



Application Procedures for Grants-in-Aid for Scientific Research - KAKENHI -

FY2022

Grant-in-Aid for Transformative Research Areas (A)(Publicly Offered Research)

This English version is provided for convenience of prospective KAKENHI applicants who experience difficulty in reading the Japanese original, which should be referred to, in case of dispute.

November 24, 2021

The Ministry of Education, Culture, Sports, Science
and Technology (MEXT)

Introduction

This document describes the procedures and other matters relevant to the “Call for Proposals for the Grants-in-Aid for Scientific Research-KAKENHI- for FY2022” including the “Transformative Research Areas (A)(Publicly Offered Research).”

The contents are:

- I Outline of the Grants-in-Aid for Scientific Research-KAKENHI-**
- II Call for Proposals**
- III Instructions for Prospective Applicants**
- IV Instructions for Grant Recipients**
- V Instructions for Administrative Staff of Research Institution**
- VI Other Relevant Issues**

“II Call for Proposals” provides for each of the Research Categories, such basic issues as the subjects in the research categories to be called, the range of envisaged total budget, a project period, etc. The schedule from the call for proposals, through the proposal submission and the review, to the grant delivery is also described.

The subsequent sections, “III Instructions for Prospective Applicants,” “IV Instructions for Grant Recipients” and “V Instructions for Administrative Staff of Research Institution” describe conditions for application, required procedures, and other matters to be followed by the respective actors.

This Call for Proposals is announced prior to the finalization of the national budget for FY2022, so as to let prospective applicants proceed with an early preparation for the review and enable to commence their research activities as soon as possible. It is, therefore, to be reminded that, depending on the situation of the national budget enactment, details on the grant allocation and other matters may be subject to change at a later stage.

The major changes in the FY2022 Call for Proposals are listed on the following pages.

- Grants-in-Aid for Scientific Research is a competitive funding intended to provide financial support for creative and pioneering research conducted by individual researchers. Therefore, the contents of the Research Proposal Document must be original planned by the applicant.

In preparing Research Proposal Document, plagiarism and/or misappropriation of the research contents of others are strictly impermissible. Applicants must comply with research ethics.

- The research using the KAKENHI fund should be carried out by the researchers' own initiative and responsibility. Therefore, the implementation of a KAKENHI research project and publication of the research results are solely attributed to the researchers' responsibility and view, and do not reflect that of the funding sector nor of the government.
- To ensure the quality of scientific knowledge and to gain trust of society on scientists and scientific communities, it is essential to exercise fair and conscientious research activities with the adherence to the code of conduct for scientists. Applicants must understand and practice the contents of both the Statement "Code of Conduct for Scientists -Revised Version-" (section I. "Responsibilities of Scientists") by the Science Council of Japan and the booklet "For the Sound Development of Science - The Attitude of a Conscientious Scientist -" (especially section I "What Is a Responsible Research Activity?") issued by the Japan Society for the Promotion of Science (JSPS).

< Major Changes in the Call for Proposals for Fiscal Year 2022 >

(1) Amendment of the Research Proposal Document Forms

- Items “1. Research Objectives, Research Method, etc.” in the Research Proposal Document forms for Transformative Research Areas (A)(Publicly Offered Research) have been amended.

(2) Research Integrity

- In response to the “Policy for Securement of Research Integrity” (April 27, 2021, Decision of Council for Science, Technology and Innovation), JSPS is taking necessary measures to ensure the transparency of research activities. (See page 7, 83)

(Key Actions)

- It is explicitly stated that applicants must declare not only acquisition of other domestic competitive research funding but also any foreign research funding in “The Status of Application and Acquisition of Research Grants” column in the Research Proposal Document.
- Applicants must enter the affiliated institution and position in applying for and acquiring research grants for the research project entered in “The Status of Application and Acquisition of Research Grants” column in the Research Proposal Document.
- Research Proposal Documents should be submitted after appropriately sharing with their affiliated research institutions, the status of all research activities that the applicant is engaged in. If the applicant plans to handle any technology regulated by the Foreign Exchange and Foreign Trade Act of Japan (Act No. 228 of 1949), he/she must abide by said Act and the rules, etc. of his/her affiliated research institution, and thoroughly check how to handle such technology prior to submitting the Research Proposal Document.

Note that untruthful statement or misrepresentation in the Research Proposal Document may result in cancellation or reduction of the research grant.

(3) Request for Participation in the KAKENHI Peer-review Process

- It is re-emphasized that positive acceptance of invitation to serve as KAKENHI reviewer is the responsibility of researchers. Supporting the peer-review system of KAKENHI by the whole body of researchers by appropriate sharing of the burden of proposal review is crucial in sustaining the curiosity-driven research. (See page 72)

(Reference) Changes in schedule for notification of review results

○Starting from the FY2022 Call for Proposals, JSPS will issue a notification of review results before timing of provisional grant decision.

(Reference) Schedule for FY2022 Call for Proposals and Notification of Review Results for Research Categories that Used to Start in September Every Year (Tentative)

Research Category	Start of Call for Proposals	Deadline for Submission of Applications	Timing of Notification of Review Results
Specially Promoted Research	July 1, 2021	September 6, 2021	Late March 2022
Scientific Research (S)	July 1, 2021	September 6, 2021	Early May 2022
Scientific Research (A)	July 1, 2021	September 6, 2021	End of February 2022
Scientific Research (B/C), Early-Career Scientists, Encouragement of Scientists	August 1, 2021	October 6, 2021	End of February 2022
Challenging Research	August 1, 2021	October 6, 2021	Earlier than the timing of provisional grant decisions for FY2021 (early July)
Publication of Scientific Research Results	August 1, 2021	October 6, 2021	Earlier than the timing of provisional grant decisions for FY2021 (April 1)
Home-Returning Researcher Development Research	July 1, 2021	September 6, 2021	Middle of February 2022
Transformative Research Areas (A)	August 20, 2021	October 18, 2021	Late June 2022
Transformative Research Areas (B)	August 20, 2021	October 18, 2021	Late May 2022
Scientific Research on Innovative Areas (Research in a Proposed Research Area) (Publicly Offered Research)	August 20, 2021	October 18, 2021	Earlier than the timing of provisional grant decisions for FY2021 (April 1)

*Home-Returning Researcher Development Research is a FY2021 Call for Proposals.

○The timing of the Call for Proposals for some research categories subject to the restriction on parallel grant application/receipt may vary. Applicants should check the “Table of Restriction on Parallel Grant Application/Receipt” carefully. In a case for which the restriction on parallel grant application/receipt applies, applicants are not eligible to submit a new application for the other research category even if he/she withdraws the research project that he/she had already submitted (sent) through the electronic application system. (See page 53)

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The application forms (Research Proposal Document) and other application materials are contained in separate files. Please refer to “Supplementary edition to the Application Procedures for Grants-in-Aid for Scientific Research-KAKENHI- for FY2022 (Grant-in-Aid for Transformative Research Areas (A)(Publicly Offered Research)) (Forms/Procedures for Preparing and Entering a Research Proposal Document).”

* The application forms (Research Proposal Document) and other application materials can be downloaded from the MEXT website (cf. URL below).

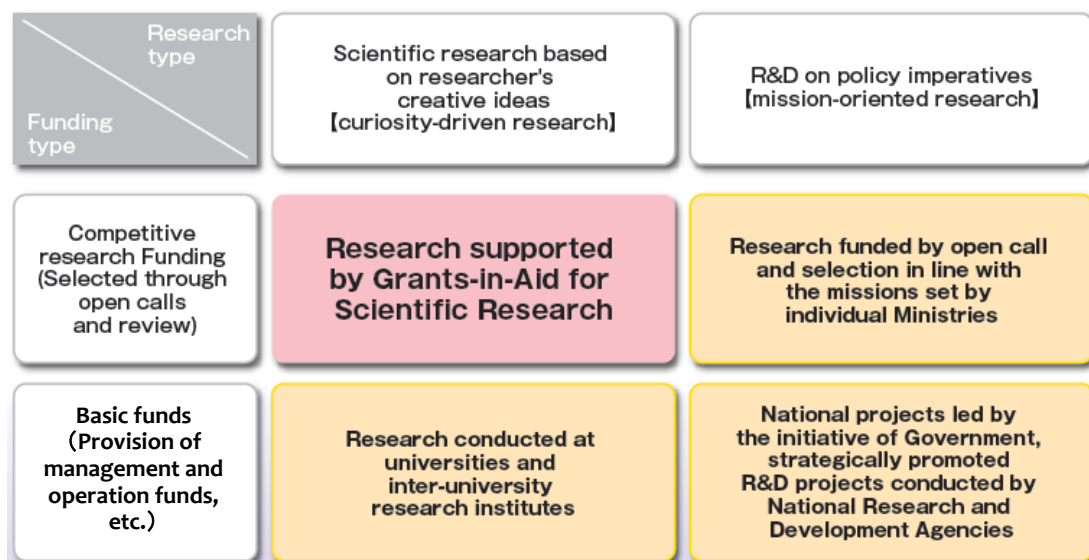
(URL) https://www.mext.go.jp/a_menu/shinkou/hojyo/boshu/1351544.htm

I. Outline of the Grants-in-Aid for Scientific Research-KAKENHI-

1. Purpose and Character of Grants-in-Aid for Scientific Research-KAKENHI-

Grants-in-Aid for Scientific Research (hereinafter referred to as “KAKENHI”) are competitive research funds that are intended to promote development of scientific research (based on original ideas of researchers), encompassing basic to applied researches in all fields ranging from humanities and social sciences to natural sciences. The grants provide financial support for creative and pioneering research projects that will become the foundation of social development. The research projects are selected by peer-review process.

<The placement of “KAKENHI” in the policy on the promotion of science, technology and scientific research in Japan>



2. Research Categories

Different research categories of KAKENHI listed below are provided so as to meet the variety of the research content and budget scale.

❖ As of November 2021

Research categories	Purposes and description of each research category	Type of fund*1
Grants-in-Aid for Scientific Research		
Grant-in-Aid for Specially Promoted Research	Outstanding and distinctive research conducted by one or a relatively small number of researchers expected to achieve remarkably excellent research results that opens up a new scientific field. The research period is 3 to 5 years. (In a truly necessary case, period up to 7 years is acceptable.) The budget ranges from 200 million to 500 million yen per project (Only in a truly necessary case, budget exceeding 500 million yen is asked for.)	SG
Grant-in-Aid for Scientific Research on Innovative Areas (Research in a Proposed Research Area)	This category is intended to foster novel research areas proposed by diverse groups of researchers that are expected to lead to development and heightening of Japan's research level in the respective fields, to be conducted by collective research efforts through collaboration, scholarly training, shared use of equipment, etc. The period is 5 years. The budget range is generally set between 10 million to 300 million yen per fiscal year per proposed area. [A call for proposals for “Publicly Offered Research” in the on-going research areas	SG

	only is put out in FY2020 and beyond.]		
Grant-in-Aid for Transformative Research Area	(A) Research areas proposed through co-creative and interdisciplinary efforts of diverse researchers, which aim to create research areas that will lead the way to radical transformation of and change in the existing framework and/or direction of research as well as upgrade and level-up of scientific research in Japan and nurturing young researchers, and will contribute to the development of the proposed research areas through efforts for joint research and shared use of equipment, etc. (5 years; more than 50 million yen and up to 300 million yen per fiscal year per research area (In a truly necessary case, a budget exceeding 300 million yen may be requested.)) (B) Research areas proposed by compact groups of researchers who will be bearers of the next generation of research with a smaller budget scale (about 3 or 4 groups), which aim to create research areas that will lead the way to radical transformation of and change in the existing framework and/or direction of research as well as upgrade and level-up of scientific research in Japan through more challenging and exploratory research, and expected to lead to the Transformative Research Areas (A) in the future. (3 years; 50 million yen or less per fiscal year per research area)	SG	
Grant-in-Aid for Scientific Research	(S): Creative/pioneering research conducted by one or a relatively small number of researchers. 5 years (in principle) 50 million to 200 million yen (A), (B), (C): Creative/pioneering research conducted by one researcher or jointly by multiple researchers. (A) 3 to 5 years; 20 million to 50 million yen (B) 3 to 5 years; 5 million to 20 million yen (C) 3 to 5 years; 5 million yen or less	(S)	SG
		(A)	
		(B)	
		(C)	MF
Grant-in-Aid for Challenging Research (Pioneering/Exploratory)	Research conducted by a single or multiple researchers that aims at radically transforming the existing research framework and/or changing the research direction and has a potential of rapid development. The scope of the (Exploratory) category encompasses research proposals that are highly exploratory and/or are in their budding stages. (Pioneering) 3 to 6 years; 5 million to 20 million yen (Exploratory) 2 to 3 years; 5 million yen or less	MF	
Grant-in-Aid for Early-Career Scientists	Research conducted by an individual researcher (*2) who is less than 8 years after Ph.D. acquisition. 2 to 5 years; 5 million yen or less	MF	
Grant-in-Aid for Research Activity Start-up	Research conducted by a single researcher who has been freshly appointed to a research position, or who has returned from his/her maternity, childcare or other kinds of leave. Up to 2 years; Up to 1.5 million per fiscal year	MF	
Grant-in-Aid for Encouragement of Scientists	Research conducted by an individual who is ineligible for application for other KAKENHI categories (e.g., individuals who belong to educational or research institutions, private companies, etc. and engage in the researches to contribute to the promotion of the science). 1 year; 100 thousand to 1 million yen	SG	
Grant-in-Aid for Special Purposes	Research projects of pressing urgency and importance.	MF	
Grant-in-Aid for Publication of Scientific Research Results			
Publication of Research Results	Subsidy for publication and/or international dissemination of research achievements of high academic values executed by academic associations and other organizations.		SG
Enhancement of International Dissemination of Information	Subsidy for efforts by academic societies and other scholarly organizations to strengthen international dissemination of academic information for the purpose of international academic exchange.		
Scientific Literature	Subsidy for academic publication of research results (books) authored by an individual or a group of researchers.		
Databases	Subsidy for creation and operation of a database open to public use by an individual or a group of researchers.		

Grant-in-Aid for JSPS Fellows	Funding period is up to 3 years for research conducted by JSPS Fellows (including Foreign JSPS Fellows). As for Cross-border Postdoctoral Fellowship (CDP) the period is up to 5 years	SG
Fund for the Promotion of Joint International Research		
Fostering Joint International Research	(A) Support of joint international research project conducted by a KAKENHI grantee in collaboration with researcher(s) at a foreign university or a research institution over a period of 6 to 12 months. The grant seeks to markedly advance research plans for the root research project and to foster independent researchers who can be internationally competitive. (The budget is up to 12 million yen.) [The category name is changed from FY2018 call for proposals.] (B) Support of joint international research project conducted by multiple domestic researchers and a researcher who belongs to overseas research institution. In addition to the development of scientific research, the grant seeks to build out infrastructure of joint international research or further strengthen joint international research and to foster researchers who can be internationally competitive. (The period is 3 to 6 years. The budget is up to 20 million yen.)	MF
International Activities Supporting Group	Support of international activities within Scientific Research on Innovative Areas. (Set period of the Area, up to 15 million yen per fiscal year) [After FY2018 call for proposals “International Activities Supporting Group” has been incorporated into “Grant-in-Aid for Scientific Research on Innovative Areas “Administrative Group.” (It continued until the FY2019 call for proposals.)]	
Home-Returning Researcher Development Research	Support of research to be conducted by a Japanese researcher with current affiliation abroad who is to be newly appointed at university or research institution in Japan. (The period is up to 3 years. The budget is up to 50 million yen.)	

*1 SG: Series of Single-year Grants, MF: Multi-year Fund

*2 Individuals who are in the prospect of acquiring Ph.D. are also eligible. When counting the years after Ph.D. acquisition, the period of maternity leave and childcare leave can be excluded.

3. Role Sharing Between MEXT and JSPS

Up to FY 1998, all aspects of KAKENHI funding were handled by the Ministry of Education (the predecessor of MEXT). From FY1999 on, these tasks have been gradually transferred to JSPS. The current role-sharing between MEXT and JSPS is as shown below.

❖ As of November 2021

Research category	Call for proposals, Review	Grant delivery
	Preparation of the document(s) for procedures, Reception of proposal submission	Notifications of unofficial decision Reception of the application form (after unofficial decision) and other documents for the relevant procedures. Notification of grant decision
Scientific Research on Innovative Areas, Transformative Research Areas, Special Purposes, Fund for the Promotion of Joint International Research (International Activities Supporting Group)	MEXT	JSPS
Specially Promoted Research, Scientific Research, Challenging Exploratory Research, Challenging Research, Early-Career Scientists, Research Activity Start-up, Encouragement of Scientists, Publication of Scientific Research Results, JSPS Research Fellow, Fund for the Promotion of Joint International Research (Fostering Joint International Research, Home-Returning Researcher Development Research),	JSPS	JSPS

4. Rules Pertaining to KAKENHI

KAKENHI (Series of Single-year Grants) are governed by the “Law on Optimizing Implementation of Budgets Relating to Subsidies” (Law No. 179, 1955), the “Procedures on the Handling of Grants-in-Aid for Scientific Research” (Public Notice of MEXT), the “Procedures on the Handling of JSPS Grants-in-Aid for Scientific Research” (KAKENHI (Series of Single-year Grants)) (Regulations No. 17, 2003), and other rules.

KAKENHI (Multi-year Fund) are governed by the application with modifications of the “Law on Optimizing Implementation of Budgets Relating to Subsidies” (Law No. 179, 1955) and the application of the “Basic Policy on the Management of the KAKENHI (Multi-year Fund) (Decision by the Minister of Education, Culture, Sports, Science and Technology)”, the “Procedures on the Handling of JSPS Grants-in-Aid for Scientific Research (KAKENHI (Multi-year Fund))” (Rule No. 19, 2011) and other rules.

(1) Three Types of Rules Pertaining to KAKENHI

The following three sets of rules pertain to various aspects of KAKENHI.

- i) Application Rules: rules concerning the submission of research proposals
- ii) Assessment Rules: rules concerning the pre-assessment (review) of applications, and rules concerning the interim, and other progress assessment of granted projects.
- iii) Spending Rules: rules concerning the use of KAKENHI

These three sets of rules apply as follows.

[Grants-in-Aid for Scientific Research]

❖ As of November 2021

	Application Rules	Assessment Rules	Spending Rules
KAKENHI (Series of Single-year Grants)	MEXT Application Procedures	MEXT Rules concerning the assessment for Grants-in-Aid for Scientific Research	JSPS For researchers: Supplementary conditions For research institutions: Administrative work and other tasks concerning the use of Grants-in-Aid for Scientific Research (KAKENHI (Series of Single-year Grants)), to be performed by each research institution
KAKENHI (Multi-year Fund)	JSPS Application Procedures	JSPS Rules concerning the review and assessment for Grants-in-Aid for Scientific Research	JSPS For researchers: Funding conditions For research institutions: Administrative work and other tasks concerning the use of Grants-in-Aid for Scientific Research (KAKENHI (Multi-year Fund)), to be performed by each research institution

(2) Appropriate Use of KAKENHI

KAKENHI are funded by the tax of citizens and other sources, so please ensure that the KAKENHI is used efficiently and effectively, for example through planning for the communal use of purchased items.

Researchers receiving the KAKENHI have a duty to comply with the related laws, regulations and spending rules by researchers (supplementary conditions or funding conditions), and also to use such grants appropriately. To facilitate the appropriate use of KAKENHI, research institutions to which the researchers belong are responsible for the management of KAKENHI. The Administrative work that each research institution is required to carry out (rules for use for institutions) is determined by JSPS. The research institutions are responsible for the appropriate accounting of KAKENHI. It is desirable, for example, to set up an accounting system for proper management of KAKENHI budget and expenditure, purchase order and delivery inspection, and internal auditing. To prevent improper business transactions, it is important, in addition to appropriate delivery inspections, to make all traders thoroughly informed of the KAKENHI rules and thus obtain cooperation of traders in the prevention of this kind of fraudulent accounting. Research institutions should take rigorous measures so as to eliminate business malpractice.

KAKENHI applicants and their research institutions must have full understanding of the KAKENHI rules prior to the submission of their research proposals.

(3) The Distinction between KAKENHI (Series of Single-year Grants) and KAKENHI (Multi-year Fund)

A research project submitted to the categories of KAKENHI (Series of Single-year Grants), if adopted, is granted as a package plan for the multi-year research period. The actual funding, however, is made on the single-year basis for each fiscal year of the research period. Therefore, this type of KAKENHI cannot be used to cover the expenditures in fiscal years other than the respective grant year.

When it is anticipated that spending of the grant cannot be completed within the fiscal year, owing to reason(s) unforeseeable at the time of grant delivery, the grant can be carried over to the next fiscal year after going through the due procedure. Firstly a Principal Investigator submits an application for carry-forward of grant through his/her affiliated research institution to JSPS. After reviewing it by JSPS and MEXT, the Minister of MEXT makes a request to the Minister of Finance for the carry-forward of grant to obtain his/her approval.

On the other hand, the KAKENHI (Multi-year Fund) is handled as single funding for the whole research period. Therefore, it is possible to use the grant to cover the expenditures extending over fiscal year boundaries.

Moreover, if an amount of grant remains unused by the end of a fiscal year, it can be carried over to the successive fiscal year(s) as long as they are within the overall research period, without going through prior authorization procedures. In case such a grant carry-over becomes necessary in the final year of the research period, the grantee may choose to request an official approval of one-year extension of the research period.

(4) Penalty for Non-submission of “Report on the Research Achievements”

i) The “Report on the Research Achievements” plays the important role in making the achievements of the research funded by the KAKENHI widely known to the public, and thereby returning the outcome of KAKENHI supported by citizens’ tax, to the society.

The contents of the “Report on the Research Achievements” submitted by KAKENHI grantees are compiled and made available to the public on the “Grants-in-Aid for Scientific Research Database” (KAKEN) of the National Institute of Informatics and other platforms. “Report on the Research Achievements” should be submitted via the research institution to which the KAKENHI grantees belong.

ii) No KAKENHI grant will be awarded to a researcher who failed to submit the “Report on the Research Achievements” at the end of his/her research period without any justifiable reason. If such a non-compliance case is uncovered, the decision of grant award to the researcher in question may be cancelled, the on-going grant may be suspended, and return of the delivered grant may be ordered. In addition, relevant information, such as the name of the research institution to which the researcher in question belongs, may be made public.

Furthermore, if researchers have failed to submit the scheduled report on the research

achievements without justifiable reason, then execution of other KAKENHI implemented in the same fiscal year will be suspended. Therefore, it is the responsibility of the representative of the research institution to ensure that the report on the research achievements is submitted without fail.

(5) Penalty for the Case of Infringement of Related Laws and Regulations

If there have been serious falsehoods in the application documents, or violation of relevant laws, regulations and guidelines, the delivery of KAKENHI may be suspended or cancelled.

5. “Guidelines on the Proper Implementation of Competitive Research Funds,” etc.

The “Guidelines on the Proper Implementation of Competitive Research Funds” (Agreement of the Liaison Meeting of Related Offices and Ministries on Competitive Research Funds, September 9, 2005; revised June 22, 2017) states common understandings among the research-related ministries and offices in regard to allocation of competitive research funds, in terms of elimination of such inappropriate practices as unreasonable duplication and/or excessive overconcentration in the grant allocation, fraudulent acquisition and/or unlawful use of grants, and misconducts in research activities. The implementation of the KAKENHI system as well as other competitive research funds scheme follows the above-mentioned “Guidelines” and other related rules. Applicants are urged to take special notice of the following points.

(1) Elimination of Unreasonable Duplication and/or Excessive Overconcentration in the Grant Allocation

i) Towards elimination of “Unreasonable Duplication and/or Excessive Overconcentration” (*) of competitive research funds, relevant information on funding applications are shared among the pertinent ministries and funding agencies, making use of the Cross-ministerial Research and Development management system (e-Rad).

Therefore, applicants, when submitting more than one KAKENHI applications and/or other competitive research funds, are urged to prepare their application documents with due care to clearly state the differences between the project to be submitted and their other projects so as to make it clear that they do not constitute unreasonable duplication.

In case a particular KAKENHI application is recognized as constituting a case of unreasonable duplication and/or excessive overconcentration, that application may not be granted.

ii) The following conducts may result in rejection of the research project, cancellation of grant, or reduction of the research budget: untruthful statement or misrepresentation in any of the entry of the status of applications and acquisitions of other competitive research funds (including those of other ministries) and other grants in the research proposal document (such as name of research grant, title of research project, research period, amount of budget, effort, affiliated institution/position upon application/acquisition of such grants, etc.); if it is found that the applicant has not appropriately shared with his/her affiliated research institution, the information necessary to ensure the transparency of all research activities that he/she is

involved in, including information on research funds and side jobs, etc., as well as information on donations and information on supports other than monetary funds, for example, through the provision of facilities and/or equipment.

- iii) Inquiries on the status of acceptance of facilities and/or equipment used for the research, the status of management of such facilities/equipment, and request for other information may be made to researchers, etc.

(*) Elimination of Unreasonable Duplication and Excessive Overconcentration in Grant Allocation

**“Guidelines on the Proper Implementation of Competitive Research Funds” -Extract-
(Agreement of the Liaison Meeting of Related Offices and Ministries on Competitive Research Funds, September 9, 2005; revised June 22, 2017)**

2. Elimination of Unreasonable Duplication and/or Excessive Overconcentration in the Grant Allocation

(1) Basic Policy of the Unreasonable Reduplication and Excessive Overconcentration

- i) In the “Guidelines”, “Unreasonable Duplication” refers to a situation in which more than one competitive research funds are unnecessarily and duplicative allotted to one and the same research project by one and the same researcher. Either of the following cases falls under “Unreasonable Duplication.”

○Cases where simultaneous applications have been made to more than one competitive research funds for substantially the same research project, and where these research projects are redundantly adopted.

○Cases where an application has been made again for substantively the same research project as another project that has already been adopted, and for which the allotment of competitive research funding has already been completed.

○Cases where there is duplication in the use of research funds among more than one research projects.

○Other cases corresponding to those above.

- ii) In these guidelines, “Excessive Concentration” is a situation in which the entire research funds that are allotted to one and the same researcher or research group (hereinafter referred to as “researcher, etc.”) in the fiscal year in question exceeds the limit within which they can be used effectively and efficiently, and in which the research funds cannot be used within the research period. Either of the following cases falls under “Excessive Concentration.”

○Cases where, in the light of the abilities of the researcher, etc. and the research methods, etc., excessive research funds are allotted.

○Cases where, in comparison with the effort (the time allocation rate (%) of time necessary for the implementation of the research activities with the entire working time of researcher) that is being allotted to the research project in question, excessive research funds are allotted.

○Cases where the purchase of unnecessarily expensive equipment is carried out.

○Other cases corresponding to the cases mentioned above.

(2) Dealing with “Improper Grant Spending,” “Fraudulent Grant Acquisition” or “Research Misconduct”

- “Improper Grant Spending,” “Fraudulent Grant Acquisition” and “Research Misconduct” refer to the following type of acts respectively.

• “Improper Grant Spending”:

Use of competitive research funds for other purposes, intentionally or by gross negligence, for example, by conducting fictitious business transactions (“*azukekin*”) with a trader through fictitious order placements, or by charging costs higher than actually needed for personnel, travel expenses, etc., or use of competitive research funds in violation of the content of the funding decision or the conditions it implies.

- “Fraudulent Grant Acquisition”:
Receiving competitive research funds by deception or other fraudulent means, for example, by applying under the name of another researcher, or by making false entries in application documents.
- “Research Misconduct”:
Fabrication, falsification, or plagiarism of data, information, or findings published research achievements based on the intent of the researcher, or the failing of the researcher to fulfill the basic duty of care that he/she has.

- (i) **No KAKENHI will be offered, for a fixed period of time, when a researcher or related party has committed an improper grant spending of KAKENHI, has committed a fraudulent grant acquisition of KAKENHI, or has committed a research misconduct.** Moreover, for research projects for which it is established that an improper grant spending of grants, a fraudulent grant acquisition of grants or research misconduct has been committed, the researcher in question may be required to return the given KAKENHI completely or partially.
- Moreover, an outline of the improper grant spending of KAKENHI, the fraudulent grant acquisition of KAKENHI, and/or the research misconduct in question of the researcher who falls in those categories (containing an outline of the outcome of the investigation in the research institution, the names of the people involved, the name of the system, the institution they belong to, the research project, the budget, the fiscal year of the research, the fraudulent content, details of the measures taken, etc.) will be made public.**
- Also researchers who have committed improper grant spending or fraudulent grant acquisition of competitive research funds other than the KAKENHI (including funds under the jurisdiction of other Offices and Ministries), etc., and/or has committed research misconduct by means of these competitive research funds, and therefore are excluded from receiving these funds in question for a certain period of time, will not receive the KAKENHI for the same period of time.**

Note: This applies to those schemes newly starting a call for proposals in FY2022 (and onward) for “competitive research funds other than KAKENHI, etc. (including funds under the jurisdiction of other Offices and Ministries)” as well. It also applies to those schemes that ended before FY2021. Refer to the website below for the schemes to which this specifically applies at present.

URL: https://www8.cao.go.jp/cstp/compefund/kyoukin_r2-3.pdf

○Period of KAKENHI suspension

[Improper Grant Spending and Fraudulent Grant Acquisition of KAKENHI]

Researcher categories	Extent of the improper grant spending		Period of KAKENHI suspension
I. Researchers who committed improper grant spending of KAKENHI and researchers who conspired in such acts	1. Misappropriation of KAKENHI for personal gain		10 years
II. Researchers who committed improper grant spending of KAKENHI and researchers who conspired in such acts	2. Other than 1.	(i) Cases of major seriousness and maliciousness	5 years
		(ii) Cases other than (i) and (iii)	2 to 4 years
		(iii) Cases of minor seriousness and maliciousness	1 year
III. Researchers who acquired KAKENHI by deception or other fraudulent means and researchers who conspired in such acts	-		5 years
IV. Researchers who were not directly involved in the improper grant spending of KAKENHI, but failed to exercise due care and used the funds as a result	-		The upper limit is 2 years and the lower limit is 1 year depending on the degree of the breach of duty by the researchers who have the duty of care as a good manager. .

For cases judged as subcritical to the punitive suspension measures, sharp reprimand is administered to the individual(s) concerned.

The following cases are pertinent to the “sharp reprimand” penalty.

1. Among the case II above, the researchers in case that the influence on society and the maliciousness of their conducts are judged to be insignificant and the amount of money involved is small.
2. Among the case IV above, the researchers in case that the influence on society and the maliciousness of their conducts are judged to be insignificant.

[Research Misconduct]

Individual Involvement in the Misconducts		Negative Impacts on Science and on Public at Large Degree of Maliciousness	Period of KAKENHI Suspension	
Subject of Research Misconduct	(a) Particularly malicious individual(s) who, for example, had intention of research misconduct from the very beginning of the research		10 years	
	(b) Author(s) of paper(s), etc. related to the research in which research misconduct (s) have been identified (other than (a) above)	Responsible author(s) of the paper(s) in question (corresponding author, lead author or other authors bearing equivalent responsibilities)	Cases where it is judged that the impact on the progress of the science in the field in question and the social impact are major, or the level of maliciousness involved in the acts is high	5 to 7 years
			Cases where it is judged that the impact on the progress of the science in the field in question and the social impact are minor, or the level of maliciousness involved in the acts is low	3 to 5 years
		Author(s) of the paper(s) in question other than the responsible author(s) described above		2 to 3 years
	(c) Individual(s) involved who are not the authors of the research paper(s) for which research misconduct(s) are identified.			2 to 3 years
Responsible author(s) of paper(s), (corresponding author, lead author or other authors bearing equivalent responsibilities) for which research misconduct(s) are identified, but not involved in the alleged research misconduct		Cases where it is judged that the impact on the progress of the science in the field in question and the social impact are major, or the level of maliciousness involved in the acts is high	2 to 3 years	
		Cases where it is judged that the impact on the progress of the science in the field in question and the social impact are low, or the degree of severity of the acts is low	1 to 2 years	

* In cases where specific issues for extenuation such as voluntary withdrawal of the paper in question may be taken into account, the suspension period can be shortened as judged fit.

(ii) The relevant information of each research misconduct case may be provided to the offices of the research funding agencies (including Incorporated Administrative Agencies) under the jurisdiction of the relevant Office. Thereby the penalized researcher may be also subject to restriction in application of and/or participation to research projects in other competitive research funds other than KAKENHI.

Note: “Application and/or participation” means proposing new research projects, applying, responding to call for proposals, newly participating to research as a person involved in collective research, etc. and participating as a Principal Investigator or a person involved in collective research, etc. in research projects in progress (continued research projects).

(iii) Research institutions are required to comply with the “Guidelines on the Management and Audit of Public Research Funds at Research Institutions (Implementation Standards) (revised in February 1, 2021), Ordered by the Minister of Education, Culture, Sports, Science and Technology” and the “Guidelines for Responding to Research Misconduct (adopted August 26, 2014 by MEXT).” Therefore, research institutions should pay adequate attention to these two sets of Guidelines when researchers implement their research activities.

In case where the status of the system improvement in line with these guidelines is recognized inadequate based on the survey results, the measures such as the reduction in indirect cost of all kinds of grants disbursed by MEXT or the Incorporated Administrative Agencies under the

control of MEXT to the research institution(s) in question can be taken.

- “Guidelines on the Management and Audit of Public Research Funds at Research Institutions”

[URL:https://www.mext.go.jp/a_menu/kansa/houkoku/1343904_21.htm](https://www.mext.go.jp/a_menu/kansa/houkoku/1343904_21.htm)

- “Guidelines for Responding to Research Misconduct”

[URL: https://www.mext.go.jp/a_menu/jinzai/fusei/index.htm](https://www.mext.go.jp/a_menu/jinzai/fusei/index.htm)

Note: Examples of improper grant spending, fraudulent grant acquisition and research misconduct of KAKENHI.

○ **Improper grant spending**

- Someone instructed a trader to forge fictitious transaction pretending to have purchased expendables, made the university pay a KAKENHI for them, and then instructed the trader to keep the money as deposit for future use.
- Someone instructed a trader to forge a fictitious transaction, obtaining a false invoice which carries item names different from those actually ordered and delivered, and then made the university pay a KAKENHI for them.
- Someone instructed his/her students to submit false work attendance sheets, made the university pay a KAKENHI for them, and then kept the money as a pooled fund of his/her lab.
- Someone visited destination not listed on the oversea travel itinerary, in order to have a meeting on cooperative research unrelated to the purpose of the KAKENHI research project.

(Note) The expenditure of the KAKENHI for fictitious and other transactions, like the ones mentioned in the case examples above, are all considered “misappropriation or misuse,” even if the expenditure was intended for the purpose of conducting the KAKENHI research project.

○ **Fraudulent grant acquisition**

- A researcher ineligible for the KAKENHI funding made application and acquired a KAKENHI grant.

○ **Research misconduct**

- Someone manipulated or forged experimental data or figures in a research paper published as an achievement of the research supported by a KAKENHI.
- Someone published books of his/her achievement with KAKENHI which contained an article translated from an original English research paper with no prior consent from the author(s) nor proper quotation statement.

6. Dissemination, Etc. of Research Achievements Supported by KAKENHI

KAKENHI research achievements are made available to other researchers and to the general public, through posting of the “Research Outline” and the “Report on the Research Achievements” on the Grants-in-Aid for Scientific Research Database (KAKEN) operated by the National Institute of Informatics.

To promote dissemination of research achievements, the KAKENHI can be used to cover such outreach-related expenses as preparation of website or printing of pamphlets. The KAKENHI grantees are urged to actively pursue public promotion of their research achievements through the aid of KAKENHI so as to make them widely known to the public at large.

In this connection, the KAKENHI grantees are encouraged to participate in the “HIRAMEKI ☆ TOKIMEKI SCIENCE” program, in which the latest science developments are presented to elementary, junior high and high school students in an easy-to-understand style.

In addition, please take note of the following issues as well.

(1) The acknowledgement for KAKENHI grant in research publications

When publishing research achievements of the KAKENHI project, researchers should be sure to express that the project has been supported by the KAKENHI grant, by stating in the “Acknowledgment” section of the paper the “JSPS KAKENHI Grant Number JP8 digits” in the case of English publication or “JSPS 科研費 JP8 桁の課題番号” in the case of Japanese publication.

〈Example〉

【English】 This work was supported by JSPS KAKENHI Grant Number JP12K34567.

【Japan】 本研究は JSPS 科研費 JP12K34567 の助成を受けたものです。

(2) The implementation of the fair and conscientious research activities

The research using the KAKENHI should be carried out based on researcher’s own self-awareness and responsibility. Therefore the publication on the implementation of the research or research achievements, etc. should not come from the government request and the views and responsibilities on the research achievements should be attributed to the researchers themselves.

On the occasion such as researchers release the research achievements using the KAKENHI broadly to the public, the examples of the indication noting that the research achievements are based on the personal views are given below.

〈Example〉

【English】 Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the author’s(s’) organization, JSPS nor MEXT.

【Japan】 本研究の成果は著者自らの見解等に基づくものであり、所属研究機関、資金配分機関及び国の見解等を反映するものではありません。

(3) Promotion of “Open Access” to the research papers supported by KAKENHI grants

JSPS endorses general policy of promotion of open access of publications of research results funded by public grants including KAKENHI. Note that open access is not mandatory if there are

justifiable reasons for deferral such as copyright-related issues, or insufficient repository infrastructure at the research institution.

○The open access implementation policy of JSPS is given on the following webpage:

URL: https://www.jsps.go.jp/data/Open_access.pdf

[Reference 1: What is “Open Access”]

“Open Access” refers to the idea that research papers published in peer-reviewed journals, etc. should be made freely accessible by anyone on line.

[Reference 2: Different Routes to Open Access]

There are three main ways of open access implementation ((i) to (iii) below).

- (i) A way in which the article published in the conventional subscription fee type academic journal after a certain period (Embargo)(*1) (for example 6 months later) is made open access by opening the final manuscript to an Institutional Repository(*2) established by the research institution to which the author belongs, or by opening the final manuscript to the website, etc. established by the researchers (self-archiving)(*3).
- (ii) A way to make the article open access by posting the article on the web established by the research community or public institution.
- (iii) A way to make the article open access immediately by paying the publication fee (APC: Article Processing Charge) by the author of the article.

*1: Embargo

The predetermined period from the time of publication of an article in an academic journal to the time of release so that it can be posted on an online open access archiving system (repository).

*2: Institutional Repository

An online archiving system created by university or research institution for storage and dissemination of the intellectual products. Institutional repositories play important roles in the reform of academic information distribution by enabling the researchers register their own articles, such as the transmission of research and education achievements of the research institution, PR for both the research institution and the researcher, guaranteeing the accountability of research and education activities towards society, and the long-term conservation of intellectual products.

*3: Self-archiving

”Self-archiving” refers to online posting of articles published in academic journals, dissertations, or data by those other than the publisher (the researcher or research institution) generally on their institutional repositories.

7. Code of Conduct for Scientists to Adhere

To ensure the quality of scientific knowledge and to gain trust of society on scientists and scientific communities, it is essential to exercise fair and conscientious research activities with the adherence to the code of conduct for scientists. Applicants must understand and practice the contents of both the Statement “Code of Conduct for Scientists -Revised Version-” (section I. “Responsibilities of Scientists”) by the Science Council of Japan and the booklet “For the Sound Development of Science -The Attitude of a Conscientious Scientist-” (especially section I “What Is a Responsible Research Activity?”) issued by JSPS.

And also take note that upon the formal application for grant delivery, it shall be confirmed through the electronic application system whether the Principal Investigator and Co-Investigator(s) will have taken the research ethics education coursework, etc. (see page 70)

[Extraction from the Statement “Code of Conduct for Scientists -Revised Version-” by the Science Council of Japan dated January 25, 2013]

I. Responsibilities of Scientists

(Basic Responsibilities of Scientists)

1 Scientists shall recognize that they are responsible for assuring the quality of the specialized knowledge and skills that they themselves create, and for using their expert knowledge, skills and experience to contribute to the health and welfare of humankind, the safety and security of society and the sustainability of the global environment.

(Attitude of Scientists)

2 Scientists shall always make judgments and act with honesty and integrity, endeavoring to maintain and improve their own expertise, abilities and skills, and shall make the utmost effort to scientifically and objectively demonstrate the accuracy and validity of the knowledge they create through scientific research.

(Scientists in Society)

3 Scientists shall recognize that scientific autonomy is upheld by public trust and the mandate of the people, understand the relationships between science, technology, society, and the natural environment from a wide-ranging perspective, and act in an appropriate manner.

(Research that Answers to Social Wishes)

4 Scientists shall recognize that they are responsible for answering to the wishes of society to investigate into truths and to achieve various issues. When using research funds that are to be provided for establishing the research environment and for conducting research scientists shall always recognize that such broad social expectations exist.

(Accountability and Disclosure)

5 Scientists shall strive to disclose and actively explain the roles and significance of their own research, evaluate the possible effects of their research on people, society and the environment as well as the changes that their research might engender, neutrally and objectively disclose the results of this evaluation, and build a constructive dialogue with society.

(Dual Use of Scientific Research Outcomes)

6 Scientists shall recognize that there exist possibilities that their research results, contrary to their own intentions, may be used for destructive actions, and shall select appropriate means and methods as allowed by society in conducting research and publicizing the results.

* URL: <http://www.scj.go.jp/ja/scj/kihan/>

[“For the Sound Development of Science – The Attitude of a Conscientious Scientist –” by the JSPS]

(Japanese version (text version)) (“For the Sound Development of Science” Editorial Committee on JSPS)

* URL: <https://www.jsps.go.jp/j-kousei/data/rinri.pdf>

II. Call for Proposals

1. Research Categories for Which a Call for Proposals is Organized

The Ministry of Education, Culture, Sports, Science and Technology (hereinafter “MEXT”) is organizing a call for proposals for the following research categories.

Grant-in-Aid for Transformative Research Areas (A)(Publicly Offered Research)

2. Schedule from Application to Grant Delivery

(1) Procedures that Need to Be Completed Prior to the Deadline for the Submission of the Application Documents

Principal Investigator should sufficiently cooperate with the research institution, and should adequately respond to its requests.

The Date and Time	Procedures to be Performed by the Principal Investigator (See “III. Instructions for Prospective Applicants”)	Procedures to be Performed by the Research Institution (See “V. Instructions for Administrative Staff of Research Institution”)
<p>From November 24 (Wednesday), 2021</p> <p>Start of the Call for Proposals</p>	<p>1) Preparing the Application Investigators should access the Electronic Application System using the ID and the e-Rad Password which has been provided by the research institution and preparing the application.</p> <p>3) Submission (Sending) of the Application Documents The Principal Investigator should submit (send) the application documents to the research institution he/she belongs to, by the deadline decided the research institution.</p>	<p>[Procedures to be completed, if the need arises]</p> <p>1) The Research Institution obtains an ID and Password for e-Rad from the person in charge of the operation of e-Rad (This does not apply if the research institution already obtained them.) *The issue of the ID and the Password takes about 2 weeks.</p> <p>2) Registration of the Researcher Information in e-Rad and other matters.</p> <p>3) Research institutions issue an ID and password to the Principal Investigators. (This does not apply if the researcher already obtained an ID and a password.)</p> <p>5) • <u>Submission of the “Self-assessment Checklist on the Improvement of the System” based on the “Guidelines on the Management and Audit of Public Research Funds at Research Institutions”</u></p> <p>• <u>Submission of the “Checklist Pertaining to the Current Status” based on the “Guidelines for Responding to Misconduct in Research”</u></p> <p>*If both Checklists have been submitted separately after April 2021, there is no need for resubmission.</p> <p><u>Deadline for submission: January 28(Friday), 2022</u></p> <p>6) <u>Submission (Sending) of the Application Documents</u></p>
<p>January 28 (Friday), 2022 4:30 pm <u>Deadline for the Submission</u> (to be strictly observed)</p>		

Notes:

1. After the Principal Investigator submit (Sending) to the application to the research institution (mentioned in “Procedures to be Performed by the Principal Investigator” 3)), the research institution should submit (Sending) to the MEXT the application by the deadline for the submission (mentioned in “Procedures to be Performed by the Research Institution” 6)).
Next, he or she should verify the section “Preparation of the KAKENHI Application Form” (pages 60-69), etc. as well as verify the procedures designated by the research institution, etc. (deadline for the submission of the application, etc., in the research institution) with the office worker in charge in the research institution.
2. When the researcher is applying for KAKENHI, he or she should register the researcher information beforehand in e-Rad. The research institution should perform the registration in e-Rad. Therefore, the researcher who is planning to apply should verify the state of the registration with the office worker in charge in the research institution.
3. The research institution should submit a “Self-assessment Checklist on the Improvement of the System” based on the “Guidelines on the Management and Audit of Public Research Funds at Research Institutions (Implementation Standards)” and a “Checklist Pertaining to the Current Status” based on “Guidelines for Responding to Misconduct in Research” (mentioned in “Procedures to be Performed by the Research Institution” 5)). If it has not been submitted, no official grant decision will be made for the researchers belonging to the research institution in question.

(2) Schedule after the Submission of the Application Documents (plan)

The schedule below is as of November 24, 2021. There may be changes in the plan including the timing of the provisional grant decision due to COVID-19. When the changes occur it will be announced on the MEXT website and through the research institutions.

Transformative Research Areas (A) (Publicly Offered Research)
Year 2022
February to May: Review *1
Late June: Provisional grant decision
Middle of July: Formal application for grant delivery
Late July: Official grant decision
Around July: Disclosure of review results
Middle of August: Grant delivery (part of the first term) *2
Middle of October: Grant delivery (part of the second term) *2

Notes:

- *1 Reviews are conducted by MEXT and the grant delivery after provision grant decision is conducted by the Japan Society for the Promotion of Science (JSPS).
- *2 The amount requested for funding or the amount requested for payment (direct costs) will be remitted separately in two installments, i.e., one during the first term (from April until September) and the other during the second term (from October until March), if this amount for the fiscal year in question is 3 million yen or more, and it will be remitted in a lump sum during the first term, if it is less than 3 million yen.

3. Details of the Research Category

Transformative Research Areas (A)(Publicly Offered Research)

: KAKENHI (Series of Single-year Grants)

A) Intended for:

Research projects of Publicly Offered Research related to 16 research area (which starts in FY2021) shown in Attached Table 1 (cf. page 25)

B) Budget provided and number of research projects scheduled to be selected:

Budget and number per research area shown in Attached Table 1 (cf. page 25)

C) Research period:

Two years (application for research period other than the left is not subject to screening)

D) Important points:

- It is not possible to involve the Co-Investigators in the research (However, it is possible to involve the Research Collaborators in the research when necessary).
- Each reviewer in the committee dedicated to the particular research area (which will also include researchers who are outside of the research area in question) will conduct a two-stage document review.
- When applying, for the details of research area in the “Grant-in-Aid for Transformative Research Area (A)”, please refer to “[references] New Research Area”

[References] New Research Area (Extraction from “Application Procedures for Grants-in-Aid for Scientific Research - KAKENHI – (Grant-in-Aid for Transformative Research Areas(A/B) , Grant-in-Aid for Scientific Research on Innovative Areas and Grant-in-Aid for Special Purposes)”))

A) Purpose:

Research areas proposed through co-creative and interdisciplinary efforts of diverse researchers, which aim to create research areas that will lead to radical transformation of and change in the existing framework and/or direction of research as well as upgrade and level-up of scientific research in Japan and nurturing of young researchers, and will contribute to the development of the proposed research areas through efforts for collective research and shared use of equipment, etc.

B) Intended for:

Research areas that aim to generate renovation and/or transformations in academic areas so as to create emerging and interdisciplinary areas transcending the existing framework of academic disciplines, or research areas that aim for a truly drastic advancement of the leading-edge portions of a particular academic discipline, which are expected to develop innovative and creative scientific research by promotion of collective research with new perspective or methods under organic coordination of diverse researcher groups, and meet all requirements of the following 1) to 3), and if applicable, 4):

- 1) Basic research area (including the area aiming for development from basic to applied research) which is expected to create research area across multiple areas or develop innovative scientific research;
- 2) “(i) Area having (or expected to have) international superiority,” or “(ii) Japanese unique area or unprecedented area having (or expected to have) creativity and novelty”;
- 3) Area in which each research project is expected to bring sufficient results, and such results are expected to achieve transformation of concepts or methodologies of existing research disciplines after research period ended;
- 4) In the case of proposals to further develop the research area adopted in "Grants-in-Aid for Scientific Research on Innovative Areas (Research in a Proposed Research Area)" or other research fund programs in the past, the area for which results expected from the grants-in-aid in question were sufficiently achieved and whose contents aim for further significant and drastic development of the leading-edge portions based on the results.

C) Range of total budget:

The budget provided per research area is set at 50 million yen or greater up to 300 million yen per fiscal year. In a truly necessary case, a budget exceeding the maximum limit for each research area may be requested.

* In case the total budget per fiscal year per research area exceeds 300 million yen

Applicants will be required to provide a detailed description of the reason for such need in the Research Area Proposal, and the necessity will be assessed.

D) Research period (set period of the area):

Five years (application for research period other than the left is not subject to screening.)

E) Number of research areas scheduled to be selected:

Around 16 projects.

F) Review section:

In application, the applicant should always select the desired category for screening from the following categories according to the contents of the research plan:

“Transformative Research Areas, Section (I)”: Research project focusing mainly on the content of Broad Section “A.”

“Transformative Research Areas, Section (II)”: Research project focusing mainly on the contents of Broad Sections “B,” “C,” “D,” or “E.”

“Transformative Research Areas, Section (III)”: Research project focusing mainly on the contents of Broad Sections “F,” “G,” “H,” or “I.”

“Transformative Research Areas, Section (IV)”: Research project focusing mainly on the contents of Broad Sections “J” or “K.”

(For a description on each broad section, see Attached Table 2 “Grants-in-Aid for Scientific Research - KAKENHI- Review Section Table”.)

G) Constitution of research area: (Applied research area that does not meet the review criteria is not subject to screening.)

