

2. Summary of Proposal

(Compile in English within 3 pages.)

Host institution	Kyoto University
Head of host institution	Hiroshi Matsumoto, Ph. D. President of Kyoto University
Research center	Institute for Integrated Cell-Material Sciences
Center director	Norio Nakatsuji, Ph. D.
Chief center-project officer (in October 2007)	Norio Nakatsuji, Ph. D. Director, Institute for Frontier Medical Sciences, Kyoto University
Project summary	<p>1. Original research objectives in 2007 We will accumulate a <i>critical mass of leading scientists for the symbiotic integration of material and cell sciences</i> (focusing on stem cells), based on the notion that <i>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.</i></p> <p>2. Clarified research objectives and plan for the next 5 years The iCeMS aims to create new cross-disciplinary fields through the integration of cell and material sciences with a focus on <i>stem cell science and technology</i> and <i>mesoscopic science and technology</i>, bringing about innovations in medicine, pharmaceuticals, the environment, and industry.</p> <p>3. Organizational reform</p> <ol style="list-style-type: none"> 1) Swift decision-making enabled by the Director's strong leadership and the Executive Board's counsel 2) One satellite laboratory established at Gifu University 3) Thirteen collaboration partners around the world 4) iCeMS Kyoto Fellow (junior PI) positions created 5) The Science Communication Group (SCG), serving as a working laboratory for broadening communication among scientists and with the public 6) The Innovation Management Group (IMG), forging alliances in academia, industry, government, and with overseas institutions 7) Ideal environment to interact across boundaries <ol style="list-style-type: none"> 1. Shared labs and open offices promoting collaboration 2. Center for Meso-Bio Single Molecule Imaging (CeMI) established 3. 43 cross-disciplinary seminars held at PI meetings 4. Retreats for all iCeMS researchers held annually 5. Cross-disciplinary journal club on cell-mat. integration & mesoscopic sci. 8) Incentives to encourage interaction across boundaries <ol style="list-style-type: none"> 1. iCeMS exploratory cross-disciplinary grants available both for joint projects within iCeMS and for research with other Kyoto University departments 9) Internationalization <ol style="list-style-type: none"> 1. English as the official language 2. High percentage of overseas researchers (more than 30%) 3. High percentage of bilingual administrative staff (more than 50%) 4. Overseas Researchers Support Office established <p>4. Center for iPS Cell Research and Application (CiRA) collaboration Prof. Shinya Yamanaka continues his basic research on iPS cells as one of the iCeMS PIs while concurrently managing the CiRA as its director. Overall, the iCeMS and the CiRA collaborate closely as sister institutes.</p> <p>5. Launch of a new scientific journal The Royal Society of Chemistry (RSC) and the iCeMS jointly launched <i>Biomaterials Science</i> in 2012. The official description: "<i>Biomaterials Science is an international, high impact journal bringing together the molecular and mesoscopic interactions of biomaterials and their applications.</i>"</p> <p>6. Post-WPI Plans A 2011 Kyoto University strategic plan, approved by President Hiroshi Matsumoto, states that "<i>the university should strongly promote multi-disciplinary studies by establishing hubs for such research.</i>" In this context, the iCeMS will act as a role model for future planning and reforms at the university level.</p>

