Host Institution's Commitment

Date June 1st, 2017

To MEXT

Name of host institution Kanazawa University
Name and title of head of host institution
Koetsu Yamazaki, President of Kanazawa University

Signature

I confirm that the measures listed below will be carried out faithfully regarding "Nano Life Science Institute" adopted under the World Premier International Research Center Initiative.

<Provision in host institution's mid-to-long-term plan>

・Describe clearly the host institution's mid-to-long-term plan and how it will position the center within that plan.

Kanazawa University aims to establish a world-class research center as a part of its mid-to-long-term plan, and is now advancing valuable original research in a systematic and focused way under the auspices of the *Chozen Project* (Center of Excellence in Kanazawa University) in the following areas: nanometrology with strong emphasis on atomic force microscopy, medical and pharmaceutical research on cancer, and supramolecular chemistry for producing innovative materials. These research fields will play major roles in the interdisciplinary research in the Nano Life Science Institute (NanoLSI).

On the president's initiative, the university also plan to amass research projects valuable to the university in the Institute for Frontier Science Initiative (a.k.a. "InFiniti," established in FY2015 to promote interdisciplinary research), and systematically and strategically develop its research programs with InFiniti taking center stage. The Institute for Frontier Science Initiative's overall plan includes the establishment of NanoLSI as a center for interdisciplinary research in FY2018, the university specifies that in "Working Papers on Budget Request FY2017."

Furthermore, Kanazawa University lays also down "YAMAZAKI PLAN 2016" to autonomously develop enhancing function and reforming systems looking ahead after twenty years. In this plan, the university aims to "form a research network with strong international competitiveness" (vision 6), and specifies "making research networks with the world-class universities" and "inviting world-class researchers and exchange researchers from Kanazawa University."

This center aims to realize the projects noted above, and intends to integrate the four branches of research: nanometrology with strong emphasis on atomic force microscopy, medical and pharmaceutical research on cancer, supramolecular chemistry for producing innovative materials, and mathematical and computational science. It will be established as an interdisciplinary center within the Institute for Frontier Science Initiative. Kanazawa University has been planning to establish this center since the start of the *Chozen Project* in FY2014. It already has an explicit place in the university's mid-to-long-term-plan. After the award, we will specify our target in mid-

to-long-term-plan and the entire university will support their execution.

<Concrete Measures>

・Describe the concrete measures that the host institution will take to satisfy the following requirements.

1) How the host institution will support the center's operation and research activities in accordance with the Application Guidelines, section "6. Host institution's commitment."

This NanoLSI-project is a proposal to establish a center for the interdisciplinary research based on the existing institute, the Institute for Frontier Science Initiative (InFiniti), which was funded with the aid of an official operating expenses grant for national university corporations (for strengthening the function of national universities). InFiniti is the organization taking the lead in university reform at Kanazawa University.

To support InFiniti's operations, Kanazawa University has comprehensively improved various systems, and it has already established the flexible personnel and administrative systems. In the establishment of the NanoLSI, Kanazawa University will provide the world-class, pioneering, and international research environment by further intensifying these organizational systems of Kanazawa University and the Institute for Frontier Science Initiative. To achieve that, Kanazawa University is committed to financially supporting the research in this center in amounts equal to or greater than the WPI grant.

Specifically, Kanazawa University continually supports the financing of this center's annual budget 600 million yen to employ Principal Investigators (PI), 60 million yen to conduct research, and 80 million yen for the location fee of the interdisciplinary research. In addition, plans to improve the environment of this center are a top priority in Kanazawa University's development project, therefore, the university would establish a new project building for the cooperation of NanoLSI and the other institutes and organizations.

The research group presided by the sixteen PIs of this center acquired its average research funds of 770 million yen from FY2013 to 2016, with 850 million yen over the last two years. In regards to the future, Kanazawa University will employ six young scientists as "Junior PI" who will work in this center's next generation research fields, and also arrange full-time staff who will give support for the acquiring of external funds. Therefore, NanoLSI will be able to acquire further funds and secure research funds equivalent or higher than that of the WPI grant.

