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

FY2025

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.

July 16, 2024

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 FY2025" including the "Grant-in-Aid for Transformative Research Areas (A) (Publicly Offered Research)."

The contents are：

"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," and "IV. 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 FY2025, 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.

See Major Changes in the Call for Proposals for Fiscal Year 2025 for details on these changes.

Explanation of Important Matters

- Grants-in-Aid for Scientific Research is a competitive research 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.
  Plagiarism and/or misappropriation of the research contents of others are strictly impermissible. Applicants must comply with research ethics. Please note that the use of generative AI in the preparation of the Research Proposal Document causes the risk of inadvertent infringement of copyright and leakage of personal information and confidential information. It is the responsibility of the individual researcher to make appropriate decisions about the usage of generative AI.

- 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).

- From the perspective of enhancing the quality of research activities among the international scientific research networks, researchers are urged to disseminate their research results aggressively to the international society by publication of scientific papers in international journals, co-authoring of international papers, presentations in international conferences, etc.

<Major Changes in the Call for Proposals for Fiscal Year 2025>

(1) Digitalization and Colorization of Review Materials
○Research Proposal Documents in color will be newly accepted for Grant-in-Aid for Transformative Research Areas (A/B), Grant-in-Aid for Transformative Research Areas (A) (Publicly Offered Research), and Grant-in-Aid for Encouragement of Scientists. Accordingly, the reviewers will view Research Proposal Documents in color (PDF files) on the electronic application system to conduct reviews (Research Proposal Documents will no longer be printed out in monochrome (grayscale) and mailed to the reviewers). (Refer to III. Instructions for Prospective Applicants 3. Preparation of the KAKENHI Application Form (Research Proposal Document), etc. (2) (iii))

[Research Categories Already Subject to Digitalization and Colorization of Review Materials]*

・Specially Promoted Research, Scientific Research (S), Research Activity Start-up, International Collaborative Research, Fostering Joint International Research, and Home-Returning Researcher Development Research

*For the review of other research categories, Research Proposal Documents printed out in monochrome will continue to be used as review materials. Please note, however, that JSPS plans to expand research categories subject to digitalization and colorization of review materials based on the review situation in the future.

(2) Relaxation of Application Requirements to Promote Gender Equality
○In order to create an environment that enables early-career or child-raising researchers to more actively return to or participate in research activities, the “period of raising preschooler(s)” will newly be taken into consideration under the application requirements of Grant-in-Aid for Research Activity Start-up and Grant-in-Aid for Early-Career Scientists. The scope of “preschooler(s)” is limited to “child(ren)”, and based on the interpretation of the Civil Code, it covers the child(ren) of applicants themselves (including their natural child(ren), child(ren) out of wedlock, and adopted child(ren)). The new application requirements will apply, starting from the FY2024 call for proposals for Grant-in-Aid for Research Activity Start-up and the FY2025 call for proposals for Grant-in-Aid for Early-Career Scientists. Please refer to the respective Application Procedures for Grants-in-Aid for Scientific Research for details.

【FY2024 Grant-in-Aid for Research Activity Start-up】

A) An individual who obtains eligibility for KAKENHI application on or after

September 20, 2023, and has not submitted an application under the call for proposals for the following research categories (*1) announced by MEXT and JSPS.
B) An individual who has not submitted an application under the call for proposals for the following research categories (*1) announced by MEXT and JSPS because he/she was on maternity leave or was raising a preschooler (*2) in FY2023.
(*1) FY2024 Grants-in-Aid for Specially Promoted Research, transformative Research Areas, Scientific Research, Challenging Research, and Early-Career Scientists
(*2) Including the period of childcare leave.

【FY2025 Grant-in-Aid for Early-Career Scientists】

Researchers who are less than eight years after the acquisition of their Ph.D. as of April 1, 2025 (*)
(*) Eligible researchers include the following:

・Those who are expected to acquire their Ph.D. by April 1, 2025

・Those who are deemed less than eight years after the acquisition of their Ph.D. by exempting the period of maternity leave or the period of raising preschooler(s) following their Ph.D. acquisition

(3) Changes to the Review Method of Grant-in-Aid for Research Activity Start-up and Grant-in-Aid for Encouragement of Scientists
○Starting from FY2024, the review method of Grant-in-Aid for Research Activity Start-up and Grant-in-Aid for Encouragement of Scientists has changed from a two-stage document review to a one-stage document review to make adoption/rejection decisions. This will allow for early notice of review results, and those whose research proposals were not adopted under Grant-in-Aid for Research Activity Start-up will be able to secure sufficient preparation time needed for the application for Grant-in-Aid for Scientific Research, etc. upon receiving the notice.

(4) Research Integrity
○In line with the “Policy on Measures to Ensure Research Integrity” (April 27, 2021, Decision of Council for Integrated Innovation Strategy), etc., JSPS has taken necessary measures to ensure the transparency of research activities.
Starting from the FY2025 call for proposals, research integrity information registered in e-Rad will be linked to the KAKENHI electronic application system, and you will be requested to enter the necessary information in your Research Proposal Document based on the e-Rad registered research integrity details.
Please note, in particular, that you cannot make application if the Principal

Investigator and/or Co-Investigators have not registered in e-Rad the status of pledge regarding their research integrity information for their affiliated institution. Therefore, please make sure to confirm the registration status of the relevant information in advance. (Refer to III. Instructions for Prospective Applicants 1. Procedures to be Completed Prior to Application (2) and IV. Instructions for Administrative Staff of Research Institution 3. Issues that Need to Be Verified When Compiling the Application Forms (Preparing the Research Proposal Document), (2))

(5) Development of Security Export Control Systems

○Researchers who conduct KAKENHI-funded research activities and plan to export (provide) technologies restricted under the Foreign Exchange and Foreign Trade Act (Act No. 228 of 1949) are required to fully confirm security export control systems, response measures, and other matters, in accordance with the said Act and the rules and regulations of their affiliated research institution.

Starting from research projects to be funded in FY2025, JSPS will, by the time of official grant decision, confirm whether the provision of goods and technologies subject to export controls under the Foreign Exchange and Foreign Trade Act is planned in the relevant research projects and, if there is an intent to provide them, whether the research institution has developed a control system.

In the case that the provision is planned, it is necessary to establish a control system. Therefore, research institutions must develop a system necessary to properly conduct the relevant affairs and make sure to register the status of establishment in e-Rad. (Refer to IV. Instructions for Administrative Staff of Research Institution 2. Issues to Be Completed Beforehand by the "Research Institution" (10) and V. Other Relevant Issues 7. Security Export Control Policy (Coping with Technology Leakage Overseas)

(6) Research Data Management

○Starting from fiscal year 2024, researchers are asked to prepare research Data Management Plans (DMPs) of their projects under all research categories in principle. Details such as an example of a DMP will be given at the time of provisional grant decision. As such, please store, manage, and take other measures for research results and data of your research projects in accordance with your DMPs. (Refer to I. Outline of the Grants-in-Aid for Scientific Research -KAKENHI- 6. Dissemination, Etc. of Research Achievements Supported by KAKENHI (4))

(7) Promotion of Scientific Research with Significant International Ripple Effects

○From FY 2025 onwards, the new item, "Rating element for the internationality of the research project" to the Scientific Research (A, B, and C) will be added in order to promote scientific research with significant international ripple effects, and a description about "what sort of internationality the research project has" will be required in the column, "1. Research Objectives, Research Method, etc." in the

Research Proposal Document.
Improvements and enhancements of KAKENHI and future direction of discussions in the Subdivision on KAKENHI in the 12th Term (Interim Summary) (June 24, 2024)

URL:https://www.mext.go.jp/content/20240624-mxt_gakjokik-000036755_1.pdf

Table of Contents

References

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 FY2025 (Grant-in-Aid for Transformative Research Areas (A) (Publicly Offered Research)) (Forms / Procedures for Preparing and Entering a Research Proposal Document).” (Japanese only)

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

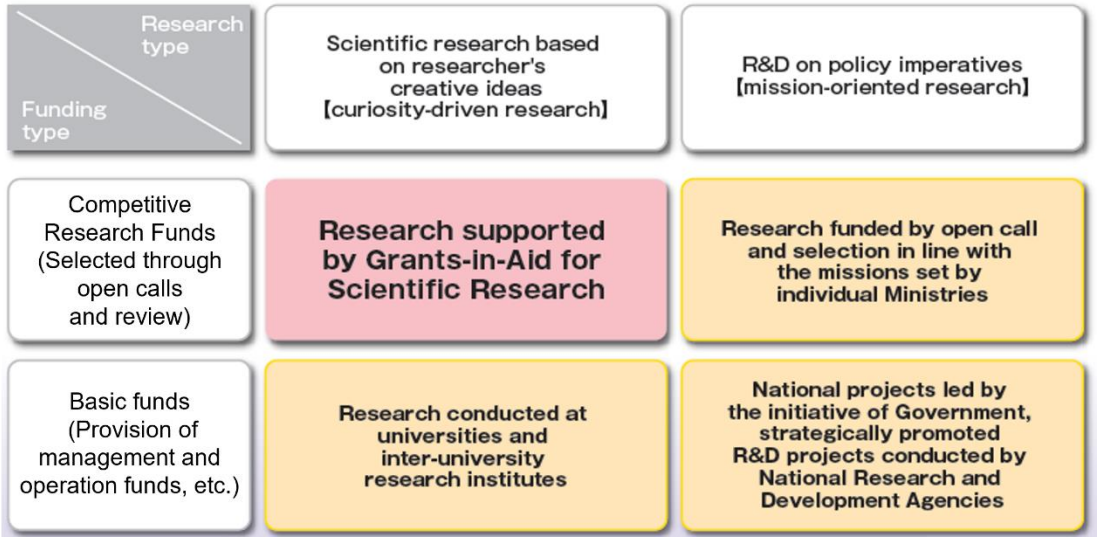
(URL) https://www.mext.go.jp/a_menu/shinkou/hojyo/boshu/1351544.htm

