FY 2008 WPI Project Progress Report
World Premier International Research Center (WPI) Initiative

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

Summary of center project progress

1. Leadership and Management of iCeMS

The management of the iCeMS is featured with the strong leadership of its director. In order to assist him and strengthen his leadership, the institute has been seeking candidates for a full-time administrative director. An incumbent dean of a graduate school of Kyoto University is considered to be an excellent candidate who can play a key role of the interface between the academia and the administration with his academic background as well as the management skills exerted as a dean. The institute aspires that he will join the iCeMS in April 2009.

2. Recruitment of Principal Investigators and Researchers

As a result of active recruitment efforts, the iCeMS is now consisted of 17 principal investigators (PIs), and 89 other researchers totaling to106. Among them, 15 are from abroad and 26 are female.

3. Recruitment of the iCeMS Fellows

The iCeMS has started to seek actively candidates for the iCeMS Fellows, which is to support top-level young scientists as independent researchers for 5 years. Several candidates are being invited for interviews and the selection process is now under way.

4. Administration

The operations of the administrative office have been expanded to include public relations as well as intellectual properties. Several staff members have been appointed for these special tasks.

5. Buildings and Facilities

The renovation of the Research Building 1 was completed in September 2008, allowing some of the PIs joining the iCeMS from outside to set up their labs in this state-of-the-art research environment. The renovation and the construction of other buildings are underway.

6. Center for iPS Cell Research and Application (CiRA)

Supported by grants from multiple sources as well as the iCeMS basic funds, the CiRA has made a jump start of its research activities. Kyoto University has established iPS Academia Japan, Inc. as a strategic organization to manage intellectual properties related to iPS cell research. In addition, the CiRA has hired an experienced executive from the industry sector to head its Research Strategy Division and develop close relationships with the industry.

7. Strategies to promote cross-disciplinary research at the iCeMS

1) To hold an hour-long cross-disciplinary meeting every two weeks to seek the possibilities of interdisciplinary collaboration among PI groups.
2) To give priority to the recruitment of researchers suitable for the advance of cross-disciplinary research.
3) To launch the Exploratory Grants for junior investigators to start new cross-disciplinary collaboration.
4) To build common laboratories and open offices to promote interaction among research groups.
5) To introduce Lab-Next-Door System, a video conference system to facilitate communication among laboratories located in remote places including the PIs holding another laboratory overseas.
6) To initiate “Cross-Disciplinary Journal Club” within the “iCeMS Web Room” on the Intranet, where the PIs and other researchers can exchange their ideas on interesting cross-disciplinary research papers posted on the site for possible collaboration.

8. International Activities

1) The 2nd and the 3rd iCeMS International Symposia were held in June 2008, and in January 2009, respectively.
2) Relationship building with its international partners is underway.
   1. Held a CNSI/iCeMS workshop (CNSI: California NanoSystems Institute, UCLA) in September 2008 in Tokyo.
   2. Visited the CNSI and Max Planck Institute of Molecular Cell Biology and Genetics.
3) Numerous visits by non-Japanese researchers to the iCeMS as well as invitations to international meetings made to the iCeMS researchers.

9. Science Communication Program

The iCeMS has appointed Dr. Kazuto Kato, Assoc. Prof. of Kyoto University's Institute for Research in Humanities as an adjunct assoc. professor of the iCeMS to head its Science Communication Group. The group has held Science Café five times successfully.

1. Summary of center project

<Initial plan>

We will accumulate a critical mass of leading scientists for the symbiotic integration of material and cell sciences (focusing on mouse and monkey pluripotent stem cells), based on the notion that the fundamental understanding and control of molecular complexes in the meso-scale of 10-100 nm is critical for creating the science and technology of the next generation. We will achieve this goal by taking cross-disciplinary approaches, with the following inter-related targets. For basic science:
1) New Chemistry/Physics of Meso-Space 2) Cellular meso-biophysics; and 3) Stem-cell-differentiation meso-engineering. We will contribute to human wellness by developing A) environmentally-friendly chemical reaction systems, by developing new methods of material conversion (chemical reaction), separation, and storage B) drug-synthesis/controlled-release microvessels working in the body, and C) regenerative medicine based on regulated cell-material complexes.

<Results/progress/alternations from initial plan>

As for the three interdisciplinary research areas: 1) New Chemistry/Physics of Meso-Space, 2) Cellular Meso-Biophysics and 3) Stem-Cell Control Meso-Engineering, preliminary operations for collaborative researches are now in progress with intensive efforts by researchers of the iCeMS. Also, the iCeMS aims at applications for human wellness.

As for the target of stem-cell differentiation meso-engineering and its application for “regenerative medicine based on regulated cell-material complexes,” we set the first goal of “Regenerative Medicine by Controlling Stem Cells with Smart Materials.”

In November 2007, Professor Shinya Yamanaka, a Principal Investigator of the iCeMS, succeeded in generating human induced pluripotent stem (iPS) cells, which could complement the use of embryonic stem (ES) cells, greatly advancing regenerative medicine (one of the most important targets has been achieved).

The Center for iPS Cell Research and Application (CiRA) was established as an affiliate body of the iCeMS in FY 2007. Here, the research for the clinical application will be advanced as well as the basic research of the iPS cells, with thorough measures for the center infrastructure being launched.

Concern about the energy, environment and natural resources is dramatically increasing these days. As for the target of chemistry in nano-meso space and its application for “Environmentally-friendly chemical reaction systems by developing new methods of material conversion (chemical reaction), separation and storage,” the iCeMS has increased its effort to realize the goal by encouraging cross-disciplinary collaboration in this field.

In addition, the renovation and the construction of research buildings are underway. With the renovation of the first laboratory building completed, researchers are now able to work together literally side by side in this building. With more facilities completed, the iCeMS will be ready to become a full-fledged research center and invite more researchers to join in.

2. Research fields

<Initial plan>

An interdisciplinary research field, spanning Biosciences, Chemistry, Material Sciences, and Physics (selected from the provided list of fields).
The scientific direction of this proposed Institute was conceived based on TWO KEY CONCEPTS. They are MESO-SPACE and STEM CELLS.

(1) Meso-space is the space of 10-100 nm. Between the two well-walked lands of bulk- and nano-spaces, there is the vast unexplored field of meso-space. However, we can find fledgling developments there in various branches of science. The cooperative structural changes of porous coordination polymers present good examples. Many key functions of the cell, such as transcription (mRNA synthesis using a DNA template) and signaling, are achieved by large molecular complexes of 10-100 nm, rather than simple bimolecular collisions. In this Institute, we will develop a fundamental understanding and control of the key molecular (weakly cooperative) interactions occurring in the meso-space, throughout cellular, chemical, physical, and materials sciences. By taking interdisciplinary approaches, we will establish a unified view of the molecular interactions in the meso-space in all of these fields, and will develop a variety of unprecedented technologies based on the meso-scale interactions.

(2) Mouse and monkey pluripotent STEM CELLS will be used as an important paradigm of the cell throughout the research in this Institute. A unified cellular paradigm is critical for fostering the collaborative research by investigators with various backgrounds. This would enable the application to regenerative medicine using human embryonic stem (ES) cells.

Kyoto University has been known worldwide for its excellence in both material and cell sciences. Physics and chemistry-related departments have produced four Nobel Laureates, and the times cited for Chemistry of Kyoto University was fourth in the world and first in Japan in 2006. Its Institute for Frontier Medical Sciences is a strong world leader in pluripotent stem cell research. Many faculty members of Kyoto University are active leaders in the forefront of such scientific integration, and thus will enable a critical mass of researchers to establish an ideal research environment.

<Results/progress/alternations from initial plan>

There has been no major modification of the initial plan, except for the following achievement: by the strong leadership of the director, the Center for iPS Cell Research and Application (CiRA) was established as an affiliate body of the iCeMS in FY 2007, making giant steps toward enabling the application in regenerative medicine using human stem cells.