- A research area should consist of “Planned Research” and “Publicly Offered Research”
- The “Planned Research” consists of “Administrative Group” and “Planned Research other than Administrative Group.”
- One “Administrative Group” must be established. Sizable numbers of “Planned Research other than Administrative Group” and “Publicly Offered Research” must be established.
- The Administrative Group is an organization which provides the overall management of the research area. A plan for the purpose of conducting research is not permitted.
- A research area should be composed to include two or more “Planned Research other than Administrative Group” with researchers who will be bearers of the next generation of research (researchers of age 45 or under as of April 1, 2022) participating as Principal Investigators.
- A plan in which Planned Research is intended to be added during the research period is not permitted
- “Publicly Offered Research” should be set so that the research period is two years (the second to third year and fourth to fifth year of the set period of the area), and organize a call for proposals for FY2023-2024 in the first year of the set period of the area and a call for proposals for FY2025-2026 in the third year of the set period of the area, and exceed either of the following minimum standards. In such case, the applicant should ensure that the number of research projects and amounts not only exceed the minimum requirement, but also be enough to aim for broader development of research in the research area, considering the purpose of Transformative Research Areas (A) and characteristics of the research area in question.
 - 1) Each number of research projects scheduled to be selected exceeds 15 in the first year and the third year
 - 2) The total amount of budget for Publicly Offered Research (the total from FY2023-2026) exceeds 15 % of the budget (the total for five years) for the whole research area

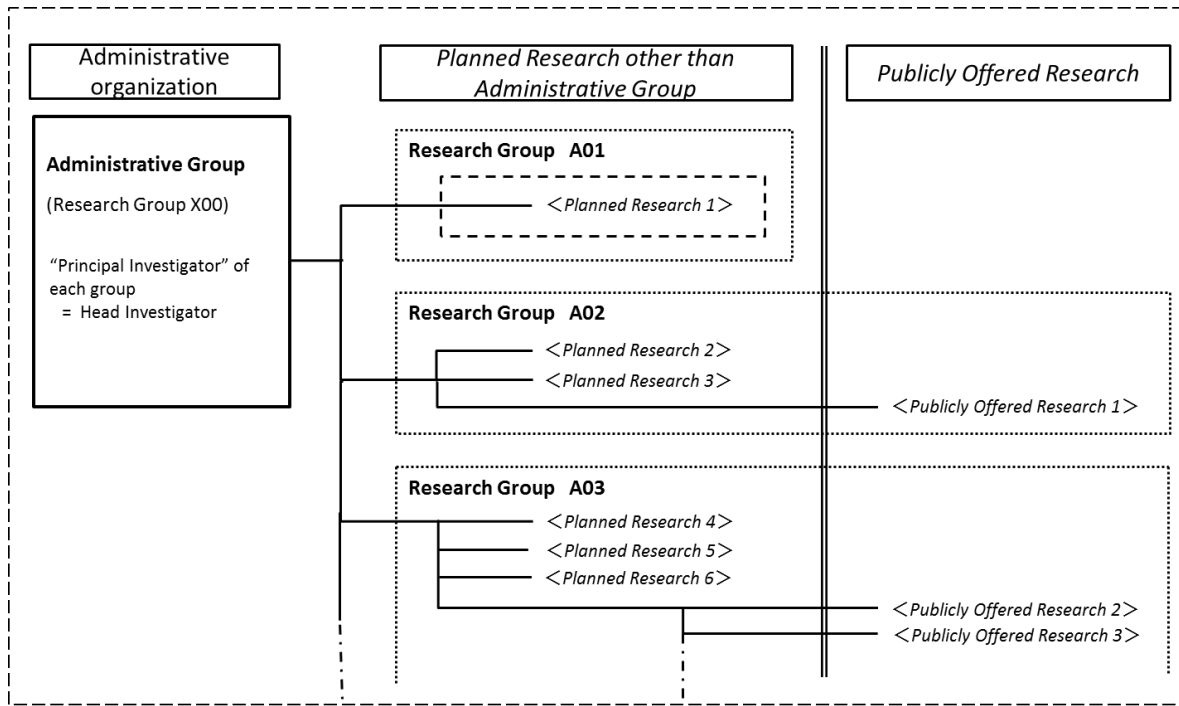
● Constitution of research area and roles

Planned Research	Administrative Group	Organization which formulates research policy for the whole research area, adjusts projects, and conducts research support activities (provision of support for international activities (formulation of optimum policy for international development (strengthening of the research area by finding current international researches, development of new international network, etc.), analysis of international trends, and performance of support activities (promotion of international joint researches and formulation of overseas network (invitation of overseas researchers who are highly evaluated internationally, mutual dispatch of postdoctoral researchers, etc.))) purchase, development, and operation of equipment and devices shared in the research area, or provision of experimental samples and materials, etc.), and other activities (<u>an organization which does not conduct research</u>)
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	Planned Research other than Administrative Group	Research projects in which a Head Investigator (Principal Investigator of “Administrative Group”) organizes researchers in the research area in question in advance and systematically make progress in order to develop the research area
Publicly Offered Research	Research projects which one researcher performs in cooperation with “Planned Research” in order to further promote research in the research area in question.	

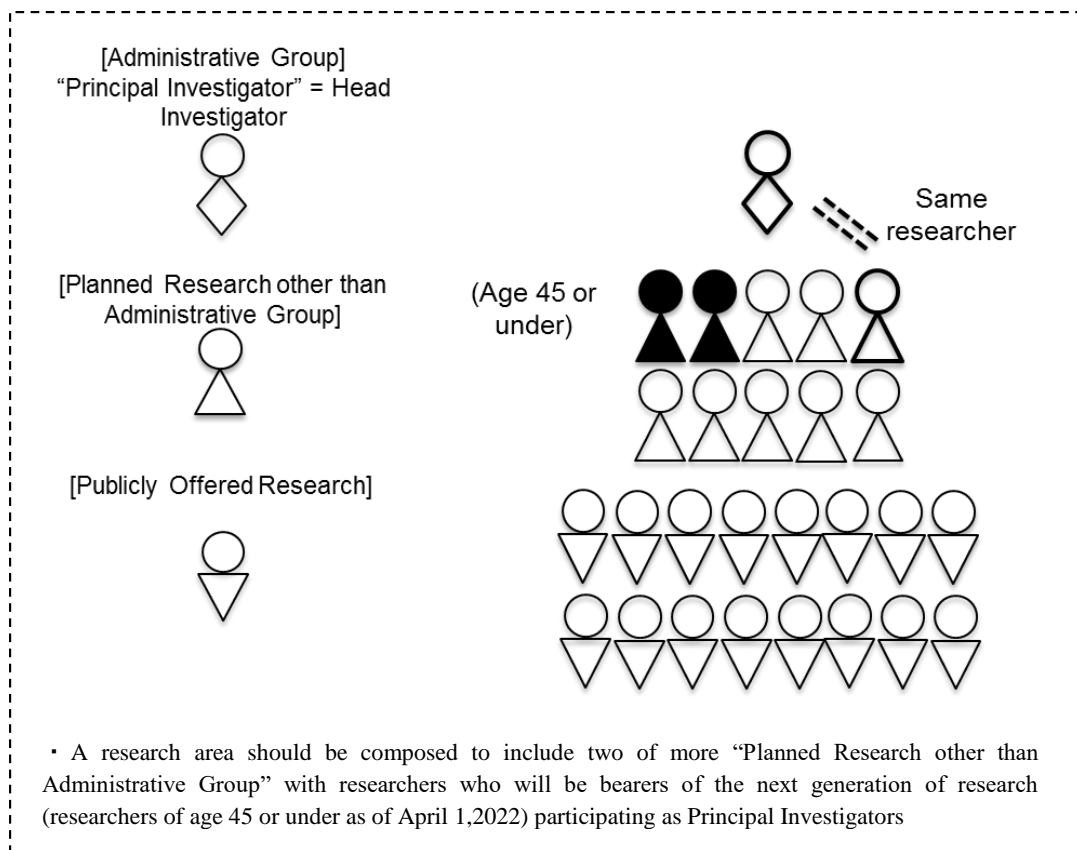
- *1: When setting up the budget for Publicly Offered Research, please post annual budget enough to achieve research per project.
- *2: In order to efficiently develop the research area, a research group can be established, in which “Planned Research” or “Publicly Offered Research” are grouped by research theme or role in the research area.
- *3: The replacement of the Principal Investigator is not permitted in principle except for the “Administrative Group.” If a Principal Investigator of Planned Research lacks (due to death, etc.), however, it may be permitted as a special case via screening by the Academic Deliberation Council for Science and Technology.
- *4: It is not permitted to allot direct expenses for research projects of “Administrative Group” to costs directly required for achieving other research projects in the research area in question.

● Image of constitution of research area



* A research group needs to have a number of research group such as “A01” for the sake of convenience for electronic processing (“X00” is used for Administrative Group), and please see “Supplementary edition to the Application Procedures for Grants-in-Aid for Scientific Research-KAKENHI- for FY2022 (Grant-in-Aid for Transformative Research Areas (A/B)) (Forms/Procedures for Preparing and Entering a Research Proposal Document)”(Japanese only) for detailed numbering method.

● Image of participation of researchers who will be bearers of the next generation of research



● Participation of members of research area in “Administrative Group”

The Principal Investigator and Co-Investigator of the “Administrative Group” are as shown below:

“Administrative Group”	=	Position in the Research Area
Principal Investigator	=	Head Investigator
Co-Investigator	=	Principal Investigator or Co-Investigator of “Planned Research other than Administrative Group”

The Principal Investigator of “Planned Research other than Administrative Group” must be a member (Co-Investigator or Research Collaborator) of the “Administrative Group.”

H) Interim assessment, ex-post assessment:

- Interim assessment is conducted in the fourth fiscal year of the set period of the area and ex-post assessment is conducted in the fiscal year following completion of the set period of the area.
- Research plan may be reviewed and adjusted and the allotted amount may be subject to change (including the halt of funding) based on the result of the interim assessment

I) Others:

- During the second fiscal year of the set period of the area, follow-up will be conducted to check whether improvements are made based on issues, etc. pointed out in the opinions expressed upon selection.
- It is possible to perform procedures after screening for review of continuous Planned Research or other matters based on the progress situation of research in the area.
- Submission of a Data Management Plan (DMP)
 In order to secure the autonomy of Japan’s research and development activities and promote international open science, policies such as the Basic Policies on the Management and Utilization of Research Data Created by Publicly-Funded Research Activities (April 27, 2021, Decision of Council for Science, Technology and Innovation) and the Integrated Innovation Strategy 2020 (Cabinet Decision on July 17, 2020) call for initiatives towards strategic storage and management of research data as well as broader utilization of the research results. Therefore, for “Grant-in-Aid for Transformative Research Areas”, the Head Investigator of an adopted research area will be asked, upon formal application for grant delivery, to submit a Data Management Plan (“DMP”) outlining the storage and management, etc. of research results and research data of his/her research project.
- For Grant-in-Aid for Transformative Research Areas, there are no plans for calls for “budget for collecting research results of Finished Research Area” for Finished Research Areas in Grant-in-Aid for Scientific Research on Innovative Areas (Research in a Proposed Research Area).

- Basic Policies on the Management and Utilization of Research Data Created by Publicly-Funded Research Activities (April 27, 2021, Decision of Council for Science, Technology and Innovation)

URL: <https://www8.cao.go.jp/cstp/tyousakai/kokusaiopen/sanko1.pdf>

- Integrated Innovation Strategy 2020 (Cabinet Decision on July 17, 2020, pp.56-59)

URL: https://www8.cao.go.jp/cstp/togo2020_honbun.pdf

Attached Table 1

List of Research Areas in which "Publicly Offered Research" is Solicited in Grant-in-Aid for Transformative Research Areas (A)

No	Number of Research Area	Title	Term of Project	Research Period	Number of projects scheduled to be selected	Upper Limit of Annual Budget (in million yen)
1	21A101	Human behavioral science for subjectification ("tojisha-ka") by interaction-based & rule-/story-based understanding of the brain & the world	FY2021-2025	2 years	5 10	5.2 3
2	21A102	Integrated Sciences for Sustainable Human-Aqua Environment	FY2021-2025	2 years	5 11	4 1.5
3	21A201	The Natural Laws of Extreme Universe--A New Paradigm for Spacetime and Matter from Quantum Information	FY2021-2025	2 years	3 7 17	5 3 1
4	21A202	Creation of Materials by Super-thermal Field: Neo-3D printing by Manipulating Atomic Arrangement through Giant Potential Gradient	FY2021-2025	2 years	16	3.5
5	21A203	Science of Slow-to-Fast Earthquakes	FY2021-2025	2 years	9 10	4 2
6	21A204	Digitalization-driven Transformative Organic Synthesis	FY2021-2025	2 years	24 7	3.5 3
7	21A205	Bottom-up creation of cell-free molecular systems: surpassing nature	FY2021-2025	2 years	25	4
8	21A206	Science of 2.5 Dimensional Materials: Paradigm Shift of Materials Science Toward Future Social Innovation	FY2021-2025	2 years	4 13 4	5 3 1.5
9	21A301	Census-based biomechanism of circuit construction and transition for adaptive brain functions (Adaptive Circuit Census, ACC)	FY2021-2025	2 years	4 4 10 3	6 5 4 2
10	21A302	Cross-scale new biology	FY2021-2025	2 years	15	4
11	21A303	Life Science Innovation Driven by Supersulfide Biology	FY2021-2025	2 years	5 15	3 2
12	21A304	Biology of non-domain biopolymer	FY2021-2025	2 years	18	4
13	21A305	Understanding multicellular autonomy by competitive cell-cell communications	FY2021-2025	2 years	16	4.5
14	21A401	Hierarchical Bio-Navigation Integrating Cyber-Physical Space	FY2021-2025	2 years	20	3
15	21A402	Advanced mechanics of cell behavior shapes formal algorithm of protozoan smartness awoken in diorama conditions.	FY2021-2025	2 years	24 10	2.2 1.9
16	21A403	Digital Biosphere: Integrated Biospheric Science for Mitigating Global Environmental Change	FY2021-2025	2 years	3 8 12	8 4 2

(Attached Table 2) Research Outline of Research Areas Showed on Attached Table 1

When applying for Publicly Offered Research, the applicant should note the following points.

- Research period is 2 years (Application of research period other than this period is not subject to screening).
- The Principal Investigator cannot set up a team of project members together with a Co-Investigator. (However, Research Collaborator is allowed to participate in research project when necessary.)
- Please be aware that the maximum application amount listed is not the total amount for the research period (two years) but the amount equal to a single fiscal year.
- It is possible to receive grants for up to 2 projects in Publicly Offered Research.
In case that there are no projects of Publicly Offered Research for which grants has currently been received, it is possible to apply and receive grants for new 2 projects. However, it is not possible to apply and receive grants for 2 projects in the same research area.
In case that grants have been received for 2 projects continuation of which will be in FY2022 in Publicly Offered Research, it is not possible to apply for another project.
- Please refer to the website of each research area for the details of application contents.

学術変革領域研究（A）の公募研究の内容（英語版）

Human behavioral science for subjectification (“tojisha-ka”) by interaction-based & rule-/story-based understanding of the brain & the world

<https://tojishaka.net/english/>

{	Number of Research Area	: 21A101	Term of Project	: FY2021-2025
	Head Investigator	: KASAI Kiyoto		
	Research Institution	: The University of Tokyo Hospital		

1. Details of Research Area

People with minority characteristics that do not match the world designed to be predictable for the majority have developed the knowledge that noticing the discrepancy between their own rules/stories and those of the world is the beginning of recovery. Learning from this, we consider rules and stories as follows. When humans interact with the world, if the same event is repeated many times, the brain internalizes it as a rule and uses it to predict the next situation, which is defined as rule-based process. On the other hand, story-based process is defined as the internalization of a single event in the world as an episode, a position, and its transition with a spatio-temporal beginning and end point. If we define rule-/story-based process in this way, it is possible that this two-dimensionality is the basic mode of recognizing and internalizing the environment and events by the brain in animals in general including humans. Furthermore, the cognitive process by which human beings find and internalize rules and stories in the world when they earnestly interact with the real world, which is difficult to predict and difficult to follow, is defined as “tojisha-ka”. We will elucidate the adolescent developmental process and mechanism of “tojisha-ka” through academic innovation that integrates the academician's own “tojisha-ka”, co-production with user researchers with minority characteristics, and the integrative sciences.

2. Call for Proposals and Expectations for Publicly Offered Research, etc.

Research Group A01 calls for theoretical research that constructs a brain model of the individual-world interaction loop that can be applied to population science based on reinforcement learning theory, game theory, etc., as well as experimental research in large populations. However, cognitive enhancement research using AI, etc., should be submitted after careful consideration of the possibility that the research results will be enjoyed exclusively by the majority, leading to increased social disparity. For A02, we are looking for empirical research on the individual-world interaction loop and the process of “tojisha-ka” through population science using domestic and international adolescent cohorts. For A03, we expect research proposals on the interaction of era, generation, geography, and gender in the individual-world interaction loop that integrate a wide range of academic methods, including evolutionary science, brain science, social psychology, cultural psychology, medical anthropology, and sociology. The subject can be a large group or a small number of individuals, and the analysis method can be either quantitative or qualitative. However, if the results of the analysis of animal collective behavior are to be used to interpret the nature of human groups, please apply after careful scientific and ethical consideration so as not to merely endorse the mechanisms that have caused social disparities in human history. For B01, we are looking for psychological and behavioral analysis research on the mechanism of “tojisha-ka” and the process of adolescent development, especially based on the understanding of the rule-/story-based process in the individual-world interaction. Theoretical studies and intervention studies using methods such as user-led research, complex systems science, and knowledge science are also eligible. B02 calls for research on experimental animals or human subjects that will lead to the elucidation of the brain basis of “tojisha-ka”. We expect new research proposals that address the brain basis for modeling the individuals' interactions with the world. Research that deals only with the elemental functions of the brain by simply reading prediction/prediction error, episodic memory, and the formation/elimination of fear conditioning as rule-based or story-based function is not eligible. Despite conventional dichotomy of rule-based process as targets in natural science and story-based process as those in humanities and social science, this research area is expected to produce results that will lead to an integration of these two fields, as well as the integration of Planned Research A: Research on Interaction Loop and Planned Research B: Research on Rule/Story (see the area website). We welcome applications from young researchers, female researchers, and user researchers with diverse backgrounds. With the support of the Coordinating Team, we hope that researchers will actively participate in the academic transformation of “tojisha-ka” themselves and co-production of research with user researchers.

3. Research Group, Upper Limit of Annual Budget and Number of research projects scheduled to be selected

Research Group Number	Research Group	Upper Limit of Annual Budget (Million yen)	Number of research projects scheduled to be selected
A01	Population neuroscience of brain-behavior model of “tojisha-ka” based on individual brain-world interaction loop	Large-scale research : 5.2 Small-scale research : 3	Large-scale research : 5 Small-scale research : 10
A02	Population science of real-world process of “tojisha-ka” based on individual-world interaction loop		
A03	Elucidation of era, generation, and gender effects of individual brain-world interaction loop		
B01	Behavioral science of rule-/story-based process during “tojisha-ka” and co-production		
B02	Neuroscience of rule-/story-based process during “tojisha-ka”		

学術変革領域研究（A）の公募研究の内容（英語版）

Integrated Sciences for Sustainable Human-Aqua Environment
<https://mizu.kyousei.net>

Number of Research Area	: 21A102	Term of Project	: FY2021-2025
Head Investigator	: ARAYA Kunio		
Research Institution	: Kyushu University, Faculty of Social and Cultural Studies		

1. Details of Research Area

The hydrosphere environment, which is essential for life, is constantly subject to “fluctuations” caused by a variety of internal and external factors, such as climate change, ecosystem transition, and changes in social conditions related to water. As the range of these “fluctuations” increases, human society and ecosystems will be greatly affected by frequent weather disasters, water resource conflicts, and loss of biodiversity. Reducing these water crises and risks, and realizing a society where water, humans, and creatures can coexist in a sustainable manner, is an internationally important issue. In this Research Area, we consider the hydrosphere environment as a “water cycle system” established by the interaction of the geosphere, biosphere, and anthroposphere. We aim to create a new academic area, “Aqua Science,” with the main objective of elucidating the historical transition and current dynamics of the balance among these three spheres, exploring ways to solve social issues related to the water environment in line with local conditions, and proposing a vision for the future.

There are four research plans under three Research Groups targeting the geosphere (A), anthroposphere (B), and biosphere (C) in this Research Area. Planned Research A01 is to create information to understand the interaction between the geosphere, biosphere, and anthroposphere dynamically from the viewpoint of the water cycle based on the measurement and analysis of information on water and the surrounding environment, and to develop an information translation approach necessary for utilizing the information in other Planned Research. Planned Research B02 is to dynamically clarify the fluctuation of the water cycle system from the past to the present from the viewpoint of social culture and history, and to extract the socio-cultural factors that should be protected or modified in order to create a desirable water symbiotic society. Planned Research B03 will empirically analyze, from the standpoint of economics, what kind of water use methods are suitable for realizing healthy and prosperous lives in regions where water resources are scarce and water infrastructure is poor, and what kind of management measures and systems are necessary to conserve and improve the water environment to explore the ideal form of sustainable water resource governance. Planned Research C01 will assess the health of the basin ecosystem system by investigating the characteristics of the ecosystem and biodiversity that form the basis of the “basin sphere” where the natural environment surrounding water and human society and culture coexist to explore ways to conserve, restore, and sustainably use the water cycle system in ecosystems.

2. Call for Proposals and Expectations for Publicly Offered Research, etc.

In the Publicly Offered Research, there are four Research Groups related to Planned Research and two Research Groups related to the entire Research Area, which aim to adopt about 11 research plans with an upper limit of 1.5 million yen per year and about 5 research plans with an upper limit of 4 million yen per year. Examples for each Research Group are shown below. For details, please refer to our website.

Research Group A01 calls for research proposals on methods to utilize geosphere, anthroposphere, and biosphere data, such as climate proxies and historical data, for water cycle estimation and on simulation technology as a basis for water cycle estimation in order to conduct research on the creation of information on water and its surrounding environment. Research Group B02 calls for research on the relationship between fluctuations in the water cycle system and society, culture, and behavior, specifically, research that contributes to the elucidation of institutions and culture surrounding water, the nature and transition of human perception and behavior, and the mechanisms and differences of fluctuations among regions. Research Group B03 invites applications for research on various problems related to water use and water environment and their countermeasures. Specifically, research on waterborne diseases and poverty in developing countries, agricultural water use and water pollution in developing countries, historical research on water resource allocation problems among industrial sectors, historical empirical analysis of water-related disasters and their management, and the history of water supply and sewage system development are envisioned. In Research Group C01, research on empirical clarification of the basin ecosystem is expected, including economic approaches to realize a regional circulation symbiosis zone in the basin ecosystem, construction of a biological monitoring system using environmental DNA, and research proposals on bio-environment interactions in the basin ecosystem using stable isotopes. Research Group D01, which is related to the entire Research Area, calls for historical research on the relationship between the water cycle system and human activities. Research Group E01, which is also related to the entire Research Area, calls for research on the interaction between the geosphere, biosphere, and anthroposphere regarding water. The accepted researchers are expected to actively participate in the research activities of each Planned Research and the entire Research Area, especially in the joint field research. Young and female researchers are expected to actively apply for any of the Research Groups. An environment that facilitates the participation of diverse researchers will be created, such as enabling remote participation in web conferences and setting hours that take into consideration researchers of child-rearing age.

3. Research Group, Upper Limit of Annual Budget and Number of research projects scheduled to be selected

Research Group Number	Research Group	Upper Limit of Annual Budget (Million yen)	Number of research projects scheduled to be selected
A01	Research on the creation of information on water and its surrounding environment	1.5 4	11 5
B02	Research on fluctuations in the water cycle system and society, culture, and behavior		
B03	Research on various problems related to water use and water environment, and countermeasures against them		
C01	Research on empirical clarification of basin ecosystems		
D01	Historical research on the relationship between the water cycle system and human activities		
E01	Research on the interaction among the geosphere, biosphere, and anthroposphere regarding water		

学術変革領域研究（A）の公募研究の内容（英語版）

The Natural Laws of Extreme Universe--A New Paradigm for Spacetime and Matter from Quantum Information

[http:// https://www2.yukawa.kyoto-u.ac.jp/~extremeuniverse/en](http://https://www2.yukawa.kyoto-u.ac.jp/~extremeuniverse/en)

Number of Research Area	: 21A201	Term of Project	: FY2021-2025
Head Investigator	: TAKAYANAGI Tadashi		
Research Institution	: Kyoto University, Yukawa Institute for Theoretical Physics		

1. Details of Research Area

Conventionally, physics has explained the laws of nature using time, space, and matter as its basic building blocks. However, in the extreme situations in nature (which we call the “extreme universe” in our area), due to the strong quantum nature of the target physical systems, the degrees of freedom of space, time, and matter themselves fluctuate enormously, and existing theoretical approaches in physics face difficulties in the following three limits: the “limit of space” (quantum theory of black holes), the “limit of time” (quantum theory of cosmology), and the “limit of matter” (dynamics of quantum matter). However, as soon as the field of quantum information emerged in the 21st century, this new way of looking at things began to bring dynamic changes to physics. For example, the extreme universe based on quantum gravity can be regarded as an accumulation of quantum information, while such accumulation of quantum information also provides a highly accurate numerical analysis method for quantum materials called tensor network. In addition to the limits of space, time, and matter, this Research Area aims to bring together researchers involved in the study of the "limit of information" (quantum information), and to promote interdisciplinary research beyond the boundaries of existing fields toward the ultimate laws of physics associated with the various problems in the extreme universe.

The goals of Planned Research are as follows. In the limit of space, the quantum theory of black holes is to be clarified and verified by integrating the viewpoint of quantum information into the gauge-gravity correspondence (B01), ultra-cold atom experiments (B02), and the general relativity (B03). In the limit of time, we explore quantum theory of cosmology by introducing quantum information theoretic ideas into quantum gravity (C01), quantum Hall experiment (C02) and cosmology (C03). In the limit of matter, we aim to reveal the dynamics of quantum matter by incorporating the concept of quantum information into quantum field theory (D01) and quantum many-body problems (D02). In addition, A01 will promote theoretical research on quantum information, and bridge the latest progress in quantum information research to physics of the extreme universe. Another important objective of this area is to promote international research on the extreme universe in the light of quantum information, and to actively encourage young researchers. Through these efforts, we aim to realize the above research goals and to transform physics into a discipline suitable for the era of quantum information.

2. Call for Proposals and Expectations for Publicly Offered Research, etc.

This Research Area brings together various researchers in the fields of quantum information and physics to study the quantum information and the extreme universe (quantum theory of black holes, quantum theory of cosmology, and dynamics of quantum matter). We also aim to create new research developments that are not limited to existing fields. In addition to the research projects related to the Research Group A01-D02, we expect theoretical and experimental research proposals complementary to Research Group or those covering multiple research topics above. For example, various researches on quantum information with potential applications to physics, application of tensor networks to particle theory, analysis of strongly correlated matter and non-equilibrium quantum systems by numerical calculations and gauge-gravity correspondence, numerical approaches to the general relativity, simulation using quantum computers, and so on. We also envision experiments on quantum many-body systems and qubit systems with high controllability, such as quantum optics and NMR, as well as new approaches through experiments and observations in the fields of elementary particles, atomic nuclei, and cosmology. In addition to the above, we expect novel ideas that connect quantum information and physics, and proposals for research that bridges theory and experiment. For details of each research topic, please refer to the website of this Research Area.

The upper limit of annual budget is set at 1 million yen, 3 million yen, and 5 million yen per year, depending on the scale of the research. 1 million yen budget is mainly for theoretical research, 3 million yen one is for numerical calculations and experimental research, and 5 million yen one is for large-scale numerical calculations and experimental research.

3. Research Group, Upper Limit of Annual Budget and Number of research projects scheduled to be selected

Research Group Number	Research Group	Upper Limit of Annual Budget (Million yen)	Number of research projects scheduled to be selected
E01	Theoretical or Experimental Research on Quantum Information	5	3
E02	Theoretical Research on Extreme Universe	3	7
E03	Experimental Research on Extreme Universe	1	17

学術変革領域研究（A）の公募研究の内容（英語版）

Creation of Materials by Super-thermal Field: Neo-3D printing by Manipulating Atomic Arrangement through Giant Potential Gradient

<http://www.mat.eng.osaka-u.ac.jp/super3dp>

Number of Research Area	: 21A202	Term of Project	: FY2021-2025
Head Investigator	: KOIZUMI Yuichiro		
Research Institution	: Osaka University, Graduate School of Engineering		

1. Details of Research Area

The target of this Research Area is the mechanisms of unique crystal growth under super-thermal fields generated by local heating by electron beams or lasers, which have been found to occur in metal 3D printing (3DP). Studies to be conducted include advanced *in-situ* observations, such as high-speed temperature field analysis, synchrotron X-ray transmission imaging, and laser irradiation in a transmission electron microscope, focusing on the occurrence of absolute stability, as well as numerical simulations using computational thermal fluid dynamics, phase-field method, molecular dynamics, precisely matched to the experiments to elucidate the mechanisms. Furthermore, artificial intelligence to analyze the process of microstructure to structure performance correlation and establish the Science for Creation of Materials by Super-thermal Field, which contributes to the creation of new materials, such as 3DP of high-quality single-crystals. The outcomes will contribute to a great novelty in materials science.

2. Call for Proposals and Expected proposal, etc.

The followings describe the scope of Planned Research for the Research Groups A01, A02, A03, the Publicly Offered Research for each. Researches that can be linked to the scope, or that will open new developments to the cited research fields, are welcomed. For more information, see the website of this Research Area.

Research Group A01 “Construction of Digital Research Infrastructure for Super-thermal Field Material Fabrication Science”

【Digital twin science for creation of materials by super-thermal field (A01-a)】 In-process monitoring of a 3DP and computer simulation to evaluate the dynamic changes of the super-thermal field. 《Expected proposal》 Advanced analytical methods such as *in-situ* measurement of crystal orientation in 3DP processes, large-scale, high-accuracy, computer simulations of melting, fluid flow, crystal growth, microstructure formation, and diffusion. 【Materials informatics for creation of materials by super-thermal field (A01-b)】 Discovery of the laws, using data science, in the relationships among the process, thermal field, microstructure, and material properties. Derivation of the parameters for the simulation by A01-a. 《Expected proposal》 Analysis of big data obtained by monitoring, the creation of microstructure-property correlation data using crystal plasticity finite element simulation, image sharpening processing (in collaboration with A02).

Research Group A02 “In-situ and Precise Analysis of Crystal Growth under Super-thermal Field”

【Micro-dynamics of crystal growth by super-thermal field (A02-a)】 *In-situ* observation by synchrotron X-ray imaging of rapid melting, rapid solidification, and crystal growth in super-thermal field. 《Expected proposal》 Improvement of resolution of imaging, the advanced analysis of image data, *in-situ* observation of crystal growth by various of microscopy (in collaboration with A01 and A03). 【Lattice defects analysis of materials created by super-thermal field (A02-b)】 Analysis of microstructure, composition, stress, strain, and lattice defects using advanced analytical methods such as electron microscopy, neutron diffraction, and positron annihilation. 《Expected proposal》 Atom probe tomography, theoretical and simulation research on defect formation, the evaluation of lattice defects by various methods, and 3D observation by serial sectioning tomography.

Research Group A03 “Fabrication of Transcendental Materials Utilizing Super-thermal Fields”

【Science for creation of super-titanium by super-thermal field (A03-a)】 Development of lightweight and heat-resistant super-titanium materials by controlling crystal orientation and microstructure using super-thermal fields 《Expected proposal》 Analysis of thermal stress with crystal anisotropy (in collaboration with A01 and A02), measurement of fundamental properties of the new titanium alloys, strengthening and fracture mechanisms of 3DP titanium alloys and related materials, and advanced research using advanced methods. 【Science for creation of biomaterials by super-thermal field (A03-b)】 Improvement of metallic implant devices by controlling mechanical biocompatibility through crystal orientation control of biomedical metallic materials by using super-thermal fields, and by surface fabrication using super-thermal fields. 《Expected proposal》 Computer simulation of surface fabrication in 3DP process by super-thermal field (in collaboration with A01 and A02), and molecular orientation control and surface fabrication of polymer materials by super-thermal field. 【Science for creation of ceramic materials by super-thermal field (A03-c)】 Establishment of the academic basis for the fabrication of new ceramics materials by applying super-thermal fields to melt growth, gas phase growth, and solid particle deposition, direct observation of crystal growth front. 《Expected proposal》 Research on interactions between lasers and inorganic crystalline materials, correlations with atomic bonding, and heterogeneous absorption due to microstructure.

3. Research Group, Upper Limit of Annual Budget and Number of research projects scheduled to be selected

Research Group Number	Research Group	Upper Limit of Annual Budget (Million yen)	Number of research projects scheduled to be selected
A01	Digital twin science for creation of materials by super-thermal field (A01-a) Materials informatics for creation of materials by super-thermal field (A01-b)	3.5	16
A02	Micro-dynamics of crystal growth by super-thermal field (A02-a) Lattice defects analysis of materials created by super-thermal field (A02-b)		
A03	Science for creation of super-titanium by super-thermal field (A03-a) Science for creation of biomaterials by super-thermal field (A03-b) Science for creation of ceramic materials by super-thermal field (A03-c)		

学術変革領域研究（A）の公募研究の内容（英語版）

Science of Slow-to-Fast Earthquakes

<http://en.slow-to-fast-eq.org/>

Number of Research Area	: 21A203	Term of Project	: FY2021-2025
Head Investigator	: IDE Satoshi		
Research Institution	: The University of Tokyo, Graduate School of Science		

1. Details of Research Area

Slow earthquakes, first discovered in the 21st century, result from shear deformation like previously recognized fast earthquakes, but they do not radiate strong seismic waves. As our understanding of slow earthquakes deepens, the relationship between slow and fast earthquakes, including large earthquakes, has become a high research priority. To update earthquake science based on a comprehensive understanding of slow and fast earthquakes and to make a quantitative forecast of future earthquake occurrence, we are launching a new research initiative: Science of Slow-to-Fast Earthquakes.

The critical question for a comprehensive and holistic understanding is "How and when does a slow earthquake become a fast earthquake?" and this question involves many related questions. Answering these questions requires the cooperation of researchers from many different fields. In addition to geophysics (seismology and geodesy), understanding crustal materials cannot be achieved without inputs from geology and geochemistry. Studies of earthquake rupture and frictional sliding are underpinned by fundamental physics. Developments in instrument technology open new avenues for geophysical observation, and application of information science and statistical methods can extract information from the large and expanding earthquake datasets.

This research initiative inherits the DNA of the Research Area "Science of Slow Earthquakes." Following the strategy of the previous Research Area, we promote collaborative research in various fields and incorporate technological innovations progressing in related fields. The initiative is organized around a core of six Research Groups (A01 Experimental Physics, A02 Structural Anatomy, A03 International Comparison, B01 New Technology Observation, B02 Information Science, and B03 Model Prediction), supported by Publicly Offered Research projects to be solicited this time.

2. Call for Proposals and Expectations for Publicly Offered Research, etc.

We plan to fund 19 projects with maximum annual budgets of either 2 or 4 million yen (see below). The research plan for each proposed project should match with one or more of research activities of the six Research Groups. We also encourage research projects that include researchers with overseas experience, researchers from the private sector, and research that contributes to increasing diversity in the Research Area.

Research Group A01: Research related to fundamental physicochemical processes of slow-to-fast phenomena through mechanical experiments using natural and analog materials, as well as theoretical approaches from statistical mechanics.

Research Group A02: Geological and geophysical study with the aim of determining the structure, physical properties, reaction, and fluid distribution of slow-to-fast seismogenic zone; formation of a research platform in the Kii Peninsula.

Research Group A03: Review and comparative study of the velocity structure, resistivity structure, and friction parameters of sediments and rocks. International collaborative research on slow and fast earthquakes and volcanic eruption processes.

Research Group B01: Development of new instruments to improve the accuracy and range of measurements relevant to slow and fast earthquakes; development of analytical methods suitable for analyzing new types of data.

Research Group B02: Studies about data-driven analysis for efficient feature extraction from big data, connections between Slow and Fast earthquakes, statistical models of Slow earthquakes, and construction of Slow and Fast earthquake catalogs.

Research Group B03: Integration of data and models for forecasting Slow and Fast earthquakes, examination of scaling rules and seismicity using large-scale computing, and research on expanding the spatio-temporal range of the earthquake catalog.

3. List of Research Groups, upper limits of annual budgets and number of research projects scheduled to be selected

Research Group Number	Research Group Name	Upper Limit of Annual Budget (Million yen)	Number of research projects scheduled to be selected
A01	Physicochemical processes in slow-to-fast phenomena	4	9
A02	Anatomy of Slow-to-Fast seismogenic zones		
A03	SF Eqs through comparison across global subduction zones		
B01	Development of multiscale observation techniques	2	10
B02	Data-driven discovery & monitoring of Slow-to-Fast earthquakes		
B03	Multiscale modeling and forecast of Slow-to-Fast earthquakes		

学術変革領域研究（A）の公募研究の内容（英語版）

Digitalization-driven Transformative Organic Synthesis

<https://digi-tos.jp>

Number of Research Area	: 21A204	Term of Project	: FY2021-2025
Head Investigator	: OHSHIMA Takashi		
Research Institution	: Kyushu University, Graduate School of Pharmaceutical Sciences		

1. Details of Research Area

Synthetic organic chemistry has supported manufacturing by creating highly complex and valuable molecules from readily available organic materials and is now facing major changes due to digitalization. For Japan to continue to lead the world in synthetic organic chemistry, it is urgent to build a foundation for digital organic synthesis (interdisciplinary fusion of experimental and information science) that leads to disruptive innovation in organic synthesis. In this Research Area, we are developing automated methods (molecular design, synthetic pathway search, optimization of reaction conditions, batch-to-flow conversion, and autonomous synthesis systems) that thoroughly utilize artificial intelligence (AI) techniques to eliminate waste and accelerate innovation for creating novel reactions and molecules. We will also construct our own database (DB) optimized for machine learning (ML) in organic chemistry, which will serve as the basis for the development of automated methods.

2. Call for Proposals and Expectations for Publicly Offered Research, etc.

This Research Area consists of three Research Groups: Research Group A01 (deepening reaction control with AI), A02 (deepening synthetic method with AI), and A03 (deepening AI methods to support organic synthesis). The key to promoting research in this area is how to functionally integrate experimental science (synthetic organic chemistry) and information science, and it is important to (1) rapidly accumulate reliable reaction data for machine learning (ML) and (2) experimentally demonstrate the molecules, reaction conditions, and reaction pathways predicted and devised by ML through experiments. The Publicly Offered Research proposals for Research Groups A01 and A02 must be engaged in providing data to the database and utilizing AI and ML, and those for Research Group A03 must be conducted in collaboration with the experimental groups.

Research Group A01 aims at the development of innovative methods for control/reversal of selectivity, mechanism elucidation, and their applications. In the Publicly Offered Research, we expect researchers to develop novel reactions that cannot be covered in the Planned Research by developing new catalysts and new methods using electricity and light energy and to deepen the control methods for organic synthetic reactions. A thorough analysis of the reaction mechanism is important for the development of innovative reactions, and we also expect research proposals that cut into reaction mechanism analysis using ML methods.

Research Group A02 aims to promote the automation of organic synthesis by deepening devices and to create and apply new academic principles that sublimate technology into science. In the Publicly Offered Research, we expect researchers who can develop a method for converting batch to flow systems, highly reliable systems for rapid collection of all experimental data necessary for ML, and autonomous systems for automatic optimization of reaction conditions that incorporate inline analysis.

Research Group A03 aims to deepen AI methods for organic synthesis by supporting Research Groups A01 and A02 and creating a new theory of informatics through the field fusion. In the Publicly Offered Research, we expect researchers who can support discovering innovative chemical reactions and super-improving development efficiency by parallel optimization of multiple parameters, estimation of the main factors controlling reactions, and development of AI methods for understanding and predicting reaction mechanisms. We look forward to applications from the researchers who will develop new molecular (reaction) generation techniques suitable for the diversity of organic chemistry. We also seek researchers working on the design of synthetic routes including retrosynthetic analysis. Research proposals that integrate computational science and ML are also expected; research on various ML methods is essential for DB construction, and research proposals on innovative ML methods that go beyond simple predictive model construction are also expected.

Since this Research Area aims at *transformative research by integrating data science and organic synthesis*, it is necessary to reconfirm the recognition of data in joint research. In order to construct our own next-generation DB optimized for ML, we plan to collect data on side reactions and negative data that do not normally appear in the public domain and collect comprehensive chemoselectivity data using a functional group evaluation kit. We look forward to the application of researchers who understand the purpose of the Research Area, can contribute to the provision of experimental data (specify the three stages of closed, shared, and open), and can structure the data. We also expect the active application of young and female researchers.

3. Research Group, Upper Limit of Annual Budget and Number of research projects scheduled to be selected

Research Group Number	Research Group	Upper Limit of Annual Budget (Million yen)	Number of research projects scheduled to be selected
A01	Deepening reaction control with AI support	3.5	16
A02	Deepening synthetic method with AI support	3.5	8
A03	Deepening AI methods to support organic synthesis	3.0	7

学術変革領域研究（A）の公募研究の内容（英語版）

Bottom-up creation of cell-free molecular systems: surpassing nature

<https://bottomup-biotech.elsi.jp>

Number of Research Area	: 21A205	Term of Project	: FY2021-2025
Head Investigator	: MATSUURA Tomoaki		
Research Institution	: Tokyo Institute of Technology, Earth-Life Science Institute		

1. Details of Research Area

In this Research Area, we aim to construct molecular systems which have capabilities that exceed those of natural cells, or that natural cells do not possess, from the bottom up. Outcomes of this research will have applied and social impacts, e.g., material production, drug discovery, measurement technology, environmental and energy technology, etc.

Research on the bottom-up creation of cells has progressed substantially around the world, resulting in reconstituted molecular systems that mimic various cellular functions and properties. However, the bottom-up construction of molecular systems aimed at applied and socially relevant goals has seldomly been pursued. Moreover, there are a limited number of examples of constructing molecular systems from the bottom-up which utilize the concept of Darwinian evolution to screen for an optimal combination of multiple components among various combinations, suggesting that research which incorporates continuous trials followed by selection may dramatically improve bottom-up research outcomes. In this Research Area, we define cell-free molecular systems as those constructed from defined molecules and materials from the bottom up, without using cells themselves as components. To construct cell-free molecular systems that can contribute to practical and applied goals, we will combine biomolecules, organic compounds, polymers, and micro- and nano-devices, while utilizing theoretical studies. In addition, we will search for optimum combinations of components, as nature has done in the course of Darwinian evolution, and elucidate the interactions among the components. In this way, we will construct a molecular system in which the components are highly functional by virtue of evolved interactions, and simultaneously systematize the methodology to create such systems.

2. Call for Proposals and Expectations for Publicly Offered Research, etc.

We invite a wide range of researchers working on Research Group F01 and F02.

Research Group F01: Experimental work on bottom-up construction of cell-free molecular systems. Research proposals aiming to construct cell-free molecular systems that contribute to practical applications (material production, drug discovery, measurement technology, environmental/energy technology, etc.) by combining biomolecules, organic compounds, polymers, nano/microdevices, etc. are solicited. The components of molecular systems are not limited to those mentioned earlier. Researchers from a wide range of fields such as applied chemistry, chemical engineering, biophysics, bioengineering, applied physics, and nano-, micro-technology, are expected. Research on the construction of molecular systems which use as components living cells or organelles, and research on the construction of systems consisting of a single molecular species are out of scope. In addition, research aimed merely at the construction of molecular systems that mimic natural cellular functions are also out of scope.

Research Group F02: Theoretical studies that contribute to the construction of cell-free molecular systems. Research proposals are solicited that aim to design cell-free molecular systems composed of multiple components, or theories for optimizing cell-free molecular systems and the design of their constituent using statistical science, AI, MD, etc. Research proposals that aim to construct theories and implement them in experimental themes in collaboration with Planned Research Groups are desired. A wide range of fields such as mathematical science, information science, systems engineering, biophysics, and bioinformatics is expected. For details of each Planned Research Group, please refer to the area website.

The Principal Investigators of the Publicly Offered Research have access to the “Center for Systems Materials” and the “Center for Measurements and Analysis” organized and run by the Planned Research Groups (see the website for details). Proposals that assume the use of materials and methods provided by the Centers are encouraged.

3. Research Group, Upper Limit of Annual Budget and Number of research projects scheduled to be selected

Research Group Number	Research Group	Upper Limit of Annual Budget (Million yen)	Number of research projects scheduled to be selected
F01	Experimental work on bottom-up construction of cell-free molecular systems	4	21
F02	Theoretical studies that contribute to the construction of cell-free molecular systems	4	4

学術変革領域研究（A）の公募研究の内容（英語版）

Science of 2.5 Dimensional Materials: Paradigm Shift of Materials Science Toward Future Social Innovation

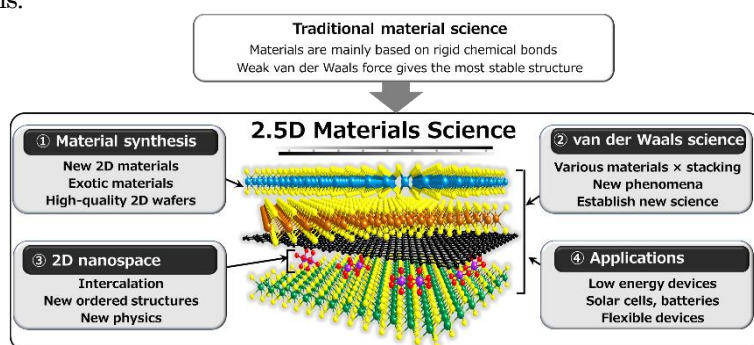
<http://25d-materials.jp>

Number of Research Area	: 21A206	Term of Project	: FY2021-2025
Head Investigator	: AGO Hiroki		
Research Institution	: Kyushu University, Global Innovation Center (GIC)		

1. Details of Research Area

Materials science has established the basis of our modern society through the development of emergent internet of things (IoT) technologies. Traditional materials science is mainly based on the precise control of bulk materials with rigid chemical bonds. On the other hand, two-dimensional (2D) materials, such as graphene, offer novel ways to make new materials by integrating different layers via van der Waals interaction. This is accomplished by artificial stacking of 2D materials with controlled compositions and stacking angles, an approach that is expected to significantly expand the frontier of materials science. Furthermore, well-defined 2D nanospace existing between the layers of stacked 2D materials offer the opportunity to explore novel phenomena and to synthesize new materials.

In this Research Area we propose to explore the "Science of 2.5 dimensional materials" by introducing the new concepts "freedom of integration" and "2D nanospace", in combination with the synthesis of a wide variety of 2D materials. We will develop academic research based on this unique "2.5D" concept to achieve world-leading results, giving rise to upcoming social innovation. This Research Area consists of five Research Groups (A01~A05), and all the members in this area collaborate closely to establish the new scientific field. In addition, the collaborations are supported by the four joint research centers of the groups, allowing access to a wide range of facilities, such as automatic stacking equipment.



2. Call for Proposals and Expectations for Publicly Offered Research, etc.

In this Research Area, we are developing unique and novel 2.5D material research by integrating the strength of the group members through close collaborations. Therefore, researchers applying to this Publicly Offered Research are strongly encouraged to describe a detailed collaboration plan with some of the group members, in addition to an original research plan (if some collaboration has already been done, please also include the achievements). It is also required to indicate how the proposed research can contribute to this Research Area.

The following are the details of the possible research topics: (1) Material synthesis and assembly: synthesis of novel 2D materials including organic-inorganic 2D superstructures, such as COF and MOF, proposal of new assembly technology of 2D materials, proposal of exploring the potential of 2D nanospace by introducing molecules or new architectures. (2) Analysis: development of new methods to analyze thin 2.5D materials with high spatial/energy resolution and high sensitivity, and new methods to detect defects and impurities of large 2.5D wafers in short measurement time. (3) Physical properties and applied research: research which is not covered with the present members. Topics like strongly correlated electron systems, quantum information, spintronics, terahertz devices, applications in information communication (6G), thermoelectric applications, MEMS/NEMS, and tribology are welcomed. (4) Theoretical solid state physics and quantum chemistry that explain the science of 2.5D materials, enabling the prediction of new physical properties based on the combination of different 2D materials. In addition to the topics listed above, we also seek for proposal on challenging topics that can dramatically advance this Research Area. Finally, we also encourage applications from young researchers and female researchers.

3. Research Group, Upper Limit of Annual Budget and Number of research projects scheduled to be selected

Research Group Number	Research Group	Upper Limit of Annual Budget (Million yen)	Number of research projects scheduled to be selected
A01	Materials synthesis for 2.5D structures	Experimental: 5	4
A02	Assembly for 2.5D integrated structures		
A03	Development of analysis methods for 2.5D structures	Experimental or theoretical: 3	13
A04	Development of novel physical properties with 2.5D structures		
A05	Development of electronic, photonic, and energy applications with 2.5D structures	Theoretical: 1.5	4

学術変革領域研究（A）の公募研究の内容（英語版）

Census-based biomechanism of circuit construction and transition for adaptive brain functions
(Adaptive Circuit Census, ACC)

<https://ac-census.org/>

Number of Research Areas	: 21A301	Term of Project	: FY2021-2025
Head Investigator	: ISOMURA Yoshikazu		
Research Institution	: Tokyo Medical and Dental University, Graduate School of Medical and Dental Sciences,		

1. Details of Research Area

We will focus on neural circuit formation and transitions responsible for adaptive brain functions. Combining cutting-edge technologies of advanced neuroscience that enable measuring and manipulating neural circuit activity and single-cell gene expression analysis will provide detailed information about cell type-specific adaptive circuits. In this Research Area, Adaptive Circuit Census (ACC), we will experimentally validate the responsible circuits and theoretically establish adaptive circuit operating principles. To further promote the ACC Research Area, we establish a seamless, interdisciplinary cooperative framework to exchange creative and innovative ideas as well as cutting-edge experimental and analytical techniques. The Research Groups are divided into A01, "Census of adaptive circuit construction," and B01, "Census of adaptive circuit transition," based on timescale differences. In addition, Research Group C01 (Experimental) and C02 (Theoretical), "Technology and theory for adaptive circuit census," interacts with A01 and B01 to facilitate targeting of adaptive circuits.

