u>Hashida, Mitsuru</u> ; Polyamidoamine dendrimer-conjugated quantum dots for efficient labeling of primary cultured mesenchymal stem cells; <i>Biomaterials</i> 32 , 6676-6682 (2011)
95	<u>Umeyama, Daiki</u> ; <u>Horike, Satoshi</u> ; <u>Inukai, Munehiro</u> ; <u>Hijikata, Yuh</u> ; <u>Kitagawa, Susumu</u> ; Confinement of Mobile Histamine in Coordination Nanochannels for Fast Proton Transfer; <i>Angew. Chem.-Int. Edit.</i> 50 , 11706-11709 (2011)

96	<u>Tanaka, Koichiro</u> ; <u>Hirori, Hideki</u> ; Nagai, Masaya; THz Nonlinear Spectroscopy of Solids; <i>IEEE Transactions on Terahertz Science and Technology</i> 1 , 301-312 (2011)
97	Sasaki, Naoya; Ishii, Takamichi; Kamimura, Ryo; Kajiwara, Masatoshi; Machimoto, Takafumi; <u>Nakatsuji, Norio</u> ; Suemori, Hirofumi; Ikai, Iwao; Yasuchika, Kentaro; Uemoto, Shinji; Alpha-fetoprotein-producing pancreatic cancer cells possess cancer stem cell characteristics; <i>Cancer Lett.</i> 308 , 152-161 (2011)
98	Ooi, Kazufumi; Okada, Takanori; <u>Tanaka, Koichiro</u> ; Mimicking electromagnetically induced transparency by spoof surface plasmons; <i>Phys. Rev. B</i> 84 , 115405 (2011)
99	Matano, Yoshihiro; Kon, Yusuke; Saito, Arihiro; Kimura, Yoshifumi; Murafuji, Toshihiro; <u>Imahori, Hiroshi</u> ; Divergent Synthesis of 2,5-Diarylphospholes Based on Cross-coupling Reactions: Substituent Effects on the Optical and Redox Properties of Benzene-Phosphole-Benzene pi-Systems; <i>Chem. Lett.</i> 40 , 919-921 (2011)
100	Doi, Atsushi; <u>Blanchard, Francois</u> ; <u>Tanaka, Tomoko</u> ; <u>Tanaka, Koichiro</u> ; Improving Spatial Resolution of Real-Time Terahertz Near-Field Microscope; <i>J. Infrared Millim. Terahertz Waves</i> 32 , 1043-1051 (2011)
101	Abdu-Allah, Hajjaj H. M.; Watanabe, Kozo; Daikoku, Shusaku; Kanie, Osamu; Tsubata, Takeshi; <u>Ando, Hiromune</u> ; Ishida, Hideharu; <u>Kiso, Makoto</u> ; Design and Synthesis of a Multivalent Heterobifunctional CD22 Ligand as a Potential Immunomodulator; <i>Synthesis</i> 18 , 2968-2974 (2011)
<u>102</u>	Hagiwara, Akari; Tanaka, Yasuhiro; Hikawa, Rie; <u>Morone, Nobuhiro</u> ; <u>Kusumi, Akihiro</u> ; Kimura, Hiroshi; Kinoshita, Makoto; Submembranous Septins as Relatively Stable Components of Actin-Based Membrane Skeleton; <i>Cytoskeleton</i> 68 , 512-525 (2011)
103	<u>Nagao, Kohjiro</u> ; <u>Tomioka, Maiko</u> ; <u>Ueda, Kazumitsu</u> ; Function and regulation of ABCA1-membrane meso-domain organization and reorganization; <i>FEBS J.</i> 278 , 3190-3203 (2011)
104	Hatano, Yuichiro; <u>Yamada, Yasuhiro</u> ; Hata, Kazuya; Phutthaphadoong, Suphot; Aoki, Hitomi; Hara, Akira; Genetic ablation of a candidate tumor suppressor gene, Rest, does not promote mouse colon carcinogenesis; <i>Cancer Sci.</i> 102 , 1659-1664 (2011)
105	Tatsumi, Rie; Suzuki, Yutaka; Sumi, Tomoyuki; Sone, Masakatsu; Suemori, Hirofumi; <u>Nakatsuji, Norio</u> ; Simple and Highly Efficient Method for Production of Endothelial Cells From Human Embryonic Stem Cells; <i>Cell Transplant.</i> 20 , 1423-1430 (2011)
106	Umeyama, Tomokazu; Mihara, Junya; Hayashi, Hironobu; Kadota, Naoki; Chukharev, Vladimir; Tkachenko, Nikolai V.; Lemmetyinen, Helge; Yoshida, Kaname; <u>Isoda, Seiji</u> ; <u>Imahori, Hirohi</u> ; Effects of fullerene encapsulation on structure and photophysical properties of porphyrin-linked single-walled carbon nanotubes; <i>Chem. Commun.</i> 47 , 11781-11783 (2011)
107	Koirala, Deepak; Dhakal, Soma; Ashbridge, Beth; Sannohe, Yuta; Rodriguez, Raphael; <u>Sugiyama, Hiroshi</u> ; Balasubramanian, Shankar; Mao, Hanbin; A single-molecule platform for investigation of interactions between G-quadruplexes and small-molecule ligands; <i>Nat. Chem.</i> 3 , 782-787 (2011)
108	Rajendran, Arivazhagan; <u>Endo, Masayuki</u> ; Katsuda, Yousuke; Hidaka, Kumi; <u>Sugiyama, Hiroshi</u> ; Photo-Cross-Linking-Assisted Thermal Stability of DNA Origami Structures and Its Application for Higher-Temperature Self-Assembly; <i>J. Am. Chem. Soc.</i> 133 , 14488-14491 (2011)
109	<u>Blanchard, F.</u> ; Golde, D.; Su, F. H.; Razzari, L.; Sharma, G.; Morandotti, R.; Ozaki, T.; Reid, M.; Kira, M.; Koch, S. W.; Hegmann, F. A.; Effective Mass Anisotropy of Hot Electrons in Nonparabolic Conduction Bands of n-Doped InGaAs Films Using Ultrafast Terahertz Pump-Probe Techniques; <i>Phys. Rev. Lett.</i> 107 , 107401 (2011)

110	Hayashi, Katsuhiko; Ohta, Hiroshi; Kurimoto, Kazuki; Aramaki, Shinya; <u>Saitou, Mitinori</u> ; Reconstitution of the Mouse Germ Cell Specification Pathway in Culture by Pluripotent Stem Cells; <i>Cell</i> 146 , 519-532 (2011)
<u>111</u>	Uehara, Hiromitsu; <u>Diring, Stephane</u> ; <u>Furukawa, Shuhei</u> ; <u>Kalay, Ziya</u> ; <u>Tsotsalas, Manuel</u> ; Nakahama, Masashi; Hirai, Kenji; <u>Kondo, Mio</u> ; Sakata, Osami; <u>Kitagawa, Susumu</u> ; Porous Coordination Polymer Hybrid Device with Quartz Oscillator: Effect of Crystal Size on Sorption Kinetics; <i>J. Am. Chem. Soc.</i> 133 , 11932-11935 (2011)
112	Zhang, Fan; Tian, Jinghua; Wang, Li; He, Pingang; <u>Chen, Yong</u> ; Correlation between cell growth rate and glucose consumption determined by electrochemical monitoring; <i>Sens. Actuator B-Chem.</i> 156 , 416-422 (2011)
113	Watanabe, Shun N.; Iwaki, Takafumi; Kohira, Masahiro I.; <u>Magome, Nobuyuki</u> ; Yoshikawa, Kenichi; Negative photophoresis of smoke particles observed under microgravity; <i>Chem. Phys. Lett.</i> 511 , 447-451 (2011)
114	Akiyama, George; <u>Matsuda, Ryotaro</u> ; <u>Sato, Hiroshi</u> ; Takata, Masaki; <u>Kitagawa, Susumu</u> ; Cellulose Hydrolysis by a New Porous Coordination Polymer Decorated with Sulfonic Acid Functional Groups; <i>Adv. Mater.</i> 23 , 3294-+ (2011)
115	Maes, Michael; Schouteden, Stijn; Hirai, Kenji; <u>Furukawa, Shuhei</u> ; <u>Kitagawa, Susumu</u> ; De Vos, Dirk E.; Liquid Phase Separation of Polyaromatics on [Cu(2)(BDC)(2)(dabco)]; <i>Langmuir</i> 27 , 9083-9087 (2011)
116	Lhoste, Kevin; Malaquin, Laurent; Billot, Laurent; Haghiri-Gosnet, Anne Marie; <u>Chen, Yong</u> ; Fabrication of high density gold nanoparticle arrays on glass for high sensitivity bio-detection; <i>Microelectron. Eng.</i> 88 , 2474-2477 (2011)
117	Jiang, Lianmei; Liu, Jianmiao; Shi, Jian; Li, Xin; Li, Hao; Liu, Jun; Ye, Jiannong; <u>Chen, Yong</u> ; Impedance monitoring of cell adhesion and growth on mesoporous membrane; <i>Microelectron. Eng.</i> 88 , 1722-1725 (2011)
118	Wang, Li; Shi, Jian; <u>Liu, Li</u> ; Secret, Emilie; <u>Chen, Yong</u> ; Fabrication of polymer fiber scaffolds by centrifugal spinning for cell culture studies; <i>Microelectron. Eng.</i> 88 , 1718-1721 (2011)
119	Hu, J.; Tian, J. H.; Shi, J.; Zhang, F.; He, D. L.; <u>Liu, L.</u> ; Jung, D. J.; Bai, J. B.; <u>Chen, Y.</u> ; Cell culture on AAO nanoporous substrates with and without geometry constrains; <i>Microelectron. Eng.</i> 88 , 1714-1717 (2011)
120	Liu, J. J.; Li, H.; Zhang, F.; Li, X.; Wang, L.; <u>Chen, Y.</u> ; Online impedance monitoring of yeast cell culture behaviors; <i>Microelectron. Eng.</i> 88 , 1711-1713 (2011)
121	Luo, ChunXiong; <u>Liu, Li</u> ; Ni, XiaoFang; Wang, Li; <u>Nomura, Shinichiro M.</u> ; Qi Ouyang; <u>Chen, Yong</u> ; Differentiating stem cells on patterned substrates for neural network formation; <i>Microelectron. Eng.</i> 88 , 1707-1710 (2011)
122	Tian, J. H.; Hu, J.; Zhang, F.; Li, X.; Shi, J.; Liu, J.; Tian, Z. Q.; <u>Chen, Y.</u> ; Fabrication of high density metallic nanowires and nanotubes for cell culture studies; <i>Microelectron. Eng.</i> 88 , 1702-1706 (2011)
123	Shi, Jian; <u>Liu, Li</u> ; <u>Chen, Yong</u> ; Investigation of cell culture in microfluidic devices with different bi-layer substrates; <i>Microelectron. Eng.</i> 88 , 1693-1697 (2011)
124	Magesh, S.; <u>Ando, H.</u> ; Tsubata, T.; Ishida, H.; <u>Kiso, M.</u> ; High-Affinity Ligands of Siglec Receptors and their Therapeutic Potentials; <i>Curr. Med. Chem.</i> 18 , 3537-3550 (2011)