Discussions and plans are in progress to achieve the goal stated in the initial plan of advancing interdisciplinary studies.

Cross-disciplinary research across the following scientific fields, as stated in the application, are being prepared or have been started.

A. Stem-Cell Control Meso-Engineering

B. Cellular Meso-Biophysics

C. New Chemistry/Physics of Meso-Space

3. Research objectives

<Initial plan>	<Results/progress/alternations from initial plan>
The same as those described in the “Project Summary” and “Research fields”	The institute is making the following efforts to promote cross-disciplinary research fields, including "Stem-Cell Control Meso-Engineering", "Cellular Meso-Biophysics", and "New Chemistry/Physics of Meso-Space": By the fiscal year 2010, the iCeMS will have developed a floor space of approximately 11,000 m^2 for research and experiments, designed to promote the integration of biological, chemical, and physical studies. Laboratories and offices will be shared to facilitate communication and interaction among research groups from different fields. Common-use laboratory areas, accounting for 41% of the total room space, include common-use/shared laboratories, advanced equipment laboratories in collaboration with leading research instrument companies, and common-use equipment rooms. Priority is given, in terms of personnel costs and other resources, to researchers who are suitable for advancing interdisciplinary research. In order to facilitate communication among researchers from different fields and promote cross-disciplinary research, a PI group makes a presentation followed by an ample discussion at a cross-disciplinary seminar every other Wednesday. Also the institute started a new initiative, called the “Cross-Disciplinary Journal Club” within the “iCeMS Web Room” on the Intranet, where the PIs and other researchers can exchange their ideas on interesting cross-disciplinary research papers posted on the site for possible collaboration across the fields. To enhance daily interactions, the institute introduced the Lab-Next-Door System, a video conference system available at all times to iCeMS researchers around the world. Personal interaction is to be further encouraged in lounge areas in the main building of the iCeMS Complex 1, which will serve as the headquarters. The Exploratory Grant for junior investigators to start new cross-disciplinary collaboration is set to be launched FY2009.

4. Management

<Initial plan>
1) Composition of administrative staff
An Administrative Director and a Deputy-Director, together with an administrative staff (approximately 27 people) will be hired. One of the Directors should have impeccable experience in international scientific collaboration matters, whereas the other should know how administrative business is carried out in a Japanese national university, thus complementing each other. Six administrative sections will be created, to be in charge of General Affairs (including Personnel and Public Relations), Planning and Industry Liaison, Finance, Research Support and Intellectual Property, Facilities (Physical Plant), and Research Ethics and Safety. All sections will have at least two staff members who are fluent in English.
For the qualifications of such administrative leaders, firstly, she/he needs to be familiar with university administrative matters, including those of Kyoto University, and to be able to plan and create new directions in the administration of this new Institute. On the other hand, she/he must have impeccable experience in international scientific collaboration matters. An especially close connection with the administrative headquarters of Kyoto University will be strongly required during the initial establishment of the center. Thus, the Director of Research Promotion of the Kyoto University Administration Bureau will be designated as the Administrative Director, and the Deputy Director will be recruited from a younger member of the career staff of JSPS (Japan Society for Promotion of Science) overseas center in Europe, for the above-mentioned necessity.

<Results/progress/alternations from initial plan>
1) Composition of the administration:
- One Administrative Director
- One Deputy Administrative Director
- One Assistant Administrative Director

General Affairs Section:
- One Section Leader
- Three staff members

International Public Relations Office (as part of General Affairs Sec.):
- One Office Chief
- Two staff members

Finance Section (Intellectual Property Management included):
- One Section Leader
- Eight staff members

CiRA Support Office
- One Deputy Administrative Director (Head of the office)

General Affairs Section:
- One Section Leader
- Two staff members

Research Network Coordination Section:
- One Section Leader

Finance Section
- One Section Leader
- Four staff members

Contract Administration Section:
- One Section Leader

As the number of researchers increases, the Administration will be expanded

	in the future. Regarding the qualifications for the administrative director and deputy administrative director mentioned in the iCeMS' application, the incumbent deputy administrative director possesses ample knowledge of how the administration works at national universities in Japan. Therefore, the institute has decided to search for a new full-time administrative director with considerable experiences in international scientific collaboration matters and as the interface between the academia and the administration, so that they can support the director in a full scope of the management of the iCeMS, while complementing each other.
2) Decision-making system The Director is responsible for all aspects of running the Institute, with the aid of the Deputy Director as well as the Administrative Director. A Steering Committee, which advises the Director, will consist of both scientists and non-scientists from within and outside Kyoto University, and will gather twice a year regularly, and accordingly upon the Director's request. The Core Committee Meeting of the Principal Investigators will provide scientific advice.	<u>2) Decision-making system</u> In FY 2007, as an autonomous and independent management system to ensure the institute's autonomy and the director's leadership in making decisions regarding the institute's overall operation, the Board Committee consisting of the director, the deputy director, the chairman of the PI Committee and the administrative director was established. The Board Committee plays a role equivalent to that of a faculty board in deliberating on important matters (personnel, budget, etc.). In addition, the PI Committee was also organized as an advisory body for the director on research/education matters. The same management system has been maintained in FY 2008.
3) Allocation of authority between center director and host institution In the organizational structure of Kyoto University, this Institute will occupy a special position, freed from many binding rules of the classical Japanese university archetype, to present a future-model of a highly authorized research institute not only to Kyoto University but also throughout Japan and to the world. For this purpose, flexible rules of a new paradigm, as for the relationships with the university headquarters, the salary levels and deserved special bonuses, and the reduced duties in various committees and undergraduate education, will be created. These rules will be applied as a basis and model for the foundation of other research institutes within Kyoto University in the future. The Director will report directly to the President of Kyoto University and the Member of Executive Board in charge of research, but the Institute will basically be run autonomously.	<u>3) Allocation of authority between center director and host institution</u> In FY 2007, as for the personnel affairs, job title categories for program specific professors and other academic staffers were newly created (e.g. Program-Specific Research Center Professor, etc.) so that the director could decide on their salaries. In addition, the "iCeMS Incentive" was introduced, on which the director decides as well. In consideration of the mission of the iCeMS as a WPI research center, Kyoto University decided that duties on researchers of the iCeMS, such as membership of various committees of Kyoto University, shall be as reduced as possible.

5. Researchers and center staffs

i) “Core” to be established within host institution

Principal investigators

	At beginning	Planned for end of FY 2007	Final goal (Date: month, year)	Results at end of FY 2007	Results at end of FY 2008
Researchers from within host institution	12	12	13	9	11
Foreign researchers invited from abroad	0	4	5	2	3
Researchers invited from other Japanese institutions	2	3	3	2	3
Total principal investigators	14	19	21	13	17

All members

	At beginning	Planned for end of FY 2007	Final goal (Date: month, year)	Results at end of FY 2007	Results at end of FY 2008
Researchers <Number of foreign researchers among them and their percentage> [Number of female researchers among them and their percentage]	70 < 10, 15%>	111 < 29, 27%>	171 < 52, 31%>	24 <2,9%> [3,13%]	90 <16,18%> [15,17 %]
Principal investigators <Number of foreign researchers among them and their percentage> [Number of female researchers among them and their percentage]	14 < 0, 0%>	19 < 4, 22%>	21 < 5, 24%>	13 <2,16%> [1,8%]	17 <2,12%> [2,12%]
Other researchers <Number of foreign researchers among them and their percentage> [Number of female researchers among them and their percentage]	56 <10, 18%>	92 < 25, 28%>	150 < 48, 32%>	11 <0,0%> [2,19 %]	73 <14,20%> [13,18%]
Research support staffs	45	53	59	7	43
Administrative staffs	27	29	29	18	19
Total	142	193	259	49	152

All members (CiRA)