2. Call for Proposals and Expectations for Publicly Offered Research, etc.

Research Group A01 aims to elucidate the mechanism of formation/reorganization of neuronal circuits during dynamic structural changes such as development, homeostasis, formation of instinct behaviors, brain degenerative diseases, and relevant compensatory responses. Research Group B01 aims to elucidate how neuronal circuits change brain state and lead to adaptation during functional transitions such as memory/learning, emotion, decision making, consciousness, mental illness, and drug addiction. We will use a unique experimental animal that suits each question and employ a precise cell type census and neuronal circuit identification method to capture the properties of specific neuronal circuits. We then compare and analyze the results from each Research Group to obtain comprehensive knowledge of the ACC.

We utilize profiling technology that captures cell types and dissects cell-type specific neuronal circuits; however, profiling itself is not the project's primary purpose. Instead, we expect to reveal the responsible adaptive circuits and fundamental operation mechanisms that alter animal behavior using various methodologies (spatial distribution, circuit structure, and neuronal activity information).

The profiling methodology is not necessarily limited to transcriptome analysis (various types of RNA-seq), and experience with transcriptomic analysis is not necessary since the integration of neuroscience and omics-based analyses is a key focus of the project. Moreover, to perform RNA-seq for the first time, it is crucial to make a detailed experimental design before starting transcriptomic analysis to obtain a successful result. For example, the number of viable cells to be analyzed and the RNA amount/cell need to be carefully considered before transcriptomic analysis. Therefore, the ACC offers consultation of experimental plan, technical advice, and financial support related to transcriptomic analysis to the members.

Research Group C01 aims to develop profiling technology to reveal the mechanism of adaptive circuits. Experience in the neuroscience field is not necessary. We also seek theoretical and bioinformatics experts in Research Group C02, who can verify the operating principle of adaptive circuits by theoretical models and simulations based on big data and integrate multi-layered experimental data. Altogether, we expect to establish a seamless, interdisciplinary cooperative framework to exchange creative and innovative ideas as well as cutting-edge experimental and analytical techniques.

3. Research Group, Upper Limit of Annual Budget and Number of research projects scheduled to be selected

Research Group Number	Research Group	Upper Limit of Annual Budget (Million yen)	Number of research projects scheduled to be selected
A01	Cell type census for adaptive circuit construction	6	4
B01	Cell type census for adaptive circuit transition	4	10
C01	Technology and theory for adaptive circuit census (Experimental)	5	4
C02	Technology and theory for adaptive circuit census (Theory)	2	3

学術変革領域研究（A）の公募研究の内容（英語版）

Cross-scale new biology

<https://structure.m.u-tokyo.ac.jp/xscalebio>



{	Number of Research Area	: 21A302	Term of Project	: FY2021-2025
	Head Investigator	: KIKKAWA Masahide		
	Research Institution	: The University of Tokyo, Graduate School of Medicine		

1. Details of Research Area

We aim to elucidate the molecular and cellular mechanisms of life phenomena and diseases by using quantitative cross-scale measurements in this Research Area. In particular, we focus on “meso-entangled bodies (MEBs).” We define MEB as a sub-cellular “body,” where molecules are disordered, whose size is 20 to 500 nm, and transitioning of MED to an ordered state determines the fate of cells and organisms. A liquid-liquid phase separation (LLPS) condensate is one example of MEBs.

For the cross-scale measurement, we combine cryo-electron tomography, super-resolution imaging, intracellular NMR, and intracellular atomic force microscopy (AFM). Large-scale computational science is also used to integrate and interpret experimental data. The aims of study of our biology group include the following three biological and medical areas: “The polarity of cell and development,” “The shape and topology of membranes,” “Structural abnormalities and quality control of proteins that cause diseases.” We want to create new frameworks of cell biology that answer how highly ordered and functional structures are built from the random MEBs by analyzing these fundamental phenomena by cross-scale measurements.

The Research Area is roughly divided into A01 = Technical Group and A02 = Biological Group. A virtual “cross-scale cell measurement center” will be established so that these groups can efficiently collaborate together.

2. Call for Proposals and Expectations for Publicly Offered Research, etc.

(A01) Technology Group: we expect applications from researchers aiming to develop unique technologies for analyzing intracellular molecular structure dynamics at the mesoscale level. Examples of technologies not covered by the Planned Research Group include quantitative proteome analysis, labeling techniques that can be applied to multiple intracellular cross-scale visualization technologies at the same time. We also expect applications from computational scientists to analyze the data obtained by cross-scale observations and to perform large-scale simulations on MEB using supercomputers, such as “Fugaku.”

The grant application should clearly explain the applicant’s technologies and their superiority and how the technologies contribute to the elucidation of the MEB.

(A02) Biology Group: we expect applications from researchers aiming to elucidate the mechanisms of fundamental phenomena in cells from the viewpoint of intracellular molecular structure dynamics. Example areas include, not limited to, cell differentiation, reprogramming, cell cycle control, cell-cell communication, immunological synapse, and LLPS. We also expect applications from researchers who aim to elucidate disease mechanisms from the viewpoint of intracellular molecular structure dynamics.

The grant application should clearly explain what kind of MEB is expected to be observed by the above methods and what can be concluded from the observation.

We also expect applications from young and/or female researchers.

3. Research Group, Upper Limit of Annual Budget and Number of research projects scheduled to be selected

Research Group Number	Research Group	Upper Limit of Annual Budget (Million yen / year)	Number of research projects scheduled to be selected
A01	Technology Group	4	5
A02	Biology Group	4	10

学術変革領域研究（A）の公募研究の内容（英語版）

Life Science Innovation Driven by Supersulfide Biology

<http://www.supersulfide.proj.med.tohoku.ac.jp>

Number of Research Area	: 21A303	Term of Project	: FY2021-2025
Head Investigator	: MOTOHASHI Hozumi		
Research Institution	: Tohoku University, Institute of Development, Aging and Cancer		

1. Details of Research Area

Sulfur has been an essential element for living organisms on the earth during the long history of evolution. Unique chemical properties of sulfur include redox-sensitive nature and ability to catenate only by itself. The latter allows generation of a wide variety of sulfur-containing molecules that are rather fragile due to the former. We define “supersulfides” as metabolites and proteins possessing sulfur catenation.

Because supersulfides are so sensitive to redox perturbation and easily degraded or altered during the sample processing, their presence in biological contexts has been overlooked for a long time. Thanks to a recent technical advancement in the analytical chemistry, substantial amount of supersulfides, such as glutathione persulfide and cysteine persulfide, have been found in various organisms. Low-molecular weight supersulfides are now recognized as universal metabolites and play critical roles in energy production, antioxidant function, and anti-inflammatory function. Supersulfidated proteins are expected to be involved in the protein folding, proteostasis regulation, and regulation of protein functions. Based on these emerging biological functions of sulfur, we aim at creating and establishing innovative sulfur biology by further clarifying chemical, physical and biological characteristics of supersulfides and interdisciplinary research network among wide range of scientific fields, including chemistry, physics, geoscience, biology, mathematics and so on.

Here are three goals of our Research Area.

- 1) Development of quantification methods for supersulfides in terms of high sensitivity, high fidelity, and high reproducibility.
- 2) Discovery of life principles from a viewpoint of supersulfides in electron transfer and signal transduction.
- 3) Application of supersulfides for contribution to the SDGs

2. Call for Proposals and Expectations for Publicly Offered Research, etc.

We welcome all research focusing on sulfur-containing metabolites and proteins for reevaluation of biological function of sulfur by cooperating with Planned Research Group members. Young investigators and women investigators are strongly encouraged to apply for the Publicly Offered Research.

Specific topic examples in each Research Group are as follows.

Research Group A01) Clarification of structure and properties of supersulfides from the viewpoint of inorganic and organic chemistry, biochemical analysis of interaction between sulfur and metal (iron, zinc, molybdenum, etc.), functional analysis of supersulfide-synthesizing enzymes and supersulfidated proteins, and development of new methodologies for quantification and synthesis of supersulfides.

Research Group A02) Analysis of electron transfer inside and outside of organisms via sulfur, clarification of redox reactions involving supersulfides and their significance, discovery of new homeostasis regulation utilizing sulfur, and clarification of relations between sulfur and other free radicals (reactive oxygen species, nitrogen species, etc.).

Research Group A03) Clarification of functional significance of sulfur-containing metabolites and proteins in signal transduction, mechanisms of supersulfide synthesis from the viewpoint of genetic and epigenetic regulation, and regulation of sulfur-metabolizing enzyme activities at protein levels.

Research Group B01) Interdisciplinary research on sulfur, such as sulfur cycle at global scale, roles of environmental biogenic sulfur, molecular evolution of aminoacyl-tRNA synthetase, sulfur utilization by living organisms during the evolution, is highly welcome. Other creative proposals are encouraged to be applied.

3. Research Group, Upper Limit of Annual Budget and Number of Research Projects Scheduled to Be Selected

Research Group Number	Research Group	Upper Limit of Annual Budget (Million yen)	Number of Research Projects Scheduled to Be Selected
A01	Analysis, quantification, and visualization of supersulfides	2	5
A02	Electron flux mediated by supersulfides	2	5
A03	Signal transduction utilizing supersulfides	2	5
B01	Interdisciplinary research on sulfur biology	3	5

学術変革領域研究（A）の公募研究の内容（英語版）

Biology of non-domain biopolymer

<http://www.nondomain.org>

Number of Research Area	: 21A304	Term of Project	: FY2021-2025
Head Investigator	: NAKAGAWA Shinichi		
Research Institution	: Hokkaido University, Faculty of Pharmaceutical Sciences		

1. Details of Research Area

A number of novel biopolymers, including long noncoding RNAs and super-disordered proteins, have been reported recent years, which exert their functions without functional domains widely conserved between different species. These biopolymers share common characteristics that they do not form distinct three dimensional structures, which is largely different from the dogma of molecular biology that the primary sequences determine the three dimensional structures and the three dimensional structures determine their molecular functions. In this Research Area, we designate these biomolecules as "non-domain biopolymers", of which functions are hardly predicted from their primary sequences. We will perform functional analyses from a diverse point of view, ranging from the atomic levels to the organism levels, to reveal evolutionary strategies to create novel functional biomolecules during the evolution.

2. Call for Proposals and Expectations for Publicly Offered Research, etc.

We appreciate analyses of originally identified novel non-domain biopolymers. However, we also consider research on the molecular regions of which functions are hardly predicted from the sequences, including untranslated regions of known mRNAs or intrinsically disordered regions of known proteins, of which sequences are not necessarily conserved between a wide range of species.

The A01 Physiological Functions Unit welcomes proposals to examine physiological functions of non-domain biopolymers at the organism level. Although the core members use mice and *Drosophila* as model animals, model organisms such as *Arabidopsis thaliana*, nematodes, zebrafish, and various non-model organisms are also welcomed.

The A02 Cell Function Unit welcomes research proposals that clarify the function of non-domain biopolymers using molecular biology or biochemistry of cultured cells. We also welcome proposals to identify novel non-domain biopolymers using large-scale screening techniques such as CRISPR libraries, as well as proposals to analyze the molecular mechanism of known non-domain biopolymers in depth using deep-mutagenesis libraries.

The A03 Molecular Mechanism Unit welcomes research projects to clarify the detailed molecular mechanisms of non-domain biopolymers at molecular and atomic levels. We also welcome proposals to clarify the behavior of non-domain biopolymers from the viewpoint of soft matter physics, or proposals to reveal the "grammar" of sequences using bioinformatical approaches.

3. Research Group, Upper Limit of Annual Budget and Number of research projects scheduled to be selected

Research Group Number	Research Group	Upper Limit of Annual Budget (Million yen)	Number of research projects scheduled to be selected
A01	Functional analyses of non-domain biopolymers at the organism levels	4	18
A02	Functional analyses of non-domain biopolymers at the cellular levels		
A03	Functional analyses of non-domain biopolymers at the atomic and molecular levels		

学術変革領域研究（A）の公募研究の内容（英語版）

Understanding multicellular autonomy by competitive cell-cell communications

<http://www.multicellular-autonomy.lif.kyoto-u.ac.jp>

Number of Research Area	: 21A305	Term of Project	: FY2021-2025
Head Investigator	: IGAKI Tatsushi		
Research Institution	: Kyoto University, Graduate School of Biostudies		

1. Details of Research Area

A critical difference between multicellular living organisms and non-living thing is that the former has ‘autonomy’. A multicellular system can spontaneously construct tissues and organs and optimize its structure and function by itself. Such characteristic of the multicellular system is emerged only when cells are grouped together, and it is a unique natural phenomenon that reduces entropy (randomness). While the mechanism by which a cell population spontaneously creates a structure is gradually being clarified, the mechanism by which a cell population optimizes its own structure and function is still elusive. Recent advances in single-cell analysis technology have identified that there are ‘variations’ in various cell populations within the animal and that these variations are eliminated over time. In addition, when cells with slightly different properties or status are emerged in a cell population, ‘unfit’ cells are actively eliminated from the population through cell-cell interactions, a phenomenon called ‘cell competition’. Cell competition is a context-dependent cell elimination whereby slightly abnormal cells that can survive on their own are eliminated from the population when coexisting with normal cells, thereby optimizing the structure and function of the cell population. In this Research Area, we will approach one of the greatest mysteries of life, the multicellular autonomy, by studying competitive cell-cell communications. To achieve this, we will strongly promote research on cell competition in various model systems and physiological processes, and dramatically advance our understanding of competitive cell-cell communication and its physiological roles. We will also promote interdisciplinary research in the Research Area to understand how multicellular autonomy is created by competitive cell-cell communications.

2. Call for Proposals and Expectations for Publicly Offered Research, etc.

In this Research Area, we aim to comprehensively understand competitive cell-cell communications and elucidate the principle that autonomy is created in multicellular systems. In the Planned Research, in addition to approaches that have strongly promoted cell competition researches (which include genetic, biochemical, and cell biological analyses using *Drosophila*, cultured mammalian cells, mice, and zebrafish), we will promote multifaceted approaches such as mechanobiology, mathematical analysis, synthetic biology, and development of spatial omics technology to understand competitive cell-cell communications. Therefore, for the publicly offered researches, we will call for proposals not only for researches on various cell competition phenomena that complement and strengthen the Planned Researches but also on competitive cell-cell communications that do not fall within the category of cell competition. We also call for researches that aim to elucidate the principle by which competitive cell-cell communication creates multicellular autonomy and optimizes multicellular structure or function. In addition, we expect research proposals on competitive cell-cell communication or the phenomenon in which the structure and function of multicellular systems are autonomously optimized using model organisms, cutting-edge technologies, theoretical analyses, or data analysis methods that are not covered by the Planned Research. We also expect proposals that strengthen theoretical approaches to understand how competitive cell-cell communication creates multicellular autonomy and synthetic approaches to reconstruct multicellular autonomy. In addition to researches on competitive cell-cell communication in animal development, tissue repair, and regeneration, cell competition researches in the context of various temporal changes such as diseases and animal aging are also expected, if it matches the goals and directions of the Research Area. While aiming to accelerate the Research Area and achieve goals through collaboration with the Planned Researches, we also expect challenging research proposals that seek to find new questions or dramatically develop and transform the Research Area. We look forward to applications from young researchers and female researchers who will lead future cell competition and multicellular autonomy researches.

In this Research Area, in order to eliminate the barriers among different specialties, we have set only A01 as the Research Group. Therefore, all the Publicly Offered Researches belong to A01. In order to achieve the above goals, we have set the upper limit of the amount of the Publicly Offered Research budget to 4.5 million yen per year for 16 research proposals.

3. Research Group, Upper Limit of Annual Budget and Number of research projects scheduled to be selected

Research Group Number	Research Group	Upper Limit of Annual Budget (Million yen)	Number of research projects scheduled to be selected
A01	Understanding multicellular autonomy by competitive cell-cell communications	4.5	16

学術変革領域研究（A）の公募研究の内容（英語版）

Hierarchical Bio-Navigation Integrating Cyber-Physical Space

<https://bio-navigation.jp>

Number of Research Area	: 21A401	Term of Project	: FY2021-2025
Head Investigator	: HASHIMOTO Koichi		
Research Institution	: Tohoku University, Graduate School of Information Sciences		

1. Details of Research Area

Our world is filled with the movements of living things, including humans and artificial objects. In this Research Area, we define “navigation” (how to reach a destination) as individual-level behaviors focusing on movements; “interaction” as behaviors that influence other individuals and the environment; and “hierarchical navigation” as behaviors that allow individuals and groups to reach a destination in a hierarchical manner. Hierarchical navigation is the basic mechanism supporting biological and human society. We will develop engineering and information techniques to identify the essential components of hierarchical navigation and their causal relationships. We aim to transform the methods and techniques used to solve problems involving the behavior of organisms, thereby creating a new academic field: “hierarchical bio-navigation”. We will develop or use existing fundamental technologies for behavior measurement, quantification, intervention, and modeling, and automate these technologies to expand our knowledge of hierarchical bio-navigation. In addition, we will integrate these technologies to create an AI-driven experimental logging robot (“ χ logbot”), in which AI is used to select intervention strategies autonomously, and a new experimental methodology called “seamless CPS” (CPS: Cyber-Physical System) is implemented. These will enable a comprehensive understanding of hierarchical navigation.

2. Call for Proposals and Expectations for Publicly Offered Research, etc.

The Planned Research in this Research Area falls within two groups. Research Group A01 will collect and analyze data on hierarchical navigation in the real world (physical space), create models, and conduct interventions that will improve our understanding of the relationship between the environment, biological information, behavior, and other factors. Research Group A02 will develop modeling approaches and use engineering techniques for measurement and intervention to develop technologies for the χ logbot. We will build an academic community that integrates biology, engineering, and informatics with the Planned Research. To this end, the call for Publicly Offered Research is open to a wide range of research related to hierarchical navigation, which complements our Planned Research, and fusion research spanning fields related to the area.

Research Group A01 invites research proposals in zoology (mammalogy, ornithology, herpetology, etc.), animal behavior, ecology, neuroethology, neuroscience, and fields related to hierarchical navigation in various species. We solicit wide-ranging research on individual- and population-level movement of insects, migratory birds, fish, and other animals with excellent navigation skills. Examples include herd dynamics, decision-making in organisms moving in groups, and migration studies of fishery species, pest animals, and invasive species of high social importance. For mice and other model animals, high-precision analysis at the cellular level using biogenetics and other techniques is expected. Particular emphasis will be placed on research that uses the χ logbot and intradisciplinary fusion research with engineering and information science researchers.

Research Group A02, in collaboration with Research Group A01, invites engineering, information science, and related research on measurement, intervention, and analysis in hierarchical navigation. Examples include research on technologies fundamental to the χ logbot, such as robotics, measurement and control technologies, and technologies for measuring and intervening in navigation with high accuracy and over longer lengths of time in various environments. Research on information technologies is also solicited; for example, exploratory AI research and mathematical, statistical, and machine learning models that enhance our understanding of hierarchical navigation. Research Group A02 also invites research on analyzing, designing, and planning human and object movements using sensors and cameras, including IoT.

For details on each Research Group and the χ logbot/seamless CPS, please refer to the Research Area’s website. For Publicly Offered Research, we intend to offer joint use of the χ logbot, technical workshops, support for young researchers, and support for overseas travel expenses if necessary.

3. Research Group, Upper Limit of Annual Budget and Number of research projects scheduled to be selected

Research Group Number	Research Group	Upper Limit of Annual Budget (Million yen)	Number of research projects scheduled to be selected
A01	Research proposals on hierarchical bio-navigation in related fields, such as ecology and neuroscience	3	10
A02	Research proposals on hierarchical bio-navigation in related fields, such as engineering and information science	3	10

学術変革領域研究（A）の公募研究の内容（英語版）

Advanced mechanics of cell behavior shapes formal algorithm of protozoan smartness awoken in diorama conditions.

<http://diorama-ethology.jp/>

Number of Research Area	: 21A402	Term of Project	: FY2021-2025
Head Investigator	: NAKAGAKI Toshiyuki		
Research Institution	: Hokkaido University, Research Institute for Electronic Science		

1. Details of Research Area

Intelligence broadly describes an ability to adapt to the environment. In this sense, single-celled organisms like protists (eukaryotic unicellular organisms) have a prototype of intelligence, or rather they can demonstrate skillful behavior in complex field environments due to their sophisticated evolution over hundreds of millions of years. This behavioral ability seems to be inherited as ‘single-cellular’ behavior in multicellular organisms (sperm motility during fertilization, cell motility in the internal environment, etc.).

In this Research Area, we define ‘proto-intelligence’ as the fundamental adaptability to the environment that single-celled organisms potentially possess. We name such artificial conditions as ‘diorama environments’, where organisms can show their potential proto-intelligence. Diorama environments may mimic the complexity of a habitat but in a setup designed for testing proto-intelligence. For example, one such instance is that of an amoeboid organism of slime mold, which displays the ability to find the shortest path in a maze of diorama environments.

Since the mechanisms of proto-intelligence can often be formulated using coupled kinetic equations of cell motion and the environment, such environment-coupled mechanics will be thoroughly applied. We will challenge and advance the algorithms (heuristics) of proto-intelligence. ‘Ethological dynamics in diorama environments’ is short for the full name of this Research Area, which is ‘Ethological dynamics to formulate proto-intelligence exerted in diorama environments’.

The Planned Research consists of four groups (diorama ethology, diorama implementation, mechanical modeling, algorithmic evaluation). Firstly, this focuses on the two main areas of (1) single sperm behavior (the smallest scale) and (2) collective motion of a red tide (the largest scale) in order to survey a wide range of scale for ethological dynamics. Secondly, the scope of investigation will be expanded to include the behavior of various other organisms (e.g. ciliates and algae). In Publicly Offered Research, we expect that the proposed Research Area will be applied to a wide range of species, enabling the establishment of ethological dynamics in diorama environments through active research exchanges between the Research Groups within the Research Area.

2. Call for Proposals and Expectations for Publicly Offered Research, etc.

The call for proposals is seeking skillful assessments of cell behavior in various species and investigations into the algorithms of cell behavior in various species. In this way, we seek to establish common algorithms of proto-intelligence across the species. Planned Research Groups may propose technical support (advanced measuring instruments and technologies, and advanced methods for mechanical modeling and simulation) for possible collaboration with Publicly Offered Research. Joint research and research exchanges between Publicly Offered Research Groups are strongly encouraged.

In Research Group A01, the call is for cell biological and ethological research on smart adaptive behaviors under diorama environments, field environments, the internal environment of multicellular organisms, or industrial environments (bio-reactor, etc). The main target is single-celled eukaryotes (protists), but single-cellular behaviors found in multicellular organisms and prokaryotic behaviors are also included. In Research Group A02, the call is for research on technologies and methods that contribute to the creation of a diorama environment. Expected subjects are, for example, measurement engineering and micro-engineering, technology for measuring cell behavior with high temporal and spatial resolution, development of software for visualizing and analyzing cell behavior, development of methods for applying complex physical stimuli to cells, methods of collecting and culturing protists from a field environment, and development of microscope for observing cell behavior within a field environment, etc.

In Research Group B01, the call is for biophysical and applied-mathematical research. Expected subjects are not only excellent mathematical model of cell behavior, and simulation with high temporal and spatial resolution, but also, for example, mathematical models dealing with the interaction of multiple species, simulation technology with the aim of assimilation with experimental data, and kinetic research on intracellular machines that control cell behavior. In Research Group B02, the call is for research on information science and comparative cognitive science. Expected subjects are not only excellent research proposals on the algorithm of proto-intelligence in a diorama environment, but also, for example, research on environmental adaptation, learning and evolution in cellular organisms, and research on proto-intelligence in comparative cognitive psychology.

3. Research Group, Upper Limit of Annual Budget and Number of research projects scheduled to be selected

Research Group Number	Research Group	Upper Limit of Annual Budget (Million yen)	Number of research projects scheduled to be selected
A01	studies on skillful cell behavior in diorama environments	2.2	24
A02	studies on creation of diorama environments and measurement		
B01	studies on mechanical modeling for skillful cell behavior	1.9	10
B02	studies on algorithm evaluation of photo-intelligence		

学術変革領域研究（A）の公募研究の内容（英語版）

Digital Biosphere: Integrated Biospheric Science for Mitigating Global Environmental Change

<http://digital-biosphere.jp>

Number of Research Area	: 21A403	Term of Project	: FY2021-2025
Head Investigator	: ITO Akihiko		
Research Institution	: National Institute for Environmental Studies, Earth System Division		

1. Details of Research Area

Preventing global environmental change is an urgent issue for human sustainable society, and so various countermeasures have been proposed and deployed. Facilitating biospheric functions such as CO₂ assimilation and biomass production is expected to make contributions to mitigation, but our understanding, data, and models are far from sufficient.

This Research Area aims at establishing a new research field of integrated biospheric science by re-organizing findings of relevant areas, and thereby at presenting a new countermeasure to prevent critical global environmental impacts. Research members conduct a variety of basic studies and related applications to overcome barriers associated with scale gaps spanning from micro to macro scales of biological systems and global biodiversity and heterogeneity. This Research Area is composed of three categories of Research Group: A) investigation of mechanisms of biospheric functions, B) observation of biospheric functions under changing global environment, and C) development of a new model, called Digital Biosphere. Through intimate collaborations and simulations with the integrated model, this Research Area conducts a quantitative assessment of important mitigation-related indices such as CO₂ fixation, biomass production, and necessary land area.

2. Call for Proposals and Expectations for Publicly Offered Research, etc.

To establish the integrated biospheric science, it is required to deepen our understanding through multidisciplinary approach and cover a wide variety of ecosystems. The Publicly Offered Research is expected to reinforce research fields covered weakly by the Planned Research, to expand spatial and scientific coverage, and to propose original studies. The Research Area expects diverse and collaborative applications from biosphere-related fields such as ecology, biogeochemistry, and climatology, applicative fields such as agronomy, forestry, and fishery, analysis of big-data from the biosphere with machine learning, proposal of mitigation technologies based on outcomes of the Research Area, and assessment from socioeconomic perspective.

Research Group A04 conducts studies related to the Research Group A, i.e., mechanisms of CO₂ fixation and biomass supply. Since the Planned Research assesses forest, vegetation, and soil microbes, the Publicly Offered Research is expected to conduct studies on other mechanisms, such as blue carbon accumulation in coastal area and functional response to short- to long-term environmental variations. Also, a proposal on the relationship between biodiversity and functions is anticipated.

Research Group B03 conducts studies related to the Research Group B, i.e., broad-scale observation of biospheric function. The Planned Research performs micrometeorological measurements and high-resolution remote sensing, and we expect participation of many sites to cover a wide spatial extent. Applications of long-term monitoring by utilizing existing sites and integrated data synthesis by participating intensive field campaign and manipulative experiments are expected.

Research Group C03 conducts studies related to the Research Group C, i.e., biospheric modeling and mitigation options. The Planned Research develops a high-resolution model 'Digital Biosphere' and assesses climatic feedback using the Earth system model. The Publicly Offered Research is expected to make contributions to these model studies and to facilitate intimate collaborations with the Research Groups of A and B. Proposals on improvement of simulation efficiencies with data-driven models and on examination of mitigation options taking account of socioeconomic factors are expected.

The Research Area plans to adopt three categories of the Publicly Offered Research: studies about high-priority topics and integration at 8 million yen per year (about 3 projects), developing research topics at 4 million yen per year (about 8 projects), and emerging (beyond the Research Area) topics and site maintenance for long-term observation at 2 million yen per year (about 12 projects). Applications from young or female researchers are strongly encouraged.

3. Research Group, Upper Limit of Annual Budget and Number of research projects scheduled to be selected

Research Group Number	Research Group	Upper Limit of Annual Budget (Million yen)	Number of research projects scheduled to be selected
A04	Studies on mechanisms of biospheric functions	8 [high priority]	3 [high priority]
B03	Studies on monitoring by observations	4 [developing]	8 [developing]
C03	Studies on modeling and mitigation options	2 [emerging]	12 [emerging]

4. Review Panels and Other Matters

(1) Concerning KAKENHI Review

Omitted

(2) Review Methods and Other Matters

The review for Grant-in-Aid for Scientific Research is carried out based on application documents in the Academic Deliberation Council for Science and Technology of MEXT. Moreover, the review takes place behind closed doors. The submitted application documents are not returned to the applicants.

For details on “assessment rules” (“Rules concerning the assessment for Grants-in-Aid for Scientific Research” (decided by the Research Grant Screening Section of the Academic Deliberation Council for Science and Technology on November 12, 2002) including the review criteria for Transformative Research Areas (A)(Publicly Offered Research), please check the website for Grants-in-Aid for Scientific Research of MEXT (URL: https://www.mext.go.jp/a_menu/shinkou/hojyo/1284403.htm).

(“Rules concerning the assessment for Grants-in-Aid for Scientific Research” for FY2022 have already been released as of the time of this call for proposals.)

In Transformative Research Areas (A)(Publicly Offered Research), each reviewer in the committee dedicated to the particular research area (which will also include researchers who are outside of the research area in question) will conduct a two-stage document review. The panel reviews will not be conducted.

In the review process, the reviewers can utilize, as necessary, the “researchmap” and the Grants-in-Aid for Scientific Research Database (KAKEN). (see page 71).

(3) Notification of Screening Results

Grant-in-Aid for Transformative Research Areas (A)(Publicly Offered Research)

- 1) The council will issue a notification in writing to the research institution on whether the research project has been selected or not, based on the results of the review. (Planned for late June)
- 2) To Principal Investigator whose proposals have not been adopted and who wish to request for disclosure of the review results at the first stage of the review, JSPS is ready to disclose the approximate ranking per the Basic Section, the score (average score), and the “standard-format opinion” via the electronic application system. (Planned for July)

III. Instructions for Prospective Applicants

1. Procedures to be Completed Prior to Application

The following three items must be completed prior to the submission of the research proposal:

- (1) Ascertainment of the Eligibility for KAKENHI Application,**
- (2) Confirmation of the Researcher Information Registered in the e-Rad System,**
- (3) Obtainment of an ID and a Password for the Electronic Application System.**

(1) Ascertainment of the Eligibility for KAKENHI Application

An applicant submitting a research proposal to Grants-in-Aid for Scientific Research (KAKENHI) as Principal Investigator (PI) must meet the requirements (i) and (ii) stated below.

A researcher carrying KAKENHI eligibility through more than one research institution can submit application(s) through either of the research institutions. However, in the event of parallel submissions, they have to comply with the rules on restrictions on the parallel grant application/receipt (see page 50).

(i) At the time of the proposal submission, a researcher needs to have been approved by his/her research institution(*) as an eligible researcher who meets the Requirements a) , b) and c) stated below, and have his/her Researcher Information properly registered in the e-Rad system as eligible for KAKENHI application.

< Requirements >

- a) **The applicant must be an individual belonging to a research institution with a job assignment including a research activity within the said institution.** (Whether the job is paid/unpaid, or full-time/part-time is irrelevant. It is not a prerequisite of eligibility that the research activity constitutes the main part of his/her job.)
- b) **The applicant must be actually engaged in a research activity in his/her research institution.** (Those who are only engaged in research assisting jobs are ineligible.)
- c) **The applicant must not be a graduate student or any other categories of student.** (However, an individual who has a position in a research institution with a research activity as his/her main job (e.g., a university teaching staff, a researcher belonging to a company, etc.) and holds a student status at the same time is eligible.)

(*): Here, the research institution must be such that designated according to the Article 2 of the “Rules for the Handling of Grants-in-Aid for Scientific Research” (Notification of MEXT)

(Reference) Requirements that the research institution must meet (see page 74):

< Requirements >

- The research institution must authorize the research project for which KAKENHI is granted, as its proper activity.
- The research institution must take responsibility for management and accounting of the KAKENHI delivered to its researchers.

(ii) The individual must not be categorized as ineligible for grant acquisition in the fiscal year covered by a call for proposals, as a penalty for his/her improper grant spending, fraudulent grant acquisition, or research misconduct.

<Important Point 1>

A researcher who is employed with a KAKENHI grant (hereinafter referred to as “KAKENHI employee”), is generally bound by their employment contract to concentrate on the research work relevant to the KAKENHI project for which he/she is employed (hereinafter referred to as “employment-related work”) specified in his/her employment contract. Therefore, such a KAKENHI employee cannot apply for his/her own KAKENHI project which is to be conducted within the working hours of his/her employment.

However, provided that he/she can clearly demarcate his/her own research hours from the working hours of employment and intends to conduct his/her own research project during the working hours on his/her own initiative, the KAKENHI employee can submit his/her own KAKENHI proposal, on the condition that the following points are verified by his/her research institution. The KAKENHI employee can apply for KAKENHI as a PI or become as a Co-I.

- The KAKENHI employee is granted on his/her employment contract, to conduct research on his/her own initiative, besides the employment-related work.
- The employment-related work and the work devoted to the research on his/her own initiative are clearly demarcated in regard to the working hours and the effort.
- The KAKENHI employee is able to secure enough research hours (besides the working hours for his/her employment-related work) to be allotted to his/her own KAKENHI project.

[Self-motivated research activities by young researchers employed with KAKENHI funding]

A young researcher (*) who is employed with KAKENHI funds (KAKENHI employee) and meets the following conditions, may conduct his/she own research during the working hours assigned for the employment-related work, after going through the necessary procedures set by his/her research institution. He/She can apply for KAKENHI as a PI or become a Co-I.

- (1) A young researcher desires on his/her own will to conduct his/she own research.
- (2) The PI and Co-I (the employer of the young researcher) desires that the said research has a positive contribution to the promotion of the funded research project for which he/she is employed, and the research institution approves the said decision.
- (3) The PI and Co-I judges that the efforts to be spared by the young researcher to the said research within the extent that do not cause any hindrance to the execution of the funded research project for which he/she is employed, and the research institution approves the judgement. (The upper limit of the efforts to be spared to the self-motivated research is 20 percent of the efforts to be put into the funded research project for which he/she is employed.)

* In this context, “young researcher” is defined as an individual who is age 39 or under or less than 8 years after Ph.D. acquisition as of April 1 of each fiscal year, and whose job assignment includes research activities. When applying for Grants-in-Aid for Scientific Research (KAKINHI) he/she must meet the eligibility requirements for KAKENHI application.

Provided that the KAKENHI employer approves such self-motivated research activities in accordance with its funding resources (project) rules, if a researcher had originally met the eligibility requirements for KAKENHI’s self-motivated research activities at the time of his/her application or participation, he/she may apply for KAKENHI and continue to engage in the adopted research project even if, during the project period, he/she is no longer age 39 or under or less than 8 years after Ph.D. acquisition. If there are changes to the funding resources (project) of the KAKENHI employer, the researcher must abide by the new funding resources (project) rules and reobtain the approval to conduct self-motivated research activities as a young researcher at the time the of the changing of funding resources.

(Reference) Views on the self-motivated research activities by the KAKENHI employee

Attachment 1 to the “Changes in the FY2020 Call for Proposals for Grants-in-Aid for Scientific Research (KAKENHI) and Other Matters” (March 19, 2020) (Excerpt)

https://www.jsps.go.jp/j-grantsinaid/06_jsps_info/g_200316/index.html

Grants-in-Aid for Scientific Research (hereinafter referred to as “KAKENHI”) is a funding scheme that is intended to promote development of scientific research (based on original ideas of researchers), encompassing basic to applied researches in all fields ranging from humanities and social sciences to natural sciences. Scientific research is a source of innovation i.e., value creation based on new knowledge and has a vital role in nurturing human resources for leading a knowledge-based society broadly. It is particularly important to foster young scientists who are responsible for the next generation in order that the scientific research may sustainably exercise its role in the society.

It enable young researchers employed with a KAKENHI grant to conduct self-motivated research activities (including research activities with other research funds and activities helping research/management capacity building; hereinafter the same). Allowing them to conduct research activities in an independent and free research environment contributes not only to fostering young researchers, but also to the further development of the KAKENHI projects of their research institutions through research based on their freewheeling thinking and to the development of scientific research the entire country. Therefore, the concept of self-motivated research activities by young researchers is introduced in the KAKENHI scheme in this call for proposals.

For details refer to the following.

“Implementation Guidelines for Self-motivated Research Activities by Young Researchers Employed with Competitive Research Funds” (Revised on December 18, 2020, Agreement of the Liaison Meeting of Related Offices and Ministries on Competitive Research Funds)

https://www.mext.go.jp/a_menu/shinkou/torikumi/1385716_00001.htm

<Important Point 2>

JSPS Research Fellows (DC) and JSPS International Research Fellows are not eligible for KAKENHI application. In general, graduate students are not eligible either (See the notes below for exceptions.). Therefore, an individual with the status of student in a research institution is not eligible even if he/she also holds a position to conduct research in that or other research institution.

(Note 1) The term “student” as defined here does not include such an individual who has a position to conduct research in his/her research institution, as the main job (e.g., university teaching staff,

researcher belonging to company, etc.), and holds a student status at the same time.

(Note 2) If a JSPS Research Fellow (SPD, PD, RPD, or CPD) meets the application requirements set forth above at the research institution which **he/she registers as host research institution, he/she can also apply for the following research categories other than the “Grant-in-Aid for JSPS Fellows,” but only from the registered host research institution.** Unlike applying for KAKENHI as PI, he/she may apply for any of these research categories so long as he/she takes part in a KAKENHI proposal as Co-I.

(i) Publicly Offered Research of Transformative Research Areas (A)(Publicly Offered Research) or Scientific Research on Innovative Areas (Research in a Proposed Research Area)(Publicly Offered Research)

(ii) Scientific Research (B/C)

(iii)Challenging Research (Exploratory)

(iv)Early-Career Scientists

(v) Fund for the Promotion of Joint International Research (Fostering Joint International Research (A)) (Excluding CPD)

<Important Point 3>

The PIs and the Co-Is constitute the “members of funded projects,” as stipulated in the Law on the Improvement of the Administration of the Budget for Grants-in-Aid (1955, Law no. 179). In an event that they have committed improper grant spending, fraudulent grant acquisition, research misconduct, etc. the eligibility for KAKENHI application will be suspended for a period of time specified by the rule.

In the following cases, an individual registered in the e-Rad system as “eligible for KAKENHI application” may be subject to different treatment.

- In case the research institution to which the individual belongs has made a judgement that it is not appropriate to let the individual conduct the said research activity as a part of his/her work within the institution, the institution may withhold the submission of his/her KAKENHI proposal, or may withhold the formal application for grant delivery of a provisionally adopted KAKENHI grant resulting in declination of the grant in question.
- In case a KAKENHI recipient has failed to submit the “Report on the Research Achievements” that is due after the completion of the research period of his/her KAKENHI without any good reason, no new KAKENHI grant(s) will be delivered to him/her, even if the grant(s) have been provisionally adopted. Moreover, if a KAKENHI recipient has failed to submit the “Report on the Research Achievements” by the due date, then the delivery of KAKENHI grant(s) for that fiscal year will be suspended.

(2) Confirmation of the Researcher Information Registered in the e-Rad System

A researcher who intends to submit a research document proposal as the PI to any of the KAKENHI research categories for which “Call for Proposals” is announced, must carry the eligibility for KAKENHI application at the time of submission of the “Research Proposal Document” from his/her research institution to MEXT, and must be registered in the e-Rad system as such.

Therefore, it is important for the researcher to ascertain proper registration of his/her Researcher Information in the e-Rad system.

The registration in the e-Rad system is handled by the research institution to which the researcher belongs. The researcher should check with the administrative section of his/her institution about the registration procedures including the registration deadline within the institution, the method of confirmation of the current contents of registration, etc. If any of the entry items (such as “affiliation,” “position,” etc.) of the researcher who has been already registered in the e-Rad system need updating, they should be duly completed.

(3) Obtainment of an ID and a Password for the Electronic Application System

When the research institution completes the e-Rad registration of a researcher, an ID and a password will be issued for him/her. The researcher can access the KAKENHI Electronic Application System using the ID and password and prepare the Research Proposal Document.

The ID and the password issued to a researcher remain valid after he/she moves to another research institution. Every researcher should exercise due care in handling his/her ID and password so as to prevent their leakage and abuse.

2. Restrictions on Parallel Grant Application/Receipt

A researcher who intends to submit research proposal(s) to KAKENHI should be well acquainted with the “Restrictions on Parallel Grants Application/Receipt” before starting preparation of research proposal document(s) to check if applications to the intended categories are permitted.

(1) The Basic Policy for Restriction on Parallel Grant Application/Receipt

KAKENHI consists of different “Research Categories” and “Application Sections” set on the basis of budget scale, content, and other factors of the intended research, so as to meet various needs and research styles of the applicants.

On the other hand, in consideration of the necessity to support many excellent researchers with limited funding resources, and of the possible detrimental influence of overcrowding applications on the proper management of the review process, the “Rules for Restrictions on Parallel Submission of Research Proposals” have been set up, according to the following basic principles.

- Give considerations so as to ensure that as many excellent researchers as possible can be supported with limited funding resources.
- Give considerations so as to ensure that the number of applications does not become excessive in comparison with the review scheme of each research category.
- The restrictions to be enforced are primarily directed to the applicant as Principal Investigator (PI) who bears all responsibility for the implementation of the research project. In some cases such as the research categories with large budget scale, however, the restrictions may be also extended to individuals as the Co-Investigator (Co-I).
- The restriction on parallel submission of research proposals and the restriction on simultaneous receipt of grants are separately set on each of the KAKENHI research categories, in accordance of the basic concepts outlined above and by taking into consideration the purpose, characteristics and other factors of each KAKENHI category

Restrictions on parallel grant application/receipt do apply to the current round of call for proposals. Accordingly, the applicant should be well acquainted with the description of the rules given below, and the “Table of Restriction on Parallel Grants Application/Receipt” (see pages 56-59).

In case a particular research project falls under the concept of “unreasonable duplication” as put forward in the “Guidelines on the Proper Implementation of Competitive Funding” (see page 7), it may be judged as such in the review process. Therefore, the applicant should take due precautions in preparing his/her research proposal document.

(2) Restrictions on Parallel Grant Application/Receipt

- Restrictions on parallel grant application/receipt related to "Grants-in-Aid for Transformative Area (A)(Publicly Offered Research)" and "Grants-in-Aid for Scientific Research on Innovative Areas(Publicly Offered Research)"

The total number of new research proposals and on-going projects, in Publicly Offered Research, including both “Scientific Research on Innovative Areas” and “Transformative Research Areas (A)”, is at most two. In case the applicant have one on-going project in “Scientific Research on Innovative Areas (Research in a proposed research area) (Publicly Offered Research), he/ she can apply for one research project in either “Scientific Research on Innovative Areas (Research in a proposed research area)(Publicly Offered Research)” or “Transformative Research Areas (A) (Publicly Offered Research).”

[Reference] Restrictions on parallel grant application/receipt related to "Grants-in-Aid for Transformative Area (A/B)" and "Grants-in-Aid for Scientific Research on Innovative Areas"

(i) In Grant-in-Aid for “Transformative Research Areas (A)” and “Transformative Research Areas (B)”, cases in which the applicant intends to submit to the same research area.

In Grant-in-Aid for “Transformative Research Areas (A)” and “Transformative Research Areas (B)”, **the application for the same research area by one researcher is limited to one research project, regardless of whether he/she is a Principal Investigator or a Co-Investigator (except for the research project of "Administrative Group.").** (If a researcher holds an on-going KAKENHI research project in a particular research area, he/she cannot submit a new KAKENHI research proposal in the same research area.)

However, Principal Investigators of "Planned Research other than Administrative Group" must participate as Co-Investigator or Research Collaborator of "Administrative Group." In addition, Co-Investigator of "Planned Research other than Administrative Group" can participate in "Administrative Group" when necessary.

(cases marked with “—” in the Table)

(ii) Cases in which the applicant intends to submit two research proposals as the “Principal Investigator” for both.
【“PI → PI” type】

In case an applicant intends to submit two research proposals (to different research categories) as PI for both, the following rules (cases A to D) of restrictions on parallel grant application /receipt apply.

Cases in which a researcher extended the research period for a KAKENHI grant (Multi-year Fund) or a KAKENHI grant (Partial Multi-year Fund) in the final fiscal year (except the extension of research period due to maternity/childcare leave, research stay abroad, etc.), constitute exception to the rules given below.

A Cases where a researcher can submit only one research proposal as PI.

(cases marked with “×” in the Table)

B Cases where a researcher cannot submit a new research proposal, as he/she holds an on-going research project.

(cases marked with “▲” in the Table)

C Cases where a researcher can make parallel submission of research proposals to a research category in the column A and to another category in the column B. If both proposals are adopted, only one of them is granted, as indicated by the symbols in the Table.

(For cases marked with “■” the research category in the column A is given priority. For cases marked with “□” the research category in the section B is given priority.)

D Cases of accepting up to 2 research projects which are applied for Publicly Offered Research of “Grant-in Aid for Scientific Research for Transformative Research Areas” and “Grant-in-Aid for Scientific Research on Innovative Areas” are accepted (the application for the same area is not permitted.).

(cases marked with “◆” in the Table)

(iii) Cases in which an applicant submitting a research proposal as PI to a category in column A participates as Co-I in another research proposal submitted to a category in column B
【“PI → Co-I” type】

For cases in which a researcher submitting a certain research proposal as a PI intends to participate in another research project as a Co-I, or a researcher who is the PI of the prospected on-going project in FY2022 intends to participate in another research project as a Co-I, there are no restrictions in general so that the researcher can participate in both projects.

However, for some research categories, the following rules (cases A to C) of restrictions on parallel grant application/receipt as stated below do apply.

- A Cases in which the researcher cannot be a Co-I of the other project
(cases marked with “×” in the Table)
- B Cases where the researcher cannot be a Co-I of the other project, because of his/her on-going project.
(cases marked with “▲” in the Table)
- C Cases where a researcher can participate in the other proposal as Co-I, but, if both are adopted, he/she has to carry out the project in the column A.
(For cases marked with “■” the research category in the column A is given priority.)

(iv) Cases where a researcher who participates as Co-I in a newly-submitted research proposal or a researcher who is a Co-I of an on-going project intends to submit a new research proposal as the PI of another research project.
【“Co-I → PI” type】

For cases in which a researcher participating in a certain research project (on-going or newly submitted) as a Co-I intends to submit another research proposal as a PI, or a researcher who is a Co-I of the prospected on-going project in FY2022 intends to submit another research proposal as PI, there are no restrictions in general, so that the researcher can participate in both projects. However, for some research categories, the following rules (cases A to C) of restrictions on parallel grant application/receipt as stated below do apply.

- A Cases in which the researcher cannot be a PI of the other project
(cases marked with “×” in the Table)
- B Cases where the researcher cannot be a PI of the other project, because of his/her on-going project.
(cases marked with “▲” in the Table)
- C Cases where a researcher can participate in the other proposal, but, if both are adopted, he/she has to carry out the project in the column B.
(For cases marked with “□” the research category in the column B is given priority.)

(v) Cases in which a researcher who participates as Co-I in more than one research projects (on-going or newly submitted) also intends to participate as Co-I in another research proposal.
【“Co-I → Co-I” type】

For cases in which a researcher participating in a certain research project (on-going or newly submitted) as a Co-I intends to participate in another research project as a Co-I, or a researcher who is a Co-I of the prospected on-going project in FY2021 intends to participate in another research project as a Co-I, there are no restrictions in general, so that the researcher can participate in both projects.

However, the following rules (cases A and B) of restrictions on parallel grant application/receipt as stated below do apply.

A Cases in which the researcher cannot be a Co-I of the other project

(cases marked with “×” in the Table)

B Cases where the researcher cannot be a Co-I of the other project, because of his/her on-going project.

(cases marked with “▲” in the Table)

(3) Restrictions on Simultaneous Receipt of Grants

According to the “Restriction on Parallel Grant Application/Receipt,” cases in which parallel submission of research projects is permitted, but only one of them can be granted even if both are adopted, are handled as follows.

Handling of the cases marked with “■” or “□” when both projects are adopted

A For the “PI → PI” type (such as the case of PI of a Specially Promoted Research project and PI of another project in other research categories), the researcher must decline the grant delivery of the project in the lower priority category, or abolish the on-going project in the lower priority.

B If the PI of a newly adopted Specially Promoted Research project has been acting as Co-I of on-going project(s) in other research categories, he/she must withdraw the Co-I status of the latter project(s).

In an event that the withdrawal of the Co-I status makes the implementation of the latter project(s) unsustainable, the said project(s) have to be abolished (or withdrawn).

(4) Important Notes

i) Even for the cases in which parallel grant application/receipt is not prohibited by the rules, the applicant should give a careful consideration so as not to fall in such situation that he/she cannot carry his/her responsibility as PI or Co-I, by committing him/herself to too many research projects. The applicant should be well acquainted with the content of “Elimination of Unreasonable Duplication and/or Excessive Overconcentration in the Grant Allocation” mentioned on page 7.

ii) Starting from the FY2022 call for proposals, the schedule for the call for proposals has been changed to earlier dates, and as such, the timing of the call for proposals for some research categories subject to the restriction on parallel grant application/receipt may vary. Applicants should check the “Table of Restriction on Parallel Grant Application/Receipt” carefully. **In a case for which the restriction on parallel grant application/receipt applies, applicants are not eligible to submit a new application for the other research category even if he/she withdraws the research project that he/she had already submitted (sent) through the electronic**

application system.

Example A researcher cannot apply for Grant-in-Aid for Transformative Research (A) (Publicly Offered research) after applying for Grant-in-Aid for Challenging Research (Pioneering) as PI (even if he/she withdraws the application for Grant-in-Aid for Challenging Research (Pioneering)).