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 July 2024

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 Transformative Research Areas	(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	SG

	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)		
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) (A)	SG
		(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 newly hired by a research institution, or who has returned from his/her childcare leave, etc. or from the nursing of his/her preschooler(s). 1 to 2 years; 3 million yen or less (1.5 million yen or less if the research period is 1 year.)	MF	
Grant-in-Aid for Encouragement of Scientists	Research conducted by an individual who belongs to educational or research institutions, private companies, etc. and engages 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		SG	
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.		
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 (CPD) the period is up to 5 years.	MF	
Fund for the Promotion of Joint International Research		MF	
International Leading Research	This grant aims to enable research groups led by top-level researchers in our country to play a central role in the international network, thereby achieving research results of high scientific value internationally. With the participation of postdoctoral fellows and graduate students, the grant seeks to foster researchers who can play leading roles in the international research community in the future. (7 years (extendable up to 10 years); up to 500 million yen)		

Fostering Joint International Research	Support of joint international research project conducted by a KAKENHI grantee in collaboration with researcher(s) at a foreign university or 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 FY2023 call for proposals.]	
International Collaborative Research	Support of joint international research project conducted by multiple domestic researchers and a researcher who belongs to an 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.) [The category name is changed from the FY2023 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 the period of raising preschooler(s) 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 The Ministry of Education, Culture, Sports, Science and Technology (hereinafter "MEXT")). From FY1999 on, these tasks have been gradually transferred to the Japan Society for the Promotion of Science (hereinafter "JSPS"). The current role-sharing between MEXT and JSPS is as shown below.

Research category	**Call for proposals, Review** Preparation of the Application Procedures, Reception of proposal submission	**Grant delivery** Notifications of provisional grant decision Reception of the form of the formal application for grant delivery and other documents for the relevant procedures. Notification of grant decision
Scientific Research on Innovative Areas, Transformative Research Areas, Special Purposes	MEXT	JSPS
Specially Promoted Research, Scientific 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 (International Leading Research Fostering Joint International Research, International Collaborative 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.

<table>
<tr><th></th><th>Application Rules</th><th>Assessment Rules</th><th>Spending Rules</th></tr>
<tr><td rowspan="2">KAKENHI (Series of Single-year Grants)</td><td>MEXT
Application Procedures</td><td>MEXT
Rules concerning the assessment for Grants-in-Aid for Scientific Research

*Assessment rules for fiscal year 2025 are available on the MEXT website.</td><td rowspan="2">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</td></tr>
<tr><td>JSPS
Application Procedures</td><td>JSPS
Rules concerning the review and assessment for Grants-in-Aid for Scientific Research</td></tr>
<tr><td>KAKENHI (Multi-year Fund)</td><td></td><td></td><td>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</td></tr>
</table>

(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 December 17, 2021) 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" (see below) of competitive research funds, relevant information on funding applications is 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) Applicants are urged to state in the Research Proposal Document the status of applications and acquisitions of other competitive research funds (including those of other ministries) and other research grants (such as name of research grant, title of research project, research period, amount of budget, effort, etc.) as well as the information on all affiliated institutions and positions (such as side jobs, participation in a foreign recruitment program, position of professor emeritus without employment contract, etc.). Untruthful statement or misrepresentation may result in rejection of the research project, cancellation of grant, or reduction of the research budget.

iii) Applicants are required to make a pledge that they have appropriately reported to their affiliated research institutions the information necessary to ensure the transparency of all research activities that they are 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. The status of pledge will be confirmed with e-Rad registration details. Please note that applicants cannot make applications if they have not made a pledge. If it is found that applicants have not appropriately made reports contrary to their pledge, it may result in rejection of the research project, cancellation of grant, or reduction of the research budget.

iv) Inquiries on the status of acceptance and/or management of facilities and/or equipment used

for the research 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 December 17, 2021)

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 where more than one competitive research fund and other research grants (all current research funds that are allocated to individual research contents, including both domestic and overseas grants-in-aid, subsidies, joint research funds, commissioned research funds, etc.; hereinafter the same) are unnecessarily and redundantly allocated to the same research project (meaning, the name and content of the research to which the competitive research funds are allocated; hereinafter the same) by the same researcher. Any of the following cases fall under "Unreasonable Duplication."

- **Cases where simultaneous applications have been made to more than one competitive research funds / other 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 funds / other research funds 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 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 funds in violation of the content of the funding decision or the conditions it implies.

・"Fraudulent Grant Acquisition":
Receiving 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 FY2025 (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 FY2024. Refer to the website below for the schemes to which this specifically applies at present.
URL: https://www8.cao.go.jp/cstp/compefund/

○Period of KAKENHI suspension

[Improper Grant Spending and Fraudulent Grant Acquisition of KAKENHI]

<table>
<tr><th>Researcher categories</th><th colspan="2">Extent of the improper grant spending</th><th>Period of KAKENHI suspension</th></tr>
<tr><td>I. Researchers who committed improper grant spending of KAKENHI and researchers who conspired in such acts</td><td colspan="2">1. Misappropriation of KAKENHI for personal gain</td><td>10 years</td></tr>
<tr><td rowspan="3">II. Researchers who committed improper grant spending of KAKENHI and researchers who conspired in such acts</td><td rowspan="3">2. Other than 1.</td><td>(i) Impact of the misconduct on the society is substantial and maliciousness of the misconduct is judged to be high</td><td>5 years</td></tr>
<tr><td>(ii) Cases other than (i) and (iii)</td><td>2 to 4 years</td></tr>
<tr><td>(iii) The impact of the misconduct on the society is small and the maliciousness of the misconduct is judged to be low</td><td>1 year</td></tr>
<tr><td>III. Researchers who acquired KAKENHI by deception or other fraudulent means and researchers who conspired in such acts</td><td colspan="2">－</td><td>5 years</td></tr>
<tr><td>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</td><td colspan="2">－</td><td>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. .</td></tr>
</table>

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]

<table>
<tr><th colspan="3">Individual Involvement in the Misconducts</th><th>Negative Impacts on Science and on Public at Large Degree of Maliciousness</th><th>Period of KAKENHI Suspension</th></tr>
<tr><td rowspan="4">Subject of Research Misconduct</td><td colspan="2">(a) Particularly malicious individual(s) who, for example, had intention of research misconduct from the very beginning of the research</td><td></td><td>10 years</td></tr>
<tr><td rowspan="3">(b) Author(s) of paper(s), etc. related to the research in which research misconduct (s) have been identified (other than (a) above)</td><td rowspan="2">Responsible author(s) of the paper(s) in question (corresponding author, lead author or other authors bearing equivalent responsibilities)</td><td>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</td><td>5 to 7 years</td></tr>
<tr><td>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</td><td>3 to 5 years</td></tr>
<tr><td>Author(s) of the paper(s) in question other than the responsible author(s) described above</td><td></td><td>2 to 3 years</td></tr>
<tr><td colspan="2">(c) Individual(s) involved who are not the authors of the research paper(s) for which research misconduct(s) are identified.</td><td></td><td>2 to 3 years</td></tr>
<tr><td colspan="3" rowspan="2">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</td><td>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</td><td>2 to 3 years</td></tr>
<tr><td>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</td><td>1 to 2 years</td></tr>
</table>

* 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 on 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” (Revised February 1, 2021; Ministry of Education, Culture, Sports, Science and Technology)

URL:https://www.mext.go.jp/a_menu/kansa/houkoku/1343904_21.htm

○ “Guidelines for Responding to Research Misconduct” (Established August 26, 2014; Ministry of Education, Culture, Sports, Science and Technology)

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

(Reference): 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 broadly available to other researchers and to the general public, through posting and publication 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.

Moreover, the expenses for outreach-related activities including dissemination of international research achievements by publishing research papers, etc., can be covered by direct expenses. The KAKENHI grantees are urged to actively pursue public promotion of their international research achievements through the aid of KAKENHI so as to make them widely known to the public at large.

Upon disseminating the research achievements, 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" or other designated 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.
【Japanese】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.
【Japanese】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

We have seen the acceleration of open science efforts to advance the sharing and publication of research results, including open access to research papers and open research data, and help to speed up research activities and create new knowledge.

In line with the government's policy, JSPS has established its implementation policy on the promotion of open access of publications, which in principle requires research papers funded by

KAKENHI and other research grants to be openly accessible. Hence, JSPS seeks cooperation for the promotion of open access of papers.

In addition, with the formulation of the Basic Policy for the Realization of Immediate Open Access to Academic Papers, etc. (February 16, 2024, Decision of Council for Integrated Innovation Strategy) and the Concrete Measures to Implement the "Basic Policy for the Realization of Immediate Open Access to Academic Papers, etc." (February 16, 2024, Decision of Council for Integrated Innovation Strategy) (February 21, 2024, Agreement of Related Offices and Ministries), starting from a new KAKENHI call for proposals in FY2025, the publication of academic papers and supporting data on institutional repositories and other information infrastructure is required immediately after they are published in academic journals. JSPS plans to announce specific measures, etc. later.

