Progress Plan for Maintaining Academy Center Certification
World Premier International Research Center Initiative (WPI)

Host Institution	Kyoto University
Research Center	Institute for Integrated Cell-Material Sciences (iCeMS)
Host Institution Head	Yamagiwa Juichi
Center Director	Kitagawa Susumu
Administrative Director	Ueda Kazumitsu

Please prepare this Progress plan based on your application for WPI Academy. Summarize the Center's future plans with regard to the following 8 items **within five A-4 pages**. (Also fill out the appendices at the end of this form.)

1. Overall Image of Your Center

* Describe the Center's overall image including its identity.

After iCeMS was certified for "WPI Academy" in 2017, young ambitious researches have been employed as PIs from outside iCeMS and also newly appointed to PIs. As a result, among 10 core PIs 30% are international researchers and 20% are female researchers. Their average age is 42.1. The environment of iCeMS that values diversity of scientific field, nationality, gender and age makes it possible to achieve **true integration of "cell biology" and "materials science"**. iCeMS concentrates on the study of three essential properties of cells: Cell Communication; Nucleus Information; and Membrane Compartments. **Generation of Smart Materials** with functionalities equivalent to those of membrane compartments in living cells, which simultaneously "select" and "condense" molecules, and their application in the fields of medicine, energy and environment. To further promote the integrative cell-material studies, iCeMS has set up the "iCeMS Analysis Center", which facilitates atomic/molecular characterization of materials and detailed observation of biological activities of cells. iCeMS also founded the Research Administration Office (RAO) to promote the WPI Academy program such as international brain circulation, outreach activity, and fundraising.

2. Mid- to Long-term Research Objectives and Strategies

* Describe new challenges in the Center's research objectives and plans after FY 2020.
* Describe your future research strategy and plans and research organization including your line-up of Principal Investigators, and your outlook for fostering and securing the next generation of researchers.

The long-term research objective of iCeMS is true integration of fundamental cell science and materials science, which makes ground-breaking contributions to both sciences and becomes relevant to global issues such as disease or diet, energy or the environment. One of the most important mid- to long-term strategies is the further facilitation of five collaboration laboratories with overseas research institutes. The "**Smart Materials Research Center**" with Vidyasirimedhi Institute of Science and Technology (VISTEC) in Thailand, which is aiming the synthesis of new materials inspired by the biological reactions to solve environmental and energy problems. As a future development, **Horike** focuses on the education of doctoral students and also works on the technical needs of the Thai chemical companies that are collaborating with VISTEC. At the "**Center for Integrated Biosystems**", collaborative researches with Academia Sinica researchers are on-going. Especially, a joint research based on unbiased screening to identify new molecules which regulate and control important physiological reactions, which is **Suzuki**'s specialty, will be conducted. The iCeMS Taiwan Office, which was established last year, is also expected to deepen exchanges between universities in Taiwan and Kyoto University. In the "**Kyoto University Shanghai Lab"**, **Uesugi**, an iCeMS Deputy Director and also a specially-appointed associate professor at

Fudan University, is conducting advanced collaborative research (three fields of chemical biology, new materials, and energy conversion) between Shanghai area universities, and utilizing this On-site Lab to give lectures and interviews to attract international students from top Chinese schools. He is expanding his chemical biology joint research to the fields of new materials and energy conversion. The"**Quantum Nano Medicine Research Center**" was established by cross-appointed professor **Tamanoi** for a collaboration between iCeMS and California Nano-Systems Institute (CNSI) of UCLA. The aim of the Center is to highlight recent emergence of a new field of science that is created by the convergence of quantum beams research and nanomaterial studies. It is now operated as an in-bound type laboratory, but he is planning to develop this center to cross-bound type by establishing a laboratory in UCLA. The "**Small Molecule Laboratory (Smolab)**" as a International Associated Laboratory (LIA) with French National Centre for Scientific Research (CNRS) is aiming the synthesis of new materials inspired by the biological reactions to solve environmental and energy problems. These five collaborative laboratories promote the international brain circulation and stimulate the interdisciplinary research of iCeMS.