- iii) In some cases, even after a research proposal has been duly submitted via the Electronic Application System, it may be eliminated from the subsequent review process on the basis of the rules of restrictions on parallel grant application/receipt. This may happen, for example, in a case where the said proposal becomes in conflict with the “Restrictions on Parallel Submission of Research Proposals” by a change in the project members of an on-going research project. The applicant should check against such possibility before submitting the research proposal document.
- iv) The rules of restrictions on parallel submission of research proposals do apply to a case in which a researcher carrying eligibility for applications in more than one research institutions intends to submit different proposals from each of those institutions.
- v) In regard to the “Table of Restrictions on Parallel Grant Application/Receipt,” the participation in to the “Transformative Research Area” and the “Administrative Group” in the “Scientific Research on Innovative Areas (Research in a Proposed Research Area)” are deemed exceptional (see “Application Procedures for Grants-in-Aid for Scientific Research-KAKENHI- FY2022 (MEXT)”). The following points should be noted
 - A The PI of the research projects of the “Transformative Research Areas” and of the “Administrative Group” of the “Scientific Research on Innovative Areas (Research in a Proposed Research Area)” should check the restriction on parallel submission of proposal as PI or Co-I of other research proposals they intend to submit in parallel by referring to the relevant entries of the “Table of Restriction on Parallel Grant Application/Receipt.”
 - B The Co-I of the of the research projects of the “Transformative Research Areas” and of the “Administrative Group” of the “Scientific Research on Innovative Areas (Research in a Proposed Research Area)” should check the restriction on the **participation as PI or Co-I to the “Planned Research (Planned Research other than the research projects of the “Administrative Group”) and the parallel submission of proposal as PI or Co-I of other research proposals they intend to submit in parallel** by referring to the relevant entries of the “Table of Restriction on Parallel Grant Application/Receipt.”
- vi) In regard to the Restrictions on Parallel Grant Application/Receipt relevant to “the researcher submitting a research proposal as PI or Co-I” or “the PI or Co-I of the prospected on-going project in FY2021” for the research categories for which the call for proposals is announced by the JSPS, applicants should refer to the “Research categories for which JSPS organizes a call for proposals” in the “Table of Restrictions on Parallel Grant Application/Receipt.”
- vii) When a PI of an on-going project of KAKENHI (Multi-year Fund) or KAKENHI (Partial Multi-year Fund) extends the research period in the final fiscal year (except the case with the interruption

of the research due to maternity/childcare leave, research stay abroad, etc.), the restriction on parallel grant application/receipt does not apply between the on-going project and a new research proposal he/she intends to submit.

On the other hand, the restriction on parallel grant application/receipt does apply between the new research proposal and other new research proposal(s) (including the on-going project(s)) to be submitted by the same PI.

viii)When an individual who is a JSPS Research Fellow (SPD, PD, RPD, or CPD) has obtained the eligibility for KAKENHI application at the research institution which he/she has registered as his/her host research institution, he/she can submit a research proposal in the following research categories; the “Publicly Offered Research” of the “Transformative Research Areas (A)(Publicly Offered Research) and Scientific Research on Innovative Areas (Research in a Proposed Research Area),” “Scientific Research (B/C),” “Challenging Research (Exploratory),” “Early-Career Scientists” and “Fund for the Promotion of Joint International Research (Fostering Joint International Research (A)(excluding CPD).”

As for the restrictions on parallel grant application/receipt for JSPS Fellows (SPD, PD, RPD, or CPD), the applicant should read the description in the section “Grant-in-Aid for JSPS Fellows (JSPS Research Fellow)” of the “Table of Restriction on Parallel Grant Application/Receipt,” even if he/she does not receive the “Grant-in-Aid for JSPS Fellows.”

ix)If an individual is granted his/her application for “Planned Research in Transformative Research Areas (A/B) (including research projects of “Administrative Group””, and if subsequently he/she is adopted as JSPS Fellow, he/she has to choose either the JSPS fellowship or the KAKENHI project.

A JSPS Research Fellow (SPD, PD, RPD, or CPD), during the period of his/her term, cannot submit any research proposals to those research categories for which the rule of restrictions on parallel grant application/receipt applies.

Therefore, even after a submitted proposal has been duly filed in the Electronic Application System, it may be eliminated from the subsequent review process by the rule of restrictions on parallel grant application/receipt. The applicant should check against such possibility before submitting the research proposal document.

x)There are no restrictions on parallel grant application/receipt between KAKENHI and other competitive funding schemes. Still, applicants should read the description in the column “Elimination of Unreasonable Duplication and/or Excessive Overconcentration in the Grant Allocation” on page 7.

2) Type "Principal Investigator (New Proposal/Continued) (Column A) → Co-Investigator (Column B)"

This table shows the restrictions on parallel grant application/receipt in case of "a person who tries to apply as Principal Investigator for a research project mentioned in Column A (research categories for which MEXT organizes a call for proposals), or a person who has already become Principal Investigator of a research project that is scheduled to be continued in FY2022 (continued research project) mentioned in Column A" participates in a research project mentioned in Column B as Co-Investigator.

Column B			Scientific Research on Innovative Areas (Research in a proposed research area)		Transformative Research Areas (A)						Transformative Research Areas (B)					Specially Promoted Research	Scientific Research (S)	Scientific Research (A)	Scientific Research (B)	Scientific Research (C)	Challenging Research	
			Research area same as the one in Column A.	Research area different from the one in Column A.	Research area same as the one in Column A			Research area different from the one in Column A			Research area same as the one in Column A			Research area different from the one in Column A.								
					New Research Area			Continued			New Research Area				Continued							
			Planned research ^{*)}	Planned research ^{*)}	Administrative group	Planned research	Planned research ^{*)}	Planned research ^{*)}	Administrative group	Planned research	Planned research ^{*)}	Planned research ^{*)}	Administrative group	Planned research	Planned research ^{*)}						Planned research ^{*)}	
New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal									
Column A			Co-I	Co-I	Co-I	Co-I	Co-I	Co-I	Co-I	Co-I	Co-I	Co-I	Co-I	Co-I	Co-I	Co-I	Co-I	Pioneering	Discovery			
Scientific Research on Innovative Areas (Research in a proposed research area)	Administrative group ¹⁾	Continued	PI	▲	/	/	/	/	/	/	/	/	/	▲	▲							
		Planned research	PI	—	▲	/	/	/	/	/	/	/	/	/	▲							
	Publicly offered research	New Proposal	PI	—	/	/	/	/	/	/	/	/	/	/								
		Continued	PI	—	/	/	/	/	/	/	/	/	/	/								
	Transformative Research Areas (A)	Administrative group	New Proposal	PI	×	—	—	—	×	/	/	/	/	/	×	×						
			Continued	PI	▲	/	/	/	/	/	/	/	/	/	/	▲	▲					
Planned research		New Proposal	PI	×	/	—	—	×	/	/	/	/	/	/	×							
		Continued	PI	▲	/	/	/	/	/	/	/	/	/	/	▲							
Publicly offered research		New Proposal	PI	/	/	/	/	/	/	/	/	/	/	/								
		Continued	PI	/	/	/	/	/	/	/	/	/	/	/								
Transformative Research Areas (B)	Administrative group	New Proposal	PI	×	/	/	/	×	—	—	×	/	/	×								
		Continued	PI	▲	/	/	/	/	/	/	/	/	/	/	▲							
	Planned research	New Proposal	PI	×	/	/	/	×	—	—	×	/	/	×								
		Continued	PI	▲	/	/	/	/	/	/	/	/	/	/	▲							

Blank cell: The researcher can apply for both research projects.
 — A researcher can only apply for one research project (except for the research project of "Administrative Group") in one and the same research area regardless of Principal Investigators or Co-Investigators. (In case he or she has a continued research project mentioned in Column A, he or she cannot apply for a research project mentioned in Column B).
 × The researcher can only apply for one research project (in case he or she applied for a research project mentioned in Column A, he or she cannot apply for a research project mentioned in Column B).
 ▲ The researcher cannot apply for a research project mentioned in Column B (he or she only implements the research of a continued research project mentioned in Column A).
 Shaded cell: There are not cases that the researcher apply for both research projects mentioned in Column A and Column B.
 *1 The "International Activities Supporting Group" (No new proposals have been called since FY2016.) has the same restrictions on duplications as the "Administrative Group."
 *2 In regards to the "continued research area" under "Research area same as the one in Column A" and the "research area different from the one in Column A", the Administrative Group has the same restrictions on duplication as for "Planned research."

3) Type "Co-Investigator (NewProposal/Continued) (Column A) → Principal Investigator (Column B)"

This table shows the restrictions on parallel grant application/receipt in case of "a person who tries to participate as Co-Investigator in a research project mentioned in Column A (research categories for which MEXT organizes a call for proposals), or a person who has already become Co-Investigator of a research project that is scheduled to be continued in FY2022(continued research project) mentioned in Column A" applies as Principal Investigator for mentioned in Column B.

Column B \ Column A	Scientific Research on Innovative Areas (Research in a proposed research area)		Transformative Research Area (A)						Transformative Research Area (B)				Specially Promoted Research	Scientific Research (S)	Scientific Research (A)	Scientific Research (B)	Scientific Research (C)	Early-Career Scientists	Challenging Research																				
	Research area same as the one in Column A		Research area same as the one in Column A			Research area different from the one in Column A			Research area same as the one in Column A		Research area different from the one in Column A																												
	Planned research	Continued research	New Research Area			Continued			New Research Area		Continued																												
			Administrative group	Planned research	Planned research ¹⁾	Planned research ¹⁾	Planned research ¹⁾	Planned research ¹⁾	Administrative group	Planned research	Planned research ¹⁾	Planned research ¹⁾																											
	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal							New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	Pioneering	Exploratory													
Scientific Research on Innovative Areas (Research in a proposed research area)	Planned research	Continued research	Co-I	-	/	/	/	/	/	/	/	/	/	×	□																								
Transformative Research Area (A)	Planned research	Continued research	Co-I	/	/	/	/	/	/	/	/	/	/	/	×	□																							
Transformative Research Area (B)	Planned research	Continued research	Co-I	/	/	/	/	/	/	/	/	/	/	/	×	□																							

4) Type "Co-Investigator (New/Continued) (Column A) → Co-Investigator (Column B)"

This table shows the restrictions on parallel grant application/receipt in case of "a person who tries to participate as Co-Investigator in a research project mentioned in Column A (research categories for which MEXT organizes a call for proposals), or a person who has already become Co-Investigator of a research project that is scheduled to be continued in FY2022(continued research project) mentioned in Column A" participates in a research project mentioned in Column B as Co-Investigator.

Column B \ Column A	Scientific Research on Innovative Areas (Research in a proposed research area)		Transformative Research Area (A)						Transformative Research Area (B)				Specially Promoted Research	Scientific Research (S)	Scientific Research (A)	Scientific Research (B)	Scientific Research (C)	Challenging Research																					
	Research area same as the one in Column A		Research area same as the one in Column A			Research area different from the one in Column A			Research area same as the one in Column A		Research area different from the one in Column A																												
	Planned research	Continued research	New Research Area			Continued			New Research Area		Continued																												
			Administrative group	Planned research	Planned research ¹⁾	Planned research ¹⁾	Planned research ¹⁾	Planned research ¹⁾	Administrative group	Planned research	Planned research ¹⁾	Planned research ¹⁾																											
	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal						New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	New Proposal	Pioneering	Exploratory														
Scientific Research on Innovative Areas (Research in a proposed research area)	Planned research	Continued research	Co-I	-	×	/	/	/	/	/	/	/	/	×	□																								
Transformative Research Area (A)	Planned research	Continued research	Co-I	/	×	/	/	/	/	/	/	/	/	/	×	□																							
Transformative Research Area (B)	Planned research	Continued research	Co-I	/	×	/	/	/	/	/	/	/	/	/	×	□																							

Blank cell: The researcher can apply for both research projects.
 - A researcher can only apply for one research project (except for the research project of "Administrative Group") in one and the same research area regardless of Principal Investigators or Co-Investigators.
 (In case he or she has a continued research project mentioned in Column A, he or she cannot apply for a research project mentioned in Column B).
 × The researcher can only apply for one research project (in case he or she applied for a research project mentioned in Column A, he or she cannot apply for a research project mentioned in Column B).
 ▲ The researcher cannot apply for a research project mentioned in Column B (he or she only implements the research of a continued research project mentioned in Column A).
 □ The researcher can apply for both research projects. However, in case both are adopted, he or she only implements the research of the research project in Column B.
 Shaded cell: There are not cases that the researcher apply for both research projects mentioned in Column A and Column B.

¹⁾ In regards to the "continued research area" under "Research area same as the one in Column A" and the "research area different from the one in Column A", the Administrative Group has the same restrictions on duplication as for "Planned research."

5) Type "Research categories for which JSPS organizes a call for proposals (Column A) → Principal Investigator (Column B)"

This table shows the restrictions on parallel grant application/receipt in case of "a person who as Principal Investigator tries to apply for or as Co-Investigator participate in a research project mentioned in Column A (research categories for which JSPS organizes a call for proposals), or a person who has already become Principal Investigator or Co-Investigator of a research project that is scheduled to be continued in FY2022 (continued research project) mentioned in Column A" applies as Principal Investigator for mentioned in Column B. There is no restriction on parallel grant application/receipt between a research category, which JSPS organizes a call for proposals and which this table does not describe, and a research project mentioned in Column B.

Column A \ Column B		Scientific Research on Innovative Areas (Research in a proposed research area)		Transformative Research Areas (A)			Transformative Research Areas (B)	
		Publicly offered research		Administrative group	Planned Research	Publicly offered research	Administrative group	Planned Research
		New Proposal		New Proposal	New Proposal	New Proposal	New Proposal	New Proposal
		PI		PI	PI	PI	PI	PI
Specially Promoted Research	New Proposal	PI	■	×	■	■	×	■
	Continued	PI	▲	▲	▲	▲	▲	▲
	New Proposal	Co-I		×				
	Continued	Co-I		▲				
Scientific Research (S)	New Proposal	PI		□				
	Continued	PI		▲				
Scientific Research (B)	Generative Research Fields	Continued	PI		□	□	□	□
Scientific Research (C)	Generative Research Fields	Continued	PI		□	□	□	□
Challenging Research (Pioneering)	New Proposal	PI	×	×	×	×		
	Continued	PI	▲	▲	▲	▲		
JSPS Fellows (JSPS Research Fellows)	Continued	PI		▲	▲	▲	▲	▲
Home-Returning Researcher Development Research	Continued	PI	□	□	□	□	□	□

6) Type "Research categories for which JSPS organizes a call for proposals (Column A) → Co-Investigator (Column B)"

This table shows the restrictions on parallel grant application/receipt in case of "a person who as Principal Investigator tries to apply for in a research project mentioned in Column A (research categories for which JSPS organizes a call for proposals), or a person who has already become Principal Investigator of a research project that is scheduled to be continued in FY2022 (continued research project) mentioned in Column A" participates in a research project mentioned in Column B as Co-Investigator. There is no restriction on parallel grant application/receipt between a research category, which JSPS organizes a call for proposals and which this table does not describe, and a research project mentioned in Column B.

Column A \ Column B		Scientific Research on Innovative Areas (Research in a proposed research area)		Transformative Research Areas (A)	Transformative Research Areas (B)
		Planned Research*1		Planned Research*1	Planned Research*1
		New Proposal		New Proposal	New Proposal
		Co-I		Co-I	Co-I
Specially Promoted Research	New Proposal	PI	■	■	■
	Continued	PI	▲	▲	▲

Blank cell: The researcher can apply for both research projects.
 ×: The researcher can only apply for one research project (in case he or she applied for a research project mentioned in Column A, he or she cannot apply for a research project mentioned in Column B).
 ▲: The researcher cannot apply for a research project mentioned in Column B (He or she only implements the research of a continued research project mentioned in Column A).
 ■: The researcher can apply for both research projects. However, in case both are adopted, he or she only implements the research of the research project in Column A.
 □: The researcher can apply for both research projects. However, in case both are adopted, he or she only implements the research of the research project in Column B.

*1 The Administrative Group has the same restrictions on duplication as for "Planned research."

3. Preparation of the KAKENHI Application Form (Research Proposal Document), etc.

Grants-in-Aid for Scientific Research is a competitive research funds intended to provide financial support for creative and pioneering research conducted by individual researchers. Therefore, the contents of the Research Proposal Document must be original planned by the applicant.

In preparing Research Proposal Document, plagiarism and/or misappropriation of the research contents of others are strictly impermissible. Applicants must comply with research ethics.

In addition, applicants should note that the entire Research Proposal Document, including the title of the research project will be reviewed, and will be publicized widely in the Grants-in-Aid for Scientific Research (KAKENHI) Database (KAKEN) if the research proposal is adopted. Therefore, make sure to select a title that effectively reflects the content of the research project.

(1) Revision of the Research Proposal Document

The forms to be uploaded as an attached file in the Research Proposal Document has been amended. Please read the Supplement to the Application Procedures “Forms/Procedures for Preparing and Entering a Research Proposal Document” carefully.

(2) Verification of the Eligibility to Apply

When applying for “Transformative Research Areas (A)(Publicly Offered Research)”, the applicant should carefully verify the following contents.

For submission of a research proposal, the applicant has to complete the relevant Research Proposal Document.

The applicant has to complete the Research Proposal Document (PDF file) by entering the “Items to be entered in the Website” and by uploading the “Forms to be uploaded as an attached file” to the Electronic Application System. Then he/she should submit the Research Proposal Document to the administrative section of his/her research institution, by the deadline set by the institution.

The details of preparation and application methods of application documents are as follows.

Preparing the Research Proposal Document

When applying, applicants need to access the Electronic Application System using the ID and password for e-Rad and prepare the application documents.

1) Preparation of the Research Proposal Document by Principal Investigator

The Principal Investigator should prepare the Research Proposal Document based on "Procedures for Preparing and Entering Application Information (to be entered on the Website)" and "Procedures for Preparing and Entering a Research Proposal Document" for the specific research category he or she is applying for.

A Research Proposal Document consists of the following two parts:

Items to be entered in the Website :

Items to be directly entered by the applicant on the website of the KAKENHI Electronic Application System

Forms to be uploaded :

A part containing such entries as “Research Plan, Research Methods” to be prepared by downloading the form from the “Grants-in-Aid for Scientific Research-KAKENHI-” page within the MEXT website (*), and by uploading the filled form to the KAKENHI Electronic Application System so as to compile a PDF file of the research proposal document. **(Paper-based applications will not be accepted.)**

(*) URL: http://www.mext.go.jp/a_menu/shinkou/hojyo/boshu/1351544.htm

Research category	Research Proposal Document		
	Items to be entered in the Website (First part)	Forms to be uploaded (File ID)	Items to be entered in the Website (Second part)
Transformative Research Areas (A)(Publicly Offered Research)	To be entered in the electronic application system (Title of research project, Fundamental data on the research project such as total budget, etc.)	S-74	To be entered in the electronic application system (Research expenses, status of application and acquisition of research grants, etc.)

* Forms can be downloaded from the “Grants-in-Aid for Scientific Research-KAKENHI-” page within the MEXT website (URL: http://www.mext.go.jp/a_menu/shinkou/hojyo/boshu/1351544.htm) even before the obtaining of the e-Rad ID and password.

2) Submission of the Research Proposal Document

The research institution to which the Principal Investigator belongs collects and submits the Research Proposal Documents.

Therefore, the Principal Investigators should submit (send) their application documents to the research institution to which they belong by the deadline designated by the research institution in question. Moreover, when submitting (sending) the documents, the applicant should sufficiently verify the contents of the prepared Research Proposal Document (PDF file), and subsequently, perform the "check completed and submission" process. (This means that they should submit the Research Proposal Document (PDF file) to the research institution to which they belong.)

(3) Important Checkpoints of the Research Proposal Document

In preparing a Research Proposal Document, the applicant should pay attention to the following points among others, so as to avoid “outright rejection by incompleteness of the research proposal document”.

1. Qualification as a KAKENHI project

The following kinds of research plans fall outside the scope of funding target:

- A) A research plan which merely aims at purchasing ready-made research equipment.
- B) A research plan whose purpose is to build a large-size research facility or equipment which is more appropriate to be funded by other resources.
- C) A research plan whose purpose lies at developing and selling goods and/or services (including market research associated with such as them).
- D) An entrusted research conducted as regular business.
- E) A research plan with a yearly budget less than 100,000 yen.

2. Eligibility of the Project Members

The PI (see page 65 1)) may organize a research team with appropriate combination of Research Collaborators(s) (see page 66 3)), as needed by the nature of the research project. (In the case of Publicly Offered Research, the Principal Investigator cannot set up a team of project members together with a Co-Investigator.)

To be a Research Collaborators, registration to the e-Rad system is not a requirement.

< Requirements >

- 1) **The applicant must be an individual belonging to a research institution with a job assignment including research activity within the said institution.** (Whether the job is paid/unpaid, or full-time/part-time is irrelevant. It is not a prerequisite of eligibility that the research activity constitutes the main part of his/her job.)
- 2) **The applicant must be actually engaged in a research activity in his/her research institution.** (Those who are only engaged in research assisting jobs are ineligible.)
- 3) **The applicant must not be a graduate student or any other categories of student.** (An individual who has a position in a research institution with a research activity as his/her main job (e.g., a university teaching staff, a researcher belonging to a company, etc.), and holds a student status at the same time is ineligible.)

(*): Here, the research institution must be such that designated according to the Article 2 of the “Rules for the Handling of Grants-in-Aid for Scientific Research” (issued by the MEXT)

(Reference) Requirements that the research institution must meet (see page 74):

< Requirements >

- The research institution must authorize the research project for which KAKENHI is granted, as its proper activity.

- The research institution must take responsibility for management and accounting of the KAKENHI delivered to its researcher staffs.

(Note 1) If a JSPS Research Fellow (SPD, PD, RPD, or CPD) meets the application requirements set forth above at the research institution which he/she registers as host research institution, he/she can also apply for the following research categories other than the “Grant-in-Aid for JSPS Fellows,” but only from the registered host research institution. Unlike applying for KAKENHI as PI, he/she may apply for any of these research categories so long as he/she takes part in a KAKENHI proposal as Co-I.

- (i) Publicly Offered Research of Transformative Research Areas (A)(Publicly Offered Research) or Scientific Research on Innovative Areas (Research in a Proposed Research Area)(Publicly Offered Research)
- (ii) Scientific Research (B/C)
- (iii) Challenging Research (Exploratory)
- (iv) Early-Career Scientists
- (v) Fund for the Promotion of Joint International Research (Fostering Joint International Research (A)) (Excluding CPD)

(Note 2) JSPS Research Fellows (DC), Foreign JSPS Fellows and graduate students (or students of any other category) cannot be a PI of a KAKENHI project.

<Important Point 1>

KAKENHI employee is generally bound by his/her employment contract to concentrate on the research work relevant to the employment-related work specified in it. Therefore, such a KAKENHI employee cannot apply for his/her own KAKENHI project which is to be conducted within the working hours of his/her employment.

However, provided that a KAKENHI employee can clearly demarcate his/her own research hours from the working hours of employment and intends to conduct his/her own research project during the working hours on his/her own initiative, he/she can submit his/her own KAKENHI proposal, on the condition that the following points are verified by his/her research institution. In this case, he/she can apply for other KAKENHI project(s) as PI.

- The KAKENHI employee is granted on his/her employment contract, to conduct research on his/her own initiative, besides the employment-related work.
- The employment-related work and the work devoted to the research on the KAKENHI employee’s own initiative are clearly demarcated in regard to the working hours and the effort.
- The KAKENHI employee is able to secure enough research hours (besides the working hours for his/her employment-related work) to be allotted to his/her own KAKENHI project.

[Self-motivated research activities by an “early-career scientist” employed with KAKENHI]

A young researcher (*) who is employed with KAKENHI funds (KAKENHI employee) and meets the following conditions, may conduct his/her own research during the working hours assigned for the employment-related work, after going through the necessary procedures set by his/her research

institution. He/she can apply for KAKENHI as a PI.

- (1) The young researcher desires on his/her own will to conduct his/her own research.
- (2) The PI or Co-I (the employer of the young researcher) decides that the said research has a positive contribution to the promotion of the funded research project for which he/she is employed, and the research institution approves the decision.
- (3) The PI or Co-I judges that the efforts to be spared by the young researcher to the said research is within the extent that do not cause any hindrance to the execution of the funded research project for which he/she is employed, and the research institution approves the judgement. (The upper limit of the efforts to be spared to the self-motivated research is 20 percent of the efforts to be put into the funded research project for which he/she is employed.)

* In this context, “young researcher” is defined as an individual who is age 39 or under or less than 8 years after Ph.D. acquisition as of April 1 of each fiscal year, and whose job assignment includes research activities. When applying for Grants-in-Aid for Scientific Research (KAKENHI) he/she must meet the eligibility requirements for KAKENHI application.

Provided that the KAKENHI employer approves such self-motivated research activities in accordance with its funding resources (project) rules, if a researcher had originally met the eligibility requirements for KAKENHI's self-motivated research activities at the time of his/her application or participation, he/she may apply for KAKENHI and continue to engage in the adopted research project even if, during the project period, he/she is no longer age 39 or under or less than 8 years after Ph.D. acquisition. If there are changes to the funding resources (project) of the KAKENHI employer, the researcher must abide by the new funding resources (project) rules and reobtain the approval to conduct self-motivated research activities as a young researcher at the time the of the changing of funding resources.

(Reference) Views on the introduction of self-motivated research activities by KAKENHI employee

Attachment to the “Proposals of the Grants-in-Aid for Scientific Research (KAKENHI) in Fiscal Year 2020” (March 19, 2020) (Excerpt)

https://www.jsps.go.jp/j-grantsinaid/06_jsps_info/g_200316/index.html

Grants-in-Aid for Scientific Research (hereinafter referred to as “KAKENHI”) is a funding scheme that is intended to promote development of scientific research (based on original ideas of researchers), encompassing basic to applied researches in all fields ranging from humanities and social sciences to natural sciences. Scientific research is a source of innovation *i.e.*, value creation based on new knowledge and has a vital role in nurturing human resources for leading a knowledge-based society broadly. It is particularly important to foster young scientists who are responsible for the next generation in order that the scientific research may sustainably exercise its role in the society.

It enable young researchers employed with a KAKENHI grant to conduct self-motivated research activities (including research activities with other research funds and activities helping research/management capacity building; hereinafter the same). Allowing them to conduct research activities in an independent and free research environment contributes not only to fostering young researchers, but also to the further development of the KAKENHI projects of their research institutions through research based on their freewheeling thinking and to the development of scientific research the entire country. Therefore, the concept of self-motivated research activities by young researchers is introduced in the KAKENHI scheme in this call for proposals.

For details, refer to the following:

“Implementation Guidelines for Self-motivated Research Activities by Young Researchers Employed with Competitive Research Funds” (February 12, 2020, Agreement of the Liaison Meeting of Related Offices and Ministries on Competitive Research Funds)

https://www.mext.go.jp/a_menu/shinkou/torikumi/1385716_00001.htm

<Important Point 2>

The PIs and the Co-Is constitute the “members of funded projects,” as stipulated in the Law on the Improvement of the Administration of the Budget for Grants-in-Aid (1955, Law no. 179). In an event that they have committed improper grant spending, fraudulent grant acquisition or research misconduct, the eligibility for KAKENHI application will be suspended for a period of time specified by the rule.

In the following cases, an individual registered in the e-Rad system as “eligible for KAKENHI application” may be subject to different treatment.

- In case the research institution to which the individual belongs has made a judgement that it is not appropriate to let him/her conduct the said research activity as a part of his/her work within the institution, it may withhold the submission of his/her KAKENHI proposal, or may withhold the formal application for grant delivery of a provisionally adopted KAKENHI grant resulting in declination of the grant in question.
- In case a KAKENHI recipient has failed to submit the “Report on the Research Achievements” that is due after the completion of the research period of his/her KAKENHI without any justifiable reason, no new KAKENHI grant(s) will be delivered to him/her, even if the grant(s) have been provisionally adopted. Moreover, if a KAKENHI recipient has failed to submit the “Report on the Research Achievements” by the due date, then the delivery of KAKENHI grant(s) for that fiscal year will be suspended.

1) Principal Investigator (PI) (Applicant)

- (A) Principal Investigator is the main recipient of the grant who bears full responsibility for the implementation of the research project (including compiling the research achievements). An individual who is anticipated to become unable to carry through the PI’s responsibility over the entire research period due to, for example, loss of the KAKENHI eligibility caused by PI’s own accord, should refrain from becoming a PI. (See note below)

(Note)

The Principal Investigator is the researcher who plays the central role in the implementation of the research plan and thus bears a heavy responsibility. An individual who is anticipated to lose his/her eligibility for KAKENHI application during the research period due to his/her own accord so that is anticipated to be unable to carry through the responsibility, should refrain from becoming a Principal Investigator. Substitutions of the PI of an on-going KAKENHI project are not permitted.

As an exception, for the “Planned Research” of “Transformative Research Areas” replacements of PI may be accepted by going through appropriate procedures.

- (B) When organizing project members, the Principal Investigator must obtain a consent to become a Co-Investigator from the researcher via Electronic Application System in advance.**

- (C) The PI must be registered in the e-Rad system as “Eligible for KAKENHI Application”. It is also required that he/she is *not* designated as “ineligible for grant receipt” in the fiscal year covered by

a call for proposals (suspension of eligibility), as a penalty for such misconducts as improper grant spending, fraudulent grant acquisition or research misconduct associated with KAKENHI or any other competitive funds.

2) Co-Investigator (Co-I)(*In the case of Publicly Offered Research, the Principal Investigator cannot set up a team of project members together with a Co-Investigator.)

(A) The Co-Investigator is a recipient of the grant who, in cooperation with the PI, bears responsibility for the implementation of the research project in accordance with the clear share of his/her roles. The Co-I must be a member of the project who receives a share of the grant based on the contents of the share as a recipient of the grant. (This rule applies even when the Co-I belongs to the same institution as the PI.)

An individual who is anticipated to become unable to carry through the Co-I's responsibility over the entire research period due to, for example, the loss of the KAKENHI eligibility caused by Co-I's own accord, should refrain from becoming a Co-I.

(B) The Co-I must be registered in the e-Rad system as being "Eligible for KAKENHI Application." It is also required that he/she is *not* designated as being "ineligible for grant receipt" in the fiscal year covered by a call for proposals (a suspension of eligibility), as a penalty for such misconducts as an improper grant spending, a fraudulent grant acquisition or a research misconduct associated with the KAKENHI or any other competitive funds.

3) Research Collaborator

(A) Research Collaborator is an individual who cooperates in the implementation of a research project other than the PI and the Co-I(s).

(B) Registration as "Eligible for KAKENHI Application" in the e-Rad system is *not* a requirement for becoming a Research Collaborator.

For example, following people can also participate in the research project as a Research Collaborator: a postdoctoral researcher, a graduate student, a research assistant (RA), a JSPS Research Fellow (DC), JSPS Fellows (SPD, PD, RPD or CPD) who are not registered as eligible for KAKENHI application in their host research institution, a researcher belonging to an overseas research institution, a researcher belonging to a corporation not designated as a research institution according to Article 2 of the Rules for the Handling of Grants-in-Aid for Scientific Research, and an individual offering research support such as technician and intellectual property specialist.

3. Requirements for the Appropriation of Research Expenditure

1) Expenditures that can be covered by direct expense

Expenditures necessary for the implementation of the research plan (including those necessary for compiling the research achievements) can be covered by the direct expense.

* If any of the expenditure categories (equipment costs, travel expenses, or personnel cost/honoraria) exceeds 90%

of the total yearly expenditure in any fiscal year of the research period, or if the expenditure in category Consumables or Miscellaneous constitutes a significant portion of the total expenditure, the necessity of that spending should be clarified in Research Proposal Document.

[Direct Expense of Competitive Research Funds to Cover the Costs of Assignments Other Than Research]

The cost of “buyout” (*i.e.*, the cost for hiring someone taking over a part of the duties other than research (*) of the Principal Investigator or Co-Investigator(s)) can be covered by the direct expense so that they can secure ample amount of time for research projects (the buyout system).

* The kinds of duties that can be covered by the buyout system are those authorized as proper jobs of the researcher at his/her research institution, excluding (i) research activities, and (ii) administrative work for institutional management. They include educational and related activities, e.g., educational activities (teaching and preparation for teaching, supervising students) and social engagement activities (medical practices, outreach activities). Activities associated with business profit are excluded.

Starting from the FY2021 Call for Proposals, the buyout system is applicable in the research categories listed below. A KAKENHI applicant who wish to use the buyout system should do so according to the buyout scheme agreed upon between him/her and his/her research institution.

When an applicant wishes to use the buyout system, enter the cost of the buyout in the “Miscellaneous expense” column, and enter the word “buyout” in the “Item” column of the Research Proposal Document form. (Please refer to the supplementary volume of “Application Procedures for Grants-in-Aid for Scientific Research-KAKENHI-” (Forms/Procedures for Preparing and Entering a Research Proposal Document).

[Research categories subject to the buyout system]

Specially Promoted Research, Transformative Research Areas, Scientific Research on Innovative Areas (Research in a Proposed Research Area) (excluding “Platforms for Advanced Technologies and Research Resources”), Scientific Research, Challenging Research (including “Challenging Exploratory Research”), Early-Career Scientists (including “Young Scientists (A/B)”), Research Activity Start-up, Fostering Joint International Research (B), Home-Returning Researcher Development Research (limited to those who belongs to the domestic research institutions), Special Purposes.

[Research categories *not* subject to the buyout system]

Encouragement of Scientists, Publication of Scientific Research Results, JSPS Fellows, Scientific Research on Innovative Areas (Research in a Proposed Research Area) (Platforms for Advanced Technologies and Research Resources), Fostering Joint International Research (A) (including the Joint International Research before name change). As for the research category of Fostering Joint International Research (A) (including the Joint International Research before name change) it is possible to budget the cost for hiring replacements.

As for the details of the expenses covered by the buyout system and matters to be done by the research institution refer to the following.

"Amendment Enabling Direct Expense of Competitive Research Funds to Cover the Costs of Duties Other Than Research (Introduction of Buyout System)" (October 9, 2020, Agreement among Research

Promotion Bureau, Science and Technology Policy Bureau, Research and Development Bureau and Higher Education Bureau)

https://www.mext.go.jp/a_menu/shinkou/torikumi/1385716_00003.htm

The objective of the buyout system is to increase the number of hours the PI (or Co-I) can devote to the funded project on the basis of his/her own needs and request. Accordingly, items such as the actual presence of the PI's (or Co-I's) needs and request, and the resulting expansion of research time devoted to the funded project (increased number of hours for research) may be subject to later inspection in relation to the grant spending. In the event that the buyout expenditure is found to be used improperly (e.g., the increase in hours devoted to the funded project is not verified), an order to return the delivered grant may be issued. Therefore, the research institution should ensure the appropriate implementation of the buyout system.

2) Expenditures that cannot be covered by KAKENHI

The following kinds of spending cannot be covered by KAKENHI:

A. Costs associated with buildings and other facilities (excluding expenditure for installations necessary for installation of research equipment purchased by the KAKENHI direct expense).

B. Expenditures for measures to deal with accidents or disasters that occurred during the implementation of funded project

C. Personnel cost/Honoraria for the PI or Co-I(s)

D. Other expenditures that are apt to be covered by indirect expense*

- Indirect expense which amounts to 30% of the direct expense, is intended for use by the research institution in covering expenditures needed by the research institution for the management and other things associated with the implementation of the research project. Indirect expense will be placed for all the research categories of this call for proposals. Applicant does not need to state the indirect expense in his/her Research Proposal Document.

4. Other Important Points

1) The compiled books of the submitted KAKENHI Research Proposal Document to **be sent to the reviewers are in black-and-white (gray scale) print**. Therefore, in preparing the Research Proposal Document, the applicant should pay attention to the clarity of the figure when printed in gray scale.

2) The personal information included in the Research Proposal Document will be used for the elimination of “unreasonable duplication and/or excessive concentration in the allocation of competitive funds” and for the appropriate funding of KAKENHI grants. (This includes providing the data to external contractor(s) in charge of electronic processing and management of the KAKENHI data.) The information included in the Research Proposal Document is to be provided to the e-Rad system. (The information registered in the e-Rad system is utilized for proper assessment of research and development by national funding, development of effective and efficient comprehensive strategy, planning and development of resource allocation policy, etc. Therefore the information will be supplied to the Cabinet Office through the e-Rad system. The applicant may be requested to cooperate in verification of the information

and other related works.)

The information on the adopted KAKENHI projects (the title of research project, the name of PI and his/her affiliated research institution, the grant to be delivered, research period, etc.) is categorized as “information that is scheduled to be made public,” as laid down in Article 5, paragraph (1), item (i), (a) of the “Act on Access to Information Held by Administrative Organs” (Act No. 42 of 1999) and Article 5, paragraph (1), item (i), (a) of the “Act on Access to Information Held by Independent Administrative Agencies” (Act No. 140 of 2001). The information will be made public through press release materials, the Grants-in-Aid for Scientific Research Database (KAKEN) of the National Institute of Informatics, and other means.

The researchers and their affiliated research institutions are requested to carry out the application procedures with full understanding of the information handling (utilization, provision and disclosure) stated above.

3) Upon application to the "Grant-in-Aid for Transformative Research Areas," applicants may make inquiries to the Senior Scientific Research Specialists (See note) of the MEXT about the system. Please contact the Scientific Research Promotion Division, Research Promotion Bureau, MEXT (see page 159).

(Note) Researchers in universities or other research institutions who make investigation, instruction, and advice on academic matters (Article 53 and 62 of “Ministry of Education, Culture, Sports, Science and Technology organization rules”).

- **"List of Senior Scientific Research Specialist (in charge of Grants-in-Aid for Scientific Research)"**

URL: https://www.mext.go.jp/a_menu/shinkou/hojyo/1284449.htm

4. Completion of Research Ethics Education Coursework, etc.

Principal Investigators and Co-Investigators taking part in a research funded by the KAKENHI, are requested to have completed properly the following procedures including research ethics, by the time they submit the formal application for grant delivery of a newly adopted research project in the FY2022 Grants-in-Aid for Scientific Research, and upon the formal application for a grant delivery, it shall be confirmed through the Electronic Application System whether they will have taken the research ethics education coursework, etc.

If a PI or Co-I completed the research ethics related procedures in the past, or has moved from the research institute at which he/she completed the procedure, he/she should check with the administrative section of his/her current institution for the validity of the procedure he/she conducted in the past.

[Actions to be taken by the Principal Investigator]

- The PI must either read through and learn the teaching materials by him/herself concerning the research ethics education coursework such as “For the Sound Development of Science - The Attitude of a Conscientious Scientist” published by the JSPS Editorial Committee of “For the Sound Development of Science,” the “e-Learning Course on Research Ethics [eL CoRE]” or “APRIN e-learning program (eAPRIN),” etc., or attend a lecture on research ethics conducted by research institutes based on “Guidelines for Responding to Misconduct in Research” (Adopted by the MEXT on August 26, 2014), by the time of the formal application for grant delivery.
- The PI must understand thoroughly and exercise the proper research practices in conducting his/her research, from amongst the contents of both the Statement “Code of Conduct for Scientists -Revised Version-” by the Science Council of Japan and the booklet “For the Sound Development of Science -The Attitude of a Conscientious Scientist-” issued by the JSPS, by the time of the formal application for grant delivery.
- From each Co-Investigator-to-be, the PI must
 - (i) obtain a consent of participation in the research project as a Co-I through the Electronic Application System and also a consent expressing “the completion of a seminar attendance or other kinds of coursework relevant to research ethics by the time of the formal application for the grant delivery of the research project in question,” by the time of submitting (sending) the Research Proposal Document to the research institution which the PI belongs to, and;
 - (ii) ascertain that the Co-I has actually completed the coursework such as an attendance at the lecture on research ethics by the time of the formal application for the grant delivery.

[Actions to be taken by the Co-Investigator-to-be]

- The Co-I must provide the PI with both a consent of the participation in the research project as a Co-I via the Electronic Application System and a consent expressing “the completion of a seminar attendance or other kinds of coursework relevant to research ethics by the time of the formal application for the grant delivery of the research project in question”.
- The Co-I must either read through and learn the teaching materials by oneself concerning the research ethics education coursework such as “For the Sound Development of Science - The Attitude of a Conscientious Scientist” published by the JSPS Editorial Committee of “For the

Sound Development of Science,” the “e-Learning Course on Research Ethics [eL CoRE]” or “APRIN e-learning program (eAPRIN),” etc., or attend a lecture on research ethics conducted by research institutes based on “Guidelines for Responding to Misconduct in Research” (Adopted by the MEXT on August 26, 2014), and report the PI to the effect that he/she has done, by the time of the formal application for the grant delivery by the PI.

- The Co-I must understand thoroughly and exercise the proper research practices in conducting their research, from amongst the contents of both the Statement “Code of Conduct for Scientists - Revised Version-” by the Science Council of Japan and the booklet “For the Sound Development of Science - The Attitude of a Conscientious Scientist-” issued by the JSPS, and report the PI to the effect that he/she has done, by the time of the formal application for the grant delivery by the PI.

5. Registration of the Researcher Information in “researchmap”

The “researchmap (<https://researchmap.jp/>)” is the Japan’s largest researcher information database as a general guide to Japanese researchers. The information on the research achievements registered in the researchmap is ready to be openly available over the Internet and the database itself is linked to the e-Rad, many university faculty databases and so on. The Japanese Government as a whole is going to further utilize the researchmap.

Furthermore, since the posted information in the researchmap and/or the Grants-in-Aid for Scientific Research Database (KAKEN) is to be handled as a reference according to the necessity in the review of the KAKENHI applications, the registration of the researcher information into the researchmap is encouraged. In addition, when doing so, make sure to register the “Researcher Number” because the posted information is to be searched with the “Researcher Number” when referring to the posted information in the researchmap in the course of the review.

< Inquiries >

Service Support Center (in charge of the “researchmap”)

Department for Information Infrastructure

Japan Science and Technology Agency

Web inquiry form: <https://researchmap.jp/public/inquiry/>

6. Cooperation to Review

The Grants-in-Aid for Scientific Research-KAKENHI- adopts a peer review process in which the researchers selected from their own community engaged themselves in the assessment and reviewing of each research proposals on the basis of its scientific merit. The KAKENHI review is conducted thanks to the cooperation of more than 7,000 researchers as reviewers. The peer review forms the basis of the autonomy of academic community and plays an important role in ensuring quality of scientific research and its improvement. The review of applications is carried out with the constructive and mutually critical spirit of scientists and based on the purely academic value. It is no exaggeration to say that the KAKENHI review system is indispensable in supporting Japan's scientific research into the future among other research funds.

The Grants-in-Aid for Scientific Research (KAKENHI) program is supported by researchers who have responsibilities not only to conduct the funded research projects as applicants and grant recipients but also as a reviewers. It is important for researchers to find out excellent research proposals as reviewers in order to support the scientific research as is the case of putting out excellent research results with KAKENHI funds. It is expected that the above-stated understanding is share in the academic community. Furthermore, participating to the review process has an aspect of fostering researchers through enhancing their capability to conduct the objective and academic assessments based on the various views of fellow reviewers leading up to broaden their horizons. In order to support the peer-review system of KAKENHI by the whole body of researchers by appropriately sharing the burden of proposal review without putting an extra load on some researchers. The researchers' positive participation in the review process is well appreciated when they are requested to become the KAKENHI reviewer by JSPS or MEXT in the future.

JSPS has registered the Principal Investigators' information including their names and affiliated research institutions in the Database of Review Committee Candidate (136,000 entries as of FY2020) and has utilized it so as to select the fair and excellent reviewers. The request to update the registered information is made through the researchers' research institutions every April (planned), researchers' cooperation for updating is also well appreciated.

IV. Instructions for Grant Recipients

Handling of a research project that is to be continued in FY2022(hereafter referred to as “continued research project”)

1. Handling of Continued Research Projects Whose PI Fails to Submit the Report on the Research Achievements of his/her Other KAKENHI Project

As is the case for new proposal submissions, no KAKENHI will be delivered to a researcher who fails to submit the Report on the Research Achievements at the end of the research period, without any justifiable reason. In such cases, a cancellation of the official grant decision and an order for refund of the grant may be issued. In addition, the information such as the name of the research institution of the said researcher may be made public.

Furthermore, if a researcher fails to submit the scheduled Report on the Research Achievements without any justifiable reason, then he/she may be ordered to suspend the spending of his/her other KAKENHI grant(s) for the same fiscal year.

2. Completion of Research Ethics Education Coursework, etc.

The PI should check with the administrative section of his/her institution about the rules concerning the research ethics education coursework, etc. For a continued research project upon the formal application for a grant delivery or request for payment in every fiscal year, it shall be confirmed through the electronic application system whether the PI and Co-I(s) have taken the research ethics education coursework, etc.

In case that the PI intends to add a new Co-I to the continued project in FY2022, the PI has to obtain a consent to become a Co-I from the Co-I-to-be via the electronic application system in advance. In this case, the Co-I-to-be has to complete the followings prior to the formal application for grant delivery and report to the PI what he/she has done. (Or, in case the grant has been already delivered, he/she has to do the followings by the time the “application for approval of change of the Co-Investigator” is submitted by the PI to JSPS.)

- Either to read through and learn the teaching materials by oneself concerning the research ethics education coursework such as “For the Sound Development of Science - The Attitude of a Conscientious Scientist” published by the JSPS Editorial Committee of “For the Sound Development of Science, the “e-Learning Course on Research Ethics [eL CoRE]” or “APRIN e-learning program (eAPRIN),” etc., or to attend a lecture on research ethics conducted by research institutions based on “Guidelines for Responding to Misconduct in Research” (adopted by MEXT on August 26, 2014) .
- To understand thoroughly and to exercise the proper research practices in conducting their research, from amongst the contents of both the statement “Code of Conduct for Scientists - Revised Version-” by the Science Council of Japan and the booklet “For the Sound Development of Science -The Attitude of a Conscientious Scientist -” issued by JSPS.

V. Instructions for Administrative Staff of Research Institution

1. Sharing the Purpose and Aim of the KAKENHI System

The KAKENHI provides a financial support for the creative and pioneering researches based on the original ideas of researchers.

Review of the submitted research proposals is conducted by the peer review process, in which researchers selected from their own community engage themselves in the assessment and reviewing of each research proposals on the basis of its scientific merit. The KAKENHI review process is based on the cooperation of more than 8,000 reviewers.

While the KAKENHI review process has been continually improved by, for instance, the introduction of new review methods from the FY2018 grant, the growing needs of KAKENHI have resulted in the number of new applications exceeding one hundred thousand in recent years. The workload on the researchers who are cooperating as reviewers is getting heavier along with the increase in the applicant number. Pressing concern is that if the burden on the reviewers keeps increasing to be excessive, it may seriously affect the reviewers' own research and educational activities, and may also result in deterioration of the quality of the review process. One of the possible factors for the recent increase in the application number may be attributed to the fact that some of research institutions seem to set the KAKENHI application as one of their organizational activity indicators. Application for the KAKENHI grant per se should be made on the basis of the initiative of the researchers. Therefore, such action on the part of research institutions as to set quota to the constituent researchers is undesirable.

All research institutions are requested to share and disseminate within themselves the primary purpose and aim of the KAKENHI system afresh.

2. Issues to Be Completed Beforehand by the “Research Institution”

(1) Requirements as a “Research Institution” and Procedures for Designation and Change

In order to apply for the KAKENHI, a researcher needs to belong to a “Research Institution.” Concerning the “Research Institution” cited here, the following four types of “Research Institution” have been designated as eligible in Article 2 of the Rules for the Handling of Grants-in-Aid for Scientific Research announced by the Ministry of Education, Culture, Sports, Science, and Technology (MEXT).

- 1) Universities and inter-university research institutions
- 2) MEXT facilities and other institutions engaged in scientific research
- 3) Technical colleges
- 4) Institutions designated by the MEXT (see note as below)

Note:

In order to become a research institution, institutions not falling under 1) to 3) first need to receive the designation by MEXT. Therefore, institutions should consult with the Scientific Research Aid Division of the Research Promotion Bureau of MEXT.

Moreover, if changes in one of the following items have been scheduled, institutions that have received the designation by MEXT and already have been recognized as a research institution should promptly report the content of these changes to the Scientific Research Aid Division of the Research Promotion Bureau of MEXT.

- A) Abolition or dissolution of the research institution
- B) Name and address of the research institution, and name of the representative
- C) Matters concerning laws, regulations, endowment acts, and other rules that prescribe the purpose of establishment, the business content, and the internal organization of the research institution

Moreover, researchers who belong to such institutions should consider that, in order to conduct research activities using the KAKENHI, **the research institution should meet the requirements mentioned below.**

< Requirements >

- 1) The research institution must authorize the research project for which the KAKENHI is granted, as its proper activity.**
- 2) The research institution must take responsibility for management and accounting of the KAKENHI delivered to its researcher(s).**

(2) Ascertainment of the Eligibility to Apply of the Affiliated Researcher

Researchers who intend to apply for KAKENHI should meet the requirements (i) and (ii) below. Therefore, they should sufficiently verify these requirements with the research institution.

Researchers who intend to apply for KAKENHI should meet following application eligibility. (see page 44)

(i) At the time of the proposal submission, a researcher needs to have been approved by his/her research institution as an eligible researcher who meets the Requirements a) , b) and c) stated below, and have his/her Researcher Information properly registered in the e-Rad system as eligible for KAKENHI application.

< Requirements >

a) The applicant must be an individual belonging to a research institution with job assignment including research activity within the said institution. (Whether the job is paid/unpaid, or full-time/part-time is irrelevant. It is not a prerequisite of eligibility that the research activity constitutes the main part of his/her job.)

b) The applicant must be actually engaged in research activity in his/her research institution. (Those who are only engaged in research assisting jobs are ineligible.)

c) The applicant must not be a graduate student or any other categories of student. (However, an individual who has a position in a research institution with a research activity as his/her main job (e.g., university teaching staff, researcher belonging to a company, etc.) and holds a student status at the same time is eligible.)

