

World Premier International Research Center Initiative (WPI)

FY2012 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	Susumu Kitagawa

Common instructions:

* Unless otherwise specified, prepare this report from the timeline of 31 March 2013.

* 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 two pages)

1. Conducting research of the highest world level

1) World-class achievement: iCeMS PI and CiRA Director Prof **Yamanaka** was awarded the 2012 **Nobel Prize in Physiology or Medicine** together with Sir John B Gurdon, University of Cambridge, and was appointed iCeMS Scientific Advisor from April 2013.

2) Publications: In 2012, iCeMS published **216** peer-reviewed papers, **29 (13%)** of which in journals with IF 10 or more, and **6** ranking among top **1%** by field and year based on total citations received (data obtained from Thomson Reuters Essential Science Indicators as of May 2013).

3) Obtained major grants: iCeMS researchers acquired a total of **JPY1,759 million** in research funds, stemming from 400 million from Grants-in-Aid for Scientific Research, 165 million from the Next-Generation Leading Research Funding Program, 983 million from sponsored research funding, and 211 million from other competitive research funding sources.

2. Advancing fusion of various research fields

1) Interdisciplinary research: iCeMS produced **45** highly interdisciplinary and **77** interdisciplinary peer-reviewed papers, **20 (16%)** of which in IF 10+ journals and **3** ranking among the **top 1%** by field and year based on total citations received.

2) Mesoscopic research: iCeMS published **51** highly mesoscopic papers and **73** mesoscopic papers, **22 (18%)** of which in IF 10+ journals and **5** ranking among the **top 1%** by field and year based on total citations received.

3) Key strategies: 1. new initiative focusing on promoting targeted research projects launched in FY2013; 2. establishment of a new administrative section devoted to research planning support; 3. iCeMS exploratory cross-disciplinary grants continued; 4. collaboration with polymer chemists at the Katsura Lab; 5. shared imaging center (CeMI) strengthened with full-time staff; 6. collaboration with the domestic satellite at the Faculty of Applied Biological Sciences, Gifu University.

3. Globalization of the institution

1) New international journal *Biomaterials Science* was published in collaboration with the Royal Society of Chemistry (RSC), with a kickoff symposium held in Kyoto in March 2013 including members of the editorial board. 39 papers and 7 review articles have appeared online in the journal as of the end of March 2013.

2) Overseas Visit Program for Young Researchers: The iCeMS-JSPS Overseas Visit Program for Young Researchers has been run successfully since 2010. In FY2012, 27 researchers earned opportunities to visit world-class institutions, opening the door to further international collaborations and careers. A successor program for young researchers is to be launched in FY2013.

3) International symposia: 10 international symposia were held primarily in Kyoto during the fiscal year, along with one each in Beijing and Melbourne. In Beijing, a MoU was exchanged with the Center for Life Sciences (CLS) of Peking University and Tsinghua University.

4. Implementing organizational reforms

Kyoto University has started an intensive round of working-level discussions on the reform of educational and research organizations. In such a far-reaching reform process, the WPI program and iCeMS are being recognized and respected for their advanced views of goal-setting and achievements. Establishment of the **Overseas Planning and Public Relations Section** at the new Yoshida South Administrative Office and **Kyoto University Research Administration Office (KURA)** illustrate iCeMS' marked impact on the university's administrative reform efforts.

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

1) Director succession to Prof Kitagawa: iCeMS decided that the time had come to implement a more materials science and *cell-inspired materials* approach under the leadership of Prof Kitagawa, in addition to the primarily cell science, *materials for cell control* approach of the first five years under the leadership of Prof Nakatsuji, taking the institute to a higher level of cell-material integration.

2) Research vision established: Director Kitagawa has defined two focal areas of study based on the following questions, seeking to ultimately create a new research field of integrated cell-material science, delving deeply into the mesoscale world lying at the boundary of materials and life.

Question 1: "Can we describe mesoscopic cellular processes in terms of chemistry and create materials to control them?" This focal area of *materials for cell control* presents three fields of study: 1. gene expression control in stem cells; 2. organized functions on the cell membrane; 3. biogas control.

Question 2: "Can we reproduce mesoscopic cellular structures with materials, and manipulate them?" This focal area of *cell-inspired materials* incorporates two fields: 1. materials for cell membrane functions; 2. energy storage in cells.

3) Structure reformed

New leadership team: iCeMS' new leadership team, consisting of Profs **Kitagawa** (director), **Uesugi** and **Kageyama** (deputy directors), strong in both international and interdisciplinary contexts, will be well placed to lead iCeMS in this new phase of its unified study crossing the boundaries between cells and materials.

New PIs: two eminent scientists have joined iCeMS as new PIs: Prof **Ryoichiro Kageyama** in the field of neurogenesis, and Prof **Mitinori Saitou** in mammalian germ cell biology.

4) Beyond WPI-iCeMS

Kyoto University is committed to establishing a new institute for interdisciplinary and exploratory research areas including proto-science based on the WPI program's goals and iCeMS' achievements in mesoscopic science. Details of these plans are under deliberation as part of university-wide reform of educational and research organizations.

7. Center's response to the results of the FY2012 follow-up

iCeMS has tackled several challenges following the suggestions of the WPI committee. The new director's vision was established and a new mission for the institute was identified. A critical review of ongoing collaborative projects was conducted, resulting in a tightened focus on 10 institute-initiated proposals. In addition, two eminent scientists joined the institute to strengthen cell biology research, replacing two outgoing PIs.

- 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

- * Regarding the criteria used when evaluating the world level of center, please note any updated results using your previous evaluation criteria and methods or any improvements you have made to those criteria and methods.

(1) The World-Class Achievement of Professor Shinya Yamanaka

iCeMS PI and CiRA Director Prof **Yamanaka** was awarded the 2012 **Nobel Prize in Physiology or Medicine** together with Sir John B Gurdon, University of Cambridge, for the discovery that mature cells can be reprogrammed to become pluripotent. In honor of this accomplishment, iCeMS asked Prof Yamanaka to take on a new position as **Scientific Advisor** to the institute beginning in April 2013. The organizational relationship between iCeMS and CiRA and joint research undertaken between them is described in section 5.

(2) Peer-reviewed publications

a) Up to FY2011

By FY2011 (ending March 2012), iCeMS achieved outstanding results in cell biology, chemistry, and physics, resulting in **633** papers, **85 (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* (2011, 2009), *Science* (2008, 2008), *Cell* (2007), etc and 2) functional porous materials research by the **Kitagawa** lab with **8** papers in Nature journals, **13** in *Angew Chem Int Ed* (IF 13.5, the highest in the field except review journals), etc.

b) New in 2012

In 2012, iCeMS published **216** peer-reviewed papers, **29 (13%)** of which in journals with IF 10 or more (Note: 1.8% of all journals registered in Thomson Reuters *Journal Citation Reports Science Edition* 2011 have IF 10+), and **6** ranking among **top 1%** by field and year based on total citations received (data obtained from Thomson Reuters *Essential Science Indicators* as of May 2013). See Appendix 1 for the full list. Section D (P. 17) in particular showcases 6 “highly cited” papers.

These clearly demonstrate the iCeMS’ high level of productivity of influential papers (see “2. Advancing fusion of various research fields” for details).

(3) Honors and awards to date and in FY2012

a) Up to FY2011

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), MEXT National Institute of Science and Technology Policy (NISTEP) Prize (Prof **Imahori**, 2007), US 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), German Innovation Award “Gottfried Wagener Prize 2010” (Prof **Uesugi**, 2011)

b) New in FY2012

Awards conferred in FY2012 include:

Senior researchers: Nobel Prize in Physiology or Medicine (Prof **Yamanaka**, 2012), Breakthrough Prize in Life Sciences (Prof **Yamanaka**, 2013), Life-time Achievement Award (Journal of Drug Targeting) (Prof **Hashida**, 2012), Millennium Technology Grand Prize (Prof **Yamanaka**, 2012), Millennium Technology Prize (Prof **Yamanaka**, 2012), Order of Culture (Prof **Yamanaka**, 2012), Yomiuri Techno Forum Gold Medal Prize (Prof **Saitou**, 2013)

Young researchers: Poster Award Grand Prize (Information Education Symposium 2012) (Asst Prof **Morimura**, Assoc Prof **Kano** and Research Associate **Mizumachi**, 2012), Young Scientist Award of the Physical Society of Japan (Asst Prof **Hirori**, 2012)

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

iCeMS researchers acquired **JPY1,759 million** of research funds in total, 400 million from Grants-in-Aid for Scientific Research, 165 million from the Next-Generation Leading Research Funding Program, 983 million from sponsored research funding, and 211 million from other competitive research funding sources.

a) Major competitive grants continuing in FY 2012

- 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**, 41 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**, 282]
- Japan Science and Technology Agency (JST) program for Development of Systems and Technology for Advanced Measurement and Analysis [Prof **Kusumi**, 12]
- Japan Science and Technology Agency (JST) program for Advanced Low Carbon Technology Research and Development Program(ALCA) [Prof **Imahori**, 26]
- Japan Science and Technology Agency (JST) program for Strategic Basic Research Programs (PRESTO) [Prof **Tanaka**, 46, Senior Lecturer **Tsunaka**, 15, Assoc Prof **Ariyoshi**, 14]
- Ministry of Education, Culture, Sports, Science and Technology project for realization of regenerative medicine [Prof **Yamanaka**, 1,535]
- Ministry of Economy, Trade and Industry's New Energy and Industrial Technology Development Organization (NEDO) programs for:
 - porous materials R&D [Prof **Kitagawa**, 98]

b) Major competitive grants newly obtained in FY 2012

- Ministry of Economy, Trade and Industry's sponsored projects:
 - solar hydrogen R&D [Prof **Koji Tanaka**, 92]
 - iron nitride R&D [Prof **Takano**, 21]
- Japan Science and Technology Agency (JST) program for Advanced Catalytic Transformation program for Carbon utilization (ACT-C) of Strategic Basic Research Programs (CREST) [Prof **Kitagawa** 66]
- National Agriculture and Food Research Organization (NARO), Bio-oriented Technology Research Advancement Institution's (BRAIN) funding program, Fundamental research for innovation creation [Prof **Ueda**, 17]

2. Advancing fusion of various research fields

In the development of *materials for cell control*, iCeMS has succeeded in creating epigenetic switches consisting of a series of organic derivatives. And in studies of the cell membrane, key basic units for mesoscale raft generation have been found, along with the first steps toward raft formation

and function. These are examples of concrete outcomes based on a solid understanding of cellular functions directing mesoscopic research into chromatin and membranes.

In the area of new materials, the advent of design and creation of multi-scale porous materials and mesoscale crystals using aggregated architecture control has opened the door to applications in cell biology. And the creation of motors and machines using proteins and DNA molecules demonstrates the potential for the creation of further *cell-inspired materials*.

(1) Interdisciplinary/mesoscopic papers published

a) Up to FY 2011

Interdisciplinary papers: iCeMS produced **14** highly interdisciplinary and **59** interdisciplinary peer-reviewed papers, **5 (7%)** of which in IF 10+ journals.

Mesosopic papers: iCeMS published **3** papers on mesoscopic sciences (namely those that include the word “mesoscopic/mesoscale/meso-domain” in the paper title).

b) New in 2012

Interdisciplinary papers: iCeMS produced **45** highly interdisciplinary and **77** interdisciplinary peer-reviewed papers, **20 (16%)** of which in IF 10+ journals and **3** ranking among top 1% by field and year based on total citations received. See P. 18 of Appendix 1 (section E) for the list of 20 interdisciplinary papers.

Mesosopic papers: iCeMS published **51** highly mesoscopic papers and **73** mesoscopic papers, **22 (18%)** of which in IF 10+ journals and **5** ranking among the top 1% by field and year based on total citations received. See P. 19 of Appendix 1 (section F) for the full list of 22 papers.

(2) Description of notable papers

Out of 216 published papers in total, some titles representatively illustrate iCeMS’ intensive effort and high impact on interdisciplinary research in the mesoscopic domain. Shown below, the former 4 articles are especially benchmarked by **Director Kitagawa’s new research vision** (details described in the “New director’s research vision” on P. 14), and the latter 4, including one review article, demonstrate **mesoscopic science** in the broader context of the institute’s efforts to develop a new research field.

a) Materials for cell control

- [Nakatsuji, Uesugi, Heuser, Yamamoto labs] *Cell Reports* 2, 1448–1460, **A Small Molecule that Promotes Cardiac Differentiation of Human Pluripotent Stem Cells under Defined, Cytokine- and Xeno-free Conditions** [IF n/a]

Integration of cell biology and chemistry in iCeMS led to the discovery of KY02111, a small molecule that potently promotes differentiation of human pluripotent stem cells to cardiomyocytes. Combined use of KY02111 and WNT signaling modulators enabled robust cardiac differentiation of hPSCs under a xeno-free, cytokine-free, and defined condition. The methodology provides a powerful means for the practical production of human cardiomyocytes.

- [Sugiyama lab] *Sci. Rep.* 2, 544, **A synthetic small molecule for rapid induction of multiple pluripotency genes in mouse embryonic fibroblasts.** [IF n/a]

Cellular reprogramming involves profound alterations in genome-wide gene expression that is precisely controlled at the mesoscopic level by a hypothetical epigenetic code. Small molecules have been shown to artificially induce epigenetic modifications in a sequence independent manner. Taking cues from nature, a synthetic small molecule with dual functionality (sequence-specificity and epigenetic activity) was developed to concomitantly modulate core pluripotency genes. In just 24 h, our targeting transcriptional activator termed, δ dramatically induced multiple pluripotency genes to initiate cellular reprogramming and switch the cells to epithelial state. Strategies to expand our tunable epigenetic switches could create an epoch-making approach in cellular reprogramming as they may precisely coax the somatic cells into pluripotent stem cells and/or a totally new type of cells.

b) Cell-inspired materials

- [Kitagawa lab] *Nat. Mater.* 11, 1081–1085, **Autonomous motors of a metal-organic framework powered by reorganization of self-assembled peptides at interfaces** [IF 32.8]

We have developed new autonomous biochemical motors by integrating a porous coordination polymer (PCP) and self-assembling peptides. The PCP is applied as an energy-storing cell that assembles peptides inside nanoscale pores of the coordination framework. The nature of peptides enables their assemblies to be reconfigured at the water/PCP interface, and thus converted to fuel energy. This demonstration opens the route towards new applications of PCPs and reconfigurable molecular self-assembly, possibly evolving into a smart autonomous motor capable of mimicking swimming bacteria and, with integrated recognition units, harvesting target chemicals.

- [Sugiyama lab] *Nat. Nanotechnol.* 7, 169–173, **A DNA-based molecular motor that can navigate a network of tracks** [IF 27.3]

We created a controlled DNA transportation system in which a mobile DNA nanomachine can move along the designed track constructed on the DNA origami surface. A branched track was constructed on the DNA origami, and then three-branching points and four final destinations were created. Using this system, we precisely control direction of nanomachine to the predefined destinations by following the programmed instructions. This system can be used for the precise delivery of the functional molecules in the mesoscale space. Also, this could be developed to be a programmed system for drug manufacture and controlled release.

c) Mesoscopic chemistry

- [Kitagawa lab] *Nat. Mater.* 11, 717–723, **Mesosopic architectures of porous coordination polymers fabricated by pseudomorphic replication** [IF 32.8]

The spatial organization of porous coordination polymer (PCP) crystals into higher-order structures is critical for their integration into separation systems, heterogeneous catalysts, ion/electron transport and photonic devices. Here, we demonstrated a rapid method to synthesize a porous material having a hierarchical porous structure (micro-, meso-, and macroporous), and controlling the formation of mesoscopic architecture made of PCPs, in both two and three dimensions. The obtained hierarchical porous material synergistically enhanced the material's selectivity and mass transfer for water/ethanol separation.

- [Kitagawa, Takano labs] *J. Am. Chem. Soc.* 134, 13341–13347, **Modular Design of Domain Assembly in Porous Coordination Polymer Crystals via Reactivity-Directed Crystallization Process** [IF 9.9]

The mesoscale design of domain assembly is crucial for controlling the bulk properties of solids. Herein, we propose a modular design of domain assembly in porous coordination polymer crystals via exquisite control of the kinetics of the crystal formation process. Employing precursors of distinct chemical reactivity affords the preparation of heterogeneous phase separated crystals. We have utilized this reactivity-directed crystallization process for the facile synthesis of mesoscale architecture which are either solid-solution or phase-separated type crystals. The results shed light on the importance of crystal formation kinetics for control of mesoscale domains in order to create porous solids with unique cooperative functionality.

- [NCBS-inStem Satellite Lab Group, Kusumi lab, CeMI] *Nat. Chem. Biol.* 8, 774–783, **Transient GPI-anchored protein homodimers are units for raft organization and function** [IF 14.7]

The sterol-dependent mesoscale domains in cellular membranes, called raft domains, have been controversial, including their very existence. In this work, cutting-edge single-molecule fluorescence methods revealed the interactions among some of the most rudimentary units from which rafts may originate, clarifying the basic units to generate rafts and the first steps to raft formation and function. This will lead to further cross-disciplinary studies.

d) Review paper

- [Kusumi lab, CeMI, Kalay, NCBS-inStem Satellite Lab Group] *Annu. Rev. Cell Dev. Biol.* 28, 215–250, **Dynamic organizing principles of the plasma membrane that regulate signal**

transduction: commemorating the fortieth anniversary of Singer and Nicolson's fluid-mosaic model [IF 15.8]

Departing from the textbook fluid-mosaic model of the biological membrane, this review proposes that the cooperative action of the hierarchical three-tiered mesoscale domains—actin membrane-skeleton induced compartments (40–300 nm), raft domains (2–20 nm), and dynamic protein complexes (3–10 nm)—is critical for membrane function, laying the basis for further multidisciplinary research into the mechanisms of membrane functions.

(3) Key strategies to promote cross-disciplinary research

a) New initiative adopted under the leadership of Director Kitagawa in FY2012

In response to the WPI mandate to promote interdisciplinary research and produce more highly visible results, iCeMS will undertake a new initiative of **Accelerated Research Projects** in FY2013 (a prototype of which was implemented in FY2012).

- Background: Since 2009, iCeMS has awarded research grants to young researchers pursuing multidisciplinary projects, the results of which have begun to appear as published papers. As the institute enters a new phase this year, it is of the utmost importance to publish the very highest quality research results covering the three key areas of study as defined by Director Kitagawa.
- Grant Program Goal: The aim of these grants is to accelerate outstanding projects in the three areas of primary importance for multidisciplinary research, which are expected to yield results within two years in the highest quality scientific journals (higher than Nature publications). The three areas are:
 - Gene expression control in stem cells
 - Organized functions on the cell membrane
 - Energy storage in cells
- Eligibility: Proposed research projects must fall into one of the following two categories:
 1. Joint research by two or more iCeMS researchers from two or more PI labs (participation of researchers other than PIs and from outside the iCeMS is also possible)
 2. Joint research being conducted with an iCeMS partner organization

b) Establishment of the Research Planning Section

In FY2012 an administrative section devoted to research planning support was established. The aims of the section are to strengthen international cooperation and improve the organization's financial standing, acquire large-scale research funds including international grants, help manage intellectual property by recruiting a University Research Administrator (URA), and advance open innovation with industry via the newly organized Open Innovation Task Force and Industrial Advisory Committee.

c) iCeMS exploratory cross-disciplinary grants

iCeMS has provided two types of small startup grants to initiate interdisciplinary collaboration within the institute and within university. The former is "iCeMS Exploratory Grants for Junior Investigators," and the latter is the "iCeMS Cross-Disciplinary Research Promotion Project". Numbers of past grantees are as follows:

- 13 (2009), 28 (2010), 40 (2011), 34 (2012) joint projects within iCeMS
- 19 (2010), 15 (2011), 15 (2012) joint projects with other Kyoto University departments

Note that the above grant for collaboration within the institute is to be merged into the Acceleration Project for FY2013, marking a shift from the institute's startup phase into one focusing on promoting targeted research projects. Meanwhile the latter grant for collaboration within the university will be continued, albeit with a reduced total budget.

d) Collaboration with the Katsura Lab

During the FY2011 Site Visit, one of the suggestions iCeMS received was to promote joint research in

polymer chemistry. In response, iCeMS has opened a 220 m² shared-use laboratory on Kyoto University's Katsura campus, with collaboration by four professors of the university's Graduate School of Engineering at its core. Some notable progress is already being achieved, such as in the **Imahori**, **Mori**, and **Murakami** groups demonstration of effective control over cell functions utilizing the photoinduced charge-separated state for the first time, and the **Kitagawa**, **Chen** and **Wang** groups using a living cell made by the **Mori** group for working on a new PCP-based cell-stimulation platform that releases nitric oxide by photoactivation. See P. 21 of Appendix 1 (section G-1) for a notable paper.

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. Highlights of CeMI's achievements include the following:

- 1) 28 papers were published by CeMI-affiliated labs in 2012. See P. 21 of Appendix 1 (section G-2) for 15 notable papers.
- 2) 89 users registered: 61 within the iCeMS, 21 from other Kyoto University departments, 7 from other universities.
- 3) 8 CeMI seminars were held (as part of the iCeMS Seminar series): 12 leading scientists in their fields were invited, including Dr. Jennifer Lippincott-Schwartz of NIH, Prof. Xiaoliang Sunney Xie of Harvard University, and Prof. Pietro De Camilli of Howard Hughes Medical Institute/Yale University School of Medicine.
- 4) 36 CeMI training sessions were conducted: approximately 90 researchers attended training sessions on microscopy and imaging technology for a total of 77 days.
- 5) Accessibility was enhanced by daily consultation services from full-time CeMI staff and upgrading of imaging facilities based on iCeMS researchers' requests.

f) 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. See P. 22 of Appendix 1 (section G-3) for notable papers.

[Collaborations in progress]

- with **Kusumi lab**: Understanding the function of mesoscopic raft domain
- with **Ueda lab**: Understanding the relationship between ABC protein and glycolipid
- with **Heuser lab**: Defining the mesoscopic complex structure comprising glycans and other membrane molecules
- with **Hashida, Imahori labs**: Development of smart nanomaterial for DDS
- with **Kitagawa, Ueno labs**: Development of smart nanomaterial for stem cell culturing

(4) Other strategies to promote cross-disciplinary research

a) Annual iCeMS retreats for all research staff

The purpose of the overnight retreat is to share on-going, unpublished multidisciplinary research activities thorough poster presentations and short talks, including iCeMS researchers from the widest possible variety of backgrounds. This once-a-year opportunity has contributed significantly to the generation of new collaborations and the acceleration of on-going multidisciplinary projects. Numbers of attendees and poster presentations have increased by **197%** (83 to 164) and **264%** (39 to 103) in four years.

b) iCeMS seminars

In FY2012, iCeMS matched its highest total of seminars held (31) featuring lectures by 38 invited speakers from across the globe. Nearly 80% of the invited speakers were from a university or institute

from abroad, totaling 9 countries excluding Japan. The topics of the seminars were diverse and reflected the iCeMS' commitment to integrated cell material sciences, as broken down as follows: materials (20%); cell sciences (55%); integrated materials and cell sciences (16%); and science communication (10%). In previous years, iCeMS has annually held a minimum of 18 seminars, and hosted no less than 24 speakers, of whom at least 78% represented a foreign institution.

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

The Young Scientists' Colloquia and Happy Hour Series" was officially launched in April 2012 with the main goal being to promote an interdisciplinary exchange of ideas among researchers. The informal gatherings are organized by iCeMS Kyoto Fellows and are open to any researchers, including those outside of iCeMS, who are interested in attending. To date, six colloquia have been held. The format consists of two speakers, each giving a 30-minute overview of their research activities, followed by a discussion with pizza and refreshments. The colloquia series has succeeded in drawing in approximately 20 attendees per colloquium.

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) Kick-off for *Biomaterials Science*, a new international journal published in collaboration with the UK-based Royal Society of Chemistry (RSC)

In January 2012, iCeMS began an important new 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 RSC. Following the publication of the first issue online in August 2012, the journal's first print edition, volume 1, appeared in January 2013. A kickoff symposium for the journal was held in Kyoto on 18th and 19th March, 2013, including remarks by WPI Program Director Dr **Toshio Kuroki**, iCeMS Founding Director **Nakatsuji**, and Managing Editor **Niamh O'Connor**. Several members of the editorial board delivered presentations, together with members of the iCeMS Academic Advisory Committee.

39 papers and 7 review articles have appeared in the online journal as of the end of March 2013.

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

a) Large number of researcher visits to iCeMS

The large number of active, world-leading researchers together with the high-standard research environment of iCeMS have been attracting scientists from around the world. In FY2012, a total of 42 visited (details in Appendix 5).

b) High rate of external grants awarded to young researchers

- Grant-in-Aid for Young Scientists (A): 1 project newly selected, in addition to 5 continuing projects
- Grant-in-Aid for Young Scientists (B): 11 projects newly selected, in addition to 8 continuing projects
- The Cabinet Office's Funding Program for Next Generation World-Leading Researchers (NEXT) Program: 5 projects continuing (the rate of selection ranked 5th of 209 recipient departments across Japan)

c) Awards received by young scientists

- Asst Prof **Hideki Hirori**, awarded "The 7th Young Scientist Award of the Physical Society of Japan" in 2012.

- Asst Prof **Morimura**, Assoc Prof **Kano** and Research Associate **Mizumachi** awarded the “Poster Award Grand Prize (Information Education Symposium 2012)”
- Asst Prof **Nobuhiro Yanai**, Kyushu University, former iCeMS-JSPS Overseas Visit Program for Young Researchers grantee as a member of Kitagawa lab, awarded “Quadrant Award First Prize” in 2013.

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

- An iCeMS research associate became an assistant professor at the Graduate School of Bioscience and Biotechnology, Tokyo Institute of Technology.
- An iCeMS assistant professor became an associate professor at the Graduate School of Science and Engineering for Research, Toyama University.
- An iCeMS assistant professor became a senior fellow at the Center for Integrative Medical Sciences, RIKEN.
- An iCeMS assistant professor became an associate professor at the Hakubi Center for Advanced Research, Kyoto University.

(3) Partner institutions

iCeMS has formed linkages with the following high-level institutions, based on two overall objectives: to enhance academic exchange and researcher mobility, including postdoctoral and graduate students (crucial to position the institute in the global flow of young researchers’ careers), and secondly to enhance the scientific output of the institute and at partner institutions by complementing each other’s expertise and excellence.

a) Partner institution relations in FY2012

The number of iCeMS’ partner institutions as of the end of FY2012 was 14. Memoranda of Understanding (MoUs) have been exchanged with most of these institutions.

In FY2012, iCeMS newly signed a MoU with the **Center for Life Sciences (CLS) of Peking University and Tsinghua University** in China. In addition, iCeMS held a joint symposium with **Stem Cells Australia (SCA) at the University of Melbourne** and is planning to exchange a MoU in FY2013, aiming to accelerate the progress of both teams toward applications of stem cells in research and medicine.

b) Notable progress in FY2012

Among numerous collaborative projects underway with the preceding institutions, three 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

The iCeMS satellite lab in Bangalore on stem cell research and single molecule imaging was established in NCBS’ new building, completed in June 2012. Assoc Prof Kenichi Suzuki, for single molecule imaging, and Senior Lecturer Kouichi Hasegawa, for stem cell research, conduct research activities there as group leaders. During FY2012, in addition to winning an international research grant between India and Australia (JPY 20 million over 2 years) together with the University of Melbourne, Dr Hasegawa was involved in a number of international collaborations such as acting as an invited editor of *Stem Cell International*. In total the research group published eight papers, two of which appeared in journals with IF 10 or more. See P. 22 of Appendix 1 (section G-4) for notable papers.

2) Heidelberg University

First formed in 2011, the Japanese-German University Presidents’ Conference (German-Japanese HeKKSAGOn Universities Consortium, consisting of Heidelberg University, Göttingen University, Karlsruhe Institute of Technology, Tohoku University, Osaka University, and Kyoto University) continues to meet annually. Kyoto University works especially closely with Heidelberg University in the area of

cell-material integration, resulting in the Heidelberg-Kyoto joint symposium “Crossing Boundaries: Stem Cells, Materials, and Mesoscopic Sciences” held in Heidelberg in July 2011. Subsequently, on March 30, 2012, Profs Nakatsuji and Ho continued their collaboration by co-organizing a session of the 2nd Japanese-German Presidents’ Conference hosted by Kyoto University.

As a concrete result of this collaboration, Prof **Motomu Tanaka** of Heidelberg will be appointed to an iCeMS PI position beginning in FY2013.