3. Management System of the Research Organization

* Describe the system of organizational management via which the Center will execute the above-described research strategy and plans.
* In Appendix 1-3, list the Principal Investigators, enter the number of Center personnel (researchers, research-support staff, and administrative staff), and provide a diagram of the Center's organizational management system.

3-1. Basic Organization

In order to make prompt decisions, iCeMS continuously empowers the **Director** with strong decision-making authority. At the same time, the Director's decision is supported by the **Executive Board Meeting**, which consists of the Director, Deputy Directors, PI Board Chair, Research Administrative Director, and Deputy Research Administrative Director. In the **PI Meeting**, the decisions are shared with PIs and researchers, while management tasks suggested by PIs are brainstormed and brushed up. Since 2019, iCeMS set up three committees; the Facilities Management Committee, the Outreach Committee, and the Fundraising Committee, each are comprised of PIs, the RAO members, and the administration to discuss improvement plans and solutions to various problems. The committees will be further activated in order to smoothly realize various ideas by researchers. Furthermore, iCeMS is to establish another one, "On-site Laboratories Steering Committee", to plan the strategy for the management of the overseas collaboration.

3-2. COVID-19 Task Force Committee

Immediately after the nationwide spread of COVID-19, iCeMS set up the "COVID-19 Task Force Committee" to protect researchers from infection, to collect and share correct information, and to maintain the minimum research activity. Because iCeMS has open offices without physical walls between research groups, it was an urgent issue to make rules on how to use the offices and labs efficiently without spreading infection. The Committee has made prompt decision-making in response to ever-changing situations of the spread of COVID-19. Another important task is to secure the safety of overseas researchers. Many of the researchers from abroad, about 30% of the iCeMS researchers, have difficulties in understanding information from Japanese government and the local government related to COVID-19, because most of the information is released in Japanese. The Committee distributes correct information about the current situation and also provides information about medical institutions providing English support.

4. Plan for Promoting the International Circulation of World's Best Brains

* Describe your policy and concrete plan for promoting the international circulation of the world's best brains, which is an important function of the WPI Academy.

4-1. iCeMS Internationalization Program

iCeMS will continue to offer the researchers a grant program for inviting prominent researchers from overseas institutes and supporting travel of iCeMS researchers to overseas institutes. Other than aid for travel expenses, iCeMS will also actively support global exchanges that contribute to the

internationalization of research activities such as expansion of the research network and promotion of the iCeMS visibility.

4-2. International Symposia Held for Brain Circulation

iCeMS will actively host international research meetings both in Japan and abroad. This provides a place not only for the young researchers of iCeMS to hunt a next job by presenting their works, but also for researchers from different disciplines to gather and exchange to acquire new insights. Especially, iCeMS places emphasis on the opportunities to hold international symposia with the partner institutes of On-site Laboratories. In addition, iCeMS is discussing ways to hold international online meetings involving hundreds of researchers, which can provide the same effect as real symposia. Through such an attempt, iCeMS will propose a new model of a symposium in combination with the advantages of real meetings and virtual ones.

4-3. iCeMS Retreats with Inviting Overseas Prominent Researchers

iCeMS holds its annual retreats for the purpose of sharing the on-going, unpublished multidisciplinary research activities. At this opportunity, iCeMS is planning to invite several overseas cutting-edge scientists to encourage iCeMS young researchers.

5. Plan for Disseminating the WPI Program Achievements

* Describe your policy and concrete plan for disseminating WPI center achievements both within the host institution and to other universities, especially their experience and know-how accumulated on establishing top world research institute and advancing system reforms.