(ii) The individual must not be categorized as ineligible for grant acquisition in the fiscal year subjected to call for proposals, as a penalty for his/her improper grant spending, fraudulent grant acquisition, or research misconduct.

<Important point 1>

KAKENHI employee whose personnel cost is covered with the KAKENHI fund is generally bound by their employment contract to concentrate on the research work relevant to the employment-related work specified in his/her employment contracts. Therefore, such a KAKENHI employee cannot apply for his/her own KAKENHI project which is to be conducted within the working hours of his/her employment.

However, provided that he/she can clearly demarcate his/her own research hours from the working hours of employment and intends to conduct his/her own research project during the working hours on his/her own initiative, the KAKENHI employee can submit his/her own KAKENHI proposal, on the condition that the following points are verified by his/her research institution. In this case, he/she can apply as PI, or participate to other KAKENHI project(s) as Co-I.

- The KAKENHI employee is granted on his/her employment contract, to conduct research on his/her own initiative, besides the employment-related work.
- The employment-related work and the work devoted to the research on the KAKENHI employee's own initiative are clearly demarcated in regard to the working hours and the effort.
- The KAKENHI employee is able to secure enough research hours (besides the working hours for his/her employment-related work) to be allotted to his/her own KAKENHI project.

[Self-motivated research activities by an "early-career scientist" employed with KAKENHI]

A young researcher (*) who is employed with KAKENHI funds (KAKENHI employee) and meets

the following conditions, may conduct his/her own research during the working hours assigned for the employment-related work, after going through the necessary procedures set by his/her research institution. He/she can apply for KAKENHI as a PI or become a Co-I.

- (1) The young researcher desires on his/her own will to conduct his/her own research.
- (2) The PI or Co-I (the employer of the young researcher) decides that the said research has a positive contribution to the promotion of the funded research project for which he/she is employed, and the research institution approves the decision.
- (3) The PI or Co-I judges that the efforts to be spared by the young researcher to the said research is within the extent that do not cause any hindrance to the execution of the funded research project for which he/she is employed, and the research institution approves the judgement. (The upper limit of the efforts to be spared to the self-motivated research is 20 percent of the efforts to be put into the funded research project for which he/she is employed.)

* In this context, “young researcher” is defined as an individual who is age 39 or under or less than 8 years after Ph.D. acquisition as of April 1 of each fiscal year, and whose job assignment includes research activities. When applying for Grants-in-Aid for Scientific Research (KAKENHI) he/she must meet the eligibility requirements for KAKENHI application.

Provided that the KAKENHI employer approves such self-motivated research activities in accordance with its funding resources (project) rules, if a researcher had originally met the eligibility requirements for KAKENHI's self-motivated research activities at the time of his/her application or participation, he/she may apply for KAKENHI and continue to engage in the adopted research project even if, during the project period, he/she is no longer age 39 or under or less than 8 years after Ph.D. acquisition. If there are changes to the funding resources (project) of the KAKENHI employer, the researcher must abide by the new funding resources (project) rules and reobtain the approval to conduct self-motivated research activities as a young researcher at the time the of the changing of funding resources.

(Reference) Views on the introduction of self-motivated research activities by KAKENHI employee

Attachment to the “Proposals of the Grants-in-Aid for Scientific Research (KAKENHI) in Fiscal Year 2020” (March 19, 2020) (Excerpt)

https://www.jsps.go.jp/j-grantsinaid/06_jsps_info/g_200316/index.html

Grants-in-Aid for Scientific Research (hereinafter referred to as “KAKENHI”) is a funding scheme that is intended to promote development of scientific research (based on original ideas of researchers), encompassing basic to applied researches in all fields ranging from humanities and social sciences to natural sciences. Scientific research is a source of innovation *i.e.*, value creation based on new knowledge and has a vital role in nurturing human resources for leading a knowledge-based society broadly. It is particularly important to foster young scientists who are responsible for the next generation in order that the scientific research may sustainably exercise its role in the society.

It enable young researchers employed with a KAKENHI grant to conduct self-motivated research activities (including research activities with other research funds and activities helping research/management capacity building; hereinafter the same). Allowing them to conduct research activities in an independent and free research environment contributes not only to fostering young researchers, but also to the further development of the KAKENHI projects of their research institutions through research based on their free-wheeling thinking and to the development of scientific research the entire country. Therefore, the concept of self-motivated research activities by young researchers is introduced in the KAKENHI scheme in this call for proposals.

For details, refer to the following:

“Implementation Guidelines for Self-motivated Research Activities by Young Researchers Employed with Competitive Research Funds” (Revised on December 18, 2020, Agreement of the Liaison Meeting of Related Offices and Ministries on Competitive Research Funds)

https://www.mext.go.jp/a_menu/shinkou/torikumi/1385716_00001.htm

<Important point 2>

If a JSPS Research Fellow (SPD, PD, RPD, or CPD) meets the application requirements set forth above at the research institution which he/she registers as host research institution, he/she can also apply for the following research categories other than the “Grant-in-Aid for JSPS Fellows,” but only from the registered host research institution. Unlike applying for KAKENHI as PI, he/she may apply for any of these research categories so long as he/she takes part in a KAKENHI proposal as Co-I.

- i) Publicly Offered Research of Transformative Research Areas (A) (Publicly Offered Research) and Scientific Research on Innovative Areas (Research in a Proposed Research Area) (Publicly Offered Research)
- ii) Scientific Research (B/C)
- iii) Challenging Research (Exploratory)
- iv) for Early-Career Scientists
- v) Fund for the Promotion of Joint International Research (Fostering Joint International Research (A)) (Excluding CPD)

Moreover, research institutions should bear in mind that JSPS Research Fellows (DC), Overseas JSPS Fellows, and students including graduate students cannot apply, even if they hold a position in which they conduct research activities in the research institution to which they belong or in another research institution.

(3)Confirmation of the Researcher Information Registered in the e-Rad System

In addition to the Principal Investigator who intends to apply, the Co-Investigator who makes up the Project Members should be limited to whom the researcher information has been registered in e-Rad as “Eligible to Apply for KAKENHI” when research institution submits (sends) the Research Proposal Document to MEXT.

Regarding the registration (update) of the researcher information necessary when applying, the administrative staff in the research institution to which the researcher belongs should perform the procedures using e-Rad. (If there is any item, such as the institution, the position, or others, that needs to be corrected, even though the applicant information has already been included in the researcher list of the research institution, he/she needs to register the correct information on the researcher list.)

For specifics on the method of registration, administrative staff of the research institution should verify the “Manual for Research Institutions to which the Researchers belong (for Research Institution Office Representatives and for Research Institution Office Workers).”

Moreover, concerning the registration of the researcher information in e-Rad, there is no registration period (deadline). Therefore, registration is possible at any time.

However, since Research Proposal Document will not be accepted after the deadline for submission of Research Proposal Document, applicants should complete the registration (update) of the researcher information early, in order to have sufficient time to submit them.

In order not to negatively affect the compilation of the applications within the research institution, when completing the applications, the research institution should perform the various procedures (including the procedures within the research institution), positioning this specific procedure as one of the important procedures to be performed by the research institution.

(4)Obtainment of an ID and a Password for the Researcher Belonging to the Research Institution

In order to apply for KAKENHI, researchers should perform the procedures, by accessing the “Electronic Application System,” he/she should retain the ID and the Password for e-Rad.

For this reason, the research institution should verify whether researchers who intend to apply have an ID and a Password, or not.

In the case where there is a researcher who intends to apply and who has neither ID nor Password, the research institution should provide him/her with an ID and a password in accordance with the following procedure.

- 1) In order to provide the researcher with an ID and a Password, the research institution needs to have an ID and a Password for use of the research institution. If the research institution has not yet obtained them, it should first of all download a registration form from the e-Rad Portal site, conduct a registration application in writing.

It takes approximately two weeks for the “ID and Password for use of the research institution” to arrive after registration application the “Application for Use of the Electronic Application System”.

Notes:

*1: Please refer to “How to Apply for the Registration on Research Institutions.” (URL: <https://www.e-rad.go.jp/organ/entry.html>) on the e-Rad website for information on downloading an application

form for the ID and password for e-Rad.

*2: Research institutions that already obtained an ID and a password for e-Rad issued do not need to obtain it again.

*3: It is not necessary to obtain an ID and a password for e-Rad for each research category of the KAKENHI.

2) After obtaining an ID and a Password for use of the research institution, the administrative staff in the research institution should provide an ID and a password to the researcher who is planning to apply as a Principal Investigator. The ID and password for each researcher is issued through registration of the researcher information in e-Rad. Please refer to the “Manual for Research Institutions” (for Research Institution Office Representatives and for Research Institution Office Workers: the section of “Procedures for Researchers”) for information on the concrete way how to provide them.

Notes:

*1: When providing the login ID and password, research institutions must make it known to researchers that they must strictly protect the login ID and password in order to prevent them from being disclosed to others.

*2: Once the ID and the password for the researcher have been provided they can be used, even if the research institution changes.

*3: Please be sure to obtain and use the latest version of the Operation Manual.

(5)Submission of the “Self-Assessment Checklist on the Improvement of the System” Based on the “Guidelines on the Management and Audit of Public Research Funds at Research Institutions (Implementation Standards)”

When implementing the adopted research projects with KAKENHI grant the research institutions must comply with the content of the “Guidelines on the Management and Audit of Public Research Funds at Research Institutions (Implementation Standards)” (Adopted by the Minister of MEXT. Revised on February 1, 2021.) (hereinafter referred to as “Guidelines on Public Research Funds”), they must set up a system of the management and audit for implementing the public research funds and report the state of implementation and other matters by submitting a “Self-Assessment Checklist on the Improvement of the System based on the Guidelines on the Management and Audit of Public Research Funds at Research Institutions (Implementation Standards)” (hereinafter referred to as “Self-Assessment Checklist on the Improvement of the System”).

Therefore, “those research institutions which Principal Investigators and Co-Investigators applying for KAKENHI in FY2022 belong to” and “those research institutions which Principal Investigators and Co-Investigators continuing research projects using KAKENHI are scheduled to belong to in FY2022” **must submit in accordance with the procedure and forms posted on the MEXT the “Self-Assessment Checklist on the Improvement of the System” to the Office of Competitive Research Funding Administration, Research Environment Division, Science and Technology Policy Bureau of the MEXT by January 28 (Friday), 2022 via e-Rad. For details, refer to the website (URL: https://www.mext.go.jp/a_menu/kansa/houkoku/1324571.htm).**If the “Self-Assessment Checklist on the Improvement of the System” has already been submitted in April 2021 or later, it is not necessary to submit it again.

Researchers affiliated to a research institution which has not turned in the said checklist cannot receive the official grant decision.

Note: When using e-Rad, an ID and a Password for the research institution are necessary.

< Inquiries >

(Concerning forms and submission of the Guidelines on Public Research Funds)

Competitive Research Funding Administration, Research Environment Division, Science and Technology Policy Bureau, MEXT

Telephone: 03-5253-4111 (ext. 3866, 3827)

E-mail: kenkyuhi@mext.go.jp

URL: https://www.mext.go.jp/a_menu/kansa/houkoku/1324571.htm

(Concerning the research institute e-Rad registration)

Helpdesk of the Cross-ministerial Research and Development Management System of MEXT

Telephone: 0570-066-877 (Navi Dial)

Office hours: 9:00-18:00, except on Saturdays, Sundays, National Holidays and the New Year Holidays (from December 29 until January 3)

URL: <https://www.e-rad.go.jp/organ/entry.html>

(Time period when e-Rad is available for use)

Monday to Sunday 0:00 - 24:00 (in operation 24 hours a day, 365 days a year)

However, even during the above-mentioned time period, it may happen that the operation of e-Rad is disrupted or suspended, when maintenance and inspection is being carried out. If the operation is scheduled to be disrupted or suspended, this will be announced beforehand on the portal site.

(6) Submission of the “Checklist Pertaining to the Current Status” Based on the “Guidelines for Responding to Research Misconduct”

When implementing the research projects with KAKENHI grant the research institutions must comply with the content of the “Guidelines for Responding to Research Misconduct” (Adopted by the Minister of MEXT on 26 August 2014) (hereinafter referred to as “Guidelines on Research Misconduct”) and submit a “Checklist Pertaining to the Current Status based on the Guidelines for Responding to Research Misconduct” (hereinafter referred to as “Checklist on the Research Misconduct”).

Therefore “those research institutions which the Principal Investigators and Co-investigators applying for KAKENHI in FY2022 belong to” and “those research institutions which Principal Investigators and Co-Investigators continuing research projects using KAKENHI are scheduled to belong to in FY2022” **must submit in accordance with the procedure and forms posted on the MEXT the “Checklist on the Research Misconduct” to the Office for Research Integrity Promotion, Research Environment Division, Science and Technology Policy Bureau of the MEXT by January 28 (Friday), 2021 via e-Rad. For details, refer to the website (URL: https://www.mext.go.jp/a_menu/jinzai/fusei/1420301_00001.htm).** If the “Checklist on the Research Misconduct” has already been submitted in April 2020 or later, it is not necessary to submit it again.

Researchers affiliated to a research institution which has not turned in the said checklist cannot receive the official grant decision.

Note: Please note that while the “Checklist on the Research Misconduct” is the same in using e-Rad for submission with the “Self-Assessment Checklist on the Improvement of the System,” the submission destination is different. Both checklists must be submitted.

Note: When using e-Rad, an ID and a Password for the research institution are necessary.

< Inquiries >

(Concerning the format and submission of Guidelines for Responding to Research Misconduct)

* Differs from the contact information for the Guidelines on Public Research Funds.

Office for Research Integrity Promotion, Research Environment Division, Science and Technology Policy Bureau, MEXT

Telephone: 03-6734-3874

E-mail: kiban@mext.go.jp

URL: https://www.mext.go.jp/a_menu/jinzai/fusei/index.htm

(Concerning the research institute e-Rad registration)

Helpdesk of the Cross-ministerial Research and Development Management System (e-Rad) of MEXT

Telephone: 0570-066-877 (Navi Dial)

Office hours: 9:00-18:00, except on Saturdays, Sundays, National Holidays and the New Year Holidays (from December 29 until January 3)

URL: <https://www.e-rad.go.jp/organ/entry.html>

(Time period when e-Rad is available for use)

Monday to Sunday 0:00 - 24:00 (in operation 24 hours a day, 365 days a year)

Even during the above-mentioned time period, the operation of e-Rad may be disrupted or suspended, when maintenance and inspection is being carried out. If the operation is scheduled to be disrupted or suspended, this will be announced beforehand on the portal site.

(7)Implementation of a Research Ethics Education Coursework Based on the “Guidelines on Research Misconduct,” etc.

Principal Investigators and Co-Investigators taking part in a new research project have to complete followings before the formal application for grant delivery.

- Either to read through and learn the teaching materials by oneself concerning the research ethics coursework such as “For the Sound Development of Science -The Attitude of a Conscientious Scientist-” (JSPS Editing Committee of “For the Sound Development of Science”), the “e-Learning Course on Research Ethics (eL CoRE),” the “APRIN e-learning program (eAPRIN),” etc., or to attend a lecture on research ethics conducted by research institutes based on the “Guidelines on Research Misconduct.”
- To understand thoroughly and to exercise the proper research practices in conducting their research, from amongst the contents of both the Statement “Code of Conduct for Scientists -

Revised Version-” by the Science Council of Japan and the booklet “For the Sound Development of Science -The Attitude of a Conscientious Scientist-” issued by the JSPS. To that end, each research institution is requested to disseminate broadly what the researchers should consider, in conducting of their researches as well as carrying out an ethics education in research training session based on the “Guidelines on Research Misconduct.”

(8)On the Submission of the Report on the Research Achievements

The research institution to which researchers belong has to collect and submit the report on the research achievements. If the research institution has failed, without justifiable reason, to submit the report on the research achievements at the end of the research period, it may happen that it is treated as indicated below. Therefore, it is the responsibility of the representative of the research institution to ensure that the report on the research achievements is submitted without fail.

- No KAKENHI will be delivered to researchers who do not submit the report on the research achievements at the end of the research period, without justifiable reason. Moreover, it may happen that the official grant decision to the researcher is cancelled, that an order to return the grant is issued, or that the information such as the name of the research institute the said researcher belongs to is disclosed in public.

Furthermore, if researchers have failed to submit the scheduled report on the research achievements without justifiable reason, then execution of other KAKENHI implemented in the same fiscal year will be suspended.

(9)Obtaining Sufficient Knowledge about the Contents of the Application Procedures

The research institution should beforehand disseminate the contents of the Application Procedures to all the researchers belonging to it. MEXT would especially like to request the dispersion of information on the items listed in the Application Procedures and the submission deadlines of Research Proposal Document, in order to avoid potential misunderstandings.

Moreover, the Application Procedures are available on the section Grants-in-Aid for Scientific Research of the MEXT website.

URL: https://www.mext.go.jp/a_menu/shinkou/hojyo/boshu/1351544.htm

(10)Ensuring Research Integrity Among Research Institutions

In April 2021, the Government decided on the “Policy on Measures to Ensure Research Integrity Against New Risks as a Consequence of the Globalization and Openness of Research Activities (April 27, 2021, Decision of Council for Science, Technology and Innovation).” The Policy states: “In order to promote the creation of science, technology, and innovation in Japan, we must continue to strengthen overseas joint research with various partners based on the principle of open science. At the same time, in light of newly emerging risks as a consequence of the globalization and openness of research activities in the recent years, there is a growing concern that the values of openness and transparency which constitute the basis of the research environment will be lost and the danger of researchers unknowingly being trapped in conflict of interest or conflict of responsibilities. In such climate, it is vital for our country to build a globally reliable research

environment to protect the values that constitute the basis of research environment while encouraging necessary global collaboration and international exchanges.”

Therefore, we ask research institutions to undertake initiatives to ensure research integrity and to make efforts to achieve a common understanding among relevant parties in accordance with the Policy.

Research institutions may be requested, as necessary, to provide information on the status of measures for securing research integrity.

○ “Policy on Measures to Ensure Research Integrity Against New Risks as a Consequence of the Globalization and Openness of Research Activities (April 27, 2021, Decision of Council for Science, Technology and Innovation)”

URL: https://www8.cao.go.jp/cstp/tougosenryaku/integrity_housin.pdf

3. Issues that Need to Be Verified When Compiling the Application Forms (Preparing the Research Proposal Document)

The contents of the Research Proposal Document should be verified in each research institution, and all the Research Proposal Document should be submitted to MEXT together. When doing so, special attention should be paid to the following points.

(1) Ascertainment of the Eligibility for KAKENHI Application

It should be verified whether the Principal Investigator listed in the Research Proposal Document are researchers who meet the requirements that are stipulated in the Application Procedures (see page 44), and also whether the researcher information is registered in e-Rad as “Eligible to Apply for KAKENHI.”

Moreover, it should be verified certainly that they must not be categorized as ineligible for grant acquisition in FY20221 in KAKENHI and other competitive research funds, as a penalty for their improper grant spending, fraudulent grant acquisition, or research misconduct.

(2) Confirmation of the Researcher Information Registered in the e-Rad System

Regarding the registration (update) of the researcher information necessary when applying, the administrative staff in the research institution to which the researcher belongs should perform the procedures using e-Rad.

Moreover, even though applicant has already been included in the researcher list of the research institution, if there is any item such as the department placed, the position, or others that needs to be corrected, the applicant’s information on the researcher list should be corrected.

(3) Verification with the Principal Investigator

The research institution should verify whether the Principal Investigator who have been listed in the Research Proposal Document have completed the Research Proposal Document, after confirming the description in the column “II. Call for Proposals” in this Application Procedures for Grants-in-Aid for Scientific Research.

(4) Verification of the Application Forms

It should be verified whether the application format is in conformity with the prescribed format. As for the forms to be uploaded, in particular, verify not only the total number of pages but also the numbers of pages instructed for each column is met.

Moreover, the format and other matters of the application forms for each research category are as follows.

Research category	Research Proposal Document		
	Items to be entered in the Website (First part)	Forms to be uploaded (File ID)	Items to be entered in the Website (Second part)
Transformative Research Areas(A)(Publicly Offered Research)	To be entered in the electronic application system (Title of research project, Fundamental data on the research project such as total budget, etc.)	S-74	To be entered in the electronic application system (Research expenses, status of application and acquisition of research grants, etc.)

4. Submission and Other Matters of the Research Proposal Document (Preparing the Research Proposal Document)

Submission and other Matters of application documents of “Grant-in-Aid for Transformative Research Areas (A)(Publicly Offered Research)” are as follows.

- 1) The research institution should access the Electronic Application System using the e-Rad ID and the password to obtain the “Research Proposal Document (PDF files)” prepared by the Principal Investigators, and verify the contents and other matters.
- 2) If there are no mistakes in the contents of the “Research Proposal Document (PDF files),” the research institution should perform the “approval” process. (Completed to submit (send) the Research Proposal Document (PDF files) to JSPS.) Moreover, it is not possible to make corrections or other modifications to the Research Proposal Document (PDF files) for which the research institution has already performed the “approval” process.

The deadline for the submission of the Research Proposal Document is:

January 28 (Monday), 2022, 4:30 pm (This deadline should be strictly observed.)

Note 1: Research Proposal Document that are submitted (sent) after this deadline will not be accepted for any reason. Therefore, the documents should be submitted (sent) well in advance.

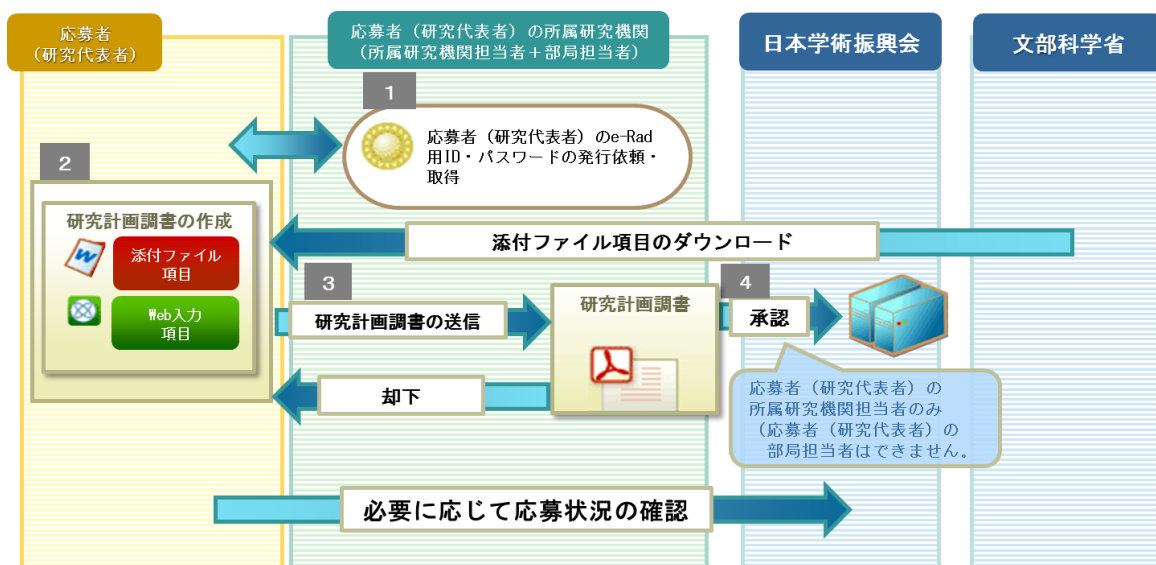
Note 2: After the submission (sending) of the application documents, it is not possible to make corrections or to re-submit them.

Outline of the Electronic Application Procedures

The ID and the password which are used in the e-Rad are designed to verify the individual. Therefore, the handling and administration of them should be done carefully when carrying out the application procedures.

Moreover, an outline of the procedures for electronic application can be found below. However, for details on the operating environment, procedure, etc. of the “Electronic Application System,” please refer to the “Operation Manual” of the website below.

URL: https://www-shinsei.jsps.go.jp/kaken/topkakenhi/shinsei_ka.html



[The administrative staff in the research institution to which the applicant (Principal Investigator) belongs]

1 The administrative staff in the research institution to which the applicant belongs issues the ID and the password to the applicant.

[The applicant (Principal Investigator)]

2 The applicant accesses the “Electronic Application System,” using the ID and the password he/she received, and prepares the Research Proposal Document (PDF file), by entering the “items to be entered” in the website and by uploading the “forms to be uploaded” as an attached file.

[The applicant (Principal Investigator)]

3 If there are no mistakes in the Research Proposal Document (PDF file) and Letter of Intent the applicant prepared, he/she submits the Research Proposal Document (PDF file) to the research institution to which he/she belongs, by performing the “completed and submission” process.

[The administrative staff in the research institution to which the applicant (Principal Investigator) belongs]

4 By approving the Research Proposal Document (PDF file), etc. the administrative staff in the research institution to which the applicant belongs submits (sends) it to JSPS. Moreover, if the Research Proposal Document (PDF file), etc. that the applicant submitted is not approved due to mistakes or other reasons, it will be rejected and the applicant will be requested to make corrections.

VI. Other Relevant Issues

1. Support through Grant-in-Aid for Scientific Research on Innovative Areas - Platforms for Advanced Technologies and Research Resources

In order to respond effectively to the diverse needs of researchers of KAKENHI research projects, the Grant-in-Aid for Scientific Research on Innovative Areas - Platforms for Advanced Technologies and Research Resources forms a resource and technical support platform for research (hereinafter referred to as “Platform”) under the close cooperation of relevant institutes with inter-university research institutes and Joint Usage/Research Centers as core institutes. Together with providing technical support towards individual research projects and providing advanced problem solving methods to researchers, it provides an integral promotion of cooperation between researchers, interdisciplinary integration, and human resources development.

Applications for technical support, etc. are open for each of the Platforms below where it concerns research projects carried out through KAKENHI. Researchers desiring technical support, etc. from each of the Platforms are requested to check their respective websites, etc. and actively apply.

* “Technical Support, etc.” points to the sharing of equipment with researchers from a wide range of research fields, technical support and the collecting, conservation, and providing of resources (documents, data, experiment samples, specimen, etc.), and support for conservation techniques, etc.

“Advanced Technology Support Platform Program” has scientific value and an advanced nature through the combination of multiple facilities and equipment, and provides shared use of equipment and technical support to researchers in a wide variety of research areas.

“Research Platform Resource Support Program” collects, conserves, and supplies the resources that are the basis of research (documents, data, experiment samples, specimen, etc.) and also conducts support for conservation techniques, etc.

Area	Platform Name	Core Institution	Support Function
Advanced Technology Support Platform Program	Platform of Advanced Bioimaging Support (*)	National Institute for Physiological Sciences National Institute for Basic Biology	Advanced technical support and user training for : <ul style="list-style-type: none"> · Light microscopy · Electron microscopy · Magnetic resonance imaging · Imaging analysis
	Platform of Advanced Animal Model Support (*)	The Institute of Medical Science The University of Tokyo	Support for constructing animal models, Support for pathological analysis, Support for physiological analysis, and Support for molecular profiling
	Platform for Advanced Genome Science (*)	National Institute of Genetics	Advanced genome analysis (de novo genome sequencing; re-sequencing for genome variation detection; analysis of transcriptome, epigenome and metagenome; ultra-high sensitivity analysis for single cells, single molecules, etc.; big-data analysis and advanced bioinformatics; by using of the latest facilities and technologies)

Area	Platform Name	Core Institution	Support Function
Research Platform Resource Support Program	Platform for Integration and Sophistication of Image Information on Area Studies	National Museum of Ethnology	Digital Picture Library for Area Studies
	Supply Platform of Short-lived Radioisotopes for Fundamental Research	Research Center for Nuclear Physics, Osaka University	Supply short-lived radioisotopes produced by accelerators for fundamental research in various scientific fields.
	Platform of Supporting Cohort Study and Biospecimen Analysis (*)	The Institute of Medical Science The University of Tokyo	Support for cohort study using bioresources, Support for maintaining and utilizing human brain resources, and Support using biospecimen

Also, Committee on Promoting Collaboration in Life Sciences that functions as a general information point and coordinator across the four Platforms marked with an asterisk (*) above is set up. (Core Institution: The Institute of Medical Science, The University of Tokyo)

Each platform's website can be found in the link collection below: URL:

https://www.mext.go.jp/a_menu/shinkou/hojyo/1367903.htm

2. Promotion of the Shared Use of Research Equipment

In “Reform of Competitive Research Funds: Towards a Sustained Output of Research Achievements (Interim Summary)” (June 24, 2015, Competitive Research Fund Reform Review meeting) it was decided that, when the original research objectives were fully achieved, versatile and large equipment should, in principle, be shared.

Furthermore, in “On the Management of Research Organizations and the Introduction of a New, Unified System for the Shared Use of Research Equipment” (November, 2015, Science and Technology Council Advanced Research Foundation Subcommittee), the establishment and operation of a “research equipment sharing system on the research organization level” (hereinafter referred to as “equipment sharing system”) is demanded of universities and national research and development agencies, etc.

With this in mind, when purchasing equipment with competitive research funds, please actively work on the use of equipment purchased with other research funds, and the purchase and shared use of equipment from several research funds where it concerns especially large and versatile equipment. Please also make ensure that sharing is possible within the rules of the said competitive research funds, and no obstacle is made to the execution of the research project.

- “On the Management of Research Organizations and the Introduction of a New, Unified System for the Shared Use of Research Equipment”

(November 25, 2015, Science and Technology Council Advanced Research Foundation Subcommittee)

URL: https://www.mext.go.jp/b_menu/shingi/gijyutu/gijyutu17/houkoku/1366220.htm

- “Reform of Competitive Research Funds: Towards a Sustained Output of Research Achievements (Interim Summary)”

(June 24, 2015, Competitive Research Fund Reform Review meeting)

URL: https://www.mext.go.jp/b_menu/shingi/chousa/shinkou/039/gaiyou/1359306.htm

- Unified Rules for Administrative Procedures, Etc. Pertaining to Competitive Research Funds
(March 3, 2021, Agreement of the Liaison Meeting of Related Offices and Ministries on
Competitive Research Funds)
URL: https://www8.cao.go.jp/cstp/compefund/toitsu_rule_r30305.pdf

3. Promotion of the ‘Dialogue on Science and Technology with Citizens’ (A Basic Approach Policy)

In the “Promotion of the ‘Dialogue on Science and Technology with Citizens’ (A Basic Course of Action)” (Adopted by the Minister of State for Science and Technology Policy and the Executive Members of the Council for Science and Technology Policy on June 19, 2010) which was compiled in June 2010, the activity in which researchers explain the content and achievements of their research activities to society and citizens in an easy-to-understand form is placed in the above-mentioned ‘Dialogue on Science and Technology with Citizens.’ Researchers who have received an allotment of public research funds amounting more than 30 million yen per year per case are requested to positively work on the ‘Dialogue on Science and Technology with Citizens.’ Universities and other research institutions are also requested to make positive efforts in order for researchers who have received public research funds to ensure the proper implementation of the ‘Dialogue on Science and Technology between Citizens,’ for example, by setting up support systems.

For KAKENHI, there is the question “Are you positively trying to publicize and disseminate the research content and research achievements?” especially in the research progress assessment of Specially Promoted Research, for which researchers receive a relatively high amount of research funds, and the interim/ex-post assessment of Scientific Research on Innovative Areas (Research in a Proposed Research Area). Therefore, based on the above-mentioned basic policy, researchers should disseminate the achievements of research funded with KAKENHI to society and citizens in an even more positive way.

4. Cooperation with the National Bioscience Database Center

The National Bioscience Database Center (URL: <https://biosciencedbc.jp/>) has been established in the Japan Science and Technology Agency (JST, a national research and development agency), in order to promote the integrated use of databases in the area of life science that have been created by various research institutions and other institutions.

This Center spurs the active participation of related institutions, and based on four pillars, namely (1) the planning of strategies, (2) creation and operation of portal websites, (3) research on and development of core technology for the integration of databases and (4) the promotion of the integration of biotechnology-related databases, it is promoting projects aiming at the integration of databases in the area of life science. In this way, through wide sharing and utilization in the researchers community of the research achievements in the area of life science produced in Japan in researcher community, the Center aims at invigorating overall research in the area of life science, including research and development connected to basic research and industrial applied research.

JSPS would like to request researchers to cooperate by providing to the Center copies of raw data related to achievements published in research papers and other output in the area of life science, or copies of created open databases.

Moreover, the copies provided will be able to be utilized on a non-exclusive basis as reproductions, alterations, or in other necessary forms. Furthermore, JSPS would like researchers to understand in advance that, in response to requests of the institutions that received copies, it would also like request researchers to cooperate by providing all the information necessary for utilizing the copies.

Furthermore, the National Bioscience Database Center has developed guidelines for data on humans, in order to promote the sharing and use of data related to research in the area of life science, with due considerations to the protection of personal information.

NBDC Human Data Sharing Guidelines

URL: <https://humandbs.biosciencedbc.jp/guidelines/>

< Inquiries >

National Bioscience Database Center, Japan Science and Technology Agency

Telephone: 03-5214-8491

5. Inter-University Bio-Backup Project

The purpose of the Inter-University Bio-Backup Project (IBBP) is to “back up” biological genetic resources, which are indispensable research resources in various research areas, and to avoid damage or loss of biological genetic resources due to unforeseen accidents, disasters, etc. The project newly commenced from 2012.

In the National Institute for Basic Biology of the Inter-University Research Institute Corporation National Institutes of Natural Sciences, which is the core of this project, the Inter-University Bio-Backup Project for Basic Biology (IBBP Center, URL: <http://www.nibb.ac.jp/ibbp/>) has been established as a backup center for biological genetic resources. It is equipped with the newest equipment necessary for the backup of biological genetic resources.

Any researcher who belongs to a university or a research institution may apply for storage. Biological genetic resources that can be stored in the IBBP are samples that can be proliferated (amplified) or cryopreserved (for vegetable seeds, the refrigeration or deep-freezing preservation condition needs to be definite), and being not pathogenic is also a condition. Since backup is provided free of charge, researchers should make use of the IBBP Center.

< Inquiries >

Executive Office, IBBP Center, Inter-University Research Institute Corporation National Institutes of Natural Sciences

Telephone: 0564-59-5930, 5931

6. National BioResource Project

The National BioResource Project (NBRP) strategically collects and preserves important bioresources that are the basic and foundation of life science research at the core bases of this project and provides them to universities and research institutes, thereby contributing to the development of life science research in Japan. In the future, in order to contribute to the development of life science research in Japan, it is necessary to continually collect useful bioresources.

For that matter, please deposit (*) available bioresources among bioresources developed by Grants-in-Aid for Scientific Research (limited to the bioresource targeted for NBRP). Please cooperate with the

NBRP collecting activities.

It is recommended to utilize the resources already collected in NBRP from the viewpoint such as efficient implementation of research.

(*) Deposit: This is a procedure to approve the use (preservation/provision) in this project without transferring the various rights related to the resource. By specifying specific provision conditions in the deposit agreement, you can add usage conditions such as restrictions on usage and quotation of articles to users.

List of NBRP core bases representative agencies

URL: <https://nbrp.jp/resource/>

< Inquiries >

Division of Genomic Medicine, Department of Health and Clinical Data, Japan Agency for Medical Research and Development

Telephone: 03-6870-2228

7. Security Export Control Policy (Coping with Technology Leakage Overseas)

In Japan, export controls (*) are carried out under the Foreign Exchange and Foreign Trade Act (Act No. 228 of 1949) (hereinafter referred to as “Foreign Exchange Act”). Therefore, in principle, in order to export (provide) cargo and technology regulated by the Foreign Exchange Act, it is necessary to obtain permission of the Minister of Economy, Trade and Industry. It is reminded that KAKENHI grantees must observe the Foreign Exchange Act as well as other laws, guidelines and circular notices issued by the government.

(*) Japan's Security Export Control System established on the basis of international agreements mainly consists of (i) “List rules” which require permission of the Minister of Economy, Trade and Industry in principle when exporting cargo or providing technology that carry specifications and/or functions higher than certain levels, such as carbon fiber and numerically controlled machine tool etc., and (II) “Catch-all regulation” which requires permission of the Minister of Economy, Trade and Industry when exporting cargo or providing technology that are not subject to regulation under the List rules but do fall under certain regulatory requirements (application requirements, consumer requirements and/or informed requirements).

Not only export of cargo but also provision of technology will be subject to the regulation by the Foreign Exchange Act. When providing a “List rules” technology to non-residents or providing it in a foreign country, prior permission for provision is required. “Provision of technology” includes not only providing technical information such as design drawings, specifications, manuals, samples, and prototypes via storage media such as paper, mail, CD, USB memory, but also providing work knowledge and technical assistance at seminars through technical instruction, skill training, etc. Researchers should be aware that there may be case in which technologies subject to regulation by the Foreign Exchange Act are involved when mentoring foreign students and/or joint research activities with overseas groups.

For this reason, in implementing various research activities including research projects funded with

KAKENHI, research institutions are asked to take systematic measures to ensure that the research achievements which have potential risks of being diverted to military use are not transferred to WMD developers, terrorist organizations, or people carrying out other dubious activities.

Details of the security trade control are published on the websites including the Ministry of Economy, Trade and Industry website.

○Ministry of Economy, Trade and Industry: Security Trade Control (General)

<http://www.meti.go.jp/policy/ampo/>

○Ministry of Economy, Trade and Industry: “Handbook on Security Trade Control”

<https://www.meti.go.jp/policy/ampo/seminer/shiryo/handbook.pdf>

○Center for Information on Security Trade Controls

<http://www.cistec.or.jp/index.html>

○“Guidance for the Control of Sensitive Technologies for Security Export for Academic and Research Institutions 3rd Edition”

https://www.meti.go.jp/policy/ampo/law_document/tutatu/t07sonota/t07sonota_jishukanri03.pdf

8. Strict Implementation of United Nations Security Council Resolution 2321

In the face of the nuclear test by Democratic People’s Republic of Korea (DPRK) in September 2016 and repeated launches of ballistic missiles, the United Nations Security Council adopted the United Nations Security Council Resolution 2321 on November 30, 2016 (ET, New York) deciding to impose additional and stronger sanctions on DPRK. In this regard, MEXT issued a letter of request entitled, “Strict Implementation of United Nations Security Council Resolution 2321 (Request)” (28受文科際第98号) to relevant organizations as of February 17, 2017.

“Scientific and technical cooperation” as set forth in Paragraph 11 in the main text of the Resolution not only includes technologies regulated by the Foreign Exchange and Foreign Trade Act of Japan, but all cooperative activities except for medical exchanges. Therefore, it is critical that research institutions exercise strict implementation of the Resolution when conducting various research activities including said sponsored research.

The UNSC Resolution 2321 can be found at:

○ MOFA: United Nations Security Council Resolution 2321, Japanese translation (MOFA Notice No. 463 (issued on December 9, 2016)

<https://www.mofa.go.jp/mofaj/files/000211409.pdf>

9. Improvement of Treatment of Students in the Doctoral Course

“The 6th Science, Technology, and Innovation Basic Plan (Cabinet Decision on March 26, 2021)” addresses the need to enhance financial support for doctoral students in particular, in order to attract outstanding talents from home and abroad, and calls for research institutions to provide greater

employment opportunities for doctoral students as research assistants (RAs) and to improve their treatment. To this end, the Basic Plan, for example, sets a numerical target to triple the number of doctoral students to receive subsidy roughly equivalent to their living cost (which is equivalent to about 30% of students enrolling in doctoral courses to receive such subsidy).

Furthermore, the “Guideline on Recruiting and Fostering Postdoctoral Fellows, Etc. (December 3, 2020, Committee on Human Resources, the Council for Science and Technology)” states that doctoral students “are students, but at the same time, also researchers in a certain way, and therefore it is the key responsibility of universities that foster researchers to provide the environment for research activities and to ensure proper treatment...It is of particular importance to treat them based on appropriate assessment of their contribution, by establishing compensations that meet the nature and content of their jobs and paying hourly wages according to the actual work hours under the proper labor management...When submitting applications to competitive research funds and other grants, universities and institutions must record the expenditures necessary to employ RAs as direct expense, and revise the school rules as necessary to make sure that the RAs are paid proper compensations.”

Based on the above, when employing a doctoral student as RA, etc. for a KAKENHI project, set the hourly wage according to the nature and content of his/her job based on the standard of each research institution and pay the wage according to the actual work hours under the proper labor management.

Furthermore, when employing a doctoral student as RA, etc., be mindful not to overload him/her with excessive work hours and make sure that he/she can maintain a good balance between the work and his/her own research and study hours.

10. Promoting Gender Equality in JSPS Programs

To advance science, it is important to secure an environment that allows diverse researchers to exercise their potentials and advance their activities. In March 2020, JSPS established the “Basic Guidelines for Promoting Gender Equality in JSPS Programs” to promote gender equal participation in areas of science. As part of this initiative, JSPS opened a new website CHEERS! (<https://cheers.jps.go.jp/>) in an aim to support the diverse careers of all researchers, such as balancing research and life events. JSPS will release useful information on, for example, how to balance research and childcare and actively carry out various initiatives through CHEERS! to create a network among researchers. Researchers are encouraged to visit the website.

Attached Table 4

Grants-in-Aid for Scientific Research-KAKENHI- “Review Section Table”

○About the Review Section Table	97
○The Review Section Table (Overview)	98
○The Review Section Table (Table for Basic Section)	105
○The Review Section Table (Table for Medium-sized and Broad Sections)	130

December 22, 2016

Subdivision on Research Grant Screening Section of the Academic Deliberation
in the Subdivision on Science, Council for Science and Technology

About the Review Section Table

- The Review Section Table is classified by sections for the KAKENHI's review criteria. Applicants should select a review section that is most suitable for their own research proposal.
- There are three review sections: Basic, Medium-sized and Broad. The Review Section Table contains 1) Overview, 2) Table for Basic Section, 3) Table for Medium-sized and Broad Sections. Looking at the Overview, the applicants can understand an overall picture of sections. In addition, check the each Review Section Table for the detailed contents of each section and select a review section for their research proposal.
- The Basic Section is the fundamental unit. The Basic Section applies to “Grant-in-Aid for Scientific Research (B/C) (application section “General”)” and for “Grant-in-Aid for Early-Career Scientists”. Each item of Basic Section offers some examples related research contents. They help applicants understand the concrete contents. However, it does not exclude proposal of contents other than if applicants' contents are not included the examples.
- The Medium-sized Section applies to “Grant-in-Aid for Scientific Research (A) (application section “General”)” and “Grant-in-Aid for Challenging Research (Pioneering/Exploratory)”. Several Basic Sections are attached to indicate the scope of review for the Middle-sized Section. However, it does not exclude proposal of contents other than the Basic Sections included in the Middle-sized Section. In addition, some items of Basic Sections belong to multiple Middle-sized Sections, so applicants can select a Middle-sized Section that seems to be most suitable for their own research proposal.
- The Broad Section applies to “Grant-in-Aid for Scientific Research (S)”. Several Medium-sized Sections are attached to indicate the scope of review of the Broad Section. However, it does not exclude proposal of contents other than the Medium-sized Sections included in the Broad Section. Some items of Medium-sized Sections belong to several Broad Sections, so applicants can select a Broad Section that seems to be most suitable for their own research proposal.
- To respond flexibly to research diversity in the review process, application in the Basic, Medium-sized and Broad Sections is made in the following formats: Basic Section: “○○ -related”; Medium-sized Section: “○○ and related fields,” and Broad Section: listed alphabetically.