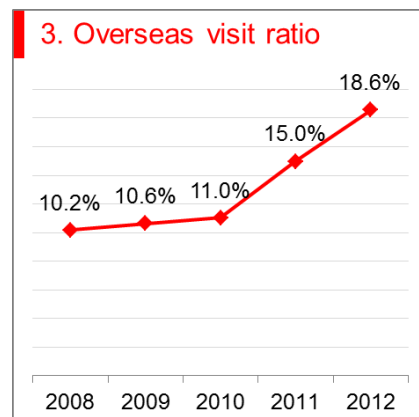
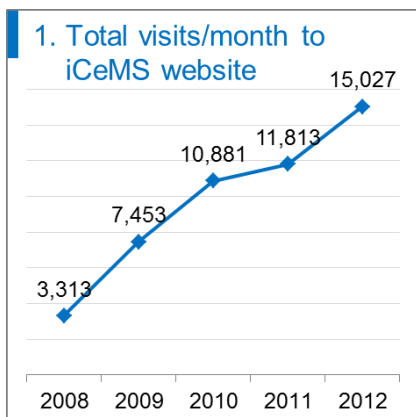
3) Center for Life Sciences (CLS), Peking University and Tsinghua University

iCeMS exchanged an MoU and held a joint symposium entitled “Crossing Boundaries: Stem cells, Materials, Mesoscopic Sciences and Beyond” in Beijing with CLS in April 2012, aiming at future collaboration related to stem cell biology as well as biomaterials sciences. Additionally, iCeMS will play a key role in a “Kyoto University Day” to be held at Peking University in the near future (Once cancelled in November 2012). The iCeMS-CLS partnership is at the forefront of collaboration between Kyoto and Beijing.

(4) Raising international visibility

a) Web traffic analysis

The iCeMS website continued its fifth consecutive year of growth in traffic, up 454% from 3,313 visits per month in 2008 to 15,027 in 2012 (see chart 1). In a global perspective, access from overseas has increased for the fifth straight year, up 828% from 337 visits per month in 2008 to 2,790 in 2012 (see chart 2). The proportion of access from overseas is also on a continued rise (see chart 3), indicating an enhanced visibility of the iCeMS in the international community.



b) Social media utilization

To engage with a wider audience across the globe — younger generations of scientists in particular — iCeMS is also committed to utilizing social media, such as Twitter (from March 2011), YouTube (December 2011), and Facebook (March 2012). In particular Facebook has aided in raising iCeMS’ visibility: the iCeMS Facebook page drove 1,912 visits to the iCeMS website in 2012. The page also garnered 11,559 views (the number of times iCeMS updates are seen by Facebook users) per month in 2012, reaching those in and outside of the iCeMS “fan base”.

c) World Stem Cell Summit

The iCeMS was actively involved in co-organizing and participating in the 2012 World Stem Cell Summit, an event held in Florida, USA, that attracted 1,200 visitors from industry, academia, and government of 40 countries. Prof Nakatsuji gave the plenary for the second year in a row to an audience, which included 170 experts in the stem cell and regenerative medicine fields. An iCeMS booth showcased stem cell technologies developed at iCeMS and attracted industry leaders interested in forging potential partnerships. Other iCeMS’ members gave poster presentations and were part of the awards evaluation committee.

(5) iCeMS Housing Guarantor System launched as a part of strategic plan to provide a truly

international environment

For enhancing the international environment of the institute, iCeMS has launched a Housing Guarantor System to fulfill the role of guarantor when international scientists lease housing for mid- to long term stays. Joint guarantors are often requested for leases, a custom that has been a persistent barrier for researchers from overseas who have difficulty finding a Japanese guarantor at the time of their arrival. iCeMS has partnered with several cooperative housing agencies in the area in order to improve the move-to-Japan experience.

(6) 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 iCeMS, they are expected to continue on a further international scientific career, or be promoted at Kyoto University. Such a process will help establish iCeMS as a prominent hub for building a global scientific career. There are presently 6 fellows (including 3 from overseas).

In 2012, 22 papers were published by Kyoto Fellows' and Assoc Kyoto Fellow's groups, 3 of which in IF 10+ journals. See P. 23 of Appendix 1 (section G-5) for the full list.

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 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 **53** (FY2009: 1, FY2010: 10, FY2011: 15, FY2012: 27) researchers thus far have earned opportunities to visit world-class institutions, opening the door to further international collaborations and careers.

This program was terminated in FY2012 due to an end to financial support from JSPS. iCeMS will launch a successor program for young researchers for FY2013, using its own budget, making the most of the collective experiences and networks compiled to date.

c) International symposia

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 FY2012 are as follows.

- 1) CLS-iCeMS Joint Symposium "Crossing Boundaries: Stem Cells, Materials, Mesoscopic Sciences, and Beyond": April 20–22, 2012 in Beijing
- 2) iCeMS-ERATO Symposium "New Dimensions of Functional Coordination Frameworks": July 27, 2012 in Kyoto
- 3) 12th iCeMS International Symposium/6th Annual Symposium on Nanobiotechnology "Kyoto Cell-Material Integration": November 8–9, 2012 in Kyoto
- 4) One-Day International Symposium on "Artificial Photosynthesis and Solar Energy Conversion": November 20, 2012 in Kyoto
- 5) Joint SCA (Stem Cells Australia) and iCeMS Symposium: February 12–13, 2013 in Melbourne
- 6) iCeMS Symposium on Theoretical and Computational Biology: March 1, 2013 in Kyoto
- 7) UK-Japan Workshop on Stem Cells "Building a Better Environment for Application": March 7–8, 2013 in Kyoto

- 8) iCeMS Symposium on Programing Functionalities into Porous Materials: March 8, 2013 in Kyoto
- 9) The Fourteenth International Membrane Research Forum: March 15–17, 2013 in Kyoto
- 10) 13th iCeMS International Symposium/RSC-iCeMS Joint International Symposium “Cell-Material Integration and Biomaterials Science”: March 18–19, 2013 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) Kyoto University overall research and educational reform

Kyoto University has started a round of intensive working-level discussions on the reform of educational and research organizations. The establishment of *faculties* is one of the main features of these plans: these being virtual pools to which all academic staff belong, in addition to their existing affiliations. Important decisions, such as regarding personnel matters and the creation and dissolution of research organizations, will be made at the faculty level. The goal of this reform is to 1) build a university-wide undergraduate education system, 2) enhance the flexibility for educational and research reform, and 3) establish a system of ensuring teaching support university-wide. In such a far-reaching reform process, the WPI program and iCeMS are being recognized and respected for their advanced views of goal-setting and achievements in world-class and interdisciplinary research, internationalization, and thorough organizational reform.

(2) Kyoto University overall administrative reform

Since its establishment in 2007, the new administrative paradigm created by iCeMS has strongly influenced plans for the future of Kyoto University's administration, such as: the use of English as an official language, the hiring of bilingual administrative staff (50% or more), and the strengthening of support for overseas researchers. In line with iCeMS' experiences, Kyoto University is now undertaking substantial reforms, such as the 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. These reforms will become operational as of July 1, 2013. The following are two points illustrating iCeMS' marked impact on the university's administrative reform efforts.

a) Overseas Planning and Public Relations Section

Over the course of several years, separate university department, graduate school, and institute administrative offices have been combined, resulting in six new centralized administrative offices. iCeMS belongs to the new Yoshida South Administrative Office, which includes a new Overseas Planning and Public Relations Section, aiming to support and accelerate internationalization far beyond iCeMS to the Graduate School of Advanced Integrated Studies in Human Survivability (*Shishu-Kan*) and the Foundation for Liberal Arts Studies, to be newly established in FY2013. iCeMS' rich accumulated experience in internationalization is anticipated to have a large impact on these new institutions.

b) Kyoto University Research Administration Office (KURA)

With an aiming to set future research strategy and gain large-scale competitive funding, KURA was recently established at the university, newly hiring nearly 20 university research administrators (URAs). With its pioneering experience such as in its work with the Innovation Management Group, iCeMS' Research Planning Section will play an important role in collaborating with KURA.

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) Director succession to Prof Kitagawa

At a research center such as iCeMS, where the fields of study are particularly cross-disciplinary and evolving rapidly, appropriate adjustment of the direction of the institute by shifting to a leader from a different background may aid in re-inspiring work across disciplines, and in nurturing a younger generation of scientists who are truly multidisciplinary minded and whose work will potentially lead to important new breakthroughs. In this light, replacement of the director has long been part of iCeMS' future plans.

In office since the institute's founding in 2007, Director **Nakatsuji** based his vigorous leadership on a cell biology approach to the integration of the cell and material sciences, resulting in ground-breaking advances in the development of *materials for cell control* such as bioactive substances and technologies for the observation and control of cells.

Yet in keeping with the spirit of rejuvenation outlined above, the institute decided that the time had come to implement a more materials science and *cell-inspired materials* approach under the leadership of Prof **Kitagawa**, in addition to the primarily cell science, *materials for cell control* approach of the first five years, taking the institute to a higher level of cell-material integration.

As a 2010 Thomson Reuters Citation Laureate and Nobel Chemistry Prize nominee, Prof Kitagawa is a renowned chemist with a truly global reputation for his work in developing functional materials such as porous coordination polymers (PCPs). He led the Cross-Disciplinary Research Task Force as the iCeMS deputy director and will continue playing a leading role in promoting multidisciplinary research as director.

Prof Kitagawa assumed the iCeMS directorship on January 1, 2013, and on the same date Prof Nakatsuji was named to a new position of **Founding Director**, reflecting the importance of his contributions to the institute as well as his continuing role as the iCeMS' preeminent cell biologist.

(2) Research vision established and structure reformed

a) New director's research vision

Director **Kitagawa** has defined two focal areas of study based on the following questions, seeking to ultimately create a new, integrated cell-material science, delving deeply into the mesoscopic world lying at the boundary of materials and life.

1) Question 1: Can we describe mesoscopic cellular processes in terms of chemistry, and create materials to control them?

Cells sustain life through properties of self-assembly and cooperative interactions among nearly countless chemical materials, moving ceaselessly in space and time. Broadening the scope beyond the narrow confines of nanoscale molecular interactions, iCeMS has found it necessary to take a wider, mesoscopic view of molecular complexes. To accomplish this, iCeMS has been pursuing the development of advanced imaging technologies and modeling, and physical and chemical technologies to dissect complex cellular events. Based on this analysis, iCeMS seeks to investigate *materials for cell control*. Research areas in this context are as follows:

- **Gene Expression Control in Stem Cells**, such as a mesoscopic understanding of gene expression in cellular reprogramming and differentiation, and the development of materials to control such expression.
- **Organized Functions on the Cell Membrane**, such as a mesoscopic understanding of mechanisms controlling channels and transporters, and the development of materials to control such systems.
- **Biogas Control**, such as a mesoscopic understanding of mechanisms involving gases in living

systems, and the development of porous materials for cellular control using such gases.

2) Question 2: Can we reproduce mesoscopic cellular structures with materials, and manipulate them?

Renowned physicist Richard P Feynman once wrote: "What I cannot create, I do not understand." In other words, only in the process of creation can we achieve true understanding.

In this spirit, the institute aims to replicate mesoscopic cellular functions with designed materials (*cell-inspired materials*). This should be possible once a full understanding of such cellular processes (as described above) has been achieved. iCeMS therefore simultaneously advances analysis and synthesis, applying the resulting higher level of knowledge to further research, such as in the proposed creation of the following chemical materials:

- **Materials for Cell Membrane Functions**, such as the development of materials based on a mesoscopic understanding of the complex balance and interaction of processes on the cell membrane.
- **Energy Storage in Cells**, such as the creation of mesoscopic materials mimicking living systems' abilities to sort and store energy bearing ions and molecules, and materials to unlock the energy storage potential of carbon dioxide and nitrogen gas.

b) New leadership team and new PIs

New leadership team

Director **Kitagawa** is a specialist in materials science. Two deputy directors have been appointed to support his leadership, one is iCeMS Adjunct Professor **Ryoichiro Kageyama**, a highly-respected cell scientist, and the other is iCeMS Professor **Motonari Uesugi**, a highly-regarded chemical biologist in the United States and Japan with a solid record of uniting cell-material research. The institute's new leadership team, strong in both international and interdisciplinary contexts, will be well placed to lead iCeMS in this new phase of its unified study crossing the boundaries between cells and materials.

New PIs appointed

In FY 2012, two eminent researchers have joined the iCeMS as new PIs. One is Prof **Ryoichiro Kageyama** of Kyoto University Institute for Virus Research, a highly-respected cell scientist especially in the field of neurogenesis. The other is Prof **Mitinori Saitou** of Kyoto University Graduate School of Medicine, specialized in Mammalian Germ Cell Biology. In addition, Prof **Motomu Tanaka** of Heidelberg University, an internationally recognized authority on Biological Physics, will be appointed to a PI of the iCeMS in FY2013.

- Prof **Kageyama's** group has been investigating the molecular mechanisms of proliferation and differentiation of neural stem cells, aiming at controlling these cells at will. His group has so far found several key genes that regulate proliferation of neural stem cells and differentiation of neurons and revealed that the gene expression dynamics are very important for their functions. It is expected that novel strategies using chemicals or biomaterials that control cell proliferation and differentiation will be developed with the acquisition of more detailed knowledge of the significance of gene expression dynamics. Such strategies will be useful for many medical purposes such as brain disease treatment and tissue regeneration. At iCeMS Prof Kageyama's group will make an intensive collaboration with other staff of material fields to attain such a multidisciplinary research on cell and material integration.
- Prof **Saitou's** group has been investigating signaling, global transcription and epigenetic dynamics associated with germ cell specification and development in mice. Recently, using mouse pluripotent stem cells [embryonic stem cells (ESCs) and induced pluripotent stem cells (iPSCs)], his group has succeeded in precisely reconstituting the specification and development of primordial germ cells (PGCs) in culture. This work will serve as a foundation for systems analysis of germ cell development as well as for the reconstitution of the entire germ-cell development process in vitro, not only in mice but also in other mammals, including humans. At iCeMS his group will make a collaboration to attain

multidisciplinary research such as to identify chemicals that facilitate the proliferation/differentiation of PGCs or human ESCs/iPSCs.

- Prof **Tanaka's** scientific motivation is to understand fundamental physical principles that govern key phenomena in biology, such as cell adhesion, proliferation, and differentiation. He has been trying to extend such a concept in cell-material sciences, using the experimental/theoretical tools in the field of soft matter physics and interface sciences. Multidisciplinary research projects have been planned with existing iCeMS scientists such as (1) Regulation of the fate of hES/iPS cells using dynamic niche models collaborating with Nakatsuji, Yamanaka, Kitagawa, Chen labs, (2) Quantitative determination of stem cell-material interactions with Sugiyama, Uesugi labs, and (3) Influence of mesoscopic scale confinement of functional molecules with Kiso, Harada, Kusumi, Heuser labs.

(3) Reorganization of research groups, and fostering next-generation scientists

a) Personnel management and PI contract renewal

- 1) 4 PIs have reached the ends of their 5-year contract terms and 2 of them resigned at the end of March 2013.
- 2) Plans for FY2013 onward: 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) Encouraging young researchers' 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 started in FY2012. 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". These 2 teaching courses will continue in FY2013.

2) Co-Mentor Program

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. In FY2012, 11 faculty members acted as co-mentors.

3) Overseas Visit Program for Young Researchers (see P. 12 for details)

4) iCeMS exploratory cross-disciplinary grants (see P. 7 for details)

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

a) Recent examples of iCeMS-CiRA organizational cooperation

- 1) Prof **Yamanaka** is appointed to the Scientific Advisor to the iCeMS from April 2013.
- 2) Participation of 11 members from the CiRA, including 3 CiRA PIs, at the 2012 iCeMS Retreat.
- 3) Joint planning and hosting of iCeMS/CiRA stem cell classroom events for high school students and their teachers.

b) iCeMS-CiRA collaborative research

5 papers including two shown below were published in 2012 as a result of continued joint efforts between iCeMS and CiRA. See P. 24 of Appendix 1 (section G-6) for the full list.

- [Nakatsuji, Uesugi, Heuser, Yamamoto labs] *Cell Reports* 2, 1448–1460, A Small Molecule that Promotes Cardiac Differentiation of Human Pluripotent Stem Cells under Defined, Cytokine- and Xeno-free Conditions
- [Heuser, Yamanaka, Yamamoto labs] *Blood* 120, 1299–1308, Induced pluripotent stem cells from CINCA syndrome patients as a model for dissecting somatic mosaicism and drug discovery

(5) Support for center management by host institution

To secure resources for center operation and research activities, the university has continued and will continue as before until the end of the WPI program.

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

The host institution plans to establish a global science incubator, incorporating iCeMS as the basis of this new research institution.

a) Core concepts of the proposed new institution

- Incubator for innovative and exploratory research areas including proto-sciences
- Global hub of interdisciplinary science
- Accommodating full support for the international and mobile careers of all researchers and staff
- Providing a place where selected, talented Kyoto University scientists can devote time to their own research such as in the form of internal sabbaticals
- Placement directly under the president as a permanent laboratory for university reform efforts

b) Operating policies and support from the host institution

- iCeMS is to strive for a flexibly integrated institute focused on bench-to-market solutions, self-sustainability, and the nurturing of human resources, in addition to the WPI program's four existing missions of cutting-edge research, interdisciplinary science, truly international environments, and organizational reform.
- Kyoto University is supportive of these measures, such as related to plans regarding continued use of existing research buildings, distribution of personnel (based in part on the scientific output of the organization) and the allocation of 8 permanent administrative staff.

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)

- SCG, established in 2007 and led by Adj Prof **Kazuto Kato**, implemented numerous outreach efforts in FY2012, such as science cafés (twice in December 2012), hands-on iCeMS-CiRA joint stem cell classrooms (once in July, two times in November 2012), hands-on exhibitions at science festivals hosted by the Cabinet Office (two days in March 2013), and lectures for middle and high school students (over 5 times throughout FY2012).
- SCG offered a "Dialogue Skills Training Program" for young scientists within iCeMS (once in November in 2012) and within Kyoto University (in August and January 2012). This program was created with support from the iCeMS Cross-Disciplinary Research Promotion Project, and employed by the Center for Science Communication of the Japan Science & Technology Agency (JST) as its communication program for scientists.
- The importance of the practical research on science outreach implemented by the SCG has been increasingly well recognized.
 - Sponsored by the Japan Association for Educational Broadcasting, SCG conducted a concept designing for science education TV programs. This was aiming that Japan Broadcasting Corporation (NHK) would implement the new concept to its programs.
 - The SCG has acquired a couple of outside funding resources including Grants-in-Aid for

Scientific Research and Science of Science, Technology and Innovation Policy of Research Institute of Science and Technology for Society (RISTEX), JST.

- See P. 25 of Appendix 1 (section H-1) for SCG publications.

(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 in order to realize for society the promises of their leading edge inventions and discoveries.
- IMG proceeds with a study on the organization dynamics in scientific interdisciplinary research for organizational development, human resource management and strategic management.
- IMG proceed with a project for integrative innovation management research, human resources development, and support for commercialization in the stem cell science and technology sphere, funded by the CSTP/JSPS NEXT Program.
- IMG has been conducting social implementation initiatives for advanced cross-sector partnership by designing new and better collaboration systems with the public and private sectors, in collaboration with Kyoto SMI (Smart Materials & Innovation), a satellite NPO as an intermediate organization of the WPI-iCeMS, e.g. organizing a consortium named The Smart Stem Cell for Innovation (SSCI) Initiative, as well as holding Kyoto SMI Seminar across the Academic, Industry and Public Domains (once in June 2012, once in February 2013).
- IMG is committing to human resource and talent development in collaboration with the Graduate School of Biostudies, the Graduate School of Medicine and STiPS of Kyoto University, focusing on recruitment, education, and training of next-generation PhD holders seeking careers in innovation manage.
- See P. 25 of Appendix 1 (section H-2) for IMG publications.

7. Center's response to the results of the FY2012 follow-up (including the results of the site visit)

* Note how the center has responded to the results of FY2012 follow-up. However, if you have already provided this information, please indicate where in the report.

1) The mission statement "to create new disciplinary fields through integration of cell and materials sciences with a focus on stem cell science and technology and mesoscopic science and technology" is still too diverse and ambiguous. Clear identification of the current mission as well as plans for the next 5 years is needed.

Our institute seeks to **develop a new field of mesoscopic science** at the interface of chemistry, physics, and cell biology, creating compounds to control processes in cells such as stem cells (*materials for cell control*) and sparking cellular processes to create chemical materials (*cell-inspired materials*).

Over the remaining years of the initial 10-year span of the program, we will be able to show specific examples of this new mesoscopic science through publications, news releases, and commercialization of research outcomes outlined in 3) below. As a world-leading center of mesoscopic science, iCeMS is expected to establish a clear shape of this science toward the end of a subsequent 5-year phase, if granted (toward 2022).

2) New director should clarify and implement his vision and agenda for the next 5 years. It is not clear how the change of Director will affect the strategy of the institute as well as composition of the PIs.

The institute's new leadership, under the directorship of Susumu Kitagawa, has clarified the center's vision and strategy to develop the field of mesoscopic science.

Biochemistry uses proteins, and molecular biology takes a DNA-based approach to explaining cellular functions, but simply assembling macro-sized bodies of these elements does not alone result in living matter. Cell biology, such as in research related to embryonic stem (ES) cells and induced pluripotent stem (iPS) cells, considers cells as a whole, but attempting to break cells into their relevant molecular parts causes them to lose their integrity as living systems.

Our institute seeks a middle ground: between the large, whole-cell approach of cell biology, and the small, protein and DNA approaches of biochemistry and molecular biology. We call this the **mesoscopic realm**, lying between a few tens and a few hundreds of nanometers, on the border between materials and living matter. Investigating this boundary region, we strive to explain the material-chemical basis of cells' living functions, ultimately using materials to create facsimiles of these mechanisms.

Over the next 5 years we expect to succeed in creating a framework for the boundary parameters of mesoscopic science, including contributions of new PIs and top-level researchers, such as **Motomu Tanaka** of Heidelberg (joining iCeMS in April 2013) and **Easan Sivaniah** of Cambridge (July 2013).

3) Integration of material science into cell biology has considerably progressed in this one year. This line of study should be further extended to various aspects of cell biology. Taking this success into account, reconsideration and focusing of research strategy are recommended. Upon critical reviewing the ongoing research subjects, some projects that are not promising or not closely related to the recent progress had better be excluded from or less emphasized in the plans of iCeMS.

A critical review of ongoing collaborative projects was conducted toward the end of the fiscal year, resulting in a tightened focus on 10 institute-initiated proposals covering the following five areas.

Materials for cell control:

- (1) **gene expression control in stem cells**, such as a mesoscopic understanding of gene expression in cellular reprogramming and differentiation, and the development of materials to control such expression
- (2) **organized functions on the cell membrane**, such as a mesoscopic understanding of mechanisms controlling channels and transporters, and the development of materials to control such systems
- (3) **biogas control**, such as a mesoscopic understanding of mechanisms involving gases in living systems, and the development of porous materials for cellular control using such gases

Cell-inspired materials:

- (4) **materials for cell membrane functions**, such as the development of materials based on a mesoscopic understanding of the complex balance and interaction of processes on the cell membrane
- (5) **energy storage in cells**, such as the creation of mesoscopic materials mimicking living systems' abilities to sort and store energy bearing ions and molecules, and materials to unlock the energy storage potential of carbon dioxide and nitrogen gas

4) Several works seem to lack biological and mechanistic insight. More critical appraisals should be pursued from cell biologists.

In January 2013, Kyoto University scientists **Ryoichiro Kageyama** (Institute for Virus Research) and **Mitunori Saitou** (Graduate School of Medicine) became iCeMS PIs, bringing with them world-class knowledge in cell biology. Prof Kageyama was also appointed one of two new deputy directors, who together with chemical biologist **Motonari Uesugi** completes the institute's new leadership team. Each scientist will continue leading research in his specific field, while supporting and contributing to cooperation and strict review of collaborative projects throughout the institute.

List of Center's Research Results and Main Awards

A. Refereed Papers

List only the Center's papers published in 2012. (Note: The list should be for the calendar year, not the fiscal year.)

(1) Divide the papers into two categories, A and B.

A. WPI papers

List papers whose author(s) can be identified as affiliated with the WPI program (e.g., that state the name of his/her WPI center). (*Not including* papers whose acknowledgements contain the names of persons affiliated with the WPI program.)

B. WPI-related papers

Among papers published in 2012, list those related to the WPI program but whose authors are not noted in the institutional affiliations as WPI affiliated. (*Including* papers whose acknowledgements contain the names of researchers affiliated with the WPI program.)

Note: On 14 December 2011, the Basic Research Promotion Division in MEXT's Research Promotion Bureau circulated an instruction requiring paper authors to include the name or abbreviation of their WPI center among their institutional affiliations. As some WPI-affiliated authors of papers published up to 2013 may not be aware of this requirement, their papers are treated as "WPI-related papers." From 2014, however, the authors' affiliations must be clearly noted and only category A papers will be listed.

Newly selected centers are to list papers under category C below (in addition to categories A and B above).

C. Previously published important WPI-related papers

List previously published papers that provided the basis for the center's research project plan. (Around 30 papers as a yardstick.)

(2) Method of listing paper

- List only referred papers. Divide them into categories (e.g., original articles, reviews, proceedings).
- For each, write the author name(s); year of publication; journal name, volume, page(s), and article title. Any listing order may be used as long as format is the same. (The names of the center researchers do not need to be underlined.)
- If a paper has many authors (say, more than 20), all of their names do not need to be listed.
- If the papers are written in languages other than English, divide them into language categories when listing them.
- Assign a serial number to each paper to be used to identify it throughout the system.

(3) Submission of electronic data

- In addition to the above, for each paper provide a .cvs file output from the Web of Science (e.g.) or other database giving the paper's raw data including Document ID. (Note: the Document ID is assigned by paper database.)
- These files do not need to be divided into paper categories.

(4) Use in assessments

- The lists of papers will be used in assessing the state of WPI project's progress in FY 2012.
- They will be used as reference in analyzing the trends and states of research in all the WPI centers, not to evaluate individual researcher performance.
- The special characteristics of each research domain will be considered when conducting assessments.

(5) Additional documents

After all documents, including these paper listings, showing the state of research progress have been submitted, additional documents may be requested.

Order of Listing

A. WPI papers

1. Original articles
2. Review articles
3. Proceedings
4. Other English articles

5. Articles written in other than English

B. WPI-related papers

1. Original articles
2. Review articles
3. Proceedings
4. Other English articles
5. Articles written in other than English

C. Previously published WPI-related papers

A. Refereed Papers

List only the Center's papers published in 2012. (Note: The list should be for the calendar year, not the fiscal year.)