5-1. Cooperation with ASHBi in Kyoto University

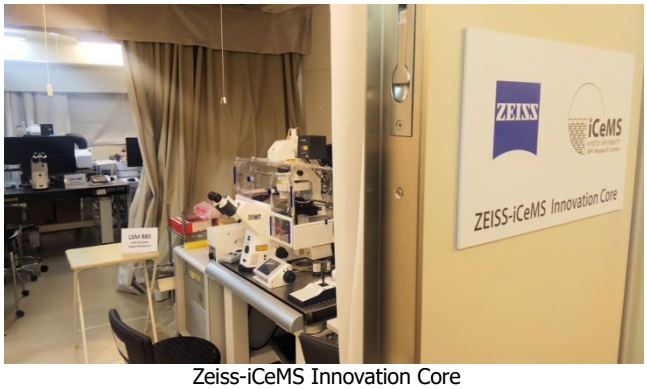
In 2018, a new WPI research center, Institute for the Advanced Study of Human Biology (ASHBi) was founded in Kyoto University. iCeMS and ASHBi, both of which are organized under the Kyoto University Institute for Advanced Study (KUIAS), cooperate with each other through in-depth exchange of information. In particular, their cooperation such as holding of symposia and outreach activities is expected to have a synergistic effect.

5-2. Cooperation with URA in Kyoto University

Kyoto University Research Administration Office (KURA) facilitates the environment where researchers can concentrate on their research activities by supporting the planning and operating research projects and returning the benefits of research to society. The iCeMS RAO cooperates with KURA to support grant application by iCeMS PIs and to share the experience and knowledge gained through the establishment of the iCeMS On-site Laboratories with other departments in Kyoto University. Furthermore, several new attempts by iCeMS such as introduction of virtual communication will be shared to KURA to suggest to other departments in Kyoto University.

5-3. Analysis Center

The iCeMS Analysis Center operates several characteristic analytical instruments both for materials science and for cell biology. The Center includes the "**Zeiss-iCeMS Innovation Core**", where the development of new bio-imaging techniques has been conducted in collaboration with Carl-Zeiss. To effectively use the instruments, the Center has already begun sharing its equipment based on a billing system. Through this procedure, the Center is expected to function as a hub for domestic and overseas instrumental analysis in the cell-material science.



Zeiss-iCeMS Innovation Core

5-4. Cooperation with Other WPI Centers

Since iCeMS covers a wide range of scientific fields, iCeMS has a high potential to promote collaboration

with researchers at other WPI centers. In addition to collaboration by individual researchers, iCeMS is planning to have opportunities of joint symposia with other WPI centers.

Outreach activities will also be collaborative with other WPI centers. iCeMS regularly takes part in exhibition booths at WPI Science Symposia and at AAAS Annual Meetings. iCeMS also presents a booth at the European Materials Research Society (E-MRS)' conference to introduce the research environment in Japan and WPI to materials scientists from all over the world. Furthermore, this year iCeMS and iFReC started to deliver a series of lectures for general public together in the center of Osaka. We are planning to give lectures via webinar this summer. Other WPI centers could join in this activity in the future.

6. Plan for Sustaining the WPI Brand

* Describe your plan for sustaining and enhancing the WPI brand.

6-1. Research Administration Office

The iCeMS Research Administration Office (RAO) is responsible for planning of the international brain circulation, outreach activity, and fundraising. The RAO also plays a role in practicing various new efforts to improve the environment for researchers and staff at university. Successful cases are to be recognized as the achievements of the WPI Academy, and will be shared with other WPI centers as well as other departments in Kyoto University.

6-2. Publication of Brochures and Newsletters

iCeMS publishes its brochures with the general information on the institute, and the newsletters "Our World Your Future" (two or three times a year) to reach high school students and other general public, all in both English and Japanese, both in electronic media and in print media.

6-3. International and Domestic Dissemination of Research Results

iCeMS actively disseminates research results, both domestically and internationally. Each press release is distributed along with an artistic and approachable illustration to represent the news. Using illustrations increases the visibility of press releases on science press release portals such as Asia Research News and EurekAlert!, and web-based international news sites tend to share the story with the image provided with the press release. An attractive image makes the news easier to be shared and featured.