The Review Section Table (Overview)

Broad Section A	
Medium-sized Section 1 : Philosophy, art, and related fields	
Basic Section	
01010	Philosophy and ethics-related
01020	Chinese philosophy, Indian philosophy and Buddhist philosophy-related
01030	Religious studies-related
01040	History of thought-related
01050	Aesthetics and art studies-related
01060	History of arts-related
01070	Theory of art practice-related
01080	Sociology of science, history of science and technology-related
90010	Design-related
Medium-sized Section 2 : Literature, linguistics, and related fields	
Basic Section	
02010	Japanese literature-related
02020	Chinese literature-related
02030	English literature and literature in the English language-related
02040	European literature-related
02050	Literature in general-related
02060	Linguistics-related
02070	Japanese linguistics-related
02080	English linguistics-related
02090	Japanese language education-related
02100	Foreign language education-related
90020	Library and information science, humanistic and social informatics-related
Medium-sized Section 3 : History, archaeology, museology, and related fields	
Basic Section	
03010	Historical studies in general-related
03020	Japanese history-related
03030	History of Asia and Africa-related
03040	History of Europe and America-related
03050	Archaeology-related
03060	Cultural assets study-related
03070	Museology-related
Medium-sized Section 4 : Geography, cultural anthropology, folklore, and related fields	
Basic Section	
04010	Geography-related
04020	Human geography-related
04030	Cultural anthropology and folklore-related
80010	Area studies-related
80020	Tourism studies-related
80030	Gender studies-related

Broad Section A (continued)	
Medium-sized Section 5 : Law and related fields	
Basic Section	
05010	Legal theory and history-related
05020	Public law-related
05030	International law-related
05040	Social law-related
05050	Criminal law-related
05060	Civil law-related
05070	New fields of law-related
Medium-sized Section 6 : Political science and related fields	
Basic Section	
06010	Politics-related
06020	International relations-related
80010	Area studies-related
80030	Gender studies-related
Medium-sized Section 7 : Economics, business administration, and related fields	
Basic Section	
07010	Economic theory-related
07020	Economic doctrines and economic thought-related
07030	Economic statistics-related
07040	Economic policy-related
07050	Public economics and labor economics-related
07060	Money and finance-related
07070	Economic history-related
07080	Business administration-related
07090	Commerce-related
07100	Accounting-related
80020	Tourism studies-related
Medium-sized Section 8 : Sociology and related fields	
Basic Section	
08010	Sociology-related
08020	Social welfare-related
08030	Family and consumer sciences, and culture and living-related
80020	Tourism studies-related
80030	Gender studies-related

Broad Section A (continued)	
Medium-sized Section 9 : Education and related fields	
Basic Section	
09010	Education-related
09020	Sociology of education-related
09030	Childhood and nursery/pre-school education-related
09040	Education on school subjects and primary/ secondary education-related
09050	Tertiary education-related
09060	Special needs education-related
09070	Educational technology-related
09080	Science education-related
02090	Japanese language education-related
02100	Foreign language education-related
Medium-sized Section 10 : Psychology and related fields	
Basic Section	
10010	Social psychology-related
10020	Educational psychology-related
10030	Clinical psychology-related
10040	Experimental psychology-related
90030	Cognitive science-related

Broad Section B	
Medium-sized Section 11 : Algebra, geometry, and related fields	
Basic Section	
11010	Algebra-related
11020	Geometry-related
Medium-sized Section 12 : Analysis, applied mathematics, and related fields	
Basic Section	
12010	Basic analysis-related
12020	Mathematical analysis-related
12030	Basic mathematics-related
12040	Applied mathematics and statistics-related
Medium-sized Section 13 : Condensed matter physics and related fields	
Basic Section	
13010	Mathematical physics and fundamental theory of condensed matter physics-related
13020	Semiconductors, optical properties of condensed matter and atomic physics-related
13030	Magnetism, superconductivity and strongly correlated systems-related
13040	Biophysics, chemical physics and soft matter physics-related
Medium-sized Section 14 : Plasma science and related fields	
Basic Section	
14010	Fundamental plasma-related
14020	Nuclear fusion-related
14030	Applied plasma science-related
80040	Quantum beam science-related
Medium-sized Section 15 : Particle-, nuclear-, astro-physics, and related fields	
Basic Section	
80040	Quantum beam science-related
15010	Theoretical studies related to particle-, nuclear-, cosmic ray and astro-physics
15020	Experimental studies related to particle-, nuclear-, cosmic ray and astro-physics
Medium-sized Section 16 : Astronomy and related fields	
Basic Section	
16010	Astronomy-related
Medium-sized Section 17 : Earth and planetary science and related fields	
Basic Section	
17010	Space and planetary sciences-related
17020	Atmospheric and hydrospheric sciences-related
17030	Human geosciences-related
17040	Solid earth sciences-related
17050	Biogeosciences-related

Broad Section C	
Medium-sized Section 18: Mechanics of materials, production engineering, design engineering, and related fields	
Basic Section	
18010	Mechanics of materials and materials-related
18020	Manufacturing and production engineering-related
18030	Design engineering-related
18040	Machine elements and tribology-related
Medium-sized Section 19: Fluid engineering, thermal engineering, and related fields	
Basic Section	
19010	Fluid engineering-related
19020	Thermal engineering-related
Medium-sized Section 20: Mechanical dynamics, robotics, and related fields	
Basic Section	
20010	Mechanics and mechatronics-related
20020	Robotics and intelligent system-related
Medium-sized Section 21: Electrical and electronic engineering and related fields	
Basic Section	
21010	Power engineering-related
21020	Communication and network engineering-related
21030	Measurement engineering-related
21040	Control and system engineering-related
21050	Electric and electronic materials-related
21060	Electron device and electronic equipment-related
Medium-sized Section 22: Civil engineering and related fields	
Basic Section	
22010	Civil engineering material, execution and construction management-related
22020	Structure engineering and earthquake engineering-related
22030	Geotechnical engineering-related
22040	Hydroengineering-related
22050	Civil engineering plan and transportation engineering-related
22060	Environmental systems for civil engineering-related
Medium-sized Section 23: Architecture, building engineering, and related fields	
Basic Section	
23010	Building structures and materials-related
23020	Architectural environment and building equipment-related
23030	Architectural planning and city planning-related
23040	Architectural history and design-related
90010	Design-related
Medium-sized Section 24: Aerospace engineering, marine and maritime engineering, and related fields	
Basic Section	
24010	Aerospace engineering-related
24020	Marine engineering-related
Medium-sized Section 25: Social systems engineering, safety engineering, disaster prevention engineering, and related fields	
Basic Section	
25010	Social systems engineering-related
25020	Safety engineering-related
25030	Disaster prevention engineering-related

Broad Section D	
Medium-sized Section 26: Materials engineering and related fields	
Basic Section	
26010	Metallic material properties-related
26020	Inorganic materials and properties-related
26030	Composite materials and interfaces-related
26040	Structural materials and functional materials-related
26050	Material processing and microstructure control-related
26060	Metals production and resources production-related
Medium-sized Section 27: Chemical engineering and related fields	
Basic Section	
27010	Transport phenomena and unit operations-related
27020	Chemical reaction and process system engineering-related
27030	Catalyst and resource chemical process-related
27040	Biofunction and bioprocess engineering-related
Medium-sized Section 28: Nano/micro science and related fields	
Basic Section	
28010	Nanometer-scale chemistry-related
28020	Nanostructural physics-related
28030	Nanomaterials-related
28040	Nanobioscience-related
28050	Nano/micro-systems-related
Medium-sized Section 29: Applied condensed matter physics and related fields	
Basic Section	
29010	Applied physical properties-related
29020	Thin film/surface and interfacial physical properties-related
29030	Applied condensed matter physics-related
Medium-sized Section 30: Applied physics and engineering and related fields	
Basic Section	
30010	Crystal engineering-related
30020	Optical engineering and photon science-related
Medium-sized Section 31: Nuclear engineering, earth resources engineering, energy engineering, and related fields	
Basic Section	
31010	Nuclear engineering-related
31020	Earth resource engineering, Energy sciences-related
Medium-sized Section 90: Biomedical engineering and related fields	
Basic Section	
90110	Biomedical engineering-related
90120	Biomaterials-related
90130	Medical systems-related
90140	Medical technology assessment-related
90150	Medical assistive technology-related

Broad Section E	
Medium-sized Section 32: Physical chemistry, functional solid state chemistry, and related fields	
Basic Section	
32010	Fundamental physical chemistry-related
32020	Functional solid state chemistry-related
Medium-sized Section 33: Organic chemistry and related fields	
Basic Section	
33010	Structural organic chemistry and physical organic chemistry-related
33020	Synthetic organic chemistry-related
Medium-sized Section 34: Inorganic/coordination chemistry, analytical chemistry, and related fields	
Basic Section	
34010	Inorganic/coordination chemistry-related
34020	Analytical chemistry-related
34030	Green sustainable chemistry and environmental chemistry-related
Medium-sized Section 35: Polymers, organic materials, and related fields	
Basic Section	
35010	Polymer chemistry-related
35020	Polymer materials-related
35030	Organic functional materials-related
Medium-sized Section 36: Inorganic materials chemistry, energy-related chemistry, and related fields	
Basic Section	
36010	Inorganic compounds and inorganic materials chemistry-related
36020	Energy-related chemistry
Medium-sized Section 37: Biomolecular chemistry and related fields	
Basic Section	
37010	Bio-related chemistry
37020	Chemistry and chemical methodology of biomolecules-related
37030	Chemical biology-related

Broad Section F	
Medium-sized Section 38: Agricultural chemistry and related fields	
Basic Section	
38010	Plant nutrition and soil science-related
38020	Applied microbiology-related
38030	Applied biochemistry-related
38040	Bioorganic chemistry-related
38050	Food sciences-related
38060	Applied molecular and cellular biology-related
Medium-sized Section 39: Agricultural and environmental biology and related fields	
Basic Section	
39010	Science in plant genetics and breeding-related
39020	Crop production science-related
39030	Horticultural science-related
39040	Plant protection science-related
39050	Insect science-related
39060	Conservation of biological resources-related
39070	Landscape science-related
Medium-sized Section 40: Forestry and forest products science, applied aquatic science, and related fields	
Basic Section	
40010	Forest science-related
40020	Wood science-related
40030	Aquatic bioproduction science-related
40040	Aquatic life science-related
Medium-sized Section 41: Agricultural economics and rural sociology, agricultural engineering, and related fields	
Basic Section	
41010	Agricultural and food economics-related
41020	Rural sociology and agricultural structure-related
41030	Rural environmental engineering and planning-related
41040	Agricultural environmental engineering and agricultural information engineering-related
41050	Environmental agriculture-related
Medium-sized Section 42: Veterinary medical science, animal science, and related fields	
Basic Section	
42010	Animal production science-related
42020	Veterinary medical science-related
42030	Animal life science-related
42040	Laboratory animal science-related

Broad Section G	
Medium-sized Section 43: Biology at molecular to cellular levels, and related fields	
Basic Section	
43010	Molecular biology-related
43020	Structural biochemistry-related
43030	Functional biochemistry-related
43040	Biophysics-related
43050	Genome biology-related
43060	System genome science-related
Medium-sized Section 44: Biology at cellular to organismal levels, and related fields	
Basic Section	
44010	Cell biology-related
44020	Developmental biology-related
44030	Plant molecular biology and physiology-related
44040	Morphology and anatomical structure-related
44050	Animal physiological chemistry, physiology and behavioral biology-related
Medium-sized Section 45: Biology at organismal to population levels and anthropology, and related fields	
Basic Section	
45010	Genetics-related
45020	Evolutionary biology-related
45030	Biodiversity and systematics-related
45040	Ecology and environment-related
45050	Physical anthropology-related
45060	Applied anthropology-related
Medium-sized Section 46: Neuroscience and related fields	
Basic Section	
46010	Neuroscience-general-related
46020	Anatomy and histopathology of nervous system-related
46030	Function of nervous system-related

Broad Section H	
Medium-sized Section 47: Pharmaceutical sciences and related fields	
Basic Section	
47010	Pharmaceutical chemistry and drug development sciences-related
47020	Pharmaceutical analytical chemistry and physicochemistry-related
47030	Pharmaceutical hygiene and biochemistry-related
47040	Pharmacology-related
47050	Environmental and natural pharmaceutical resources-related
47060	Clinical pharmacy-related
Medium-sized Section 48: Biomedical structure and function and related fields	
Basic Section	
48010	Anatomy-related
48020	Physiology-related
48030	Pharmacology-related
48040	Medical biochemistry-related
Medium-sized Section 49: Pathology, infection/immunology, and related fields	
Basic Section	
49010	Pathological biochemistry-related
49020	Human pathology-related
49030	Experimental pathology-related
49040	Parasitology-related
49050	Bacteriology-related
49060	Virology-related
49070	Immunology-related

Broad Section I	
Medium-sized Section 50 : Oncology and related fields	
Basic Section	
50010	Tumor biology-related
50020	Tumor diagnostics and therapeutics-related
Medium-sized Section 51 : Brain sciences and related fields	
Basic Section	
51010	Basic brain sciences-related
51020	Cognitive and brain science-related
51030	Pathophysiological neuroscience-related
Medium-sized Section 52 : General internal medicine and related fields	
Basic Section	
52010	General internal medicine-related
52020	Neurology-related
52030	Psychiatry-related
52040	Radiological sciences-related
52050	Embryonic medicine and pediatrics-related
Medium-sized Section 53 : Organ-based internal medicine and related fields	
Basic Section	
53010	Gastroenterology-related
53020	Cardiology-related
53030	Respiratory medicine-related
53040	Nephrology-related
53050	Dermatology-related
Medium-sized Section 54 : Internal medicine of the bio-information integration and related fields	
Basic Section	
54010	Hematology and medical oncology-related
54020	Connective tissue disease and allergy-related
54030	Infectious disease medicine-related
54040	Metabolism and endocrinology-related
Medium-sized Section 55 : Surgery of the organs maintaining homeostasis and related fields	
Basic Section	
55010	General surgery and pediatric surgery-related
55020	Digestive surgery-related
55030	Cardiovascular surgery-related
55040	Respiratory surgery-related
55050	Anesthesiology-related
55060	Emergency medicine-related
Medium-sized Section 56 : Surgery related to the biological and sensory functions and related fields	
Basic Section	
56010	Neurosurgery-related
56020	Orthopedics-related
56030	Urology-related
56040	Obstetrics and gynecology-related
56050	Otorhinolaryngology-related
56060	Ophthalmology-related
56070	Plastic and reconstructive surgery-related

Broad Section I (continued)	
Medium-sized Section 57 : Oral science and related fields	
Basic Section	
57010	Oral biological science-related
57020	Oral pathobiological science-related
57030	Conservative dentistry-related
57040	Regenerative dentistry and dental engineering-related
57050	Prosthodontics-related
57060	Surgical dentistry-related
57070	Developmental dentistry-related
57080	Social dentistry-related
Medium-sized Section 58 : Society medicine, nursing, and related fields	
Basic Section	
58010	Medical management and medical sociology-related
58020	Hygiene and public health-related: including laboratory approach
58030	Hygiene and public health-related: excluding laboratory approach
58040	Forensics medicine-related
58050	Fundamental of nursing-related
58060	Clinical nursing-related
58070	Lifelong developmental nursing-related
58080	Gerontological nursing and community health nursing-related
Medium-sized Section 59 : Sports sciences, physical education, health sciences, and related fields	
Basic Section	
59010	Rehabilitation science-related
59020	Sports sciences-related
59030	Physical education, and physical and health education-related
59040	Nutrition science and health science-related
Medium-sized Section 90 : Biomedical engineering and related fields	
Basic Section	
90110	Biomedical engineering-related
90120	Biomaterials-related
90130	Medical systems-related
90140	Medical technology assessment-related
90150	Medical assistive technology-related

Broad Section J	
Medium-sized Section 60 : Information science, computer engineering, and related fields	
Basic Section	
60010	Theory of informatics-related
60020	Mathematical informatics-related
60030	Statistical science-related
60040	Computer system-related
60050	Software-related
60060	Information network-related
60070	Information security-related
60080	Database-related
60090	High performance computing-related
60100	Computational science-related
Medium-sized Section 61 : Human informatics and related fields	
Basic Section	
61010	Perceptual information processing-related
61020	Human interface and interaction-related
61030	Intelligent informatics-related
61040	Soft computing-related
61050	Intelligent robotics-related
61060	Kansei informatics-related
90010	Design-related
90030	Cognitive science-related
Medium-sized Section 62 : Applied informatics and related fields	
Basic Section	
62010	Life, health and medical informatics-related
62020	Web informatics and service informatics-related
62030	Learning support system-related
62040	Entertainment and game informatics-related
90020	Library and information science, humanistic and social informatics-related

Broad Section K	
Medium-sized Section 63 : Environmental analyses and evaluation and related fields	
Basic Section	
63010	Environmental dynamic analysis-related
63020	Radiation influence-related
63030	Chemical substance influence on environment-related
63040	Environmental impact assessment-related
Medium-sized Section 64 : Environmental conservation measure and related fields	
Basic Section	
64010	Environmental load and risk assessment-related
64020	Environmental load reduction and remediation-related
64030	Environmental materials and recycle technology-related
64040	Social-ecological systems-related
64050	Sound material-cycle social systems-related
64060	Environmental policy and social systems-related

The Review Section Table (Table for Basic Section)

When selecting a review section, applicants should first acquire an overall picture of the review sections based on the Review Section Table (Overview). In addition, check the Review Section Table (Table for Basic Section) for the detailed contents of each section and select a review section for their research proposal.

Also, some items of Basic Section may be presented in plural Medium-sized and Broad Sections. The items of Basic Section presented in plural Medium-sized Section are 9 and 3 items among 9 are presented in plural Medium-sized and Broad Sections (as shown below).

In addition, five other Basic Sections (90110-90150) may be presented in only one Medium-sized Section and two Broad Sections.

When selecting a Medium-sized or Broad Section, applicants should refer to the Attachment 2 “Review Section Table (Table for Medium-sized and Broad Sections), and select the one that seems to be most suitable for their own research proposal.

【Basic sections may be presented in plural Medium-sized and Broad Section】

Basic Section Item	Basic Section Description	Medium-sized Sections corresponding Basic Sections	Broad Sections corresponding Basic Sections
02090	Japanese language education-related	2, 9	A
02100	Foreign language education-related	2, 9	A
80010	Area studies-related	4, 6	A
80020	Tourism studies-related	4, 7, 8	A
80030	Gender studies-related	4, 6, 8	A
80040	Quantum beam science-related	1 4, 1 5	B
90010	Design-related	1, 2 3, 6 1	A, C, J
90020	Library and information science, humanistic and social informatics-related	2, 6 2	A, J
90030	Cognitive science-related	1 0, 6 1	A, J
90110	Biomedical engineering-related	9 0	D, I
90120	Biomaterials-related	9 0	D, I
90130	Medical systems-related	9 0	D, I
90140	Medical technology assessment-related	9 0	D, I
90150	Medical assistive technology-related	9 0	D, I

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
01010	Philosophy and ethics-related	1	A
	Philosophy in general, Ethics in general, Western philosophy, Western ethics, Japanese philosophy, Japanese ethics, Applied ethics, etc.		
01020	Chinese philosophy, Indian philosophy and Buddhist philosophy-related	1	A
	Chinese philosophy/thought, Indian philosophy/thought, Buddhist philosophy, Bibliography, Philology, etc.		
01030	Religious studies-related	1	A
	History of religions, Philosophy of religion, Theology, Sociology of religion, Psychology of religion, Anthropology of religion, Studies of religious folklore, Mythology, Bibliography, Philology, etc.		
01040	History of thought-related	1	A
	History of thought in general, History of Western thought, History of Eastern thought, History of Japanese thought, etc.		
01050	Aesthetics and art studies-related	1	A
	Philosophy of art, Aesthetics, Miscellaneous art studies, etc.		
01060	History of arts-related	1	A
	Japanese art, Eastern art, Western art, Contemporary art, Craft, Design, Architecture, Costume, Photography, etc.		
01070	Theory of art practice-related	1	A
	Art expression, Arts management, Art policy, Art production, etc.		
01080	Sociology of science, history of science and technology-related	1	A
	Sociology of science, History of science, History of technology, History of medicine, Industrial archeology, Philosophy of science, Foundation of science, STS (Science, technology and society), etc.		
02010	Japanese literature-related	2	A
	Japanese literature in general, Ancient literature, Medieval literature, Chinese classics in Japan, Bibliography, Philology, Premodern literature, Modern literature, Contemporary literature, Literary theory, etc.		
02020	Chinese literature-related	2	A
	Chinese literature, Bibliography, Philology, Literary theory, etc.		
02030	English literature and literature in the English language-related	2	A
	English literature, American literature, Literature in the English language, Literary theory, Bibliography, Philology, etc.		
02040	European literature-related	2	A
	French literature, Literature in the French language, German literature, Literature in the German language, Classics, Russian and East European literature, Literature in other European languages, Literary theory, Bibliography, Philology, etc.		
02050	Literature in general-related	2	A
	Literature in other languages and areas, Literary theory, Comparative literature, Bibliography, Philology, Literature education, etc.		
02060	Linguistics-related	2	A
	Phonetics/phonology, Semantics/pragmatics, Morphosyntax, Sociolinguistics, Contrastive linguistics, Psycholinguistics, Neurolinguistics, Historical linguistics, Corpus linguistics, Endangered and minority languages, etc.		

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
02070	Japanese linguistics-related	2	A
	Phonetics/phonology, Writing systems, Lexicon and semantics, Grammar, Stylistics, Pragmatics, Language life, Dialect, History of the Japanese language, History of Japanese linguistics, etc.		
02080	English linguistics-related	2	A
	Phonetics/phonology, Lexicon and semantics, Grammar, Stylistics, Pragmatics, Sociolinguistics, Diversity of the English language, Corpus linguistics, History of the English language, History of English linguistics, etc.		
02090	Japanese language education-related	2, 9	A
	Research on learners, Language acquisition, Teaching material, Curriculum evaluation, Japanese language education for specific purposes, Bilingual education, Research on teachers, Japanese language for Japanese language education, History of Japanese language education, Cross-cultural understanding, etc.		
02100	Foreign language education-related	2, 9	A
	Learning method, Computer-assisted language learning (CALL), Teaching material, Language testing, Theory of second language acquisition, Early English education, History of foreign language education and language policies, Curriculum evaluation, Training foreign language teachers, Cross-cultural understanding, etc.		
03010	Historical studies in general-related	3	A
	Historical theory, Historical methodology, Research in historical materials, Memory and medium, World history, History of cultural and diplomatic exchange, Comparative history, etc.		
03020	Japanese history-related	3	A
	Japanese history in general, History of ancient Japan, History of medieval Japan, History of early modern Japan, History of modern Japan, History of local Japan, History of Japanese culture, History of Japanese religion, History of Japanese environment, History of Japanese city, History of cultural and diplomatic exchange, Comparative history, Research in historical materials, etc.		
03030	History of Asia and Africa-related	3	A
	History of pre-modern China, History of modern China, East Asian history, Central Eurasian history, Southeast Asian history, Oceanian history, South Asian history, West Asian history, African history, History of cultural and diplomatic exchange, Comparative history, Research in historical materials, etc.		
03040	History of Europe and America-related	3	A
	Ancient European history, Medieval European history, Modern and contemporary West European history, Modern and contemporary East European history, North and South American history, History of cultural and diplomatic exchange, Comparative history, Research in historical materials, etc.		
03050	Archaeology-related	3	A
	Archaeology in general, Prehistoric archaeology, Historical archaeology, Japanese archaeology, Asian archaeology, Ancient civilizations, History of material culture, Experimental archaeology, Information archaeology, Study of buried cultural property, etc.		
03060	Cultural assets study-related	3	A
	Dating methods, Material analysis, Production techniques, Conservation science, Archaeological prospection, Plant and animal residues, Human remains, Cultural heritage, Cultural resources, Cultural property policy, etc.		

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
03070	Museology-related	3	A
	Exhibition studies, Museum pedagogy, Museum informatics, Museum business management, Public finance and administration of museums, Museum material resources, History of museology, etc.		
04010	Geography-related	4	A
	Geography in general, Land use, Landscape, Environmental system, Geomorphology, Climatology, Hydrology, Cartography, Geographic information system, Regional planning, etc.		
04020	Human geography-related	4	A
	Human geography in general, Economic geography, Social geography, Political geography, Cultural geography, Urban geography, Rural geography, Historical geography, Regional geography, Geography education, etc.		
04030	Cultural anthropology and folklore-related	4	A
	Cultural anthropology in general, Folklore in general, Material culture, Ecology, Social relationship, Religion, Arts, Health care, Border crossing, Minority, etc.		
80010	Area studies-related	4, 6	A
	Area studies in general, Cross-regional comparative studies, Aid, International cooperation, Interregional exchange, Environment, Transnationalism, Globalization, Social development, etc.		
80020	Tourism studies-related	4, 7, 8	A
	Tourism studies in general, Tourism, Tourism resources, Tourism policy, Tourism industry, Regional development, Tourists, Pilgrimage, etc.		
80030	Gender studies-related	4, 6, 8	A
	Gender studies in general, Feminism, Sexuality, Queer studies, Labor, Violence, Prostitution, Reproductive technology, Gender equality, etc.		
05010	Legal theory and history-related	5	A
	Legal philosophy, Roman law, Legal history, Sociology of law, Comparative law, Foreign law, Law and policy, Law and economics, Judicial system, etc.		
05020	Public law-related	5	A
	Constitutional law, Administrative law, Tax law, etc.		
05030	International law-related	5	A
	Public international law, Private international law, International human rights law, International economic law, EU law, etc.		
05040	Social law-related	5	A
	Labor law, Economic law, Social security law, Education law, etc.		
05050	Criminal law-related	5	A
	Criminal law, Criminal procedure, Criminology, Criminal justice policy, Juvenile law, Law and psychology, etc.		
05060	Civil law-related	5	A
	Civil law, Commercial law, Civil procedure, Insolvency law, Alternative dispute resolution, etc.		
05070	New fields of law-related	5	A
	Environmental law, Medical law, Information law, Consumer law, Intellectual property law, Law and gender, Legal profession, etc.		

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
06010	Politics-related	6	A
	Political theory, History of political thought, Political history, Japanese political history, Japanese politics, Political process, Electoral studies, Political economy, Public administration, Local government, Comparative politics, Public policy, etc.		
06020	International relations-related	6	A
	Theory of international relations, Modern international relations, Diplomatic history, International history, Foreign policy, International security, International political economy, Global governance, International cooperation, etc.		
07010	Economic theory-related	7	A
	Microeconomics, Macroeconomics, Game theory, Behavioral economics, Experimental economics, Economic theory, Evolutionary economics, Economic institutions, Economic systems, etc.		
07020	Economic doctrines and economic thought-related	7	A
	Economic doctrines, Economic thought, Social thought, Economic philosophy, etc.		
07030	Economic statistics-related	7	A
	Statistical system, Statistical research, Population statistics, Income/wealth distribution, National accounts, Econometrics, Financial econometrics, etc.		
07040	Economic policy-related	7	A
	International economics, Industrial organization, Economic development, Urban economics, Regional economy, Environmental and resource economics, Japanese economy, Economic policy, Transportation economics, Development economics, International development, etc.		
07050	Public economics and labor economics-related	7	A
	Public finance, Public economics, Health economics, Labor economics, Social security, Education economics, Law and economics, Political economy, etc.		
07060	Money and finance-related	7	A
	Monetary economics, Finance, International finance, Corporate finance, Financial engineering, Insurance, etc.		
07070	Economic history-related	7	A
	Economic history, Business history, Industrial history, etc.		
07080	Business administration-related	7	A
	Corporation theory, Organization theory, Organizational behavior, Corporate strategy, Business management, Human resource management, Management of technology, International business, Management information, Industrial management, Management in general, etc.		
07090	Commerce-related	7	A
	Marketing, Consumer behavior, Distributive sciences, Logistics, Commerce in general, etc.		
07100	Accounting-related	7	A
	Financial accounting, Management accounting, Auditing, Accounting in general, etc.		
08010	Sociology-related	8	A
	Sociology in general, Community, Family, Labor, Sociology of welfare, Gender, Media, Ethnicity, Social movements, Social research, Sociology of medicine, Social demography, etc.		

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
08020	Social welfare-related	8	A
	Social work, Social policy, Social welfare history, Child welfare, Social welfare for people with disabilities, Social welfare for aging, Community welfare, Poverty, Volunteerism, Social welfare in general, etc.		
08030	Family and consumer sciences, and culture and living-related	8	A
	Culture and living, Home economics, Consumer affairs, Lifestyle, Culture of clothing, Culture of food, Culture of dwelling, Dress and fashion, Diet habits, Housing, Family and consumer sciences in general, Family and consumer education, etc.		
09010	Education-related	9	A
	History of education, Philosophy of education, Curriculum and pedagogy, Evaluation of education, Teacher and trainer, School education, Social and community education, Vocational education and training, Lifelong learning, Institutions and administration, etc.		
09020	Sociology of education-related	9	A
	Sociology of education, Socialization, Educational organization and system, Destination and career formation, Class disparities, Gender, Education policy, Comparative education, Globalization and development, etc.		
09030	Childhood and nursery/pre-school education-related	9	A
	Childhood, Nursery/pre-school education, Right of child, Development, Contents and methods of child care, Childcare facilities and kindergarten, Caregiver and pre-school teacher, Child care support, Childhood culture, History and thought, etc.		
09040	Education on school subjects and primary/secondary education-related	9	A
	Education of individual subjects, Education excluding subjects, Student guidance and counselling, Career education, School management, Teacher education, ESD, Environmental education, Literacy, etc.		
09050	Tertiary education-related	9	A
	Policy, Admission and articulation, Curriculum, Career guidance, Teacher and staff, Scientific research, Regional link and contribution, Globalization, Management and governance, Non-university higher education, etc.		
09060	Special needs education-related	9	A
	Philosophy and history, Inclusion and cohesive society, Instructions and supports, Developmental disabilities, Emotional disturbance, Intellectual disabilities, Language disorders, Physical disabilities, Career education, etc.		
09070	Educational technology-related	9	A
	Curriculum development, Teaching-learning support systems, Utilization of media, Utilization of ICT, Teacher's education, Information literacy, etc.		
09080	Science education-related	9	A
	Science education, Science communication, Scientific literacy, Science and society, etc.		
10010	Social psychology-related	10	A
	Social psychology in general, Self, Group, Attitude and behavior, Affection/emotion, Interpersonal relation, Social issues, Culture, etc.		
10020	Educational psychology-related	10	A
	Educational psychology in general, Development, Family, School, Clinical practice, Personality, Learning, Assessment and evaluation, etc.		

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
10030	Clinical psychology-related	10	A
	Clinical psychology in general, Psychological disorder, Assessment, Psychological intervention, Training, Mental health, Crime and delinquency, Community, etc.		
10040	Experimental psychology-related	10	A
	Experimental psychology in general, Sensation, Perception, Attention, Memory, Language, Emotion, Learning, etc.		
11010	Algebra-related	11	B
	Group theory, Ring theory, Representation theory, Algebraic combinatorics, Number theory, Arithmetic geometry, Algebraic geometry, Algebraic analysis, etc.		
11020	Geometry-related	11	B
	Differential geometry, Riemannian geometry, Symplectic geometry, Complex geometry, Topology, Differential topology, Low dimensional topology, etc.		
12010	Basic analysis-related	12	B
	Functional analysis, Complex analysis, Probability theory, Harmonic analysis, Operator theory, Spectral analysis, Operator algebras, Algebraic analysis, Representation theory, etc.		
12020	Mathematical analysis-related	12	B
	Functional equations, Real analysis, Dynamical system, Variational method, Nonlinear analysis, Applied analysis, etc.		
12030	Basic mathematics-related	12	B
	Mathematical logic and foundations, Information theory, Discrete mathematics, Computer mathematics, etc.		
12040	Applied mathematics and statistics-related	12	B
	Numerical analysis, Mathematical modelling, Optimal control, Game theory, Statistical mathematics, etc.		
13010	Mathematical physics and fundamental theory of condensed matter physics-related	13	B
	Statistical physics, Fundamental theory of condensed matter physics, Mathematical physics, Nonequilibrium nonlinear physics, Fluid dynamics, Computational physics, Quantum information theory, etc.		
13020	Semiconductors, optical properties of condensed matter and atomic physics-related	13	B
	Semiconductors, Dielectrics, Atoms and molecules, Mesoscopic systems, Crystals, Surfaces and interfaces, Optical properties of condensed matter, Quantum electronics, Quantum information, etc.		
13030	Magnetism, superconductivity and strongly correlated systems-related	13	B
	Magnetism, Strongly correlated electron systems, Superconductivity, Quantum fluids and solids, Molecular solids, etc.		
13040	Biophysics, chemical physics and soft matter physics-related	13	B
	Physics of biological phenomena, Physics of biological matters, Liquids and glasses, Soft matters, Rheology, etc.		
14010	Fundamental plasma-related	14	B
	Basic plasmas, Magnetized plasmas, Laser plasmas, Strongly coupled plasmas, Plasma diagnostics, Astrophysical and space plasmas, etc.		
14020	Nuclear fusion-related	14	B
	Plasma confinement, Plasma control, Plasma heating, Plasma diagnostics, Edge plasma, Plasma wall interaction, Inertial fusion, Fusion material, Fusion system, etc.		

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
14030	Applied plasma science-related	14	B
	Plasma processing, Plasma photonics, Plasma material science, General plasma applications, etc.		
80040	Quantum beam science-related	14, 15	B
	Accelerators, Beam physics, Radiation detectors, Beam control, Applied quantum beam science, etc.		
15010	Theoretical studies related to particle-, nuclear-, cosmic ray and astro-physics	15	B
	Particle physics, Nuclear physics, Cosmic-ray physics, Astrophysics, Relativity, Gravity, etc.		
15020	Experimental studies related to particle-, nuclear-, cosmic ray and astro-physics	15	B
	Particle physics, Nuclear physics, Cosmic-ray physics, Astrophysics, Relativity, Gravity, etc.		
16010	Astronomy-related	16	B
	Optical/infrared astronomy, Radio astronomy, Solar physics, Astrometry, Theoretical astronomy, X-ray/ γ -ray astronomy, etc.		
17010	Space and planetary sciences-related	17	B
	Solar-terrestrial physics, Aeronomy, Planetary science, Exoplanetary science, Extraterrestrial material science, etc.		
17020	Atmospheric and hydrospheric sciences-related	17	B
	Climate system, Atmospheric science, Ocean science, Limnology, Glaciology, Paleoclimatology, etc.		
17030	Human geosciences-related	17	B
	Geoenvironmental science, Natural disaster science, Geospatial information science, Quaternary research, Earth resources science, etc.		
17040	Solid earth sciences-related	17	B
	Solid earth geophysics, Geology, Earth's interior material science, Solid earth geochemistry, etc.		
17050	Biogeosciences-related	17	B
	Origin and evolution of life, Extremophile biology, Biogeochemistry, Paleoenvironmental science, Paleontology, etc.		
18010	Mechanics of materials and materials-related	18	C
	Structural mechanics, Fatigue, Fracture, Biomaterials, Material design, Material characteristics, Material evaluation, etc.		
18020	Manufacturing and production engineering-related	18	C
	Machine tools, Machining, Non-traditional machining, Ultraprecision machining, Additive manufacturing, Precision metrology, Manufacturing systems, Computer-aided technology, Process planning, etc.		
18030	Design engineering-related	18	C
	Product design, Service design, Design for reliability, Maintainability design, Lifecycle engineering, Reverse engineering, Safety design, Design engineering, etc.		
18040	Machine elements and tribology-related	18	C
	Machine elements, Mechanisms, Tribology, Actuators, Micromachines, etc.		
19010	Fluid engineering-related	19	C
	Fluid machinery, Flow measurement, Computational fluid dynamics, Turbulence, Multiphase flow, Compressible flow, Incompressible flow, etc.		

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
19020	Thermal engineering-related	19	C
	Heat transfer, Convection, Combustion, Thermophysical properties, Refrigeration and air-conditioning, Heat engine, Energy conversion, etc.		
20010	Mechanics and mechatronics-related	20	C
	Kinematics, Kinetics, Vibration, Acoustics, Automation, Learning control, Mechatronics, Micro/nano mechatronics, Biomechanics, etc.		
20020	Robotics and intelligent system-related	20	C
	Robotics, Intelligent system, Human mechanical system, Human interface, Planning, Intelligent spatial system, Virtual reality, Augmented reality, etc.		
21010	Power engineering-related	21	C
	Electrical energy-related, Energy conservation, Power system engineering, Electric machinery, Power electronics, Effective utilization of electric energy, Electromagnetic compatibility, etc.		
21020	Communication and network engineering-related	21	C
	Information theory, Nonlinear theory, Signal processing, Wired/wireless communication systems, Modulation/demodulation, Antennas, Networks, Multimedia, Cryptography/security, etc.		
21030	Measurement engineering-related	21	C
	Measurement theory, Measuring instruments, Applied wave metrology, Measurement systems, Signal processing, Sensing devices, etc.		
21040	Control and system engineering-related	21	C
	Control theory, System theory, Control systems, Knowledge-based control systems, System information processing, System control applications, Biosystems engineering, etc.		
21050	Electric and electronic materials-related	21	C
	Semiconductor, Dielectric materials, Magnetic materials, Organic materials, Superconductor, Composite materials, Thin films, Quantum structures, Thick films, Fabrication/characterization methods, etc.		
21060	Electron device and electronic equipment-related	21	C
	Electron devices, Circuit design, Optical devices, Spintronic devices, Millimeter wave/terahertz wave, Applied wave devices, Storage devices, Displays, Micro fabrication process technology, Implementation technology, etc.		
22010	Civil engineering material, execution and construction management-related	22	C
	Concrete, Steel, Composite material, Wood, Pavement material, Repair and reinforce material, Execution, Maintenance, Construction management, Underground space, etc.		
22020	Structure engineering and earthquake engineering-related	22	C
	Applied mechanics, Structure engineering, Steel structure, Concrete structure, Composite structure, Wind engineering, Earthquake engineering, Aseismatic structure, Earthquake prevention, etc.		
22030	Geotechnical engineering-related	22	C
	Soil mechanics, Foundation engineering, Rock engineering, Engineering Geology, Ground behavior, Soil structure, Geo-disaster prevention, Geoenvironmental engineering, Tunnel engineering, Soil environment, etc.		
22040	Hydroengineering-related	22	C
	Hydraulics, Environmental hydraulics, Hydrology, River engineering, Water resource engineering, Coastal engineering, Port and harbor engineering, Ocean engineering, etc.		
22050	Civil engineering plan and transportation engineering-related	22	C
	Civil engineering plan, Regional urban planning, Spatial planning, Disaster prevention plan, Transportation plan, Transportation engineering, Railway engineering, Surveying and remote sensing, Landscape design, Civil engineering history, etc.		

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
22060	Environmental systems for civil engineering-related	22	C
	Environment plan, Environmental system, Environment conservation, Water serve and drainage systems, Waste, Water environment, Atmospheric circulation, Noise and vibration, Environment ecology, Environmental monitoring, etc.		
23010	Building structures and materials-related	23	C
	Load theory, Structural analysis, Structural design, Structures, Earthquake resistant design, Foundation, Geotechnics, Structural material, Maintenance, Building construction method, etc.		
23020	Architectural environment and building equipment-related	23	C
	Sound environment, Vibration environment, Light environment, Heat environment, Air environment, Environmental psychology/physiology, Building equipment, Fire engineering, Urban environment, Environment design, etc.		
23030	Architectural planning and city planning-related	23	C
	Planning theory, Design theory, Housing theory, Buildings, Urban/regional planning, Administration, Building economics, Production management, Disaster prevention planning, Landscape, etc.		
23040	Architectural history and design-related	23	C
	Architectural history, Urban history, Architectural theory, Design, Landscape, Preservation, Renovation, etc.		
24010	Aerospace engineering-related	24	C
	Thermo-fluid dynamics, Structural strength, Propulsion, Aerospace craft design, Production engineering, Aircraft system, Specific aircraft, Aerodynamics, Spacecraft system, Space utilization, etc.		
24020	Marine engineering-related	24	C
	Navigation, Structural mechanics, Structural design, Production technology, Marine propulsion, Marine transport, Marine development engineering, Underwater engineering, Polar engineering, Marine environmental technology, etc.		
25010	Social systems engineering-related	25	C
	Social systems, Industrial engineering, Operations research, Industrial management, Reliability engineering, Policy science, Regulatory science, Quality control, etc.		
25020	Safety engineering-related	25	C
	Safety engineering, Safety system, Risk engineering, Risk management, Work safety, Product safety, Safety information, Human engineering, Liability engineering, etc.		
25030	Disaster prevention engineering-related	25	C
	Disaster prediction, Hazard map, Building prevention against disaster, Lifeline prevention against disaster, Regional disaster prevention planning, Risk evaluation of disaster, Disaster prevention policy, Disaster resilience, etc.		
26010	Metallic material properties-related	26	D
	Electric and magnetic properties, Electronic information properties, Metastable states, Diffusion, Phase transformation, Phase diagram, Crystal lattice defects, Mechanical properties, Thermal and optical properties, Materials computational science, etc.		
26020	Inorganic materials and properties-related	26	D
	Functional ceramics, Functional glasses, Structural ceramics, Carbon-based materials, Crystal structure analysis, Microstructure control, Electric properties, Mechanical properties, Physical and chemical properties, Grain boundary, etc.		

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
26030	Composite materials and interfaces-related	26	D
	Functional composite materials, Structural composite materials, Biocompatible composite materials, Polymer composite, Surface treatment, Dispersion control, Joining and welding, Adhesive bonding, Interface properties, Gradient function, etc.		
26040	Structural materials and functional materials-related	26	D
	Social infrastructure materials, Toughness, Medical welfare materials, Functional polymer materials, Reliability, Photo-functional materials, Sensor materials, Energy materials, Battery functional materials, Environment functional materials, etc.		
26050	Material processing and microstructure control-related	26	D
	Processing and molding, Thermal treatment, Crystal microstructure control, Laser processing, Precision processing, Polishing, Powder metallurgy, Coatings, Metal plating, Corrosion and protection, etc.		
26060	Metals production and resources production-related	26	D
	Separation and purification, Melting and solidifying, Crystal growth, Casting, Resource security reservation, Scarce resources substitution, Low environment impact, Recycle, Ecomaterials, Energy saving, etc.		
27010	Transport phenomena and unit operations-related	27	D
	Phase equilibrium, Transport properties, Momentum/heat/mass transfer, Fluid-phase unit operation, Adsorption, Membrane separation, Mixing, Powder technology, Crystallization, Film formation, etc.		
27020	Chemical reaction and process system engineering-related	27	D
	Reaction operation, Novel reaction process, Reaction mechanism, Reactor design, Materials synthesis process, Micro-chemical process, Process control, Process system design, Process informatics, etc.		
27030	Catalyst and resource chemical process-related	27	D
	Catalysis, Catalyst preparation, Catalytic function, Energy conversion process, Energy development, Energy-saving technology, Resources effective utilization technology, etc.		
27040	Biofunction and bioprocess engineering-related	27	D
	Biocatalyst engineering, Biofunction engineering, Food engineering, Medicochemical engineering, Bioproduction process, Nano-bioprocess, Bioreactor, Bioseparation, Biosensor, Biorefinery, etc.		
28010	Nanometer-scale chemistry-related	28	D
	Nanostructure creation, Clusters, Nanoparticles, Mesoscopic chemistry, Superstructures, Nanometer-scale surfaces and interfaces, Self-assembly, Nanocarbons, Molecular devices, Nanometer-scale optical devices, etc.		
28020	Nanostructural physics-related	28	D
	Physics in nanoscale materials and structures, Nanoprobes, Quantum effects, Quantum dots, Quantum devices, Electron devices, Spin devices, Nanotribology, Nanocarbon physics, etc.		
28030	Nanomaterials-related	28	D
	Creation of nanomaterials, Analysis of nanomaterials, Nanosurfaces, Nanointerfaces, Functional nanomaterials, Nanostructures, Nanoparticles, Carbon nanomaterials, Nanocrystalline materials, Nanocomposites, Nanodefects, Nanofabrication process, etc.		
28040	Nanobioscience-related	28	D
	Biomolecular devices, Molecular manipulation, Molecular imaging, Nanomeasurements, Nanosynthesis, Single molecule science, Nano-bio interfaces, Biomolecular array, Genome engineering, etc.		

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
28050	Nano/micro-systems-related	28	D
	MEMS, NEMS, BioMEMS, Nano/micro-fabrication, Nano/micro-optical devices, Nano/micro-chemical systems, Nano/micro-biosystems, Nano/micro-organism systems, Nano/micro-mechanics, Nano/micro-sensors, etc.		
29010	Applied physical properties-related	29	D
	Magnetic materials, Superconductors, Dielectrics, Fine particles, Organic molecules, Liquid crystals, New functional materials, Organic molecules and bioelectronics, Spintronics, etc.		
29020	Thin film/surface and interfacial physical properties-related	29	D
	Thin-film engineering, Thin-film electronics, Oxide electronics, Vacuum, Surface science, Analysis, Measurement, Nanoscopic technology, Surface and interfacial engineering, Advanced equipment, etc.		
29030	Applied condensed matter physics-related	29	D
	Elementary quantities, Standards, Units, Physical quantity measurements and detection, Energy conversion, etc.		
30010	Crystal engineering-related	30	D
	Metals, Semiconductors, Ceramics, Amorphous materials, Crystal growth, Artificial structures, Crystal characterization, Plasma materials engineering, Plasma processing, Plasma engineering, etc.		
30020	Optical engineering and photon science-related	30	D
	Optical materials, Optical elements, Optical properties, Optical information processing, Laser, Optical sensing, Optical recording, Opto-electronics, Nonlinear optics, Vision optics, etc.		
31010	Nuclear engineering-related	31	D
	Reactor physics and safety design, Thermal-hydraulics and structure, Fuel material, Nuclear chemistry, Nuclear life cycle, Radiation safety, Radiation beam engineering, Plasma engineering for fusion reactor, Equipment and material engineering for fusion reactor, Nuclear social environment, etc.		
31020	Earth resource engineering, Energy sciences-related	31	D
	Earth resource sciences, Resource prospecting, Resource development, Resource cycle, Resource economy, Energy system, Environmental load evaluation, Renewable energy, Natural resource and energy technological policy, etc.		
32010	Fundamental physical chemistry-related	32	E
	Theoretical chemistry, Molecular spectroscopy, Structural chemistry, Electronic state dynamics, Chemical reaction dynamics, Surface/interface, Cluster and nano materials, Bio-related physical chemistry, Liquid structure dynamics, Solid state properties, Molecular properties, etc.		
32020	Functional solid state chemistry-related	32	E
	Optical properties, Electron spin, Molecular electronics and devices, Supermolecules, Liquid crystals, Crystals, Surface/interface, Nano particles, Colloids, Electrochemistry, Electronic properties, etc.		
33010	Structural organic chemistry and physical organic chemistry-related	33	E
	Organic crystals, Molecular recognition, Supermolecules, Organic functional materials, Extended π -electron system compounds, Heterocyclic chemistry, Organoelement chemistry, Organic reaction mechanism, Organic photochemistry, Theoretical organic chemistry, etc.		
33020	Synthetic organic chemistry-related	33	E
	Selective reactions, Asymmetric synthesis, Organometallic complex/catalysis, Catalyst design, Organocatalysts, Biocatalysis, Sustainable organic synthesis, Natural product synthesis, Process chemistry, Organic electrochemistry, etc.		

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
34010	Inorganic/coordination chemistry-related	34	E
	Coordination chemistry, Organometallic chemistry, Inorganic solid-state chemistry, Bioinorganic chemistry, Solution chemistry, Clusters, Supramolecular complexes, Coordination polymers, Typical elements, Physical properties and functions, etc.		
34020	Analytical chemistry-related	34	E
	Spectrometric analysis, Advanced measurements, Surface/interface analysis, Separation analysis, Analytical reagents, Radiochemical analysis, Electrochemical analysis, Bioanalysis, New analysis methods, etc.		
34030	Green sustainable chemistry and environmental chemistry-related	34	E
	Green process, Green catalysts, Recycle, Environmental assessment, Environmentally conscious materials, Reduction of environmental load, Environmental restoration, Resource saving, Geochemistry, Environmental radioactivity, etc.		
35010	Polymer chemistry-related	35	E
	Polymer synthesis, Polymer reactions, Precision polymerization, Functional polymers, Self-assembled polymers, Chiral polymers, Bio-related polymers, Polymer properties, Polymer structures, Polymer thin film/surface, etc.		
35020	Polymer materials-related	35	E
	Properties of polymer materials, Synthesis of polymer materials, Functional polymer materials, Liquid crystal polymers, Textiles, Rubbers, Gel, Biopolymers, Polymer composites, Polymer processing, etc.		
35030	Organic functional materials-related	35	E
	Organic semiconductors, Liquid crystals, Optical materials, Device-related materials, Electrically conductive materials, Hybrid materials, Molecular functional materials, Organic hybrid materials, Materials for energy conversion, etc.		
36010	Inorganic compounds and inorganic materials chemistry-related	36	E
	Crystals, Amorphous, Ceramics, Semiconductors, Inorganic device-related materials, Low-dimensional compounds, Porous materials, Nanoparticles, Multicomponent compounds, Hybrid materials, etc.		
36020	Energy-related chemistry	36	E
	Energy resources, Energy conversion materials, Energy carriers, Solar energy utilization, Material separation, Catalytic transformation, Battery and electrochemical materials, Energy-saving materials, Renewable energy, Unused energy, etc.		
37010	Bio-related chemistry	37	E
	Bioorganic chemistry, Bioinorganic chemistry, Biological reaction engineering, Biofunctional chemistry, Biofunctional materials, Biotechnology, etc.		
37020	Chemistry and chemical methodology of biomolecules-related	37	E
	Natural product chemistry, Biologically active compounds, Molecular mechanism of biological activities, Biofunctional molecules, Combinatorial chemistry, Metabolomic analysis, etc.		
37030	Chemical biology-related	37	E
	In vivo functional expression, Intracellular chemical reactions, Drug discovery science, Chemical library, Structure-activity relationship, Chemical probes, Biomolecular measurements, Molecular imaging, Proteomics, etc.		
38010	Plant nutrition and soil science-related	38	F
	Plant metabolism and physiology, Nutritional elements in plants, Soil classification, Soil physical chemistry, Soil organisms, etc.		

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
38020	Applied microbiology-related	38	F
	Microbial genetics/breeding, Microbial function, Microbial metabolism and physiology, Microbial applications, Control of microbes, Microbial ecology, Production of useful materials, etc.		
38030	Applied biochemistry-related	38	F
	Cellular biochemistry, Applied biochemistry, Structural biology, Regulation of bioactivity, Metabolism and physiology, Cellular function, Molecular function, Production of useful materials, etc.		
38040	Bioorganic chemistry-related	38	F
	Bioactive substances, Signal molecules, Natural products chemistry, Biosynthesis, Structure-activity relationship, Synthetic organic chemistry, Chemical biology, etc.		
38050	Food sciences-related	38	F
	Food function, Food chemistry, Nutritional chemistry, Food analysis, Food engineering, Food safety, Functional food, Nutritional epidemiology, Clinical nutrition, etc.		
38060	Applied molecular and cellular biology-related	38	F
	Molecular cell biology, Cellular bioengineering, Molecular engineering, Gene expression control, Cell-cell/intermolecular interactions, Cellular function, Production of useful materials, etc.		
39010	Science in plant genetics and breeding-related	39	F
	Genetic resources, Breeding theories, Genomic breeding, Plants with novel traits, Quality components, Stress tolerance, Yielding ability, Reproduction and multiplication, Growth physiology, Development, etc.		
39020	Crop production science-related	39	F
	Field crops, Crop yield, Crop product quality, Crop morphology, Growth prediction, Crop physiology, Field management, Low-cost cultivation techniques, Environmentally friendly agriculture, Field ecosystem, etc.		
39030	Horticultural science-related	39	F
	Plant growth, flowering, and fruit development, Nursery plant propagation and production, Crop production systems, Cultivation techniques, Protected horticulture, Controlled environment systems, Breeding and development of new cultivars, Quality of horticultural products, Postharvest physiology and management, Socio-horticulture, etc.		
39040	Plant protection science-related	39	F
	Plant pathology, Clinical plant science, Agricultural insect pest, Natural enemy, Weed, Agricultural chemicals, Integrated pest management, etc.		
39050	Insect science-related	39	F
	Sericulture insect technology, Insect genetics, Insect pathology, Insect physiology and biochemistry, Insect ecology, Chemical ecology, Systematics, Symbiosis and parasitism, Social insects, Medical entomology, etc.		
39060	Conservation of biological resources-related	39	F
	Conservation biology, Biodiversity conservation, Conservation of phylogenetic diversity, Conservation of genetic resources, Ecosystem conservation, Conservation of endemic species, Conservation of microorganisms, etc.		
39070	Landscape science-related	39	F
	Landscape architecture, Parks and open space planning, Landscape planning, Cultural landscape, Nature conservation, Landscape ecology, Parks and open space management, Parks, Environmental greening, Participatory community design, etc.		
40010	Forest science-related	40	F
	Forest ecology, Forest biodiversity, Forest genetics and breeding, Silviculture, Forest protection, Forest environments, Erosion control, Forest planning, Forest policy, etc.		

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
40020	Wood science-related	40	F
	Wood structure, Wood property, Lignocellulose, Trace element, Fungus, Wood processing, Biomass-refinery, Wood based material, Wooden building, Forest products education, etc.		
40030	Aquatic bioproduction science-related	40	F
	Aquatic environment, Fisheries, Aquatic resource management, Aquatic organisms, Aquatic ecosystem, Aquaculture, Fisheries engineering, Fishing community/fisheries policy, Fisheries economics/management/marketing, Fisheries education, etc.		
40040	Aquatic life science-related	40	F
	Aquatic nutrition, Aquatic pathology, Aquatic genetics/heredity/breeding, Aquatic physiology, Utilization of aquatic organisms and biomass, Aquatic biological chemistry, Aquatic biotechnology, Aquatic food sciences, etc.		
41010	Agricultural and food economics-related	41	F
	Food economy, Agricultural production economy, Policy for agriculture, forestry and fishery, Food system, Food marketing, International agricultural development, Trade of agricultural commodities and livestock products, Rural resources and environment, etc.		
41020	Rural sociology and agricultural structure-related	41	F
	Farm organization, Farm management, Agricultural structure, Agricultural market, Agricultural history, Rural society, Rural life, Agricultural cooperative, etc.		
41030	Rural environmental engineering and planning-related	41	F
	Irrigation and drainage, Reclamation and conservation of agricultural land, Rural planning, Rural environment, Circulation of resources and energy, Disaster prevention in rural area, Stock management of agricultural infrastructures, Hydrodynamics and hydrology, Soil physics, Design and construction materials, etc.		
41040	Agricultural environmental engineering and agricultural information engineering-related	41	F
	Agricultural production facilities, Bioproduction machinery, Environmental control, Agricultural meteorology and micrometeorology, Agricultural information, Greenhouse horticulture, Plant factory, Postharvest and supply chain, Nondestructive measurement, Remote sensing and geographic information system, etc.		
41050	Environmental agriculture-related	41	F
	Biomass, Environmental manipulation, Biodiversity, Environmental analysis, Ecosystem services, Resources circulation system, Low-carbon societies, Life-cycle assessment, Environmental friendly agriculture, Watershed management, etc.		
42010	Animal production science-related	42	F
	Breeding/genetics, Reproduction, Nutrition/feeding, Anatomy/physiology, Product, Environment, Behavior, Therapy, Grassland, Grazing, etc.		
42020	Veterinary medical science-related	42	F
	Basic veterinary science, Pathological veterinary science, Applied veterinary science, Clinical veterinary science, Animal nursing, Animal welfare, Wildlife, etc.		
42030	Animal life science-related	42	F
	Homeostasis, Cellular function, Biological defense, Integrated genetics, Development/differentiation, Biotechnology, etc.		
42040	Laboratory animal science-related	42	F
	Genetic engineering, Developmental engineering, Animal models of disease, Facility management, Laboratory animal welfare, Laboratory animal-related technology, Bioresource, etc.		