No.	Author(s) and details
A. WPI papers	
1. Original articles	
1	Minami, Itsunari; Yamada, Kohei; Otsuji, Tomomi G.; Yamamoto, Takuya; Shen, Yan; Otsuka, Shinya; Kadota, Shin; Morone, Nobuhiro; Barve, Maneesha; Asai, Yasuyuki; Tenkova-Heuser, Tatyana; Heuser, John E.; Uesugi, Motonari; Aiba, Kazuhiro; Nakatsuji, Norio; A Small Molecule that Promotes Cardiac Differentiation of Human Pluripotent Stem Cells under Defined, Cytokine- and Xeno-free Conditions; <i>Cell Reports</i> 2, 1448–1460 (2012)
2	Suzuki, Kenichi G. N.; Lipid rafts generate digital-like signal transduction in cell plasma membranes; <i>Biotechnol. J.</i> 7, 753–761 (2012)
3	Pandian, Ganesh N.; Nakano, Yusuke; Sato, Shinsuke; Morinaga, Hironobu; Bando, Toshikazu; Nagase, Hiroki; Sugiyama, Hiroshi; A synthetic small molecule for rapid induction of multiple pluripotency genes in mouse embryonic fibroblasts; <i>Sci Rep</i> 2, 544 (2012)
4	Jung, Dongju; Minami, Itsunari; Patel, Sahishnu; Lee, Jonghwan; Jiang, Bin; Yuan, Qinghua; Li, Liu; Kobayashi, Sachiko; Chen, Yong; Lee, Ki-Bum; Nakatsuji, Norio; Incorporation of functionalized gold nanoparticles into nanofibers for enhanced attachment and differentiation of mammalian cells; <i>J. Nanobiotechnol.</i> 10, 23 (2012)
5	Hasegawa, Kouichi; Yasuda, Shin-ya; Teo, Jia-Ling; Cu Nguyen; McMillan, Michael; Hsieh, Chih-Lin; Suemori, Hirofumi; Nakatsuji, Norio; 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 Transl. Med.</i> 1, 18–28 (2012)
6	Xu, Jiakun; Shoji, Osami; Fujishiro, Takashi; Ohki, Takahiro; Ueno, Takafumi; 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)
7	Wada, Tamaki; Goparaju, Sravan K.; Tooi, Norie; Inoue, Haruhisa; Takahashi, Ryosuke; Nakatsuji, Norio; Aiba, Kazuhiro; Amyotrophic Lateral Sclerosis Model Derived from Human Embryonic Stem Cells Overexpressing Mutant Superoxide Dismutase 1; <i>Stem Cells Transl. Med.</i> 1, 396–402 (2012)
8	Chen, Wei-Tin; Saito, Takashi; Hayashi, Naoaki; Takano, Mikio; Shimakawa, Yuichi; Ligand-hole localization in oxides with unusual valence Fe; <i>Sci Rep</i> 2, 449 (2012)

9	Kamimura, Ryo; Ishii, Takamichi; Sasaki, Naoya; Kajiwara, Masatoshi; Machimoto, Takafumi; Saito, Michiko; Kohno, Kenji; Suemori, Hirofumi; Nakatsuji, Norio; Ikai, Iwao; Yasuchika, Kentaro; Uemoto, Shinji; Comparative Study of Transplantation of Hepatocytes at Various Differentiation Stages Into Mice With Lethal Liver Damage; <i>Cell Transplant.</i> 21, 2351–2362 (2012)
10	Miki, Kenji; Uenaka, Hisazumi; Saito, Atsuhiko; Miyagawa, Shigeru; Sakaguchi, Taichi; Higuchi, Takahiro; Shimizu, Tatsuya; Okano, Teruo; Yamanaka, Shinya; Sawa, Yoshiki; Bioengineered Myocardium Derived from Induced Pluripotent Stem Cells Improves Cardiac Function and Attenuates Cardiac Remodeling Following Chronic Myocardial Infarction in Rats; <i>Stem Cells Transl. Med.</i> 1, 430–437 (2012)
11	Ikezoe, Yasuhiro; Washino, Gosuke; Uemura, Takashi; Kitagawa, Susumu; Matsui, Hiroshi; Autonomous motors of a metal-organic framework powered by reorganization of self-assembled peptides at interfaces; <i>Nat. Mater.</i> 11, 1081–1085 (2012)
12	Reboul, Julien; Furukawa, Shuhei; Horike, Nao; Tsotsalas, Manuel; Hirai, Kenji; Uehara, Hiromitsu; Kondo, Mio; Louvain, Nicolas; Sakata, Osami; Kitagawa, Susumu; Mesoscopic architectures of porous coordination polymers fabricated by pseudomorphic replication; <i>Nat. Mater.</i> 11, 717–723 (2012)
13	Kobayashi, Yoji; Hernandez, Olivier J.; Sakaguchi, Tatsunori; Yajima, Takeshi; Roisnel, Thierry; Tsujimoto, Yoshihiro; Morita, Masaki; Noda, Yasuto; Mogami, Yuuki; Kitada, Atsushi; Ohkura, Masatoshi; Hosokawa, Saburo; Li, Zhaofei; Hayashi, Katsuro; Kusano, Yoshihiro; Kim, Jung Eun; Tsuji, Naruki; Fujiwara, Akihiko; Matsushita, Yoshitaka; Yoshimura, Kazuyoshi; Takegoshi, Kiyonori; Inoue, Masashi; Takano, Mikio; Kageyama, Hiroshi; An oxyhydride of BaTiO ₃ exhibiting hydride exchange and electronic conductivity; <i>Nat. Mater.</i> 11, 507–511 (2012)
14	Hayashi, Katsuhiko; Ogushi, Sugako; Kurimoto, Kazuki; Shimamoto, So; Ohta, Hiroshi; Saitou, Mitinori; Offspring from Oocytes Derived from in Vitro Primordial Germ Cell-like Cells in Mice; <i>Science</i> 338, 971–975 (2012)
15	Wickham, Shelley F. J.; Bath, Jonathan; Katsuda, Yousuke; Endo, Masayuki; Hidaka, Kumi; Sugiyama, Hiroshi; Turberfield, Andrew J.; A DNA-based molecular motor that can navigate a network of tracks; <i>Nat. Nanotechnol.</i> 7, 169–173 (2012)
16	Kohsaka, Y.; Hanaguri, T.; Azuma, M.; Takano, M.; Davis, J. C.; Takagi, H.; Visualization of the emergence of the pseudogap state and the evolution to superconductivity in a lightly hole-doped Mott insulator; <i>Nat. Phys.</i> 8, 534–538 (2012)
17	Suzuki, Kenichi G. N.; Kasai, Rinshi S.; Hirosawa, Koichiro M.; Nemoto, Yuri L.; Ishibashi, Munenori; Miwa, Yoshihiro; Fujiwara, Takahiro K.; Kusumi, Akihiro; Transient GPI-anchored protein homodimers are units for raft organization and function; <i>Nat. Chem. Biol.</i> 8, 774–783 (2012)
18	Xiol, Jordi; Cora, Elisa; Kogelgruber, Rubina; Chuma, Shinichiro; Subramanian, Sailakshmi; Hosokawa, Mihoko; Reuter, Michael; Yang, Zhaolin; Berninger, Philipp; Palencia, Andres; Benes, Vladimir; Penninger, Josef; Sachidanandam, Ravi; Pillai, Ramesh S.; A Role for Fkbp6 and the Chaperone Machinery in piRNA Amplification and Transposon Silencing; <i>Mol. Cell</i> 47, 970–979 (2012)
19	Hu, Ming; Furukawa, Shuhei; Ohtani, Ryo; Sukegawa, Hiroaki; Nemoto, Yoshihiro; Reboul, Julien; Kitagawa, Susumu; 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)
20	Endo, Masayuki; Tatsumi, Koichi; Terushima, Kosuke; Katsuda, Yousuke; Hidaka, Kumi; Harada, Yoshie; Sugiyama, Hiroshi; Direct Visualization of the Movement of a Single T7 RNA Polymerase and Transcription on a DNA Nanostructure; <i>Angew. Chem.-Int. Edit.</i> 51, 8778–8782 (2012)
21	Kasai, Hitoshi; Murakami, Tatsuya; Ikuta, Yoshikazu; Koseki, Yoshitaka; Baba, Koichi; Oikawa, Hidetoshi; Nakanishi, Hachiro; Okada, Masahiro; Shoji, Mitsuru; Ueda, Minoru; Imahori, Hiroshi; Hashida, Mitsuru; Creation of Pure Nanodrugs and Their Anticancer Properties; <i>Angew. Chem.-Int. Edit.</i> 51, 10315–10318 (2012)
22	Nakata, Eiji; Liew, Fong Fong; Uwatoko, Chisana; Kiyonaka, Shigeki; Mori, Yasuo; Katsuda, Yousuke; Endo, Masayuki; Sugiyama, Hiroshi; Morii, Takashi; Zinc-Finger Proteins for Site-Specific Protein Positioning on DNA-Origami Structures; <i>Angew. Chem.-Int. Edit.</i> 51, 2421–2424 (2012)

23	Chien, Chih-Tao; Li, Shao-Sian; Lai, Wei-Jung; Yeh, Yun-Chieh; Chen, Hsin-An; Chen, I-Shen; Chen, Li-Chyong; Chen, Kuei-Hsien; Nemoto, Takashi; Isoda, Seiji; Chen, Mingwei; Fujita, Takeshi; Eda, Goki; Yamaguchi, Hisato; Chhowalla, Manish; Chen, Chun-Wei; Tunable Photoluminescence from Graphene Oxide; <i>Angew. Chem.-Int. Edit.</i> 51, 6662–6666 (2012)
24	Ohtsu, Hideki; Tanaka, Koji; An Organic Hydride Transfer Reaction of a Ruthenium NAD Model Complex Leading to Carbon Dioxide Reduction; <i>Angew. Chem.-Int. Edit.</i> 51, 9792–9795 (2012)
25	Endo, Masayuki; Yang, Yangyang; Suzuki, Yuki; Hidaka, Kumi; Sugiyama, Hiroshi; Single-Molecule Visualization of the Hybridization and Dissociation of Photoresponsive Oligonucleotides and Their Reversible Switching Behavior in a DNA Nanostructure; <i>Angew. Chem.-Int. Edit.</i> 51, 10518–10522 (2012)
26	Falcaro, Paolo; Furukawa, Shuhei; Doping Light Emitters into Metal-Organic Frameworks; <i>Angew. Chem.-Int. Edit.</i> 51, 8431–8433 (2012)
27	Higuchi, Masakazu; Nakamura, Kohei; Horike, Satoshi; Hijikata, Yuh; Yanai, Nobuhiro; Fukushima, Tomohiro; Kim, Jungeun; Kato, Kenichi; Takata, Masaki; Watanabe, Daisuke; Oshima, Shinji; Kitagawa, Susumu; Design of Flexible Lewis Acidic Sites in Porous Coordination Polymers by using the Viologen Moiety; <i>Angew. Chem.-Int. Edit.</i> 51, 8369–8372 (2012)
28	Foo, Maw Lin; Horike, Satoshi; Inubushi, Yasutaka; Kitagawa, Susumu; An Alkaline Earth 1300 Porous Coordination Polymer: [Ba ₂ TMA(NO ₃)(DMF)]; <i>Angew. Chem.-Int. Edit.</i> 51, 6107–6111 (2012)
29	Igarashi, Ryuji; Yoshinari, Yohsuke; Yokota, Hiroaki; Sugi, Takuma; Sugihara, Fuminori; Ikeda, Kazuhiro; Sumiya, Hitoshi; Tsuji, Shigenori; Mori, Ikue; Tochio, Hidehito; Harada, Yoshie; Shirakawa, Masahiro; Real-Time Background-Free Selective Imaging of Fluorescent Nanodiamonds in Vivo; <i>Nano Lett.</i> 12, 5726–5732 (2012)
30	Un, Keita; Kawakami, Shigeru; Yoshida, Mitsuru; Higuchi, Yuriko; Suzuki, Ryo; Maruyama, Kazuo; Yamashita, Fumiyoshi; Hashida, Mitsuru; Efficient suppression of murine intracellular adhesion molecule-1 using ultrasound-responsive and mannose-modified lipoplexes inhibits acute hepatic inflammation; <i>Hepatology</i> 56, 259–269 (2012)
31	Tsuneyoshi, Norihiro; Tan, Ee Kim; Sadasivam, Akila; Poobalan, Yogavalli; Sumi, Tomoyuki; Nakatsuji, Norio; Suemori, Hirofumi; Dunn, N. Ray; The SMAD2/3 corepressor SNON maintains pluripotency through selective repression of mesendodermal genes in human ES cells; <i>Genes Dev.</i> 26, 2471–2476 (2012)
32	Mohri, Kohta; Nishikawa, Makiya; Takahashi, Natsuki; Shiomi, Tomoki; Matsuoka, Nao; Ogawa, Kohei; Endo, Masayuki; Hidaka, Kumi; Sugiyama, Hiroshi; Takahashi, Yuki; Takakura, Yoshinobu; Design and Development of Nanosized DNA Assemblies in Polypod-like Structures as Efficient Vehicles for Immunostimulatory CpG Motifs to Immune Cells; <i>ACS Nano</i> 6, 5931–5940 (2012)
33	Zou, Jianli; Kim, Franklin; Self-Assembly of Two-Dimensional Nanosheets Induced by Interfacial Polyionic Complexation; <i>ACS Nano</i> 6, 10606–10613 (2012)
34	Courtois, Aurelien; Schuh, Melina; Ellenberg, Jan; Hiiragi, Takashi; The transition from meiotic to mitotic spindle assembly is gradual during early mammalian development; <i>J. Cell Biol.</i> 198, 357–370 (2012)
35	Kitada, Atsushi; Hasegawa, George; Kobayashi, Yoji; Kanamori, Kazuyoshi; Nakanishi, Kazuki; Kageyama, Hiroshi; Selective Preparation of Macroporous Monoliths of Conductive Titanium Oxides TiO ₂ n-1 (n=2, 3, 4, 6); <i>J. Am. Chem. Soc.</i> 134, 10894–10898 (2012)
36	Xu, Gang; Yamada, Teppei; Otsubo, Kazuya; Sakaida, Shun; Kitagawa, Hiroshi; Facile "Modular Assembly" for Fast Construction of a Highly Oriented Crystalline MOF Nanofilm; <i>J. Am. Chem. Soc.</i> 134, 16524–16527 (2012)
37	Otsubo, Kazuya; Haraguchi, Tomoyuki; Sakata, Osami; Fujiwara, Akihiko; Kitagawa, Hiroshi; Step-by-Step Fabrication of a Highly Oriented Crystalline Three-Dimensional Pillared-Layer-Type Metal-Organic Framework Thin Film Confirmed by Synchrotron X-ray Diffraction; <i>J. Am. Chem. Soc.</i> 134, 9605–9608 (2012)

38	Kobayashi, Hirokazu; Morita, Hitoshi; Yamauchi, Miho; Ikeda, Ryuichi; Kitagawa, Hiroshi; Kubota, Yoshiki; Kato, Kenichi; Takata, Masaki; Toh, Shoichi; Matsumura, Syo; Nanosize-Induced Drastic Drop in Equilibrium Hydrogen Pressure for Hydride Formation and Structural Stabilization in Pd-Rh Solid-Solution Alloys; <i>J. Am. Chem. Soc.</i> 134, 12390–12393 (2012)
39	Kobayashi, Hirokazu; Yamauchi, Miho; Kitagawa, Hiroshi; Finding Hydrogen-Storage Capability in Iridium Induced by the Nanosize Effect; <i>J. Am. Chem. Soc.</i> 134, 6893–6895 (2012)
40	Numata, Tomohiro; Murakami, Tatsuya; Kawashima, Fumiaki; Morone, Nobuhiro; Heuser, John E.; Takano, Yuta; Ohkubo, Kei; Fukuzumi, Shunichi; Mori, Yasuo; Imahori, Hiroshi; 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	Horike, Satoshi; Kishida, Keisuke; Watanabe, Yoshihiro; Inubushi, Yasutaka; Umeyama, Daiki; Sugimoto, Masayuki; Fukushima, Tomohiro; Inukai, Munehiro; Kitagawa, Susumu; Dense Coordination Network Capable of Selective CO ₂ Capture from C1 and C2 Hydrocarbons; <i>J. Am. Chem. Soc.</i> 134, 9852–9855 (2012)
42	Fukushima, Tomohiro; Horike, Satoshi; Kobayashi, Hirokazu; Tsujimoto, Masahiko; Isoda, Seiji; Foo, Maw Lin; Kubota, Yoshiki; Takata, Masaki; Kitagawa, Susumu; Modular Design of Domain Assembly in Porous Coordination Polymer Crystals via Reactivity-Directed Crystallization Process; <i>J. Am. Chem. Soc.</i> 134, 13341–13347 (2012)
43	Yanai, Nobuhiro; Uemura, Takashi; Inoue, Masafumi; Matsuda, Ryotaro; Fukushima, Tomohiro; Tsujimoto, Masahiko; Isoda, Seiji; Kitagawa, Susumu; Guest-to-Host Transmission of Structural Changes for Stimuli-Responsive Adsorption Property; <i>J. Am. Chem. Soc.</i> 134, 4501–4504 (2012)
44	Ke, Zhuofeng; Abe, Satoshi; Ueno, Takafumi; Morokuma, Keiji; Catalytic Mechanism in Artificial Metalloenzyme: QM/MM Study of Phenylacetylene Polymerization by Rhodium Complex Encapsulated in apo-Ferritin; <i>J. Am. Chem. Soc.</i> 134, 15418–15429 (2012)
45	Murakami, Tatsuya; Nakatsuji, Hirotaka; Inada, Mami; Matoba, Yoshinori; Umeyama, Tomokazu; Tsujimoto, Masahiko; Isoda, Seiji; Hashida, Mitsuru; Imahori, Hiroshi; Photodynamic and Photothermal Effects of Semiconducting and Metallic-Enriched Single-Walled Carbon Nanotubes; <i>J. Am. Chem. Soc.</i> 134, 17862–17865 (2012)
46	Yang, Yangyang; Endo, Masayuki; Hidaka, Kumi; Sugiyama, Hiroshi; Photo-Controllable DNA Origami Nanostructures Assembling into Predesigned Multiorientational Patterns; <i>J. Am. Chem. Soc.</i> 134, 20645–20653 (2012)
47	Yoshidome, Tomofumi; Endo, Masayuki; Kashiwazaki, Gengo; Hidaka, Kumi; Bando, Toshikazu; Sugiyama, Hiroshi; 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)
48	Endo, Masayuki; Miyazaki, Ryoji; Emura, Tomoko; Hidaka, Kumi; Sugiyama, Hiroshi; Transcription Regulation System Mediated by Mechanical Operation of a DNA Nanostructure; <i>J. Am. Chem. Soc.</i> 134, 2852–2855 (2012)
49	Uemura, Takashi; Uchida, Noriyuki; Asano, Atsushi; Saeki, Akinori; Seki, Shu; Tsujimoto, Masahiko; Isoda, Seiji; Kitagawa, Susumu; Highly Photoconducting pi-Stacked Polymer Accommodated in Coordination Nanochannels; <i>J. Am. Chem. Soc.</i> 134, 8360–8363 (2012)
50	Umeyama, Daiki; Horike, Satoshi; Inukai, Munehiro; Itakura, Tomoya; Kitagawa, Susumu; Inherent Proton Conduction in a 2D Coordination Framework; <i>J. Am. Chem. Soc.</i> 134, 12780–12785 (2012)
51	Horike, Satoshi; Umeyama, Daiki; Inukai, Munehiro; Itakura, Tomoya; Kitagawa, Susumu; Coordination-Network-Based Ionic Plastic Crystal for Anhydrous Proton Conductivity; <i>J. Am. Chem. Soc.</i> 134, 7612–7615 (2012)
52	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; Imahori, Hiroshi; 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)

53	Takagaki, Toshiki; Bando, Toshikazu; Sugiyama, Hiroshi; Synthesis of Pyrrole-Imidazole Polyamide seco-1-Chloromethyl-5-hydroxy-1,2-dihydro-3H-benz[e]indole Conjugates with a Vinyl Linker Recognizing a 7 bp DNA Sequence; <i>J. Am. Chem. Soc.</i> 134, 13074–13081 (2012)
54	Yamamoto, Takafumi; Kobayashi, Yoji; Hayashi, Naoaki; Tassel, Cedric; Saito, Takashi; Yamanaka, Shoji; Takano, Mikio; Ohoyama, Kenji; Shimakawa, Yuichi; Yoshimura, Kazuyoshi; Kageyama, Hiroshi; (Sr _{1-x} Ba _x)FeO ₂ (0.4 ≤ x ≤ 1): A New Oxygen-Deficient Perovskite Structure; <i>J. Am. Chem. Soc.</i> 134, 11444–11454 (2012)
55	Yajima, Takeshi; Kitada, Atsushi; Kobayashi, Yoji; Sakaguchi, Tatsunori; Bouilly, Guillaume.; Kasahara, Shigeru; Terashima, Takahito; Takano, Mikio; Kageyama, Hiroshi; Epitaxial Thin Films of ATiO(3-x)H(x) (A = Ba, Sr, Ca) with Metallic Conductivity; <i>J. Am. Chem. Soc.</i> 134, 8782–8785 (2012)
56	Hu, Ming; Reboul, Julien; Furukawa, Shuhei; Torad, Nagy L.; Ji, Qingmin; Srinivasu, Pavuluri; Ariga, Katsuhiko; Kitagawa, Susumu; Yamauchi, Yusuke; Direct Carbonization of Al-Based Porous Coordination Polymer for Synthesis of Nanoporous Carbon; <i>J. Am. Chem. Soc.</i> 134, 2864–2867 (2012)
57	Kawai, Tomoki; Nishikomori, Ryuta; Izawa, Kazushi; Murata, Yuuki; Tanaka, Naoko; Sakai, Hidemasa; Saito, Megumu; Yasumi, Takahiro; Takaoka, Yuki; Nakahata, Tatsutoshi; Mizukami, Tomoyuki; Nunoi, Hiroyuki; Kiyohara, Yuki; Yoden, Atsushi; Murata, Takuji; Sasaki, Shinya; Ito, Etsuro; Akutagawa, Hiroshi; Kawai, Toshinao; Imai, Chihaya; Okada, Satoshi; Kobayashi, Masao; Heike, Toshio; Frequent somatic mosaicism of NEMO in T cells of patients with X-linked anhidrotic ectodermal dysplasia with immunodeficiency; <i>Blood</i> 119, 5458–5466 (2012)
58	Tanaka, Takayuki; Takahashi, Kazutoshi; Yamane, Mayu; Tomida, Shota; Nakamura, Saori; Oshima, Koichi; Niwa, Akira; Nishikomori, Ryuta; Kambe, Naotomo; Hara, Hideki; Mitsuyama, Masao; Morone, Nobuhiro; Heuser, John E.; Yamamoto, Takuya; Watanabe, Akira; Sato-Otsubo, Aiko; Ogawa, Seishi; Asaka, Isao; Heike, Toshio; Yamanaka, Shinya; Nakahata, Tatsutoshi; Saito, Megumu K.; Induced pluripotent stem cells from CINCA syndrome patients as a model for dissecting somatic mosaicism and drug discovery; <i>Blood</i> 120, 1299–1308 (2012)
59	Meer, Elliott J.; Wang, Dan Ohtan; 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)
60	Tanaka, Koji; Isobe, Hiroshi; Yamanaka, Shusuke; Yamaguchi, Kizashi; Similarities of artificial photosystems by ruthenium oxo complexes and native water splitting systems; <i>Proc. Natl. Acad. Sci. U. S. A.</i> 109, 15600–15605 (2012)
61	Arita, Kyohei; Isogai, Shin; Oda, Takashi; Unoki, Motoko; Sugita, Kazuya; Sekiyama, Naotaka; Kuwata, Keiko; Hamamoto, Ryuji; Tochio, Hidehito; Sato, Mamoru; Ariyoshi, Mariko; Shirakawa, Masahiro; Recognition of modification status on a histone H3 tail by linked histone reader modules of the epigenetic regulator UHRF1; <i>Proc. Natl. Acad. Sci. U. S. A.</i> 109, 12950–12955 (2012)
62	Cho, Kwang-jin; Kasai, Rinshi S.; Park, Jin-Hee; Chigurupati, Sravanthi; Heidorn, Sonja J.; van der Hoeven, Dharini; Plowman, Sarah J.; Kusumi, Akihiro; Marais, Richard; Hancock, John F.; Raf Inhibitors Target Ras Spatiotemporal Dynamics; <i>Curr. Biol.</i> 22, 945–955 (2012)
63	Saitou, Mitinori; Yamaji, Masashi; Primordial Germ Cells in Mice; <i>Cold Spring Harbor Perspect. Biol.</i> 4, a008375 (2012)
64	Neu, Ursula; Hengel, Holger; Blaum, Baerbel S.; Schowalter, Rachel M.; Macejak, Dennis; Gilbert, Michel; Wakarchuk, Warren W.; Imamura, Akihiro; Ando, Hiromune; Kiso, Makoto; Arnberg, Niklas; Garcea, Robert L.; Peters, Thomas; Buck, Christopher B.; Stehle, Thilo; Structures of Merkel Cell Polyomavirus VP1 Complexes Define a Sialic Acid Binding Site Required for Infection; <i>PLoS Pathog.</i> 8, e1002738 (2012)
65	Zhang, Weibin; Miley, Natasha; Zastrow, Michael S.; MacQueen, Amy J.; Sato, Aya; Nabeshima, Kentaro; Martinez-Perez, Enrique; Mlynarczyk-Evans, Susanna; Carlton, Peter M.; Villeneuve, Anne M.; HAL-2 Promotes Homologous Pairing during <i>Caenorhabditis elegans</i> Meiosis by Antagonizing Inhibitory Effects of Synaptonemal Complex Precursors; <i>PLoS Genet.</i> 8, e1002880 (2012)

66	Abe, Satoshi; Tsujimoto, Masahiko; Yoneda, Ko; Ohba, Masaaki; Hikage, Tatsuo; Takano, Mikio; Kitagawa, Susumu; Ueno, Takafumi; Porous Protein Crystals as Reaction Vessels for Controlling Magnetic Properties of Nanoparticles; <i>Small</i> 8, 1314–1319 (2012)
67	Morozumi, Yuichi; Ino, Ryohei; Takaku, Motoki; Hosokawa, Mihoko; Chuma, Shinichiro; Kurumizaka, Hitoshi; Human PSF concentrates DNA and stimulates duplex capture in DMC1-mediated homologous pairing; <i>Nucleic Acids Res.</i> 40, 3031–3041 (2012)
68	Han, Yong-Woon; Matsumoto, Tomoko; Yokota, Hiroaki; Kashiwazaki, Gengo; Morinaga, Hironobu; Hashiya, Kaori; Bando, Toshikazu; Harada, Yoshie; Sugiyama, Hiroshi; Binding of hairpin pyrrole and imidazole polyamides to DNA: relationship between torsion angle and association rate constants; <i>Nucleic Acids Res.</i> 40, 11510–11517 (2012)
69	Egawa, Naohiro; Kitaoka, Shiho; Tsukita, Kayoko; Naitoh, Motoko; Takahashi, Kazutoshi; Yamamoto, Takuya; Adachi, Fumihiko; Kondo, Takayuki; Okita, Keisuke; Asaka, Isao; Aoi, Takashi; Watanabe, Akira; Yamada, Yasuhiro; Morizane, Asuka; Takahashi, Jun; Ayaki, Takashi; Ito, Hidefumi; Yoshikawa, Katsuhiko; Yamawaki, Satoko; Suzuki, Shigehiko; Watanabe, Dai; Hioki, Hiroyuki; Kaneko, Takeshi; Makioka, Kouki; Okamoto, Koichi; Takuma, Hiroshi; Tamaoka, Akira; Hasegawa, Kazuko; Nonaka, Takashi; Hasegawa, Masato; Kawata, Akihiro; Yoshida, Minoru; Nakahata, Tatsutoshi; Takahashi, Ryosuke; Marchetto, Maria C. N.; Gage, Fred H.; Yamanaka, Shinya; Inoue, Haruhisa; Drug Screening for ALS Using Patient-Specific Induced Pluripotent Stem Cells; <i>Sci. Transl. Med.</i> 4, 145ra104 (2012)
70	Yang, Wenbin; Davies, Andrew J.; Lin, Xiang; Suetin, Mikhail; Matsuda, Ryotaro; Blake, Alexander J.; Wilson, Claire; Lewis, William; Parker, Julia E.; Tang, Chiu C.; George, Michael W.; Hubberstey, Peter; Kitagawa, Susumu; Sakamoto, Hirotochi; Bichoutskaia, Elena; Champness, Neil R.; Yang, Sihai; Schroeder, Martin; Selective CO ₂ uptake and inverse CO ₂ /C ₂ H ₂ selectivity in a dynamic bifunctional metal-organic framework; <i>Chem. Sci.</i> 3, 2993–2999 (2012)
71	Horike, Satoshi; Inubushi, Yasutaka; Hori, Takashi; Fukushima, Tomohiro; Kitagawa, Susumu; 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)
72	Sheng, Ren; Chen, Yong; Gee, Heon Yung; Stec, Ewa; Melowic, Heather R.; Blatner, Nichole R.; Tun, Moe P.; Kim, Yonjung; Kaellberg, Morten; Fujiwara, Takahiro K.; Hong, Ji Hye; Kim, Kwang Pyo; Lu, Hui; Kusumi, Akihiro; Lee, Min Goo; Cho, Wonhwa; Cholesterol modulates cell signaling and protein networking by specifically interacting with PDZ domain-containing scaffold proteins; <i>Nat. Commun.</i> 3, 1249 (2012)
73	Miyazaki, Takamichi; Futaki, Sugiko; Suemori, Hirofumi; Taniguchi, Yukimasa; Yamada, Masashi; Kawasaki, Miwa; Hayashi, Maria; Kumagai, Hideaki; Nakatsuji, Norio; Sekiguchi, Kiyotoshi; Kawase, Eihachiro; Laminin E8 fragments support efficient adhesion and expansion of dissociated human pluripotent stem cells; <i>Nat. Commun.</i> 3, 1236 (2012)
74	Matsumura, Shigeru; Hamasaki, Mayumi; Yamamoto, Takuya; 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)
75	Okabe, Kohki; Inada, Noriko; Gota, Chie; Harada, Yoshie; Funatsu, Takashi; Uchiyama, Seiichi; Intracellular temperature mapping with a fluorescent polymeric thermometer and fluorescence lifetime imaging microscopy; <i>Nat. Commun.</i> 3, 705 (2012)
76	Collet, E.; Watanabe, H.; Brefuel, N.; Palatinus, L.; Roudaut, L.; Toupet, L.; Tanaka, K.; Tuchagues, J. -P.; Fertey, P.; Ravy, S.; Toudic, B.; Cailleau, H.; Aperiodic Spin State Ordering of Bistable Molecules and Its Photoinduced Erasing; <i>Phys. Rev. Lett.</i> 109, 257206 (2012)
77	Tani, Shuntaro; Blanchard, Francois; Tanaka, Koichiro; Ultrafast Carrier Dynamics in Graphene under a High Electric Field; <i>Phys. Rev. Lett.</i> 109, 166603 (2012)
78	Katayama, I.; Aoki, H.; Takeda, J.; Shimosato, H.; Ashida, M.; Kinjo, R.; Kawayama, I.; Tonouchi, M.; Nagai, M.; Tanaka, K.; 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)
79	Yanai, Nobuhiro; Uemura, Takashi; Kitagawa, Susumu; Behavior of Binary Guests in a Porous Coordination Polymer; <i>Chem. Mat.</i> 24, 4744–4749 (2012)