Mission statement and/or center's identity	The iCeMS' mission is to <u>create new cross-disciplinary fields through the integration of cell and material sciences</u> with a focus on <i>stem cell science and technology</i> and <i>mesoscopic science and technology</i> , bringing about innovations in medicine, pharmaceuticals, the environment, and industry.
Research fields	In addition to having established the study of cell-material integration , the iCeMS also promotes study in the emerging field of mesoscopic science, which is gradually gaining interest in academia, industry, and government: for example, the new RSC-iCeMS journal <i>Biomaterials Science</i> focuses on mesoscopic science; and the United States Department of Energy (DOE) has asked its advisory committee to identify mesoscale science directions most promising to advance the DOE's mission.
Research objectives	The main research objective is the integration of cell and material sciences . Examples include: A. Stem cell science and technology 1. Reprogramming with chemical compounds for iPS cell derivation 2. Chemical probes for stem cell research 3. Control of ES/iPS cell growth and differentiation with chemicals/materials 4. Creation and applications of stem cell-derived model cells for cell biology, medical research and drug discovery B. Mesoscopic science and technology 1. Imaging and probing for mesoscopic complexes in the cell 2. Production of functional materials performing in the mesoscopic domain 3. Integration of living cells and functional materials performing in the mesoscopic domain 4. Modeling/simulation/physics theories of mesoscopic events in living cells
Outline of management	<u>1. Composition of administrative staff</u> 1) The Administrative Director possesses a wealth of experience in research, management, and international academic exchange; a total of 34 talented administrative staff (in 8 sections) has been hired. 2) More than 50% of the staff is English-Japanese bilingual. 3) The iCeMS administration is strongly supported by two unique research groups, the SCG and the IMG (see project summary 3.5)&6)). <u>2. Decision-making system</u> 1) The Executive Board, consisting of the director, deputy director, chair of the Board of PIs, and administrative director, deliberates on high-ranking personnel issues and other key decisions of the institute. This enables notably swift decision making by the iCeMS Director, incorporating thorough deliberation with the Executive Board. 2) The Board of PIs hosts seminars by job applicants, and deliberates on iCeMS planning matters. 3) The Strategic Task Force for Cross-Disciplinary Research provides strong institutional support to cross-disciplinary research projects. 4) The Advisory Committee, consisting of 10 distinguished outside researchers (7 non-Japanese) provides the institute with unbiased and expert feedback. <u>3. Allocation of authority between the Institute and the host institution</u> The host institution is responsible for overall governance and rule-making, while the center director determines policies that are specific to the institute. The host institution and center director will continue to share authority as they consult closely and constantly on the future direction of the institute.
Researchers and other center staffs, satellites, partner institutions	<u>1. Personnel</u> (as of 2012.3.31): 1) 18 Principal Investigators (including four overseas and two female researchers, and one located at a satellite location) 2) 179 Investigators (including 60 overseas and 47 female investigators) 3) 289 personnel including administrative and other staff <u>2. Satellite:</u> Faculty of Applied Biological Sciences, Gifu University. Prof. Kiso is a PI of the iCeMS as well as of Gifu University. <u>3. Partner institutions:</u> The iCeMS has 13 partner institutions. All partners have played important roles particularly in the initiation phase (first five years), assisting the iCeMS to establish itself quickly as a global organization and helping increase the institute's name recognition. From the start of the second phase in FY2012, we intend to achieve even more substantial collaborations.

	For this purpose, prioritized and weighted personnel and budget planning will be undertaken, as seen in the NCBS partnership.						
Administrative director	Shinji Tomita, Ph. D.						
Outline of research environment	<ol style="list-style-type: none"> 1) Kyoto University provides Complex 1 and Complex 2 research buildings with office and lab space totaling 11,000m² creating a research environment suitable for a first-class research institute. 2) A policy of open offices and shared laboratories has been implemented to promote interdisciplinary research. 3) CeMI was established to enable the wide use of state-of-the-art imaging equipment for collaborative research. 4) A highly-skilled and ample administrative staff helps minimize the administrative burden on researchers. 5) The official language is English, for both research and administration. 6) An Overseas Researchers Support Office has been established. 7) Startup funds for researchers from other institutions will be guaranteed by the Institute and Kyoto University. In addition, startup small grants to initiate cross-disciplinary collaboration are provided to junior faculty and postdocs. 8) An overseas visit program for young researchers is supported by the JSPS. 9) International symposia at both domestic and overseas venues, promoting the integration of the cell and material sciences, are held at least twice a year, inviting leading scientists from around the globe. 10) Annual research staff retreats, Cross-Disciplinary Seminars, the Cross-Disciplinary Journal Club, and other mechanisms accelerate the fusion of differing disciplines. 						
Outline of indicators for evaluating a center's global standing	<p>The following five criteria have been adopted since the iCeMS' foundation:</p> <ol style="list-style-type: none"> 1) Has each investigator conducted high-level research impacting the field? 2) Have individual investigators originally from different disciplines worked collaboratively to produce significant results? 3) Has the administration properly supported the investigators, in a manner suitable for a premier international research center? 4) Has the Institute become recognized by researchers worldwide as an excellent place for young investigators to establish their careers? 5) Has the Institute sufficiently promoted interaction with researchers from other Asian countries? <p>Additionally, the Innovation Management Group (IMG) is developing quantitative means of evaluating the institute's global standing, in strict adherence to academic principles.</p>						
Securing research funding	External funding in the form of Grants-in-Aid in Scientific Research and large grants from NEDO and Next Generation FIRST have been secured. Total external funds, including financial support by the host organization for personnel and facilities, are approximately 1.6 billion yen per year for the next several years. A newly established Research Planning Section including science and technology administrators aims to secure larger sources of external funding using strategic methods.						
Appropriations plan (Exchange Rate: JPY/USD=80)	FY	2012	2013	2014	2015	2016	Total
	Cost (\$ millions)	16.68	16.68	16.68	16.68	16.68	83.4
Summary of host institution's commitment	<ol style="list-style-type: none"> 1) Kyoto University covers all indirect costs associated with competitive grants obtained by the center's researchers. 2) The university provides five positions and expenses for principal investigator-class personnel. 3) Nine full-time administrative staff and necessary personnel expenses are provided. (Ongoing discussions related to the overall university administrative reform may lead to numerous improvements). 4) The University will continue to provide a high-quality research environment. 5) The university recognizes the iCeMS as being a role model for university institutions in the future. Beyond WPI-iCeMS, the knowledge and experience of the Institute will be part of a process defining a future reformed and revitalized Kyoto University. 						