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
43010	Molecular biology-related	43	G
	Chromosome function, Chromatin, Epigenetics, Genome maintenance, Genome transmission, Chromosome re-organization, Gene expression, Non-coding RNA, Regulation of protein function, Molecular genetics, etc.		
43020	Structural biochemistry-related	43	G
	Proteins, Nucleic acids, Lipids, Carbohydrates, Biological membrane, Molecular recognition, Denaturation, Three-dimensional structural analysis, Three-dimensional structural prediction, Molecular dynamics, etc.		
43030	Functional biochemistry-related	43	G
	Enzymes, Sugar chain, Bioenergy conversion, Biological trace elements, Physiologically active substances, Cell signaling, Membrane transport, Proteolysis, Molecular recognition, etc.		
43040	Biophysics-related	43	G
	Structure biology, Physical property of biomolecules, Biomembrane, Photobiology, Molecular motor, Biometrics, Bioimaging, Systems biology, Synthetic biology, Theoretical biology, etc.		
43050	Genome biology-related	43	G
	Genome organization, Genome function, Genome diversity, Molecular evolution of genome, Genome repair/maintenance, Trans-omics, Epigenome, Gene resource, Genome dynamics, etc.		
43060	System genome science-related	43	G
	Network analyses, Synthetic biology, Biological databases, Bioinformatics, Genome analysis technology, Genome biotechnology, etc.		
44010	Cell biology-related	44	G
	Cytoskeleton, Proteolysis, Organelle dynamics, Nuclear structure and function, Extracellular matrix, Signal transduction, Cell cycle, Cell motility, Cell-cell interaction, Cellular genetics, etc.		
44020	Developmental biology-related	44	G
	Cell differentiation, Stem cells, Regeneration, Germ layer formation, Morphogenesis, Organogenesis, Fertilization, Germ cells, Regulation of gene expression, Developmental genetics, Evolution and development, etc.		
44030	Plant molecular biology and physiology-related	44	G
	Photosynthesis, Growth physiology, Plant development, Organelle, Cell wall, Responses to environment, Plant-microbe interaction, Metabolism, Plant molecular function, etc.		
44040	Morphology and anatomical structure-related	44	G
	Animal and plant morphology, Micro-organismal morphology, Molecular morphology, Microstructure, Tissue organization, Morphogenesis, Comparative endocrinology, Microscopic technology, Imaging, etc.		
44050	Animal physiological chemistry, physiology and behavioral biology-related	44	G
	Metabolic physiology, Neurophysiology, Neuroethology, Behavioral physiology, Animal physiological chemistry, Chronobiology, Comparative physiology, etc.		
45010	Genetics-related	45	G
	Genetic mechanism, Molecular genetics, Cellular genetics, Population genetics, Evolutionary genetics, Developmental genetics, Behavioral genetics, Genetic diversity, etc.		
45020	Evolutionary biology-related	45	G
	General evolutionary biology, Molecular evolution, Phenotypic evolution, Evolution of developmental traits, Evolution of ecological traits, Evolution of behaviors, Experimental evolution, Evolutionary theory, Evolution of symbiosis, Phylogenetics, Speciation, etc.		

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
45030	Biodiversity and systematics-related	45	G
	Taxonomic characters, Taxon, Classification system, Biodiversity, Phylogenetics, Evolution, Natural history, Speciation, etc.		
45040	Ecology and environment-related	45	G
	Chemical ecology, Molecular ecology, Physiological ecology, Evolutionary ecology, Behavioral ecology, Population ecology, Community ecology, Ecosystem, Conservation ecology, Natural environment, etc.		
45050	Physical anthropology-related	45	G
	Molecular anthropology and genetics, Morphology and function, Bioarchaeology, Behavior and cognition, Ecology, Primates, Evolution, Development and ontogeny, Variation and diversity, etc.		
45060	Applied anthropology-related	45	G
	Physiological anthropology, Ergonomics, Forensic anthropology, Medical anthropology, Physiological polymorphisms, Environmental adaptability, Somatic and physiological function, Anthropometry and bioengineering, etc.		
46010	Neuroscience-general-related	46	G
	Neurochemistry, Neuron, Glia, Genome, Epigenetics, Neurobiology, Information processing, Synapse, Neurogenesis, etc.		
46020	Anatomy and histopathology of nervous system-related	46	G
	Neural development, Anatomy of nervous system, Neural network structure, Neuropathology, etc.		
46030	Function of nervous system-related	46	G
	Neurophysiology, Neuropharmacology, Neurotransmission, Neuroinformatics, Behavioral neuroscience, Neural system physiology, Cerebral blood flow, Autonomic nervous system, etc.		
47010	Pharmaceutical chemistry and drug development sciences-related	47	H
	Inorganic chemistry, Organic chemistry, Medicinal chemistry, Medicinal molecular design, Drug discovery, Bio-related materials, Chemical biology, etc.		
47020	Pharmaceutical analytical chemistry and physicochemistry-related	47	H
	Environmental analysis, Bioanalysis, Physicochemistry, Biophysics, Structural biology, Radiochemistry, Bioimaging, Drug formulation design, Computer science, Information science, etc.		
47030	Pharmaceutical hygiene and biochemistry-related	47	H
	Environmental hygiene, Healthful nutrition, Disease prevention, Toxicology, Drug metabolism, Host defense, Molecular biology, Cell biology, Biochemistry, etc.		
47040	Pharmacology-related	47	H
	Pharmacology, Pharmacogenomics, Applied pharmacology, Signal transduction, Drug interactions, Drug response, Pharmacotherapy, Pharmacotoxicology, etc.		
47050	Environmental and natural pharmaceutical resources-related	47	H
	Environmental resource science, Natural products chemistry, Bioactive natural compounds, Medicinal resources, Medicinal foods, Pharmaceutical microbiology, etc.		
47060	Clinical pharmacy-related	47	H
	Pharmacokinetics, Medical informatics, Social pharmacy, Clinical pharmacy, Pharmaceutics, Regulatory science, Education for the pharmacist, etc.		
48010	Anatomy-related	48	H
	Macroscopic anatomy, Histology, Embryology, etc.		

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
48020	Physiology-related	48	H
	General physiology, Pathophysiology, Comparative physiology, Environmental physiology, etc.		
48030	Pharmacology-related	48	H
	Genomic pharmacology, Molecular and cellular pharmacology, Pathological pharmacology, Behavioral pharmacology, Pharmacology for drug discovery, Clinical pharmacology, etc.		
48040	Medical biochemistry-related	48	H
	Biofunctional molecular and medical biochemistry, Genome medical sciences, Human genetics, Disease model, etc.		
49010	Pathological biochemistry-related	49	H
	Molecular pathology, Metabolic disorders, Molecular diagnosis, etc.		
49020	Human pathology-related	49	H
	Molecular pathology, Cyto- and histo-pathology, Diagnostic pathology, etc.		
49030	Experimental pathology-related	49	H
	Disease models, Pathological regulation, Tissue regeneration, etc.		
49040	Parasitology-related	49	H
	Parasite, Vector organism, Parasite pathogenicity, Epidemiology of parasites, Control of parasite infections, etc.		
49050	Bacteriology-related	49	H
	Bacterium, Fungus, Antimicrobial resistance, Bacterial pathogenicity, Epidemiology of bacteria, Control of bacterial infections, etc.		
49060	Virology-related	49	H
	Virus, Prion, Viral pathogenicity, Epidemiology of viruses, Control of viral infections, etc.		
49070	Immunology-related	49	H
	Immune system, Immune response, Inflammation, Immune-related disorder, Immune regulation, etc.		
50010	Tumor biology-related	50	I
	Cancer and gene, Tumor development, Invasion, Metastasis, Cancer microenvironment, Cancer and signal transduction, Characteristics of cancer cells, etc.		
50020	Tumor diagnostics and therapeutics-related	50	I
	Genome analysis, Diagnostic markers, Molecule imaging, Chemotherapy, Nucleic acid therapy, Gene therapy, Immunotherapy, Molecular targeted therapy, Physical therapy, Radiation therapy, etc.		
51010	Basic brain sciences-related	51	I
	Brain-machine interface, Model animal, Computational brain science, Brain information decoding, Control technologies, Brain imaging, Brain biometrics, etc.		
51020	Cognitive and brain science-related	51	I
	Social behavior, Communication, Emotion, Decision making, Consciousness, Learning, Neuroeconomics, Neuropsychology, etc.		
51030	Pathophysiologic neuroscience-related	51	I
	Clinical neuroscience, Dolorology, Sensory impairment, Movement disorder, Neurological disorder, Neurogenesis, Neuroimmunology, Cellular degeneration, Disease model, etc.		

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
52010	General internal medicine-related	52	I
	Laboratory medicine, General practice, Geriatrics, Psychosomatic internal medicine, Oriental medicine, Palliative medicine, etc.		
52020	Neurology-related	52	I
	Neurology, Neurofunctional imaging, etc.		
52030	Psychiatry-related	52	I
	Clinical psychiatry, Biological psychiatry, Forensic mental health, etc.		
52040	Radiological sciences-related	52	I
	Diagnostic radiology, Therapeutic radiology, Radiation biology, Radiological technology, etc.		
52050	Embryonic medicine and pediatrics-related	52	I
	Fetal medicine, Neonatal medicine, Pediatrics, etc.		
53010	Gastroenterology-related	53	I
	Upper digestive tract, Lower digestive tract, Liver, Biliary tract, Pancreas, etc.		
53020	Cardiology-related	53	I
	Ischemic heart disease, Valvular heart disease, Arrhythmia, Cardiomyopathy, Heart failure, Peripheral arterial disease, Arteriosclerosis, Hypertension, etc.		
53030	Respiratory medicine-related	53	I
	Respiratory medicine, Asthma, Diffusive lung disease, COPD, Lung cancer, Pulmonary hypertension, etc.		
53040	Nephrology-related	53	I
	Acute renal failure, Chronic kidney disease, Diabetic nephropathy, Hypertension, Aqueous electrolyte metabolism, Artificial dialysis, etc.		
53050	Dermatology-related	53	I
	Dermatology, Cutaneous immune disease, Cutaneous infection, Cutaneous tumor, etc.		
54010	Hematology and medical oncology-related	54	I
	Hematological oncology, Hematological immunology, Anemia, Thrombosis and hemostasis, Chemotherapy, etc.		
54020	Connective tissue disease and allergy-related	54	I
	Connective tissue disease, Allergy, Clinical immunology, Inflammation, etc.		
54030	Infectious disease medicine-related	54	I
	Infection diagnostics, Infection therapeutics, Host defense, International infection science, etc.		
54040	Metabolism and endocrinology-related	54	I
	Energy balance, Glucose metabolism, Lipid metabolism, Purine metabolism, Bone metabolism, Electrolyte balance, Endocrinology, Neuroendocrinology, Reproductive endocrinology, etc.		
55010	General surgery and pediatric surgery-related	55	I
	Surgical basic principles, Breast surgery, Endocrine surgery, Pediatric surgery, Transplant surgery, Artificial organs science, Regeneration, Operation support, etc.		

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
55020	Digestive surgery-related	55	I
	Upper gastrointestinal surgery, Lower gastrointestinal surgery, Hepatic surgery, Biliary surgery, Pancreatic surgery, etc.		
55030	Cardiovascular surgery-related	55	I
	Coronary artery surgery, Heart valve surgery, Surgery for myocardial disease, Aortic surgery, Vascular surgery, Congenital heart surgery, etc.		
55040	Respiratory surgery-related	55	I
	Lung surgery, Mediastinal surgery, Chest wall surgery, Respiratory tract surgery, etc.		
55050	Anesthesiology-related	55	I
	Anesthesiology, Perioperative management, Pain management, Resuscitology, Palliative medicine, etc.		
55060	Emergency medicine-related	55	I
	Intensive care medicine, Emergency resuscitation science, Trauma surgery, Disaster medicine, Disaster medical care, etc.		
56010	Neurosurgery-related	56	I
	Neurosurgery, Spine and spinal cord diseases, etc.		
56020	Orthopedics-related	56	I
	Orthopedics, Rehabilitation medicine, Sports medicine, etc.		
56030	Urology-related	56	I
	Urology, Male genitalia science, etc.		
56040	Obstetrics and gynecology-related	56	I
	Obstetrics, Reproductive endocrinology, Gynecologic oncology, Female health care medicine, etc.		
56050	Otorhinolaryngology-related	56	I
	Otorhinolaryngology, Head and neck surgery, etc.		
56060	Ophthalmology-related	56	I
	Ophthalmology, Ophthalmological optics, etc.		
56070	Plastic and reconstructive surgery-related	56	I
	Plastic surgery, Reconstructive surgery, Aesthetic plastic surgery, etc.		
57010	Oral biological science-related	57	I
	Oral anatomy, Oral histology and embryology, Oral physiology, Oral biochemistry, Pharmacology for hard tissues, etc.		
57020	Oral pathobiological science-related	57	I
	Oral infectious diseases, Oral pathology, Oral experimental oncology, Immunity and inflammation, Laboratory medicine, etc.		
57030	Conservative dentistry-related	57	I
	Operative dentistry, Endodontology, Periodontology, etc.		

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
57040	Regenerative dentistry and dental engineering-related	57	I
	Regenerative dentistry, Biomaterial science, Dental materials science, Oral and maxillofacial prosthetics, Oral implantology, etc.		
57050	Prosthodontics-related	57	I
	Prosthodontics, Oral rehabilitation, Gerodontology, etc.		
57060	Surgical dentistry-related	57	I
	Oral and maxillofacial surgery, Oral maxillofacial reconstructive surgery, Dental anesthesiology, Psychosomatic medicine dentistry, Dental radiology, etc.		
57070	Developmental dentistry-related	57	I
	Orthodontics, Pediatric dentistry, etc.		
57080	Social dentistry-related	57	I
	Dental hygiene, Preventive dentistry, Oral health administration and management, Dental education, Forensic odontology, etc.		
58010	Medical management and medical sociology-related	58	I
	Medical management, Medical social science, Ethics for medical science, Ethics for medical care, Biomedical education, History of medical science, Health policy and economics, Clinical trials, Health and medical services administration, Disaster medical science, etc.		
58020	Hygiene and public health-related: including laboratory approach	58	I
	Hygiene, Public health, Epidemiology, Global health, etc.		
58030	Hygiene and public health-related: excluding laboratory approach	58	I
	Hygiene, Public health, Epidemiology, Global health, etc.		
58040	Forensics medicine-related	58	I
	Forensic medicine, Forensic pathology, Forensic toxicology, Forensic genetics, Suicide, Abuse, Clinical forensic medicine, Sudden death, etc.		
58050	Fundamental of nursing-related	58	I
	Fundamental of nursing, Nursing education, Nursing administration, etc.		
58060	Clinical nursing-related	58	I
	Critical care and emergency nursing, Perioperative nursing, Nursing of chronic illness, Oncology nursing, Psychiatric nursing, Palliative care nursing, etc.		
58070	Lifelong developmental nursing-related	58	I
	Women's health nursing, Maternal nursing, Midwifery, Family health nursing, Child health nursing, School nursing, etc.		
58080	Gerontological nursing and community health nursing-related	58	I
	Gerontological nursing, Community health nursing, Public health nursing, Disaster nursing, etc.		
59010	Rehabilitation science-related	59	I
	Rehabilitation medicine, Rehabilitation nursing, Rehabilitation medical care, Physiotherapeutics, Occupational therapy, Assistive technology, Speech and language therapy, etc.		

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
59020	Sports sciences-related	59	I
	Sports physiology, Sports biochemistry, Sports medicine, Sports sociology, Sports management, Sports psychology, Sports education, Training science, Sports biomechanics, Adapted sports science, Doping, etc.		
59030	Physical education, and physical and health education-related	59	I
	Growth developmental science, Physical and health education, Physical education in school, Educational physiology, Physical systems science, Higher brain function science, Martial arts theory, Outdoor education, etc.		
59040	Nutrition science and health science-related	59	I
	Nutritional physiology, Nutritional biochemistry, Nutritional education, Clinical nutrition, Functional food, Lifestyle-related disease, Health promotion, Aging, etc.		
60010	Theory of informatics-related	60	J
	Discrete structure, Mathematical logic, Theory of computation, Mathematical theory of programs, Computational complexity theory, Algorithm theory, Information theory, Coding theory, Theory of cryptography, Learning theory, etc.		
60020	Mathematical informatics-related	60	J
	Optimization theory, Mathematical systems theory, System control theory, System analysis, System methodology, System modeling, System simulation, Combinatorial optimization, Queueing theory, Mathematical finance, etc.		
60030	Statistical science-related	60	J
	Statistics, Data science, Modeling, Statistical inference, Multivariate analysis, Time series analysis, Statistical quality control, Applied statistics, etc.		
60040	Computer system-related	60	J
	Computer architecture, Circuit and system, LSI design, LSI testing, Reconfigurable system, Dependable architecture, Low power technology, Hardware/software codesign, Embedded system, etc.		
60050	Software-related	60	J
	Programming language, Programming methodology, Operating system, Parallel and distributed computing, Software engineering, Virtualization technology, Cloud computing, Software dependability, Software security, etc.		
60060	Information network-related	60	J
	Network architecture, Network protocol, Internet, Mobile network, Pervasive computing, Sensor network, IoT, Traffic engineering, Network management, Service platform technology, etc.		
60070	Information security-related	60	J
	Cryptography, Tamper resistance technology, Authentication, Biometrics, Access control, Malware countermeasure, Countermeasures against denial-of-service attacks, Privacy protection, Digital forensics, Security evaluation and authorization, etc.		
60080	Database-related	60	J
	Data model, Database system, Multimedia database, Information retrieval, Content management, Metadata, Big data, Geographic information system, etc.		
60090	High performance computing-related	60	J
	Parallel processing, Distributed processing, Cloud computing, Numerical analysis, Visualization, Computer graphics, High performance computing application, etc.		

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
60100	Computational science-related	60	J
	Mathematical engineering, Computational mechanics, Numerical simulation, Multi-scale modeling, Large-scale computing, Massively parallel computing, Numerical computing methods, Advanced algorithms, etc.		
61010	Perceptual information processing-related	61	J
	Pattern recognition, Image processing, Computer vision, Visual media processing, Acoustic media processing, Media editing, Media database, Sensing, Sensor fusion, etc.		
61020	Human interface and interaction-related	61	J
	Human interface, Multi-modal interface, Human-computer interaction, Computer supported cooperative work, Virtual reality, Augmented reality, Realistic communication, Wearable device, Usability, Ergonomics, etc.		
61030	Intelligent informatics-related	61	J
	Search, Inference, Machine learning, Knowledge acquisition, Intelligent system, Intelligent information processing, Natural language processing, Data mining, Ontology, Agent system, etc.		
61040	Soft computing-related	61	J
	Neural network, Evolutionary computation, Fuzzy theory, Chaos, Complex systems, Probabilistic information processing, etc.		
61050	Intelligent robotics-related	61	J
	Intelligent robot, Behavior and environment recognition, Planning, Sensory behavior system, Autonomous system, Digital human, Real world information processing, Physical agents, Intelligent space, etc.		
61060	Kansei informatics-related	61	J
	Kansei design, Kansei cognitive science, Kansei psychology, Kansei robotics, Kansei measurement evaluation, Kansei interface, Kansei physiology, Kansei material science, Kansei pedagogy, Kansei brain science, etc.		
62010	Life, health and medical informatics-related	62	J
	Bioinformatics, Life informatics, Biological information, Neuroinformatics, Neural information processing, Molecular computing, DNA computing, Medical information, Health information, Medical image, etc.		
62020	Web informatics and service informatics-related	62	J
	Web system, Social web, Semantic web, Web mining, Social network analysis, Service engineering, Educational service, Medical service, Welfare service, Social service, Information culture, etc.		
62030	Learning support system-related	62	J
	Media literacy, Learning media, Social media, Learning content, Learning management, Learning support, Remote learning, e-Learning, etc.		
62040	Entertainment and game informatics-related	62	J
	Music information processing, 3D content, Animation, Game programming, Network entertainment, Media art, Digital museum, Experience design, etc.		
63010	Environmental dynamic analysis-related	63	K
	Global warming, Environmental change, Water and material cycle, Polar regions, Chemical oceanography, Biological oceanography, Environmental measurements, Environmental model, Environmental information, Remote sensing, etc.		
63020	Radiation influence-related	63	K
	Radiation, Measurement, Control, Repair, Biological effects, Risk, etc.		

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
63030	Chemical substance influence on environment-related	63	K
	Toxicology, Toxic substance to human, Trace chemical substance, Endocrine disruptor, Repair, etc.		
63040	Environmental impact assessment-related	63	K
	Atmosphere, Hydrosphere, Terrestrial impact, Impact assessment on human health, Social and economic impacts, Impact assessment on the future generation, Environmental impact assessment, Assessment methods, Monitoring, Simulation, etc.		
64010	Environmental load and risk assessment-related	64	K
	Environmental analysis, Environmental load analysis, Environmental monitoring, Dynamics of environmental pollution, Environmental modelling, Evaluation of contamination, Exposure assessment, Toxicity evaluation, Environmental assessment, Chemical substance management, etc.		
64020	Environmental load reduction and remediation-related	64	K
	Removal of contamination, Treatment of waste material, Control of contamination source, Disposal of waste material, Environmental load reduction, Remediation measure of contamination, Noise and vibration reduction, Countermeasure of ground settlement, Bioremediation, Radioactive decontamination, etc.		
64030	Environmental materials and recycle technology-related	64	K
	Recycle materials, Valuable materials recovery, Separation, refining and purification, Environment-conscious design, Recycle chemistry, Green production, Zero emission, Resource circulation, Renewable energy, Biomass utilization, etc.		
64040	Social-ecological systems-related	64	K
	Biodiversity, Conservation biology, Ecosystem services, Natural capital, Impact analysis on ecosystem, Ecosystem management, Ecosystem restoration, Ecological engineering, Regional environmental planning, Impact of climate change, etc.		
64050	Sound material-cycle social systems-related	64	K
	Sound material-cycle systems, Material and energy budget analysis, Low carbon society, Unused energy, Regional revitalization, Water use system, Industrial symbiosis, Life cycle assessment (LCA), Integrated environmental management, 3R (reduction, reuse, recycle) social systems, etc.		
64060	Environmental policy and social systems-related	64	K
	Environmental philosophy and ethics, Environmental laws, Environmental economics, Environmental information, Environmental education, Environmental social activities, Environmental management and governance, Consensus forming, Environmental safety and security, Social and public system, Sustainable development, etc.		
90010	Design-related	1, 23, 61	A, C, J
	Information design, Environmental design, Industrial design, Spatial design, Design history, Theory of design, Design standard, Design support, Evaluation of design, Design education, etc.		
90020	Library and information science, humanistic and social informatics-related	2, 62	A, J
	Library science, Information services, Information organizing, Information retrieval, Information media, Bibliometrics, Information resources, Information ethics, Digital humanities, Social Informatics, Digital archives, etc.		
90030	Cognitive science-related	10, 61	A, J
	Cognitive science in general, Cognitive models, Kansei, Human factors, Cognitive and brain science, Comparative cognition, Cognitive linguistics, Cognitive engineering, etc.		

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
90110	Biomedical engineering-related	90	D, I
	Medical imaging, Medical modeling, Biological simulation, Biometrics, Artificial organs, Tissue engineering, Biophysical properties, Biocontrol, Biomechanics, Nanobio systems, etc.		
90120	Biomaterials-related	90	D, I
	Biofunctional materials, Tissue engineering materials, Biocompatible materials, Nanobio materials, Drug delivery systems, Stimuli-sensitive materials, Genetic engineering material, etc.		
90130	Medical systems-related	90	D, I
	Medical ultrasound system, Diagnostic imaging system, Laboratory diagnosis systems, Minimally invasive treatment systems, Remote diagnosis and treatment systems, Organ preservation systems, Medical information systems, Computer-assisted surgery, Medical robot, etc.		
90140	Medical technology assessment-related	90	D, I
	Regulatory science, Safety evaluation, Clinical study, Medical technology ethics, Medical devices, etc.		
90150	Medical assistive technology-related	90	D, I
	Healthcare and rehabilitation engineering, Life assist technology, Care support technology, Accessibility design, Universal design, Rehabilitation and nursing robot, Assist device for artificial internal organ, Rehabilitation devices, Nursing science and engineering, etc.		

The Review Section Table (Table for Medium-sized and Broad Sections)

When selecting a review section, applicants should first acquire an overall picture of the review sections based on the Review Section Table (Overview). In addition, check the Review Section Table (Table for Medium-sized and Broad Sections) for the detailed contents of each section and select a review section for their research proposal.

Also, some items of Basic Section may be presented in plural Medium-sized and Broad Sections. The items of Basic Section presented in plural Medium-sized Section are 9 and 3 items among 9 are presented in plural Medium-sized and Broad Sections (as shown below).

In addition, five other Basic Sections (90110-90150) may be presented in only one Medium-sized Section and two Broad Sections.

【Basic sections may be presented in plural Medium-sized and Broad Section】

Basic Section Item	Basic Section Description	Medium-sized Sections corresponding Basic Sections	Broad Sections corresponding Basic Sections
02090	Japanese language education-related	2, 9	A
02100	Foreign language education-related	2, 9	A
80010	Area studies-related	4, 6	A
80020	Tourism studies-related	4, 7, 8	A
80030	Gender studies-related	4, 6, 8	A
80040	Quantum beam science-related	1 4, 1 5	B
90010	Design-related	1, 2 3, 6 1	A, C, J
90020	Library and information science, humanistic and social informatics-related	2, 6 2	A, J
90030	Cognitive science-related	1 0, 6 1	A, J
90110	Biomedical engineering-related	9 0	D, I
90120	Biomaterials-related	9 0	D, I
90130	Medical systems-related	9 0	D, I
90140	Medical technology assessment-related	9 0	D, I
90150	Medical assistive technology-related	9 0	D, I

【Medium-sized section may be presented in plural Broad Section】

Medium-sized Section Item	Medium-sized section Description	Broad Sections corresponding Medium-sized Section
9 0	Biomedical engineering and related fields	D, I

Broad Section A

Medium-sized Section 1 : Philosophy, art, and related fields

Basic Section	Examples of related research content
01010	Philosophy and ethics-related
	Philosophy in general, Ethics in general, Western philosophy, Western ethics, Japanese philosophy, Japanese ethics, Applied ethics, etc.
01020	Chinese philosophy, Indian philosophy and Buddhist philosophy-related
	Chinese philosophy/thought, Indian philosophy/thought, Buddhist philosophy, Bibliography, Philology, etc.
01030	Religious studies-related
	History of religions, Philosophy of religion, Theology, Sociology of religion, Psychology of religion, Anthropology of religion, Studies of religious folklore, Mythology, Bibliography, Philology, etc.
01040	History of thought-related
	History of thought in general, History of Western thought, History of Eastern thought, History of Japanese thought, etc.
01050	Aesthetics and art studies-related
	Philosophy of art, Aesthetics, Miscellaneous art studies, etc.
01060	History of arts-related
	Japanese art, Eastern art, Western art, Contemporary art, Craft, Design, Architecture, Costume, Photography, etc.
01070	Theory of art practice-related
	Art expression, Arts management, Art policy, Art production, etc.
01080	Sociology of science, history of science and technology-related
	Sociology of science, History of science, History of technology, History of medicine, Industrial archeology, Philosophy of science, Foundation of science, STS (Science, technology and society), etc.
90010	Design-related
	Information design, Environmental design, Industrial design, Spatial design, Design history, Theory of design, Design standard, Design support, Evaluation of design, Design education, etc.

Medium-sized Section 2 : Literature, linguistics, and related fields

Basic Section	Examples of related research content
02010	Japanese literature-related
	Japanese literature in general, Ancient literature, Medieval literature, Chinese classics in Japan, Bibliography, Philology, Premodern literature, Modern literature, Contemporary literature, Literary theory, etc.
02020	Chinese literature-related
	Chinese literature, Bibliography, Philology, Literary theory, etc.
02030	English literature and literature in the English language-related
	English literature, American literature, Literature in the English language, Literary theory, Bibliography, Philology, etc.
02040	European literature-related
	French literature, Literature in the French language, German literature, Literature in the German language, Classics, Russian and East European literature, Literature in other European languages, Literary theory, Bibliography, Philology, etc.

02050	Literature in general-related
	Literature in other languages and areas, Literary theory, Comparative literature, Bibliography, Philology, Literature education, etc.
02060	Linguistics-related
	Phonetics/phonology, Semantics/pragmatics, Morphosyntax, Sociolinguistics, Contrastive linguistics, Psycholinguistics, Neurolinguistics, Historical linguistics, Corpus linguistics, Endangered and minority languages, etc.
02070	Japanese linguistics-related
	Phonetics/phonology, Writing systems, Lexicon and semantics, Grammar, Stylistics, Pragmatics, Language life, Dialect, History of the Japanese language, History of Japanese linguistics, etc.
02080	English linguistics-related
	Phonetics/phonology, Lexicon and semantics, Grammar, Stylistics, Pragmatics, Sociolinguistics, Diversity of the English language, Corpus linguistics, History of the English language, History of English linguistics, etc.
02090	Japanese language education-related
	Research on learners, Language acquisition, Teaching material, Curriculum evaluation, Japanese language education for specific purposes, Bilingual education, Research on teachers, Japanese language for Japanese language education, History of Japanese language education, Cross-cultural understanding, etc.
02100	Foreign language education-related
	Learning method, Computer-assisted language learning (CALL), Teaching material, Language testing, Theory of second language acquisition, Early English education, History of foreign language education and language policies, Curriculum evaluation, Training foreign language teachers, Cross-cultural understanding, etc.
90020	Library and information science, humanistic and social informatics-related
	Library science, Information services, Information organizing, Information retrieval, Information media, Bibliometrics, Information resources, Information ethics, Digital humanities, Social Informatics, Digital archives, etc.

Medium-sized Section 3: History, archaeology, museology, and related fields

Basic Section	Examples of related research content
03010	Historical studies in general-related
	Historical theory, Historical methodology, Research in historical materials, Memory and medium, World history, History of cultural and diplomatic exchange, Comparative history, etc.
03020	Japanese history-related
	Japanese history in general, History of ancient Japan, History of medieval Japan, History of early modern Japan, History of modern Japan, History of local Japan, History of Japanese culture, History of Japanese religion, History of Japanese environment, History of Japanese city, History of cultural and diplomatic exchange, Comparative history, Research in historical materials, etc.
03030	History of Asia and Africa-related
	History of pre-modern China, History of modern China, East Asian history, Central Eurasian history, Southeast Asian history, Oceanian history, South Asian history, West Asian history, African history, History of cultural and diplomatic exchange, Comparative history, Research in historical materials, etc.
03040	History of Europe and America-related
	Ancient European history, Medieval European history, Modern and contemporary West European history, Modern and contemporary East European history, North and South American history, History of cultural and diplomatic exchange, Comparative history, Research in historical materials, etc.
03050	Archaeology-related
	Archaeology in general, Prehistoric archaeology, Historical archaeology, Japanese archaeology, Asian archaeology, Ancient civilizations, History of material culture, Experimental archaeology, Information archaeology, Study of buried cultural property, etc.

03060	Cultural assets study-related
	Dating methods, Material analysis, Production techniques, Conservation science, Archaeological prospection, Plant and animal residues, Human remains, Cultural heritage, Cultural resources, Cultural property policy, etc.
03070	Museology-related
	Exhibition studies, Museum pedagogy, Museum informatics, Museum business management, Public finance and administration of museums, Museum material resources, History of museology, etc.

Medium-sized Section 4: Geography, cultural anthropology, folklore, and related fields

Basic Section	Examples of related research content
04010	Geography-related
	Geography in general, Land use, Landscape, Environmental system, Geomorphology, Climatology, Hydrology, Cartography, Geographic information system, Regional planning, etc.
04020	Human geography-related
	Human geography in general, Economic geography, Social geography, Political geography, Cultural geography, Urban geography, Rural geography, Historical geography, Regional geography, Geography education, etc.
04030	Cultural anthropology and folklore-related
	Cultural anthropology in general, Folklore in general, Material culture, Ecology, Social relationship, Religion, Arts, Health care, Border crossing, Minority, etc.
80010	Area studies-related
	Area studies in general, Cross-regional comparative studies, Aid, International cooperation, Interregional exchange, Environment, Transnationalism, Globalization, Social development, etc.
80020	Tourism studies-related
	Tourism studies in general, Tourism, Tourism resources, Tourism policy, Tourism industry, Regional development, Tourists, Pilgrimage, etc.
80030	Gender studies-related
	Gender studies in general, Feminism, Sexuality, Queer studies, Labor, Violence, Prostitution, Reproductive technology, Gender equality, etc.

Medium-sized Section 5 :Law and related fields

Basic Section	Examples of related research content
05010	Legal theory and history-related
	Legal philosophy, Roman law, Legal history, Sociology of law, Comparative law, Foreign law, Law and policy, Law and economics, Judicial system, etc.
05020	Public law-related
	Constitutional law, Administrative law, Tax law, etc.
05030	International law-related
	Public international law, Private international law, International human rights law, International economic law, EU law, etc.
05040	Social law-related
	Labor law, Economic law, Social security law, Education law, etc.
05050	Criminal law-related
	Criminal law, Criminal procedure, Criminology, Criminal justice policy, Juvenile law, Law and psychology, etc.
05060	Civil law-related
	Civil law, Commercial law, Civil procedure, Insolvency law, Alternative dispute resolution, etc.

05070	New fields of law-related
	Environmental law, Medical law, Information law, Consumer law, Intellectual property law, Law and gender, Legal profession, etc.

Medium-sized Section 6: Political science and related fields

Basic Section	Examples of related research content
06010	Politics-related
	Political theory, History of political thought, Political history, Japanese political history, Japanese politics, Political process, Electoral studies, Political economy, Public administration, Local government, Comparative politics, Public policy, etc.
06020	International relations-related
	Theory of international relations, Modern international relations, Diplomatic history, International history, Foreign policy, International security, International political economy, Global governance, International cooperation, etc.
80010	Area studies-related
	Area studies in general, Cross-regional comparative studies, Aid, International cooperation, Interregional exchange, Environment, Transnationalism, Globalization, Social development, etc.
80030	Gender studies-related
	Gender studies in general, Feminism, Sexuality, Queer studies, Labor, Violence, Prostitution, Reproductive technology, Gender equality, etc.

Medium-sized Section 7 :Economics, business administration, and related fields

Basic Section	Examples of related research content
07010	Economic theory-related
	Microeconomics, Macroeconomics, Game theory, Behavioral economics, Experimental economics, Economic theory, Evolutionary economics, Economic institutions, Economic systems, etc.
07020	Economic doctrines and economic thought-related
	Economic doctrines, Economic thought, Social thought, Economic philosophy, etc.
07030	Economic statistics-related
	Statistical system, Statistical research, Population statistics, Income/wealth distribution, National accounts, Econometrics, Financial econometrics, etc.
07040	Economic policy-related
	International economics, Industrial organization, Economic development, Urban economics, Regional economy, Environmental and resource economics, Japanese economy, Economic policy, Transportation economics, Development economics, International development, etc.
07050	Public economics and labor economics-related
	Public finance, Public economics, Health economics, Labor economics, Social security, Education economics, Law and economics, Political economy, etc.
07060	Money and finance-related
	Monetary economics, Finance, International finance, Corporate finance, Financial engineering, Insurance, etc.
07070	Economic history-related
	Economic history, Business history, Industrial history, etc.
07080	Business administration-related
	Corporation theory, Organization theory, Organizational behavior, Corporate strategy, Business management, Human resource management, Management of technology, International business, Management information, Industrial management, Management in general, etc.

07090	Commerce-related
	Marketing, Consumer behavior, Distributive sciences, Logistics, Commerce in general, etc.
07100	Accounting-related
	Financial accounting, Management accounting, Auditing, Accounting in general, etc.
80020	Tourism studies-related
	Tourism studies in general, Tourism, Tourism resources, Tourism policy, Tourism industry, Regional development, Tourists, Pilgrimage, etc.

Medium-sized Section 8 :Sociology and related fields

Basic Section	Examples of related research content
08010	Sociology-related
	Sociology in general, Community, Family, Labor, Sociology of welfare, Gender, Media, Ethnicity, Social movements, Social research, Sociology of medicine, Social demography, etc.
08020	Social welfare-related
	Social work, Social policy, Social welfare history, Child welfare, Social welfare for people with disabilities, Social welfare for aging, Community welfare, Poverty, Volunteerism, Social welfare in general, etc.
08030	Family and consumer sciences, and culture and living-related
	Culture and living, Home economics, Consumer affairs, Lifestyle, Culture of clothing, Culture of food, Culture of dwelling, Dress and fashion, Diet habits, Housing, Family and consumer sciences in general, Family and consumer education, etc.
80020	Tourism studies-related
	Tourism studies in general, Tourism, Tourism resources, Tourism policy, Tourism industry, Regional development, Tourists, Pilgrimage, etc.
80030	Gender studies-related
	Gender studies in general, Feminism, Sexuality, Queer studies, Labor, Violence, Prostitution, Reproductive technology, Gender equality, etc.

Medium-sized Section 9 :Education and related fields

Basic Section	Examples of related research content
09010	Education-related
	History of education, Philosophy of education, Curriculum and pedagogy, Evaluation of education, Teacher and trainer, School education, Social and community education, Vocational education and training, Lifelong learning, Institutions and administration, etc.
09020	Sociology of education-related
	Sociology of education, Socialization, Educational organization and system, Destination and career formation, Class disparities, Gender, Education policy, Comparative education, Globalization and development, etc.
09030	Childhood and nursery/pre-school education-related
	Childhood, Nursery/pre-school education, Right of child, Development, Contents and methods of child care, Childcare facilities and kindergarten, Caregiver and pre-school teacher, Child care support, Childhood culture, History and thought, etc.
09040	Education on school subjects and primary/secondary education-related
	Education of individual subjects, Education excluding subjects, Student guidance and counselling, Career education, School management, Teacher education, ESD, Environmental education, Literacy, etc.
09050	Tertiary education-related
	Policy, Admission and articulation, Curriculum, Career guidance, Teacher and staff, Scientific research, Regional link and contribution, Globalization, Management and governance, Non-university higher education, etc.

09060	Special needs education-related
	Philosophy and history, Inclusion and cohesive society, Instructions and supports, Developmental disabilities, Emotional disturbance, Intellectual disabilities, Language disorders, Physical disabilities, Career education, etc.
09070	Educational technology-related
	Curriculum development, Teaching-learning support systems, Utilization of media, Utilization of ICT, Teacher's education, Information literacy, etc.
09080	Science education-related
	Science education, Science communication, Scientific literacy, Science and society, etc.
02090	Japanese language education-related
	Research on learners, Language acquisition, Teaching material, Curriculum evaluation, Japanese language education for specific purposes, Bilingual education, Research on teachers, Japanese language for Japanese language education, History of Japanese language education, Cross-cultural understanding, etc.
02100	Foreign language education-related
	Learning method, Computer-assisted language learning (CALL), Teaching material, Language testing, Theory of second language acquisition, Early English education, History of foreign language education and language policies, Curriculum evaluation, Training foreign language teachers, Cross-cultural understanding, etc.

Medium-sized Section 10 : Psychology and related fields

Basic Section	Examples of related research content
10010	Social psychology-related
	Social psychology in general, Self, Group, Attitude and behavior, Affection/emotion, Interpersonal relation, Social issues, Culture, etc.
10020	Educational psychology-related
	Educational psychology in general, Development, Family, School, Clinical practice, Personality, Learning, Assessment and evaluation, etc.
10030	Clinical psychology-related
	Clinical psychology in general, Psychological disorder, Assessment, Psychological intervention, Training, Mental health, Crime and delinquency, Community, etc.
10040	Experimental psychology-related
	Experimental psychology in general, Sensation, Perception, Attention, Memory, Language, Emotion, Learning, etc.
90030	Cognitive science-related
	Cognitive science in general, Cognitive models, Kansei, Human factors, Cognitive and brain science, Comparative cognition, Cognitive linguistics, Cognitive engineering, etc.

Broad Section B

Medium-sized Section 11 : Algebra, geometry, and related fields

Basic Section	Examples of related research content
11010	Algebra-related
	Group theory, Ring theory, Representation theory, Algebraic combinatorics, Number theory, Arithmetic geometry, Algebraic geometry, Algebraic analysis, etc.
11020	Geometry-related
	Differential geometry, Riemannian geometry, Symplectic geometry, Complex geometry, Topology, Differential topology, Low dimensional topology, etc.

Medium-sized Section 12: Analysis, applied mathematics, and related fields	
Basic Section	Examples of related research content
12010	Basic analysis-related
	Functional analysis, Complex analysis, Probability theory, Harmonic analysis, Operator theory, Spectral analysis, Operator algebras, Algebraic analysis, Representation theory, etc.
12020	Mathematical analysis-related
	Functional equations, Real analysis, Dynamical system, Variational method, Nonlinear analysis, Applied analysis, etc.
12030	Basic mathematics-related
	Mathematical logic and foundations, Information theory, Discrete mathematics, Computer mathematics, etc.
12040	Applied mathematics and statistics-related
	Numerical analysis, Mathematical modelling, Optimal control, Game theory, Statistical mathematics, etc.
Medium-sized Section 13: Condensed matter physics and related fields	
Basic Section	Examples of related research content
13010	Mathematical physics and fundamental theory of condensed matter physics-related
	Statistical physics, Fundamental theory of condensed matter physics, Mathematical physics, Nonequilibrium nonlinear physics, Fluid dynamics, Computational physics, Quantum information theory, etc.
13020	Semiconductors, optical properties of condensed matter and atomic physics-related
	Semiconductors, Dielectrics, Atoms and molecules, Mesoscopic systems, Crystals, Surfaces and interfaces, Optical properties of condensed matter, Quantum electronics, Quantum information, etc.
13030	Magnetism, superconductivity and strongly correlated systems-related
	Magnetism, Strongly correlated electron systems, Superconductivity, Quantum fluids and solids, Molecular solids, etc.
13040	Biophysics, chemical physics and soft matter physics-related
	Physics of biological phenomena, Physics of biological matters, Liquids and glasses, Soft matters, Rheology, etc.
Medium-sized Section 14: Plasma science and related fields	
Basic Section	Examples of related research content
14010	Fundamental plasma-related
	Basic plasmas, Magnetized plasmas, Laser plasmas, Strongly coupled plasmas, Plasma diagnostics, Astrophysical and space plasmas, etc.
14020	Nuclear fusion-related
	Plasma confinement, Plasma control, Plasma heating, Plasma diagnostics, Edge plasma, Plasma wall interaction, Inertial fusion, Fusion material, Fusion system, etc.
14030	Applied plasma science-related
	Plasma processing, Plasma photonics, Plasma material science, General plasma applications, etc.
80040	Quantum beam science-related
	Accelerators, Beam physics, Radiation detectors, Beam control, Applied quantum beam science, etc.

Medium-sized Section 15: Particle-, nuclear-, astro-physics, and related fields	
Basic Section	Examples of related research content
80040	Quantum beam science-related
	Accelerators, Beam physics, Radiation detectors, Beam control, Applied quantum beam science, etc.
15010	Theoretical studies related to particle-, nuclear-, cosmic ray and astro-physics
	Particle physics, Nuclear physics, Cosmic-ray physics, Astrophysics, Relativity, Gravity, etc.
15020	Experimental studies related to particle-, nuclear-, cosmic ray and astro-physics
	Particle physics, Nuclear physics, Cosmic-ray physics, Astrophysics, Relativity, Gravity, etc.
Medium-sized Section 16: Astronomy and related fields	
Basic Section	Examples of related research content
16010	Astronomy-related
	Optical/infrared astronomy, Radio astronomy, Solar physics, Astrometry, Theoretical astronomy, X-ray/ γ -ray astronomy, etc.
Medium-sized Section 17: Earth and planetary science and related fields	
Basic Section	Examples of related research content
17010	Space and planetary sciences-related
	Solar-terrestrial physics, Aeronomy, Planetary science, Exoplanetary science, Extraterrestrial material science, etc.
17020	Atmospheric and hydrospheric sciences-related
	Climate system, Atmospheric science, Ocean science, Limnology, Glaciology, Paleoclimatology, etc.
17030	Human geosciences-related
	Geoenvironmental science, Natural disaster science, Geospatial information science, Quaternary research, Earth resources science, etc.
17040	Solid earth sciences-related
	Solid earth geophysics, Geology, Earth's interior material science, Solid earth geochemistry, etc.
17050	Biogeosciences-related
	Origin and evolution of life, Extremophile biology, Biogeochemistry, Paleoenvironmental science, Paleontology, etc.

Broad Section C

Medium-sized Section 18: Mechanics of materials, production engineering, design engineering, and related fields	
Basic Section	Examples of related research content
18010	Mechanics of materials and materials-related
	Structural mechanics, Fatigue, Fracture, Biomaterials, Material design, Material characteristics, Material evaluation, etc.
18020	Manufacturing and production engineering-related
	Machine tools, Machining, Non-traditional machining, Ultraprecision machining, Additive manufacturing, Precision metrology, Manufacturing systems, Computer-aided technology, Process planning, etc.

	18030	Design engineering-related
		Product design, Service design, Design for reliability, Maintainability design, Lifecycle engineering, Reverse engineering, Safety design, Design engineering, etc.
	18040	Machine elements and tribology-related
		Machine elements, Mechanisms, Tribology, Actuators, Micromachines, etc.
Medium-sized Section 19: Fluid engineering, thermal engineering, and related fields		
	Basic Section	Examples of related research content
19010	Fluid engineering-related	
	Fluid machinery, Flow measurement, Computational fluid dynamics, Turbulence, Multiphase flow, Compressible flow, Incompressible flow, etc.	
19020	Thermal engineering-related	
	Heat transfer, Convection, Combustion, Thermophysical properties, Refrigeration and air-conditioning, Heat engine, Energy conversion, etc.	
Medium-sized Section 20: Mechanical dynamics, robotics, and related fields		
	Basic Section	Examples of related research content
20010	Mechanics and mechatronics-related	
	Kinematics, Kinetics, Vibration, Acoustics, Automation, Learning control, Mechatronics, Micro/nano mechatronics, Biomechanics, etc.	
20020	Robotics and intelligent system-related	
	Robotics, Intelligent system, Human mechanical system, Human interface, Planning, Intelligent spatial system, Virtual reality, Augmented reality, etc.	
Medium-sized Section 21: Electrical and electronic engineering and related fields		
	Basic Section	Examples of related research content
21010	Power engineering-related	
	Electrical energy-related, Energy conservation, Power system engineering, Electric machinery, Power electronics, Effective utilization of electric energy, Electromagnetic compatibility, etc.	
21020	Communication and network engineering-related	
	Information theory, Nonlinear theory, Signal processing, Wired/wireless communication systems, Modulation/demodulation, Antennas, Networks, Multimedia, Cryptography/security, etc.	
21030	Measurement engineering-related	
	Measurement theory, Measuring instruments, Applied wave metrology, Measurement systems, Signal processing, Sensing devices, etc.	
21040	Control and system engineering-related	
	Control theory, System theory, Control systems, Knowledge-based control systems, System information processing, System control applications, Biosystems engineering, etc.	
21050	Electric and electronic materials-related	
	Semiconductor, Dielectric materials, Magnetic materials, Organic materials, Superconductor, Composite materials, Thin films, Quantum structures, Thick films, Fabrication/characterization methods, etc.	
21060	Electron device and electronic equipment-related	
	Electron devices, Circuit design, Optical devices, Spintronic devices, Millimeter wave/terahertz wave, Applied wave devices, Storage devices, Displays, Micro fabrication process technology, Implementation technology, etc.	

Medium-sized Section 22: Civil engineering and related fields	
Basic Section	Examples of related research content
22010	Civil engineering material, execution and construction management-related
	Concrete, Steel, Composite material, Wood, Pavement material, Repair and reinforce material, Execution, Maintenance, Construction management, Underground space, etc.
22020	Structure engineering and earthquake engineering-related
	Applied mechanics, Structure engineering, Steel structure, Concrete structure, Composite structure, Wind engineering, Earthquake engineering, Aseismatic structure, Earthquake prevention, etc.
22030	Geotechnical engineering-related
	Soil mechanics, Foundation engineering, Rock engineering, Engineering Geology, Ground behavior, Soil structure, Geo-disaster prevention, Geoenvironmental engineering, Tunnel engineering, Soil environment, etc.
22040	Hydroengineering-related
	Hydraulics, Environmental hydraulics, Hydrology, River engineering, Water resource engineering, Coastal engineering, Port and harbor engineering, Ocean engineering, etc.
22050	Civil engineering plan and transportation engineering-related
	Civil engineering plan, Regional urban planning, Spatial planning, Disaster prevention plan, Transportation plan, Transportation engineering, Railway engineering, Surveying and remote sensing, Landscape design, Civil engineering history, etc.
22060	Environmental systems for civil engineering-related
	Environment plan, Environmental system, Environment conservation, Water serve and drainage systems, Waste, Water environment, Atmospheric circulation, Noise and vibration, Environment ecology, Environmental monitoring, etc.
Medium-sized Section 23: Architecture, building engineering, and related fields	
Basic Section	Examples of related research content
23010	Building structures and materials-related
	Load theory, Structural analysis, Structural design, Structures, Earthquake resistant design, Foundation, Geotechnics, Structural material, Maintenance, Building construction method, etc.
23020	Architectural environment and building equipment-related
	Sound environment, Vibration environment, Light environment, Heat environment, Air environment, Environmental psychology/physiology, Building equipment, Fire engineering, Urban environment, Environment design, etc.
23030	Architectural planning and city planning-related
	Planning theory, Design theory, Housing theory, Buildings, Urban/regional planning, Administration, Building economics, Production management, Disaster prevention planning, Landscape, etc.
23040	Architectural history and design-related
	Architectural history, Urban history, Architectural theory, Design, Landscape, Preservation, Renovation, etc.
90010	Design-related
	Information design, Environmental design, Industrial design, Spatial design, Design history, Theory of design, Design standard, Design support, Evaluation of design, Design education, etc.
Medium-sized Section 24: Aerospace engineering, marine and maritime engineering, and related fields	
Basic Section	Examples of related research content
24010	Aerospace engineering-related
	Thermo-fluid dynamics, Structural strength, Propulsion, Aerospace craft design, Production engineering, Aircraft system, Specific aircraft, Aerodynamics, Spacecraft system, Space utilization, etc.