	At beginning	Planned for end of FY 2007	Final goal (Date: month, year)	Results at end of FY 2007	Results at end of FY 2008
Researchers <Number of foreign researchers among them and their percentage> [Number of female researchers among them and their percentage]	-	-	-	-	31 <2,7%> [10,33%]
Principal investigators <Number of foreign researchers among them and their percentage> [Number of female researchers among them and their percentage]	-	-	-	-	-
Other researchers <Number of foreign researchers among them and their percentage> [Number of female researchers among them and their percentage]	-	-	-	-	-
Research support staffs	-	-	-	-	25
Administrative staffs	-	-	-	-	12
Total	-	-	-	-	68

ii) Satellites <Initial plan> <u>Institution (1)</u> <u>Faculty of Applied Biological Sciences, Gifu University</u> -Role Collaboration and instruction between glycol-technology and stem cell biology -Personnel composition and structure A PI -Collaborative framework In relation to the chemical reaction between: - cells and cells - cells and air quality	<Results/progress/alternations from initial plan> <u>Institution (1)</u> <u>Faculty of Applied Biological Sciences, Gifu University</u> -Role No change -Personnel composition and structure One principal investigator, one associate professor, three researchers, and one assistant technical staff member -Collaborative framework No Change
iii) Partner institutions <Initial plan> <u>Institution (1)</u> <u>Bionanotechnology Interdisciplinary Research Centre, the University of Oxford</u> - Role Collaborative research on DNA-based nano-meso technology -Personnel composition and structure Prof. John Ryan -Collaborative framework Academic exchanges of ideas, samples, PIs, postdocs, and graduate students	<Results/progress/alternations from initial plan> <u>Institution (1)</u> <u>Bionanotechnology Interdisciplinary Research Centre, the University of Oxford</u> -Role: Collaborative research on the structure-function of G-protein-coupled receptors. The initial target of the research is shifted due to the changes of the research directions of the main collaborators at Oxford University. -Personnel composition and structure: Profs. John Ryan, Anthony Watts, and Simon Davis -Collaborative framework: Academic exchanges of ideas, samples, PIs, postdocs, and graduate students. -Progress made in FY2008: Prof. Aki Kusumi was invited to a scientific symposium on Nanobiotechnology held at Oxford University, where Profs. John Ryan and Anthony Watts, our major collaborators, played key roles. In September 2008, Profs. Watts and Kusumi discussed future exchange programs, and agreed to have more exchanges at the level of graduate students and postdocs. The basic concept here is that if we start the exchanges for young scientists now, in 5-10 years, some of those who take part in the exchange program are likely to become

	key people for advancing science as well as exchanges between Kyoto and Oxford, and our ties would become much stronger than now. Therefore, this is a long-term plan, which should be given constant attention by both parties. In addition, Prof. Simon Davis, who is also associated with the Bionanotechnology Interdisciplinary Research Centre of the University of Oxford, now collaborates with us in the project of single-molecule nano-tracking of several G-protein-coupled receptors (GPCRs) and T-cell receptor-related proteins. This is based on our previous agreement made on February 18, 2008 that we will initiate the exchange program by working on the structure-function studies of GPCRs, using NMR, AFM, single-molecule tracking as well as technologies handling stem cells.
Institution (2) Wellcome Trust Centre for Stem Cell Research, The University of Cambridge - Role Research collaboration in interdisciplinary stem cell biology studies -Personnel composition and structure -Collaborative framework Joint research and academic interaction including the professors, postdocs and graduate students visiting one another	Institution (2) Wellcome Trust Centre for Stem Cell Research, The University of Cambridge Professor Fiona Watt, the Deputy Director of the center, has joined as an Advisory Committee member of the institute. She was recently elected to be the president of the International Society for Stem Cell Research. Discussions are planned on how to promote cooperative research in the future.
Institution(3) National Centre for Biological Sciences (NCBS), Bangalore, India - Role Collaborative research on membrane meso-domains -Personnel composition and structure Profs. Satyajit Mayor and K. VijayRaghavan -Collaborative framework Academic exchanges of ideas, samples, PIs, postdocs, and graduate students. Co-sponsoring meetings and symposia.	Institution (3) National Centre for Biological Sciences (NCBS), Bangalore, India -Role: Collaborative research on membrane meso-domains -Personnel composition and structure: Profs. Satyajit Mayor, Madan Rao, and K. VijayRaghavan -Collaborative framework: Academic exchanges of ideas, samples, PIs, postdocs, and graduate students. Co-sponsoring meetings and symposia. -Progress made in FY2008: Dr. Rahul Chadda, who obtained Ph. D. under the guidance of Prof. Satyajit Mayor, a key person in this partner institution, joined iCeMS in May 2008 as a postdoctoral fellow. He is now engaged in a project of forming micron-scale

	membrane domains, based on the nano-meso domains in the plasma membrane, in order to investigate the physical properties of nano-meso domains in the plasma membrane. Understanding membrane meso-domains is the key target of the collaborative research between NCBS and iCeMS. Meanwhile, a few visits of Prof. Satyajit Mayor to iCeMS are being planned, but are likely to take place in May 2009 or later.
Institution(4) Max Planck Institute for Molecular Cell Biology and Genetics -Role: Collaborative research on vesicular-transport meso-complexes -Personnel composition and structure: Prof. Kai Simons -Collaborative framework: Academic exchanges of ideas, samples, PIs, postdocs, and graduate students	Institution(4) Max Planck Institute for Molecular Cell Biology and Genetics (MPI-CBG) -Role: Collaborative research on vesicular-transport meso-complexes -Personnel composition and structure: We agreed to include many more PIs from both institutions. In addition to Prof. Kai Simons and Prof. Wieland Huttner, Profs. Mario Zerial and Jonathan Jones will join in this collaborative effort. -Collaborative framework: Academic exchanges of ideas, samples, PIs, postdocs, and graduate students -Progress made in FY2008: To continue our first discussion of the collaborative efforts between these two institutes, which took place at the iCeMS, when Profs. Kai Simons and Wieland Huttner visited iCeMS on February 19, 2008, Prof. Kusumi visited MPI-CBG between November 10 and 12, and discussed collaborative directions covering many overlapping areas of iCeMS and MPI-CBG: vesicular-transport meso-complexes, protein cluster functions in cells during tissue development, and nanobiotechnology. We agreed that we will encourage our Ph. D. students to go to the other institute to do postdocs. As our first effort in this direction, Mr. Martin Loose, a graduate student in their affiliated graduate program, was invited to iCeMS on December 5 – 8, for a seminar and personal discussions, as a candidate for the superpostdoc position. In addition, Profs. Simons and Huttner gave us a variety of important and useful suggestions for running a multi-disciplinary research institutes and establishing international reputations. (1) In addition to having strong core groups, increasing ties with research groups in nearby institutes and departments is important for greater development of research. (2) For establishing international reputation, having its own graduate program and collecting students internationally are keys. MPI-CBG now has 40% of its

	graduate students from outside Germany, and this could not have occurred if it had not had its own graduate program and a strong will to make the place an internationally renowned place for both researchers and graduate students. (3) For having such a students' demography, it is mandatory to educate the support staff so that they can manage in English, and to force students to write all of the e-mail communications in English. At MPI-CBG, they prohibit the use of other languages but English by students. In February 2009, a delegation from the iCeMS consisting of its PIs and administrative staff visited MPI-CBG to discuss the following agenda: - Conceptual aspects for founding and running the institute - Measures to attract highly qualified foreign researchers both at the level of principal investigators, junior faculty members, and postdocs, graduate students - Graduate programs - Structure and operations of the administration - Budgets (funding and expenditures)
Institution(5) California NanoSystems Institute, UCLA -Role While PCPs (PCP: porous coordination polymer) are mainly constructed by coordination bonds, zeolites are dominated by ionic bonds and activated carbon by covalent bonds. The advantage of the latter chemical bond types is stability against thermal and mechanical stimuli, which is important for industrial applications. Therefore, Kitagawa PI's and Yaghi's groups develop synthetic methods of new materials, which are characterized by covalent organic frameworks with porous crystalline forms constructed solely from light elements (H, B, C, N, and O), and discover new type of functions including sensing, trapping, and conversion of molecules as catalysts, which perform even in biological environment. -Personnel composition and structure Yaghi and coworkers will continue to create these materials while Kitagawa and coworkers plan to explore the functions of such novel porous compounds. Both leaders will allocate at least one postdoctoral fellow to this project. -Collaborative framework New PCPs will be prepared in Yaghi's group, CNSI while the function is	Institution(5) California NanoSystems Institute, UCLA (CNSI) In November 2008, PI Susumu Kitagawa's group visited the Yaghi Laboratory of CNSI to obtain information on COF (Covalent Organic Framework) synthesis methods and PCP (Porous Coordination Polymer) (Metal-Organic Framework) on which Yaghi et al. has been working. Based on the information, the PI group started to develop COF and PCP in vivo.