125	<u>Heuser, John E.</u> ; The origins and evolution of freeze-etch electron microscopy; <i>J. Electron Microsc.</i> 60 , S3-S29 (2011)
126	<u>Khambu, Bilon</u> ; <u>Uesugi, Motonari</u> ; Kawazoe, Yoshinori; Translational repression stabilizes messenger RNA of autophagy-related genes; <i>Genes Cells</i> 16 , 857-867 (2011)
<u>127</u>	<u>Kalay, Ziya</u> ; Fundamental and functional aspects of mesoscopic architectures with examples in physics, cell biology, and chemistry; <i>Crit. Rev. Biochem. Mol. Biol.</i> 46 , 310-326 (2011)
<u>128</u>	<u>Orlova, Yuliya</u> ; <u>Magome, Nobuyuki</u> ; <u>Liu, Li</u> ; <u>Chen, Yong</u> ; <u>Agladze, Konstantin</u> ; Electrospun nanofibers as a tool for architecture control in engineered cardiac tissue; <i>Biomaterials</i> 32 , 5615-5624 (2011)
129	<u>Endo, Masayuki</u> ; Yang, Yangyang; Emura, Tomoko; Hidaka, kumi; <u>Sugiyama, Hiroshi</u> ; Programmed placement of gold nanoparticles onto a slit-type DNA origami scaffold; <i>Chem. Commun.</i> 47 , 10743-10745 (2011)
130	Wang, Ziyue; Takezawa, Yusuke; Aoyagi, Hiroki; <u>Abe, Satoshi</u> ; Hikage, Tatsuo; Watanabe, Yoshihito; <u>Kitagawa, Susumu</u> ; <u>Ueno, Takafumi</u> ; Definite coordination arrangement of organometallic palladium complexes accumulated on the designed interior surface of apo-ferritin; <i>Chem. Commun.</i> 47 , 170-172 (2011)
131	Ando, Hideo; Nakao, Yoshihide; Sato, Hirofumi; <u>Ohba, Masaaki</u> ; <u>Kitagawa, Susumu</u> ; <u>Sakaki, Shigeyoshi</u> ; Theoretical study on high-spin to low-spin transition of {Fe(pyrazine)[Pt(CN)(4)]}: Guest-induced entropy decrease; <i>Chem. Phys. Lett.</i> 511 , 399-404 (2011)
132	Yoshida, Yukihiro; Kai, Kazuya; <u>Kageyama, Hiroshi</u> ; Saito, Gunzi; Viscoelastic nanocomposite composed of titania nanosheets: multiple conductometric sensitivities; <i>Dalton Trans.</i> 40 , 7291-7294 (2011)
133	Mathew, Simon; Iijima, Hiroaki; Toude, Yuuki; Umeyama, Tomokazu; Matano, Yoshihiro; Ito, Seigo; Tkachenko, Nikolai V.; Lemmetyinen, Helge; <u>Imahori, Hiroshi</u> ; Optical, Electrochemical, and Photovoltaic Effects of an Electron-Withdrawing Tetrafluorophenylene Bridge in a Push-Pull Porphyrin Sensitizer Used for Dye-Sensitized Solar Cells; <i>J. Phys. Chem. C</i> 115 , 14415-14424 (2011)
134	<u>Kobayashi, Hirokazu</u> ; Morita, Hitoshi; Yamauchi, Miho; Ikeda, Ryuichi; <u>Kitagawa, Hiroshi</u> ; Kubota, Yoshiki; Kato, Kenichi; Takata, Masaki; Nanosize-Induced Hydrogen Storage and Capacity Control in a Non-Hydride-Forming Element: Rhodium; <i>J. Am. Chem. Soc.</i> 133 , 11034-11037 (2011)
135	Nakanishi, Hideyuki; Higuchi, Yuriko; Kawakami, Shigeru; Yamashita, Fumiyoshi; <u>Hashida, Mitsuru</u> ; Comparison of piggyBac transposition efficiency between linear and circular donor vectors in mammalian cells; <i>J. Biotechnol.</i> 154 , 205-208 (2011)
136	Hayashi, Hironobu; Nihashi, Wataru; Umeyama, Tomokazu; Matano, Yoshihiro; Seki, Shu; Shimizu, Yo; <u>Imahori, Hiroshi</u> ; Segregated Donor-Acceptor Columns in Liquid Crystals That Exhibit Highly Efficient Ambipolar Charge Transport; <i>J. Am. Chem. Soc.</i> 133 , 10736-10739 (2011)
137	Ueda, Yoshikatsu; Kolesnikov, Alexander I.; <u>Koyanaka, Hideki</u> ; Sensing hydrogen gas concentration using electrolyte made of proton conductive manganese dioxide; <i>Sens. Actuator B-Chem.</i> 155 , 893-896 (2011)
138	Umeyama, Tomokazu; Fueno, Hiroyuki; Kawabata, Eisuke; Kobayashi, Yoshikazu; Tanaka, Kazuyoshi; Tezuka, Noriyasu; Matano, Yoshihiro; <u>Imahori, Hiroshi</u> ; Density Functional Theory Studies on Chemical Functionalization of Single-Walled Carbon Nanotubes by Bingel Reaction; <i>Bull. Chem. Soc. Jpn.</i> 84 , 748-753 (2011)

139	Nagae, Genta; Isagawa, Takayuki; Shiraki, Nobuaki; Fujita, Takanori; Yamamoto, Shogo; Tsutsumi, Shuichi; Nonaka, Aya; Yoshiba, Sayaka; Matsusaka, Keisuke; Midorikawa, Yutaka; Ishikawa, Shumpei; Soejima, Hidenobu; Fukayama, Masashi; Suemori, Hirofumi; <u>Nakatsuji, Norio</u> ; Kume, Shoen; Aburatani, Hiroyuki; Tissue-specific demethylation in CpG-poor promoters during cellular differentiation; <i>Hum. Mol. Genet.</i> 20 , 2710-2721 (2011)
140	Kamisuki, Shinji; Shirakawa, Takashi; Kugimiya, Akira; Abu-Elheiga, Lutfi; Choo, Hea-Young Park; Yamada, Kohei; Shimogawa, Hiroki; Wakil, Salih J.; <u>Uesugi, Motonari</u> ; Synthesis and Evaluation of Diarylthiazole Derivatives That Inhibit Activation of Sterol Regulatory Element-Binding Proteins; <i>J. Med. Chem.</i> 54 , 4923-4927 (2011)
141	Nomura, Mami; Nagai, Takeharu; <u>Harada, Yoshie</u> ; Tani, Tomomi; Facilitated Intracellular Transport of TrkA by an Interaction with Nerve Growth Factor; <i>Dev. Neurobiol.</i> 71 , 634-649 (2011)
<u>142</u>	Un, Keita; Kawakami, Shigeru; Yoshida, Mitsuru; Higuchi, Yuriko; Suzuki, Ryo; Maruyama, Kazuo; Yamashita, Fumiyoshi; <u>Hashida, Mitsuru</u> ; The elucidation of gene transferring mechanism by ultrasound-responsive unmodified and mannose-modified lipoplexes; <i>Biomaterials</i> 32 , 4659-4669 (2011)
143	<u>Wijagkanalan, Wassana</u> ; Kawakami, Shigeru; <u>Hashida, Mitsuru</u> ; Designing Dendrimers for Drug Delivery and Imaging: Pharmacokinetic Considerations; <i>Pharm. Res.</i> 28 , 1500-1519 (2011)
144	Hirai, Kenji; <u>Furukawa, Shuhei</u> ; <u>Kondo, Mio</u> ; Uehara, Hiromitsu; Sakata, Osami; <u>Kitagawa, Susumu</u> ; Sequential Functionalization of Porous Coordination Polymer Crystals; <i>Angew. Chem.-Int. Edit.</i> 50 , 8057-8061 (2011)
145	<u>Iwayama, Yuki</u> ; <u>Ando, Hiromune</u> ; <u>Tanaka, Hide-Nori</u> ; Ishida, Hideharu; <u>Kiso, Makoto</u> ; Synthesis of the glycan moiety of ganglioside HPG-7 with an unusual trimer of sialic acid as the inner sugar residue; <i>Chem. Commun.</i> 47 , 9726-9728 (2011)
146	Umeyama, Tomokazu; Odoi, Masaaki; Yoshikawa, Osamu; Sagawa, Takashi; Yoshikawa, Susumu; Evgenia, Douvogianni; Tezuka, Noriyasu; Matano, Yoshihiro; Stranius, Kati; Tkachencko, Nikolai V.; Lemmetyinen, Helge; <u>Imahori, Hiroshi</u> ; Synthesis and photovoltaic properties of thiophene-imide-fused thiophene alternating copolymers with different alkyl side chains; <i>J. Mater. Chem.</i> 21 , 12454-12461 (2011)
147	<u>Endo, Masayuki</u> ; <u>Sugiyama, Hiroshi</u> ; Recent Progress in DNA Origami Technology; <i>Curr. Protoc. Nucleic Acid Chem.</i> 12.8.1-12.8.19 (2011)
148	Shirai, Tetsuya; <u>Mizumachi, Eri</u> ; <u>Kano, Kei</u> ; Kurokawa, Hiromi; Nakaya, Fumio; <u>Motoki, Tamaki</u> ; Shiose, Takayuki; Bridging the Communication Gap in the Current Nuclear Power Disaster; <i>Japanese Journal of Science Communication</i> 9 , 107-119 (2011)
149	Tanaka, Takashi; <u>Hosokawa, Mihoko</u> ; Vagin, Vasily V.; Reuter, Michael; Hayashi, Eri; Mochizuki, Ayako L.; Kitamura, Kouichi; Yamanaka, Hidenori; Kondoh, Gen; Okawa, Katsuya; Kuramochi-Miyagawa, Satomi; Nakano, Toru; Sachidanandam, Ravi; Hannon, Gregory J.; Pillai, Ramesh S.; <u>Nakatsuji, Norio</u> ; <u>Chuma, Shinichiro</u> ; Tudor domain containing 7 (Tdrd7) is essential for dynamic ribonucleoprotein (RNP) remodeling of chromatoid bodies during spermatogenesis; <i>Proc. Natl. Acad. Sci. U. S. A.</i> 108 , 10579-10584 (2011)
150	Seo, Joobeom; Bonneau, Charlotte; <u>Matsuda, Ryotaro</u> ; Takata, Masaki; <u>Kitagawa, Susumu</u> ; Soft Secondary Building Unit: Dynamic Bond Rearrangement on Multinuclear Core of Porous Coordination Polymers in Gas Media; <i>J. Am. Chem. Soc.</i> 133 , 9005-9013 (2011)
151	Maekawa, Momoko; Yamaguchi, Kei; Nakamura, Tomonori; Shibukawa, Ran; Kodanaka, Ikumi; Ichisaka, Tomoko; Kawamura, Yoshifumi; Mochizuki, Hiromi; Goshima, Naoki; <u>Yamanaka, Shinya</u> ; Direct reprogramming of somatic cells is promoted by maternal transcription factor Glis1; <i>Nature</i> 474 , 225-U268 (2011)