6-4. Posting Information through Social Media

iCeMS makes frequent postings to its social media; Facebook, Twitter, YouTube, and Instagram. iCeMS' postings have been viewed by many people and have received active responses. iCeMS is also utilizing the social media as tools to acquire research resources, such as recruitment of young researchers, donation, and opportunity of collaboration. Especially for the international recruitment, iCeMS is planning to construct a dissemination platform to reach overseas young researchers and graduate students utilizing social media, in cooperation with overseas consulting company. This approach is expected to promote the recruitment of motivated young and excellent researchers.

6-5. Activation of Fundraising

iCeMS has always been accepting donations through the "iCeMS fund". In the near future, iCeMS will join the donation project by an internet portal site well-known in Japan. This contributes to not only increase of the donation, but also improvement of the iCeMS visibility for the general public. iCeMS will hold the "Thanks Gathering for iCeMS Donors", for the same purpose as the event we physically held in March 2019, but not a physical one. It is now being planned to include online events such as a virtual lab-tour for the donors to enjoy even if they cannot get together at iCeMS in order to avoid coronavirus infections.

6-6. Construction of Alumni Database

iCeMS started to construct a database of alumni, who are currently, or were formerly, associated with iCeMS. The purpose of this database is to provide centralized management of iCeMS member information and to use this to send the iCeMS alumni attractive news regarding various events, donation opportunities,

recruitment, and other relevant information. After the database is almost completed, the operational rules for updating the data will be set, and posting various information to alumni will be started. It is expected to enhance the interactive exchange of research resources (manpower, donation, and information) between iCeMS and its alumni, and among the alumni in the near future.

6-7. Trial for "New Normal"

The RAO is making trials to make suggestions for the "new normal" working style without reducing the quality of communication. One of the attempts is the introduction of a virtual office application, which can facilitate the communication among the office members during telework. The other is the further effective utilization of a chat tool, which has already been used by the faculty and the RAO members. The RAO will evaluate such online tools including web conferencing, and will suggest the most effective communication procedure, which may stand between real and virtual.

7. Support by Host Institution

* Describe measures that the host institution is and will take to support and sustain your Center.

7-1. Support Policy of Host Institution to Sustain the Center

To secure resources for operations and research activities of iCeMS, Kyoto University will continuously implement the following measures:

1. As a necessary financial measure for the iCeMS' operation, the university will provide indirect costs associated with competitive grants to iCeMS.
2. The university will provide 12 positions and expenses for principal investigators (PIs).
3. The university will provide 10 young researchers.
4. The university will provide 9 full-time positions and expenses to support the administrative part.
5. The university will offer a research environment of the highest quality, with a total area of about 11,000 square meters and fully-equipped facilities for exclusive use.
6. The university will support maintenance cost for large-scale facilities and equipment.

7-2. Operation of On-site Laboratories

The pursuit of "a flexible and dynamic approach to knowledge creation" is one component of Kyoto University's strategy as a Designated National University. As part of those efforts, the university is implementing an initiative to establish locally-managed "On-site Laboratories" in cooperation with overseas partner universities and research institutions. By the end of FY2019, Kyoto University has authorized a total of ten centers for this project. Four of these are run by researchers belonging to iCeMS (Smart Materials Research Center, Kyoto University Shanghai Lab, Quantum Nano Medicine Research Center, and Center for Integrated Biosystems). Kyoto University will provide financial support for these On-site Laboratories continuously after 2020.

8. Resource Allocation Plan

* Describe your plans over a 5-year period for allocating resources acquired from the host institution (e.g., financial resources and positions) and from external research funding to use in carrying out the Center's functions and activities described above.
* In Appendix 4, enter concrete numbers in the Resource Allocation Plan.

8-1. Funding Support by Host Institution

Until FY2024, Kyoto University plans to continuously support more than 1.6 billion yen annually for iCeMS. iCeMS draws a blueprint for self-reliance by increasing large-scale external funds acquired by iCeMS active researchers, most of whom are in their forties, though the support by the university will be declining gradually.