designed and the materials are prepared by Kitagawa's group. Kitagawa PI hires at least one post doctoral fellow for the purpose. They keep the further close and enduring relationship by an internet communication and organize a on-site meetig in either Kyoto or Los Angels in every year. Institution(6) Membrane Center, Purdue University - Role Collaborative research of on-chip membrane technology -Personnel composition and structure Prof. Ken Ritchie -Collaborative framework Academic exchanges of ideas, samples, PIs, postdocs, and graduate students	Institution(6) Membrane Center, Purdue University -Role: Collaborative research of on-chip membrane technology -Personnel composition and structure Prof. Ken Ritchie -Collaborative framework: Academic exchanges of ideas, samples, PIs, postdocs, and graduate students -Progress made in FY2008: Prof. Ken Ritchie is a physicist, and is interested in collaborating with us for the development of nano-meso technologies that could be applied to studying and regulating the embryonic as well as induced pluripotent stem cells, by working on their plasma membranes. Prof. Ritchie participated in the Third iCeMS International Symposium on January 27 and 28. We had in-depth discussions with him during his stay in Kyoto.
Institution(7) The Center for Developmental Biology, RIKEN - Role Research collaboration between developmental biology and stem cell biology -Personnel composition and structure -Collaborative framework Joint research and academic interaction among the professors, postdocs and graduate students	Institution(7) The Center for Developmental Biology, RIKEN In collaboration with the CDB, RIKEN, workshops were organized to promote iPS cell research. Since FY 2008, the CiRA has been engaged in research exchange as one of four centers selected for the MEXT's "Project for Realization of Regenerative Medicine"" along with the CDB.

6. Summary of center's research environment

<Initial plan>	<Results/progress/alternations from initial plan>
1) Environment in which researchers can devote themselves to their research The Board Committee, consisting of the director, deputy director and administrative director, is to be formed and to be engaged in the general management of the institute. Six administrative sections will be created, to be in charge of General Affairs (including Personnel and Public Relations), Planning and Industry Liaison, Finance, Research Support and Intellectual Property, Facilities (Physical Plant), and Research Ethics and Safety. All sections will have at least two staff members who are fluent in English. Researchers are exempt from administrative tasks. The PI Board is engaged in only research-related tasks. Two secretaries are to be assigned to each PI group.	1) Environment in which researchers can devote themselves to their research As of FY 2008, the iCeMS has 19 administrative staffers and 40 research support staff members. The CiRA has 11 administrative staffers and 19 research support staff members. The Research Strategy Division of the CiRA is responsible for the management of intellectual property and public relations around the world. Since the establishment of the institute, in accordance with the purpose of the World Premier International Research Center (WPI) Initiative, researchers of the institute have been allowed to focus on research activities, exempt from the management tasks of the university with support from Administration Bureau of the Kyoto University.
2) Start-up research funding In addition to general support, PIs joining outside of Kyoto University will be provided with annual financial support as a start-up fund ranging from US$300,000 to US$1,000,000 for two years for the purchase of research equipment and other office supplies. Laboratory space will be renovated and equipped with basic research facilities.	2) Start-up research funding PIs joining from outside of Kyoto University were provided with 10,000,000 to 50,000,000 yen as a start-up fund from the program's expense and budget provided by the university. The priority was given to these PIs moving into the newly renovated first laboratory building. Junior investigators initiating the cross-disciplinary research receive the Exploratory Grants. They are supposed to yield concrete results within a year or two using these start-up funds to apply for external grants.
3) Postdoctoral positions through open international solicitations Researcher posts at the iCeMS are classified into principal investigators, associate professors, assistant professors and post-doctoral fellows. These posts are to be advertised internationally through every possible means such as advertisement on prominent magazines such as "Nature" and "Science."	3) Postdoctoral positions through international advertisement and solicitations Job advertisements were placed on the iCeMS website and international scientific media, such as Nature, Science, etc. The iCeMS is accepting applications from around the world. In FY 2008, there were 54 applications including 12 from abroad. The iCeMS now consists of 89 researchers besides its PIs, 13 of which are non-Japanese. On top of that, the institute is considering actively accepting researchers recommended by its partner institutes across the globe.

4) Administrative personnel who can facilitate the use of English in the work process English is to be used as the official language to form English-language administration.	4) Administrative personnel who can facilitate the use of English in the work process Since FY 2007, nine fluent English-speakers have been hired and allotted in the administration so English can be used to facilitate the work processes.
5) Rigorous system for evaluating research and system of merit-based compensation Interim evaluations are to be conducted by the external committee chosen from home and abroad in 3, 5, 8 and 10 years, and a merit-based pay system is to be employed.	5) Rigorous system for evaluating research and system of merit-based compensation The "iCeMS Incentive," which can be offered depending on academic achievements, has been introduced and implemented. (up to 300,000 yen per month) In FY 2008, the Advisory Committee consisting of ten experts, seven of which are non-Japanese researchers, was organized. The institute will hold the first advisory committee meeting in May 2009.
6) Equipment and facilities, including laboratory space, appropriate to a top world-level research center Laboratories, lounges and equipment suitable for a World Premiere International Research Center are to be prepared In iCeMS research buildings, walls among different research groups are to be removed and many laboratories are to be shared by several research groups, which is expected to encourage the interaction of the different research groups on a daily basis.	6) Equipment and facilities, including laboratory space, appropriate to a top world-level research center In FY 2007, the reform of the institute's buildings started. In September 2008, the renovation of the first research building (iCeMS Complex 2) was completed, with a floor space of 2,390 m^2. By March 2009, the renovation of the iCeMS headquarters building (iCeMS Complex 1) with a floor space of 4,802 m^2 will have been finished. By June 2009, 534 m^2 of research space for the iCeMS will be added adjacent to the first research building In June 2010, a new building (3,000 m^2) is scheduled to be completed. Another new building of 12,000 m^2 is due to be completed in February 2010 as research space for the CiRA. Those iCeMS' buildings, in which PI groups are not separated by walls, are designed to promote cross-disciplinary research, and encourage researchers to communicate and interact with each other across various research fields.