Broad Section C	24020	Marine engineering-related Navigation, Structural mechanics, Structural design, Production technology, Marine propulsion, Marine transport, Marine development engineering, Underwater engineering, Polar engineering, Marine environmental technology, etc.
	Medium-sized Section 25 : Social systems engineering, safety engineering, disaster prevention engineering, and related fields	
	Basic Section	Examples of related research content
	25010	Social systems engineering-related Social systems, Industrial engineering, Operations research, Industrial management, Reliability engineering, Policy science, Regulatory science, Quality control, etc.
	25020	Safety engineering-related Safety engineering, Safety system, Risk engineering, Risk management, Work safety, Product safety, Safety information, Human engineering, Liability engineering, etc.
	25030	Disaster prevention engineering-related Disaster prediction, Hazard map, Building prevention against disaster, Lifeline prevention against disaster, Regional disaster prevention planning, Risk evaluation of disaster, Disaster prevention policy, Disaster resilience, etc.
	Broad Section D	
	Medium-sized Section 26 : Materials engineering and related fields	
	Basic Section	Examples of related research content
	26010	Metallic material properties-related Electric and magnetic properties, Electronic information properties, Metastable states, Diffusion, Phase transformation, Phase diagram, Crystal lattice defects, Mechanical properties, Thermal and optical properties, Materials computational science, etc.
26020	Inorganic materials and properties-related Functional ceramics, Functional glasses, Structural ceramics, Carbon-based materials, Crystal structure analysis, Microstructure control, Electric properties, Mechanical properties, Physical and chemical properties, Grain boundary, etc.	
26030	Composite materials and interfaces-related Functional composite materials, Structural composite materials, Biocompatible composite materials, Polymer composite, Surface treatment, Dispersion control, Joining and welding, Adhesive bonding, Interface properties, Gradient function, etc.	
26040	Structural materials and functional materials-related Social infrastructure materials, Toughness, Medical welfare materials, Functional polymer materials, Reliability, Photo-functional materials, Sensor materials, Energy materials, Battery functional materials, Environment functional materials, etc.	
26050	Material processing and microstructure control-related Processing and molding, Thermal treatment, Crystal microstructure control, Laser processing, Precision processing, Polishing, Powder metallurgy, Coatings, Metal plating, Corrosion and protection, etc.	
26060	Metals production and resources production-related Separation and purification, Melting and solidifying, Crystal growth, Casting, Resource security reservation, Scarce resources substitution, Low environment impact, Recycle, Ecomaterials, Energy saving, etc.	
Medium-sized Section 27 : Chemical engineering and related fields		
Basic Section	Examples of related research content	
27010	Transport phenomena and unit operations-related Phase equilibrium, Transport properties, Momentum/heat/mass transfer, Fluid-phase unit operation, Adsorption, Membrane separation, Mixing, Powder technology, Crystallization, Film formation, etc.	

27020	Chemical reaction and process system engineering-related
	Reaction operation, Novel reaction process, Reaction mechanism, Reactor design, Materials synthesis process, Micro-chemical process, Process control, Process system design, Process informatics, etc.
27030	Catalyst and resource chemical process-related
	Catalysis, Catalyst preparation, Catalytic function, Energy conversion process, Energy development, Energy-saving technology, Resources effective utilization technology, etc.
27040	Biofunction and bioprocess engineering-related
	Biocatalyst engineering, Biofunction engineering, Food engineering, Medicochemical engineering, Bioproduction process, Nano-bioprocess, Bioreactor, Bioseparation, Biosensor, Biorefinery, etc.

Medium-sized Section 28: Nano/micro science and related fields

Basic Section	Examples of related research content
28010	Nanometer-scale chemistry-related
	Nanostructure creation, Clusters, Nanoparticles, Mesoscopic chemistry, Superstructures, Nanometer-scale surfaces and interfaces, Self-assembly, Nanocarbons, Molecular devices, Nanometer-scale optical devices, etc.
28020	Nanostructural physics-related
	Physics in nanoscale materials and structures, Nanoprobes, Quantum effects, Quantum dots, Quantum devices, Electron devices, Spin devices, Nanotribology, Nanocarbon physics, etc.
28030	Nanomaterials-related
	Creation of nanomaterials, Analysis of nanomaterials, Nanosurfaces, Nanointerfaces, Functional nanomaterials, Nanostructures, Nanoparticles, Carbon nanomaterials, Nanocrystalline materials, Nanocomposites, Nanodefects, Nanofabrication process, etc.
28040	Nanobioscience-related
	Biomolecular devices, Molecular manipulation, Molecular imaging, Nanomeasurements, Nanosynthesis, Single molecule science, Nano-bio interfaces, Biomolecular array, Genome engineering, etc.
28050	Nano/micro-systems-related
	MEMS, NEMS, BioMEMS, Nano/micro-fabrication, Nano/micro-optical devices, Nano/micro-chemical systems, Nano/micro-biosystems, Nano/micro-organism systems, Nano/micro-mechanics, Nano/micro-sensors, etc.

Medium-sized Section 29: Applied condensed matter physics and related fields

Basic Section	Examples of related research content
29010	Applied physical properties-related
	Magnetic materials, Superconductors, Dielectrics, Fine particles, Organic molecules, Liquid crystals, New functional materials, Organic molecules and bioelectronics, Spintronics, etc.
29020	Thin film/surface and interfacial physical properties-related
	Thin-film engineering, Thin-film electronics, Oxide electronics, Vacuum, Surface science, Analysis, Measurement, Nanoscopic technology, Surface and interfacial engineering, Advanced equipment, etc.
29030	Applied condensed matter physics-related
	Elementary quantities, Standards, Units, Physical quantity measurements and detection, Energy conversion, etc.

Medium-sized Section 30: Applied physics and engineering and related fields

Basic Section	Examples of related research content
30010	Crystal engineering-related
	Metals, Semiconductors, Ceramics, Amorphous materials, Crystal growth, Artificial structures, Crystal characterization, Plasma materials engineering, Plasma processing, Plasma engineering, etc.

(Broad Section D)

30020	Optical engineering and photon science-related
	Optical materials, Optical elements, Optical properties, Optical information processing, Laser, Optical sensing, Optical recording, Opto-electronics, Nonlinear optics, Vision optics, etc.

Medium-sized Section 31 : Nuclear engineering, earth resources engineering, energy engineering, and related fields

Basic Section	Examples of related research content
31010	Nuclear engineering-related
	Reactor physics and safety design, Thermal-hydraulics and structure, Fuel material, Nuclear chemistry, Nuclear life cycle, Radiation safety, Radiation beam engineering, Plasma engineering for fusion reactor, Equipment and material engineering for fusion reactor, Nuclear social environment, etc.
31020	Earth resource engineering, Energy sciences-related
	Earth resource sciences, Resource prospecting, Resource development, Resource cycle, Resource economy, Energy system, Environmental load evaluation, Renewable energy, Natural resource and energy technological policy, etc.

Medium-sized Section 90 : Biomedical engineering and related fields

Basic Section	Examples of related research content
90110	Biomedical engineering-related
	Medical imaging, Medical modeling, Biological simulation, Biometrics, Artificial organs, Tissue engineering, Biophysical properties, Biocontrol, Biomechanics, Nanobio systems, etc.
90120	Biomaterials-related
	Biofunctional materials, Tissue engineering materials, Biocompatible materials, Nanobio materials, Drug delivery systems, Stimuli-sensitive materials, Genetic engineering material, etc.
90130	Medical systems-related
	Medical ultrasound system, Diagnostic imaging system, Laboratory diagnosis systems, Minimally invasive treatment systems, Remote diagnosis and treatment systems, Organ preservation systems, Medical information systems, Computer-assisted surgery, Medical robot, etc.
90140	Medical technology assessment-related
	Regulatory science, Safety evaluation, Clinical study, Medical technology ethics, Medical devices, etc.
90150	Medical assistive technology-related
	Healthcare and rehabilitation engineering, Life assist technology, Care support technology, Accessibility design, Universal design, Rehabilitation and nursing robot, Assist device for artificial internal organ, Rehabilitation devices, Nursing science and engineering, etc.

Broad Section E

Medium-sized Section 32 : Physical chemistry, functional solid state chemistry, and related fields

Basic Section	Examples of related research content
32010	Fundamental physical chemistry-related
	Theoretical chemistry, Molecular spectroscopy, Structural chemistry, Electronic state dynamics, Chemical reaction dynamics, Surface/interface, Cluster and nano materials, Bio-related physical chemistry, Liquid structure dynamics, Solid state properties, Molecular properties, etc.
32020	Functional solid state chemistry-related
	Optical properties, Electron spin, Molecular electronics and devices, Supermolecules, Liquid crystals, Crystals, Surface/interface, Nano particles, Colloids, Electrochemistry, Electronic properties, etc.

Medium-sized Section 33: Organic chemistry and related fields	
Basic Section	Examples of related research content
33010	Structural organic chemistry and physical organic chemistry-related
	Organic crystals, Molecular recognition, Supermolecules, Organic functional materials, Extended p-electron system compounds, Heterocyclic chemistry, Organoelement chemistry, Organic reaction mechanism, Organic photochemistry, Theoretical organic chemistry, etc.
33020	Synthetic organic chemistry-related
	Selective reactions, Asymmetric synthesis, Organometallic complex/catalysis, Catalyst design, Organocatalysts, Biocatalysis, Sustainable organic synthesis, Natural product synthesis, Process chemistry, Organic electrochemistry, etc.
Medium-sized Section 34: Inorganic/coordination chemistry, analytical chemistry, and related fields	
Basic Section	Examples of related research content
34010	Inorganic/coordination chemistry-related
	Coordination chemistry, Organometallic chemistry, Inorganic solid-state chemistry, Bioinorganic chemistry, Solution chemistry, Clusters, Supramolecular complexes, Coordination polymers, Typical elements, Physical properties and functions, etc.
34020	Analytical chemistry-related
	Spectrometric analysis, Advanced measurements, Surface/interface analysis, Separation analysis, Analytical reagents, Radiochemical analysis, Electrochemical analysis, Bioanalysis, New analysis methods, etc.
34030	Green sustainable chemistry and environmental chemistry-related
	Green process, Green catalysts, Recycle, Environmental assessment, Environmentally conscious materials, Reduction of environmental load, Environmental restoration, Resource saving, Geochemistry, Environmental radioactivity, etc.
Medium-sized Section 35: Polymers, organic materials, and related fields	
Basic Section	Examples of related research content
35010	Polymer chemistry-related
	Polymer synthesis, Polymer reactions, Precision polymerization, Functional polymers, Self-assembled polymers, Chiral polymers, Bio-related polymers, Polymer properties, Polymer structures, Polymer thin film/surface, etc.
35020	Polymer materials-related
	Properties of polymer materials, Synthesis of polymer materials, Functional polymer materials, Liquid crystal polymers, Textiles, Rubbers, Gel, Biopolymers, Polymer composites, Polymer processing, etc.
35030	Organic functional materials-related
	Organic semiconductors, Liquid crystals, Optical materials, Device-related materials, Electrically conductive materials, Hybrid materials, Molecular functional materials, Organic hybrid materials, Materials for energy conversion, etc.
Medium-sized Section 36: Inorganic materials chemistry, energy-related chemistry, and related fields	
Basic Section	Examples of related research content
36010	Inorganic compounds and inorganic materials chemistry-related
	Crystals, Amorphous, Ceramics, Semiconductors, Inorganic device-related materials, Low-dimensional compounds, Porous materials, Nanoparticles, Multicomponent compounds, Hybrid materials, etc.
36020	Energy-related chemistry
	Energy resources, Energy conversion materials, Energy carriers, Solar energy utilization, Material separation, Catalytic transformation, Battery and electrochemical materials, Energy-saving materials, Renewable energy, Unused energy, etc.

(Broad Section E)

Medium-sized Section 37: Biomolecular chemistry and related fields

Basic Section	Examples of related research content
37010	Bio-related chemistry
	Bioorganic chemistry, Bioinorganic chemistry, Biological reaction engineering, Biofunctional chemistry, Biofunctional materials, Biotechnology, etc.
37020	Chemistry and chemical methodology of biomolecules-related
	Natural product chemistry, Biologically active compounds, Molecular mechanism of biological activities, Biofunctional molecules, Combinatorial chemistry, Metabolomic analysis, etc.
37030	Chemical biology-related
	In vivo functional expression, Intracellular chemical reactions, Drug discovery science, Chemical library, Structure-activity relationship, Chemical probes, Biomolecular measurements, Molecular imaging, Proteomics, etc.

Broad Section F

Medium-sized Section 38: Agricultural chemistry and related fields

Basic Section	Examples of related research content
38010	Plant nutrition and soil science-related
	Plant metabolism and physiology, Nutritional elements in plants, Soil classification, Soil physical chemistry, Soil organisms, etc.
38020	Applied microbiology-related
	Microbial genetics/breeding, Microbial function, Microbial metabolism and physiology, Microbial applications, Control of microbes, Microbial ecology, Production of useful materials, etc.
38030	Applied biochemistry-related
	Cellular biochemistry, Applied biochemistry, Structural biology, Regulation of bioactivity, Metabolism and physiology, Cellular function, Molecular function, Production of useful materials, etc.
38040	Bioorganic chemistry-related
	Bioactive substances, Signal molecules, Natural products chemistry, Biosynthesis, Structure-activity relationship, Synthetic organic chemistry, Chemical biology, etc.
38050	Food sciences-related
	Food function, Food chemistry, Nutritional chemistry, Food analysis, Food engineering, Food safety, Functional food, Nutritional epidemiology, Clinical nutrition, etc.
38060	Applied molecular and cellular biology-related
	Molecular cell biology, Cellular bioengineering, Molecular engineering, Gene expression control, Cell-cell/intermolecular interactions, Cellular function, Production of useful materials, etc.

Medium-sized Section 39: Agricultural and environmental biology and related fields

Basic Section	Examples of related research content
39010	Science in plant genetics and breeding-related
	Genetic resources, Breeding theories, Genomic breeding, Plants with novel traits, Quality components, Stress tolerance, Yielding ability, Reproduction and multiplication, Growth physiology, Development, etc.
39020	Crop production science-related
	Field crops, Crop yield, Crop product quality, Crop morphology, Growth prediction, Crop physiology, Field management, Low-cost cultivation techniques, Environmentally friendly agriculture, Field ecosystem, etc.
39030	Horticultural science-related
	Plant growth, flowering, and fruit development, Nursery plant propagation and production, Crop production systems, Cultivation techniques, Protected horticulture, Controlled environment systems, Breeding and development of new cultivars, Quality of horticultural products, Postharvest physiology and management, Socio-horticulture, etc.

39040	Plant protection science-related
	Plant pathology, Clinical plant science, Agricultural insect pest, Natural enemy, Weed, Agricultural chemicals, Integrated pest management, etc.
39050	Insect science-related
	Sericulture insect technology, Insect genetics, Insect pathology, Insect physiology and biochemistry, Insect ecology, Chemical ecology, Systematics, Symbiosis and parasitism, Social insects, Medical entomology, etc.
39060	Conservation of biological resources-related
	Conservation biology, Biodiversity conservation, Conservation of phylogenetic diversity, Conservation of genetic resources, Ecosystem conservation, Conservation of endemic species, Conservation of microorganisms, etc.
39070	Landscape science-related
	Landscape architecture, Parks and open space planning, Landscape planning, Cultural landscape, Nature conservation, Landscape ecology, Parks and open space management, Parks, Environmental greening, Participatory community design, etc.

Medium-sized Section 40: Forestry and forest products science, applied aquatic science, and related fields

Basic Section	Examples of related research content
40010	Forest science-related
	Forest ecology, Forest biodiversity, Forest genetics and breeding, Silviculture, Forest protection, Forest environments, Erosion control, Forest planning, Forest policy, etc.
40020	Wood science-related
	Wood structure, Wood property, Lignocellulose, Trace element, Fungus, Wood processing, Biomass-refinery, Wood based material, Wooden building, Forest products education, etc.
40030	Aquatic bioproduction science-related
	Aquatic environment, Fisheries, Aquatic resource management, Aquatic organisms, Aquatic ecosystem, Aquaculture, Fisheries engineering, Fishing community/fisheries policy, Fisheries economics/management/marketing, Fisheries education, etc.
40040	Aquatic life science-related
	Aquatic nutrition, Aquatic pathology, Aquatic genetics/heredity/breeding, Aquatic physiology, Utilization of aquatic organisms and biomass, Aquatic biological chemistry, Aquatic biotechnology, Aquatic food sciences, etc.

Medium-sized Section 41: Agricultural economics and rural sociology, agricultural engineering, and related fields

Basic Section	Examples of related research content
41010	Agricultural and food economics-related
	Food economy, Agricultural production economy, Policy for agriculture, forestry and fishery, Food system, Food marketing, International agricultural development, Trade of agricultural commodities and livestock products, Rural resources and environment, etc.
41020	Rural sociology and agricultural structure-related
	Farm organization, Farm management, Agricultural structure, Agricultural market, Agricultural history, Rural society, Rural life, Agricultural cooperative, etc.
41030	Rural environmental engineering and planning-related
	Irrigation and drainage, Reclamation and conservation of agricultural land, Rural planning, Rural environment, Circulation of resources and energy, Disaster prevention in rural area, Stock management of agricultural infrastructures, Hydrodynamics and hydrology, Soil physics, Design and construction materials, etc.
41040	Agricultural environmental engineering and agricultural information engineering-related
	Agricultural production facilities, Bioproduction machinery, Environmental control, Agricultural meteorology and micrometeorology, Agricultural information, Greenhouse horticulture, Plant factory, Postharvest and supply chain, Nondestructive measurement, Remote sensing and geographic information system, etc.

(Broad Section F)	41050	Environmental agriculture-related Biomass, Environmental manipulation, Biodiversity, Environmental analysis, Ecosystem services, Resources circulation system, Low-carbon societies, Life-cycle assessment, Environmental friendly agriculture, Watershed management, etc.
	Medium-sized Section 42: Veterinary medical science, animal science, and related fields	
	Basic Section	Examples of related research content
	42010	Animal production science-related Breeding/genetics, Reproduction, Nutrition/feeding, Anatomy/physiology, Product, Environment, Behavior, Therapy, Grassland, Grazing, etc.
		Veterinary medical science-related Basic veterinary science, Pathological veterinary science, Applied veterinary science, Clinical veterinary science, Animal nursing, Animal welfare, Wildlife, etc.
	42020	Animal life science-related Homeostasis, Cellular function, Biological defense, Integrated genetics, Development/differentiation, Biotechnology, etc.
		Laboratory animal science-related Genetic engineering, Developmental engineering, Animal models of disease, Facility management, Laboratory animal welfare, Laboratory animal-related technology, Bioresource, etc.
	42030	Animal life science-related Homeostasis, Cellular function, Biological defense, Integrated genetics, Development/differentiation, Biotechnology, etc.
		Laboratory animal science-related Genetic engineering, Developmental engineering, Animal models of disease, Facility management, Laboratory animal welfare, Laboratory animal-related technology, Bioresource, etc.
	42040	Laboratory animal science-related Genetic engineering, Developmental engineering, Animal models of disease, Facility management, Laboratory animal welfare, Laboratory animal-related technology, Bioresource, etc.
Laboratory animal science-related Genetic engineering, Developmental engineering, Animal models of disease, Facility management, Laboratory animal welfare, Laboratory animal-related technology, Bioresource, etc.		
Broad Section G		
Medium-sized Section 43: Biology at molecular to cellular levels, and related fields		
Basic Section	Examples of related research content	
43010	Molecular biology-related Chromosome function, Chromatin, Epigenetics, Genome maintenance, Genome transmission, Chromosome re-organization, Gene expression, Non-coding RNA, Regulation of protein function, Molecular genetics, etc.	
	Structural biochemistry-related Proteins, Nucleic acids, Lipids, Carbohydrates, Biological membrane, Molecular recognition, Denaturation, Three-dimensional structural analysis, Three-dimensional structural prediction, Molecular dynamics, etc.	
43020	Functional biochemistry-related Enzymes, Sugar chain, Bioenergy conversion, Biological trace elements, Physiologically active substances, Cell signaling, Membrane transport, Proteolysis, Molecular recognition, etc.	
	Biophysics-related Structure biology, Physical property of biomolecules, Biomembrane, Photobiology, Molecular motor, Biometrics, Bioimaging, Systems biology, Synthetic biology, Theoretical biology, etc.	
43030	Genome biology-related Genome organization, Genome function, Genome diversity, Molecular evolution of genome, Genome repair/maintenance, Trans-omics, Epigenome, Gene resource, Genome dynamics, etc.	
	System genome science-related Network analyses, Synthetic biology, Biological databases, Bioinformatics, Genome analysis technology, Genome biotechnology, etc.	
43040	System genome science-related Network analyses, Synthetic biology, Biological databases, Bioinformatics, Genome analysis technology, Genome biotechnology, etc.	
	System genome science-related Network analyses, Synthetic biology, Biological databases, Bioinformatics, Genome analysis technology, Genome biotechnology, etc.	
43050	System genome science-related Network analyses, Synthetic biology, Biological databases, Bioinformatics, Genome analysis technology, Genome biotechnology, etc.	
	System genome science-related Network analyses, Synthetic biology, Biological databases, Bioinformatics, Genome analysis technology, Genome biotechnology, etc.	
43060	System genome science-related Network analyses, Synthetic biology, Biological databases, Bioinformatics, Genome analysis technology, Genome biotechnology, etc.	
	System genome science-related Network analyses, Synthetic biology, Biological databases, Bioinformatics, Genome analysis technology, Genome biotechnology, etc.	
Medium-sized Section 44: Biology at cellular to organismal levels, and related fields		
Basic Section	Examples of related research content	
44010	Cell biology-related Cytoskeleton, Proteolysis, Organelle dynamics, Nuclear structure and function, Extracellular matrix, Signal transduction, Cell cycle, Cell motility, Cell-cell interaction, Cellular genetics, etc.	
	Cell biology-related Cytoskeleton, Proteolysis, Organelle dynamics, Nuclear structure and function, Extracellular matrix, Signal transduction, Cell cycle, Cell motility, Cell-cell interaction, Cellular genetics, etc.	

44020	Developmental biology-related
	Cell differentiation, Stem cells, Regeneration, Germ layer formation, Morphogenesis, Organogenesis, Fertilization, Germ cells, Regulation of gene expression, Developmental genetics, Evolution and development, etc.
44030	Plant molecular biology and physiology-related
	Photosynthesis, Growth physiology, Plant development, Organelle, Cell wall, Responses to environment, Plant-microbe interaction, Metabolism, Plant molecular function, etc.
44040	Morphology and anatomical structure-related
	Animal and plant morphology, Micro-organismal morphology, Molecular morphology, Microstructure, Tissue organization, Morphogenesis, Comparative endocrinology, Microscopic technology, Imaging, etc.
44050	Animal physiological chemistry, physiology and behavioral biology-related
	Metabolic physiology, Neurophysiology, Neuroethology, Behavioral physiology, Animal physiological chemistry, Chronobiology, Comparative physiology, etc.

Medium-sized Section 45: Biology at organismal to population levels and anthropology, and related fields

Basic Section	Examples of related research content
45010	Genetics-related
	Genetic mechanism, Molecular genetics, Cellular genetics, Population genetics, Evolutionary genetics, Developmental genetics, Behavioral genetics, Genetic diversity, etc.
45020	Evolutionary biology-related
	General evolutionary biology, Molecular evolution, Phenotypic evolution, Evolution of developmental traits, Evolution of ecological traits, Evolution of behaviors, Experimental evolution, Evolutionary theory, Evolution of symbiosis, Phylogenetics, Speciation, etc.
45030	Biodiversity and systematics-related
	Taxonomic characters, Taxon, Classification system, Biodiversity, Phylogenetics, Evolution, Natural history, Speciation, etc.
45040	Ecology and environment-related
	Chemical ecology, Molecular ecology, Physiological ecology, Evolutionary ecology, Behavioral ecology, Population ecology, Community ecology, Ecosystem, Conservation ecology, Natural environment, etc.
45050	Physical anthropology-related
	Molecular anthropology and genetics, Morphology and function, Bioarchaeology, Behavior and cognition, Ecology, Primates, Evolution, Development and ontogeny, Variation and diversity, etc.
45060	Applied anthropology-related
	Physiological anthropology, Ergonomics, Forensic anthropology, Medical anthropology, Physiological polymorphisms, Environmental adaptability, Somatic and physiological function, Anthropometry and bioengineering, etc.

Medium-sized Section 46: Neuroscience and related fields

Basic Section	Examples of related research content
46010	Neuroscience-general-related
	Neurochemistry, Neuron, Glia, Genome, Epigenetics, Neurobiology, Information processing, Synapse, Neurogenesis, etc.
46020	Anatomy and histopathology of nervous system-related
	Neural development, Anatomy of nervous system, Neural network structure, Neuropathology, etc.
46030	Function of nervous system-related
	Neurophysiology, Neuropharmacology, Neurotransmission, Neuroinformatics, Behavioral neuroscience, Neural system physiology, Cerebral blood flow, Autonomic nervous system, etc.

Broad Section H

Medium-sized Section 47: Pharmaceutical sciences and related fields

Basic Section	Examples of related research content
47010	Pharmaceutical chemistry and drug development sciences-related
	Inorganic chemistry, Organic chemistry, Medicinal chemistry, Medicinal molecular design, Drug discovery, Bio-related materials, Chemical biology, etc.
47020	Pharmaceutical analytical chemistry and physicochemistry-related
	Environmental analysis, Bioanalysis, Physicochemistry, Biophysics, Structural biology, Radiochemistry, Bioimaging, Drug formulation design, Computer science, Information science, etc.
47030	Pharmaceutical hygiene and biochemistry-related
	Environmental hygiene, Healthful nutrition, Disease prevention, Toxicology, Drug metabolism, Host defense, Molecular biology, Cell biology, Biochemistry, etc.
47040	Pharmacology-related
	Pharmacology, Pharmacogenomics, Applied pharmacology, Signal transduction, Drug interactions, Drug response, Pharmacotherapy, Pharmacotoxicology, etc.
47050	Environmental and natural pharmaceutical resources-related
	Environmental resource science, Natural products chemistry, Bioactive natural compounds, Medicinal resources, Medicinal foods, Pharmaceutical microbiology, etc.
47060	Clinical pharmacy-related
	Pharmacokinetics, Medical informatics, Social pharmacy, Clinical pharmacy, Pharmaceutics, Regulatory science, Education for the pharmacist, etc.

Medium-sized Section 48: Biomedical structure and function and related fields

Basic Section	Examples of related research content
48010	Anatomy-related
	Macroscopic anatomy, Histology, Embryology, etc.
48020	Physiology-related
	General physiology, Pathophysiology, Comparative physiology, Environmental physiology, etc.
48030	Pharmacology-related
	Genomic pharmacology, Molecular and cellular pharmacology, Pathological pharmacology, Behavioral pharmacology, Pharmacology for drug discovery, Clinical pharmacology, etc.
48040	Medical biochemistry-related
	Biofunctional molecular and medical biochemistry, Genome medical sciences, Human genetics, Disease model, etc.

Medium-sized Section 49: Pathology, infection/immunology, and related fields

Basic Section	Examples of related research content
49010	Pathological biochemistry-related
	Molecular pathology, Metabolic disorders, Molecular diagnosis, etc.
49020	Human pathology-related
	Molecular pathology, Cyto- and histo-pathology, Diagnostic pathology, etc.

(Broad Section H)

49030	Experimental pathology-related
	Disease models, Pathological regulation, Tissue regeneration, etc.
49040	Parasitology-related
	Parasite, Vector organism, Parasite pathogenicity, Epidemiology of parasites, Control of parasite infections, etc.
49050	Bacteriology-related
	Bacterium, Fungus, Antimicrobial resistance, Bacterial pathogenicity, Epidemiology of bacteria, Control of bacterial infections, etc.
49060	Virology-related
	Virus, Prion, Viral pathogenicity, Epidemiology of viruses, Control of viral infections, etc.
49070	Immunology-related
	Immune system, Immune response, Inflammation, Immune-related disorder, Immune regulation, etc.

Broad Section I

Medium-sized Section 50: Oncology and related fields

Basic Section	Examples of related research content
50010	Tumor biology-related
	Cancer and gene, Tumor development, Invasion, Metastasis, Cancer microenvironment, Cancer and signal transduction, Characteristics of cancer cells, etc.
50020	Tumor diagnostics and therapeutics-related
	Genome analysis, Diagnostic markers, Molecule imaging, Chemotherapy, Nucleic acid therapy, Gene therapy, Immunotherapy, Molecular targeted therapy, Physical therapy, Radiation therapy, etc.

Medium-sized Section 51 : Brain sciences and related fields

Basic Section	Examples of related research content
51010	Basic brain sciences-related
	Brain-machine interface, Model animal, Computational brain science, Brain information decoding, Control technologies, Brain imaging, Brain biometrics, etc.
51020	Cognitive and brain science-related
	Social behavior, Communication, Emotion, Decision making, Consciousness, Learning, Neuroeconomics, Neuropsychology, etc.
51030	Pathophysiologic neuroscience-related
	Clinical neuroscience, Dolorology, Sensory impairment, Movement disorder, Neurological disorder, Neurogenesis, Neuroimmunology, Cellular degeneration, Disease model, etc.

Medium-sized Section 52 : General internal medicine and related fields

Basic Section	Examples of related research content
52010	General internal medicine-related
	Laboratory medicine, General practice, Geriatrics, Psychosomatic internal medicine, Oriental medicine, Palliative medicine, etc.
52020	Neurology-related
	Neurology, Neurofunctional imaging, etc.

52030	Psychiatry-related
	Clinical psychiatry, Biological psychiatry, Forensic mental health, etc.
52040	Radiological sciences-related
	Diagnostic radiology, Therapeutic radiology, Radiation biology, Radiological technology, etc.
52050	Embryonic medicine and pediatrics-related
	Fetal medicine, Neonatal medicine, Pediatrics, etc.

Medium-sized Section 53: Organ-based internal medicine and related fields

Basic Section	Examples of related research content
53010	Gastroenterology-related
	Upper digestive tract, Lower digestive tract, Liver, Biliary tract, Pancreas, etc.
53020	Cardiology-related
	Ischemic heart disease, Valvular heart disease, Arrhythmia, Cardiomyopathy, Heart failure, Peripheral arterial disease, Arteriosclerosis, Hypertension, etc.
53030	Respiratory medicine-related
	Respiratory medicine, Asthma, Diffusive lung disease, COPD, Lung cancer, Pulmonary hypertension, etc.
53040	Nephrology-related
	Acute renal failure, Chronic kidney disease, Diabetic nephropathy, Hypertension, Aqueous electrolyte metabolism, Artificial dialysis, etc.
53050	Dermatology-related
	Dermatology, Cutaneous immune disease, Cutaneous infection, Cutaneous tumor, etc.

Medium-sized Section 54: Internal medicine of the bio-information integration and related fields

Basic Section	Examples of related research content
54010	Hematology and medical oncology-related
	Hematological oncology, Hematological immunology, Anemia, Thrombosis and hemostasis, Chemotherapy, etc.
54020	Connective tissue disease and allergy-related
	Connective tissue disease, Allergy, Clinical immunology, Inflammation, etc.
54030	Infectious disease medicine-related
	Infection diagnostics, Infection therapeutics, Host defense, International infection science, etc.
54040	Metabolism and endocrinology-related
	Energy balance, Glucose metabolism, Lipid metabolism, Purine metabolism, Bone metabolism, Electrolyte balance, Endocrinology, Neuroendocrinology, Reproductive endocrinology, etc.

Medium-sized Section 55: Surgery of the organs maintaining homeostasis and related fields

Basic Section	Examples of related research content
55010	General surgery and pediatric surgery-related
	Surgical basic principles, Breast surgery, Endocrine surgery, Pediatric surgery, Transplant surgery, Artificial organs science, Regeneration, Operation support, etc.

55020	Digestive surgery-related
	Upper gastrointestinal surgery, Lower gastrointestinal surgery, Hepatic surgery, Biliary surgery, Pancreatic surgery, etc.
55030	Cardiovascular surgery-related
	Coronary artery surgery, Heart valve surgery, Surgery for myocardial disease, Aortic surgery, Vascular surgery, Congenital heart surgery, etc.
55040	Respiratory surgery-related
	Lung surgery, Mediastinal surgery, Chest wall surgery, Respiratory tract surgery, etc.
55050	Anesthesiology-related
	Anesthesiology, Perioperative management, Pain management, Resuscitology, Palliative medicine, etc.
55060	Emergency medicine-related
	Intensive care medicine, Emergency resuscitation science, Trauma surgery, Disaster medicine, Disaster medical care, etc.

Medium-sized Section 56: Surgery related to the biological and sensory functions and related fields

Basic Section	Examples of related research content
56010	Neurosurgery-related
	Neurosurgery, Spine and spinal cord diseases, etc.
56020	Orthopedics-related
	Orthopedics, Rehabilitation medicine, Sports medicine, etc.
56030	Urology-related
	Urology, Male genitalia science, etc.
56040	Obstetrics and gynecology-related
	Obstetrics, Reproductive endocrinology, Gynecologic oncology, Female health care medicine, etc.
56050	Otorhinolaryngology-related
	Otorhinolaryngology, Head and neck surgery, etc.
56060	Ophthalmology-related
	Ophthalmology, Ophthalmological optics, etc.
56070	Plastic and reconstructive surgery-related
	Plastic surgery, Reconstructive surgery, Aesthetic plastic surgery, etc.

Medium-sized Section 57: Oral science and related fields

Basic Section	Examples of related research content
57010	Oral biological science-related
	Oral anatomy, Oral histology and embryology, Oral physiology, Oral biochemistry, Pharmacology for hard tissues, etc.
57020	Oral pathobiological science-related
	Oral infectious diseases, Oral pathology, Oral experimental oncology, Immunity and inflammation, Laboratory medicine, etc.

57030	Conservative dentistry-related
	Operative dentistry, Endodontology, Periodontology, etc.
57040	Regenerative dentistry and dental engineering-related
	Regenerative dentistry, Biomaterial science, Dental materials science, Oral and maxillofacial prosthetics, Oral implantology, etc.
57050	Prosthodontics-related
	Prosthodontics, Oral rehabilitation, Gerodontology, etc.
57060	Surgical dentistry-related
	Oral and maxillofacial surgery, Oral maxillofacial reconstructive surgery, Dental anesthesiology, Psychosomatic medicine dentistry, Dental radiology, etc.
57070	Developmental dentistry-related
	Orthodontics, Pediatric dentistry, etc.
57080	Social dentistry-related
	Dental hygiene, Preventive dentistry, Oral health administration and management, Dental education, Forensic odontology, etc.

Medium-sized Section 58: Society medicine, nursing, and related fields

Basic Section	Examples of related research content
58010	Medical management and medical sociology-related
	Medical management, Medical social science, Ethics for medical science, Ethics for medical care, Biomedical education, History of medical science, Health policy and economics, Clinical trials, Health and medical services administration, Disaster medical science, etc.
58020	Hygiene and public health-related: including laboratory approach
	Hygiene, Public health, Epidemiology, Global health, etc.
58030	Hygiene and public health-related: excluding laboratory approach
	Hygiene, Public health, Epidemiology, Global health, etc.
58040	Forensics medicine-related
	Forensic medicine, Forensic pathology, Forensic toxicology, Forensic genetics, Suicide, Abuse, Clinical forensic medicine, Sudden death, etc.
58050	Fundamental of nursing-related
	Fundamental of nursing, Nursing education, Nursing administration, etc.
58060	Clinical nursing-related
	Critical care and emergency nursing, Perioperative nursing, Nursing of chronic illness, Oncology nursing, Psychiatric nursing, Palliative care nursing, etc.
58070	Lifelong developmental nursing-related
	Women's health nursing, Maternal nursing, Midwifery, Family health nursing, Child health nursing, School nursing, etc.
58080	Gerontological nursing and community health nursing-related
	Gerontological nursing, Community health nursing, Public health nursing, Disaster nursing, etc.

(Broad Section I)

Medium-sized Section 59: Sports sciences, physical education, health sciences, and related fields	
Basic Section	Examples of related research content
59010	Rehabilitation science-related
	Rehabilitation medicine, Rehabilitation nursing, Rehabilitation medical care, Physiotherapeutics, Occupational therapy, Assistive technology, Speech and language therapy, etc.
59020	Sports sciences-related
	Sports physiology, Sports biochemistry, Sports medicine, Sports sociology, Sports management, Sports psychology, Sports education, Training science, Sports biomechanics, Adapted sports science, Doping, etc.
59030	Physical education, and physical and health education-related
	Growth developmental science, Physical and health education, Physical education in school, Educational physiology, Physical systems science, Higher brain function science, Martial arts theory, Outdoor education, etc.
59040	Nutrition science and health science-related
	Nutritional physiology, Nutritional biochemistry, Nutritional education, Clinical nutrition, Functional food, Lifestyle-related disease, Health promotion, Aging, etc.
Medium-sized Section 90: Biomedical engineering and related fields	
Basic Section	Examples of related research content
90110	Biomedical engineering-related
	Medical imaging, Medical modeling, Biological simulation, Biometrics, Artificial organs, Tissue engineering, Biophysical properties, Biocontrol, Biomechanics, Nanobio systems, etc.
90120	Biomaterials-related
	Biofunctional materials, Tissue engineering materials, Biocompatible materials, Nanobio materials, Drug delivery systems, Stimuli-sensitive materials, Genetic engineering material, etc.
90130	Medical systems-related
	Medical ultrasound system, Diagnostic imaging system, Laboratory diagnosis systems, Minimally invasive treatment systems, Remote diagnosis and treatment systems, Organ preservation systems, Medical information systems, Computer-assisted surgery, Medical robot, etc.
90140	Medical technology assessment-related
	Regulatory science, Safety evaluation, Clinical study, Medical technology ethics, Medical devices, etc.
90150	Medical assistive technology-related
	Healthcare and rehabilitation engineering, Life assist technology, Care support technology, Accessibility design, Universal design, Rehabilitation and nursing robot, Assist device for artificial internal organ, Rehabilitation devices, Nursing science and engineering, etc.
Broad Section J	
Medium-sized Section 60: Information science, computer engineering, and related fields	
Basic Section	Examples of related research content
60010	Theory of informatics-related
	Discrete structure, Mathematical logic, Theory of computation, Mathematical theory of programs, Computational complexity theory, Algorithm theory, Information theory, Coding theory, Theory of cryptography, Learning theory, etc.
60020	Mathematical informatics-related
	Optimization theory, Mathematical systems theory, System control theory, System analysis, System methodology, System modeling, System simulation, Combinatorial optimization, Queueing theory, Mathematical finance, etc.

60030	Statistical science-related
	Statistics, Data science, Modeling, Statistical inference, Multivariate analysis, Time series analysis, Statistical quality control, Applied statistics, etc.
60040	Computer system-related
	Computer architecture, Circuit and system, LSI design, LSI testing, Reconfigurable system, Dependable architecture, Low power technology, Hardware/software codesign, Embedded system, etc.
60050	Software-related
	Programming language, Programming methodology, Operating system, Parallel and distributed computing, Software engineering, Virtualization technology, Cloud computing, Software dependability, Software security, etc.
60060	Information network-related
	Network architecture, Network protocol, Internet, Mobile network, Pervasive computing, Sensor network, IoT, Traffic engineering, Network management, Service platform technology, etc.
60070	Information security-related
	Cryptography, Tamper resistance technology, Authentication, Biometrics, Access control, Malware countermeasure, Countermeasures against denial-of-service attacks, Privacy protection, Digital forensics, Security evaluation and authorization, etc.
60080	Database-related
	Data model, Database system, Multimedia database, Information retrieval, Content management, Metadata, Big data, Geographic information system, etc.
60090	High performance computing-related
	Parallel processing, Distributed processing, Cloud computing, Numerical analysis, Visualization, Computer graphics, High performance computing application, etc.
60100	Computational science-related
	Mathematical engineering, Computational mechanics, Numerical simulation, Multi-scale modeling, Large-scale computing, Massively parallel computing, Numerical computing methods, Advanced algorithms, etc.

Medium-sized Section 61 : Human informatics and related fields

Basic Section	Examples of related research content
61010	Perceptual information processing-related
	Pattern recognition, Image processing, Computer vision, Visual media processing, Acoustic media processing, Media editing, Media database, Sensing, Sensor fusion, etc.
61020	Human interface and interaction-related
	Human interface, Multi-modal interface, Human-computer interaction, Computer supported cooperative work, Virtual reality, Augmented reality, Realistic communication, Wearable device, Usability, Ergonomics, etc.
61030	Intelligent informatics-related
	Search, Inference, Machine learning, Knowledge acquisition, Intelligent system, Intelligent information processing, Natural language processing, Data mining, Ontology, Agent system, etc.
61040	Soft computing-related
	Neural network, Evolutionary computation, Fuzzy theory, Chaos, Complex systems, Probabilistic information processing, etc.
61050	Intelligent robotics-related
	Intelligent robot, Behavior and environment recognition, Planning, Sensory behavior system, Autonomous system, Digital human, Real world information processing, Physical agents, Intelligent space, etc.
61060	Kansei informatics-related
	Kansei design, Kansei cognitive science, Kansei psychology, Kansei robotics, Kansei measurement evaluation, Kansei interface, Kansei physiology, Kansei material science, Kansei pedagogy, Kansei brain science, etc.
90010	Design-related
	Information design, Environmental design, Industrial design, Spatial design, Design history, Theory of design, Design standard, Design support, Evaluation of design, Design education, etc.

(Broad Section J)

90030	Cognitive science-related
	Cognitive science in general, Cognitive models, Kansei, Human factors, Cognitive and brain science, Comparative cognition, Cognitive linguistics, Cognitive engineering, etc.

Medium-sized Section 62: Applied informatics and related fields

Basic Section	Examples of related research content
62010	Life, health and medical informatics-related
	Bioinformatics, Life informatics, Biological information, Neuroinformatics, Neural information processing, Molecular computing, DNA computing, Medical information, Health information, Medical image, etc.
62020	Web informatics and service informatics-related
	Web system, Social web, Semantic web, Web mining, Social network analysis, Service engineering, Educational service, Medical service, Welfare service, Social service, Information culture, etc.
62030	Learning support system-related
	Media literacy, Learning media, Social media, Learning content, Learning management, Learning support, Remote learning, e-Learning, etc.
62040	Entertainment and game informatics-related
	Music information processing, 3D content, Animation, Game programming, Network entertainment, Media art, Digital museum, Experience design, etc.
90020	Library and information science, humanistic and social informatics-related
	Library science, Information services, Information organizing, Information retrieval, Information media, Bibliometrics, Information resources, Information ethics, Digital humanities, Social Informatics, Digital archives, etc.

Broad Section K

Medium-sized Section 63: Environmental analyses and evaluation and related fields

Basic Section	Examples of related research content
63010	Environmental dynamic analysis-related
	Global warming, Environmental change, Water and material cycle, Polar regions, Chemical oceanography, Biological oceanography, Environmental measurements, Environmental model, Environmental information, Remote sensing, etc.
63020	Radiation influence-related
	Radiation, Measurement, Control, Repair, Biological effects, Risk, etc.
63030	Chemical substance influence on environment-related
	Toxicology, Toxic substance to human, Trace chemical substance, Endocrine disruptor, Repair, etc.
63040	Environmental impact assessment-related
	Atmosphere, Hydrosphere, Terrestrial impact, Impact assessment on human health, Social and economic impacts, Impact assessment on the future generation, Environmental impact assessment, Assessment methods, Monitoring, Simulation, etc.

Medium-sized Section 64: Environmental conservation measure and related fields

Basic Section	Examples of related research content
64010	Environmental load and risk assessment-related
	Environmental analysis, Environmental load analysis, Environmental monitoring, Dynamics of environmental pollution, Environmental modelling, Evaluation of contamination, Exposure assessment, Toxicity evaluation, Environmental assessment, Chemical substance management, etc.

(Broad Section K)

64020	Environmental load reduction and remediation-related
	Removal of contamination, Treatment of waste material, Control of contamination source, Disposal of waste material, Environmental load reduction, Remediation measure of contamination, Noise and vibration reduction, Countermeasure of ground settlement, Bioremediation, Radioactive decontamination, etc.
64030	Environmental materials and recycle technology-related
	Recycle materials, Valuable materials recovery, Separation, refining and purification, Environment-conscious design, Recycle chemistry, Green production, Zero emission, Resource circulation, Renewable energy, Biomass utilization, etc.
64040	Social-ecological systems-related
	Biodiversity, Conservation biology, Ecosystem services, Natural capital, Impact analysis on ecosystem, Ecosystem management, Ecosystem restoration, Ecological engineering, Regional environmental planning, Impact of climate change, etc.
64050	Sound material-cycle social systems-related
	Sound material-cycle systems, Material and energy budget analysis, Low carbon society, Unused energy, Regional revitalization, Water use system, Industrial symbiosis, Life cycle assessment (LCA), Integrated environmental management, 3R (reduction, reuse, recycle) social systems, etc.
64060	Environmental policy and social systems-related
	Environmental philosophy and ethics, Environmental laws, Environmental economics, Environmental information, Environmental education, Environmental social activities, Environmental management and governance, Consensus forming, Environmental safety and security, Social and public system, Sustainable development, etc.

(Reference 1)

**Procedures on the Handling of Grants-in-Aid for Scientific Research
(Omitted)**

(Reference 2)

**Procedures on the Handling of JSPS Grants-in-Aid for Scientific
Research (KAKENHI (Series of Single-year Grants)) (Omitted)**

(Reference 3)

**Procedures on the Handling of JSPS Grants-in-Aid for Scientific
Research (KAKENHI (Multi-year Fund)) (Omitted)**

Inquiries

1. Inquiries about the invitation of applications should be directed to the following divisions through the research institution.

(1) For inquiries concerning the invitation of applications: Scientific Research Promotion Division, Research Promotion Bureau, MEXT

Division	Team in charge	Internal line and direct phone
General inquiries about the Application Procedures	Administrative Team for Grants-in-Aid	Direct phone:03-6734-4091 Switchboard:03-5253-4111 (Internal line:4091)
Grant-in-Aid for Transformative Research Areas (A)(Publicly Offered Research)	Grants-in-Aid for Scientific Research Team I and II	Direct phone:03-6734-4094 Switchboard:03-5253-4111 (Internal line:4094, 4308)

* Available every day except on Saturdays, Sundays, National Holidays, the New Year Holidays (from December 29 until January 3).

(2) For inquiries concerning the use of the KAKENHI Electronic Application System

• Call center

Telephone: 0120-556-739 (toll-free)

* Available from 9:30 to 17:30 every day except Saturdays, Sundays, National Holidays and the New Year Holidays (from December 29 until January 3)

• The following phone numbers are also available.

, Policy Planning Department, Japan Society for the Promotion of Science

Telephone: 03-3263-1017, 1022, 1107, 1024

(3) For inquiries concerning the use of the Cross-ministerial Research and Development Management System (e-Rad)

• e-Rad Help Desk:

Telephone: 0570-066-877 (Navi Dial)

* Available from 9:00 to 18:00 except on Saturdays, Sundays, National Holidays and the New Year Holidays (from December 29 until January 3)

* The following phone numbers are also available. 03-6631-0622

< Important points >

1) How to operate e-Rad

Manuals on how to operate e-Rad can be referred or downloaded from the portal site (URL: <https://www.e-rad.go.jp>). Please agree to the terms of service and apply.

2) Time period when e-Rad is available

Monday to Sunday, 00:00 - 24:00 (in operation 24 hours a day, 365 days a year)

However even during the above-mentioned time period, the operation of e-Rad may be disrupted or suspended, when maintenance and inspection is being carried out. If the operation is scheduled to be disrupted or suspended, this will be announced beforehand on the portal site.

(4) For matters related to the “Self-Assessment Checklist on the Improvement of the System” based on the “Guidelines on the Management and Audit of Public Research Funds at Research Institutions (Implementation Standards)”

Competitive Research Funding Administration, Research Environment Division, Science and Technology Policy Bureau, MEXT
Telephone: 03-5253-4111 (Internal line: 3866, 3827)

(5) For matters related to the “Checklist Pertaining to the Current Status” based on the “Guidelines for Responding to Misconduct in Research”

Office for Research Integrity Promotion, Research Environment Division, Science and Technology Policy Bureau, MEXT
Telephone: 03-6734-3874

(6) For matters related to use of support by Platform formed by "Foundation of Scientific Research Support"

Grants-in-Aid for Scientific Research Team I and II, Scientific Research Promotion Division, Research Promotion Bureau, MEXT
Phone: 03-6734-4087

(7) For matters related to the “National Bioscience Database”

National Bioscience Database Center, Japan Science and Technology Agency (JST)
Telephone: 03-5214-8491

(8) For matters related to the “Inter-University Bio-Backup Project”

Division of Genomic Medicine, Department of Health and Clinical Data , Japan Agency for Medical Research and Development
Telephone: 03-6870-2228

(9) For matters related to the “National BioResource Project”

Division of Biobank, Department of Research Infrastructure, National Research and Development Agency Japan Agency for Medical Research and Development
Telephone: 03-6870-2228

(10) For matters related to the “researchmap”

Service Support Center (in charge of the researchmap), Department of Information Infrastructure, National Institute of Advanced Industrial Science and Technology (JST)
Web inquiry form: <https://researchmap.jp/public/inquiry/>

(11) For matters related to the “Security Export Control Policy”

Security Export Control Administration Division, Trade Control Department, Trade and Economic Cooperation Bureau, Ministry of Economy, Trade and Industry
Telephone: 03-3501-2800
FAX: 03-3501-0996

2. Application forms can be downloaded from the following website.

MEXT’s website on Grants-in-Aid for Scientific Research
URL: https://www.mext.go.jp/a_menu/shinkou/hojyo/boshu/1351544.htm