8-2. Personnel Support by Host Institution

Kyoto University plans to maintain the current status of personnel support for five years from FY2020.

List of Principal Investigators

- If the number of principal investigators exceeds 10, add columns as appropriate.
- Give age as of 1 April 2020
- For investigators who will not participate in the Center project at the time of submission of this Progress Plan, indicate the time that their participation will start in the "Notes" column.

	Name	Age	Affiliation (Position title, department, organization)	Academic degree, Specialty	Effort (%)*	(Notes) Enter "new" or "ongoing"
1	Kitagawa Susumu	68	Director, Institute for Integrated Cell-Material Sciences, Institute for Advanced Study, Kyoto University	Ph.D. Coordination Chemistry	60%	ongoing
2	Kengaku Mineko	53	Professor, Institute for Integrated Cell-Material Sciences, Institute for Advanced Study, Kyoto University	Ph.D. Developmental Neurobiology	60%	ongoing
3	Sivaniah Easan	48	Professor, Institute for Integrated Cell-Material Sciences, Institute for Advanced Study, Kyoto University	Ph. D. Physics	60%	ongoing
4	Suzuki Jun	42	Professor, Institute for Integrated Cell-Material Sciences, Institute for Advanced Study, Kyoto University	Ph.D. Medical Biochemistry, Cell Membrane Biology	60%	ongoing
5	Fukazawa Aiko	40	Professor, Institute for Integrated Cell-Material Sciences, Institute for Advanced Study, Kyoto University	Ph.D. Organic Chemistry	60%	ongoing
6	Tamanoi Fuyuhiko	72	Program-Specific Professor, Institute for Integrated Cell-Material Sciences, Institute for Advanced Study, Kyoto University	Ph.D. Nanoparticles and Cancer Therapy	36%	ongoing
7	Ueda Kazumitsu	66	Program-Specific Professor, Institute for Integrated Cell-Material Sciences, Institute for Advanced Study, Kyoto University	Ph.D. Cellular Bio-chemistry	60%	ongoing
8	Nakanishi Kazuki	59	Program-Specific Professor, Institute for Integrated Cell-Material Sciences, Institute for Advanced Study, Kyoto University	Ph.D. Sol-Gel Science, Porous Materials	12%	ongoing
9	Furukawa Shuhei	42	Professor, Institute for Integrated Cell-Material Sciences, Institute for Advanced Study, Kyoto University	Ph.D. Chemistry of Molecular Assemblies	60%	ongoing, promoted from Associate Professor to Professor
10	Horike Satoshi	42	Associate Professor, Institute for Integrated Cell-Material Sciences, Institute for Advanced Study, Kyoto University	Ph.D. Materials Chemistry	60%	ongoing
11	Kamei Kenichiro	44	Associate Professor, Institute for Integrated Cell-Material Sciences, Institute for Advanced Study, Kyoto University	Ph.D. Microengineering, Stem Cell Research	60%	ongoing
12	Wang Dan Ohtan	44	Program-Specific Research Center Associate Professor, Institute for Integrated Cell-Material Sciences, Institute for Advanced Study, Kyoto University	Ph.D. Neuroscience	60%	ongoing
13	Sugimura Kaoru	41	Program-Specific Research Center Associate Professor, Institute for Integrated Cell-Material Sciences, Institute for Advanced Study, Kyoto University	Ph.D. Biophysics, Developmental Biology	60%	ongoing