2) How the host institution will establish a basic policy for the mid-to-long term direction of its organization and operation, one that restructures its existing organization in ways that give the center a permanent place within its organization. Please provide a concrete schedule for carrying out this organizational restructuring.

Kanazawa University will establish NanoLSI for interdisciplinary research as an internal center of the Institute for Frontier Science Initiative. The university has already placed "Research Cancer Core," grounded in the Cancer Research Institute of Kanazawa University, within the Institute for Frontier Science Initiative. Likewise, the university will consider this center as an independent organization. Besides securing its independence in this way, the university also clearly positions it as a permanent organization by establishing it within the Institute for Frontier Science Initiative.

The Institute for Frontier Science Initiative is the organization leading our strategic and systematic

reformation at Kanazawa University. In founding this institute, Kanazawa University rearranged twelve positions from each department. In addition to this, the university secured twelve tenure track positions, and employed five assistant professors through the Grant of University Reform Action Plan of MEXT. The university also allocates a special budget and selected main research projects of NanoLSI as *Chozen Project*: nanometrology with strong emphasis on atomic force microscopy, medical and pharmaceutical research on cancer, and supramolecular chemistry for producing innovative materials. Each area of research has an annual research budget of approximately twenty million yen financed by Kanazawa University, i.e. centralized additional distribution from the university.

This center will be established in the Institute of Frontier Science Initiative; therefore, it will have systems I place to support for research costs through *Chozen Project*, receive research resources such as faculty position and research spaces, and get research support from University Research Administrators (URAs) who are high-level research support specialists. After the WPI period, Kanazawa University will also maintain these systems, and regard this center as a permanent organization.

3) Ways in which the host institution will provide support to sustain the center as a world premier international research center after the WPI grant period ends.

As mentioned above, NanoLSI will be established within the permanent organization, the Institute of Frontier Science Initiative. Therefore, this center has been already defined as a permanent organization.

1. Maintaining the world-class research environment: Research Professor System and the Cross-appointment System

The Institute of Frontier Science Initiative determines the direction of research in Kanazawa University. To develop a suitable research environment for the Institute of Frontier Science Initiative, the university has introduced a variety of new systems, and improved existing systems. In particular, the Research Professor (RP) System, which is an original strategy of Kanazawa University, maintains continuous research of world-class researchers from overseas by generous provision of costs for research start-up activities. Additionally, this system secures compensation and HR transparency that meet international standards through rigorous performance evaluations and an annual salary system, and provides an environment where researchers can concentrate on research by releasing them from managerial, administrative, and undergraduate teaching duties. By the combined use of the RP-System and the Cross-appointment system, Kanazawa University has invited six world-class researchers, including a winner of the Nobel Prize 2016 in Chemistry (his research field connects with this center's research on supramolecular, and he has the world authority on the design and synthesis of molecular machines): The university is already well on its way to establishing a top-level research environment according to international standard. The Institute of Frontier Science Initiative has mechanisms in place to be continually invested with resources: both research capital through the *Chozen Project*, and human resources through the redistribution of university posts as described in detail above. Consequently, the university will enable to maintain this center's research environment as "World Premier International Research Center" after the WPI grant period ends.

Kanazawa University will support world-class researchers from overseas who participate as a PI via the

RP system, in order that the PIs can continue the further cooperation between Kanazawa University and overseas institutions as RPs after WPI grant period, as well as cultivating outstanding young researchers through international intellectual exchange and leading the further development of this center. The six Junior PIs employed through international recruitment will be further screened after the grant period ends, and those who meet university standards will be employed in the tenure-track positions.