152	Ohtani, Ryo; Yoneda, Ko; <u>Furukawa, Shuhei</u> ; Horike, Nao; <u>Kitagawa, Susumu</u> ; Gaspar, Ana B.; Carmen Munoz, M.; Real, Jose A.; <u>Ohba, Masaaki</u> ; Precise Control and Consecutive Modulation of Spin Transition Temperature Using Chemical Migration in Porous Coordination Polymers; <i>J. Am. Chem. Soc.</i> 133 , 8600-8605 (2011)
153	Li, Sisi; Hu, Jie; Li, Junjun; Tian, Jinghua; Han, Zhitao; Zhou, Xiongtu; <u>Chen, Yong</u> ; Anisotropic Wet Etched Silicon Substrates for Reoriented and Selective Growth of ZnO Nanowires and Enhanced Hydrophobicity; <i>Langmuir</i> 27 , 6549-6553 (2011)
154	<u>Hozoji-Inada, Masako</u> ; Munehira, Youichi; <u>Nagao, Kohjiro</u> ; Kioka, Noriyuki; <u>Ueda, Kazumitsu</u> ; Liver X Receptor beta (LXR beta) Interacts Directly with ATP-binding Cassette A1 (ABCA1) to Promote High Density Lipoprotein Formation during Acute Cholesterol Accumulation; <i>J. Biol. Chem.</i> 286 , 20117-20124 (2011)
155	<u>Matsui, Takeshi</u> ; Miyamoto, Kenichi; Kubo, Akiharu; Kawasaki, Hiroshi; Ebihara, Tamotsu; Hata, Kazuya; Tanahashi, Shinya; Ichinose, Shizuko; Imoto, Issei; Inazawa, Johji; Kudoh, Jun; Amagai, Masayuki; SASPase regulates stratum corneum hydration through profilaggrin-to-filaggrin processing; <i>EMBO Mol. Med.</i> 3 , 320-333 (2011)
156	<u>Wijagkanalan, Wassana</u> ; Kawakami, Shigeru; <u>Hashida, Mitsuru</u> ; Glycosylated carriers for cell-selective and nuclear delivery of nucleic acids; <i>Front. Biosci.</i> 16 , 2970-2987 (2011)
157	<u>Sengoku, Shintaro</u> ; Sumikura, Koichi; Oki, Toshihiko; <u>Nakatsuji, Norio</u> ; Redefining the Concept of Standardization for Pluripotent Stem Cells; <i>Stem Cell Rev. Rep.</i> 7 , 221-226 (2011)
158	Ikeda, Shuji; Kubota, Takeshi; <u>Wang, Dan Ohtan</u> ; Yanagisawa, Hiroyuki; Yuki, Mizue; Okamoto, Akimitsu; Emission control by binary energy transfer processes on oligouridine; <i>Org. Biomol. Chem.</i> 9 , 6598-6603 (2011)
159	Matano, Yoshihiro; Saito, Arihiro; Fukushima, Tatsuya; Tokudome, Yasuaki; Suzuki, Furitsu; Sakamaki, Daisuke; Kaji, Hironori; Ito, Akihiro; Tanaka, Kazuyoshi; <u>Imahori, Hiroshi</u> ; Fusion of Phosphole and 1,1'-Biacenaphthene: Phosphorus(V)-Containing Extended pi-Systems with High Electron Affinity and Electron Mobility; <i>Angew. Chem.-Int. Edit.</i> 50 , 8016-8020 (2011)
160	Hu, Ming; <u>Reboul, Julien</u> ; <u>Furukawa, Shuhei</u> ; Radhakrishnan, Logudurai; Zhang, Yuanjian; Srinivasu, Pavuluri; Iwai, Hideo; Wang, Hongjing; Nemoto, Yoshihiro; Suzuki, Norihiro; <u>Kitagawa, Susumu</u> ; Yamauchi, Yusuke; Direct synthesis of nanoporous carbon nitride fibers using Al-based porous coordination polymers (Al-PCPs); <i>Chem. Commun.</i> 47 , 8124-8126 (2011)
161	Kanoo, Prakash; Mostafa, Golam; <u>Matsuda, Ryotaro</u> ; <u>Kitagawa, Susumu</u> ; Maji, Tapas Kumar; A pillared-bilayer porous coordination polymer with a 1D channel and a 2D interlayer space, showing unique gas and vapor sorption; <i>Chem. Commun.</i> 47 , 8106-8108 (2011)
<u>162</u>	Li, Xin; <u>Liu, Li</u> ; Wang, Li; <u>Kamei, Ken-ichiro</u> ; Yuan, Qinghua; Zhang, Fan; Shi, Jian; <u>Kusumi, Akihiro</u> ; <u>Xie, Min</u> ; Zhao, Zhenjie; <u>Chen, Yong</u> ; Integrated and diffusion-based micro-injectors for open access cell assays; <i>Lab Chip</i> 11 , 2612-2617 (2011)
163	Yamada, Ikuya; Tsuchida, Kazuki; Ohgushi, Kenya; <u>Hayashi, Naoaki</u> ; Kim, Jungeun; Tsuji, Naruki; Takahashi, Ryoji; Matsushita, Masafumi; Nishiyama, Norimasa; Inoue, Toru; Irifune, Tetsuo; Kato, Kenichi; Takata, Masaki; <u>Takano, Mikio</u> ; Giant Negative Thermal Expansion in the Iron Perovskite SrCu ₃ Fe ₄ O ₁₂ ; <i>Angew. Chem.-Int. Edit.</i> 50 , 6579-6582 (2011)
164	Hijikata, Yuh; Horike, Satoshi; Tanaka, Daisuke; Groll, Juergen; Mizuno, Motohiro; Kim, Jungeun; Takata, Masaki; <u>Kitagawa, Susumu</u> ; Differences of crystal structure and dynamics between a soft porous nanocrystal and a bulk crystal; <i>Chem. Commun.</i> 47 , 7632-7634 (2011)
165	Nakagawa, Chie; Yagi, Ekou; <u>Kato, Kazuto</u> ; What are the features of non-expert opinions on regenerative medicine? Opinion analysis of workshop participants; <i>Journal of Science Communication</i> 10 (2011)

166	Kaneko, Megumi; Yamaguchi, Kazuhiko; Eiraku, Mototsugu; Sato, Motohiko; Takata, Norio; Kiyohara, Yoshimoto; Mishina, Masayoshi; Hirase, Hajime; Hashikawa, Tsutomu; <u>Kengaku, Mineko</u> ; Remodeling of Monopolar Purkinje Cell Dendrites during Cerebellar Circuit Formation; <i>PLoS One</i> 6 , e20108 (2011)
167	Ke, Zhuofeng; <u>Abe, Satoshi</u> ; <u>Ueno, Takafumi</u> ; Morokuma, Keiji; Rh-Catalyzed Polymerization of Phenylacetylene: Theoretical Studies of the Reaction Mechanism, Regioselectivity, and Stereoregularity; <i>J. Am. Chem. Soc.</i> 133 , 7926-7941 (2011)
168	Hayashi, Hironobu; Lightcap, Ian V.; <u>Tsujimoto, Masahiko</u> ; <u>Takano, Mikio</u> ; Umeyama, Tomokazu; Kamat, Prashant V.; <u>Imahori, Hiroshi</u> ; Electron Transfer Cascade by Organic/Inorganic Ternary Composites of Porphyrin, Zinc Oxide Nanoparticles, and Reduced Graphene Oxide on a Tin Oxide Electrode that Exhibits Efficient Photocurrent Generation; <i>J. Am. Chem. Soc.</i> 133 , 7684-7687 (2011)
169	Tian, Jing-Hua; Hu, Jie; Li, Si-Si; Zhang, Fan; Liu, Jun; Shi, Jian; Li, Xin; Tian, Zhong-Qun; <u>Chen, Yong</u> ; Improved seedless hydrothermal synthesis of dense and ultralong ZnO nanowires; <i>Nanotechnology</i> 22 , 245601 (2011)
170	Chang, Ho-Chol; Komasa, Kazuki; Kishida, Keisuke; Shiozaki, Tomoki; Ohmori, Takeshi; Matsumoto, Takeshi; Kobayashi, Atsushi; Kato, Masako; <u>Kitagawa, Susumu</u> ; Chromic Behaviors of Hexagonal Columnar Liquid Crystalline Platinum Complexes with Catecholato, 2-Thiophenolato, and Benzenedithiolato; <i>Inorg. Chem.</i> 50 , 4279-4288 (2011)
171	Ishikawa, Atsushi; <u>Sakaki, Shigeyoshi</u> ; Theoretical Study of Photoinduced Epoxidation of Olefins Catalyzed by Ruthenium Porphyrin; <i>J. Phys. Chem. A</i> 115 , 4774-4785 (2011)
172	Seinberg, Liis; Yamamoto, Takafumi; Tassel, Cedric; Kobayashi, Yoji; <u>Hayashi, Naoaki</u> ; Kitada, Atsushi; Sumida, Yuji; Watanabe, Takashi; Nishi, Masakazu; Ohoyama, Kenji; Yoshimura, Kazuyoshi; <u>Takano, Mikio</u> ; Paulus, Werner; <u>Kageyama, Hiroshi</u> ; Fe-Site Substitution Effect on the Structural and Magnetic Properties in SrFeO(2); <i>Inorg. Chem.</i> 50 , 3988-3995 (2011)
173	Yamada, Teppei; Iwakiri, Shoji; Hara, Takafumi; Kanaizuka, Katsuhiko; Kurmoo, Mohamedally; <u>Kitagawa, Hiroshi</u> ; Porous Interpenetrating Metal-Organic Frameworks with Hierarchical Nodes; <i>Cryst. Growth Des.</i> 11 , 1798-1806 (2011)
174	Sumiya, Eriko; Shimogawa, Hiroki; Sasaki, Hiroaki; Tsutsumi, Masato; Yoshita, Ken'ichi; Ojika, Makoto; Suenaga, Kiyotake; <u>Uesugi, Motonari</u> ; Cell-Morphology Profiling of a Natural Product Library Identifies Bisebromoamide and Miuraenamide A as Actin Filament Stabilizers; <i>ACS Chem. Biol.</i> 6 , 425-431 (2011)
175	<u>Fujikawa, Kohki</u> ; <u>Nakashima, Shinya</u> ; Konishi, Miku; Fuse, Tomoaki; <u>Komura, Naoko</u> ; <u>Ando, Takayuki</u> ; <u>Ando, Hiromune</u> ; Yuki, Nobuhiro; Ishida, Hideharu; <u>Kiso, Makoto</u> ; The First Total Synthesis of Ganglioside GalNAc-GD1a, a Target Molecule for Autoantibodies in Guillain-Barre Syndrome; <i>Chem.-Eur. J.</i> 17 , 5641-5651 (2011)
176	Inoue, H.; <u>Yamanaka, S.</u> ; The Use of Induced Pluripotent Stem Cells in Drug Development; <i>Clin. Pharmacol. Ther.</i> 89 , 655-661 (2011)
177	Okita, Keisuke; Matsumura, Yasuko; Sato, Yoshiko; Okada, Aki; Morizane, Asuka; Okamoto, Satoshi; Hong, Hyunjong; Nakagawa, Masato; Tanabe, Koji; Tezuka, Ken-ichi; Shibata, Toshiyuki; Kunisada, Takahiro; Takahashi, Masayo; Takahashi, Jun; Saji, Hiroh; <u>Yamanaka, Shinya</u> ; A more efficient method to generate integration-free human iPS cells; <i>Nat. Methods</i> 8 , 409-U52 (2011)
178	Totoki, Yasushi; Tatsuno, Kenji; Yamamoto, Shogo; Arai, Yasuhito; Hosoda, Fumie; Ishikawa, Shumpei; Tsutsumi, Shuichi; Sonoda, Kohtaro; Totsuka, Hirohiko; Shirakihara, Takuya; Sakamoto, Hiromi; Wang, Linghua; Ojima, Hidenori; Shimada, Kazuaki; Kosuge, Tomoo; Okusaka, Takuji; <u>Kato, Kazuto</u> ; Kusuda, Jun; Yoshida, Teruhiko; Aburatani, Hiroyuki; Shibata, Tatsuhiro; High-resolution characterization of a hepatocellular carcinoma genome; <i>Nature Genet.</i> 43 , 464-+ (2011)

179	Takashima, Yohei; Furukawa, Shuhej; Kitagawa, Susumu; Control of the charge-transfer interaction between a flexible porous coordination host and aromatic guests by framework isomerism; <i>Crystengcomm</i> 13 , 3360-3363 (2011)
180	Yanai, Nobuhiro; Uemura, Takashi; Uchida, Noriyuki; Bracco, Silvia; Comotti, Angiolina; Sozzani, Piero; Kodani, Tetsuhiro; Koh, Meiten; Kanemura, Takashi; Kitagawa, Susumu; End-functionalization of a vinylidene fluoride oligomer in coordination nanochannels; <i>J. Mater. Chem.</i> 21 , 8021-8025 (2011)
181	Kawazoe, Yoshinori; Shimogawa, Hiroki; Sato, Ayato; Uesugi, Motonari; A Mitochondrial Surface-Specific Fluorescent Probe Activated by Bioconversion; <i>Angew. Chem.-Int. Edit.</i> 50 , 5478-5481 (2011)
182	Imahori, Hiroshi; Iijima, Hiroaki; Hayashi, Hironobu; Toude, Yuuki; Umeyama, Tomokazu; Matano, Yoshihiro; Ito, Seigo; Bisquinoxaline-Fused Porphyrins for Dye-Sensitized Solar Cells; <i>ChemSusChem</i> 4 , 797-805 (2011)
183	Louvain, Nicolas; Takashima, Yohei; Kitagawa, Susumu; Furukawa, Shuhej; Thermodynamically controlled coordination-engineering of novel 2D cadmium thiolate coordination polymers; <i>New J. Chem.</i> 35 , 1265-1269 (2011)
184	Endo, Masayuki; Sugiyama, Hiroshi; DNA Origami-based Construction of Meso-scale Multi-dimensional Architects and Expression of the Functionality in the Designed DNA Nanospace; <i>J. Synth. Org. Chem. Jpn.</i> 69 , 1352-1362 (2011)
185	Nakatani, Naoki; Hitomi, Yutaka; Sakaki, Shigeyoshi; Multistate CASPT2 Study of Native Iron(III)-Dependent Catechol Dioxygenase and Its Functional Models: Electronic Structure and Ligand-to-Metal Charge-Transfer Excitation; <i>J. Phys. Chem. B</i> 115 , 4781-4789 (2011)
186	Imahori, Hiroshi; Kang, Soonchul; Hayashi, Hironobu; Haruta, Mitsutaka; Kurata, Hiroki; Isoda, Seiji; Canton, Sophie E.; Infahsaeng, Yingyot; Kathiravan, Arunkumar; Pascher, Torbjorn; Chabera, Pavel; Yartsev, Arkady P.; Sundstrom, Villy; Photoinduced Charge Carrier Dynamics of Zn-Porphyrin-TiO(2) Electrodes: The Key Role of Charge Recombination for Solar Cell Performance; <i>J. Phys. Chem. A</i> 115 , 3679-3690 (2011)
187	Uemura, Takashi; Uchida, Noriyuki; Higuchi, Masakazu; Kitagawa, Susumu; Effects of Unsaturated Metal Sites on Radical Vinyl Polymerization in Coordination Nanochannels; <i>Macromolecules</i> 44 , 2693-2697 (2011)
188	Blanchard, F.; Doi, A.; Tanaka, T.; Hirori, H.; Tanaka, H.; Kadoya, Y.; Tanaka, K.; Real-time terahertz near-field microscope; <i>Opt. Express</i> 19 , 8277-8284 (2011)
189	Yamamoto, Takafumi; Tassel, Cedric; Kobayashi, Yoji; Kawakami, Takateru; Okada, Taku; Yagi, Takehiko; Yoshida, Hideto; Kamatani, Takanori; Watanabe, Yoshitaka; Kikegawa, Takumi; Takano, Mikio; Yoshimura, Kazuyoshi; Kageyama, Hiroshi; Pressure-Induced Structural, Magnetic, and Transport Transitions in the Two-Legged Ladder Sr(3)Fe(2)O(5); <i>J. Am. Chem. Soc.</i> 133 , 6036-6043 (2011)
190	de Miguel, Gustavo; Hosomizu, Kohei; Umeyama, Tomokazu; Matano, Yoshihiro; Imahori, Hiroshi; Perez-Morales, Marta; Martin-Romero, Maria T.; Camacho, Luis; J-aggregation of a sulfonated amphiphilic porphyrin at the air-water interface as a function of pH; <i>J. Colloid Interface Sci.</i> 356 , 775-782 (2011)
191	Hishida, M.; Tanaka, K.; Long-Range Hydration Effect of Lipid Membrane Studied by Terahertz Time-Domain Spectroscopy; <i>Phys. Rev. Lett.</i> 106 , 158102 (2011)
192	Uemura, Takashi; Kadowaki, Yu; Kim, Cho Rong; Fukushima, Tomohiro; Hiramatsu, Daisuke; Kitagawa, Susumu; Incarceration of Nanosized Silica into Porous Coordination Polymers: Preparation, Characterization, and Adsorption Property; <i>Chem. Mat.</i> 23 , 1736-1741 (2011)