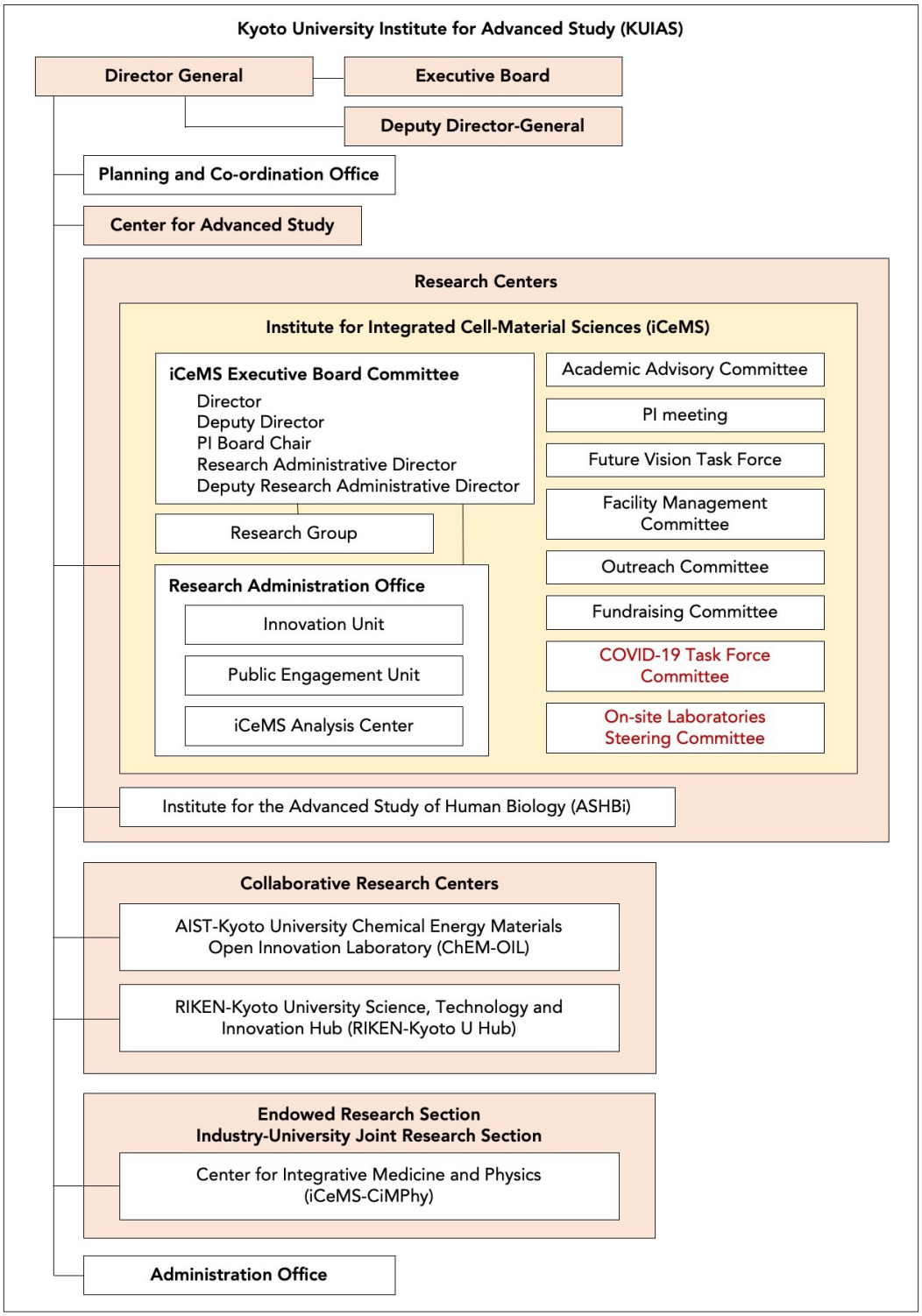
14	Fujita Daishi	36	Associate Professor, Institute for Integrated Cell-Material Sciences, Institute for Advanced Study, Kyoto University	Ph.D. Supramolecular Chemistry, Chemical Biology	60%	ongoing
15	Sugimoto Kunihisa	47	Program-Specific Associate Professor, Institute for Integrated Cell-Material Sciences, Institute for Advanced Study, Kyoto University	Ph.D. X-ray Crystallography, Synchrotron Science	24%	ongoing
16	Packwood Daniel Miles	34	Junior Associate Professor, Institute for Integrated Cell-Material Sciences, Institute for Advanced Study, Kyoto University	Ph.D. Applied Mathematics and Theoretical Chemistry	60%	ongoing
17	Hasegawa Koichi	47	Program-Specific Research Center Junior Assistant Professor, Institute for Integrated Cell-Material Sciences, Institute for Advanced Study, Kyoto University	Ph.D. Stem Cell Biology, Stem Cell Engineering, and Developmental Biology	60%	ongoing
18	Namasivayam Ganesh Pandian	40	Junior Associate Professor, Institute for Integrated Cell-Material Sciences, Institute for Advanced Study, Kyoto University	Ph.D. Bio-inspired therapeutics, Epigenetics	60%	ongoing