80	Aizawa, Emi; Hirabayashi, Yuka; Iwanaga, Yuzuru; Suzuki, Keiichiro; Sakurai, Kenji; Shimoji, Miho; Aiba, Kazuhiro; Wada, Tamaki; Tooi, Norie; Kawase, Eihachiro; Suemori, Hirofumi; Nakatsuji, Norio; Mitani, Kohnosuke; Efficient and Accurate Homologous Recombination in hESCs and hiPSCs Using Helper-dependent Adenoviral Vectors; <i>Mol. Ther.</i> 20, 424–431 (2012)
81	Fujikura, J.; Nakao, K.; Sone, M.; Noguchi, M.; Mori, E.; Naito, M.; Taura, D.; Harada-Shiba, M.; Kishimoto, I.; Watanabe, A.; Asaka, I.; Hosoda, K.; Nakao, K.; Induced pluripotent stem cells generated from diabetic patients with mitochondrial DNA A3243G mutation; <i>Diabetologia</i> 55, 1689–1698 (2012)
82	Fujishima, Kazuto; Horie, Ryota; Mochizuki, Atsushi; Kengaku, Mineko; Principles of branch dynamics governing shape characteristics of cerebellar Purkinje cell dendrites; <i>Development</i> 139, 3442–3455 (2012)
83	Aoki, Hitomi; Hara, Akira; Era, Takumi; Kunisada, Takahiro; Yamada, Yasuhiro; Genetic ablation of Rest leads to in vitro-specific derepression of neuronal genes during neurogenesis; <i>Development</i> 139, 667–677 (2012)
84	Hulpke, Sabine; Tomioka, Maiko; Kremmer, Elisabeth; Ueda, Kazumitsu; Abele, Rupert; Tampe, Robert; Direct evidence that the N-terminal extensions of the TAP complex act as autonomous interaction scaffolds for the assembly of the MHC I peptide-loading complex; <i>Cell. Mol. Life Sci.</i> 69, 3317–3327 (2012)
85	Imahori, Hiroshi; Kitaura, Shinji; Kira, Aiko; Hayashi, Hironobu; Nishi, Masayuki; Hirao, Kazuyuki; Isoda, Seiji; Tsujimoto, Masahiko; Takano, Mikio; Zhe, Zhang; Miyato, Yuji; Noda, Kei; Matsushige, Kazumi; Stranius, Kati; Tkachenko, Nikolai V.; Lemmetyinen, Helge; Qin, Lidong; Hurst, Sarah J.; Mirkin, Chad A.; A Photoconductive, Thiophene-Fullerene Double-Cable Polymer, Nanorod Device; <i>J. Phys. Chem. Lett.</i> 3, 478–481 (2012)
86	Koirala, Deepak; Mashimo, Tomoko; Sannohe, Yuta; Yu, Zhongbo; Mao, Hanbin; Sugiyama, Hiroshi; Intramolecular folding in three tandem guanine repeats of human telomeric DNA; <i>Chem. Commun.</i> 48, 2006–2008 (2012)
87	Park, Soyong; Ikehata, Keiichi; Watabe, Ryo; Hidaka, Yuta; Rajendran, Arivazhagan; Sugiyama, Hiroshi; Deciphering DNA-based asymmetric catalysis through intramolecular Friedel-Crafts alkylations; <i>Chem. Commun.</i> 48, 10398–10400 (2012)
88	Sato, Hiroshi; Matsuda, Ryotaro; Mir, Mohammad Hedayetullah; Kitagawa, Susumu; Photochemical cycloaddition on the pore surface of a porous coordination polymer impacts the sorption behavior; <i>Chem. Commun.</i> 48, 7919–7921 (2012)
89	Hirai, Kenji; Furukawa, Shuhei; Kondo, Mio; Meilikhov, Mikhail; Sakata, Yoko; Sakata, Osami; Kitagawa, Susumu; Targeted functionalisation of a hierarchically-structured porous coordination polymer crystal enhances its entire function; <i>Chem. Commun.</i> 48, 6472–6474 (2012)
90	Munoz Lara, Francisco J.; Gaspar, Ana B.; Aravena, Daniel; Ruiz, Eliseo; Carmen Munoz, M.; Ohba, Masaaki; Ohtani, Ryo; Kitagawa, Susumu; Real, Jose A.; Enhanced bistability by guest inclusion in Fe(II) spin crossover porous coordination polymers; <i>Chem. Commun.</i> 48, 4686–4688 (2012)
91	Kitaura, Shinji; Kurotobi, Kei; Sato, Maki; Takano, Yuta; Umeyama, Tomokazu; Imahori, Hiroshi; Effects of dihydronaphthyl-based [60]fullerene bisadduct regioisomers on polymer solar cell performance; <i>Chem. Commun.</i> 48, 8550–8552 (2012)
92	Seinberg, Liis; Yamamoto, Shinpei; Gallage, Ruwan; Tsujimoto, Masahiko; Kobayashi, Yoji; Isoda, Seiji; Takano, Mikio; Kageyama, Hiroshi; Low temperature solventless synthesis and characterization of Ni and Fe magnetic nanoparticles; <i>Chem. Commun.</i> 48, 8237–8239 (2012)
93	Imahori, Hiroshi; Umeyama, Tomokazu; Kurotobi, Kei; Takano, Yuta; Self-assembling porphyrins and phthalocyanines for photoinduced charge separation and charge transport; <i>Chem. Commun.</i> 48, 4032–4045 (2012)
94	Kai, Kazuya; Kobayashi, Yoji; Yamada, Yuki; Miyazaki, Kohei; Abe, Takeshi; Uchimoto, Yoshiharu; Kageyama, Hiroshi; Electrochemical characterization of single-layer MnO ₂ nanosheets as a high-capacitance pseudocapacitor electrode; <i>J. Mater. Chem.</i> 22, 14691–14695 (2012)

95	Tsotsalas, Manuel; Umemura, Ayako; Kim, Franklin; Sakata, Yoko; Reboul, Julien; Kitagawa, Susumu; Furukawa, Shuhei; Crystal morphology-directed framework orientation in porous coordination polymer films and freestanding membranes via Langmuir-Blodgettry; <i>J. Mater. Chem.</i> 22, 10159–10165 (2012)
96	Umeyama, Tomokazu; Watanabe, Yusuke; Odoi, Masaaki; Evgenia, Douvogianni; Shishido, Tetsuya; Imahori, Hiroshi; Synthesis of low bandgap polymers based on thienoquinodimethane units and their applications in bulk heterojunction solar cells; <i>J. Mater. Chem.</i> 22, 24394–24402 (2012)
97	Quartapelle Procopio, Elsa; Fukushima, Tomohiro; Barea, Elisa; Navarro, Jorge A. R.; Horike, Satoshi; Kitagawa, Susumu; A Soft Copper(II) Porous Coordination Polymer with Unprecedented Aqua Bridge and Selective Adsorption Properties; <i>Chem.-Eur. J.</i> 18, 13117–13125 (2012)
98	Miyasaka, Keiichi; Hano, Hiroko; Kubota, Yoshiki; Lin, Yangzheng; Ryoo, Ryong; Takata, Masaki; Kitagawa, Susumu; Neimark, Alexander V.; Terasaki, Osamu; A Stand-Alone Mesoporous Crystal Structure Model from in situ X-ray Diffraction: Nitrogen Adsorption on 3D Cagelike Mesoporous Silica SBA-16; <i>Chem.-Eur. J.</i> 18, 10300–10311 (2012)
99	Munoz-Lara, Francisco J.; Gaspar, Ana B.; Carmen Munoz, M.; Arai, Masashi; Kitagawa, Susumu; Ohba, Masaaki; Antonio Real, Jose; Sequestering Aromatic Molecules with a Spin-Crossover FeII Microporous Coordination Polymer; <i>Chem.-Eur. J.</i> 18, 8013–8018 (2012)
100	Hayashi, Yukiko; Matano, Yoshihiro; Suda, Kayo; Kimura, Yoshifumi; Nakao, Yoshihide; Imahori, Hiroshi; Synthesis and Structure-Property Relationships of 2,2'-Bis(benzo[b]phosphole) and 2,2'-Benzo[b]phosphole-Benzo[b]heterole Hybrid pi Systems; <i>Chem.-Eur. J.</i> 18, 15972–15983 (2012)
101	Matano, Yoshihiro; Shibano, Tarou; Nakano, Haruyuki; Imahori, Hiroshi; Nickel(II) and Copper(II) Complexes of beta-Unsubstituted 5,15-Diazaporphyrins and Pyridazine-Fused Diazacorrinoids: Metal-Template Syntheses and Peripheral Functionalizations; <i>Chem.-Eur. J.</i> 18, 6208–6216 (2012)
102	Tamai, Hideki; Ando, Hiromune; Ishida, Hideharu; Kiso, Makoto; First Synthesis of a Pentasaccharide Moiety of Ganglioside GAA-7 Containing Unusually Modified Sialic Acids through the Use of N-Troc-sialic Acid Derivative as a Key Unit; <i>Org. Lett.</i> 14, 6342–6345 (2012)
103	Shimizu, Kazunori; Kawakami, Shigeru; Hayashi, Kouji; Mori, Yuki; Hashida, Mitsuru; Konishi, Satoshi; Implantable pneumatically actuated microsystem for renal pressure-mediated transfection in mice; <i>J. Control. Release</i> 159, 85–91 (2012)
104	Nagao, Kohjiro; Takahashi, Kei; Azuma, Yuya; Takada, Mie; Kimura, Yasuhisa; Matsuo, Michinori; Kioka, Noriyuki; Ueda, Kazumitsu; 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)
105	Nagao, Kohjiro; Kimura, Yasuhisa; Ueda, Kazumitsu; 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)
106	Kashiwazaki, Gengo; Bando, Toshikazu; Yoshidome, Tomofumi; Masui, Seiji; Takagaki, Toshiki; Hashiya, Kaori; Pandian, Ganesh N.; Yasuoka, Junichi; Akiyoshi, Kazunari; Sugiyama, Hiroshi; Synthesis and Biological Properties of Highly Sequence-Specific-Alkylating N-Methylpyrrole-N-Methylimidazole Polyamide Conjugates; <i>J. Med. Chem.</i> 55, 2057–2066 (2012)
107	Wang, Dan Ohtan; 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)
108	Jung, Dongju; Abu-Elheiga, Lutfi; Ayuzawa, Rie; Gu, Ziwei; Shirakawa, Takashi; Fujiki, Yukio; Nakatsuji, Norio; Wakil, Salih J.; Uesugi, Motonari; Mislocalization and inhibition of acetyl-CoA carboxylase 1 by a synthetic small molecule; <i>Biochem. J.</i> 448, 409–416 (2012)
109	Saarenpaa, Hanna; Sariola-Leikas, Essi; Perros, Alexander Pyymaki; Kontio, Juha M.; Efimov, Alexander; Hayashi, Hironobu; Lipsanen, Harri; Imahori, Hiroshi; 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)

110	Martinez-Martinez, Virginia; Furukawa, Shuhei; Takashima, Yohei; Lopez Arbeloa, Inigo; Kitagawa, Susumu; Charge Transfer and Exciplex Emissions from a Naphthalenediimide-Entangled Coordination Framework Accommodating Various Aromatic Guests; <i>J. Phys. Chem. C</i> 116, 26084–26090 (2012)
111	Umeyama, Tomokazu; Hirose, Kohei; Noda, Kei; Matsushige, Kazumi; Shishido, Tetsuya; Hayashi, Hironobu; Matano, Yoshihiro; Ono, Noboru; Imahori, Hiroshi; Thermal Conversion of Precursor Polymer to Low Bandgap Conjugated Polymer Containing Isothianaphthene Dimer Subunits; <i>J. Phys. Chem. C</i> 116, 1256–1264 (2012)
112	Umeyama, Tomokazu; Hirose, Kohei; Noda, Kei; Matsushige, Kazumi; Shishido, Tetsuya; Saarenpaa, Hanna; Tkachenko, Nikoia V.; Lemmetyinen, Helge; Ono, Noboru; Imahori, Hiroshi; Donor-Acceptor Alternating Copolymer Based on Thermally Converted Isothianaphthene Dimer and Thiazolothiazole Subunits; <i>J. Phys. Chem. C</i> 116, 17414–17423 (2012)
113	Lin, Wan-Hsien; Saito, Hikaru; Nemoto, Takashi; Kurata, Hiroki; Chou, Mitch M. C.; Isoda, Seiji; Wu, Jih-Jen; Photoassisted Scanning Tunneling Microscopy Investigation on the ZnO(0001)-Zn Surface Treated by Alkaline Solution; <i>J. Phys. Chem. C</i> 116, 10664–10671 (2012)
114	Tashiro, Yoshitaka; Urushitani, Makoto; Inoue, Haruhisa; Koike, Masato; Uchiyama, Yasuo; Komatsu, Masaaki; Tanaka, Keiji; Yamazaki, Maya; Abe, Manabu; Misawa, Hidemi; Sakimura, Kenji; Ito, Hidefumi; Takahashi, Ryosuke; Motor Neuron-specific Disruption of Proteasomes, but Not Autophagy, Replicates Amyotrophic Lateral Sclerosis; <i>J. Biol. Chem.</i> 287, 42984–42994 (2012)
115	Kanoo, Prakash; Matsuda, Ryotaro; Kitaura, Ryo; Kitagawa, Susumu; Maji, Tapas Kumar; Topological Difference in 2D Layers Steers the Formation of Rigid and Flexible 3D Supramolecular Isomers: Impact on the Adsorption Properties; <i>Inorg. Chem.</i> 51, 9141–9143 (2012)
116	Padhi, Sumanta Kumar; Fukuda, Ryoichi; Ehara, Masahiro; Tanaka, Koji; Photoisomerization and Proton-Coupled Electron Transfer (PCET) Promoted Water Oxidation by Mononuclear Cyclometalated Ruthenium Catalysts; <i>Inorg. Chem.</i> 51, 5386–5392 (2012)
117	Padhi, Sumanta Kumar; Fukuda, Ryoichi; Ehara, Masahiro; Tanaka, Koji; Comparative Study of (CN)-N-boolean AND and (NC)-C-boolean AND Type Cyclometalated Ruthenium Complexes with a NAD(+)/NADH Function; <i>Inorg. Chem.</i> 51, 8091–8102 (2012)
118	Matano, Yoshihiro; Shibano, Tarou; Nakano, Haruyuki; Kimura, Yoshifumi; Imahori, Hiroshi; Free Base and Metal Complexes of 5,15-Diaza-10,20-dimesitylporphyrins: Synthesis, Structures, Optical and Electrochemical Properties, and Aromaticities; <i>Inorg. Chem.</i> 51, 12879–12890 (2012)
119	Zhou, Xionggu; Hu, Jie; Li, Junjun; Shi, Jian; Chen, Yong; Patterning of Two-Level Topographic Cues for Observation of Competitive Guidance of Cell Alignment; <i>ACS Appl. Mater. Interfaces</i> 4, 3888–3892 (2012)
120	Nakashima, Shinya; Ando, Hiromune; Saito, Risa; Tamai, Hideki; Ishida, Hideharu; Kiso, Makoto; Efficiently Synthesizing Lacto-Ganglio-Series Gangliosides by Using a Glucosyl Ceramide Cassette Approach: The Total Synthesis of Ganglioside X2; <i>Chem.-Asian J.</i> 7, 1041–1051 (2012)
121	Matano, Yoshihiro; Saito, Arihiro; Suzuki, Yuto; Miyajima, Tooru; Akiyama, Seiji; Otsubo, Saika; Nakamoto, Emi; Aramaki, Shinji; Imahori, Hiroshi; alpha,alpha '-Diarylacenaphtho[1,2-c]phosphole P-Oxides: Divergent Synthesis and Application to Cathode Buffer Layers in Organic Photovoltaics; <i>Chem.-Asian J.</i> 7, 2305–2312 (2012)
122	Kalay, Ziya; Fujiwara, Takahiro K.; Kusumi, Akihiro; Confining Domains Lead to Reaction Bursts: Reaction Kinetics in the Plasma Membrane; <i>PLoS One</i> 7, e32948 (2012)
123	Shimizu, Kazunori; Kawakami, Shigeru; Hayashi, Kouji; Kinoshita, Hideyuki; Kuwahara, Koichiro; Nakao, Kazuwa; Hashida, Mitsuru; Konishi, Satoshi; In vivo Site-Specific Transfection of Naked Plasmid DNA and siRNAs in Mice by Using a Tissue Suction Device; <i>PLoS One</i> 7, e41319 (2012)
124	Enoki, Sawako; Iino, Ryota; Morone, Nobuhiro; Kaihatsu, Kunihiro; Sakakihara, Shouichi; Kato, Nobuo; Noji, Hiroyuki; Label-Free Single-Particle Imaging of the Influenza Virus by Objective-Type Total Internal Reflection Dark-Field Microscopy; <i>PLoS One</i> 7, e49208 (2012)

125	Sano, Hiroko; Kunwar, Prabhat S.; Renault, Andrew D.; Barbosa, Vitor; Clark, Ivan B. N.; Ishihara, Shuji; Sugimura, Kaoru; Lehmann, Ruth; The Drosophila Actin Regulator ENABLED Regulates Cell Shape and Orientation during Gonad Morphogenesis; PLoS One 7, e52649 (2012)
126	Arioka, Yuko; Watanabe, Akira; Saito, Kuniaki; Yamada, Yasuhiro; Activation-Induced Cytidine Deaminase Alters the Subcellular Localization of Tet Family Proteins; PLoS One 7, e45031 (2012)
127	Sezaki, Takuhito; Inada, Kohki; Sogabe, Takayuki; Kakuda, Kumiyo; Tomiyama, Lucia; Matsuno, Yohsuke; Ichikawa, Takafumi; Matsuo, Michinori; Ueda, Kazumitsu; Kioka, Noriyuki; Role of Dlg5/Ip-dlg, a Membrane-Associated Guanylate Kinase Family Protein, in Epithelial-Mesenchymal Transition in LLC-PK1 Renal Epithelial Cells; PLoS One 7, e35519 (2012)
128	Yogo, Katsunori; Ogawa, Taisaku; Hayashi, Masahito; Harada, Yoshie; Nishizaka, Takayuki; Kinoshita, Kazuhiko, Jr.; Direct Observation of Strand Passage by DNA-Topoisomerase and Its Limited Processivity; PLoS One 7, e34920 (2012)
129	Otsuji, Tomomi G.; Kurose, Yuko; Suemori, Hirofumi; Tada, Masako; Nakatsuji, Norio; Dynamic Link between Histone H3 Acetylation and an Increase in the Functional Characteristics of Human ESC/iPSC-Derived Cardiomyocytes; PLoS One 7, e45010 (2012)
130	Tanabe, Maiko; Ishino, Sonoko; Yohda, Masafumi; Morikawa, Kosuke; Ishino, Yoshizumi; Nishida, Hirokazu; Structure-Based Mutational Study of an Archaeal DNA Ligase towards Improvement of Ligation Activity; ChemBioChem 13, 2575–2582 (2012)
131	Mohapatra, Sudip; Sato, Hiroshi; Matsuda, Ryotaro; Kitagawa, Susumu; Maji, Tapas Kumar; Highly rigid and stable porous Cu(I) metal-organic framework with reversible single-crystal-to-single-crystal structural transformation; Crystengcomm 14, 4153–4156 (2012)
132	Kai, Kazuya; Yoshida, Yukihiro; Kobayashi, Yoji; Kageyama, Hiroshi; Saito, Gunzi; Preparation and formation mechanism of a n-butylammonium/MnO ₂ layered hybrid via a one-pot synthesis under moderate conditions; Dalton Trans. 41, 825–830 (2012)
133	Foo, Maw Lin; Horike, Satoshi; Fukushima, Tomohiro; Hijikata, Yuh; Kubota, Yoshiki; Takata, Masaki; Kitagawa, Susumu; Ligand-based solid solution approach to stabilisation of sulphonic acid groups in porous coordination polymer Zr ₆ O ₄ (OH) ₄ (BDC) ₆ (UiO-66); Dalton Trans. 41, 13791–13794 (2012)
134	Inukai, Munehiro; Horike, Satoshi; Umeyama, Daiki; Hijikata, Yuh; Kitagawa, Susumu; Investigation of post-grafted groups of a porous coordination polymer and its proton conduction behavior; Dalton Trans. 41, 13261–13263 (2012)
135	Yanai, Nobuhiro; Uemura, Takashi; Kosaka, Wataru; Matsuda, Ryotaro; Kodani, Tetsuhiro; Koh, Meiten; Kanemura, Takashi; Kitagawa, Susumu; Inclusion and dielectric properties of a vinylidene fluoride oligomer in coordination nanochannels; Dalton Trans. 41, 4195–4198 (2012)
136	Sakamoto, Hiroto; Matsuda, Ryotaro; Kitagawa, Susumu; Systematic mechanochemical preparation of a series of coordination pillared layer frameworks; Dalton Trans. 41, 3956–3961 (2012)
137	Hirai, Kenji; Uehara, Hiromitsu; Kitagawa, Susumu; Furukawa, Shuhei; Redox reaction in two-dimensional porous coordination polymers based on ferrocenedicarboxylates; Dalton Trans. 41, 3924–3927 (2012)
138	Inaba, Hiroshi; Kanamaru, Shuji; Arisaka, Fumio; Kitagawa, Susumu; Ueno, Takafumi; Semi-synthesis of an artificial scandium(III) enzyme with a beta-helical bio-nanotube; Dalton Trans. 41, 11424–11427 (2012)
139	Naka, Nobuko; Akimoto, Ikuko; Shirai, Masanobu; Kan'no, Ken-ichi; Time-resolved cyclotron resonance in cuprous oxide; Phys. Rev. B 85, 35209 (2012)
140	Schuster, R.; Pyon, S.; Knupfer, M.; Azuma, M.; Takano, M.; Takagi, H.; Buechner, B.; Angle-dependent spectral weight transfer and evidence of a symmetry-broken in-plane charge response in Ca _{1.9} Na _{0.1} Cu ₂ O ₂ Cl ₂ ; Phys. Rev. B 86, 245112 (2012)

141	Blanchard, F.; Ooi, K.; Tanaka, T.; Doi, A.; Tanaka, K.; Terahertz spectroscopy of the reactive and radiative near-field zones of split ring resonator; <i>Opt. Express</i> 20, 19395–19403 (2012)
142	Hayashi, Yohei; Saitou, Mitinori; Yamanaka, Shinya; Germline development from human pluripotent stem cells toward disease modeling of infertility; <i>Fertil. Steril.</i> 97, 1250–1259 (2012)
143	Zhou, Shuwen; Kawakami, Shigeru; Higuchi, Yuriko; Yamashita, Fumiyoshi; Hashida, Mitsuru; 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>Clin. Exp. Metastasis</i> 29, 63–70 (2012)
144	Anzai, Tomohiro; Kusama, Ryoichi; Kodama, Hiroyuki; Sengoku, Shintaro; Holistic observation and monitoring of the impact of interdisciplinary academic research projects: An empirical assessment in Japan; <i>Technovation</i> 32, 345–357 (2012)
145	Jiu, Jinting; Nogi, Masaya; Sugahara, Tohru; Suganuma, Katsuaki; Tsujimoto, Masahiko; Isoda, Seiji; Ag/TiO ₂ core-shell nanocables prepared with a one-step polyol process; <i>J. Nanopart. Res.</i> 14, 1241 (2012)
146	Akiyama, George; Matsuda, Ryotaro; Sato, Hiroshi; Hori, Akihiro; Takata, Masaki; Kitagawa, Susumu; Effect of functional groups in MIL-101 on water sorption behavior; <i>Microporous Mesoporous Mat.</i> 157, 89–93 (2012)
147	Kawai, Tomoki; Saito, Megumu; Nishikomori, Ryuta; Yasumi, Takahiro; Izawa, Kazushi; Murakami, Tomohiko; Okamoto, Shigefumi; Mori, Yasuko; Nakagawa, Noriko; Imai, Kohsuke; Nonoyama, Shigeaki; Wada, Taizo; Yachie, Akihiro; Ohmori, Katsuyuki; Nakahata, Tatsutoshi; Heike, Toshio; Multiple Reversions of an IL2RG Mutation Restore T cell Function in an X-linked Severe Combined Immunodeficiency Patient; <i>J. Clin. Immunol.</i> 32, 690–697 (2012)
148	Hashida, Yasuhiko; Umeyama, Tomokazu; Mihara, Junya; Imahori, Hiroshi; Tsujimoto, Masahiko; Isoda, Seiji; Takano, Mikio; Hashida, Mitsuru; Development of a novel composite material with carbon nanotubes assisted by self-assembled peptides designed in conjunction with beta-sheet formation; <i>J. Pharm. Sci.</i> 101, 3398–3412 (2012)
149	Zheng, Yunlong; Nishikawa, Makiya; Ikemura, Mai; Yamashita, Fumiyoshi; Hashida, Mitsuru; 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)
150	Pandian, Ganesh N.; Ohtsuki, Akimichi; Bando, Toshikazu; Sato, Shinsuke; Hashiya, Kaori; Sugiyama, Hiroshi; 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)
151	Sannohe, Yuta; Sugiyama, Hiroshi; Single strand DNA catenane synthesis using the formation of G-quadruplex structure; <i>Bioorg. Med. Chem.</i> 20, 2030–2034 (2012)
152	Shibata, Akihiro C. E.; Fujiwara, Takahiro K.; Chen, Limin; Suzuki, Kenichi G. N.; Ishikawa, Yoshiro; Nemoto, Yuri L.; Miwa, Yoshihiro; Kalay, Ziya; Chadda, Rahul; Naruse, Keiji; Kusumi, Akihiro; Archipelago architecture of the focal adhesion: Membrane molecules freely enter and exit from the focal adhesion zone; <i>Cytoskeleton</i> 69, 380–392 (2012)
153	Ueda, Yoshikatsu; Tokuda, Yomei; Yoko, Toshinobu; Takeuchi, Ken; Kolesnikov, Alexander I.; Koyanaka, Hideki; Electrochemical property of proton-conductive manganese dioxide for sensing hydrogen gas concentration; <i>Solid State Ion.</i> 225, 282–285 (2012)
154	Tokuda, Yomei; Nishioka, Satoshi; Ueda, Yoshikatsu; Koyanaka, Hideki; Masai, Hirokazu; Takahashi, Masahide; Yoko, Toshinobu; Preparation of proton-conductive organic-inorganic hybrid titanophosphite membranes; <i>Solid State Ion.</i> 225, 232–235 (2012)
155	Nishiyama, Masayoshi; Kojima, Seiji; Bacterial Motility Measured by a Miniature Chamber for High-Pressure Microscopy; <i>Int. J. Mol. Sci.</i> 13, 9225–9239 (2012)
156	Hishida, M.; Tanaka, K.; Transition of the hydration state of a surfactant accompanying structural transitions of self-assembled aggregates; <i>J. Phys.-Condes. Matter</i> 24, 284113 (2012)