193	Yabe, Tomio; <u>Hosoda-Yabe, Ritsuko</u> ; Kanamaru, Yoshihiro; <u>Kiso, Makoto</u> ; A Peptide Found by Phage Display Discriminates a Specific Structure of a Trisaccharide in Heparin; <i>J. Biol. Chem.</i> 286 , 12397-12406 (2011)
194	Hijikata, Yuh; Horike, Satoshi; Sugimoto, Masayuki; <u>Sato, Hiroshi</u> ; <u>Matsuda, Ryotaro</u> ; <u>Kitagawa, Susumu</u> ; Relationship between Channel and Sorption Properties in Coordination Polymers with Interdigitated Structures; <i>Chem.-Eur. J.</i> 17 , 5138-5144 (2011)
<u>195</u>	Murakami, Gaku; Inoue, Haruhisa; Tsukita, Kayoko; Asai, Yasuyuki; Amagai, Yuji; <u>Aiba, Kazuhiro</u> ; Shimogawa, Hiroki; <u>Uesugi, Motonari</u> ; <u>Nakatsuji, Norio</u> ; Takahashi, Ryosuke; Chemical Library Screening Identifies a Small Molecule That Downregulates SOD1 Transcription for Drugs to Treat Amyotrophic Lateral Sclerosis; <i>J. Biomol. Screen</i> 16 , 405-414 (2011)
196	Monetti, Claudio; Nishino, Koichiro; Biechele, Steffen; Zhang, Puzheng; Baba, Takeshi; <u>Woltjen, Knut</u> ; Nagy, Andras; PhiC31 integrase facilitates genetic approaches combining multiple recombinases; <i>Methods</i> 53 , 380-385 (2011)
197	Thuy Duong Dinh; Higuchi, Yuriko; Kawakami, Shigeru; Yamashita, Fumiyoshi; <u>Hashida, Mitsuru</u> ; Evaluation of Osteoclastogenesis via NF kappa B Decoy/mannosylated Cationic Liposome-Mediated Inhibition of Pro-inflammatory Cytokine Production from Primary Cultured Macrophages; <i>Pharm. Res.</i> 28 , 742-751 (2011)
198	Otsubo, Kazuya; Wakabayashi, Yusuke; Ohara, Jun; Yamamoto, Shoji; Matsuzaki, Hiroyuki; Okamoto, Hiroshi; Nitta, Kiyofumi; Uruga, Tomoya; <u>Kitagawa, Hiroshi</u> ; Bottom-up realization of a porous metal-organic nanotubular assembly; <i>Nat. Mater.</i> 10 , 291-295 (2011)
199	Un, Keita; Kawakami, Shigeru; Suzuki, Ryo; Maruyama, Kazuo; Yamashita, Fumiyoshi; <u>Hashida, Mitsuru</u> ; Suppression of Melanoma Growth and Metastasis by DNA Vaccination Using an Ultrasound-Responsive and Mannose-Modified Gene Carrier; <i>Mol. Pharm.</i> 8 , 543-554 (2011)
200	Umeyama, Tomokazu; Tezuka, Noriyasu; Kawashima, Fumiaki; Seki, Shu; Matano, Yoshihiro; Nakao, Yoshihide; Shishido, Tetsuya; Nishi, Masayuki; Hirao, Kazuyuki; Lehtivuori, Heli; Tkachenko, Nikolai V.; Lemmetyinen, Helge; <u>Imahori, Hiroshi</u> ; Carbon Nanotube Wiring of Donor-Acceptor Nanograins by Self-Assembly and Efficient Charge Transport; <i>Angew. Chem.-Int. Edit.</i> 50 , 4615-4619 (2011)
201	Mathew, Simon; <u>Imahori, Hiroshi</u> ; Tunable, strongly-donating perylene photosensitizers for dye-sensitized solar cells; <i>J. Mater. Chem.</i> 21 , 7166-7174 (2011)
<u>202</u>	<u>Koshiyama, Tomomi</u> ; <u>Shirai, Masanobu</u> ; Hikage, Tatsuo; Tabe, Hiroyasu; <u>Tanaka, Koichiro</u> ; <u>Kitagawa, Susumu</u> ; <u>Ueno, Takafumi</u> ; Post-Crystal Engineering of Zinc-Substituted Myoglobin to Construct a Long-Lived Photoinduced Charge-Separation System; <i>Angew. Chem.-Int. Edit.</i> 50 , 4849-4852 (2011)
203	Matano, Yoshihiro; Saito, Arihiro; Fujita, Masato; <u>Imahori, Hiroshi</u> ; Effects of Heterole Spacers on the Structural, Optical, and Electrochemical Properties of 2,5-Bis(1,5-diphenylphosphol-2-yl)heteroles; <i>Heteroatom Chem.</i> 22 , 457-470 (2011)

B. Invited Lectures, Plenary Addresses (etc.) at International Conferences and International Research Meetings

- List up to 10 main presentations during FY2011 in order from most recent.

- For each, write the lecturer/presenter's name, presentation title, conference name and date(s)

No.	Lecturer/presenter names and details
1	Koichiro Tanaka, "Nonlinear transport phenomena driven by intense terahertz electric field", Gordon Research Conference: Ultrafast Phenomena in Correlated Systems, Huston, USA (21 Feb 2012)
2	Yong Chen, "Biomimetic engineering of in vitro cellular microenvironments", 10th International Conference on Nanoimprint and Nanoprint Technology, Shilla Jeju, Korea (19-21 Oct 2011)
3	Norio Nakatsuji, "Leading International Institutions and Their Strategies for Advancing Regenerative Medicine", 2011 World Stem Cell Summit, Pasadena, USA (3-5 Oct 2011) [Plenary session lecture]
4	Hiroshi Sugiyama, "Chemical Biology that Controls DNA Structure and Function", CIPSM-Fest of Chemical Biology, Munich, Germany (15-16 Sep 2011)
5	Hiroshi Imahori, "Rational materials design and strategy for organic electronics and solar energy conversion", First International Conference on Bioinspired Materials for Solar Energy Utilization, Chania, Greece (12-17 Sep 2011) [Plenary]
6	Takashi Hiiragi, "Stochastic processes in the development of pluripotency in vivo", The EMBO meeting 2011, Workshop "Balancing Potency & Specification in the Embryo", Vienna, The Republic of Austria (10-13 Sep 2011)
7	Motonari Uesugi, "Small molecule tools for cell therapy", The 14th Asian Chemical Congress (14ACC), Bangkok, Thailand (5-8 Sep 2011)
8	Susumu Kitagawa, "Soft Porous Coordination Polymers Having Optical Properties", 19th International Symposium on the Photophysics and Photochemistry of Coordination Compounds (ISPPCC 2011), Strasbourg, France (3-7 Jul 2011) [Plenary]
9	Akihiro Kusumi, "Organizing principle of the plasma membrane: three-tiered meso-scale domain architecture revealed by single-molecule tracking", The 8th European Biophysics Congress, Budapest, Hungary (26-28 Jun 2011) [Plenary]
10	Shinya Yamanaka, "Induction of Pluripotency by Defined Factors", ISSCR 9th Annual Meeting, Toronto, Canada (17 Jun 2011) [Plenary]

H. Major Awards

- List up to 10 main awards received during FY2011 in order from the most recent.
- For each, write the recipient's name, name of award, and year issued.
- In case of multiple recipients, underline those affiliated with the center.

No.	Recipient names and details
1	Hiromune Ando, Japan Society for Bioscience, Biotechnology, and Agrochemistry Award for the Encouragement of Young Scientists (2012)
2	Norio Nakatsuji, Wakayama Prefecture Culture Award (2011)
3	Namasivayam Ganesh Pandian, AAAS "Science" Days of Molecular Medicine -2011 Best Abstract and Young Investigator Award (2011)
4	Mitsuru Hashida, Member of the Science Council of Japan (2011)
5	Susumu Kitagawa, Member of the Science Council of Japan (2011)
6	<u>Shinya Yamanaka</u> , Kazutoshi Takahashi, ISSCR McEwen Centre Award for Innovation (2011)
7	Shinya Yamanaka, Wolf Prize in Medicine (2011)
8	John Heuser, National Academy of Sciences of the USA (2011)
9	Motonari Uesugi, German Innovation Award "Gottfried Wagener Prize 2010" (2011)
10	Susumu Kitagawa, The Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology, Prize for Science and Technology Research (2011)

FY 2011 List of Principal Investigators World Premier International Research Center Initiative (WPI)

NOTE:
 • Underline names of investigators who belong to an overseas research institution. Place an asterisk (*) by names of investigators considered to be ranked among world's top researchers.
 • In case of researchers not listed in initial plan or FY2009 Progress Report, attach "Biographical Sketch" (Appendix 4) for those participating as principal investigators.

<Results at the end of FY2011>

Principal Investigators Total: 18

Name (Age)	Affiliation (Position title, department, organization)	Academic degree, specialty	Working hours (Total working hours: 100%)				Starting date of project participation	Status of project participation (Describe in concrete terms)	Contributions by PIs from overseas research institutions
			Work on center project		Others				
			Research activities	Other activities	Research activities	Other activities			
Center director Nakatsuji, Norio* (62)	Professor, Institute for Integrated Cell-Material Sciences, Kyoto University	Ph.D. Developmental Biology Stem Cell Biology	40%	50%	5%	5%	Oct. 1, 2007	Usually stays at the institution.	
Kitagawa, Susumu* (60)	Professor, Institute for Integrated Cell-Material Sciences, Kyoto University	Ph.D. Inorganic Coordination Chemistry	75%	15%		10%	Oct. 1, 2007	Usually stays at the institution.	
Agladze, Konstantin* (56)	Professor, Institute for Integrated Cell-Material Sciences, Kyoto University	Ph.D. Biophysics	90%	10%			Jan. 7, 2008	Usually stays at the institution.	
Imahori, Hiroshi* (50)	Professor, Institute for Integrated Cell-Material Sciences, Kyoto University	Ph.D. Organic Chemistry Photo- chemistry	80%	10%		10%	Oct. 1, 2007	Usually stays at the institution.	