19	Uesugi Motonari	53	Professor, Institute for Chemical Research, Kyoto University	Ph.D. Chemical Biology	32%	ongoing
20	Kageyama Ryoichiro	63	Professor, Institute for Frontier Life and Medical Sciences, Kyoto University	M.D. Ph.D. Developmental Biology	10%	ongoing
21	Imahori Hiroshi	58	Professor, Graduate School of Engineering, Kyoto University	Ph.D. Organic Chemistry	10%	ongoing
22	Sugiyama Hiroshi	63	Professor, Graduate School of Science, Kyoto University	Ph.D. Chemical Biology	10%	ongoing
23	Tanaka Motomu	49	Professor, Center for Integrative Medicine and Physics, Institute for Advanced Study, Kyoto University	Ph.D. Medical Physics, Soft Matter Physics	10%	ongoing
24	Tanaka Koichiro	57	Professor, Graduate School of Science, Kyoto University	Ph.D. Terahertz Optical Science	10%	ongoing
25	Mori Yasuo	60	Professor, Graduate School of Engineering, Kyoto University	M.D. Ph.D. Molecular Biology	10%	ongoing
26	Abe Ryu	46	Professor, Graduate School of Engineering, Kyoto University	Ph.D. Artificial photosynthesis, Solar hydrogen production, Photocatalysts	10%	ongoing
27	Kitagawa Hiroshi	58	Professor, Graduate School of Science, Kyoto University	Ph.D. Solid-state Chemistry: Electron-proton Coupled System	10%	ongoing