○Implementation policy on the promotion of open access of publications of JSPS projects (March 9, 2017, Decision of JSPS President)
URL: https://www.jsps.go.jp/data/Open_access.pdf

○Basic Policy for the Realization of Immediate Open Access to Academic Papers, etc. (February 16, 2024, Decision of Council for Integrated Innovation Strategy)
URL: https://www8.cao.go.jp/cstp/oa_240216.pdf

○Concrete Measures to Implement the "Basic Policy for the Realization of Immediate Open Access to Academic Papers, etc." (February 16, 2024, Decision of Council for Integrated Innovation Strategy) (February 21, 2024, Agreement of Related Offices and Ministries)
URL: https://www8.cao.go.jp/cstp/openscience/r6_0221/hosaku.pdf

About "Open Access"

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 online.

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.

(4) Management of Research Data

On October 23, 2023, JSPS established and published its policy on the handling of research data. This policy stipulates JSPS's basic principles regarding the storage, management, and publication of research data generated during research activities funded by KAKENHI and other research grants provided by JSPS.

As such, the Principal Investigator of an adopted KAKENHI-funded research project must prepare a Data Management Plan (DMP) based on the data policy and other rules of his/her research institution, including policies and plans on the storage and management of research data generated as results during research activities as well as the publication or non-publication of such data, and conduct research activities while storing, managing, and publishing research data in accordance with the plan. In addition, he/she must add metadata specified by JSPS (*1) to research data that is subject to management in accordance with the DMP, etc.
The plan can be revised in the process of carrying out research activities.

Research institutions are requested to formulate their data policies stipulating such matters as the scope of data managed under and covered by the policies and criteria for publishing and sharing such research data. At the same time, they are asked to create an environment, develop a support

system, and take other measures, so that researchers can conduct research data management based on data policies.

(Reference) Addition of metadata

Metadata specified by JSPS refers to common metadata items specified in the Basic Policies on the Management and Utilization of Research Data Created by Publicly-Funded Research Activities (April 27, 2021, Decision of Council for Integrated Innovation Strategy) and other metadata items additionally specified by JSPS, based on its discussions on the purpose, scope, etc. of each grant.

You can register metadata on (the public platform of) the NII Research Data Cloud research data infrastructure system (*2), and search for registered metadata (of research data that has been made public) on the CiNii Research search platform of the said system.

You can also register metadata on other interoperable platforms that enable metadata search (including institutional repositories other than JAIRO Cloud (*3), a leading institutional repository, databases that obtain DOIs via JaLC (*4), and sectoral databases linked to CiNii Research (*5)).

For details, please consult with a person in charge of metadata registration at the affiliated institution.

(Reference) Supplementary terminology notes

(*1) Metadata refers to information on the nature of the very data for publication, including the created date and time, creator, format, and title of data, and is utilized mainly for centralized and efficient management of data.

(*2) The research data infrastructure system (NII Research Data Cloud) refers to a system positioned as the “core platform for the management and utilization of research data in Japan” in the Basic Policies on the Management and Utilization of Research Data Created by Publicly-Funded Research Activities. The system consists of GakuNin RDM, a management platform to manage research data, JAIRO Cloud, a public platform for the publication of research data, and a search platform for metadata search.

(*3) JAIRO Cloud is a cloud-based service to provide an institutional repository environment (available for JPCOAR (the Japan Consortium for Open Access Repository) members), jointly operated by JPCOAR and the National Institute of Informatics (NII). JPCOAR operates its community site and user helpdesk, among others, while the NII (*6) is in charge of development.

(*4) Japan Link Center (JaLC) is an institution with the authority to add digital object identifiers (DOIs) under international standards to academic contents including research papers in electronic form. The institution is jointly operated by the Japan Science and Technology Agency (JST), the National Institute for Materials Science (NIMS), the NII, and the National Diet Library (NDL).

(*5) CiNii Research is a database service that allows anyone to search for academic information, such as research papers, books and magazines, and doctoral theses. The service is developed and operated by the NII.

(*6) The NII refers to the National Institute of Informatics, Inter-University Research Institute Corporation Research Organization of Information and Systems.

JSPS plans to ask researchers to report information on published research data that is generated during their KAKENHI-funded projects to JSPS in their Reports on the Results or Reports on the

State of Implementation as well as to publish them as research results on the Grants-in-Aid for Scientific Research Database (KAKEN), in accordance with their DMPs.

○The Sixth Science, Technology, and Innovation Basic Plan (Cabinet Decision on March 26, 2021) (pp.58-61)
URL: https://www8.cao.go.jp/cstp/kihonkeikaku/6honbun.pdf

○Basic Policies on the Management and Utilization of Research Data Created by Publicly-Funded Research Activities (April 27, 2021, Decision of Council for Integrated Innovation Strategy)
URL: https://www8.cao.go.jp/cstp/tyousakai/kokusaiopen/sanko1.pdf

○Basic Policies on the Handling of Research Data of Projects Funded by JSPS Grants
URL: https://www.jsps.go.jp/file/storage/open_science/basic_policy.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 "IV. Instructions for Administrative Staff of Research Institution")
Start of the Call for Proposals **Tuesday, July 16, 2024**		[Procedures to be completed, if the need arises] 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 up to 2 weeks. 2) Registration of the Researcher Information in e-Rad and other matters. 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.)
	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.	
	2) 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.	4) ・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" **Deadline for submission:** **Monday, September 30** 5) ・Submission of the "Checklist Pertaining to the Current Status" based on the "Guidelines for Responding to Misconduct in Research" **Deadline for submission:** **Sunday, December 1** 6) Submission (Sending) of the Application Documents
Deadline for the Submission **4:30 pm** **Wednesday, September 18** **(to be strictly observed)**		

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" 2)), the research institution should submit (Sending) to the MEXT the application the application by the deadline for the submission (mentioned in "Procedures to be Performed by the Research Institution" 6)).
   Next, the Principal Investigator should verify the section "III. Instructions for Prospective Applicants 3. Preparation of the KAKENHI Application Form (Research Proposal Document), etc.", 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 administrative staff 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" 4) and 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 current schedule is as below. There may be changes in the plan including the timing of the provisional grant decision. When the changes occur it will be announced on the MEXT website and through the research institutions.

Transformative Research Areas (A) (Publicly Offered Research)	
October 2024 to January 2025	Review *1
Middle of February 2025	Notice of review results
Early April	Provisional grant decision
Late April	Formal application for grant delivery
Around April	Disclosure of review results
Late June	Official grant decision
Middle of July	Grant delivery (part of the first term) *2
Around 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 JSPS.

*2 The amount requested for funding (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

(1) Transformative Research Areas (A) (Publicly Offered Research) : KAKENHI (Series of Single-year Grants)

A) Intended for:
Research projects of Publicly Offered Research related to 30 research areas (which start in FY2022 or FY2024) shown in Attached Table 1 and Attached Table 2

B) Budget provided and number of research projects scheduled to be selected:
Budget and number per research area shown in Attached Table 1 and Attached Table 2

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) and Grant-in-Aid for Special Purposes)" FY2025)

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 18 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".)

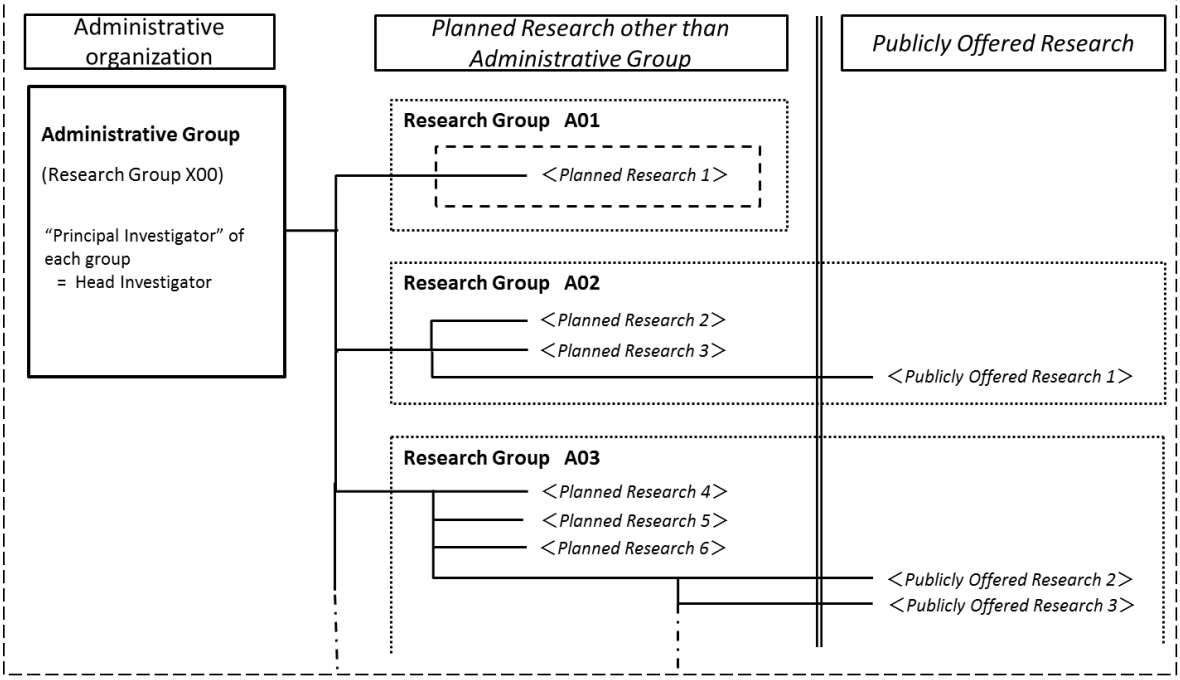
G) Constitution of research area: (Applied research area that does not meet the review criteria is not subject to screening.)
- A research area should consist of "Planned Research" and "Publicly Offered Research"
- The "Planned Research" consists of "Administrative Group" and "Planned Research other 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, 2025) 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 FY2026-2027 in the first year of the set period of the area and a call for proposals for FY2028-2029 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 FY2026-2029) exceeds 15 % of the budget (the total for five years) for the whole research area

● Constitution of research area and roles

Planned Resea	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 (an organization which does not conduct research)
	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.	