<Results at the end of FY2011>

Principal Investigators Total: 18

Name (Age)	Affiliation (Position title, department, organization)	Academic degree, specialty	Working hours (Total working hours: 100%)				Starting date of project participation	Status of project participation (Describe in concrete terms)	Contributions by PIs from overseas research institutions
			Work on center project		Others				
			Research activities	Other activities	Research activities	Other activities			
Uesugi Motonari* (45)	Professor, Institute for Integrated Cell-Material Sciences, Kyoto University	Ph.D. Chemical Biology	80%	10%		10%	Oct. 1, 2007	Usually stays at the institution.	
Ueda, Kazumitsu* (58)	Professor, Institute for Integrated Cell-Material Sciences, Kyoto University	Ph.D. Cellular Bio- chemistry	80%	10%		10%	Oct. 1, 2007	Usually stays at the institution.	
Kiso, Makoto* (64)	Professor, Gifu University	Ph.D. Applied Bio-Organic Chemistry Bioactive Compounds	80%	10%		10%	Oct. 1, 2007	Joins a video conference from Gifu University once a month. Usually stays at Gifu University satellite.	
Kusumi, Akihiro* (59)	Professor, Institute for Integrated Cell-Material Sciences, Kyoto University	Ph.D. Biophysics	80%	10%		10%	Oct. 1, 2007	Usually stays at the institution.	
Kengaku, Mineko* (45)	Associate Professor, Institute for Integrated Cell-Material Sciences, Kyoto University	Ph.D. Developmental Neurobiology	90%	10%			Oct. 1, 2008	Usually stays at the institution.	

<Results at the end of FY2011>

Principal Investigators Total: 18

Name (Age)	Affiliation (Position title, department, organization)	Academic degree, specialty	Working hours (Total working hours: 100%)				Starting date of project participation	Status of project participation (Describe in concrete terms)	Contributions by PIs from overseas research institutions
			Work on center project		Others				
			Research activities	Other activities	Research activities	Other activities			
Sugiyama, Hiroshi* (55)	Professor, Graduate School of Science, Kyoto University	Ph.D. Chemical Biology	15%	5%	70%	10%	Apr. 1, 2008	Participates at the 20% effort level. 80% devoted to the Graduate School of Science.	
Takano, Mikio* (68)	Professor, Institute for Integrated Cell-Material Sciences, Kyoto University	Ph.D. Solid State Chemistry	90%	10%			Nov. 16, 2007	Usually stays at the institution.	
Tanaka, Koichiro* (49)	Professor, Institute for Integrated Cell-Material Sciences, Kyoto University	Ph.D. Terahertz Optical Science	90%	10%			Apr. 1, 2008	Usually stays at the institution.	
Hashida, Mitsuru* (60)	Professor, Graduate School of Pharmaceutical Sciences, Kyoto University	Ph.D. Biopharma- ceuticals	40%	10%	40%	10%	Jan. 1, 2008	Participates at the 50% effort level. 50% devoted to the Graduate School of Pharmaceutical Sciences.	
Harada, Yoshie* (52)	Professor, Institute for Integrated Cell-Material Sciences, Kyoto University	Ph.D. Single- Molecule Physiology	90%	10%			Mar. 1, 2008	Usually stays at the institution.	

<Results at the end of FY2011>

Principal Investigators Total: 18

Name (Age)	Affiliation (Position title, department, organization)	Academic degree, specialty	Working hours (Total working hours: 100%)				Starting date of project participation	Status of project participation (Describe in concrete terms)	Contributions by PIs from overseas research institutions
			Work on center project		Others				
			Research activities	Other activities	Research activities	Other activities			
<u>Hiragi, Takashi</u> (44)	Professor, Institute for Integrated Cell-Material Sciences, Kyoto University Group Leader, European Molecular Biology Laboratory (EMBL)	Ph.D. Developmental Biology	40%	10%	40%	10%	Apr. 1, 2008	Participates in the institution at the 50% effort level. (Frequency of visits to Japan: 6 times and 55 days in FY 2011)	
<u>Chen, Yong</u> (55)	Professor, Institute for Integrated Cell-Material Sciences, Kyoto University Research Director, Ecole Normale Supérieure, CNRS	Ph.D. Biophysics	30%	10%	50%	10%	Mar. 1, 2008	Participates in the institution at the 40% effort level. (Frequency of visits to Japan: 6 times and 79 days in FY 2011)	
Yamanaka, Shinya* (49)	Professor, Institute for Integrated Cell-Material Sciences, Kyoto University	M.D. Stem Cell Biology Developmental Engineering	50%	10%		40%	Oct. 1, 2007	Usually stays at the institution and CiRA.	
<u>Heuser, John</u> (69)	Professor, Institute for Integrated Cell-Material Sciences, Kyoto University Professor, Washington University School of Medicine	M.D. Biophysics Cell Biology	50%		40%	10%	Nov. 16, 2009	Participates in the institution at the 50% effort level. (Frequency of visits to Japan: 6 times and 166 days in FY 2011)	

Records of FY2011 Center Activities

1. Researchers and center staff, satellites, partner institutions

1-1. Number of researchers in the "core" established within the host institution

- Enter the total number of people in the columns below. In the "Researchers" column, put the number and percentage of overseas researchers in the < > brackets and the number and percentage of female researchers in the [] brackets.
- In the "Administrative staffs" column, put the number and percentage of bilingual staffs in the () brackets.
- In the "Final Goal" column, enter the currently projected goal and the estimated date for achieving it [00 month, 00 year].

	Goal set in the "Post-interim evaluation revised center project"	Results at end of FY 2011	Final goal (Date: March, 2014)
Researchers	185 <64,35 %> [55,30%]	177 <58,33%> [48,28%]	185 <64,35%> [55,30%]
Principal investigators	18 <3,17 %> [2,12%]	18 <3,17%> [2,12%]	18 <3,17%> [2,12%]
Other researchers	167 <61,37 %> [53,32%]	149 <55,35%> [46,29%]	167 <61,37%> [53,32%]
Research support staffs	81	80	81
Administrative staffs	34	31 (18,58%)	34 (21,62%)
Total	300	288	300

Other matters of special mention

- Enter matters warranting special mention, such as concrete plans for achieving the Center's goals, established schedules for employing main researchers, particularly principal investigators.
 - As background to how the Center is working to mobilize/circulate the world's best brains, give good examples, if any, of how career paths are being established for the Center's researchers; that is, from which top-world research institutions do researchers come to the Center and to which research institutions do the Center's researchers go, and how long are their stays at those institutions.
- In an effort to recruit young, promising researchers for the iCeMS Kyoto Fellow positions, a total of five Fellows including three from overseas were selected. These scientists have established independent research groups on par with the PIs, receiving sufficient work space and startup funds to pursue cross-disciplinary and collaborative research projects. More young scientists will be hired for the position in FY2012.
 - John Heuser, an internationally recognized authority on electric microscopy, has been hired at the 50% effort level (previously participated at the 20% effort level) from FY2011.

Career paths from the iCeMS to prominent institutions in FY2007-2011

Position while at the iCeMS	New Position
Research Associate: April 2008-February 2009	Assistant Professor: Center for Frontier Science, Chiba University (Japan)
Research Associate: July 2008-March 2009	Assistant Professor: Research Center for Low Temperature and Materials Sciences, Kyoto University (Japan)

Position while at the iCeMS	New Position
Post-doctoral Researcher (JST ERATO Kitagawa Integrated Pores Project): April 2008-March 2009	Lecturer: Faculty of Frontiers of Innovative Research in Science and Technology, Konan University (Japan)
Research Associate: April 2008-June 2009	Assistant Professor: Indian Institute of Technology (India)
Research Associate: July 2009-February 2010	Associate Professor: School of Chemistry and Chemical Engineering, Lanzhou University (China)
Research Associate: April 2009-March 2010	Assistant Professor: Institute of Medical, Pharmaceutical and Health Sciences, Kanazawa University (Japan)
Post-doctoral Researcher (JST ERATO Kitagawa Integrated Pores Project): April 2008-April 2010	Assistant Professor: Graduate School of Natural Science & Technology, Kanazawa University (Japan)
Post-doctoral Researcher (JST ERATO Kitagawa Integrated Pores Project): April 2009-April 2010	Assistant Professor: iCeMS Kyoto University (Japan)
Assistant Professor: July 2009-September 2010	Senior Scientist: Petrochemical Research Institute of Petrochina (China)
JSPS Postdoctoral Fellow: November 2008-October 2010	Research Fellow: National University of Singapore (Singapore)
Post-doctoral Researcher (JST ERATO Kitagawa Integrated Pores Project): April 2009-October 2010	Assistant Professor: Hokkaido University Catalysis Research Center (Japan)
Research Associate: August 2008-November 2010	Assistant Professor: Graduate School of Science, Kyushu University (Japan)
Post-doctoral Researcher (JST ERATO Kitagawa Integrated Pores Project) April 2010-December 2010	Assistant Professor: Graduate School of Science, Kobe University (Japan)
Research Associate: October 2009-February 2011	Research Scientist: Samsung Advanced Institute of Technology (Korea)
Research Associate: April 2008-March 2011	Associate Professor: Graduate School of Engineering, Tohoku University (Japan)
Research Associate: April 2010-May 2011	Assistant Professor: Graduate School of Engineering Science, Osaka University (Japan)
Research Associate: April 2010-March 2011	Assistant Professor: Institute for Frontier Medical Sciences, Kyoto University (Japan)
Research Associate: February 2011-August 2011	Assistant Professor: Faculty of Life Sciences, Kumamoto University (Japan)
Research Associate (JST ERATO Kitagawa Integrated Pores Project) : April 2010-August 2011	Assistant Professor: Graduate School of Engineering, Kyoto University (Japan)
Research Associate: April 2009-November 2011	Assistant Professor: Graduate School of Pure and Applied Sciences, Tsukuba University (Japan)
Associate Professor: August 2008-February 2012	Professor: Graduate School of Bioscience and Biotechnology, Tokyo Institute of Technology (Japan)
Assistant Professor: April 2009-March 2012	Lecturer: Faculty of Education Shiga University (Japan)
Assistant Professor: April 2008-March 2012	Lecturer: Division of Liberal Education, Dokkyo Medical University (Japan)
Assistant Professor: November 2009-March 2012	Associate Professor: Graduate School of Science: Kyoto University (Japan)
Research Associate: October 2009-March 2012	Lecturer: College of Chemistry and Molecular Sciences, Wuhan University (China)

1-2. Satellites and partner institutions

- List the satellite and partner institutions in the table below.
- Indicate newly added and deleted institutions in the "Notes" column.
- If satellite institutions have been established, describe by satellite the Center's achievements in coauthored papers and researcher exchanges in Appendix 4.

<Satellite institutions>

Institution name	Principal Investigator(s), if any	Notes
Faculty of Applied Biological Sciences, Gifu University	Prof Makoto Kiso	

< Partner institutions>

Institution name	Principal Investigator(s), if any	Notes
Wellcome Trust Centre for Stem Cell Research and its sister institute, Wellcome/Gurdon Institute, Cambridge University		
National Centre for Biological Sciences (NCBS) and the Institute for Stem Cell Biology and Regenerative Medicine (inStem), Bangalore, India		<u>MoU exchanged on April 28, 2010</u> The iCeMS satellite lab in Bangalore has been set up in the NCBS-inStem.
Max Planck Institute for Molecular Cell Biology and Genetics		
California NanoSystems Institute, UCLA		<u>MoU exchanged on March 15, 2010</u>
Center for Basic and Applied Membrane Sciences, Purdue University		
The Center for Developmental Biology, RIKEN		
MRC Centre for Regenerative Medicine (CRM), The University of Edinburgh		<u>MoU exchanged on March 30, 2011</u>
Moscow Institute of Physics and Technology (MIPT)		<u>MoU exchanged on March 31, 2011</u>
Medicinal Bioconvergence Research Center (Biocon), Seoul National University		<u>MoU exchanged on March 29, 2011</u>
Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR)		[Partnership Established in FY 2011] <u>MoU exchanged on April 18, 2011</u>
Collaborative Research Center SFB 873 of the University of Heidelberg		
NIH Center for Regenerative Medicine, National Institutes of Health (NIH CRM)		[Partnership Established in FY 2011] <u>MoU exchanged on November 21, 2011</u>
Division of Advanced Materials Science, Pohang University of Science and Technology (POSTECH AMS)		[Partnership Established in FY 2011] <u>MoU exchanged on November 16, 2011</u>

2. Securing competitive research funding

- Competitive and other research funding secured in FY2011:

Total: 1,811 JPY million yen

- Describe external funding warranting special mention. Include the name and total amount of each grant.