157	Nohara, Tomohiro; Imamura, Akihiro; Yamaguchi, Maho; Hidari, Kazuya I. P. J.; Suzuki, Takashi; Komori, Tatsuya; Ando, Hiromune; Ishida, Hideharu; Kiso, Makoto; Design and Synthesis of a Novel Ganglioside Ligand for Influenza A Viruses; <i>Molecules</i> 17, 9590–9620 (2012)
158	Kurosaki, Tomoaki; Higuchi, Norihide; Kawakami, Shigeru; Higuchi, Yuriko; Nakamura, Tadahiro; Kitahara, Takashi; Hashida, Mitsuru; Sasaki, Hitoshi; Self-assemble gene delivery system for molecular targeting using nucleic acid aptamer; <i>Gene</i> 491, 205–209 (2012)
159	Yamashita, Fumiyoshi; Fujita, Atsuto; Zhang, Xingyi; Sasa, Yukako; Mihara, Kiyoshi; Hashida, Mitsuru; Computer-based Evolutionary Search for a Nonlinear Conversion Function for Establishing In Vitro-In Vivo Correlation (IVIVC) of Oral Drug Formulations; <i>Drug Metab. Pharmacokinet.</i> 27, 280–285 (2012)
160	Yoshida, Shuya; Yamashita, Fumiyoshi; Itoh, Takayuki; Hashida, Mitsuru; Structure-Activity Relationship Modeling for Predicting Interactions with Pregnane X Receptor by Recursive Partitioning; <i>Drug Metab. Pharmacokinet.</i> 27, 506–512 (2012)
161	Kohira, Masahiro I.; Kitahata, Hiroyuki; Magome, Nobuyuki; Yoshikawa, Kenichi; 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)
162	Yamakado, Hodaka; Moriwaki, Yasuhiro; Yamasaki, Nobuyuki; Miyakawa, Tsuyoshi; Kurisu, Junko; Uemura, Kengo; Inoue, Haruhisa; Takahashi, Makio; Takahashi, Ryosuke; alpha-Synuclein BAC transgenic mice as a model for Parkinson's disease manifested decreased anxiety-like behavior and hyperlocomotion; <i>Neurosci. Res.</i> 73, 173–177 (2012)
163	Ishihara, Shuji; Sugimura, Kaoru; Bayesian inference of force dynamics during morphogenesis; <i>J. Theor. Biol.</i> 313, 201–211 (2012)
164	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.; Kageyama, H.; Quadruple-layered perovskite (CuCl)Ca ₂ NaNb ₄ O ₁₃ ; <i>J. Solid State Chem.</i> 185, 10–17 (2012)
165	Liu, Jun; Shi, Jian; Jiang, Lianmei; Zhang, Fan; Wang, Li; Yamamoto, Shinpei; Takano, Mikio; Chang, Mengjie; Zhang, Haoli; Chen, Yong; Segmented magnetic nanofibers for single cell manipulation; <i>Appl. Surf. Sci.</i> 258, 7530–7535 (2012)
166	Lu, Kai; Cao, Tong; Gordon, Richard; A cell state splitter and differentiation wave working-model for embryonic stem cell development and somatic cell epigenetic reprogramming; <i>Biosystems</i> 109, 390–396 (2012)
167	Watanabe, Kenji; Oochiai, Toshiya; Kikuchi, Shojiro; Kumano, Tatsuya; Matsui, Takeshi; Morimoto, Koji; Yasukawa, Satoru; Nakamori, Shoji; Sasako, Mitsuru; Yanagisawa, Akio; Otsuji, Eigo; Dermokine Expression in Intraductal Papillary-Mucinous Neoplasm and Invasive Pancreatic Carcinoma; <i>Anticancer Res.</i> 32, 4405–4412 (2012)
168	Liu, Li; Yuan, Qinghua; Shi, Jian; Li, Xin; Jung, Dongju; Wang, Li; Yamauchi, Kaori; Nakatsuji, Norio; Kamei, Ken-ichiro; Chen, Yong; Chemically-defined scaffolds created with electrospun synthetic nanofibers to maintain mouse embryonic stem cell culture under feeder-free conditions; <i>Biotechnol. Lett.</i> 34, 1951–1957 (2012)
169	Umemoto, Yoshiaki; Kawakami, Shigeru; Otani, Yuki; Higuchi, Yuriko; Yamashita, Fumiyoshi; Hashida, Mitsuru; Evaluation of Long-Term Gene Expression in Mouse Liver Using PhiC31 Integrase and Hydrodynamic Injection; <i>Biol. Pharm. Bull.</i> 35, 1182–1186 (2012)
170	Tsukamoto, Masashi; Okuda, Tomoyuki; Okamoto, Hirokazu; Higuchi, Yuriko; Kawakami, Shigeru; Yamashita, Fumiyoshi; Hashida, Mitsuru; Bovine Serum Albumin as a Lyoprotectant for Preparation of DNA Dry Powder Formulations Using the Spray-Freezing Drying Method; <i>Biol. Pharm. Bull.</i> 35, 1178–1181 (2012)
171	Sakata, Yoko; Furukawa, Shuhei; Kim, Chiwon; Kitagawa, Susumu; Formation of Nanocrystals of a Zinc Pillared-layer Porous Coordination Polymer Using Microwave-assisted Coordination Modulation; <i>Chem. Lett.</i> 41, 1436–1438 (2012)
172	Kishida, Keisuke; Horike, Satoshi; Nakagawa, Keiji; Kitagawa, Susumu; Synthesis and Adsorption Properties of Azulene-containing Porous Interdigitated Framework; <i>Chem. Lett.</i> 41, 425–426 (2012)

173	Umeyama, Tomokazu; Douvogianni, Evgenia; Imahori, Hiroshi; Synthesis and Photovoltaic Properties of Conjugated Polymer Based on 1,3,4-Thiadiazole Unit; Chem. Lett. 41, 354–356 (2012)
174	Yamamoto, Shinpei; Tamada, Yoshinori; Ono, Teruo; Takano, Mikio; Reversible Phase Transfer of Ferromagnetic L1(0)-FePt Nanoparticles; Chem. Lett. 41, 1581–1583 (2012)
175	Kalay, Ziya; Exact Green's functions for a Brownian particle reversibly binding to a fixed target in a finite, two-dimensional, circular domain; J. Phys. A-Math. Theor. 45, 235001 (2012)
176	Kalay, Ziya; Effects of confinement on the statistics of encounter times: exact analytical results for random walks in a partitioned lattice; J. Phys. A-Math. Theor. 45, 215001 (2012)
177	Akimoto, I.; Torai, S.; Naka, N.; Shirai, M.; Temporal shift from magnetoplasma resonance to cyclotron resonance of photo-carriers generated from 1s-exciton in cuprous oxide crystal; Eur. Phys. J. B 85, 374 (2012)
178	Kadota, S.; Kay, M. W.; Magome, N.; Agladze, K.; Curvature-Dependent Excitation Propagation in Cultured Cardiac Tissue; JETP Lett. 94, 824–830 (2012)
179	Usukura, Jiro; Yoshimura, Azumi; Minakata, Shiho; Youn, Daehwan; Ahn, Jeonghun; Cho, Sang-Joon; Use of the unroofing technique for atomic force microscopic imaging of the intra-cellular cytoskeleton under aqueous conditions; J. Electron Microsc. 61, 321–326 (2012)
180	Tomioka, Maiko; Toda, Yoshinobu; Kurisu, Junko; Kimura, Yasuhisa; Kengaku, Mineko; Ueda, Kazumitsu; The Effects of Neurological Disorder-Related Codon Variations of ABCA13 on the Function of the ABC Protein; Biosci. Biotechnol. Biochem. 76, 2289–2293 (2012)
181	Nakajima, K.; Morita, Y.; Suzuki, M.; Narumi, K.; Saitoh, Y.; Ishikawa, N.; Hojou, K.; Tsujimoto, M.; Isoda, S.; Kimura, K.; Direct observation of fine structure in ion tracks in amorphous Si ₃ N ₄ by TEM; Nucl. Instrum. Methods Phys. Res. Sect. B-Beam Interact. Mater. Atoms 291, 12–16 (2012)
182	Un, K.; Kono, Y.; Yoshida, M.; Yamashita, F.; Kawakami, S.; Hashida, M.; Enhancement of gene expression by transcriptional activation using doxorubicin-loaded liposome/pDNA complexes; Pharmazie 67, 400–405 (2012)
183	Mizumachi, Eri; Mori, Akira S.; Akiyama, Reiko; Tokuchi, Naoko; Osawa, Naoya; Variation in herbivory-induced responses within successively flushing Quercus serrata seedlings under different nutrient conditions; J. For. Res. 17, 175–183 (2012)
184	Sakultanchareonchai, Siriwan; Chomsaeng, Natthaphol; Thepnarat, Meechai; Kurata, Hiroki; Isoda, Seiji; Chairuang Sri, Torranin; Nisaratanaporn, Ekasit; The Role of Boron on Grain Refinement in Sterling Silver Alloy; Chiang Mai J. Sci. 39, 242–253 (2012)
	2. Review articles
185	Pandian, Ganesh N.; Sugiyama, Hiroshi; Programmable genetic switches to control transcriptional machinery of pluripotency; Biotechnol. J. 7, 798–809 (2012)
186	Murakami, Tatsuya; Phospholipid nanodisc engineering for drug delivery systems; Biotechnol. J. 7, 762–767 (2012)
187	Kalay, Ziya; Reaction kinetics in the plasma membrane; Biotechnol. J. 7, 745–752 (2012)

188	Wennekamp, Sebastian; Hiiragi, Takashi; Stochastic processes in the development of pluripotency in vivo; <i>Biotechnol. J.</i> 7, 737–744 (2012)
189	Tassel, Cedric; Kageyama, Hiroshi; Square planar coordinate iron oxides; <i>Chem. Soc. Rev.</i> 41, 2025–2035 (2012)
190	Kusumi, Akihiro; Fujiwara, Takahiro K.; Chadda, Rahul; Xie, Min; Tsunoyama, Taka A.; Kalay, Ziya; Kasai, Rinshi S.; Suzuki, Kenichi G. N.; Dynamic Organizing Principles of the Plasma Membrane that Regulate Signal Transduction: Commemorating the Fortieth Anniversary of Singer and Nicolson's Fluid-Mosaic Model; <i>Annu. Rev. Cell Dev. Biol.</i> 28, 215–250 (2012)
191	Rajendran, Arivazhagan; Endo, Masayuki; Sugiyama, Hiroshi; Single-Molecule Analysis Using DNA Origami; <i>Angew. Chem.-Int. Edit.</i> 51, 874–890 (2012)
192	Wang, Dan Ohtan; Okamoto, Akimitsu; ECHO probes: Fluorescence emission control for nucleic acid imaging; <i>J. Photochem. Photobiol. C-Photochem. Rev.</i> 13, 112–123 (2012)
193	Kusumi, Akihiro; Fujiwara, Takahiro K.; Morone, Nobuhiro; Yoshida, Kenta J.; Chadda, Rahul; Xie, Min; Kasai, Rinshi S.; Suzuki, Kenichi G. N.; Membrane mechanisms for signal transduction: The coupling of the meso-scale raft domains to membrane-skeleton-induced compartments and dynamic protein complexes; <i>Semin. Cell Dev. Biol.</i> 23, 126–144 (2012)
194	Saitou, Mitinori; Kagiwada, Saya; Kurimoto, Kazuki; Epigenetic reprogramming in mouse pre-implantation development and primordial germ cells; <i>Development</i> 139, 15–31 (2012)
195	Vaijyanthi, Thangavel; Bando, Toshikazu; Pandian, Ganesh N.; Sugiyama, Hiroshi; Progress and Prospects of Pyrrole-Imidazole Polyamide-Fluorophore Conjugates as Sequence-Selective DNA Probes; <i>ChemBioChem</i> 13, 2170–2185 (2012)
196	Wu, Yan-Ling; Liang, Jing; Zhang, Wen; Tanaka, Yoshimasa; Sugiyama, Hiroshi; Immunotherapies: The Blockade of Inhibitory Signals; <i>Int. J. Biol. Sci.</i> 8, 1420–1430 (2012)
197	Park, Soyoun; Sugiyama, Hiroshi; DNA as a Chiral Scaffold for Asymmetric Synthesis; <i>Molecules</i> 17, 12792–12803 (2012)
198	Pillai, Ramesh S.; Chuma, Shinichiro; piRNAs and their involvement in male germline development in mice; <i>Dev. Growth Diff.</i> 54, 78–92 (2012)
199	Ohsawa, Shizue; Sugimura, Kaoru; Takino, Kyoko; Igaki, Tatsushi; IMAGING CELL COMPETITION IN DROSOPHILA IMAGINAL DISCS; <i>Methods Enzymol.</i> 506, 407–413 (2012)
200	Rajendran, Arivazhagan; Endo, Masayuki; Sugiyama, Hiroshi; STRUCTURAL AND FUNCTIONAL ANALYSIS OF PROTEINS BY HIGH-SPEED ATOMIC FORCE MICROSCOPY; <i>Adv. Protein Chem. Struct. Biol.</i> 87, 5–55 (2012)
	3. Proceedings
201	Hirori, Hideki; Tanaka, Koichiro; Single-cycle terahertz pulses with amplitudes exceeding 1 MV/cm generated by optical rectification in LiNbO ₃ and applications to nonlinear optics; 8240, 82400B (2012)
	4. Other English Articles

202	Sandilands, Aileen; Brown, Sara J.; Goh, Christabelle S.; Pohler, Elizabeth; Wilson, Neil J.; Campbell, Linda E.; Miyamoto, Kenichi; Kubo, Akiharu; Irvine, Alan D.; Thawer-Esmail, Fatema; Munro, Colin S.; McLean, W. H. Irwin; Kudoh, Jun; Amagai, Masayuki; Matsui, Takeshi; Mutations in the SASPase Gene (ASPRV1) Are Not Associated with Atopic Eczema or Clinically Dry Skin; <i>J. Invest. Dermatol.</i> 132, 1507–1510 (2012)
203	Kusumi, Akihiro; An MBoC Favorite: Gangliosides GM1 and GM3 in the living cell membrane form clusters susceptible to cholesterol depletion and chilling; <i>Mol. Biol. Cell</i> 23, 3925–3925 (2012)
204	Sasaki, Naoya; Ishii, Takamichi; Kamimura, Ryo; Kajiwara, Masatoshi; Machimoto, Takafumi; Nakatsuji, Norio; Suemori, Hirofumi; Ikai, Iwao; Yasuchika, Kentaro; Uemoto, Shinji; Alpha-fetoprotein-producing pancreatic cancer cells possess cancer stem cell characteristics (vol 308, pg 152, 2011); <i>Cancer Lett.</i> 323, 232–232 (2012)
205	Kurosaki, Tomoaki; Kawakami, Shigeru; Suzuki, Ryo; Maruyama, Kazuo; Sasaki, Hitoshi; Hashida, Mitsuru; Novel ultrasound-responsive gene carrier with ternary structure; <i>Hum. Gene Ther.</i> 23, A141–A142 (2012)
206	Uemura, Tadashi; Sugimura, Kaoru; Yoshiki Hotta's Challenge: From 2004 Onwards; <i>J. Neurogenet.</i> 26, 22–24 (2012)
	5. Article written in other than English
207	Uesugi, Motonari; Control and Analysis of Cells by Synthetic Small Molecules; <i>Yakugaku Zasshi-J. Pharm. Soc. Jpn.</i> 132, 575–586 (2012)
B. WPI-related papers	
	1. Original articles
208	Mulholland, Niveen; Xu, Yan; Sugiyama, Hiroshi; Zhao, Keji; SWI/SNF-mediated chromatin remodeling induces Z-DNA formation on a nucleosome; <i>Cell Biosci.</i> 2, 3 (2012)
209	Miyako, Eijiro; Deguchi, Tomonori; Nakajima, Yoshihiro; Yudasaka, Masako; Hagihara, Yoshihisa; Horie, Masanori; Shichiri, Mototada; Higuchi, Yuriko; Yamashita, Fumiyoshi; Hashida, Mitsuru; Shigeri, Yasushi; Yoshida, Yasukazu; Iijima, Sumio; Photothermic regulation of gene expression triggered by laser-induced carbon nanohorns; <i>Proc. Natl. Acad. Sci. U. S. A.</i> 109, 7523–7528 (2012)
210	Stamp, Lincon A.; Braxton, David R.; Wu, Jun; Akopian, Veronika; Hasegawa, Kouichi; Chandrasoma, Parakrama T.; Hawes, Susan M.; McLean, Catriona; Petrovic, Lydia M.; Wang, Kasper; Pera, Martin F.; The GCTM-5 Epitope Associated with the Mucin-Like Glycoprotein FCGBP Marks Progenitor Cells in Tissues of Endodermal Origin; <i>Stem Cells</i> 30, 1999–2009 (2012)
211	Saito, Kenta; Chang, Y. -F.; Horikawa, Kazuki; Hatsugai, Noriyuki; Higuchi, Yuriko; Hashida, Mitsuru; Yoshida, Yu; Matsuda, Tomoki; Arai, Yoshiyuki; Nagai, Takeharu; Luminescent proteins for high-speed single-cell and whole-body imaging; <i>Nat. Commun.</i> 3, 1262 (2012)
212	Mochizuki, Kentaro; Tachibana, Makoto; Saitou, Mitinori; Tokitake, Yuko; Matsui, Yasuhisa; Implication of DNA Demethylation and Bivalent Histone Modification for Selective Gene Regulation in Mouse Primordial Germ Cells; <i>PLoS One</i> 7, e46036 (2012)
213	Lee, Nan Sook; Rohan, Joyce G.; Zitting, Madison; Kamath, Sonia; Weitz, Andrew; Sipos, Arnold; Salvaterra, Paul M.; Hasegawa, Kouichi; Pera, Martin; Chow, Robert H.; A Novel Dual-Color Reporter for Identifying Insulin-Producing Beta- Cells and Classifying Heterogeneity of Insulinoma Cell Lines; <i>PLoS One</i> 7, e35521 (2012)

214	Zhang, Hong-Fei; Wu, Yan-Ling; Jiang, Shi-Kun; Wang, Pu; Sugiyama, Hiroshi; Chen, Xing-Lai; Zhang, Wen; Ji, Yan-Juan; Guo, Chuan-Xin; Recognition by Nonaromatic and Stereochemical Subunit-Containing Polyamides of the Four Watson-Crick Base Pairs in the DNA Minor Groove; <i>ChemBioChem</i> 13, 1366–1374 (2012)
215	Zhang, Wen; Jiang, Shi-Kun; Wu, Yan-Ling; Guo, Chuan-Xin; Zhang, Hong-Fei; Sugiyama, Hiroshi; Chen, Xing-Lai; Discrimination between T/A and A/T Base Pairs of Pyrrole-Imidazole Polyamides Substituted with Chiral ss-Hydroxy- γ -Aminobutyric Acid/ss-Alanine Pairs; <i>ChemBioChem</i> 13, 47–50 (2012)
	2. Review articles
	n/a
	3. Proceedings
	n/a
	4. Other English articles
216	Kaye, Jane; Meslin, Eric M.; Knoppers, Bartha M.; Juengst, Eric T.; Deschenes, Mylene; Cambon-Thomsen, Anne; Chalmers, Donald; De Vries, Jantina; Edwards, Kelly; Hoppe, Nils; Kent, Alastair; Adebamowo, Clement; Marshall, Patricia; Kato, Kazuto; ELSI 2.0 for Genomics and Society; <i>Science</i> 336, 673–674 (2012)
C. Previously published WPI-related papers	
	n/a

A'. Refereed Papers mentioned in the body text

The following publications (sections D to H) are categorized to match references in the main report. Note that most are already listed in sections A and B above, with the exception of those marked "not in DB" in sections G and H.

D. Highly cited papers (data obtained from Thomson Reuters <i>Essential Science Indicators</i> as of May 2013)	
1	Wickham, Shelley F. J.; Bath, Jonathan; Katsuda, Yousuke; Endo, Masayuki; Hidaka, Kumi; Sugiyama, Hiroshi; Turberfield, Andrew J.; A DNA-based molecular motor that can navigate a network of tracks; <i>Nat. Nanotechnol.</i> 7, 169–173 (2012)
2	Rajendran, Arivazhagan; Endo, Masayuki; Sugiyama, Hiroshi; Single-Molecule Analysis Using DNA Origami; <i>Angew. Chem.-Int. Edit.</i> 51, 874–890 (2012)
3	Hu, Ming; Furukawa, Shuhei; Ohtani, Ryo; Sukegawa, Hiroaki; Nemoto, Yoshihiro; Reboul, Julien; Kitagawa, Susumu; 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)

4	Hu, Ming; Reboul, Julien; Furukawa, Shuhei; Torad, Nagy L.; Ji, Qingmin; Srinivasu, Pavuluri; Ariga, Katsuhiko; Kitagawa, Susumu; Yamauchi, Yusuke; Direct Carbonization of Al-Based Porous Coordination Polymer for Synthesis of Nanoporous Carbon; <i>J. Am. Chem. Soc.</i> 134, 2864–2867 (2012)
5	Okabe, Kohki; Inada, Noriko; Gota, Chie; Harada, Yoshie; Funatsu, Takashi; Uchiyama, Seiichi; Intracellular temperature mapping with a fluorescent polymeric thermometer and fluorescence lifetime imaging microscopy; <i>Nat. Commun.</i> 3 (2012)
6	Imahori, Hiroshi; Umeyama, Tomokazu; Kurotobi, Kei; Takano, Yuta; Self-assembling porphyrins and phthalocyanines for photoinduced charge separation and charge transport; <i>Chem. Commun.</i> 48, 4032–4045 (2012)
E. Interdisciplinary papers in IF 10+ journals (1.8% of all journals registered in Thomson Reuters <i>Journal Citation Reports Science Edition 2011</i> have IF 10+)	
	Highly interdisciplinary papers
1	Ikezoe, Yasuhiro; Washino, Gosuke; Uemura, Takashi; Kitagawa, Susumu; Matsui, Hiroshi; Autonomous motors of a metal-organic framework powered by reorganization of self-assembled peptides at interfaces; <i>Nat. Mater.</i> 11, 1081–1085 (2012)
2	Reboul, Julien; Furukawa, Shuhei; Horike, Nao; Tsotsalas, Manuel; Hirai, Kenji; Uehara, Hiromitsu; Kondo, Mio; Louvain, Nicolas; Sakata, Osami; Kitagawa, Susumu; Mesoscopic architectures of porous coordination polymers fabricated by pseudomorphic replication; <i>Nat. Mater.</i> 11, 717–723 (2012)
3	Wickham, Shelley F. J.; Bath, Jonathan; Katsuda, Yousuke; Endo, Masayuki; Hidaka, Kumi; Sugiyama, Hiroshi; Turberfield, Andrew J.; A DNA-based molecular motor that can navigate a network of tracks; <i>Nat. Nanotechnol.</i> 7, 169–173 (2012)
4	Kusumi, Akihiro; Fujiwara, Takahiro K.; Chadda, Rahul; Xie, Min; Tsunoyama, Taka A.; Kalay, Ziya; Kasai, Rinshi S.; Suzuki, Kenichi G. N.; Dynamic Organizing Principles of the Plasma Membrane that Regulate Signal Transduction: Commemorating the Fortieth Anniversary of Singer and Nicolson's Fluid-Mosaic Model; <i>Annu. Rev. Cell Dev. Biol.</i> 28, 215–250 (2012)
5	Suzuki, Kenichi G. N.; Kasai, Rinshi S.; Hirosawa, Koichiro M.; Nemoto, Yuri L.; Ishibashi, Munenori; Miwa, Yoshihiro; Fujiwara, Takahiro K.; Kusumi, Akihiro; Transient GPI-anchored protein homodimers are units for raft organization and function; <i>Nat. Chem. Biol.</i> 8, 774–783 (2012)
6	Endo, Masayuki; Tatsumi, Koichi; Terushima, Kosuke; Katsuda, Yousuke; Hidaka, Kumi; Harada, Yoshie; Sugiyama, Hiroshi; Direct Visualization of the Movement of a Single T7 RNA Polymerase and Transcription on a DNA Nanostructure; <i>Angew. Chem.-Int. Edit.</i> 51, 8778–8782 (2012)
7	Kasai, Hitoshi; Murakami, Tatsuya; Ikuta, Yoshikazu; Koseki, Yoshitaka; Baba, Koichi; Oikawa, Hidetoshi; Nakanishi, Hachiro; Okada, Masahiro; Shoji, Mitsuru; Ueda, Minoru; Imahori, Hiroshi; Hashida, Mitsuru; Creation of Pure Nanodrugs and Their Anticancer Properties; <i>Angew. Chem.-Int. Edit.</i> 51, 10315–10318 (2012)
8	Nakata, Eiji; Liew, Fong Fong; Uwatoko, Chisana; Kiyonaka, Shigeki; Mori, Yasuo; Katsuda, Yousuke; Endo, Masayuki; Sugiyama, Hiroshi; Morii, Takashi; Zinc-Finger Proteins for Site-Specific Protein Positioning on DNA-Origami Structures; <i>Angew. Chem.-Int. Edit.</i> 51, 2421–2424 (2012)
9	Chien, Chih-Tao; Li, Shao-Sian; Lai, Wei-Jung; Yeh, Yun-Chieh; Chen, Hsin-An; Chen, I-Shen; Chen, Li-Chyong; Chen, Kuei-Hsien; Nemoto, Takashi; Isoda, Seiji; Chen, Mingwei; Fujita, Takeshi; Eda, Goki; Yamaguchi, Hisato; Chhowalla, Manish; Chen, Chun-Wei; Tunable Photoluminescence from Graphene Oxide; <i>Angew. Chem.-Int. Edit.</i> 51, 6662–6666 (2012)
10	Ohtsu, Hideki; Tanaka, Koji; An Organic Hydride Transfer Reaction of a Ruthenium NAD Model Complex Leading to Carbon Dioxide Reduction; <i>Angew. Chem.-Int. Edit.</i> 51, 9792–9795 (2012)

11	Mohri, Kohta; Nishikawa, Makiya; Takahashi, Natsuki; Shiomi, Tomoki; Matsuoka, Nao; Ogawa, Kohei; Endo, Masayuki; Hidaka, Kumi; Sugiyama, Hiroshi; Takahashi, Yuki; Takakura, Yoshinobu; Design and Development of Nanosized DNA Assemblies in Polypod-like Structures as Efficient Vehicles for Immunostimulatory CpG Motifs to Immune Cells; <i>ACS Nano</i> 6, 5931–5940 (2012)
12	Wang, Dan Ohtan; Okamoto, Akimitsu; ECHO probes: Fluorescence emission control for nucleic acid imaging; <i>J. Photochem. Photobiol. C-Photochem. Rev.</i> 13, 112–123 (2012)
	Interdisciplinary papers
13	Rajendran, Arivazhagan; Endo, Masayuki; Sugiyama, Hiroshi; Single-Molecule Analysis Using DNA Origami; <i>Angew. Chem.-Int. Edit.</i> 51, 874–890 (2012)
14	Hu, Ming; Furukawa, Shuhei; Ohtani, Ryo; Sukegawa, Hiroaki; Nemoto, Yoshihiro; Reboul, Julien; Kitagawa, Susumu; 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)
15	Endo, Masayuki; Yang, Yangyang; Suzuki, Yuki; Hidaka, Kumi; Sugiyama, Hiroshi; Single-Molecule Visualization of the Hybridization and Dissociation of Photoresponsive Oligonucleotides and Their Reversible Switching Behavior in a DNA Nanostructure; <i>Angew. Chem.-Int. Edit.</i> 51, 10518–10522 (2012)
16	Falcaro, Paolo; Furukawa, Shuhei; Doping Light Emitters into Metal-Organic Frameworks; <i>Angew. Chem.-Int. Edit.</i> 51, 8431–8433 (2012)
17	Higuchi, Masakazu; Nakamura, Kohei; Horike, Satoshi; Hijikata, Yuh; Yanai, Nobuhiro; Fukushima, Tomohiro; Kim, Jungeun; Kato, Kenichi; Takata, Masaki; Watanabe, Daisuke; Oshima, Shinji; Kitagawa, Susumu; Design of Flexible Lewis Acidic Sites in Porous Coordination Polymers by using the Viologen Moiety; <i>Angew. Chem.-Int. Edit.</i> 51, 8369–8372 (2012)
18	Foo, Maw Lin; Horike, Satoshi; Inubushi, Yasutaka; Kitagawa, Susumu; An Alkaline Earth I3O0 Porous Coordination Polymer: [Ba ₂ TMA(NO ₃)(DMF)]; <i>Angew. Chem.-Int. Edit.</i> 51, 6107–6111 (2012)
19	Un, Keita; Kawakami, Shigeru; Yoshida, Mitsuru; Higuchi, Yuriko; Suzuki, Ryo; Maruyama, Kazuo; Yamashita, Fumiyoshi; Hashida, Mitsuru; Efficient suppression of murine intracellular adhesion molecule-1 using ultrasound-responsive and mannose-modified lipoplexes inhibits acute hepatic inflammation; <i>Hepatology</i> 56, 259–269 (2012)
20	Zou, Jianli; Kim, Franklin; Self-Assembly of Two-Dimensional Nanosheets Induced by Interfacial Polyionic Complexation; <i>ACS Nano</i> 6, 10606–10613 (2012)

F. Mesoscopic papers in IF 10+ journals

(1.8% of all journals registered in Thomson Reuters *Journal Citation Reports Science Edition* 2011 have IF 10+)