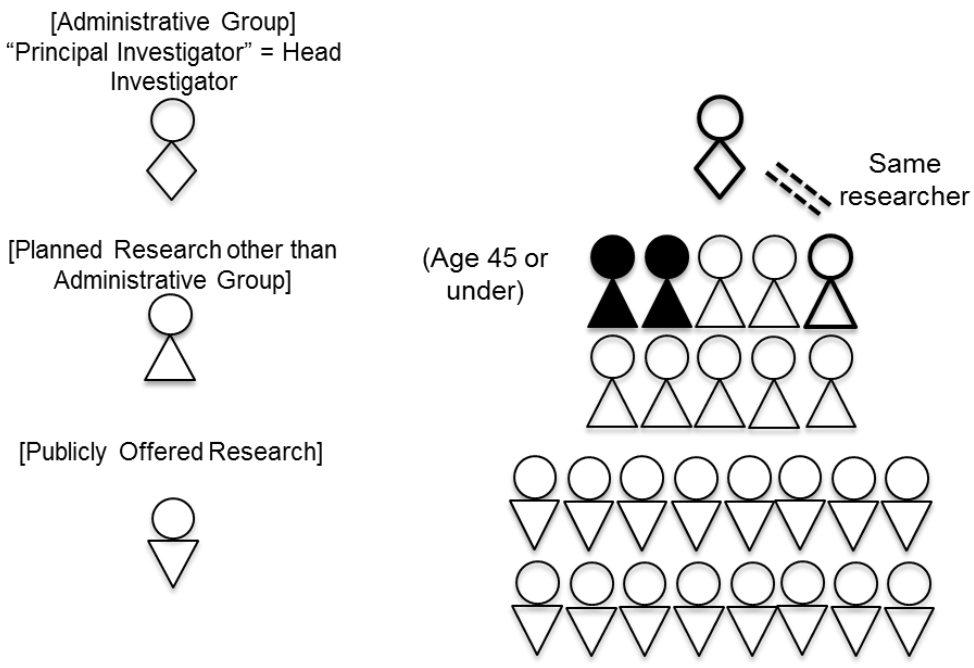
*1: When setting up the budget for Publicly Offered Research, please post annual budget enough to achieve research per project.
*2: The call for proposals and selection of research projects for "Publicly Offered Research" will be conducted in the first year and third year of research period. For a description on review process, see "II. Call for Proposals 4. Review Panels and Other Matters (2)."
*3: 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.
*4: 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.
*5: 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 FY2025 (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



・A research area should be composed to include two of 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 1,2025) participating as Principal Investigators

● 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.

- For Grant-in-Aid for Transformative Research Areas, there are no plans for calls for “budget for collecting research results of Finished Research Area”

Attached Table 1　List of Research Areas in which "Publicly Offered Research" is Solicited in Grant-in-Aid for Transformative Research Areas (A) (30 Research Areas)

Note: See "Attached Table 2: Research Outline of Research Areas Showed on Attached Table 1" for the outline of Publicly Offered Research projects in each Research Area.

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	22A101	Establishment of Child Poverty Research	FY2022-2026	2 years	15	1
2	22A201	Establishing data descriptive science and its cross-disciplinary applications	FY2022-2026	2 years	15 3	2 3
3	22A202	Foundation of "Machine Learning Physics" --- Revolutionary Transformation of Fundamental Physics by A New Field Integrating Machine Learning and Physics	FY2022-2026	2 years	33 15	1 2
4	22A203	Systems biosynthetics based on accumulation, prediction, and creation of biological reactions	FY2022-2026	2 years	24	4.5
5	22A204	Chiral materials science pioneered by the helicity of light	FY2022-2026	2 years	3 18	2 3
6	22A205	Supra-ceramics: Molecule-driven frontier of inorganic materials	FY2022-2026	2 years	30	2.3
7	22A206	CO world	FY2022-2026	2 years	12 3	3 8
8	22A301	Deciphering and Manipulating Brain Dynamics for Emergence of Behaviour Change in Multidimensional Biology	FY2022-2026	2 years	20	3
9	22A302	Mechanical self-transformation of living systems	FY2022-2026	2 years	5 12	3 5
10	22A303	Genomic dynamics underlying the plastic hermaphroditism in plants: the basis of exploratory reproductive adaptations.	FY2022-2026	2 years	10 5	4.5 7
11	22A304	Reevaluation of self recognition by immune system to decipher its physiological advantages and pathological risk	FY2022-2026	2 years	25	3
12	22A401	Photonic Computing Highlighting Ultimate Nature of Light	FY2022-2026	2 years	10 5	2.5 6
13	22A402	Macro coastal oceanography: integrated simulation for the material dynamics from the land through the open ocean	FY2022-2026	2 years	10 6	2 5
14	24A101	The past, present, and future of "misbehaving climate" and humans	FY2024-2028	2 years	2 2 1 2 2	2 2.5 3 5 7
15	24A102	Materia-Mind: Constructing a New Human Historical Science of the Co-creation of Material and Mind	FY2024-2028	2 years	4 8 2 3	1.5 2 3 4.3
16	24A201	Ion Jamology: Materials design transformation by understanding non-equilibrium and collective ion flow	FY2024-2028	2 years	5 10	3 4
17	24A202	Integrated Science of Synthesis by Chemical Structure Reprogramming	FY2024-2028	2 years	28	2.5
18	24A203	Habitable Japan: Sustainability of atmospheric and oceanic environment as a survival basis of island country Japan	FY2024-2028	2 years	9 3	3 9
19	24A204	Chimera Quasiparticles for Novel Condensed-Matter Science	FY2024-2028	2 years	11 11	2 3
20	24A205	Investigation on the Origin and Evolution of Matter in the Universe by Extremely Rare Events: Frontire of Creating a New Insight on the Matte in the Universe	FY2024-2028	2 years	10 4 2	1.5 3.7 4.5

21	24A206	Plasma-driven Seed Memory Operation: Frontiers in Molecular Dynamics in Seeds driven by Plasma	FY2024-2028	2 years	18	3
22	24A207	Generative design to unlock the potential of protein function	FY2024-2028	2 years	22	3
23	24A301	Manipulating Genomes of Intracellular Symbiotic Organelles: Advancements in Technology, Applications for Fundamental Sciences, and Beyond.	FY2024-2028	2 years	15	3.5
24	24A302	Biological cluster: dynamic assembly and functional properties of supramolecular complexes in cells	FY2024-2028	2 years	7 10	3 5
25	24A303	Co-evolutionary emergence of extended phenotypes	FY2024-2028	2 years	12	4.5
26	24A304	chronoproteinology: Protein Machinery that drives "time" on various time scales	FY2024-2028	2 years	16	4
27	24A305	Emergence of brain functions from the dynamic connectome	FY2024-2028	2 years	14 7	3 5
28	24A306	Deciphering the epicode of chromatin, which controls cell fate decisions in organisms	FY2024-2028	2 years	15	3.8
29	24A401	Multicellular neurobiocomputing: Understanding and advancing towards biological supremacy	FY2024-2028	2 years	5 14	2.5 5
30	24A402	Global Antarctic Science: connecting the chain of changing huge ice sheet and global environments	FY2024-2028	2 years	12 4	1.4 3

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.

- Please note that in principle, the allotted amount is in units of 100,000 yen.

- It is possible to apply and receive grants for up to 2 projects in Transformative Research Areas (A) (Publicly Offered Research) at the same time.
  For example, in case that grants have been received for 1 project continuation of which will be in FY2025 in Transformative Research Areas (A) (Publicly Offered Research), it is possible to apply for only 1 project in Transformative Research Areas (A) (Publicly Offered Research) for FY2025.

- Please refer to the website of each research area for the details of application contents.