	For the same purpose, the new building has many equipment rooms and laboratories to be shared by researchers from a variety of fields. As an initial example, a spacious open office has been built accommodating six groups, including the PIs, engaged in cross-disciplinary studies in the Research Building 1. The concept of this design is in line with the standards set by the world-class research centers. To enhance interaction between researchers of the institute, a cozy lounge area is being built in the Complex 1 and distant laboratories are connected by the Lab-Next-Door System, a video conference system available at all times to iCeMS researchers while the iCeMS Web Room caters to virtual interaction.
7) International research conferences or symposiums held regularly to bring world's leading researchers together In order to encourage the useful interaction between world top-notch researchers and researchers of the iCeMS, international research symposia are to be held periodically at least twice a year. Themes of these symposia are to be comprehensive as well as concrete.	7) International research conferences or symposiums held regularly to bring world's leading researchers together The 2nd iCeMS International Symposium was held from June 22 to 27, 2008, under the theme: "Excitonic Processes in Condensed Matter", attended by approximately 190 researchers including twenty guest lecturers from abroad. The 3rd iCeMS International Symposium was held from January 27 to 28, 2009 inviting twelve non-Japanese guest lecturers from abroad under the theme: "Meso-Control, of the Cells, by the Cells, for the Cells, featuring membrane transportsomes."
8) Other measures, if any	8) Other measures, if any In 2008, with the aim of promoting cross-disciplinary research at the institute, a total of nine "iCeMS Cross-disciplinary Seminars" were held by its principal investigators. In the same year, eight "iCeMS Seminars" were organized, inviting eminent researchers from around the world -- primarily abroad. In FY 2008, the "iCeMS Cafe", designed to provide an opportunity for iCeMS' researchers to enhance their "Science Communication" skills with the public, was held four times under the themes: "See the Unseen," "Transport - Discriminate Need and Uneed," "Chemical Tools for Exploration of Biology" and "Shapes in the Brain." The iCeMS website was relaunched in January 2009, contributing to the enhanced global visibility of the iCeMS.

7. Criteria and methods used to evaluate center's global standing	
<Initial plan> The iCeMS will form the international evaluation committee to assess whether: 1. researchers are individually achieve world-class research 2. joint-research between the PIs are making progress 3. the administration and support system for researchers are sufficiently functioning as an international center	<Current assessment> 1. Principal Investigator Susumu Kitagawa was awarded the Humboldt Prize for his research: "Synthesis of microporous metal complexes, and their expression". Principal Investigator Shinya Yamanaka received numerous awards, such as the Robert Koch Prize for his research on "the mechanism of inducing pluripotency in differentiated cells in mouse and human." 2. Cross-disciplinary research across the following scientific fields, as stated in the application, are being prepared or have been started by principal investigators: A. Stem-Cell Control Meso-Engineering B. Cellular Meso-Biophysics C. New Chemistry/Physics of Meso-Space 3. Nine fluent English-speakers have been hired and allotted in the administration so English can be used to facilitate the work processes. Official occasions, such as the PI meeting, are conducted all in English, and the administration communicates to the researchers basically in English or by providing summaries written in English. In FY 2007, the university's Executive Vice-President for Research and Finance, university administration, iCeMS professors and iCeMS administration visited National Institutes of Health and Cold Spring Harbor Laboratory in the United States, a well-known world premiere international institute. In FY 2008, organization of the CiRA was strengthened to advance iPS cell research including the establishment of the CiRA Support Office for administrative assistance and the Research Strategy Division in charge of the management of intellectual property and public relations around the world. The institute has begun the groundwork for establishing a team to manage IP

	rights and collaboration with the industry sector.
4. the center is in the global career flow	4. In FY 2008, by recruiting excellent researchers from home and abroad there are 54 applications including 12 from overseas. The iCeMS now consists of 89 researchers besides its PIs, 13 of which are non-Japanese.
5. collaboration with researchers from the East and Asia are promoted.	5. As of FY 2008, six researchers from China, India, and other Asian countries are working at the iCeMS. A delegation led by Chairman of the Science and Technology Agency of Singapore visited the iCeMS and exchanged opinions regarding interactions among researchers of both countries in the future.

8. Securing competitive research funding

<Initial plan> The PIs are to obtain a large amount of competitive research grants from governmental bodies, such as JSPS, JST, and so forth.	<Results/progress/alternations from initial plan> The iCeMS obtained a competitive grant of 2,098 million yen in FY2008, and the university provided financial assistance of 1,455 million yen.

9. Other important measures taken to create a world premier international research center

<Initial plan> - Mentor development program - Scientific integrity and communication program - Program to support foreign/young researchers - Program to recruit and nurture female researchers	<Results/progress/alternations from initial plan> The "iCeMS Cafe", a series of events to implement "science communication," started in FY 2007. In FY 2008, inviting Adjunct Associate Professor Kazuto Kato and recruiting two young researchers, the iCeMS organized Science Communication Group that facilitates science communication and nurture human resources. The iCeMS plans to provide educational programs to nurture top-notch scientists with highest integrity and social responsibility. The iCeMS is planning to establish an office for counseling non-Japanese and/or female researchers. The Exploratory Grant for junior investigators to start new cross-disciplinary collaboration is set to be launched FY2009. The iCeMS will provide non-Japanese researchers with attentive support for immigration, accommodation and child education. The institute has begun the groundwork for establishing a team to manage IP rights and collaboration with the industry sector.

10. Host institution's commitment

<Initial plan>	<Results/progress/alternations from initial plan>
1. Provision in host institution's mid-to-long-term plan	1. Provision in host institution's mid-to-long-term plan
Kyoto University distinctively places the "World Premier International Research Center Initiative" as its top priority program in the current (2004 to 2009) and the next (2010 to 2015) mid-term plans. As clearly defined in its mission statement, the university has strived for sustainable human societies, which are featured by harmonious coexistence within human and ecological communities on this planet, by bringing forth its outstanding research and education programs generating world-class knowledge. Kyoto University believes that establishing a world top-level academic research center within the university is an indispensable step to further promote this mission and to achieve the ultimate goal for the sustainable human societies. Under the strong leadership of the president, Kyoto University is vigorously committed to promote this program, and to actively take concrete and responsible measures, such as preparation of research systems and provision of resources, for establishing the world premier international research center to lead the world's research activities.	Kyoto University's current mid-term strategies, namely "measures to be taken to achieve objectives in respect of enhancing the quality of the university's education and researches", "measures to achieve objectives related to researches", "remarks in relation to the system to carry out researches" and "organizing the system to carry out researches", now incorporate "make a special effort to structure an organization to promote researches in respect of creating a new generation of technologies through developing meso-control science and stem cell research at iCeMS, a WPI research center". Professor Hiroshi Matsumoto, who was sworn in as President of the university on October 1, 2008, made the following commitment: "From October 1, 2008, I will be responsible for performing tasks and duties described in Application Form 4 , [Host Institution's Commitment], signed off by Professor Kazuo Oike, then President, on September 25, 2007". It should be noted that President Matsumoto also affirms host's commitments to "the Center for iPS Cell Research and Application (CiRA)" established in recognition of the successful generation of human induced pluripotent stem (iPS) cells by Professor Shinya Yamanaka, one of the principal investigators of the iCeMS.
2. Concrete Measures	2. Concrete Measures
(1) Competitive grants obtained by researchers participating in the project and in-kind contributions, etc.	(1) Competitive grants obtained by researchers participating in the project and in-kind contributions, etc.
To facilitate the center's researchers obtaining external funds, the university provides the various supports including startup funds. The funds will be used to support young researchers and foreign researchers to pursue research until they obtain their own external funds. The university will also provide researchers with various supports in every aspect of preparing the applications.	Kyoto University has adopted the policy to provide the iCeMS with the fund to cover indirect costs related to the program grant as well as the fund to cover indirect costs related to competitive grants obtained by the institute's researchers, as a part of financial support to the institute. According to this policy, the institute received the financial aid in FY 2007 and 2008 in a row.
The university provides five positions and expenses for principal investigator-class personnel in order to enable Kyoto University's	The institute also received financial support from the university for personnel costs of five PIs and five full-time administrative staffers (in FY 2007 and FY