	Highly mesoscopic papers
1	Ikezoe, Yasuhiro; Washino, Gosuke; Uemura, Takashi; Kitagawa, Susumu; Matsui, Hiroshi; Autonomous motors of a metal-organic framework powered by reorganization of self-assembled peptides at interfaces; <i>Nat. Mater.</i> 11, 1081–1085 (2012)
2	Reboul, Julien; Furukawa, Shuhei; Horike, Nao; Tsotsalas, Manuel; Hirai, Kenji; Uehara, Hiromitsu; Kondo, Mio; Louvain, Nicolas; Sakata, Osami; Kitagawa, Susumu; Mesoscopic architectures of porous coordination polymers fabricated by pseudomorphic replication; <i>Nat. Mater.</i> 11, 717–723 (2012)
3	Wickham, Shelley F. J.; Bath, Jonathan; Katsuda, Yousuke; Endo, Masayuki; Hidaka, Kumi; Sugiyama, Hiroshi; Turberfield, Andrew J.; A DNA-based molecular motor that can navigate a network of tracks; <i>Nat. Nanotechnol.</i> 7, 169–173 (2012)

4	Kohsaka, Y.; Hanaguri, T.; Azuma, M.; Takano, M.; Davis, J. C.; Takagi, H.; Visualization of the emergence of the pseudogap state and the evolution to superconductivity in a lightly hole-doped Mott insulator; <i>Nat. Phys.</i> 8, 534–538 (2012)
5	Kusumi, Akihiro; Fujiwara, Takahiro K.; Chadda, Rahul; Xie, Min; Tsunoyama, Taka A.; Kalay, Ziya; Kasai, Rinshi S.; Suzuki, Kenichi G. N.; Dynamic Organizing Principles of the Plasma Membrane that Regulate Signal Transduction: Commemorating the Fortieth Anniversary of Singer and Nicolson's Fluid-Mosaic Model; <i>Annu. Rev. Cell Dev. Biol.</i> 28, 215–250 (2012)
6	Suzuki, Kenichi G. N.; Kasai, Rinshi S.; Hirosawa, Koichiro M.; Nemoto, Yuri L.; Ishibashi, Munenori; Miwa, Yoshihiro; Fujiwara, Takahiro K.; Kusumi, Akihiro; Transient GPI-anchored protein homodimers are units for raft organization and function; <i>Nat. Chem. Biol.</i> 8, 774–783 (2012)
7	Rajendran, Arivazhagan; Endo, Masayuki; Sugiyama, Hiroshi; Single-Molecule Analysis Using DNA Origami; <i>Angew. Chem.-Int. Edit.</i> 51, 874–890 (2012)
8	Endo, Masayuki; Tatsumi, Koichi; Terushima, Kosuke; Katsuda, Yousuke; Hidaka, Kumi; Harada, Yoshie; Sugiyama, Hiroshi; Direct Visualization of the Movement of a Single T7 RNA Polymerase and Transcription on a DNA Nanostructure; <i>Angew. Chem.-Int. Edit.</i> 51, 8778–8782 (2012)
9	Kasai, Hitoshi; Murakami, Tatsuya; Ikuta, Yoshikazu; Koseki, Yoshitaka; Baba, Koichi; Oikawa, Hidetoshi; Nakanishi, Hachiro; Okada, Masahiro; Shoji, Mitsuru; Ueda, Minoru; Imahori, Hiroshi; Hashida, Mitsuru; Creation of Pure Nanodrugs and Their Anticancer Properties; <i>Angew. Chem.-Int. Edit.</i> 51, 10315–10318 (2012)
10	Endo, Masayuki; Yang, Yangyang; Suzuki, Yuki; Hidaka, Kumi; Sugiyama, Hiroshi; Single-Molecule Visualization of the Hybridization and Dissociation of Photoresponsive Oligonucleotides and Their Reversible Switching Behavior in a DNA Nanostructure; <i>Angew. Chem.-Int. Edit.</i> 51, 10518–10522 (2012)
11	Igarashi, Ryuji; Yoshinari, Yohsuke; Yokota, Hiroaki; Sugi, Takuma; Sugihara, Fuminori; Ikeda, Kazuhiro; Sumiya, Hitoshi; Tsuji, Shigenori; Mori, Ikue; Tochio, Hidehito; Harada, Yoshie; Shirakawa, Masahiro; Real-Time Background-Free Selective Imaging of Fluorescent Nanodiamonds in Vivo; <i>Nano Lett.</i> 12, 5726–5732 (2012)
12	Courtois, Aurelien; Schuh, Melina; Ellenberg, Jan; Hiiragi, Takashi; The transition from meiotic to mitotic spindle assembly is gradual during early mammalian development; <i>J. Cell Biol.</i> 198, 357–370 (2012)
	Mesoscopic papers
13	Hu, Ming; Furukawa, Shuhei; Ohtani, Ryo; Sukegawa, Hiroaki; Nemoto, Yoshihiro; Reboul, Julien; Kitagawa, Susumu; 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)
14	Nakata, Eiji; Liew, Fong Fong; Uwatoko, Chisana; Kiyonaka, Shigeki; Mori, Yasuo; Katsuda, Yousuke; Endo, Masayuki; Sugiyama, Hiroshi; Morii, Takashi; Zinc-Finger Proteins for Site-Specific Protein Positioning on DNA-Origami Structures; <i>Angew. Chem.-Int. Edit.</i> 51, 2421–2424 (2012)
15	Chien, Chih-Tao; Li, Shao-Sian; Lai, Wei-Jung; Yeh, Yun-Chieh; Chen, Hsin-An; Chen, I-Shen; Chen, Li-Chyong; Chen, Kuei-Hsien; Nemoto, Takashi; Isoda, Seiji; Chen, Mingwei; Fujita, Takeshi; Eda, Goki; Yamaguchi, Hisato; Chhowalla, Manish; Chen, Chun-Wei; Tunable Photoluminescence from Graphene Oxide; <i>Angew. Chem.-Int. Edit.</i> 51, 6662–6666 (2012)
16	Falcaro, Paolo; Furukawa, Shuhei; Doping Light Emitters into Metal-Organic Frameworks; <i>Angew. Chem.-Int. Edit.</i> 51, 8431–8433 (2012)
17	Higuchi, Masakazu; Nakamura, Kohei; Horike, Satoshi; Hijikata, Yuh; Yanai, Nobuhiro; Fukushima, Tomohiro; Kim, Jungeun; Kato, Kenichi; Takata, Masaki; Watanabe, Daisuke; Oshima, Shinji; Kitagawa, Susumu; Design of Flexible Lewis Acidic Sites in Porous Coordination Polymers by using the Viologen Moiety; <i>Angew. Chem.-Int. Edit.</i> 51, 8369–8372 (2012)
18	Foo, Maw Lin; Horike, Satoshi; Inubushi, Yasutaka; Kitagawa, Susumu; An Alkaline Earth I3O0 Porous Coordination Polymer: [Ba ₂ TMA(NO ₃)(DMF)]; <i>Angew. Chem.-Int. Edit.</i> 51, 6107–6111 (2012)

19	Un, Keita; Kawakami, Shigeru; Yoshida, Mitsuru; Higuchi, Yuriko; Suzuki, Ryo; Maruyama, Kazuo; Yamashita, Fumiyoshi; Hashida, Mitsuru; Efficient suppression of murine intracellular adhesion molecule-1 using ultrasound-responsive and mannose-modified lipoplexes inhibits acute hepatic inflammation; <i>Hepatology</i> 56, 259–269 (2012)
20	Mohri, Kohta; Nishikawa, Makiya; Takahashi, Natsuki; Shiomi, Tomoki; Matsuoka, Nao; Ogawa, Kohei; Endo, Masayuki; Hidaka, Kumi; Sugiyama, Hiroshi; Takahashi, Yuki; Takakura, Yoshinobu; Design and Development of Nanosized DNA Assemblies in Polypod-like Structures as Efficient Vehicles for Immunostimulatory CpG Motifs to Immune Cells; <i>ACS Nano</i> 6, 5931–5940 (2012)
21	Zou, Jianli; Kim, Franklin; Self-Assembly of Two-Dimensional Nanosheets Induced by Interfacial Polyionic Complexation; <i>ACS Nano</i> 6, 10606–10613 (2012)
22	Wang, Dan Ohtan; Okamoto, Akimitsu; ECHO probes: Fluorescence emission control for nucleic acid imaging; <i>J. Photochem. Photobiol. C-Photochem. Rev.</i> 13, 112–123 (2012)

G. Papers from labs and groups

	1. Katura Lab
1	Numata, Tomohiro; Murakami, Tatsuya; Kawashima, Fumiaki; Morone, Nobuhiro; Heuser, John E.; Takano, Yuta; Ohkubo, Kei; Fukuzumi, Shunichi; Mori, Yasuo; Imahori, Hiroshi; 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)
	2. Strengthening the iCeMS Center for Meso-Bio Single-Molecule Imaging (CeMI)
1	Kusumi, Akihiro; Fujiwara, Takahiro K.; Chadda, Rahul; Xie, Min; Tsunoyama, Taka A.; Kalay, Ziya; Kasai, Rinshi S.; Suzuki, Kenichi G. N.; Dynamic Organizing Principles of the Plasma Membrane that Regulate Signal Transduction: Commemorating the Fortieth Anniversary of Singer and Nicolson's Fluid-Mosaic Model; <i>Annu. Rev. Cell Dev. Biol.</i> 28, 215–250 (2012)
2	Suzuki, Kenichi G. N.; Kasai, Rinshi S.; Hirosawa, Koichiro M.; Nemoto, Yuri L.; Ishibashi, Munenori; Miwa, Yoshihiro; Fujiwara, Takahiro K.; Kusumi, Akihiro; Transient GPI-anchored protein homodimers are units for raft organization and function; <i>Nat. Chem. Biol.</i> 8, 774–783 (2012)
3	Endo, Masayuki; Tatsumi, Koichi; Terushima, Kosuke; Katsuda, Yousuke; Hidaka, Kumi; Harada, Yoshie; Sugiyama, Hiroshi; Direct Visualization of the Movement of a Single T7 RNA Polymerase and Transcription on a DNA Nanostructure; <i>Angew. Chem.-Int. Edit.</i> 51, 8778–8782 (2012)
4	Igarashi, Ryuji; Yoshinari, Yohsuke; Yokota, Hiroaki; Sugi, Takuma; Sugihara, Fuminori; Ikeda, Kazuhiro; Sumiya, Hitoshi; Tsuji, Shigenori; Mori, Ikue; Tochio, Hidehito; Harada, Yoshie; Shirakawa, Masahiro; Real-Time Background-Free Selective Imaging of Fluorescent Nanodiamonds in Vivo; <i>Nano Lett.</i> 12, 5726–5732 (2012)
5	Numata, Tomohiro; Murakami, Tatsuya; Kawashima, Fumiaki; Morone, Nobuhiro; Heuser, John E.; Takano, Yuta; Ohkubo, Kei; Fukuzumi, Shunichi; Mori, Yasuo; Imahori, Hiroshi; 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)
6	Tanaka, Takayuki; Takahashi, Kazutoshi; Yamane, Mayu; Tomida, Shota; Nakamura, Saori; Oshima, Koichi; Niwa, Akira; Nishikomori, Ryuta; Kambe, Naotomo; Hara, Hideki; Mitsuyama, Masao; Morone, Nobuhiro; Heuser, John E.; Yamamoto, Takuya; Watanabe, Akira; Sato-Otsubo, Aiko; Ogawa, Seishi; Asaka, Isao; Heike, Toshio; Yamanaka, Shinya; Nakahata, Tatsutoshi; Saito, Megumu K.; Induced pluripotent stem cells from CINCA syndrome patients as a model for dissecting somatic mosaicism and drug discovery; <i>Blood</i> 120, 1299–1308 (2012)

7	Arita, Kyohei; Isogai, Shin; Oda, Takashi; Unoki, Motoko; Sugita, Kazuya; Sekiyama, Naotaka; Kuwata, Keiko; Hamamoto, Ryuji; Tochio, Hidehito; Sato, Mamoru; Ariyoshi, Mariko; Shirakawa, Masahiro; Recognition of modification status on a histone H3 tail by linked histone reader modules of the epigenetic regulator UHRF1; <i>Proc. Natl. Acad. Sci. U. S. A.</i> 109, 12950–12955 (2012)
8	Cho, Kwang-jin; Kasai, Rinshi S.; Park, Jin-Hee; Chigurupati, Sravanthi; Heidorn, Sonja J.; van der Hoeven, Dharini; Plowman, Sarah J.; Kusumi, Akihiro; Marais, Richard; Hancock, John F.; Raf Inhibitors Target Ras Spatiotemporal Dynamics; <i>Curr. Biol.</i> 22, 945–955 (2012)
9	Han, Yong-Woon; Matsumoto, Tomoko; Yokota, Hiroaki; Kashiwazaki, Gengo; Morinaga, Hironobu; Hashiya, Kaori; Bando, Toshikazu; Harada, Yoshie; Sugiyama, Hiroshi; Binding of hairpin pyrrole and imidazole polyamides to DNA: relationship between torsion angle and association rate constants; <i>Nucleic Acids Res.</i> 40, 11510–11517 (2012)
10	Sheng, Ren; Chen, Yong; Gee, Heon Yung; Stec, Ewa; Melowic, Heather R.; Blatner, Nichole R.; Tun, Moe P.; Kim, Yonjung; Kaellberg, Morten; Fujiwara, Takahiro K.; Hong, Ji Hye; Kim, Kwang Pyo; Lu, Hui; Kusumi, Akihiro; Lee, Min Goo; Cho, Wonhwa; Cholesterol modulates cell signaling and protein networking by specifically interacting with PDZ domain-containing scaffold proteins; <i>Nat. Commun.</i> 3 (2012)
11	Okabe, Kohki; Inada, Noriko; Gota, Chie; Harada, Yoshie; Funatsu, Takashi; Uchiyama, Seiichi; Intracellular temperature mapping with a fluorescent polymeric thermometer and fluorescence lifetime imaging microscopy; <i>Nat. Commun.</i> 3 (2012)
12	Collet, E.; Watanabe, H.; Brefuel, N.; Palatinus, L.; Roudaut, L.; Toupet, L.; Tanaka, K.; Tuchagues, J. -P.; Fertey, P.; Ravy, S.; Toudic, B.; Cailleau, H.; Aperiodic Spin State Ordering of Bistable Molecules and Its Photoinduced Erasing; <i>Phys. Rev. Lett.</i> 109 (2012)
13	Tani, Shuntaro; Blanchard, Francois; Tanaka, Koichiro; Ultrafast Carrier Dynamics in Graphene under a High Electric Field; <i>Phys. Rev. Lett.</i> 109 (2012)
14	Katayama, I.; Aoki, H.; Takeda, J.; Shimosato, H.; Ashida, M.; Kinjo, R.; Kawayama, I.; Tonouchi, M.; Nagai, M.; Tanaka, K.; 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 (2012)
15	Kusumi, Akihiro; Fujiwara, Takahiro K.; Morone, Nobuhiro; Yoshida, Kenta J.; Chadda, Rahul; Xie, Min; Kasai, Rinshi S.; Suzuki, Kenichi G. N.; Membrane mechanisms for signal transduction: The coupling of the meso-scale raft domains to membrane-skeleton-induced compartments and dynamic protein complexes; <i>Semin. Cell Dev. Biol.</i> 23, 126–144 (2012)
	3. Domestic satellite: the Faculty of Applied Biological Sciences, Gifu University
1	Neu, Ursula; Hengel, Holger; Blaum, Baerbel S.; Schowalter, Rachel M.; Macejak, Dennis; Gilbert, Michel; Wakarchuk, Warren W.; Imamura, Akihiro; Ando, Hiromune; Kiso, Makoto; Arnberg, Niklas; Garcea, Robert L.; Peters, Thomas; Buck, Christopher B.; Stehle, Thilo; Structures of Merkel Cell Polyomavirus VP1 Complexes Define a Sialic Acid Binding Site Required for Infection; <i>PLoS Pathog.</i> 8 (2012)
2	Tamai, Hideki; Ando, Hiromune; Ishida, Hideharu; Kiso, Makoto; First Synthesis of a Pentasaccharide Moiety of Ganglioside GAA-7 Containing Unusually Modified Sialic Acids through the Use of N-Troc-sialic Acid Derivative as a Key Unit; <i>Org. Lett.</i> 14, 6342–6345 (2012)
3	Nakashima, Shinya; Ando, Hiromune; Saito, Risa; Tamai, Hideki; Ishida, Hideharu; Kiso, Makoto; Efficiently Synthesizing Lacto-Ganglio-Series Gangliosides by Using a Glucosyl Ceramide Cassette Approach: The Total Synthesis of Ganglioside X2; <i>Chem.-Asian J.</i> 7, 1041–1051 (2012)
4	Nohara, Tomohiro; Imamura, Akihiro; Yamaguchi, Maho; Hidari, Kazuya I. P. J.; Suzuki, Takashi; Komori, Tatsuya; Ando, Hiromune; Ishida, Hideharu; Kiso, Makoto; Design and Synthesis of a Novel Ganglioside Ligand for Influenza A Viruses; <i>Molecules</i> 17, 9590–9620 (2012)
	4. National Centre for Biological Sciences (NCBS) and the Institute for Stem Cell Biology and Regenerative Medicine (inStem) in Bangalore, India

1	Kusumi, Akihiro; Fujiwara, Takahiro K.; Chadda, Rahul; Xie, Min; Tsunoyama, Taka A.; Kalay, Ziya; Kasai, Rinshi S.; Suzuki, Kenichi G. N.; Dynamic Organizing Principles of the Plasma Membrane that Regulate Signal Transduction: Commemorating the Fortieth Anniversary of Singer and Nicolson's Fluid-Mosaic Model; <i>Annu. Rev. Cell Dev. Biol.</i> 28, 215–250 (2012)
2	Suzuki, Kenichi G. N.; Kasai, Rinshi S.; Hirose, Koichiro M.; Nemoto, Yuri L.; Ishibashi, Munenori; Miwa, Yoshihiro; Fujiwara, Takahiro K.; Kusumi, Akihiro; Transient GPI-anchored protein homodimers are units for raft organization and function; <i>Nat. Chem. Biol.</i> 8, 774–783 (2012)
3	Stamp, Lincon A.; Braxton, David R.; Wu, Jun; Akopian, Veronika; Hasegawa, Kouichi; Chandrasoma, Parakrama T.; Hawes, Susan M.; McLean, Catriona; Petrovic, Lydia M.; Wang, Kasper; Pera, Martin F.; The GCTM-5 Epitope Associated with the Mucin-Like Glycoprotein FCGBP Marks Progenitor Cells in Tissues of Endodermal Origin; <i>Stem Cells</i> 30, 1999–2009 (2012)
4	Lee, Nan Sook; Rohan, Joyce G.; Zitting, Madison; Kamath, Sonia; Weitz, Andrew; Sipos, Arnold; Salvaterra, Paul M.; Hasegawa, Kouichi; Pera, Martin; Chow, Robert H.; A Novel Dual-Color Reporter for Identifying Insulin-Producing Beta- Cells and Classifying Heterogeneity of Insulinoma Cell Lines; <i>PLoS One</i> 7 (2012)
	5. Papers from Kyoto Fellows' and Assoc Kyoto Fellow's groups
1	Minami, Itsunari; Yamada, Kohei; Otsuji, Tomomi G.; Yamamoto, Takuya; Shen, Yan; Otsuka, Shinya; Kadota, Shin; Morone, Nobuhiro; Barve, Maneesha; Asai, Yasuyuki; Tenkova-Heuser, Tatyana; Heuser, John E.; Uesugi, Motonari; Aiba, Kazuhiro; Nakatsuji, Norio; A Small Molecule that Promotes Cardiac Differentiation of Human Pluripotent Stem Cells under Defined, Cytokine- and Xeno-free Conditions; <i>Cell Reports</i> 2, 1448–1460 (2012)
2	Murakami, Tatsuya; Phospholipid nanodisc engineering for drug delivery systems; <i>Biotechnol. J.</i> 7, 762–767 (2012)
3	Kalay, Ziya; Reaction kinetics in the plasma membrane; <i>Biotechnol. J.</i> 7, 745–752 (2012)
4	Kusumi, Akihiro; Fujiwara, Takahiro K.; Chadda, Rahul; Xie, Min; Tsunoyama, Taka A.; Kalay, Ziya; Kasai, Rinshi S.; Suzuki, Kenichi G. N.; Dynamic Organizing Principles of the Plasma Membrane that Regulate Signal Transduction: Commemorating the Fortieth Anniversary of Singer and Nicolson's Fluid-Mosaic Model; <i>Annu. Rev. Cell Dev. Biol.</i> 28, 215–250 (2012)
5	Kasai, Hitoshi; Murakami, Tatsuya; Ikuta, Yoshikazu; Koseki, Yoshitaka; Baba, Koichi; Oikawa, Hidetoshi; Nakanishi, Hachiro; Okada, Masahiro; Shoji, Mitsuru; Ueda, Minoru; Imahori, Hiroshi; Hashida, Mitsuru; Creation of Pure Nanodrugs and Their Anticancer Properties; <i>Angew. Chem.-Int. Edit.</i> 51, 10315–10318 (2012)
6	Zou, Jianli; Kim, Franklin; Self-Assembly of Two-Dimensional Nanosheets Induced by Interfacial Polyionic Complexation; <i>ACS Nano</i> 6, 10606–10613 (2012)
7	Numata, Tomohiro; Murakami, Tatsuya; Kawashima, Fumiaki; Morone, Nobuhiro; Heuser, John E.; Takano, Yuta; Ohkubo, Kei; Fukuzumi, Shunichi; Mori, Yasuo; Imahori, Hiroshi; 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)
8	Murakami, Tatsuya; Nakatsuji, Hirotsugu; Inada, Mami; Matoba, Yoshinori; Umeyama, Tomokazu; Tsujimoto, Masahiko; Isoda, Seiji; Hashida, Mitsuru; Imahori, Hiroshi; Photodynamic and Photothermal Effects of Semiconducting and Metallic-Enriched Single-Walled Carbon Nanotubes; <i>J. Am. Chem. Soc.</i> 134, 17862–17865 (2012)
9	Tanaka, Takayuki; Takahashi, Kazutoshi; Yamane, Mayu; Tomida, Shota; Nakamura, Saori; Oshima, Koichi; Niwa, Akira; Nishikomori, Ryuta; Kambe, Naotomo; Hara, Hideki; Mitsuyama, Masao; Morone, Nobuhiro; Heuser, John E.; Yamamoto, Takuya; Watanabe, Akira; Sato-Otsubo, Aiko; Ogawa, Seishi; Asaka, Isao; Heike, Toshio; Yamanaka, Shinya; Nakahata, Tatsutoshi; Saito, Megumu K.; Induced pluripotent stem cells from CINCA syndrome patients as a model for dissecting somatic mosaicism and drug discovery; <i>Blood</i> 120, 1299–1308 (2012)

10	Zhang, Weibin; Miley, Natasha; Zastrow, Michael S.; MacQueen, Amy J.; Sato, Aya; Nabeshima, Kentaro; Martinez-Perez, Enrique; Mlynarczyk-Evans, Susanna; Carlton, Peter M.; Villeneuve, Anne M.; HAL-2 Promotes Homologous Pairing during <i>Caenorhabditis elegans</i> Meiosis by Antagonizing Inhibitory Effects of Synaptonemal Complex Precursors; <i>PLoS Genet.</i> 8, e1002880 (2012)
11	Egawa, Naohiro; Kitaoka, Shiho; Tsukita, Kayoko; Naitoh, Motoko; Takahashi, Kazutoshi; Yamamoto, Takuya; Adachi, Fumihiko; Kondo, Takayuki; Okita, Keisuke; Asaka, Isao; Aoi, Takashi; Watanabe, Akira; Yamada, Yasuhiro; Morizane, Asuka; Takahashi, Jun; Ayaki, Takashi; Ito, Hidefumi; Yoshikawa, Katsuhiko; Yamawaki, Satoko; Suzuki, Shigehiko; Watanabe, Dai; Hioki, Hiroyuki; Kaneko, Takeshi; Makioka, Kouki; Okamoto, Koichi; Takuma, Hiroshi; Tamaoka, Akira; Hasegawa, Kazuko; Nonaka, Takashi; Hasegawa, Masato; Kawata, Akihiro; Yoshida, Minoru; Nakahata, Tatsutoshi; Takahashi, Ryosuke; Marchetto, Maria C. N.; Gage, Fred H.; Yamanaka, Shinya; Inoue, Haruhisa; Drug Screening for ALS Using Patient-Specific Induced Pluripotent Stem Cells; <i>Sci. Transl. Med.</i> 4, 145ra104 (2012)
12	Matsumura, Shigeru; Hamasaki, Mayumi; Yamamoto, Takuya; 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)
13	Tsotsalas, Manuel; Umemura, Ayako; Kim, Franklin; Sakata, Yoko; Reboul, Julien; Kitagawa, Susumu; Furukawa, Shuhei; 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)
14	Kalay, Ziya; Fujiwara, Takahiro K.; Kusumi, Akihiro; Confining Domains Lead to Reaction Bursts: Reaction Kinetics in the Plasma Membrane; <i>PLoS One</i> 7, e32948 (2012)
15	Sano, Hiroko; Kunwar, Prabhat S.; Renault, Andrew D.; Barbosa, Vitor; Clark, Ivan B. N.; Ishihara, Shuji; Sugimura, Kaoru; Lehmann, Ruth; The <i>Drosophila</i> Actin Regulator ENABLED Regulates Cell Shape and Orientation during Gonad Morphogenesis; <i>PLoS One</i> 7, e52649 (2012)
16	Shibata, Akihiro C. E.; Fujiwara, Takahiro K.; Chen, Limin; Suzuki, Kenichi G. N.; Ishikawa, Yoshiro; Nemoto, Yuri L.; Miwa, Yoshihiro; Kalay, Ziya; Chadda, Rahul; Naruse, Keiji; Kusumi, Akihiro; Archipelago architecture of the focal adhesion: Membrane molecules freely enter and exit from the focal adhesion zone; <i>Cytoskeleton</i> 69, 380–392 (2012)
17	Uemura, Tadashi; Sugimura, Kaoru; Yoshiki Hotta's Challenge: From 2004 Onwards; <i>J. Neurogenet.</i> 26, 22–24 (2012)
18	Ishihara, Shuji; Sugimura, Kaoru; Bayesian inference of force dynamics during morphogenesis; <i>J. Theor. Biol.</i> 313, 201–211 (2012)
19	Ohsawa, Shizue; Sugimura, Kaoru; Takino, Kyoko; Igaki, Tatsushi; IMAGING CELL COMPETITION IN <i>DROSOPHILA</i> IMAGINAL DISCS; <i>Methods Enzymol.</i> 506, 407–413 (2012)
20	Lu, Kai; Cao, Tong; Gordon, Richard; A cell state splitter and differentiation wave working-model for embryonic stem cell development and somatic cell epigenetic reprogramming; <i>Biosystems</i> 109, 390–396 (2012)
21	Kalay, Ziya; Exact Green's functions for a Brownian particle reversibly binding to a fixed target in a finite, two-dimensional, circular domain; <i>J. Phys. A-Math. Theor.</i> 45, 235001 (2012)
22	Kalay, Ziya; Effects of confinement on the statistics of encounter times: exact analytical results for random walks in a partitioned lattice; <i>J. Phys. A-Math. Theor.</i> 45, 215001 (2012)
	6. iCeMS-CiRA collaborative research

1	Minami, Itsunari; Yamada, Kohei; Otsuji, Tomomi G.; Yamamoto, Takuya; Shen, Yan; Otsuka, Shinya; Kadota, Shin; Morone, Nobuhiro; Barve, Maneesha; Asai, Yasuyuki; Tenkova-Heuser, Tatyana; Heuser, John E.; Uesugi, Motonari; Aiba, Kazuhiro; Nakatsuji, Norio; A Small Molecule that Promotes Cardiac Differentiation of Human Pluripotent Stem Cells under Defined, Cytokine- and Xeno-free Conditions; <i>Cell Reports</i> 2, 1448–1460 (2012)
2	Tanaka, Takayuki; Takahashi, Kazutoshi; Yamane, Mayu; Tomida, Shota; Nakamura, Saori; Oshima, Koichi; Niwa, Akira; Nishikomori, Ryuta; Kambe, Naotomo; Hara, Hideki; Mitsuyama, Masao; Morone, Nobuhiro; Heuser, John E.; Yamamoto, Takuya; Watanabe, Akira; Sato-Otsubo, Aiko; Ogawa, Seishi; Asaka, Isao; Heike, Toshio; Yamanaka, Shinya; Nakahata, Tatsutoshi; Saito, Megumu K.; Induced pluripotent stem cells from CINCA syndrome patients as a model for dissecting somatic mosaicism and drug discovery; <i>Blood</i> 120, 1299–1308 (2012)
3	Wada, Tamaki; Goparaju, Sravan K.; Tooi, Norie; Inoue, Haruhisa; Takahashi, Ryosuke; Nakatsuji, Norio; Aiba, Kazuhiro; Amyotrophic Lateral Sclerosis Model Derived from Human Embryonic Stem Cells Overexpressing Mutant Superoxide Dismutase 1; <i>Stem Cells Transl. Med.</i> 1, 396–402 (2012)
4	Hayashi, Yohei; Saitou, Mitinori; Yamanaka, Shinya; Germline development from human pluripotent stem cells toward disease modeling of infertility; <i>Fertil. Steril.</i> 97, 1250–1259 (2012)
5 (not in DB)	Kano, Kei; Mizumachi, Eri; Yamamizu, Kohei; Tanabe, Koji; Development of a High-Level Science Education Program for High School Students Using an Emerging Science as a Topic; <i>Journal of Science Education in Japan</i> 36(2), 162–171 (2012)