Research Outline of Research Areas

Establishment of Child Poverty Research
https://www.poverty-research.jp

Number of Research Area	:	22A101	Term of Project :	FY2022-2026
Head Investigator	:	ABE Aya		
Research Institution	:	Tokyo Metropolitan University, Graduate School of Humanities		

1. Details of Research Area

This research area aims to upgrade poverty research in Japan into an academic discipline and in doing so, develop a research community who will lead an evidence-based policy making in the area of poverty alleviation. Even though the main focus of the research will be on child poverty, it is expected to expand to include poverty of other age category as well as poverty in general. However, since the Research Area's main goal is to build a community of researchers to interact with policy, the research will be focused on the poverty in Japan. The research area will construct a massive database by integrating data from social surveys on child poverty conducted by more than 300 municipalities around Japan. The database is expected to become one of the largest database on children with deprivation indicators which is becoming increasingly popular as a poverty index to supplement income-based poverty index. A group of researchers from multiple disciplines will jointly be involved in the design of the database, development of common poverty index, and its analysis. The analysis will consist of analysis of spatial and regional aspects of child poverty, analysis of small sample groups, analysis of the mechanisms connecting poverty and the child outcomes, and development of poverty alleviation systems and programs.

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

The research area calls for innovative research related to child poverty, especially those pertaining to the below mentioned research areas. The research can be qualitative and quantitative empirical studies, policy research, meta-analysis, and international comparative studies. It is encouraged that research uses the child poverty database constructed by this research area but not limited to only those. Researchers from various academic fields are welcome. All projects should draw concrete policy implications at the end of the project.

【Research Group Area E01 Research on the effects of spatial and regional characteristics on child poverty】 The strength of the relationship between poverty and child outcome is influenced by regional characteristics (geographical, demographical, and social such as social capital, etc.). The quantitative and qualitative research investigating such spatial and regional aspects of poverty are invited.

【Research Group Area E03 Research on the poverty of small groups :】 Research of small groups such as single-father households, gender minorities, children with non-Japanese origin, children with health problems and disability, young cares is often difficult due to their limited sample size. The research proposal to utilize the child poverty database which should have enough sample size to investigate such groups are called for. Qualitative and policy research on poverty of these small groups is also welcome.

【Research Group Area E04 Research on the development of systems and programs to alleviate child poverty】 Research to develop systems and programs such as policies, business models, technologies and policy programs are invited. Research is not limited to actual programs to help the poor but also include research on effective advocacy, political and bureaucratic processes.

All research projects are expected to communicate closely with the Planned Research members and participate in Research Area events as much as possible, and to coordinate their research agenda with the main body of the Research Area.

3. Research Groups, 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	Research on the effects of spatial and regional characteristics on child poverty	1	5
E03	Research on the poverty of small groups		5
E04	Research on the development of systems and programs to alleviate child poverty		5

Research Outline of Research Areas

Establishing data descriptive science and its cross-disciplinary applications
https://data-descriptive-science.org

Number of Research Area	:	22A201	Term of Project :	FY2022-2026
Head Investigator	:	HIRAOKA Yasuaki		
Research Institution	:	Kyoto University, Kyoto University Institute for Advanced Study		

1. Details of Research Area

The modern world is inundated with data. However, as seen in the black box problem in AI technology, it cannot be said that the true value contained in such data is being fully utilized. In order to make effective use of such big data, it is significant to describe the essential structure of the data in an appropriate mathematical language, and to use that descriptive language in the process of giving meaning and of understanding mechanisms behind the phenomena. In this Research Area, we will solve this problem by developing descriptors (mathematical languages that express the essential structure of data) that focus on the "shape" and "motion" of data, using state-of-the-art mathematical and data science methods. To this end, our Research Area is organized as a trinity of mathematics, data science, and application to create a new fusion area, "data descriptive science". The Planned Research consists of three groups. Research Group A01 will conduct mathematical and data science research for building theoretical foundations of data descriptive science. Research Group A02 will focus on research exploring new areas of data descriptive science. Research Group A03 will conduct research applying our methodologies to materials science and life science.

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

We welcome research proposals for Publicly Offered Research from mathematics, data science, and applications. Proposals that are complementary to the Planned Research and actively promote fusion research are expected.

Research Group A01 calls for theoretical and methodological studies for the construction of data descriptive science. In mathematics research, we expect ambitious proposals for developing new data descriptors using, for example, probability theory, optimal transport, differential equations, variational methods, operator theory, etc. In data science research, the main themes are machine learning, representation learning, mathematical statistics, natural language processing, and time series analysis. We welcome research that bridges mathematics and data science. Research Group A01 mainly focuses on theoretical research, but also welcomes proposals that can conduct fusion research with applied themes in our Research Area.

Research Group A02 calls for a wide range of exploratory research on mathematics and applications that will open up new areas of data descriptive science. In mathematics research, the call is for research on developing new data descriptors using topology, representation theory, algebraic analysis, algebraic geometry, dynamical systems, etc., and research on data analysis using these methods. As for applied research, we expect data analysis research related to high-dimensional visualization, virtual reality, large-scale complex networks, and flow/transport phenomena on complex systems.

Research Group A03 calls for theoretical and experimental research on materials science and life science. In the Planning Research of materials science, we will visualize heterogeneity within materials in structural materials and energy materials using X-ray microscopy (XRM). As Publicly Offered Research, the open call includes applications of XRM to the other new areas (ex. earth science), proposals of new experimental approaches other than XRM for observation of heterogeneity, and proposals of analysis methods of multi-dimensional big data in terms of materials science. As life science themes, we envision proposals that challenge a variety of pattern formation processes at multiple scales, develop basic technologies for manipulating cell functions based on cell mechanics, and elucidate intracellular signaling networks and the mechanisms that determine cell diversity. The research equipment (XRM and confocal microscope) prepared in our Research Area can be used by Publicly Offered Research.

For Publicly Offered Research, it is not necessary to have conducted interdisciplinary research at the beginning of the research. For such proposals, opportunities for discussions shall be provided in consideration of the direction of data descriptive science, the expertise of the proposed subject, and the research subjects to be studied by Planned 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
A01	Basic Research	2	6
A02	Exploration Research	2	6
A03	Application Research	Theoretical research: 2 Experimental research: 3	3 3

Research Outline of Research Areas

Foundation of "Machine Learning Physics"
--- Revolutionary Transformation of Fundamental Physics by A New Field Integrating Machine Learning and Physics
http://mlphys.scphys.kyoto-u.ac.jp

Number of Research Area	:	22A202	Term of Project :	FY2022-2026
Head Investigator	:	HASHIMOTO Koji		
Research Institution	:	Kyoto University, Graduate School of Science		

1. Details of Research Area

In physics, which has traditionally progressed through both experiment and theory, the search for theoretical principles and mathematics and the development of experiments through technological development have revealed new aspects of space and matter. On the other hand, recent technological innovations such as machine learning have brought about social innovations. The objective of this research area, "Machine Learning Physics," is to integrate machine learning and data science methods including network science, etc., with theoretical methods in physics to discover new laws and explore new materials, which are fundamental issues in physics. This new research area integrates particle physics, condensed matter physics, gravity, computational physics, and machine learning from the viewpoints of mathematics, statistics, and topology.

Group A aims to solve fundamental problems in physics by integrating physics and machine learning, and Group B aims to develop methods to solve problems in physics by utilizing the affinity between machine learning and physics. Group B aims to develop methods to solve problems in physics through new fields that utilize the affinity between machine learning and physics. A01: Innovative acceleration of quantum computations in computational physics; A02: Improvement of the detection sensitivity of accelerator experiments and refinement of corresponding theories in particle physics; A03: Elucidation of quantum fluctuation and quantum entanglement in condensed matter physics and construction of condensed matter physics 2.0. A04: Emergence mechanism of space-time concepts in quantum and gravitational physics; B01: Mathematical study of the mechanism of deep learning using physics domain knowledge and classification of methods to deal with the problem; B02: Overcoming the problem of computational difficulty in learning by statistical mechanics/development of a framework that can be used throughout theory and practice. B03: Development of methods based on topological data analysis and physical processes of learning models.

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

Since this research area integrates machine learning and physics, we aim to promote fusion through the participation of various researchers in machine learning, physics, and the surrounding fields of physics, and to create a new research field that transcends the boundaries of existing fields. For this reason, in addition to research proposals on themes deeply related to the research groups A01-A04 and B01-B03, we also expect related research proposals and stimulate fusion. In particular, for the latter, for example, desired are proposals that promote the fusion of diverse viewpoints, various fields of physics, and machine learning methods, proposals that contribute to the creation of a network of the entire area, and proposals that promote collaboration with surrounding academic fields.

The upper limit of the application budget is set at 1,000,000 yen/year for trial research, and 2,000,000 yen/year for developed numerical and theoretical research. We welcome applications from young researchers.

E01: Research proposals related to research groups A01, A02, and A04. Research proposals that are expected to interact with this research area in related research fields (including astronomy, quantum information, quantum computation, etc.).

E02: Research proposals related to research group A03. Research proposals that are expected to interact with this research area in related research fields (including physical chemistry, material informatics, brain science, biophysics, etc.).

E03: Research proposals developing/analyzing machine learning methods based on physical knowledge. Proposals related to research groups B01, B02, and B03. Research proposals that are expected to interact with this research area in related fields (including mathematical research on machine learning, etc.).