2. Fostering the next generation through the WPI Education Program

In FY2018, Kanazawa University and Japan Advanced Institute of Science and Technology will co-establish the Graduate School of Frontier Science Initiative Division of Transdisciplinary Science as a transdisciplinary sciences course within the Institute for Frontier Science Initiative. Some of NanoLSI's PIs will train students in this course. We will also establish the "WPI Education Program (temporary name)" for selected students in the Institute for Frontier Science Initiative's Higher Education Department (an organization for the education of the graduate students in high grades). In this program, PIs and Junior PIs will instruct students by developing the internationality, comprehensiveness, and interdisciplinarity of young researchers. NanoLSI will maintain its position as a "World Premier International Research Center" by continually fostering excellent young scientists taught by world-class researchers in a world-class research environment. To this end, the program will conduct interdisciplinary research by laboratory rotation, pay all students a research assistant allowance, support domestic and international employment, and give students priority admission into our Kanazawa University Student/International Student Dormitory "SAKIGAKE."

4) How will a system be instituted under which the center's director is able to make substantive personnel and budget allocation decisions necessary to implementing the center project—a system, which in practice, will allow the center director autonomy in making decisions regarding the center's operation.

Kanazawa University has already placed the "Cancer Research Core," grounded in Cancer Research Institute of Kanazawa University, within the Frontier Science Initiative. Likewise, the university will treat NanoLSI as an independent department. The university will give the Center Director complete authority over NanoLSI, including research subjects, budgets, and personnel affairs, so that this center can be operated flexibly and expeditiously according to the strong initiative of the Center Director.

Kanazawa University will employ an Administrative Director who has international research as well as management experience in large-scale research projects to enact the Center Director's vision. Additionally, the university will assign the active Trustee from the headquarters of Kanazawa University as Deputy Administrative Director. Through the Deputy Administrative Director, the university will closely cooperate with the Center Director and Administrative Director, promptly taking measures to support the center as needed while guaranteeing the Center Director's decision-making authority.

Additionally, Kanazawa University will make use of the experience and knowledge of the university as a whole by relocating full-time, manager-level staff with excellent management ability to the center to support its operation in terms of personnel affairs, budget, and all other matters. Measures such as this full-time personnel allocation will also be decided in consultation with the Center Director and Administrative Director through the

Deputy Administrative Director as the university supports NanoLSI's operations.

5) Support that will be provided to the center director in coordinating with other departments within the host institution when recruiting researchers for the center, while giving reasonable regard to the educational and research activities of those departments.

Regarding the Kanazawa University researchers who participate in NanoLSI, the university will devise measures to prevent their participation from hindering the educational activities of their respective departments. The Deputy Administrative Director will aid the Center Director by proactively making adjustments to support each department as needed, including securing substitute faculty.

6) Flexibility that will be given in applying, revising, or outfitting the host institution's internal systems as needed for the center to effectively implement new management methods (e.g. English-language environment, merit-based pay, top-down decision making, cooperation in graduate education) unfettered by conventional modes of operation.

Kanazawa University will actively make flexible use of its existing systems, improve them and lay down new rules, according to needs of NanoLSI in order to operate NanoLSI according to the best methods without being bound to the methods of the past. Examples of such measures include the following: creating an environment suitable to carrying out all duties in English, adopting a salary system appropriate to the abilities of all researchers and staff, developing a powerful and flexible decision-making system under the Center Director and a close cooperative relationship with Kanazawa University, and establishing an education partnership with the graduate school.

7) The accommodation that will be given the center's infrastructural requirements (for facilities, e.g., laboratory space; equipment; land, etc.).

Kanazawa University provided a research building (three-story, total floor space: 2,100 square meters) in April FY2015 to the Institute for Frontier Science Initiative, where the university planes to establish NanoLSI. Open laboratories and common spaces will allow for intellectual cross-pollination to step up interdisciplinary research. The twelve PIs at Kanazawa University already have 2,850 square meters of research space at their disposal utilizing the resources of *Chozen Project*, and the university's facilities development project will prioritize in providing more, including a project building in the Natural Science and Technology Hall 3 Building (total floor space: 7,190 square meters) to promote interdisciplinary cooperation between NanoLSI and other institutes and organizations. In these research facilities, the Department of Research Support's Technical Support Unit will provide total support via staff members with mastery of the equipment and ability to support it in English. The university will duly carry out all these measures to support NanoLSI's operations.