H. Publications partly other than covered by paper databases

	1. Public outreach by the Science Communication Group (SCG)
1	Kaye, Jane; Meslin, Eric M.; Knoppers, Bartha M.; Juengst, Eric T.; Deschenes, Mylene; Cambon-Thomsen, Anne; Chalmers, Donald; De Vries, Jantina; Edwards, Kelly; Hoppe, Nils; Kent, Alastair; Adebamowo, Clement; Marshall, Patricia; Kato, Kazuto; ELSI 2.0 for Genomics and Society; <i>Science</i> 336, 673–674 (2012)
2	Mizumachi, Eri; Mori, Akira S.; Akiyama, Reiko; Tokuchi, Naoko; Osawa, Naoya; Variation in herbivory-induced responses within successively flushing <i>Quercus serrata</i> seedlings under different nutrient conditions; <i>J. For. Res.</i> 17, 175–183 (2012)
3 (not in DB)	Kazuto, Kato; Jonathan, Kimmelman; Jason, Robert; Douglas, Sipp; Jeremy, Sugarman; Ethical and Policy Issues in the Clinical Translation of Stem Cells: Report of a Focus Session at the ISSCR Tenth Annual Meeting; <i>Cell Stem Cell</i> 11, 765–767 (2012)
4 (not in DB)	Kano, Kei; Mizumachi, Eri; Yamamizu, Kohei; Tanabe, Koji; Development of a High-Level Science Education Program for High School Students Using an Emerging Science as a Topic; <i>Journal of Science Education in Japan</i> 36(2), 162–171 (2012)
5 (not in DB)	Takanashi, Katsuya; Kano, Kei; Mizumachi, Eri; Motoki, Tamaki; Who Speaks to Whom in Bidirectional Communication?: a Micro-Analysis of Scientists' Communication Skills in Science Café; <i>Japanese Journal of Science Communication</i> 11, 3–17 (2012)
6 (not in DB)	Morimura, Yoshitaka; Kano, Kei; Mori, Mikihiro; Mizumachi, Eri; Takanashi, Katsuya; Motoki, Tamaki; A Movie Editing and Viewing Tool for Dialogue Skills Training Program for Scientists; <i>Proceedings of Information Education Symposium</i> (2012)
	2. Industry-government-academia collaboration management by the Innovation Management Group (IMG)
1	Anzai, Tomohiro; Kusama, Ryoichi; Kodama, Hiroyuki; Sengoku, Shintaro; Holistic observation and monitoring of the impact of interdisciplinary academic research projects: An empirical assessment in Japan; <i>Technovation</i> 32, 345–357 (2012)

2 (not in DB)	Anzai, Tomohiro, Sengoku, Shintaro; Collaboration of Policy Science with Research & Development Practices; The Journal of Science Policy and Research Management 27(3/4), 210–225 (2012)
3 (not in DB)	Yabuki, Hirotaka; Seki, Atsushi; Sengoku, Shintaro; Innovation in the R&D model of Pharmaceutical Firms; International Pharmaceutical Intelligence 975, 3–7 (2012)
4 (not in DB)	The Hinxton Group; Statement on Data and Materials Sharing and Intellectual Property in Pluripotent Stem Cell Science in Japan and China; The Hinxton Group website (2012)

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

- List up to 10 main presentations during FY2012 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	Hiroshi Imahori, Bio-inspired Organic Materials for Energy and Medical Applications, 2012 MRS Meeting , San Francisco, USA (April 9–13, 2012)
2	Kazumitsu Ueda, Mechanism of HDL formation by ABCA1, ASBMB: Frontiers in Lipid Biology , Banff, Canada (Sep 5–8, 2012)
3	Koichiro Tanaka, Nonlinear carrier dynamics induced by intense terahertz wave, IRMMW-THz2012 , Wollongong, Australia (Sep 21–18, 2012)
4	Mitinori Saitou, Mechanism and reconstitution in vitro of germ cell specification in mice, EMBO/EMBL Symposium: Germline-Immortality through Topipotency , Heidelberg, Germany (Oct 13–16, 2012)
5	Akihiro Kusumi, Transient GPI-anchored protein homodimer rafts are basic units for raft organization and function, The Biophysical Society Thematic Meeting , Hyderabad, India (Nov 1–5, 2012)
6	Yong Chen, Development strategy of artificial cellular microenvironments and perspectives for stem cells, 1st International Stem Cell Summit 2012 , Wuhan, China (Nov 13, 2012)
7	Norio Nakatsuji, Leading Institutions and their strategies for advancing regenerative medicine, World Stem Cell Summit , West Palm Beach, Florida, USA (Dec 3–5, 2012)
8	Shinya Yamanaka, Induction of Pluripotency by Defined Factors., Novel Lecture in Physiology or Medicine , Stockholm, Sweden (Dec 7, 2012)
9	Hiroshi Sugiyama, Chemical Biology that Controls DNA Structure and Function : DNA Origami and Artificial Genetic Switch, International Symposium on Challenges in Chemical Biology , Kolkata, India (Jan 27–29, 2013)
10	Susumu Kitagawa, Welcome to a World of Small Spaces, Symposium Celebrating 125 Years of Angewandte Chemie , Berlin, Germany (March 12, 2013)

C. Major Awards

- List up to 10 main awards received during FY2012 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	Shinya Yamanaka, 2013 Breakthrough Prize in Life Sciences , Milner Foundation (2012)
2	Dan Ohtan Wang, MBSJ Tomizawa Prize (2012)
3	Mitinori Saitou, Yomiuri Techno Forum Gold Medal Prize (2012)
4	Mitsuru Hashida, Life-time Achievement Award (2012)
5	Hideki Hirori, Young Scientist Award of the Physical Society of Japan (2012)
6	Shinya Yamanaka, Order of Cultural Merit, Japan (2012)
7	Shinya Yamanaka, The Nobel Prize in Physiology or Medicine 2012 (2012)

FY 2012 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 the latest report, attach "Biographical Sketch of a New Principal Investigator".*

<Results at the end of FY2012>									
Principal Investigators Total: 19									
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* (63)	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* (61)	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* (57)	Professor, Institute for Integrated Cell-Material Sciences, Kyoto University	Ph.D. Biophysics	90%	10%			Jan. 7, 2008	Usually stays at the institution.	
Imahori, Hiroshi* (51)	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 FY2012>

Principal Investigators Total: 19

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* (46)	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* (59)	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* (65)	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* (60)	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* (46)	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 FY2012>

Principal Investigators Total: 19

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* (56)	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.	
Tanaka, Koichiro* (50)	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* (61)	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* (53)	Professor, Institute for Integrated Cell-Material Sciences, Kyoto University	Ph.D. Single- Molecule Physiology	90%	10%			Mar. 1, 2008	Usually stays at the institution.	
<u>Hiiragi, 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 48 days in FY 2012)	

<Results at the end of FY2012>

Principal Investigators Total: 19

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>Chen, Yong</u> * (56)	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: 5 times and 82 days in FY 2012)	
Yamanaka, Shinya* (50)	Professor, CiRA, Kyoto University	M.D. Stem Cell Biology Developmental Engineering	4%	1%	75%	20%	Oct. 1, 2007	Participates at the 5% effort level. 95% devoted to the CiRA.	
<u>Heuser, John</u> * (70)	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: 4 times and 155 days in FY 2012)	
Kageyama, Ryoichiro* (56)	Professor, Institute for Virus Research, Kyoto University	M.D. Ph.D. Molecular Biology	15%	10%	65%	10%	Feb. 2, 2013	Participates at the 25% effort level. 75% devoted to the Institute for Virus Research.	
Saitou, Mitinori* (42)	Professor, Graduate School of Medicine, Kyoto University	M.D. Ph.D. Cell Biology	15%	5%	70%	10%	Jan. 16, 2013	Participates at the 20% effort level. 80% devoted to the Graduate School of Medicine.	

Biographical Sketch of a New Principal Investigator

<p style="text-align: center;">Name (Age)</p> <p><i>NOTE: Place an asterisk (*) by the name of investigators considered to be ranked among the world's top researchers.</i></p>	Kageyama, Ryoichiro* (56)																		
<p style="text-align: center;">Current affiliation (Position title, department, organization)</p>	Institute for Virus Research, Kyoto University																		
<p style="text-align: center;">Academic degree, specialty</p>	<p>Degree: M.D. in 1982 from Kyoto University Faculty of Medicine and Ph.D. in 1986 from Kyoto University Graduate School of Medicine.</p> <p>Specialty: Molecular Biology</p>																		
<p>Research and education history</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; padding: 2px;">1976-1982</td> <td style="padding: 2px;">Medical student at Kyoto University Faculty of Medicine</td> </tr> <tr> <td style="padding: 2px;">May 1982</td> <td style="padding: 2px;">Passed the National Board and obtained MD</td> </tr> <tr> <td style="padding: 2px;">1982-1986</td> <td style="padding: 2px;">PhD course at Kyoto University Faculty of Medicine</td> </tr> <tr> <td style="padding: 2px;">March 1986</td> <td style="padding: 2px;">obtained PhD at Kyoto University Faculty of Medicine</td> </tr> <tr> <td style="padding: 2px;">1986-1989</td> <td style="padding: 2px;">Postdoctoral fellow at the National Cancer Institute (USA)</td> </tr> <tr> <td style="padding: 2px;">1989</td> <td style="padding: 2px;">Assistant Professor at Kyoto University Faculty of Medicine</td> </tr> <tr> <td style="padding: 2px;">1991</td> <td style="padding: 2px;">Associate Professor at Kyoto University Faculty of Medicine</td> </tr> <tr> <td style="padding: 2px;">1997 till now</td> <td style="padding: 2px;">Professor at Institute for Virus Research, Kyoto University</td> </tr> <tr> <td style="padding: 2px;">2006-2010</td> <td style="padding: 2px;">Director at Institute for Virus Research, Kyoto University</td> </tr> </table>		1976-1982	Medical student at Kyoto University Faculty of Medicine	May 1982	Passed the National Board and obtained MD	1982-1986	PhD course at Kyoto University Faculty of Medicine	March 1986	obtained PhD at Kyoto University Faculty of Medicine	1986-1989	Postdoctoral fellow at the National Cancer Institute (USA)	1989	Assistant Professor at Kyoto University Faculty of Medicine	1991	Associate Professor at Kyoto University Faculty of Medicine	1997 till now	Professor at Institute for Virus Research, Kyoto University	2006-2010	Director at Institute for Virus Research, Kyoto University
1976-1982	Medical student at Kyoto University Faculty of Medicine																		
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1989	Assistant Professor at Kyoto University Faculty of Medicine																		
1991	Associate Professor at Kyoto University Faculty of Medicine																		
1997 till now	Professor at Institute for Virus Research, Kyoto University																		
2006-2010	Director at Institute for Virus Research, Kyoto University																		
<p>Achievements and highlights of past research activities <i>(Describe qualifications as a top-caliber researcher if he/she is considered to be ranked among the world's top researchers.)</i></p> <ol style="list-style-type: none"> 1. Elucidation of Hes1 and Hes5 as Notch effectors in stem cells 2. Elucidation of the significance of oscillatory expression of Hes1 and proneural genes in maintenance of neural stem cells 3. Elucidation of Hes7 as the segmentation clock gene 																			
<p>Achievements</p> <p>(1) International influence <i>a) Guest speaker, chair, director, or honorary member of a major international academic society in the subject field, b) Holder of a prestigious lectureship, c) Member of a scholarly academy in a major country, d) Recipient of an international award(s) , e) Editor of an influential journal etc.</i></p> <p>Plenary lecture: International Society of Developmental Neuroscience, Banff, Canada, 2006. J. Neurochem. 50th Anniversary Symposium, Singapore, 2006.</p> <p>Award: 1994 Young Investigator Award of the Japanese Biochemical Society</p> <p>Membership: The Japanese Biochemical Society (Council member from 2000) The Molecular Biology Society of Japan The Japanese Society of Developmental Biologists The Japan Neuroscience Society Society for Neuroscience American Society for Biochemistry and Molecular Biology</p> <p>Editorial board member: Journal of Molecular Cell Biology (since 2009) Mechanism of Development (since 2011)</p> <p>Editor: Genes to Cells (Associate Editor since 2010) Developmental Biology (Editor since 2012)</p> <p>Advisory board member: A- IMBN Research (since 2007)</p>																			

Science Council of Japan(since 2008)
RIKEN CDB Kobe (since 2009)

(2) Receipt of large-scale competitive fundings (*over past 5 years*)

CREST (2006.10.1-2012.3.31) Total 305,300,000yen

CREST (2012.10.1-2018.3.31) Total 310,350,000yen

(3) Article citations (*Titles of major publications, and number of citations.*)

Sasai et al. (1992) Two mammalian helix-loop-helix factors structurally related to *Drosophila hairy* and *Enhancer of split*. **Genes & Dev.** 6, 2620-2634. Cited **511**

Ishibashi et al. (1995) Targeted disruption of mammalian *hairy* and *Enhancer of split* homolog-1 (*HES-1*) leads to up-regulation of neural helix-loop-helix factors, premature neurogenesis and severe neural tube defects. **Genes & Dev.** 9, 3136-3148. Cited **455**

Ohtsuka et al.(1999) *Hes1* and *Hes5* as Notch effectors in mammalian neuronal differentiation. **EMBO J.** 18, 2196-2207. Cited **451**

Jensen et al. (2000) Control of endodermal endocrine development by HES-1. **Nature Genet.** 24, 36-44. Cited **626**

Hirata et al. (2002) Oscillatory expression of the bHLH factor Hes1 regulated by a negative feedback loop. **Science** 298, 840-843. Cited **311**

Imayoshi et al. (2008) Roles of continuous neurogenesis in the structural and functional integrity of the adult forebrain. **Nature Neurosci.** 11, 1153-1161. Cited **306**

(4) Others (*Other achievements that indicate qualification as a top-caliber researcher, if any.*)

Biographical Sketch of a New Principal Investigator

Name (Age)	Saitou, Mitinori* (42)
<i>NOTE: Place an asterisk (*) by the name of investigators considered to be ranked among the world's top researchers.</i>	
Current affiliation (Position title, department, organization)	Professor, Graduate School of Medicine, Kyoto University
Academic degree, specialty	Degree: M.D. in 1995 from Kyoto University Faculty of Medicine and Ph.D. in 1999 from Kyoto University Graduate School of Medicine. Specialty: Cell Biology
Research and education history August 2011 – Present JST ERATO Research Director April 2009 - Present Department of Anatomy and Cell Biology, Graduate School of Medicine, Kyoto University, Professor April 2003 - March 2010 RIKEN Center for Developmental Biology, Team Leader January 2003- May 2003 Wellcome Trust/ Cancer Research UK Gurdon Centre for Developmental Biology and Cancer, Senior Research Associate January 2000- December 2002 Wellcome Trust/ Cancer Research UK Gurdon Centre for Developmental Biology and Cancer, Travelling Research Fellow April 1999 - July 2001 Japan Society for the Promotion of Science, Young Research Fellow (PD) April 1996 - March 1999 Japan Society for the Promotion of Science, Young Research Fellow (DC1) April 1995 - March 1999 Graduate School of Medicine, Kyoto University, JAPAN April 1989 - March 1995 Faculty of Medicine, Kyoto University, JAPAN	
Achievements and highlights of past research activities <i>(Describe qualifications as a top-caliber researcher if he/she is considered to be ranked among the world's top researchers.)</i> Mitinori Saitou has been working on the mechanism and reconstitution in vitro of mammalian germ cell development. His achievements include the identification of key transcriptional regulators of germ cell specification in mice and reconstitution in vitro of germ cell specification using mouse pluripotent stem cells. Especially, his work on the successful isolation of offspring from oocytes derived from in vitro primordial germ cell-like cells has been selected as one of the top 10 scientific breakthroughs in 2012 by the international prestigious journal Science.	
Achievements (1) International influence <i>a) Guest speaker, chair, director, or honorary member of a major international academic society in the subject field, b) Holder of a prestigious lectureship, c) Member of a scholarly academy in a major country, d) Recipient of an international award(s) , e) Editor of an influential journal etc.</i> Mitinori Saitou has been an invited speaker of the International Society for Stem Cell Research (ISSCR) for four times, in addition to an invited speaker for many other internationally renowned meetings (such as Cold Spring Harbor Meetings, Keystone Meetings, Gordon Conferences). He is a member of the program committee of the ISSCR 2014. Editorial board member of the following journals: 2012 - Present Developmental Cell	
(2) Receipt of large-scale competitive fundings <i>(over past 5 years)</i> JST, ERATO, August 2011 - March 2017 JST, CREST, October 2009 – March 2012	

(3) Article citations (*Titles of major publications, and number of citations.*)

Total 72 papers, 5371 citations by 3293 literatures (Scopus as of April 20, 2013)

Offspring from oocytes derived from in vitro primordial germ cell-like cells in mice, *Science*, 2012, cited 12 times.

Reconstitution of the mouse germ cell specification pathway in culture by pluripotent stem cells, *Cell*, 2011, cited 67 times.

A signaling principle for the specification of the germ cell lineage in mice, *Cell*, 2009, cited 77 times

Critical function of Prdm14 for the establishment of the germ cell lineage in mice, *Nature Genetics*, 2008, cited 102 times.

Complex genome-wide transcription dynamics orchestrated by Blimp1 for the specification of the germ cell lineage in mice, *Genes and Development*, 2008, cited 84 times.

Cellular dynamics associated with the genome-wide epigenetic reprogramming in migrating primordial germ cells in mice, *Development*, 2007, cited 125 times.

An improved single-cell cDNA amplification method for efficient high-density oligonucleotide microarray analysis, *Nucleic Acids Research*, 2006, cited 130 times.

Blimp1 is a critical determinant of the germ cell lineage in mice, *Nature*, 2005, cited 314 times.

A molecular programme for the specification of germ cell fate in mice, *Nature*, 2002, cited 371 times.

(4) Others (*Other achievements that indicate qualification as a top-caliber researcher, if any.*)

Records of FY2012 Center Activities

1. Researchers and center staffs, 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 [OO month, OO year].

	Goal set in the "Post-interim evaluation revised center project"	Results at end of FY 2012	Final goal (Date: March, 2014)
Researchers	185 <64, 35%> [55, 30%]	183 <61, 33%> [41, 22%]	185 <64, 35%> [55, 30%]
Principal investigators	18 <3, 17%> [2, 12%]	19 <3, 16%> [2, 11%]	18 <3, 17%> [2, 12%]
Other researchers	167 <61, 37%> [53, 32%]	164 <58, 35%> [39, 24%]	167 <61, 37%> [53, 32%]
Research support staffs	81	86	81
Administrative staffs	34	36 (23, 64%)	34 (21, 62%)
Total	300	305	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.
- For the iCeMS Kyoto Fellow position created in an effort to recruit young, promising researchers from around the world, one new Fellow was selected in FY2012. A total of six fellows 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.
- In FY 2012, two eminent researchers joined the iCeMS as new PIs. One is Prof. Ryoichiro Kageyama of Institute for Virus Research, Kyoto University, a highly-respected cell scientist especially in the field of neurogenesis. Another is Prof Mitinori Saitou of Graduate School of Medicine, Kyoto University, who specializes in Mammalian Germ Cell Biology.
- Prof. Motomu Tanka of Heidelberg University, an internationally recognized authority on Biological Physics, will be appointed to a PI of the iCeMS in FY2013.
- Prof. Agladze and Prof. Hiiragi resigned in the end of March according to the expiration of their terms of office.

Career paths from the iCeMS to prominent institutions in FY2007-2012

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)
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)
Research Associate: August 2010-April 2012	Assistant Professor: Graduate School of Bioscience and Biotechnology, Tokyo Institute of Technology (Japan)
Research Associate: April 2010-June 2012	Assistant Professor: Faculty of Pharmaceutical Sciences, Tokushima University (Japan)
Research Associate: October 2009-July 2012	Research Associate: McGill University (Canada)
Assistant Professor: April 2012-December 2012	Associate Professor: Graduate School of Science and Engineering for Education, Toyama University (Japan)
Assistant Professor: April 2011-March 2013	Senior Fellow: Center for Integrative Medical Sciences, RIKEN (Japan)
Assistant Professor: April 2010-March 2013	Associate Professor: Hakubi Center for Advanced Research, Kyoto University (Japan)
Research Associate: April 2012-October 2012	Associate Professor: School of Life Sciences, Nanjing 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>
Peking University and Tsinghua University Center for Life Sciences (CLS)		<u>MoU exchanged on April 20, 2012</u>

2. Securing competitive research funding

- Competitive and other research funding secured in FY2012:

Total: 1,759 JPY million

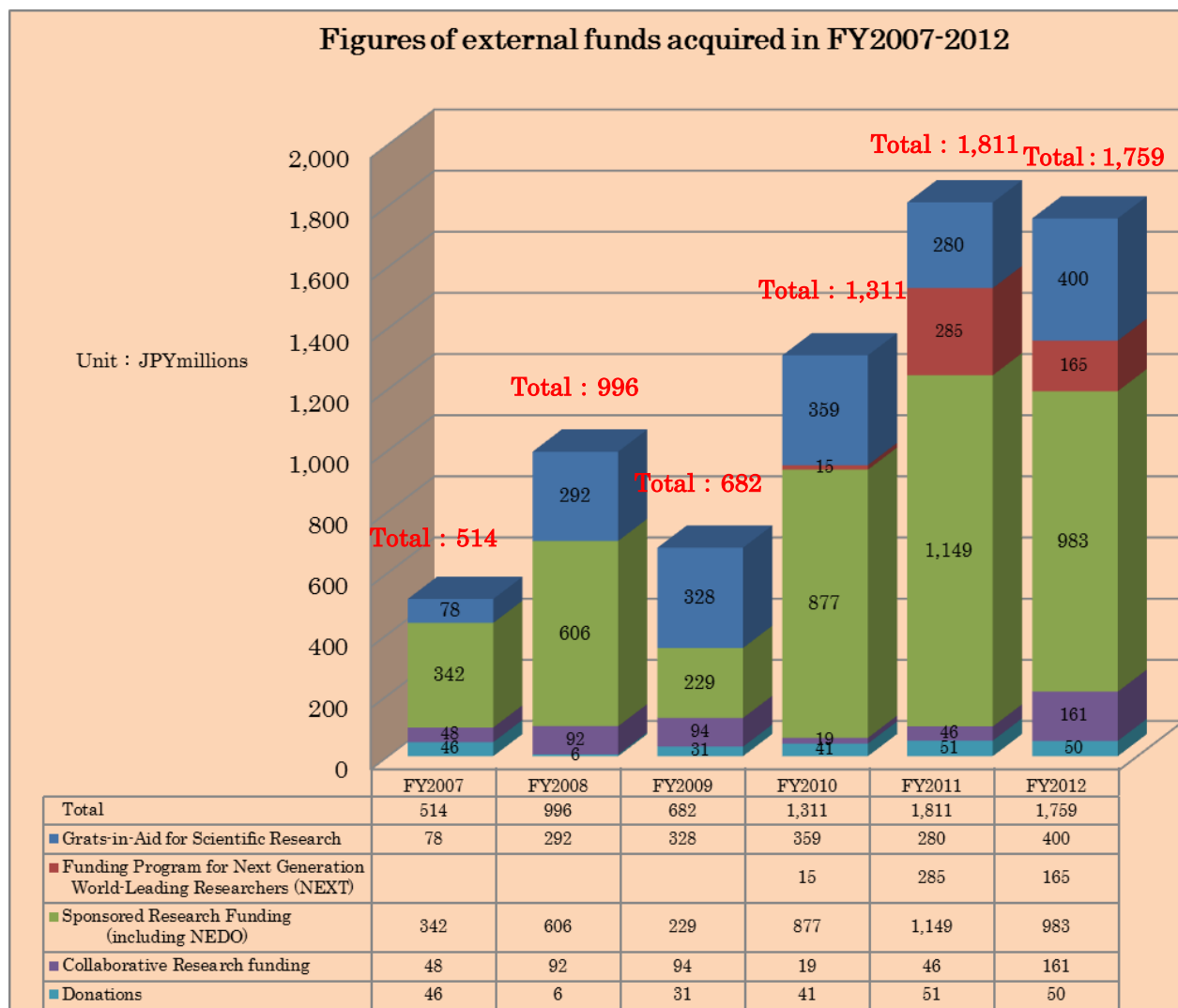
- Describe external funding warranting special mention. Include the name and total amount of each grant.

Researchers at the Institute acquired JPY1,759 million of research funds: approximately 400 million from Grants-in-Aid for Scientific Research, 165 million from the Next-Generation Leading Research Funding Program, 983 million from Sponsored Research Funding, and 211 million from other competitive research funding sources..

(Unit: JPY millions)

Grants-in-Aid for Scientific Research	400
Funding Program for Next Generation World-Leading Researchers (NEXT)	165
Sponsored Research Funding (including NEDO)	983
Collaborative Research funding	161
Donations	50
Total	1,759

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



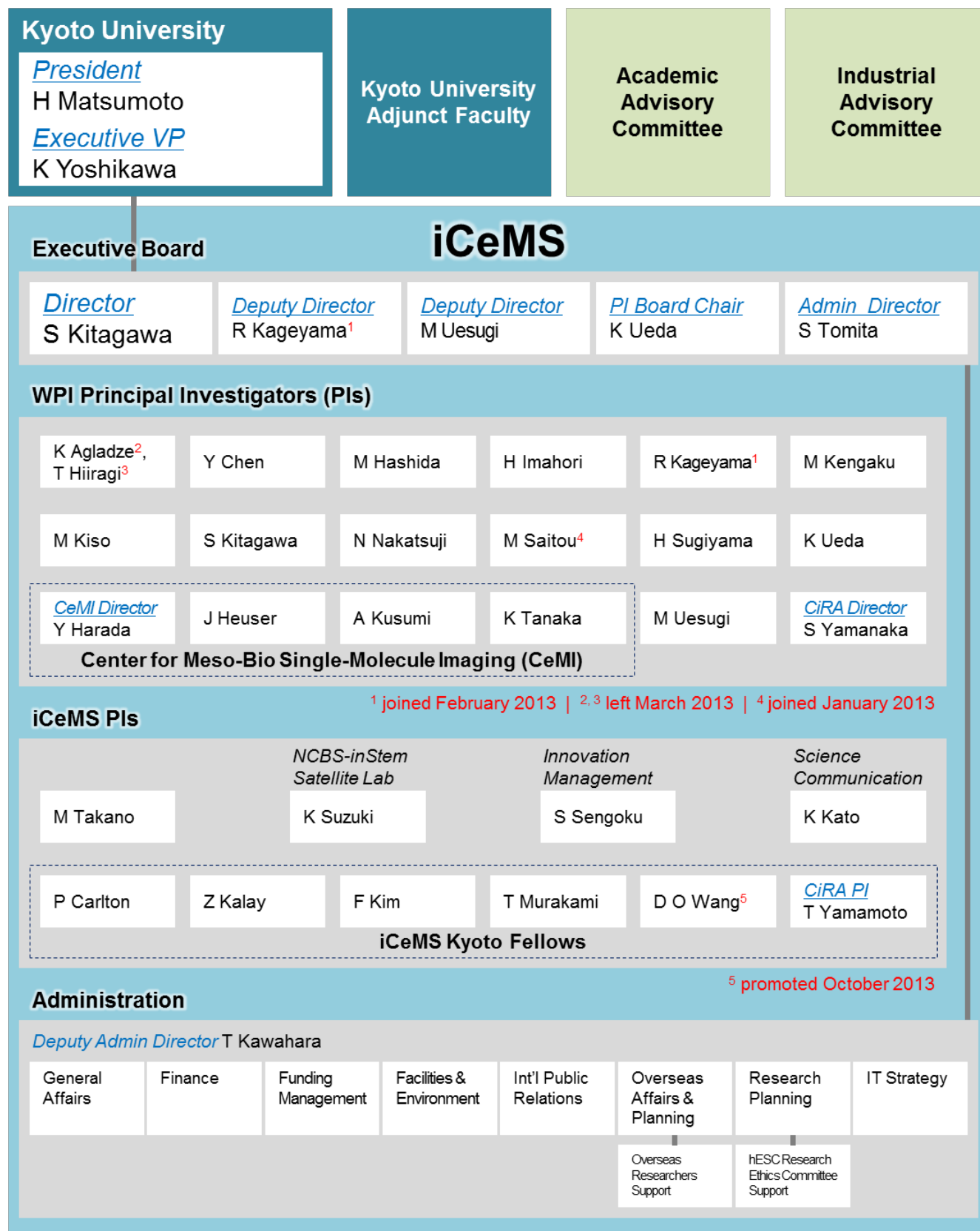
3. International research conferences or symposiums held to bring world's leading researchers together

- Indicate the number of international research conferences or symposiums held in FY2012 and give up to three examples of the most representative ones using the table below.