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	Research using machine learning in quantum, particle, space-time, gravity, and related sciences	1 2	13 6
E02	Research using machine learning in condensed matter physics and related materials science	1 2	13 6
E03	Research proposals developing/analyzing machine learning methods based on physical knowledge	1 2	7 3

Research Outline of Research Areas

Systems biosynthetics based on accumulation, prediction, and creation of biological reactions
https://bio-4cast.skr.jp/en/

Number of Research Area	:	22A203	Term of Project :	FY2022-2026
Head Investigator	:	KUZUYAMA Tomohisa		
Research Institution	:	The University of Tokyo, Graduate School of Agricultural Life Sciences		

1. Details of Research Area

Natural products are very important research targets, not only for elucidating their behavior in living organisms but also for drug discovery applications. Although a large amount of genetic information related to the biosynthesis of natural products is now available, the structure, reactivity, and selectivity of biosynthetic enzymes have not been easily analyzed and clarified, and the biosynthetic pathways of many natural products have remained unknown. Therefore, this Research Area, "Forecasting Biosynthesis," will organize an organic and complementary collaborative research setting in close collaboration with the three Research Groups of (A01) accumulation, (A02) forecasting, and (A03) creation of biological reactions related to natural product biosynthesis. The objective of this Research Area is to open an innovative field of biosynthetic research that freely integrates two experimental disciplines, synthetic biology and synthetic organic chemistry, and closely links them with theoretical systems of informatics and computational science while incorporating artificial intelligence (AI) to create molecules at will. The AI to be developed in this Research Area is a system that can theoretically forecast the structure and biosynthetic pathways of new-to-nature compounds. To construct this forecasting system, it is essential to incorporate deductive methods such as theoretical calculations and quantum chemical calculations, which have been lacking thus far in this Research Area, in addition to existing inductive analytical methods. By constructing this forecasting system, we will initiate a fundamental change in the field of natural product chemistry from the conventional concept that has persisted for more than half a century—that natural products are to be "searched for"—to one in which natural products are "created."

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

This Research Area should be composed of openly solicited researchers spanning a wide range of fields, including natural product chemistry, bioorganic chemistry, synthetic organic chemistry, synthetic biology, and structural biology in the experimental system and computational chemistry, theoretical chemistry, computational biophysics, and information science, in the theoretical system. To this end, the three Research Groups below will be established.

This Research Area aims to nurture a young generation of researchers who can use both experimental and theoretical approaches at will rather than simply collaborating with each other. Proposals from theoretical researchers who have not previously conducted research on living organisms but who are flexible and willing to collaborate with experimental researchers in this Research Area are welcome. Proposals from experimental researchers who are willing to actively develop joint research with theoretical researchers are also encouraged.

Research Group A01 (Accumulation of biological reactions) seeks to identify novel biocatalysts (enzymes) for the biosynthesis of the basic building blocks of natural products such as terpenes, polyketides, alkaloids, peptides, and their hybrids, derived from bacteria including actinomycetes, fungi, and plants, by using existing bioinformatics methods from the genome database and bioinformatics tools (initially in progress) to be developed under Research Group A02. This research will directly contribute to the construction of new scientific principles in biomolecular chemistry and related fields by discovering unknown functions and accumulating a large number of biological reactions through precise functional analysis and structural basis elucidation research.

Research Group A02 (Forecasting of biological reactions) calls for research aimed at (1) developing predictors that can predict biological reactions and (2) developing bioinformatics tools that can efficiently improve enzyme activity and extend substrate specificity by integrating structural prediction, machine learning, and quantum chemical calculations. The goal of developing these predictors is to obtain highly accurate tools that combine inductive methodology, which finds rules based on large amounts of empirical data, and deductive methodology, which derives useful information about biological reactions from the three-dimensional structure of enzymes based on theory. This includes, for example, a methodology that enables retro-biosynthetic analysis of natural products, a methodology that predicts the structure of natural products from genetic information alone, a methodology that compensates for the weak areas of the existing genome mining tool antiSMASH to increase prediction accuracy, and a methodology that uses bioinformatics tools to analyze multi-omics data to efficiently find new biocatalysts.

Research Group A03 (Creation of biological reactions) focuses on the expansion of biological reactions through approaches such as enzyme engineering by synthetic biology and evolutionary engineering; bioinformatics-based enzyme engineering using machine learning; molecular dynamics calculations, quantum chemical calculations, etc.; innovative enzyme control using decoy molecules; and chemical-enzyme hybrid synthesis. We call for research that develops new methods of molecule creation by extending biological reactions through approaches such as molecular design strategies that revolutionize biosynthesis to develop environmentally benign material production processes, create a large number of novel bioactive compounds, and extend the space of compounds that can be produced by biocatalysts. This group will play an important part in increasing the number of compounds that are output by this Research Area and improving the diversity of molecular structures.

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	Accumulation of biological reactions	4.5	14 projects together with Group A03
A02	Forecasting of biological reactions	4.5	10
A03	Creation of biological reactions	4.5	14 projects together with Group A01

Research Outline of Research Areas

Revolution of chiral materials science using helical light fields
http://light-chiral-materials-science.jp/en_front/

Number of Research Area	:	22A204	Term of Project :	FY2022-2026
Head Investigator	:	OMATSU Takashige		
Research Institution	:	Chiba University, Graduate School of Engineering		

1. Details of Research Area

An object is chiral if it cannot be superimposed onto its mirror image. In general, chiral objects have the same chemical and physical properties as their mirror images but different optical properties (e.g. circular dichroism), and they play universally important roles in materials science. Also, chiral objects possess typically helical structures, such as spirals and vortices on a nano/macro-scale.
Helical light fields encompass optical vortices with helical wavefronts, vector vortex beams with polarization singularity, and plasmonic enhanced circularly polarized light fields, and they have been widely investigated across a broad range of applications. These exotic optical fields possess an effective wavelength much shorter than that of conventional plane waves in free space.
This research area aims to freely manipulate a myriad of nano/micro-scale materials using helical light fields to establish exotic micro-scale and macro-scale helical structures with multifunctional properties.
Using these structured materials, we further aim to pioneer innovative materials sciences and advanced materials technologies, such as chemistry with helical light fields, engineering with light induced helices, and physics in vortices.

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

This research area consists of 10 planned research projects classified into three sub-projects as follows:
[A] fundamental studies of physical and chemical phenomena via interaction between helical light fields and matters
[B] direct observation of spatio-temporal evolution of the interaction between helical light fields and matters
[C] fabrication and assembly of multi-scale functional helical structures and discovery of exotic interactions between helical-light fields and matters.

This research project aims for the following three goals.
(1) Chiral crystallization at ultimate chiral bias, and ultrahigh sensitive detection of chirality at an ultrahigh spatial resolution. We herein refer 'chemistry with helical light fields'.
(2) Biomimetics with light-induced helices, and tissue engineering with light-induced helices. We herein refer 'engineering with helical-light induced helices'.
(3) Creation, annihilation and manipulation of nano/micro-scale vortices, such as quantum vortices and skyrmions, with helical-light fields. We herein refer 'physics in vortices'.

We expect that the publicly offered research proposals will reinforce and promote the aforementioned subprojects [A]-[C], and they will contribute significantly to achievement of the aforementioned goals (1)-(3).
Also, we expect that the publicly offered research projects will enable the improvement of the universal and academic achievements of this project and the establishment of further interdisciplinary research areas based on interaction between helical light fields and materials beyond the planned research projects.

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	Fundamentals of helical-light induced chiral materials science	Experimental research : 3 Theoretical research : 2	18 3
B04	Direct observations of helical-light induced chiral materials science		
C05	Demonstrations of helical-light induced chiral materials science and technology		
D01	Interdisciplinary research projects based on interaction between helical light fields and materials beyond three sub-projects		

Research Outline of Research Areas

Supra-ceramics: Molecule-driven frontier of inorganic materials
http://supraceramics.jp

Number of Research Area	:	22A205	Term of Project :	FY2022-2026
Head Investigator	:	MAEDA Kazuhiko		
Research Institution	:	Tokyo Institute of Technology, School of Science		

1. Details of Research Area

In this research area, we define "supra-ceramics" as a group of materials in which molecular units (molecular ions, complexes, clusters, etc.) are incorporated into inorganic materials, and create new materials with innovative properties and functions through cross-disciplinary research that brings together researchers from different fields. The objective is to revolutionize the academic system of materials science, focusing on inorganic materials. In this research area, the target supra-ceramics are classified into the following two types according to the way in which molecular units are incorporated, and the creation of new materials of both types will be pursued.

Endospheric supra-ceramics: New materials that contain molecular ionic species within the lattice of inorganic crystals. Based on the strong electronic interactions within the narrow space of the crystal, new properties and functions that cannot be created by conventional molecular ion-containing materials (MOFs, etc.) are expected to be created.

Exospheric supra-ceramics: New materials that have outstanding properties and functions by placing functional molecules at specific locations on the surface of inorganic solids. Unlike conventional organic-inorganic hybrids, perturbations from crystal surfaces or interfaces are maximally utilized to create new structures and electronic states that inorganic solids or molecules alone do not possess, leading to modulation of physical properties and functions.

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

In this research area, we will construct a materials design science of supra-ceramics based on close collaboration among "synthesis," "analysis and theory," and "physical properties and functions". Research Teams A01 and A02 are defined as Group A, and Research Team A03, which consists of publicly offered researches, is established in Group A. Similarly, Groups B and C are defined, and Research Teams B03 and C03 are established, respectively. We wish to expand the entire research area by including important research topics that are not included in the current research plan as publicly offered research, thereby providing a driving force for research in the area. We expect applications from various materials-related fields, such as solid-state chemistry, coordination chemistry, crystallography, supramolecular chemistry, catalysis, and condensed matter physics. We consider the possibilities of the following subjects in each research category, for example, but also welcome original one that is not covered by these categories.