8) Other types of assistance that will be provided to give maximum support to the center in achieving its concepts and objectives and in becoming a world premier international research center in both name and deed.

1. Establishment of the international employment system

NanoLSI will allocate a page especially for international recruitment on our website and update it with the latest information as needed. We will also advertise our position openings in top-level journals, for example *Nature* and *Science*, both in print and online, post them on the international recruitment site EURAXESS, and make announcements in conferences and academic organizations related to this center's research field. Moreover, Kanazawa University will assign URAs with doctorates in related fields to NanoLSI's Center Director as advisers, and recruit young scientists utilizing research networks of the Center Director and PIs. During recruitment, the university will provide information about its research and employment environment in advance, which is in accordance with the recruitment methods of research institutions outside Japan. As for selection, the university will set up a Selection Committee consisting of the Center Director, Administrative Director, Deputy Administrative Director, one or more PIs appointed by the Center Director, and one or more external experts. This committee will screen applicants based on the vision and strategy of the center. One external expert will come from the Evaluation Committee of this center. To execute these procedures, the university will speed up the hiring process by reviewing current overly complicated processes and utilizing the systems more flexibly.

2. Enhancing the research visibility of the Nano Life Science Institute

Kanazawa University will widely advertise this center's research and educational activities in and outside Japan to increase its presence as a world-class research center. Public Relations Office and Organization of Frontier Science and Innovation of Kanazawa University, in cooperation with NanoLSI's public relation officers, will conduct active outreach initiatives. Specifically, they will construct a website with careful attention to usability in a broad range of environments. In addition, a large international symposium will be hosted once a year, revolving between in NanoLSI and the satellite centers in Europe and North America, which will further increase NanoLSI's international visibility (the kick-off symposium is scheduled March 2018 in Tokyo). Monthly international seminars will also be held in this center, in order to share research results in across different research fields, and enhance interdisciplinarity. These international events will be an appeal to those in charge of new business at start-ups as well as big companies, supporting the continuation of the center after the WPI grant project is completed. With these things in mind, Kanazawa University will fully support these events by investing human and financial resources.

3. High-level research support System: The Department of Research Support (URA Unit and Technical Support Unit)

Kanazawa University will support world-class PIs and Junior PIs by the establishment of an excellent research support system. Concretely, the university will establish the Department of Research Support manned by a highly specialized research support staff. This department will consist of the URA Unit and the Technical Support Unit. The university will appoint researchers with backgrounds in fields close to the research of this center as URAs and place them directly under the Center Director as advisers. They will provide support in international grant applications, recruitment of top-level researchers, development cooperation with companies, and integration of research fields. In addition, the Center Director may request to be assigned other advisers besides URAs as needed. The university will reallocate staff from the "General Technical Department"

(centralized management of the university's technicians and technical/specialist staff, and the first independently organized department of its type in Japan) to this center to form the Technical Support Unit. This unit will take charge of measurements and analyses that require advanced skills as well as introducing these skill to young scientists and graduate school students, thus contributing to research and cultivating the next generation. In the second half of the WPI period, Department of Research Support will gradually be incorporated into the Institute for Frontier Science Initiative's existing research support department, and after WPI period, it will be a division of the Institute for Frontier Science Initiative and function as a highly skilled international support division assisting the endeavors of the university as a whole.

Including the supports described above, Kanazawa University will take whatever measures needed to fully support NanoLSI as a world-class research center.

9) How the host institution will self-evaluate the good results of the system reforms achieved by the center and take the initiative in extending them to departments throughout its organization.

Kanazawa University understands that one of WPI program's key priorities is to contribute to the systems reform of universities in Japan, for example the development of international research environments and establishment of flexible management systems. Any of NanoLSI's undertakings in this vein, which produce high quality results, will be actively rolled out across the university as a whole. We will document this in our mid-to-long-term plan.

10) If the host institution has already established a WPI center, it should be fully supporting the maintenance and further development of the existing center and be capable, at the same time, of fully supporting the new center.

Not Applicable.