FY 2012: 10 meetings	
Major examples (meeting title and place held)	Number of participants
CLS-iCeMS Joint Symposium "Crossing Boundaries: Stem Cells, Materials, Mesoscopic Sciences, and Beyond (April 20-22, 2012) Beijing, China	From domestic institutions: 42 From overseas institutions: 194
12th iCeMS International Symposium/ 6th Annual Symposium on Nanobiotechnology "Kyoto Cell-Material Integration" (November 8-9, 2012) Kyoto, Japan	From domestic institutions: 105 From overseas institutions: 37
th iCeMS International Symposium/ RSC-iCeMS Joint International Symposium "Cell-Material Integration and Biomaterials Science" (March 18-19, 2013) Kyoto, Japan	From domestic institutions: 131 From overseas institutions: 26

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)

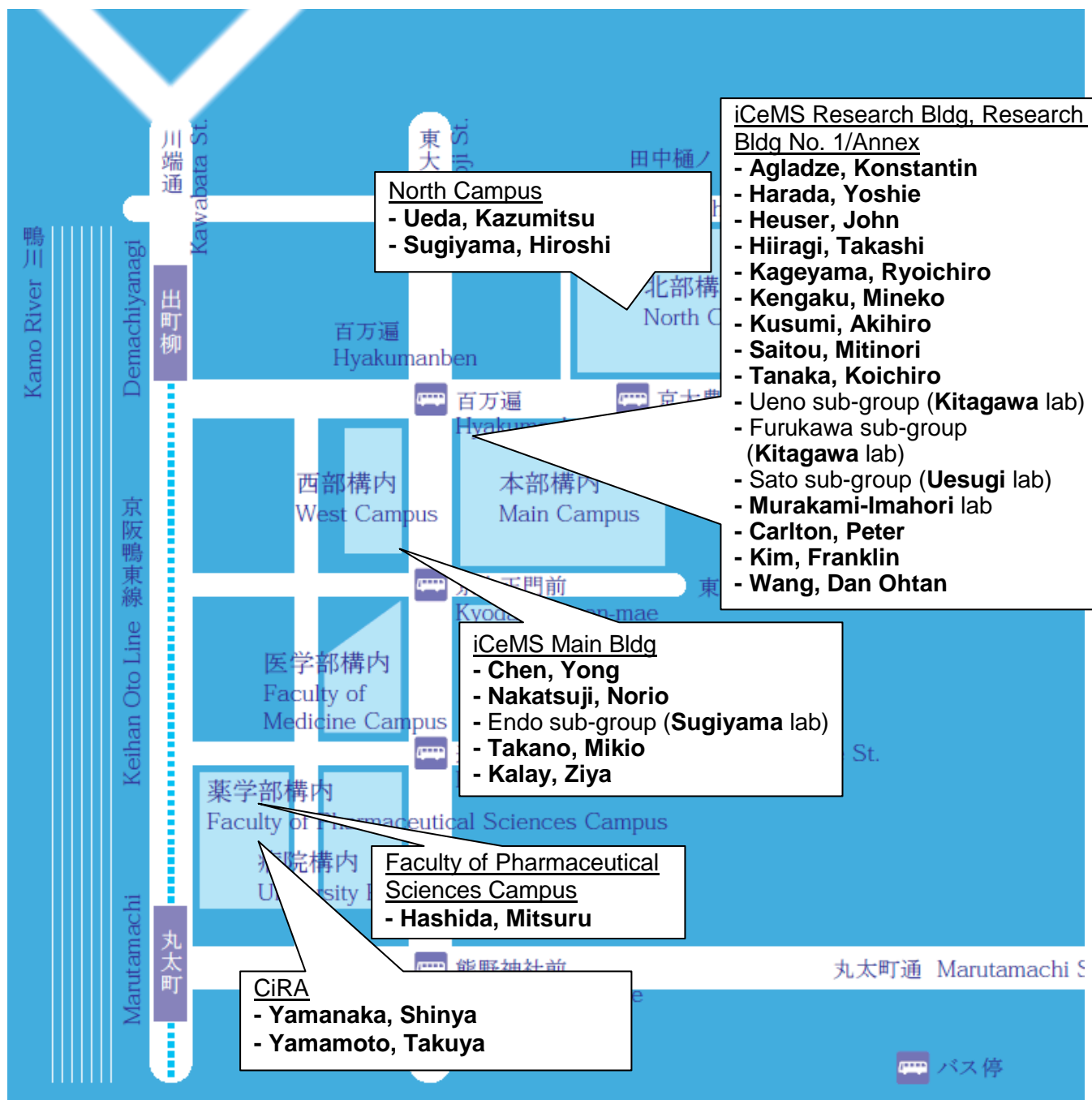


5. Campus Map

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



Yoshida Campus



6. FY2012 Project Expenditures (the exchange rate used: 1USD= 80JPY)

i) Overall project funding

(Exchange Rate: JPY/USD=80)

Ten thousand dollars

Cost Items	Details	Costs (10,000 dollars)
Personnel	Center director and Administrative director	41
	Principal investigators (no. of persons):16	225
	Other researchers (no. of persons):95	616
	Research support staffs (no. of persons):52	136
	Administrative staffs (no. of persons):22	119
	Total	1,137
Project activities	Gratuities and honoraria paid to invited principal investigators	0
	Cost of dispatching scientists (no. of persons):35	116
	Research startup cost (no. of persons):16	220
	Cost of satellite organizations (no. of satellite organizations):2	63
	Cost of international symposiums (no. of symposiums):3	8
	Rental fees for facilities	28
	Cost of consumables	109
	Cost of utilities	53
	Other costs	120
	Total	717
Travel	Domestic travel costs	9
	Overseas travel costs	25
	Travel and accommodations cost for invited scientists (no. of domestic scientists):44 (no. of overseas scientists):24	16
	Travel cost for scientists on secondment (no. of domestic scientists):7 (no. of overseas scientists):6	4
	Total	54
Equipment	Depreciation of buildings	156
	Depreciation of equipment	556
	Total	712
Other research projects	Projects supported by other government subsidies, etc.	39
	Commissioned research projects, etc.	980
	Grants-in-Aid for Scientific Research, etc.	394
	Total	1,413
Total		4,033

WPI grant	1,661
Costs of establishing and maintaining facilities	8
Others	8
Cost of equipment procured	101
Others	101

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	55
Project activities		3
Travel		4
Equipment		1
Other research projects		44
Total		107

FY2012 Visit Records of World Top-caliber Researchers from Abroad

Researchers Total: 42

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)
SILVERMAN, Michael ()	Associate Professor, Department of Biological Sciences, Simon Fraser University	PhD, Neuroscience		April 12, 2012 1 day	Short-term stay to give a seminar
IRA, Pastan (81)	Professor, National Cancer Institute, NIH (National Institute of Health)	MD, PhD, Molecular Biology	The prestigious international Antonio Feltrinelli Prize for Medicine	April 3-6, 2012 4 days	Short-term stay to give a seminar
LUTZ, Schmitt ()	Professor, Institute of Biochemistry, Heinrich Heine University Dusseldorf	PhD, Molecular Biology	Teaching awards of the Heinrich-Heine-University Düsseldorf (2008)	April 3-6, 2012 4 days	Short-term stay to give a seminar
LOHSE, Martin (56)	Chairman/Professor, Rudolf Virchow Center, University of Wurzburg	MD, PhD, Biophysics	Leibniz Award (1999)	April 4-5, 2012 2 days	Short-term stay to give a seminar
VALENTIN, Finn (65)	Professor/Director, Research Center of Biotech business, Research Center of Biotech business	MSc., Innovation & Management		May 14-16, 2012 3 days	Short-term stay to participate in an international workshop
JOLIVET, Eric Jeanregis (44)	Associate Professor, Assoc Professor, Toulouse University	PhD, Industrial Sociology & Economics		May 14-16, 2012 3 days	Short-term stay to participate in an international workshop
JOYDEEP, Goswami ()	President, Life Technologies Japan, Ltd	PhD, MBA, Chemical Engineering		May 17, 2012 1 day	Short-term stay to hold a meeting
XIE, Xiaoliang (50)	Professor, Department of Chemistry and Chemical Biology, Harvard University	PhD, Biophysics (Imaging)	Biophysical Society Founders Award (2012)/ E.O. Lawrence Award in Chemistry, U.S. Department of Energy (2009)	May 23, 2012 1 day	Short-term stay to give a seminar
CHEN, Chia-Chun ()	Professor, Department of Chemistry, National Taiwan Normal University and Institute of Atomic and Molecular Sciences, Academia Sinica	PhD, Nano-Chemistry	The Best Paper Award for Nanotech/ IAMS Annual Award for Outstanding Publication by a Research Fellow	June 25-26, 2012 2 days	Short-term stay to hold a seminar
LANGA DE LA PUENTE, Fernando (58)	University of Castilla-La Mancha, the Nanoscience, Nanotechnology and Molecular Materials Institute	PhD, Chemistry		July 9-11, 2012 3 days	Short-term stay to give a lecture at a symposium
LIPPINCOTT-SCHWA RTZ, Jennifer ()	Chief, National Institute of Child Health and Human Development, National Institute of Health	PhD, Cell Biology	Elected to the National Academy of Sciences (2008).	Aug 25, 2012 1 day	Short-term stay to give a seminar
TOOMRE, Derek ()	Associate Professor, Department of Cell Biology, Yale School of Medicine	PhD, Cell Biology	NIH Director New Innovator Award (2007) NIH Director New Innovator Award	Aug 25-30, 2012 6 days	Short-term stay to give a seminar

BLANCHARD, Scott ()	Associate Professor, Weill Medical College of Cornell University	PhD, Single-molecule Biophysics	James D. Watson Investigator Award (2006)/ Giannini Foundation Post-doctoral Fellow (2002)	Aug 26-Sep 3, 2012 9 days	Short-term stay to give a seminar
IKONEN, Elina ()	Professor, Institute of Biomedicine, Anatomy, University of Helsinki	PhD, Biochemistry		Aug 29, 2012 1 day	Short-term stay to give a seminar
JOHANSSON, Kai ()	Professor, Institute of Chemical Sciences and Engineering, Ecole Polytechnique Federale de Lausanne	PhD, Protein Chemistry	Prix APLE for the invention of the year (2003)/ Human Frontier Science Program Grant(2004)	Aug 29, 2012 1 day	Short-term stay to give a seminar
ANDERSON, Harry (49)	Professor, Department of Chemistry, University of Oxford	PhD, Chemistry	Tilden Prize(2012)	Sep 19, 2012 1 day	Short-term stay to give a seminar
VERNA, McErlane ()	Director, Commercial Operations International	PhD, Biotechnology	The Saltire Foundation Fellowship Program (2009)/ The Galen Pharmaceutical Prize (1999)	Sep 19, 2012 1 day	Short-term stay to give a seminar
WANG, Yuh-Lin ()	Distinguished Research Fellow, Institute of Atomic and Molecular Sciences, Academia Sinica	PhD, Functional Nonmaterial	Foundation for the Advancement of Outstanding Scholarship (2005~2010)/ Outstanding Nanotechnology Research Paper Award, Far Eastern Y. Z. Hsu Science and Technology Memorial Foundation, Taiwan (2002)	Sep 28, 2012 1 day	Short-term stay to give a seminar
ABRAHAM, Istvan M. (45)	Principal Investigator, Otago School of Medical Sciences, Otago School of Medical Sciences	MD, PhD, Neurobiology	University of Otago Research Grant (2009-2010)	Oct 1-Nov 1, 2012 32 days	Short-term stay to conduct a joint research
CHEETHAM, Anthony (66)	Professor, Department of Materials Science and Metallurgy, University of Cambridge	PhD, coordination chemistry	Elected a Fellow of the Royal Society/ Corday-Morgan Medal and Prize of Royal Society of Chemistry (1982)	Oct 9, 2012 1 day	Short-term stay to give a seminar
NIRUPAMA, Shevde ()	Senior Training Specialist, Primary & Stem Cells Division, Life Technologies Corporation	PhD, Bone Biology		Nov 28, 2012 1 day	Short-term stay to give a seminar
WILLNER, Itamar (66)	Professor, Institute of Chemistry, The Hebrew University of Jerusalem	PhD, Chemistry	EMET Prize in Chemistry (under the auspices of the Prime Minister of Israel) 2008/ Rothschild Prize in Chemistry 2008	Nov 19-25, 2012 1 day	Short-term stay to give a symposium
TKACHENKO, Nikolai ()	Professor, Department of Chemistry and Bioengineering, Tampere University of Technology	PhD, Physical Chemistry		Nov 19-21, 2012 3 days	Short-term stay to give a symposium
WANG, Ming-Wei ()	Professor, Shanghai Institute of Materia Medica, Chinese Academy of Sciences	PhD, Drug Discovery	The Shanghai 2002 First Prize in Science and Technology Advancement (2003)/ The National 2003 Second Prize in Science and Technology Advancement (2004)	Nov 9, 2012 1 day	Short-term stay to have a meeting
SCHURER, Orlando D. ()	Professor, Department of Pharmacological Sciences and Department of Chemistry, Stony Brook University	PhD, Mammalian DNA repair	NYSTAR Faculty Development Award (2005)/ EMBO Young Investigator Award (2001)	Nov 28-29, 2012 2 days	Short-term stay to give a seminar

DE CAMILLI, Pietro (45)	Professor, Howard Hughes Medical Institute, Yale University School of Medicine	MD, PhD, Neuroscience	Sir Bernard Katz Award by the Exocytosis and Endocytosis Subgroup of the Biophysical Society (2012)/ Javitz Neuroscience Investigator Award (2010)	Feb 5, 2013 1 day	Short-term stay to give a seminar
CHOQUET, Daniel (50)	Professor, Institute for Interdisciplinary Neuroscience, UMR 5297 CNRS-Université Bordeaux Segalen	PhD, Neuroscience	Silver Medal from the CNRS (2009)/ Grand prix de l'Académie des Sciences, prize of the CEA (2004)	Mar 17-20, 2013 4 days	Short term stay for the iCeMS Advisory Committee Meeting
SCHUTH, Ferdi (52)	Director, Max-Planck-Institute fuer Kohlenforschung	PhD, Energy, biomass conversion	Gottfried Wilhelm Leibniz Prize of the Deutsche Forschungsgemeinschaft (2003)/ Elected Vice-President of the Deutsche Forschungsgemeinschaft (German Research Foundation) (2007)	Mar 17-20, 2013 4 days	Short term stay for the iCeMS Advisory Committee Meeting
POEPELMEIER, Kenneth R. (63)	Professor, Department of Chemistry, Northwestern University	PhD, Chemistry	National Science Foundation Creativity Extension Award (2000-2002)/ Charles E. and Emma H. Morrison Professor of Chemistry (2010)	Mar 17-20, 2013 4 days	Short term stay for the iCeMS Advisory Committee Meeting
HAW, Mark D. (45)	Lecturer, Department of Chemical and Process Engineering, University of Strathclyde	PhD, Physics	Author of "Middle World: The Restless Heart of Matter and Life"	Mar 17-20, 2013 4 days	Short term stay for the iCeMS Advisory Committee Meeting
BAIRD, Barbara (61)	Horace White Professor and Chair, Baker Laboratory, Baker Laboratory	PhD, Biology	Fellow, American Academy of Arts and Sciences/ Horace White Professor of Chemistry	Mar 17-20, 2013 4 days	Short term stay for the iCeMS Advisory Committee Meeting
LEE, Eng-Hin (69)	Professor, Yong Loo Lin School of Medicine, National University of Singapore	MD, Mdicine	Best Scientific Paper Award by the Paediatric Orthopaedic Society of North America/ Executive Director of Biomedical Research Council at Agency for Science, Technology and Research	Mar 17-20, 2013 4 days	Short term stay for the iCeMS Advisory Committee Meeting
WATT, Fiona M. (57)	Director, Centre for Stem Cells and Regenerative Medicine, King's College London	PhD, Medicine	Royal Society Wolfson Research Merit Award (2011)/ Member, Academia Europaea	Mar 17-20, 2013 4 days	Short term stay for the iCeMS Advisory Committee Meeting
MOURITSEN, Ole(63)	Professor/Director, Department of Physics, Chemistry and Pharmacy, University of Southern Denmark	PhD, Biochemistry	British Royal Society of Chemistry Bourke Award/ Danish National Prize for Research Communication	Mar 15-17, 2013 3 days	Short-term stay to give a lecture at symposium
BITTMAN, Robert ()	Distinguished Professor, City University of New York, Queens College	PhD, Synthetic Chemistry	The NIH's prestigious MERIT Award/ Fellow of the American Association for the Advancement of Science	Mar 15-17, 2013 3 days	Short-term stay to give a lecture at symposium
GAUS, Katharina ()	Professor, Centre for Vascular Research, Lowy Cancer Research Centre, University of New South Wales	PhD, Cell Biology	The Young Investigator Award from the Australia and New Zealand Society for Cell and Developmental Biology (2010)/ The ARC Early Researcher Award (2005)	Mar 15-18, 2013 4 days	Short-term stay to give a lecture at symposium
CHO, Wanhwa ()	Distinguished Professor, Department of Chemistry, University of Illinois at Chicago	PhD, Biochemistry	Graduate Mentoring Award, University of Illinois (2009)/ Editorial Board, Progress in Lipid Research (2010-)	Mar 15-17, 2013 3 days	Short-term stay to give a lecture at symposium

RITCHIE, Ken ()	Associate Professor, Department of Physics, Purdue University	PhD, Biophysics		Mar 15-17, 2013 3 days	Short-term stay to give a lecture at symposium
PANG, Dai-Wen (52)	Professor, College of Chemistry and Molecular Sciences, Wuhan University	PhD, Biochemistry		Mar 15-17, 2013 3 days	Short-term stay to give a lecture at symposium
GROVES, Jay ()	Professor, Department of Chemistry, UC Berkeley	PhD, Biophysics	Nature Biotechnology Award for Outstanding/ LBNL Award for Excellence in Technology Transfer	Mar 16-17, 2013 2 days	Short-term stay to give a lecture at symposium
SUNAHARA, Roger ()	Associate Professor, University of Michigan Medical School	PhD, Biochemistry		Mar 16-17, 2013 2 days	Short-term stay to give a lecture at symposium
KENKRE, V.M. Nitant ()	Distinguished Professor, Department of Physics, University of New Mexico	PhD, Theoretical Biophysics		Mar 15-17, 2013 3 days	Short-term stay to give a lecture at symposium

State of Outreach Activities

- Using the table below, show the achievements of the Center's outreach activities in FY2012 (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 FY2012 resulting from press releases and reporting.

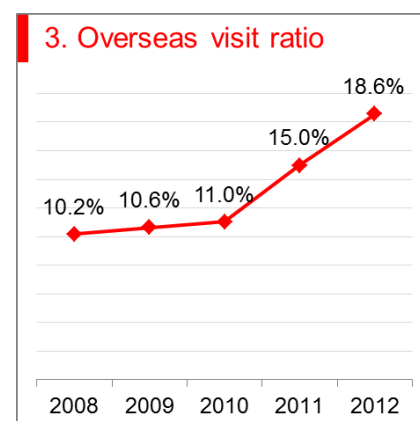
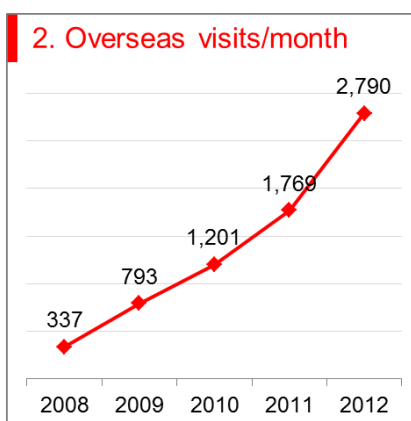
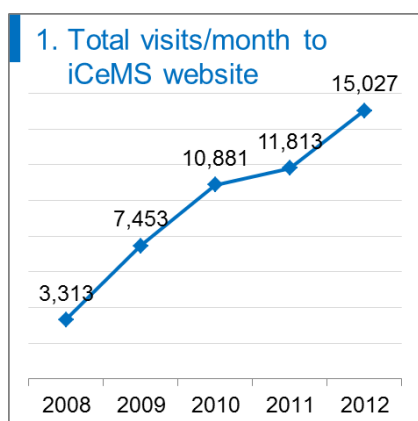
Activities	FY2012(number of activities, times held)
PR brochure, pamphlet	3
Lectures, seminars for general public	28
Teaching, experiments, training for primary and secondary school students	36
Science cafe	16
Open houses	0
Participating, exhibiting in events	13
Press releases	38

*Total number of media coverage: 1,165 times (domestic newspapers, magazines, TV and webpages)

Special Achievements: Raising international visibility

a) Web traffic analysis

The iCeMS website continued its fifth consecutive year of growth in traffic, up 454% from 3,313 visits per month in 2008 to 15,027 in 2012 (see chart 1). In a global perspective, access from overseas has increased for the fifth straight year, up 828% from 337 visits per month in 2008 to 2,790 in 2012 (see chart 2). The proportion of access from overseas is also on a continued rise (see chart 3), indicating an enhanced visibility of the iCeMS in the international community.



b) Social media utilization

To engage with a wider audience across the globe — younger generations of scientists in particular — iCeMS is also committed to utilizing social media, such as Twitter (from March 2011), YouTube (December 2011), and Facebook (March 2012). In particular Facebook has aided in raising iCeMS' visibility: the iCeMS Facebook page drove 1,912 visits to the iCeMS website in 2012. The page also garnered 11,559 views (the number of times iCeMS updates are seen by Facebook users) per month in 2012, reaching those in and outside of the iCeMS "fan base".

c) World Stem Cell Summit

The iCeMS was actively involved in co-organizing and participating in the 2012 World Stem Cell Summit, an event held in Florida, USA, that attracted 1,200 visitors from industry, academia, and government of 40

countries. Prof. Nakatsuji gave the plenary for the second year in a row to an audience, which included 170 experts in the stem cell and regenerative medicine fields. An iCeMS booth showcased stem cell technologies developed at iCeMS and attracted industry leaders interested in forging potential partnerships. Other iCeMS' members gave poster presentations and were part of the awards evaluation committee.

d) WPI-iCeMS showcased at Boston AAAS annual meeting

A team consisting of WPI centers' outreach officers (incl. iCeMS PR) and MEXT officers hosted a booth to present the WPI program, with a particular focus on its international, interdisciplinary nature, at the American Association for the Advancement of Science (AAAS) annual meeting in Boston, USA in February 2013. The Japan pavilion, of which the WPI booth was part, attracted over 1,100 visitors out of about 4,900 registered meeting attendees. The team also co-organized a workshop, entitled "Japan — your next career destination?" and held in collaboration with Riken and the University of Tsukuba, to draw young scientists' interest in the WPI centers' open, state-of-the-art research environment.

Future Plans:

The following planned events in the chart below will serve to:

1. Raise middle and high school students' scientific literacy
2. Have productive interaction with communities outside of the institute
3. Have scientists engage in outreach activities
4. Educate society on activities within the institute through mass media outlets

Date	Title	Activity	Target Audience	Objectives
June 2013	iCeMS Café #15	Science Café	General public	2. Productive interaction 3. Outreach activities
October 2013	iCeMS Café #16	Science Café	General public	2. Productive interaction 3. Outreach activities
November 2013	iCeMS/CiRA Classroom for high school teachers and journalists	Hands-on laboratory exercises on stem cells	High school teachers and journalists across Japan	2. Productive interaction 4. Educate Society
November 2013	iCeMS/CiRA Classroom for high school students	Hands-on laboratory exercises on stem cells	High school students across Japan	1. Scientific literacy 2. Productive interaction
December 2013	iCeMS/CiRA Classroom at a high school	Hands-on laboratory exercises on stem cells	High school students at Kyoto Prefectural Rakusai High school	1. Scientific literacy 2. Have productive interaction
December 21 or 22, 2013	Kyoto University Academic Day	Science dialogue	General public	2. Productive interaction 3. Outreach activities
January 2014	iCeMS Café #17	Science Café	General public	2. Productive interaction 3. Outreach activities

FY 2012 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 20, 2012	[newspaper] Nikkei (P. 10)	(Nakatsuji, Yamanaka) Advancing Alzheimer's drug discovery: ReprocCell, Kyoto U use human iPS cells to model the disease
2	Apr 30, 2012	[newspaper] Nikkei (P. 11)	(Kitagawa) Kyoto U develops cost effective materials for fuel cell electrolyte
3	May 9, 2012	[newspaper] Asahi Shimbun (P. 8)	(Nakatsuji, iCeMS) Kyoto U models ALS using embryonic stem cells
4	Jun 25, 2012	[newspaper] Nikkei Sangyo Shimbun (P. 11)	(Kitagawa) Kyoto U develops nano "screens" for high-speed formation of ethanol
5	Jul 23, 2012	[newspaper] Sankei Shimbun (P. 26)	(Suzuki) Possible understanding of signal transmission processes shed light on HIV/AIDS infection mechanism
6	Aug 30, 2012	[newspaper] Sankei Shimbun (P. 27)	(Kitagawa) Learning from a senior: 7 freshman Tonan HS students visit alum Kyoto U Prof. Kitagawa
7	Sep 13, 2012	[newspaper] Nikkan Kogyo Shimbun (P. 21)	(Nakatsuji, iCeMS) Kyoto U iCeMS to be first in Japan to cohost World Stem Cell Summit
8	Sep 30, 2012	[newspaper] Asahi Shimbun (P. 31)	(Yamanaka, Kitagawa) In hopes of liberal Kyoto U winning Nobel this fall, advanced research institutes hold the key
9	Oct 9, 2012	[newspaper] Mainichi Shimbun (P. 1)	(Yamanaka, iCeMS) Nobel prize in physiology or medicine goes to Shinya Yamanaka and British scientist
10	Oct 20, 2012	[TV] Kansai TV	(Murakami) Kyoto U finds way to kill cancer cells with carbon material
11	Oct 26, 2012	[TV] NHK	(Nakatsuji) With cheaper costs, cardiac cells can be made from iPS cells
12	Oct 30, 2012	[newspaper] Nikkei (P. 16)	(Kitagawa, Matsui) Kyoto U makes tiny machine that moves through water with emission force

No.	Date	Type media (e.g., newspaper, television)	Description
13	Nov 22, 2012	[newspaper] Yomiuri Shimbun (P. 18)	(iCeMS, SCG) HS students study iPS cells at Kyoto U
14	Nov 23, 2012	[newspaper] Sankei Shimbun (P. 25)	(iCeMS) Nipro and Kyoto U produce automated device for iPS mass production
15	Dec 1, 2012	[TV] NHK	(Nakatsuji, iCeMS) Reproduction of arrhythmia made possible with iPS cells
16	Dec 4, 2012	[TV] Fuji TV	(Nakatsuji) "2012 World Stem Cell Summit" begins
17	Dec 5, 2012	[newspaper] Nikkei (P. 42)	(Nakatsuji) Kyoto U and Osaka U mass-cultivate iPS cells, making more for less
18	Dec 24, 2012	[newspaper] Yomiuri Shimbun (P. 13)	(Tanaka, iCeMS) Kyoto U Shinagawa Seminar: Possible applications of terahertz waves in security and medical fields
19	Jan 15, 2013	[newspaper] Nikkei (P. 11)	(Kitagawa) Properties of Crystalline metal frameworks change with size, Kyoto U finds
20	Jan 30, 2013	[newspaper] Asahi Shimbun (P. 33)	(Yamanaka, Mizumachi, iCeMS) Play iPS cell game board and win Nobel prize
21	Feb 5, 2013	[TV] Yomiuri TV	(Nakatsuji) Development of the first-ever automated iPS cell analyzer
22	Feb 7, 2013	[newspaper] Kagaku Kogyo Nippou (P. 3)	(Kitagawa) Japanese wins first place Quadrant Award 2013
23	Feb 25, 2013	[web] Nikkei	(Kitagawa) Kyoto U makes high-functional resin with general materials by aligning order of polymers
24	Mar 12, 2013	[TV] ABC	(Ueda) First in world to reveal mechanism of high-density lipoprotein production
25	Mar 21, 2013	[TV] NHK World	(Nakatsuji) Generating iPS business