Researchers at the Institute acquired JPY1,811 million of research funds: approximately 280 million from Grants-in-Aid for Scientific Research, 285 million from the Next-Generation Leading Research Funding Program, 1,149 million from Sponsored Research Funding, and 97 million from other competitive research funding sources..

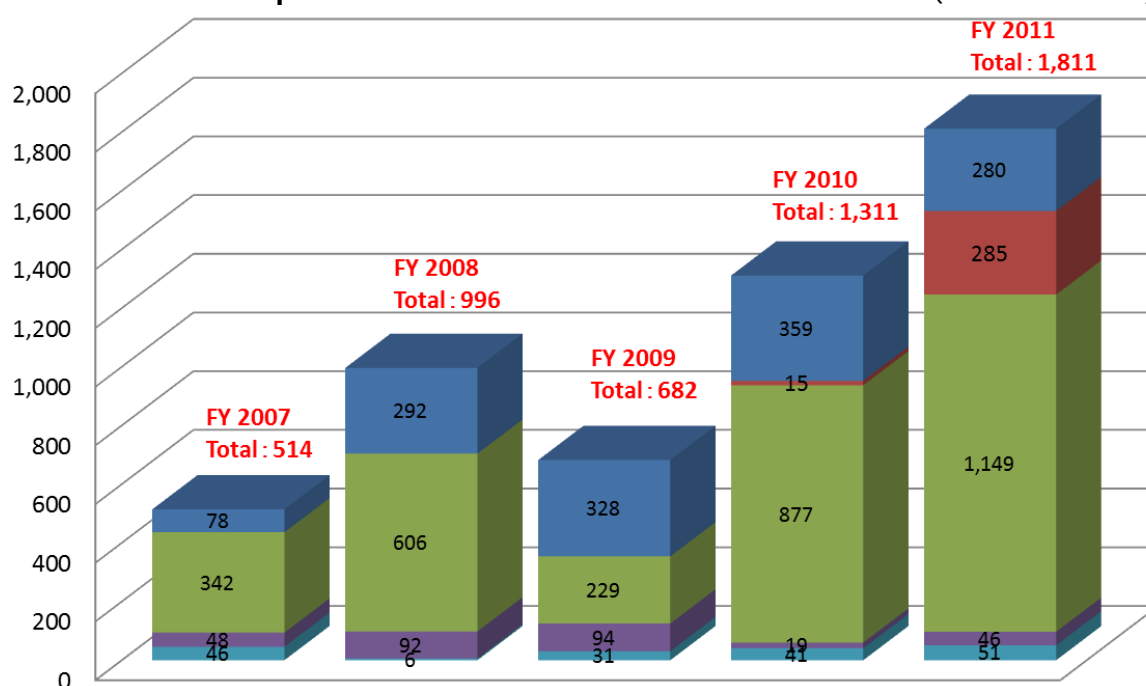
(Unit: JPY millions)

Grants-in-Aid for Scientific Research	280
Funding Program for Next Generation World-Leading Researchers (NEXT)	285
Sponsored Research Funding (including NEDO)	1,149
Collaborative Research funding	46
Donations	51
Total	1,811

*The Yamanaka Lab budget is calculated separately as part of the CiRA, and is not included above.

External funds acquired in FY 2007-2011

(Unit: JPY millions)



Year	2007	2008	2009	2010	2011
Grants-in-Aid for Scientific Research	78	292	328	359	280
Funding Program for Next Generation World-Leading Researchers (NEXT)	-	-	-	15	285
Sponsored Research Funding (including NEDO)	342	606	229	877	1,149
Collaborative Research funding	48	92	94	19	46
Donations	46	6	31	41	51
Total	514	996	682	1,311	1,811

*The Yamanaka Lab budget is calculated separately as part of the CiRA, and is not included above.

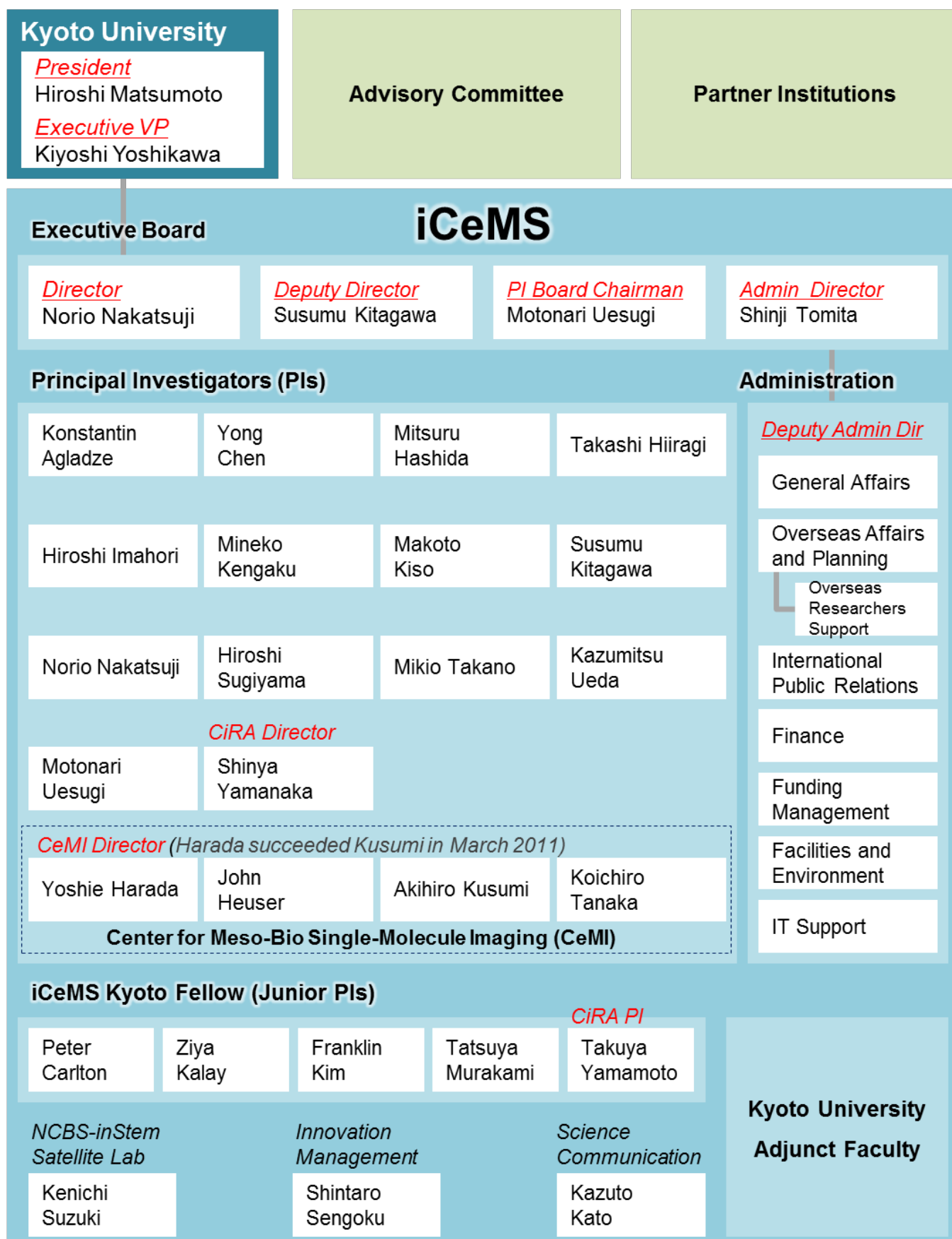
3. International research conferences or symposia held to bring world's leading researchers together

- Indicate the number of international research conferences or symposiums held in FY2011 and give up to three examples of the most representative ones using the table below.

FY 2011: 7 meetings	
Major examples (meeting title and place held)	Number of participants
Heidelberg-Kyoto Joint Symposium and 10 th iCeMS International Symposium "Crossing Boundaries: Stem Cells, Materials, and Mesoscopic Sciences" (July 21-23, 2011), Heidelberg, Germany	From domestic institutions: 41 From overseas institutions: 255
5 th Annual Symposium on Nanobiotechnology "Seoul Nanohealth 2011" (November 17-18, 2011), Seoul, Korea	From domestic institutions: 13 From overseas institutions: 157
11 th iCeMS International Symposium "Chemical Control of Cells" (December 6, 2011), Kyoto, Japan	From domestic institutions: 142 From overseas institutions: 10

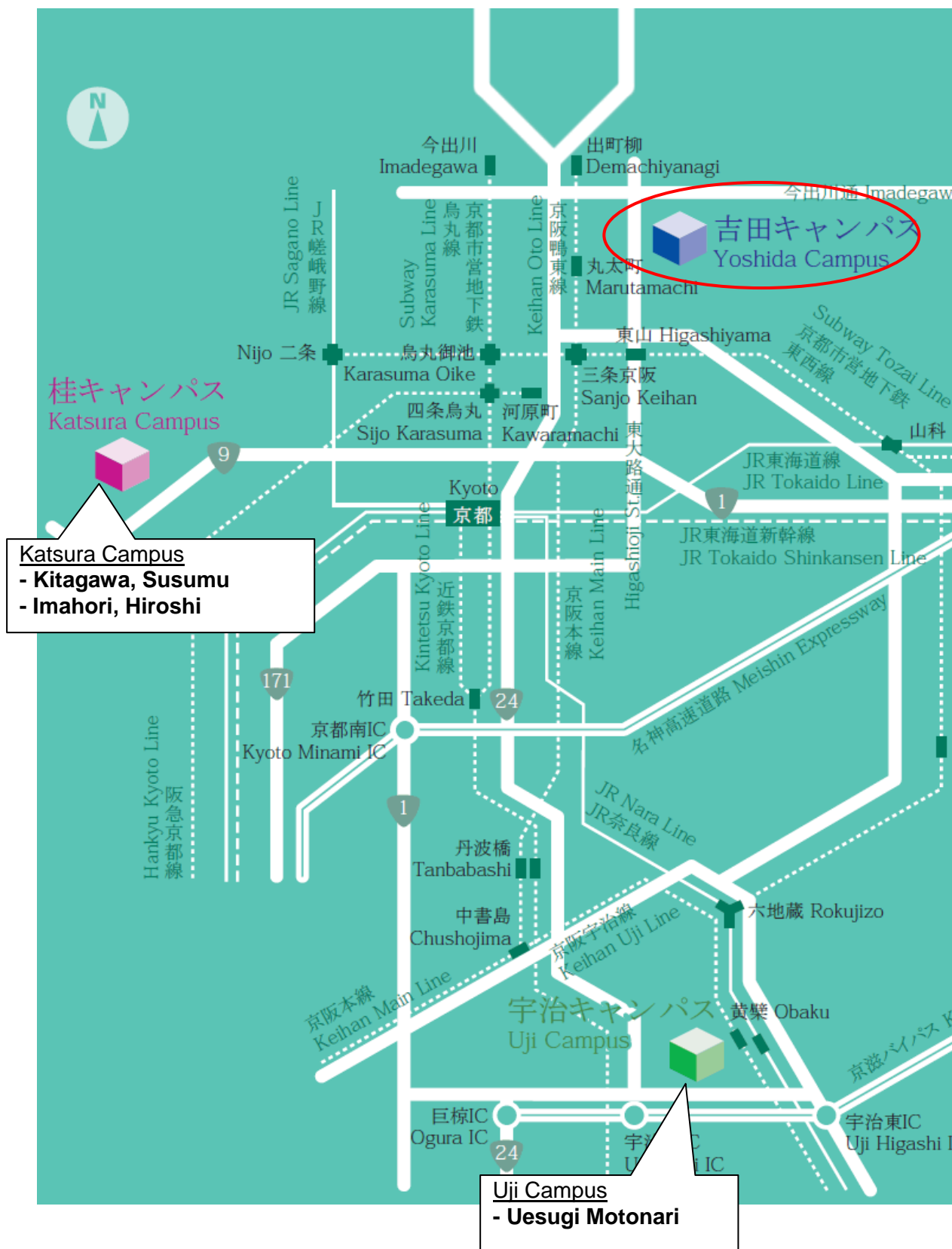
4. Center's management system

- Please diagram management system in an easily understood manner.
- If any changes have been made in the management system from that in the "Post-interim evaluation revised center project," please describe them. Please describe any changes made in the administrative director, head of host institution, and officer(s) in charge at the host institution (e.g., executive vice president for research)