world-leading researchers to conduct academic research at the center while cooperating with their original departments, as well as to minimize the impact of the absences of top-level researchers on their departments' educational and research activities. For administration, the university provides full-time administrative staff and necessary personnel expenses in order to establish an independent administrative organization. Five current university staff members will be allocated for major functions such as general affairs, planning, finance, research support and facilities. University staffers with a good command of English will be preferentially selected. As for the position of vice center director in charge of administration, a director-class personnel from the university will be allocated initially at the time of the center's establishment. This person will soon be replaced by a full-time vice center director, recruited from outside the university, as soon as he/she is appointed.	2008), and additional three administrative staffers of the CiRA (in FY 2008).
(2) System under which the center's director is able to make substantive personnel and budget allocation decisions	(2) System under which the center's director is able to make substantive personnel and budget allocation decisions
To ensure autonomy of the center's operation, the university takes the following measures: a) Flexible management of organization and operation system An autonomous and independent management system that plays a role equivalent to the faculty will be implemented, to ensure the center's autonomy and the center director's leadership in making decisions regarding the center's overall operation. Decisions on important matters (personnel, budget, etc.) of the center will be made by the center director through discussions with vice center directors, who assist and support the center director, in order to ensure appropriate operation. At the same time, to enable the university to provide various support and advice promptly, the university president and executive vice-presidents meet the director of the center on a regular basis. b) Introduction of flexible salary system to allow researchers' easy transfers The world's leading foreign researchers, Japanese researchers who are highly recognized worldwide, and postdoctoral and other promising young researchers will be assembled at this center. For these researchers, whether from inside or outside the university, Kyoto University will allow applying a	As an autonomous and independent management system to ensure the institute's autonomy and the director's leadership in making decisions regarding the institute's overall operation, the Board Committee consisting of the director, the deputy director, the chairman of the PI Committee and the administrative director was established. The Board Committee plays a role equivalent to that of a faculty board in making decisions on important matters (personnel, budget, etc.) as an autonomous organization. Under the leadership of the University's Executive Vice-President for Research and Finance, meetings are held to exchange ideas among the staff of the university administrative office, in charge of personnel, finance, facilities, and research promotion, and the Board members and the staff of the iCeMS in FY 2008 as well. In FY 2008, there have been meetings on a regular basis among the CiRA, University's Executive Vice-President for Research, and the university head office to improve the support system of the university. In addition, the administration of the institute attends weekly university meetings with the university's Executive Vice-President for Research and Finance to closely exchange information.

new personnel system that can appropriately reflect their achievements. To attract various researchers both from Japan and around the world, the university will accept the center director's request to implement a variety of salary payment systems. The university also introduces a flexible personnel system in which the center director can select a salary system appropriate for each researcher that will assure the maximum flexibility for researchers in transferring to the center. ・The annual salary system that the university has already introduced (a fixed-term employment contract and an annual salary system based on achievements) will be applied. ・The current salary system will be applied to the researchers while they will be allowed to concurrently remain in the original departments if approved. These systems will promote; (1) intra-university cooperation among researchers, (2) integration of different academic fields, (3) human resource development through their participation in the university's educational activities, (4) effective usage of university facilities, and (5) flexible transfer of researchers within the university. ・Salaries for foreign researchers will be paid in foreign currency of their home countries, in principle. ・For qualified technical and administrative staffers, a special employment contract will be arranged to extend a regular retirement contract.	As for promoting and boosting iPS cell studies, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) has been cooperating in drawing up the overall strategy and determining the direction to take in the near future at the Council for Science and Technology Policy (CSTP) while the university promptly requested support from the Minister of MEXT and the Minister of State for Science, Technology and Innovation Policy. Development of many other assistance schemes, such as planning and obtaining budget related to organizing the research environment and systemizing management of intellectual property by the Office of Society-Academia Collaboration for Innovation (SACI), is also underway with the university in its core. On personnel affairs, - The iCeMS has employed researchers under an annual salary system, already adopted by the university, and introduced a discretionary labor system, and also legitimized it to hire staff without abiding by the mandatory retirement system as an exceptional rule for this initiative. - The university has covered the personnel costs of five PIs. -Through the Specialist Administrative Staff system three administrative staff members over retirement age have been employed, starting in FY 2008.
(3) Support for the center director in coordinating with other departments at host institution when recruiting researchers, while giving reasonable regard to the educational and research activities of those departments The university takes the following measures with regard to educational and research activities within the university: a) Support for researcher transfers to the center To support researchers on their smooth and flexible intra-university transfer to the center, five (at least) principal investigator-class personnel positions will be provided so that the impacts on current educational and research activities, and administrative works will be minimized. b) Support in relation to education and research activities If approved by their original departments, researchers will be allowed to keep their research in part and education concurrently in their original departments. This will facilitate their participation in educational activities and their shared use of research facilities, equipment, and materials. This will, in	(3) Support for the director in coordinating with other departments at host institution when recruiting researchers, while giving reasonable regard to the educational and research activities of those departments In FY 2008 as well, under "the double affiliation system" adopted for seven PIs at the institute, they have been allowed to keep their posts in their original departments in order to facilitate their participation in research and graduate-school educational activities and their shared use of research facilities, equipment, and materials within the university. This has been, in turn, contributing toward more active research activities. Also in FY 2008, the institute sought advice from the university head office to provide individual non-Japanese researchers with support regarding immigration procedures, accommodation and child education.

turn, contribute toward more active research activities. To support the center's women researchers, the university provides effective assistance for and consultations on their research, child/nursing care, and daily lives. c) Support for foreign researchers To support foreign researchers and their families, the university prepares a handbook that explains immigration procedures, housing, the health-care system and other daily life information at the time of call for positions. Direct assistance by a foreign mentor will also be provided for a period of time immediately after their arrival in Japan. To support education for their children, a system will be established in cooperation with neighboring Doshisha University to provide them with education services at its international junior/senior high school.	
(4) Revamping host institution's internal systems to allow introducing of new management methods (e.g., English-language environment, merit-based pay, top-down decision making) unfettered by conventional modes of operation The university will accept necessary system revisions for implementation of new management methods unfettered from conventional modes of operation The university establishes an autonomous and independent management organization that serves a role equivalent to that performed by the existing faculty. Important issues (personnel, budget, etc.) will be discussed and decided by the center director and vice directors, in order to ensure prompt and appropriate administrative actions. However, the center director makes decisions on the following substantive matters necessary to promote this program. ・Matters related to recruitment of foreign and Japanese researchers, and postdoctoral and other young researchers ・Matters related to progress of research programs and evaluation of researchers' achievements ・Matters related to adoption/modification of the center's research programs ・Matters related to allocation and implementation of a budget for supporting research and operational activities of the center ・Matters related to management of research space in the center For matters that require revision of the university regulations, the executive vice-president of the university in charge will provide specific consultation,	(4) Revamping host institution's internal systems to allow introducing of new management methods (e.g., English-language environment, merit-based pay, top-down decision making) unfettered by conventional modes of operation In FY 2008 as well, around 50% of the administration is fluent in English. Communication to researchers is basically carried out in English through written documents including summary messages made in English. All the official events and ceremonies of the center are conducted in English. The institute has established the Board Committee, an autonomous and independent management organization that plays a role equivalent to that of the existing faculty meeting and ensures the independence of the institute and the leadership of the director. The Committee consists of the director, the deputy director, the chairman of the PI Committee, and the administrative director. Important issues (personnel, budget, etc.) are discussed at the Board Committee. With this appropriate organization in place, prompt decisions have been made on the following matters. - Matters related to recruitment of non-Japanese and Japanese researchers, postdoctoral and other young researchers - Matters related to adoption/modification of the institute's research programs - Matters related to allocation and implementation of a budget for supporting research and operational activities of the institute