28	Hamachi Itaru	59	Professor, Graduate School of Engineering, Kyoto University	Ph.D. Chemical Biology, Supramolecular Biomaterials	10%	ongoing
29	Kageyama Hiroshi	50	Professor, Graduate School of Engineering, Kyoto University	Ph.D. Solid-state Chemistry	10%	ongoing
30	Matsuda Michiyuki	61	Professor, Graduate School of Biostudies, Kyoto University	Ph.D. Bio-imaging, Visualization of inter- and intra-cellular signal transduction	10%	ongoing
31	Carlton Peter	46	Associate Professor, Graduate School of Biostudies, Kyoto University	Ph. D. Molecular and Cell Biology	10%	ongoing

*Percentage of time that the principal investigator will devote to his/her Academy center work vis-à-vis his/her total working hours.

Appendix 3 Diagram of Organizational Management System

- Diagram **separately** the Center's organizational management system **and** its position within the host institution in an easily understood manner. If you are planning to change your organization management system and/or its position within the host institution in or after FY 2020 compared to their description in Appendix 3-1 of Activities report, show the changes in the diagram.



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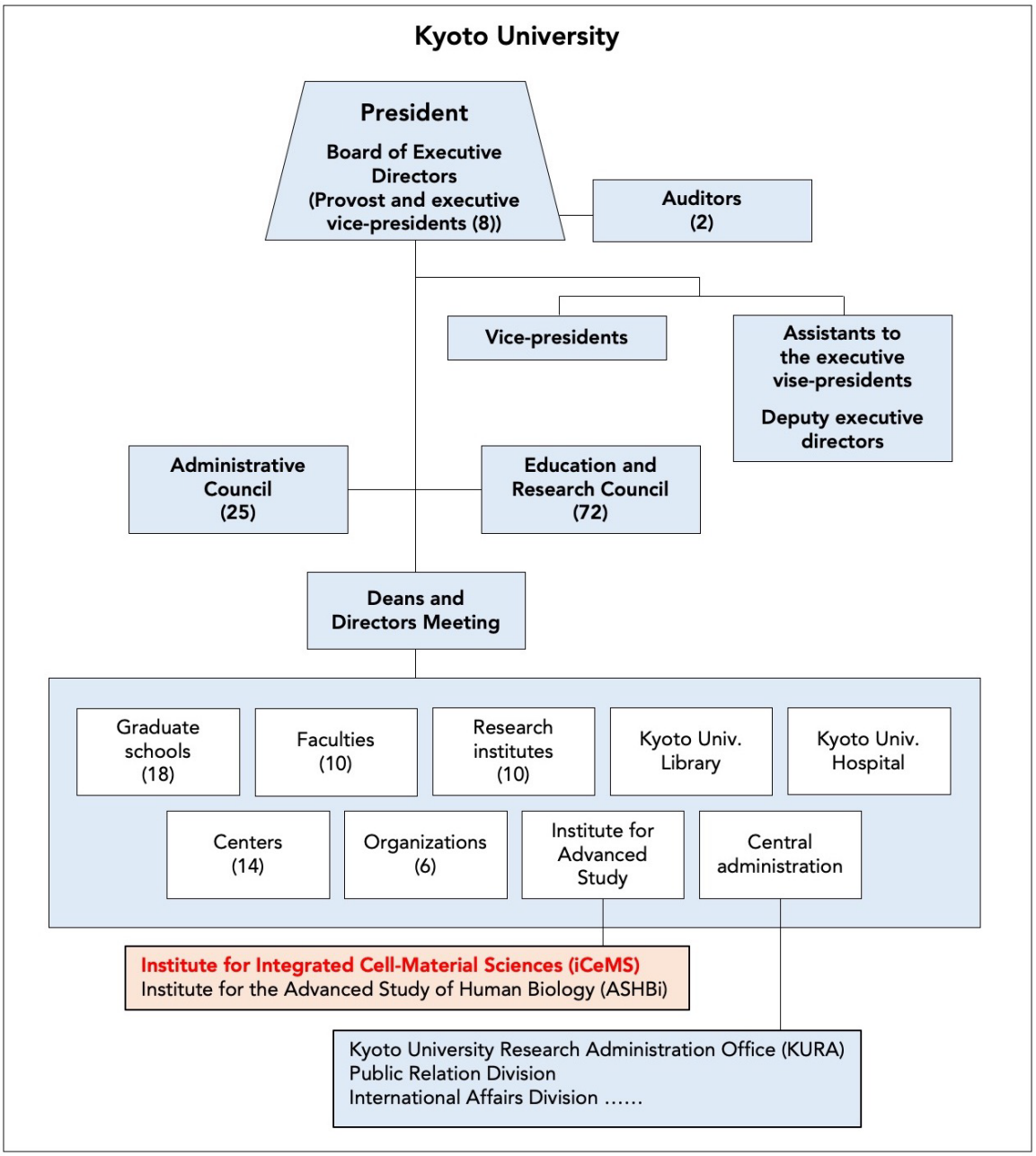
Kyoto University
President
Board of Executive Directors
(Provost and executive vice-presidents (8))
Auditors
(2)
Vice-presidents
Assistants to the executive vise-presidents
Deputy executive directors
Administrative Council
(25)
Education and Research Council
(72)
Deans and Directors Meeting
Graduate schools
(18)
Faculties
(10)
Research institutes
(10)
Kyoto Univ. Library
Kyoto Univ. Hospital
Centers
(14)
Organizations
(6)
Institute for Advanced Study
Central administration
Institute for Integrated Cell-Material Sciences (iCeMS)
Institute for the Advanced Study of Human Biology (ASHBi)
Kyoto University Research Administration Office (KURA)
Public Relation Division
International Affairs Division ……