Group A: Research on the synthesis of materials using electric fields, high pressure, etc., synthesis of materials under special atmospheres, development of processes to precisely control the chemical composition and arrangement (regular or irregular arrangement) of molecular ions and organic ligands, and establishment of guidelines for controlling dimension and morphology including nano- and macrostructure.

Group B: Structural dynamics of supra-ceramics, development of electronic structure measurement devices and analytical methods for light elements, analytical methods using first-principles calculations, etc., of data from analytical electron microscopes and various spectroscopic methods, chemical bonding of supra-ceramics, understanding and prediction of physical properties Theoretical calculation techniques for understanding and predicting chemical bonding and physical properties of supra-ceramics, prediction of materials and composition using materials informatics, etc.

Group C: Experimental/theoretical studies on the creation of properties and functions of supra-ceramics. Bulk properties of materials, interfacial properties including thin films, electronic devices, catalysts, biomaterials, etc.

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
A03	Development of new synthesis method and dimensional/ morphological control of supra-ceramics	2.3	11
B03	Design and advanced structural analysis of supra-ceramics	2.3	6
C03	Development of new properties and functions of supra-ceramics	2.3	13

Research Outline of Research Areas

Biogeochemistry of CO worlds
http://co-world.jp

Number of Research Area	: 22A206	Term of Project :	FY2022-2026
Head Investigator	: UENO Yuichiro		
Research Institution	: Tokyo Institute of Technology, Graduate School of Science		

1. Details of Research Area

This research area aims to elucidate the planetary environment necessary for emergence of life, through interdisciplinary study of "CO worlds" in which organic molecules are generated from carbon monoxide. Recent astronomical observations and planetary exploration missions have discovered habitable environments beyond the Earth; however, we still do not understand what kind of planetary environment is necessary for the emergence of life. In this research area, we investigate the diversity of possible planetary environments, systematically focusing on major carbon species (CO_2/CO/CH_4) according to the redox state. An environment rich in CO is particularly suitable for synthesizing various organic molecules. It is also interesting that the earliest carbon fixation by Earth's life (the acetyl-CoA pathway) can use CO as a carbon source. Furthermore, recent geochemical and theoretical studies have provided evidence for the presence of CO in the atmospheres of the early Earth and Mars.

Based on these considerations, this research area will promote study of CO worlds by integrating four research fields. Theory Group (A01) and Geochemistry Group (A02) will investigate how much CO is present in the atmosphere of the early Earth, Mars and other planets including exo-planets, and characterize which organic molecules are produced in each atmosphere, The two groups conduct model calculations of planetary atmosphere and material cycling together with geochemical observations and experiments of atmospheric molecules including stable isotope species (isotopologues). In parallel, the Biology Group (A03) and Chemistry Group (A04) will clarify what kind of ecosystem, metabolism and chemical reaction system are established under such a planetary environment. The presence of organic molecules is not enough to create life. Rather, a chemical system itself must arise in the environment for providing building blocks of life. By focusing on CO, this research area plans to demonstrate that a chemical system capable of evolving into life (geometabolism) can be established in the actual planetary environment. Through this interdisciplinary research, we aim to revolutionize the astrobiology research field, and provide more concrete methods for discriminating traces of life (biosignatures) in future astronomical observations and planetary explorations.

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

One of our goals is to extend "biogeochemistry" of the Earth into other planetary systems. Further, we aim to facilitate the search for life in the universe, as well as microbiology and chemistry research fields initiated from the study of CO worlds. Therefore, we are seeking proposals to award as Publicly Offered Research in various fields, not only planetary science and geochemistry, but also microbiology, mathematical science, synthetic chemistry, and the fusion of these areas. The followings are examples of reserch topics related to each Research Group:

- A01 and A02: Redox evolution of planetary atmospheres focusing on carbon species; Observation or theory of CO and biosignatures in exoplanet atmospheres; Modeling of biogeochemical cycling via CO; The CO_2 stability problem in planetary atmospheres; Development of stable isotope methodology and its applications as biomarker; Paleoenvironmental reconstruction using stable isotope anomalies; Chemical and spectroscopic observations of planetary atmospheres, etc.
- A03 and A04: Autocatalytic synthesis and/or asymmetric amplification of building block molecules such as amino acids; Interaction between metal, CO and organic molecules; Theory of autocatalytic systems established in planetary environment; Carbon fixation by electro-, photo-, and thermo-catalytic chemistry in CO environments; Biochemistry of CO metabolizm such as acetogenesis; Evolutionary analysis of carbon fixation and energy metabolism; Microbial ecology in extreme environment; Reconstruction of ancestral enzymes and their functional analysis, etc.

We also welcome innovative and challenging proposals that do not fit within these frameworks. The guideline for making these Publicly Offered Research awards is 3 million yen or less for 12 projects for theoretical and small-scale experimental research. We intend to select 3 larger projects supported at 8 million yen or less for experimental research in topics of particularly high priority.

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	Theoretical modeling of CO world	3.0	12
A02	Decoding CO world in early Earth and Mars		
A03	Biology of CO world	8.0	3
A04	Chemistry of CO world		
B01	Interdisciplinary research connecting from A01 to A04		

Research Outline of Research Areas

Deciphering and Manipulating Brain Dynamics for Emergence of Behaviour Change in Multidimensional Biology

http://braidyn-bc.jp

Number of Research Area	:	22A301	Term of Project :	FY2022-2026
Head Investigator	:	MATSUZAKI Masanori		
Research Institution	:	Graduate School of Medicine, The University of Tokyo		

1. Details of Research Area

In the process of human behavior change, multidimensional behavior changes, i.e., not only changes of the goal-directed behavior, but also changes such as facial movements that may be related to internal states such as motivation, conflict, and joy of success, often appear. This should be common not only to humans but also to many animal species, but it is difficult to measure detailed behavioral changes in small animals such as mice, and has been overlooked in many studies. However, with the rapid progress of AI technology in the past few years, it has become possible to extract with high precision the movements of a mouse's entire body, including its eyes, whiskers, tongue, jaw, and other facial features, from video data alone. In this Research area, we aim to "quantitatively" elucidate the relationship between multidimensional behavioral change and brain dynamics (brain information dynamics, which is neural activity that encodes information at a given moment, the dynamics of synaptic connections and molecular expression that define the neural activity, metacognition, and meta-learning). We will also investigate the principles by which the dynamics of related circuits operate to generate behavioral change, how this relationship differs between individuals and between healthy and diseased individuals, and whether direct manipulation of the dynamics of related circuits or behavioral interventions can promote the desired behavioral change.

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

Publicly Offered Research is invited for studies that fall under Research Groups A01 and A02. Research on the development of techniques and tools to measure and manipulate behavior change and brain dynamics with multidimensional high precision is also welcome. Target animals are not limited to mammals. The administrative group promotes the openness of measurement, standardization, and analysis methods for multidimensional data, and we encourage research that actively uses these methods to analyze multidimensional data obtained. The administrative group now acquires behavioral change data and brain dynamics data from mice and demonstration data are available at https://braidyn-bc-database.netlify.app/. Research that focuses on the analysis of data acquired by the administrative group without an animal experiment plan is also highly welcome. We are seeking participation from a wide variety of researchers, and we especially encourage young researchers and female researchers to actively apply.

In Research Group A01, "Wide Brain Dynamics of Behavior Change", we welcome proposals that measure or manipulate brain dynamics of behavior change, including social behavior change, metacognition that unconsciously defines behavior change, developmental and aging-related behavior change, and disease models, as well as research on computational models, simulations, and robotics that relate these studies and behavioral interventions. We welcome research that attempts to clarify the relationship between behavioral change and brain dynamics through behavioral interventions. We also welcome proposals on the development of methods to standardize behavioral changes and brain dynamics among individuals and to extract interspecies commonalities, as well as research mainly on analysis using mouse behavioral and brain dynamic data obtained by the administrative group.

In Research Group A02, "Interactions between Wide and Local Brain Dynamics", we welcome proposals that relate not only local brain activity but also dynamics at the single cell level and single synapse level to multidimensional behavior change based on rigorous cellular construction, and model brain circuits. We welcome proposals that perform dimensional reduction of multidimensional data, and extract behavioral changes common to the task. We are also looking for research that takes a broad view of brain dynamics, including neuronal activity by action potentials, changes at the gene and protein levels, glial cell dynamics, autonomic and peripheral nerve dynamics, and brain dynamics related to immunity and inflammation, brain-gut interaction, etc., and acquires and analyzes such multidimensional data. We welcome highly motivated research that seeks to elucidate the mechanisms of behavioral change through strong collaboration by sharing and standardizing multidimensional data within this Research area.

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	Wide Brain Dynamics of Behavior Change	3	10
A02	Interactions between Wide and Local Brain Dynamics	3	10

Research Outline of Research Areas

Mechanical self-transformation of living systems
http://multicellular-mechanics.org

Number of Research Area	:	22A302	Term of Project :	FY2022-2026
Head Investigator	:	MOTEGI Fumio		
Research Institution	:	Institute for Genetic Medicine, Hokkaido University		

1. Details of Research Area

Elucidating the design principles of multicellular organisms is a fundamental challenge in the life sciences. The global order of an organism generally emerges from local interactions between molecules and cells. Collectively, these interactions - referred to as self-organisation - give rise to the emergent properties of cell fate and function, ultimately leading to the morphogenesis of tissues and organs. Mechanical forces that induce changes in cell size, shape and position are integral to the morphogenetic processes, and indeed play instructive role in modulating cell fate and function, suggesting the existence of a complex feedback between forces and cell physiology.