and necessary administrative procedures will be handled by the head office administration in coordination with the center administration. For administration, the university will provide several administrative personnel and necessary personnel costs while ensuring autonomy in administration. External personnel with a good command of English will also be recruited.	- Matters related to management of research space in the institute The administrative director of the iCeMS, who serves concurrently as the administrative director of the CiRA, attends the both board committees, allowing him to ensure interaction between the two.
(5) Accommodation of center's requirements for infrastructural support (facilities, e.g., laboratory space; equipment; land, etc.)	(5) Accommodation of center's requirements for infrastructural support (facilities, e.g., laboratory space; equipment; land, etc.)
a) Provision of research space necessary to conduct the world top level research It is important to establish a "globally acknowledged" center attracting top-class researchers to conduct world leading research. To this end, Kyoto University provides a high-quality research environment with the total area of about 12,000m^2 by ensuring exclusive facilities with fully equipped infrastructure. As well, the center's head office will be located on the university's main campus to make available the university's diverse facilities, including conference halls for international symposiums and other academic meetings, the university hall, library, and cafeteria.	In FY 2007, the reform of the institute's buildings started. In September 2008, the renovation of the first research building (iCeMS Complex 2) was completed, with a floor space of 2,390 m^2. By March 2009, the renovation of the iCeMS headquarters building (iCeMS Complex 1) with a floor space of 4,802 m^2 will have been finished. By June 2009, 534 m^2 of research space for the iCeMS will be added adjacent to the first research building In June 2010, a new building (3,000 m^2) is scheduled to be completed. Another new building of 12,000 m^2 is due to be completed in February 2010 as research space for the CiRA.
・Center's main office space In addition to the head office functions, core facilities for the center's representative functions including research meetings, literature/academic database and information dissemination will be provided. To demonstrate autonomy of the center, a main office will be established and provided as an exclusive facility on the university main campus.	In the iCeMS buildings scheduled to be completed in FY 2008 or afterward will serve as: - the headquarters of the iCeMS. In addition to serving as a place for research laboratories, seminars and meetings, the headquarters store/provide literature, documents, and academic data, and disseminate information functioning as the central facility as well as the symbol of the iCeMS. - the core for research projects and activities where the world's leading researchers are engaged in advanced research. These research facilities provide an environment designed to respond flexibly to the progress of a variety of cross-disciplinary studies and new research projects on a long-term basis.
・Research project space As the main space for the center's research activities, the university provides exclusive research facilities for researchers to concentrate on their own research activities. The university also takes special efforts to provide and maintain a state-of-the-art research environment for the individual research, flexibly responding to requirements from each project over its duration. ・Space for shared research equipment To enable integrated management and operation of shared research equipment, exclusive space with technical staffers will be set up next to the research project space.	

・Researchers' communication space that facilitates the exchanges among researchers from different fields In order to develop new interdisciplinary research fields through a fusion of various studies, the university provides researchers in different academic fields and from various countries with space and opportunities to enhance communications. ・Accommodation (housing) facilities for researchers Accommodation facilities will be taken care of for researchers coming from domestic and foreign areas. b) Establishment of basic facilities and equipment As a part of the process establishing the necessary research environment, the university sets up basic facilities and equipment that accompany the buildings and that need intensive initial investment along with the center's head office and basic infrastructure.	- a space for research equipment to be shared. In this space, adjacent to the research project space, equipment and devices used jointly by researchers from different fields are operated and managed centrally by technical staff. - a place for cross-disciplinary research and interaction among researchers. This space is designed to facilitate communication and interaction among researchers and research groups, including young and non-Japanese scientists, across different scientific fields, which will help researchers advance to new research fields. To that end, lounge areas are being built in the iCeMS Complex 1 for face-to-face communication.
(6) Support for other types of assistance As one of the leaders of the world's academic community, Kyoto University firmly determines to take a responsibility in establishing a genuine "world top-level research center" that will serve as one of "the world's leading knowledge centers". The center is expected to function as a top-level research organization since Kyoto University already has outstanding capabilities; 1) to create research environment that attracts world top level researchers, 2) to facilitate intra-university cooperation among world's leading researchers from different fields, 3) to integrate diverse academic fields to promote an interdisciplinary approach, and 4) to contribute to the present and future societies by generating unprecedented knowledge and research findings. Kyoto University is confident that with these essential capabilities, successful performances of the center will be promised. Kyoto University has been characterized, since its foundation in1897, by an "academic atmosphere of freedom"; one that values originality and independence rather than the mere accumulation of knowledge. Located in the historic city of Kyoto, the university has developed research on diverse fields with profound originality in this unique "academic atmosphere of freedom". Based on this historical background, it is defined in its mission statement (declared in 2001) that the ultimate goal of the university is to contribute to	(6) Support for other types of assistance The iCeMS has been receiving various range of support for its operation from the university, as well as personnel and material supports as stated in the "Host Institution's Commitment" in its WPI application. While working in closer cooperation with the university, the iCeMS is determined to continue to strive to become a "World Premier International Research Center."

future sustainable human societies, featured by harmonious coexistence within human and ecological communities on this planet. This goal can be achieved by bringing forth the outstanding research and education programs in conformance with high ethical standards, and by generating world-class knowledge. We strongly believe that the best research in the world is created in the environment where the academic freedom and autonomy in research are highly valued, in this regards, Kyoto University is one of the best places to establish the world premier international research center to lead the world's research.	

11. FY 2008 funding

(Exchange Rate: JPY/USD=120)

Cost Items	Details	Costs (ten thousand dollars)
Personnel	Center director and Administrative director	20
	Principal investigators (no. of persons): 16	133
	Other researchers (no. of persons): 47	217
	Research support staffs (no. of persons): 25	32
	Administrative staffs (no. of persons): 21	83
	Total	**485**
Project activities	Gratuities and honoraria paid to invited principal investigators (no. of persons): 0	0
	Cost of dispatching scientists (no. of persons): 17	32
	Research startup cost (no. of persons): 17	108
	Cost of satellite organizations (no. of satellite organizations): 1	42
	Cost of international symposiums (no. of symposiums): 3	1
	Rental fees for facilities	27
	Cost of consumables	144
	Cost of utilities	5
	Other costs	236
	Total	**595**
Travel	Domestic travel costs	8
	Overseas travel costs	16
	Travel and accommodations cost for invited scientists (no. of domestic scientists): 37 (no. of overseas scientists): 22	7
	Travel cost for scientists on secondment (no. of domestic scientists): 12 (no. of overseas scientists): 2	3
	Total	**34**
Equipment	Depreciation of buildings	5
	Depreciation of equipment	308
	Total	**313**
Other research projects	Projects supported by other government subsidies, etc.	11
	Comissioned research projects, etc.	1,717
	Grants-in-Aid for Scientific Research, etc.	322
	Total	**2,050**
Total		**3,477**

Ten thousand dollars (Exchange Rate: JPY/USD=120)

WPI grant for FY 2008 **1,296**

Costs of establishing and maintaining facilities in FY 2008 **2,480**

Repairing facilities: Research Bldg. 1* of the iCeMS Complex 2 (Number of facilities: 1, 2,390m²)	Costs paid:	228
Repairing facilities: Main Bldg. + West Wing of the iCeMS Complex 1 (Number of facilities: 2, 4,800m²)	Costs paid:	733
Establishing new facilities: Center for iPS Cell Research and Application (CiRA)* (Number of facilities: 1, 12,000m²)	Costs paid:	1,485
Establishing new facilities: Research Bldg. 3* of the iCeMS Complex 2 (Number of facilities: 1, 3,000m²)	Costs paid:	13
Others		21

* Building names are subject to change.