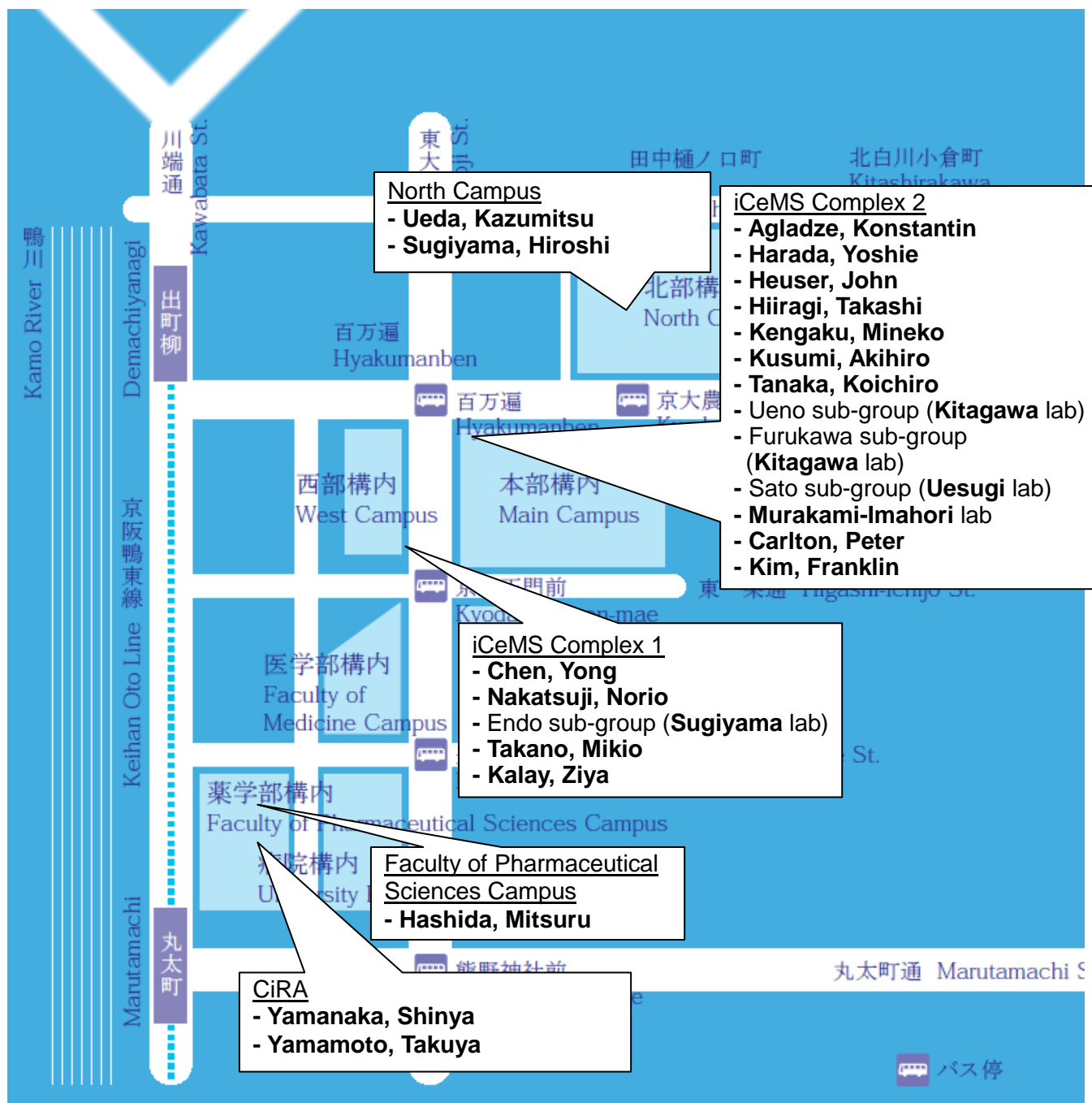


5. Campus Map

- Please draw a simple map of the campus showing where the main office and principle investigator(s) are located.



Yoshida Campus



6. FY2011 Project Expenditures (the exchange rate used: 1USD=80JPY)

Appendix 3

i) Overall project funding

Ten thousand dollars

Cost Items	Details	Costs (10,000 dollars)
Personnel	Center director and Administrative director	39
	Principal investigators (no. of persons):16	239
	Other researchers (no. of persons):95	670
	Research support staffs (no. of persons):52	101
	Administrative staffs (no. of persons):22	130
	Total	1,179
Project activities	Gratuities and honoraria paid to invited principal investigators	0
	Cost of dispatching scientists (no. of persons):35	121
	Research startup cost (no. of persons):16	251
	Cost of satellite organizations (no. of satellite organizations):2	66
	Cost of international symposiums (no. of symposiums):3	3
	Rental fees for facilities	8
	Cost of consumables	79
	Cost of utilities	53
	Other costs	143
	Total	724
Travel	Domestic travel costs	9
	Overseas travel costs	35
	Travel and accommodations cost for invited scientists (no. of domestic scientists):44 (no. of overseas scientists):24	11
	Travel cost for scientists on secondment (no. of domestic scientists):7 (no. of overseas scientists):6	3
	Total	58
Equipment	Depreciation of buildings	155
	Depreciation of equipment	1,159
	Total	1,314
Other research projects	Projects supported by other government subsidies, etc.	4
	Commissioned research projects, etc.	929
	Grants-in-Aid for Scientific Research, etc.	320
	Total	1,253
Total		4,528

WPI grant	1,630
Costs of establishing and maintaining facilities	13
Others	13
Cost of equipment procured	50
Others	50

ii) Costs of Satellites and Partner institutions

Cost Items	Details	Costs (10,000 dollars)
Personnel	Principal investigators (no. of persons):	/
	Other researchers (no. of persons):2	
	Research support staffs (no. of persons):9	
	Administrative staffs (no. of persons):	
	Total	53
Project activities		6
Travel		3
Equipment		1
Other research projects		43
Total		106

FY2011 Visit Records of World Top-caliber Researchers from Abroad

Researchers Total: 35

Name (Age)	Current affiliation (Position title, department, organization)	Academic degree, specialty	Record of research activities (Awards record, etc.)	Time, duration	Summary of activities during stay at center (e.g., participation as principal investigator; short-term stay for joint research; participation in symposium)
COLE, Susan P. C.	Vice-Principal, Cancer Research Institute, Queen's University	Ph.D. Molecular Biology	Pfizer Senior Scientist Award, Pharmacological Society of Canada (2008)/The Queen's Univ. Prize for Research Excellence (1994)	April 20-22, 2011 3 days	Short-term stay to give a seminar
KIM, Kimoon (57)	Director, Center for Smart Supramolecules, Pohang University of Science and Technology	Ph.D., Chemistry	The 2012 Izatt-Christensen Award, ISMSC (2012)/Best Scientist and Engineer Award, Korean Government (2008)	May10-11,2011 2days	Short-term stay to give a lecture
K. Vijayraghavan (58)	Director, National Center for Biological Sciences, Tata Institute of Fundamental Research	Ph.D. Genetics and Development		May 19-21, 2011 3 days	Short-term stay to have a discussion on research
MUCKE, Lennart	Director and Senior Investigator, Gladstone Institute of Neurological Disease, University of California, San Francisco	Ph.D. Neurology and Neuroscience	The Zenith Award from the Alzheimer's Association (1999)	May 20, 2011 1 day	Short-term stay for discussion on research
TRYGGVASON, Karl (64)	Professor, Department of Medical Biochemistry and Biophysics, Karolinska Institute	M.D., Ph.D. Medical Chemistry	The 2002 Louis-Jeantet Prize for Medicine	May 24, 2011 1 day	Short-term stay for discussion on research
NAM, Wonwoo	Distinguished Professor, Department of Chemistry and Nano Science, Ewha Womans University	Ph.D. Coordination Chemistry	Named as a Role Model Scientist, Korea Science Foundation (2008)/The 3rd Kyeong-Am Academic Award (2007)	May 31, 2011 1 day	Short-term stay to give a seminar
WALTER, Nils G. (45)	Professor, Department of Chemistry, University of Michigan	Ph.D. Chemistry and Chemical Biology	Alumnus of the Year Award, Sherbrooke RiboClub (2006)/Camille Dreyfus Teacher-Scholar Award (2004)	June 20, 2011 1 day	Short-term stay to give a seminar
LANE, Julia	Senior Managing Economist American Institutes for Research	Ph.D. Economics	Economic Journal, Winner of Referee Award (2012)/National Institutes of Health, Central IT Merit Award for Operational Excellence (2011)	June 24,2011 1 day	Short-term stay to give a seminar
SIMONS, Kai (73)	Professor / Director Emeritus Max-Planck-Institute of Molecular Cell Biology and Genetics		Albert Wander Prize, University of Bern (2003) /Runeberg Prize (1997)	June 26-28, 2011 3 days	Short-term stay to give a seminar
SCHMUTTENMAER, Charles Albert	Professor, Department of Chemistry, Yale University	Ph.D. Terahertz	Recipient of the NSF CAREER Award (1997) /Yale University Arthur Greer Memorial Prize (1996)/Camille and Henry Dreyfus Foundation New Faculty Award (1994)	July 12-August 6, 2011 26 days	Short-term stay for joint research
HERVE, Cailleau	Professor, Hervé Cailleau Institut de Physique, CNRS et Université de Rennes 1	Ph.D. Spin-Crossover		August 8, 2011 1 day	Short-term stay to give a seminar

WANG, Ming-Wei	Professor, Shanghai Institute of Materia Medica, Chinese Academy of Sciences	Ph.D. Drug Discovery		August 23-24, 2011 2 days	Short-term stay to give a seminar
REEDIJK, Jan (68)	Emeritus Professor, Faculty of Science, Leiden Institute of Chemistry	Ph.D. Coordination Chemistry	Knighted by the Queen; Order of the Dutch Lion (2008)/Elected Honorary Member Royal Netherlands Chemical Society (2003)	September 5, 2011 1 day	Short-term stay to give a seminar
NORDEN, Caren	Research Group Leader, Molecular Cell Biology and Genetics, Max Planck Institute	Ph.D. Chemistry		September 12, 2011 1 day	Short-term stay to give a seminar
YUAN, Xiaobing (38)	Investigator, Institute of Neuroscience, Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences	Ph.D. Neuroscience		September 13, 2011 1 day	Short-term stay to give a seminar
HOSSEINI, Wais (56)	Professor, Institut Le Bel, Université de Strasbourg	Ph.D. Organic Coordination Chemistry		October 10-12, 2011 3 days	Short-term stay to give a seminar
FISCHER, Roland A. (50)	Professor, Inorganic Chemistry II, Department of Chemistry & Biochemistry, Ruhr-University Bochum	Ph.D. Inorganic Chemistry	Alfried-Krupp-Förderpreis für junge Hochschullehrer (1996)	October 31-November 6, 2011 6 days	Short-term stay to give a seminar
YAGHI, Omar M. (46)	Professor, Department of Chemistry & Biochemistry, UCLA	Ph.D. Chemistry	American Chemical Society Chemistry of Materials Award (2009)/ American Association for the Advancement of Science Newcomb Cleveland Prize for the best paper published in Science (2007).	November 7-8, 2011 2 days	Short-term stay for discussion on research
MARTIN, Nazario	Professor, Organic Chemistry Department, Chemistry Faculty, Universidad Complutense de Madrid	Ph.D. Organic Chemistry		November 16, 2011 1 day	Short-term stay to give a seminar
MIRANDA, Rodolfo	Professor, Surface Science Lab at Universidad Autónoma de Madrid (LASUAM)	Ph.D. Surface Science		November 16, 2011 1 day	Short-term stay to give a seminar
KUCHLER, Karl (54)	Professor, Department of Medical Biochemistry, Medical University of Vienna	Ph.D. Molecular Biology	Novartis Prize (formerly Sandoz Prize) for Biology (1996)	November 15-20, 2011 6 days	Short-term stay to give a lecture at symposium
TALL, Alan Richard	Professor, Division of Molecular Medicine, Department of Medicine, Columbia University	M.D., Ph.D. Molecular Biology		November 16-18, 2011 3 days	Short-term stay to give a lecture at symposium
LU, Guanxiu	Professor, Central South University	M.D. Obstetrics & Gynecology	The new century "Woman Inventor" (2002)/The second prize of National Science and Technology Progress Award (1989)	November 25, 2011 1 day	Short-term stay to give a lecture
SMITH, Gary D.	Professor, Departments of Molecular and Integrative Physiology and Urology, University of Michigan	Ph.D. Molecular and Integrative Physiology	ASRM - Second Prize Poster (2009)/ASRM - Society for Assisted Reproductive Technologies Prize Paper (2008)	December 5-7, 2011 3 days	Short-term stay to give a lecture at symposium
CHEN, James K.	Associate Professor, Department of Chemical and Systems Biology, Stanford University School of Medicine	Ph.D. Synthetic Chemistry, Developmental Biology	NIH Director's Pioneer Award (2008-2013)/ Astellas USA Foundation Award (2005)	December 5-7, 2011 3 days	Short-term stay to give a lecture at symposium