Cost of equipment procured in FY 2008 **845**

Transmission Electron Microscope Number of units: 1	Costs paid:	29
Field Emission Scanning Electron Microscope Number of units: 1	Costs paid:	36
High Performance Liquid Chromatograph Mass Spectrometer Number of units: 1	Costs paid:	21
High-Throughput Sequence Analysis System Number of units: 1	Costs paid:	92
Virtual Slide Imaging System Number of units: 1	Costs paid:	14
Others		653

12. Efforts to improve points indicated as requiring improvement in follow-up review and results of such efforts	
1. Points specified as needing improvement	1. Efforts and results
1) As the project proceeds, its milestones need to be stated more clearly. Each research theme in biology, chemistry and physics must be linked to the mission; however, it is still not clear how such linkage will be achieved. Concrete measures must be considered to achieve this linkage.	1) By FY 2010, the iCeMS will develop an area of 11,000 m^2 for research and experiments, designed to promote the integration of biological, chemical, and physical studies. Laboratories and offices will be shared to facilitate communication and interaction among research groups from many different fields. Priority is given, in terms of personnel costs, lab space and the Exploratory Grants, to researchers suitable for conducting cross-disciplinary research. In the iCeMS Complex 2, as an initial example, a spacious open office has been built accommodating six groups, including the PIs, in which are starting cross-disciplinary research. In order to facilitate communication among researchers from different fields and promote cross-disciplinary research, a PI group makes a presentation followed by an ample discussion at a cross-disciplinary seminar every other Wednesday. The institute started a new initiative, called the “Cross-Disciplinary Journal Club” within the “iCeMS Web Room” on the Intranet, where the PIs and other researchers can exchange their ideas on interesting cross-disciplinary research papers posted on the site for possible collaboration across the fields.
2) The key to the success of this project will be how effectively the investigators collaborate in establishing this new material-cell science and produce integrated achievements. Specific strategies must be established and shared with the PIs as soon as possible. Without this important step, the whole project risks ending up with just a cluster of outcome.	2) As stated above, Cross-disciplinary studies across the following scientific fields, as stated in the application, are being prepared or have been started by principal investigators: <u>A. Stem-Cell Control Meso-Engineering</u> <u>B. Cellular Meso-Biophysics</u> <u>C. New Chemistry/Physics of Meso-Space</u> The iCeMS will develop new research projects in these cross-disciplinary fields.

3) How the CiRA is organized within the iCeMS will be critical both in terms of administration and funding. The respective missions of the two programs need to be clarified. As scientific progress on iPS is very rapid, a strategic recorganization of the iCeMS might be required within a few years. An organization and management strategy for intellectual properties is also needed, especially in the CiRA.	3) Management authorities were delegated from the director of the institute to the center director of the CiRA, to whom leadership was given. The administrative director of the iCeMS, who serves concurrently as the administrative director of the CiRA, attends the both board committees, allowing him to ensure coordination between the two. The iCeMS provides one third of its WPI fund for direct cost to the CiRA. The Research Strategy Division was organized in the CiRA on August 1, 2008. This division devises strategies for intellectual properties and manages matters related to intellectual properties. In order to handle them promptly, the division holds a patent management meeting once a week. Acknowledging the fact that the CiRA aims at clinical applications in regenerative medicine, which is beyond the WPI's scope, on top of basic research, the iCeMS continues to seek the best ways to further develop the both institutes and accomplish the missions of each.
4) The communication strategy is not clear. It is expected that the WPI center will actively and globally communicate with instates and researchers through multiple methods both on a daily basis, such as communicative webpages, and on a periodic basis, such as symposia or seminars. Researchers of the iCeMS need to communicate constantly using such tools. To facilitate these activities, newsletters and retreats might also be useful.	4) The iCeMS is making various efforts to facilitate communication among its researchers: - In order to facilitate communication among researchers from different fields and promote cross-disciplinary research, a PI group makes a 30-minute presentation followed by a 30-minute discussion at a cross-disciplinary seminar every other Wednesday. - Laboratories and offices are shared to facilitate interaction among research groups. - Face-to-face interaction in lounge areas - Lab-Next-Door System, a video conference system was introduced to connect remote laboratories and PIs nationwide and overseas. - The institute started a new initiative, called the “Cross-Disciplinary Journal Club” within the “iCeMS Web Room” on the Intranet, where the PIs and other researchers can exchange their ideas on interesting cross-disciplinary research papers posted on the site for possible collaboration across the fields. - International symposium is held twice a year
5) The iCeMS should more actively recruit foreign PIs and postdoctoral fellows to work within the institute.	5) Global recruitment is being reinforced in search of most-qualified young researchers

	- The iCeMS is now seeking the best candidates for young independent PIs (iCeMS Fellow) - The iCeMS is now actively requesting recommendations of excellent candidates from our partner institutes around the world. - Taking advantage of the scientific exchange programs with partner institutions, the iCeMS will conduct on-site interviews with candidates to accelerate the recruitment process. - Job ads have been posted on the iCeMS website and international scientific media. To gain more international recognition, the iCeMS has been eagerly engaged in our public relations activities. The iCeMS website, for instance, was relaunched in January 2009, contributing to the enhanced global visibility of the iCeMS. - Inviting visiting faculty members -- especially senior scientists -- is also under consideration to expand the global network of scientists.
2.Other Suggestions and Opinons	2. Other suggestions and opinions
1) Concerns were voiced about the WPI director and vice-director who are performing these roles in parallel with their tenure as professors of other institutes. They should devote their highest efforts to the WPI, including fostering young researchers, especially postdoctoral fellows and graduate students, in iCeMS.	1) While the iCeMS has a mission different from that of its PIs' original departments, it shares with them a great deal of activities in pursuing its own mission. Sharing these activities has contributed to the prompt establishment and advancement of the institute. Research guidance for graduate students is one of the important duties that the iCeMS has assumed as a measure to foster young researchers in the institute. Double affiliation system allows PIs to continue their guidance and supervision of graduate students while facilitating their shared use of research facilities in their original departments. Meanwhile, consideration is being given to exempt PIs of the institute from undergraduate teaching and administrative duties of the original departments so that they will be able to focus on research activities at the iCeMS.
3) Developing more globalized core partners for CiRA is suggested, especially for business development from iPS seeds. This is not an academic matter; the right partners, which may not be available in Japan, are needed.	3) Regarding the strategic partnership of the CiRA, there have been many domestic collaborations so far. At present, efforts are being made to find the right global partner for the further development of iPS cell technologies. One example is the University of Toronto, Canada. Industry partners will also be taken into consideration.

4) As the major competitors of CiRA are in the US, the center's intellectual property rights strategy has to be compatible with US policy and rules.	4) The CiRA's intellectual property strategies have to be compatible with US rules. The U.S. provisional patent applications system was introduced to make it possible to obtain an earlier patent filing date in the U.S.
5) The presentation made no mention about what in detail is planned for the new and renovated buildings. At this stage, iCeMS should be directly involved in the planning their content – what kind of lab space, etc. There is concern that the timing of the construction may slow down the progress of research at iCeMS, and that iCeMS is missing an important opportunity to build something that will encourage new patterns of collaboration.	5) In FY 2007, the reform of the institute's buildings started. In September 2008, the renovation of the first research building (iCeMS Complex 2) was completed, with a floor space of 2,390 m^2. By March 2009, the renovation of the iCeMS headquarters building (iCeMS Complex 1) with a floor space of 4,802 m^2 will have been finished. By June 2009, 534 m^2 of research space for the iCeMS will be added adjacent to the first research building In June 2010, a new building (3,000 m^2) is scheduled to be completed. Another new building of 12,000 m^2 is due to be completed in February 2010 as research space for the CiRA. Those iCeMS' buildings, in which PI groups are not separated by walls, are designed to promote cross-disciplinary research, and encourage researchers to communicate and interact with each other across various research fields. For the same purpose, the new building has many equipment rooms and laboratories to be shared by researchers from a variety of fields. The concept of this design is in line with the standards set by the world-class research centers. To enhance interaction between researchers of the institute, a cozy lounge area is being built in the Complex 1 and distant laboratories are connected by the Lab-Next-Door System, a video conference system available at all times to iCeMS researchers.
6) Need to think ahead to a future when CiRA may become an independent research center.	6) Acknowledging the fact that the CiRA aims at clinical applications in regenerative medicine, which is beyond the WPI's scope, on top of basic research, the iCeMS continues to seek the best ways to further develop the both institutes and accomplish the missions of each.