CHMIELEWSKI, Jean A.	Professor, Department of Chemistry Purdue University	Ph.D. Organic Chemistry/Chemical Biology	Bill and Melinda Gates Grand Challenges Explorations Award (2010)/Charles B. Murphy Award, Purdue University (2010)	December 5-7, 2011 3 days	Short-term stay to give a lecture at symposium
TSENG, Hsian-Rong	Associate Professor, Department of Molecular & Medical Pharmacology, David Geffen School of Medicine, University of California, Los Angeles	Ph.D. Supramolecular Nanoparticles	Arthur K. Doolittle Award (2005)/Chancellor's Award for Postdoctoral Research, University of California at Los Angeles (2003)	December 5-7, 2011 3 days	Short-term stay to give a lecture at symposium
BEN, Davis	Professor, Department of Chemistry, Chemistry Research Laboratory, Pembroke College, University of Oxford	Ph.D. Organic Chemistry	Elsevier Carbohydrate Research Award for Creativity in Carbohydrate Chemistry (2009)/ Novartis Lectureship Award (2009)	December 5-7, 2011 3 days	Short-term stay to give a lecture at symposium
QUIOCHO, Florante Adviento	Professor, Department of Biochemistry & Molecular Biology, Baylor College of Medicine	Ph.D. Structural Biophysics and Biology		December 5-7, 2011 3 days	Short-term stay to give a lecture at symposium
CHOO, Hea-Young Park	Professor, College of Pharmacy, Ewha Womans University	Ph.D. Medicinal Chemistry		December 5-7, 2011 3 days	Short-term stay to give a lecture at symposium
KWON, Youngjuu	Professor, College of Pharmacy, Ewha Womans University	Ph.D. Chemical Biology		December 5-7, 2011 3 days	Short-term stay to give a lecture at symposium
TULLIUS, Tom David	Professor, Department of Chemistry, Boston University	Ph.D. Genomics, Structural biology, Biophysical Chemistry	Herbert A. Sober Award, American Society for Biochemistry and Molecular Biology (1998) /Ellison Medical Foundation Senior Scholar Award in Aging (2009-2013)	January 4-17, 2012 14 days	Short-term stay to give a seminar
BERSIMBAY, Rakhmetkazhi I. (65)	Director/Professor, Institute of Cell Biology and Biotechnology, Eurasian National University	Ph.D. Biochemistry	CRDF (USA) award (2001-2003)/Civilian Research Developmental Fund award (1998-1999)	February 8, 2012 1 day	Short-term stay for discussion on research
PICART, Catherine	Professor, Grenoble-Institute of Technology	Ph.D. Bio-nanomaterial and Biophysics	Laureate of the European Research Council (2010)/ Prix Jean-Marc Lhoste from the French Biophysical Society (2007)	February 28, 2012 1 day	Short-term stay to give a seminar
ROBERT, Tampe	Professor, Goethe-University	Ph.D. Molecular Biology	Award for best teaching in Biochemistry (2010/11)	March 26-28, 2012 3 days	Short-term stay to give a lecture

State of Outreach Activities

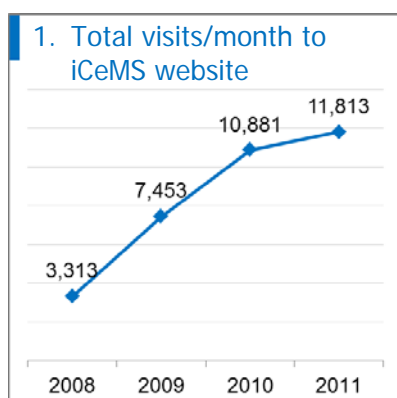
- Using the table below, show the achievements of the Center's outreach activities in FY2011 (number of activities, times held).
- Describe those activities that have yielded novel results or that warrant special mention in the "Special Achievements" space below.
- In appendix 7, list and describe media coverage (e.g., articles published, programs aired) in FY2011 resulting from press releases and reporting.

Activities	FY2011(number of activities, times held)
PR brochure, pamphlet	5
Lectures, seminars for general public	30
Teaching, experiments, training for elementary and secondary school students	22
Science cafe	6
Open houses	0
Participating, exhibiting in events	3
Press releases	14

* Media coverage in total: **432** times (newspapers, magazines, TV, web), **24** from overseas

Special Achievements

- Development of stem cell educational materials for high school teachers and students driven by the iCeMS Science Communication Group, in collaboration with CiRA.
- Science cafés focusing on the investigation into the process of scientific inquiry
- Scientifically-inspired performance art workshops aimed at a general, non-scientific audience.
- **Media spotlight overseas:** UK scientific R&D magazine *International Innovation* featured an interview with Director **Nakatsuji**, dedicating 6 pages in 2 issues. Past interviewees include NIH Director Francis Collins and French National Research Agency Director General Jacqueline Lecourtier.
- **Social media utilization:** To 1) engage "with" a wider audience across the globe — younger generations of scientists in particular — and 2) raise awareness of its research and outreach efforts, the iCeMS is also committed to the utilization of social media, such as Twitter (since March 2011), YouTube (since December 2011), and Facebook (since March 2012). This approach will be instrumental in effectively disseminating the information inside and outside the iCeMS on open seminars and informal get-togethers organized by its young researchers.
- **Web traffic analysis:** The iCeMS website has marked its fourth consecutive year of growth in traffic, up 357% from 3,313 visits per month in 2008 to 11,813 in 2011 (see chart 1 below).
 - Access from overseas has increased four straight years, up 525% from 337 visits per month in 2008 to 1,769 in 2011 (see chart 2 below).
 - The proportion of access from overseas has also risen four years in a row, from 10% in 2008 to 15% in 2011 (see chart 3 below).



Future Plans:

More public-oriented plans are as follows:

1. Raising middle and high school students' scientific literacy
2. Having effective dialogues with communities outside of the institute
3. Engaging scientists in outreach activities

Date	Title	Activity	Target Audience	Objectives
Jul 18 2012	iCeMS/CiRA Classroom	Hands-on laboratory exercises on stem cells	Nara Tezukayama High School students	1. Raising students' scientific literacy
Sep 18 2012	iCeMS/CiRA Classroom		High school students across Japan	1. Raising students' scientific literacy
Nov 24 2012	WPI Joint Symposium	Stem cell board game demonstration	High school students in Tsukuba area	1. Raising students' scientific literacy
Feb 9-10 2013	Science and Technology Festival	Stem cell board game demonstration	High school students and general public	1. Raising students' scientific literacy 2. Having effective dialogues
Nov 2012	iCeMS Café #11	Science café	General public	2. Having effective dialogues 3. Engaging scientists in outreach activities
Dec 2012	iCeMS Café #12	Science café	General public	2. Having effective dialogues 3. Engaging scientists in outreach activities
Jan 2013	iCeMS Café #13	Science café	General public	2. Having effective dialogues 3. Engaging scientists in outreach activities

FY 2011 List of Project's Media Coverage

- Select main items of coverage, and list them within these 2 pages.

No.	Date	Type media (e.g., newspaper, television)	Description
1	Apr 4, 2011	The Asahi Shimbun (P. 29)	(Yamanaka) Kyoto U improves efficiency in generating virus-free iPS cells
2	Apr 18, 2011	[TV] TV Tokyo: World Business Satellite	(Nakatsuji, Yamanaka, iCeMS,) The business of iPS cells: Changing the path to new drug development
3	Apr 21, 2011	The Nikkei (P. 34)	(Nakatsuji) First-time overseas distribution of Japanese hES cells approved by Japanese science ministry
4	May 9, 2011	The Nikkei (P. 11)	(Nakatsuji, Yamanaka) Industrialization of iPS cell technology through academic-industrial alliance
5	May 22, 2011	The Kyoto Shimbun (P. 26)	(iCeMS, Harada) Scientifically-inspired performance art workshop organized by the iCeMS
6	May 27, 2011	The Nihon Kogyo Shimbun (P. 29)	(Uesugi) Prof. Uesugi was presented with first prize in the German Innovation Awards
7	May 29, 2011	The Mainichi Shimbun (P. 21)	(Nakatsuji, iCeMS) Development of core technologies for industrial applications of human stem cells
8	June 15, 2011	The Mainichi Newspapers (P. 27)	(Kitagawa) 705 individuals to receive medals during the Spring 2011 Decorations
9	July 29, 2011	The Nikkei (P. 16)	(Kurotobi) Kyoto U researchers trap single water molecule using fullerene structure, offering hope for new drug discovery
10	Aug 27, 2011	[Magazine] International Innovation (P. 14-16)	(Nakatsuji, iCeMS) Norio Nakatsuji, iCeMS Director, expanding the frontiers of science and technology
11	Aug 30, 2011	[TV] NHK	(Kitagawa) Prof Kitagawa of Kyoto U and his research into capturing gasses
12	Sep 5, 2011	The Yomiuri Shimbun (P. 10)	(Kitagawa) Kyoto Univ team develops a method to detect CO ₂ with a fluorescent twist

13	Sep 28, 2011	The Kyoto Shimbun (P. 27)	(iCeMS, CiRA) Hands-on ES and iPS cell research workshop to be held at Kyoto Univ in November for high school students
14	Oct 4, 2011	The Sankei Shimbun (P. 22)	(Hashida, iCeMS) Prof Mitsuru Hashida, Kyoto U Graduate School of Pharmaceutical Sciences, and his drug delivery research
15	Nov 1, 2011	The Nikkei Sangyo Shimbun (P. 10)	(Tanaka) Kyoto U researchers use terahertz waves to detect hazardous materials
16	Nov 25, 2011	The Nikkan Kogyo Shimbun (P. 3)	(Yamanaka) Kyoto U issued the second iPSC patent in the U.S.
17	Nov 28, 2011	The Sankei Shimbun (P. 26)	(Chuma) Kyoto U researchers study a protein alleviating sperm production failure, showing a possibility for treating male infertility
18	Nov 28, 2011	[TV] NHK	(Nakatsuji, iCeMS) Researchers identify genetic changes that take place during the culture of ES cells
19	Dec 1, 2011	The Nikkan Kogyo Shimbun (P. 21)	(Takano, iCeMS) Kyoto U develops a cheap method to make ferromagnetic iron oxide
20	Dec 8, 2011	The Asahi Shimbun (P. 31)	(Nakatsuji, Yamanaka) Researchers identify genetic changes mapped in ES cells, potentially opening the door to cell line quality control
21	Dec 27, 2011	[Magazine] International Innovation (P. 103-105)	(Nakatsuji, iCeMS) A truly global institute
22	Jan 10, 2012	The Kyoto Shimbun (P. 7)	(Tanaka, Hirori, iCeMS) Kyoto University researchers succeed in generating the world's highest electric field density using terahertz waves
23	Jan 16, 2012	The Nikkei (P. 11)	(Nakatsuji, iCeMS) Kyoto Univ launches a science journal in collaboration with Royal Society of Chemistry
24	Jan 23, 2012	<Overseas> [Web] Discovery News	(Sugiyama, iCeMS) Motor Made of DNA Runs on Tracks
25	Feb 11, 2012	The Sankei Shimbun (P. 25)	(SCG, iCeMS) Kyoto University iCeMS organizes science café events
26	Feb 28, 2012	The Yomiuri Shimbun (P. 33)	(Kitagawa, iCeMS) iCeMS Deputy Director and Professor Susumu Kitagawa gives a talk at a Kyoto University symposium in March