This research area aims to develop new paradigms of morphogenesis by quantitatively and holistically assessing how mechanical forces control emergent properties of self-organising feedback in morphogenesis. By harnessing the power of cutting-edge technologies to measure and manipulate the magnitude and distribution of forces within cells and extracellular spaces, we will understand how these forces trigger self-organising feedback that leads to progressive self-tuning transformation of multicellular systems over longer timescales.

Our planned research consists of three research groups: A01 and A02 will elucidate mechanical self-organisation in a wide range of multicellular systems, while B01 will develop new techniques for measurement and analysis of mechanics, as well as theoretical framework for modelling and numerical simulation of self-organisation. Through organic collaborations within this multidisciplinary groups, we will uncover new insights into mechanical self-organisation and achieve a paradigm shift in the understanding of biological design principles.

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

We invite publicly offered research groups (A03 and B02) that quantitatively measure and analyze mechanical forces by inventing new techniques of cell and tissue manipulation. We expect research proposals that will investigate the physiological functions of mechanical forces by manipulating forces within cells and tissues while applying theoretical analysis. We also seek research proposals that develop new model systems for studying mechanical self-assembly events. These projects are expected not only to complement and strengthen the planned research, but also to challenge the establishment of innovative techniques to further accelerate the overall research goals.

The A03 group aims at investigating the self-organization of unique biological systems including, but not limited to "*ex vivo* analysis of tissue morphogenesis", "formation of organoids derived from differentiated stem cells", and "reconstituted systems by restructuring cellular interactions." These projects will improve our understanding of extracellular mechanics and reveal how multicellular systems sense and respond to external forces. In addition, we encourage challenging proposals that, for example, the use of "unconventional animal and plant models" and investigating "non-biological forces" (e.g., gravity, atmospheric or water pressure, and geomagnetism). A proposal addressing disease and ageing would also be considered if it fits within the overall objectives.

The B02 group aims to develop innovative techniques for the quantitative measurement, manipulation, and evaluation of various types of forces in multicellular systems. In particularly, proposals on the development of force biosensors and force-measuring technologies that can be applied to cell surfaces, nuclear membranes, and the lumenal surfaces of embryos and tubular organs are highly encouraged. We also welcome the development of new technologies for manipulating in vivo forces such as optogenetics, material engineering, and MEMS technology. B02 also welcomes "dry" proposals that focus on the theoretical investigation and mathematical modelling of mechanical self-organization.

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
A03	Research on mechanically self-organizing multi-cellular systems	5.00 (wet) 3.00 (dry)	12
B02	Development of techniques for measurement, manipulation, and theoretical analysis of mechanical self-organization		5

Research Outline of Research Areas

Genomic dynamics underlying the plastic hermaphroditism in plants: the basis of exploratory reproductive adaptations.
http://www.ige.tohoku.ac.jp/prg/flower/

Number of Research Area	:	22A303	Term of Project :	FY2022-2026
Head Investigator	:	AKAGI Takashi		
Research Institution	:	Okayama University		

1. Details of Research Area

Plants have evolved hermaphrodite flowers, in which male and female functions can coexist. Hermaphrodite flowers have allowed flexible bidirectional transitions between two contrasting reproductive systems, selfing and out-crossing, to explore a wide range of environments. In other words, in plants, multiple lineages have constantly but independently established various out-crossing systems from the ancestral hermaphroditism, while they could have disrupted them to reverse into selfing, as an adaptation. These recurrent "scrap and rebuild" would be a nature of evolution in plant reproductive systems.

The rapid scraping and rebuilding cycles in the plant reproductive systems have left strong traces on the evolution of their drivers. In turn, various evolutionary indexes in genomic information and protein interactions/conformations of these factors would be nice materials to visualize their history of exploration. Thus, plant reproductive biology is a challenging field to integrate conventional biology with various advanced information sciences, including recent AI technologies based on large-scale genomic and evolutionary information. In actuality, with a collaborative application of advanced information technologies and whole-genome sequencing across plant species, this research area preliminarily found that the establishment of hermaphrodite flowers and their plastic transitions into out-crossing systems had a fundamental impact on the history of plant reproduction.

In this research area, we will overlook the various transitions of plant reproductive strategies and find their potential links, with advanced information science platforms, integrating molecular dynamics simulation, genome evolution, structural biology, and chemical biology, etc. Our final aim is to elucidate "genome dynamics triggering exploratory reproductive adaptations, based on the plastic hermaphroditism", which goes beyond the conventional research frameworks.

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

We expect publicly offered research that can complement the topics not covered by the existing research groups, and can develop new technologies by collaborative integration with our technologies in the Research Support Centre for Interdisciplinary Science consisting of seven research units; information technology (AI) unit, genome and mathematical modeling unit, evolutionary biology unit, structural imaging unit, chemical and molecular dynamics unit, single-cell omics unit, and high-throughput genome-editing unit. We target research with various plant species, in plant physiology, biochemistry, molecular genetics, and genetic breeding. We also welcome proposals from emerging fields that integrate structural biology, molecular cell biology, evolutionary ecology, genomics and epigenomics, information science, structural systems science, and molecular dynamics simulation, etc.

This research area will adopt a total of approximately 15 publicly offered research proposals aiming for a synergistic effect through collaboration with the existing research groups. A two-stage research fund allocation will be planned, taking into account the research contents and environments. Approximately five research projects, with high relevance and performance in relation to our research area, and with the potential for drastic development, will be selected to allocate a budget of JPY 7,000,000/year. Approximately 10 projects will be selected for exploratory topics, including by young researchers, to allocate a budget of JPY 4,500,000/year.

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	Genomic dynamics underlying the plastic hermaphroditism in plants: the basis of exploratory reproductive adaptations	7 4.5	5 10

Research Outline of Research Areas

Reevaluation of self-recognition by immune system to decipher its physiological advantages and pathological risk
https://self-ref-imm-percept.biken.osaka-u.ac.jp

Number of Research Area	:	22A304	Term of Project :	FY2022-2026
Head Investigator	:	YAMASAKI Sho		
Research Institution	:	Osaka University, Research Institute for Microbial Diseases		

1. Details of Research Area

Immunology has become an extremely familiar field of science to the general public. We all now appreciate that antibody medicine has opened up new avenues for the treatment of various diseases and that vaccines have become common throughout the world in a short period of time. Thus, immunology is a scientific field that is directly related to human diseases and the results of basic research have directly led to contributions to society. However, there remain many immune diseases and phenomena that have not been elucidated. To address this, we need a systematic approach based on new technologies and perspectives that go beyond conventional views.

The immune network was considered to be a system that monitors exclusively "outward", such as pathogens. However, recent studies have revealed that many immune sensors are also looking "inward" to detect perturbations derived from external/internal stresses by sensing alteration of self-molecules, such as proteins, nucleic acids, lipids, sugar chains, metabolites, etc. Thus, various physiological processes which utilize these organic substances can be directly or indirectly linked to the immune system. Elucidating the mechanisms of self-recognition by immune sensors will advance our understanding of physiological responses and diseases that are not currently linked to the immune system.

Hence, we propose a new concept "self-referential immune perception" that reevaluates self-recognition by immune system to decipher its physiological advantages and pathological risk. Our goal is to advance scientific understanding of currently unsolved immune-related and broader physiological responses. We aim to (1) identify self-components recognized by immune sensors using cutting-edge technologies, (2) clarify the molecular basis of the self-protective response inherent in the immune system by focusing on its physiological and pathological sides, and (3) develop a methodology that enables the prediction of health status by utilizing the self-interactome database established in this research area.

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

The open call for research proposals will be based on the concept mentioned above that complement or greatly develop our research activities. A total of approximately 25 research proposals of up to 3 million yen per single year are invited under A01 and A02. We welcome research proposals focusing on the beneficial responses caused by self-recognition, and do not limit the field related to immune responses and diseases. We also expect to have challenging projects that aim to elucidate various physiological responses and disease mechanisms in a broad range of fields. The definition of "immune sensor" in our research area is "a receptor or related molecule that is known to or expected to recognize "foreign" substances". There is no restriction for target organisms unless it does not fit our research concept. We are particularly interested in challenging proposals from young researchers, female researchers, and researchers currently studying abroad who are eligible to apply.

A01: Molecular basis of self-recognition and function

We aim for the strategic identification of self-components recognized by various immune sensors. We expect research proposals that go beyond identification of such self-components and aim to elucidate the beneficial biological responses. We also expect basic research aiming at establishing new technologies for molecular interaction, molecular identification, and mathematical/informatics analysis. Proposals for innovative methodologies that integrate the data accumulating in this field are also welcome. Research projects that focus solely on pathogen recognition will not be considered.

A02: Advantageous or pathophysiological responses triggered by self-recognition

We expect research proposals that address the physiological advantages of self-recognition by immune sensors straightforwardly, or through analysis of the detrimental effects caused by its dysregulation. This research may include clinical approaches using human samples. One of our final goals is to create a system to monitor and predict our health status using our interactome database. Thus, research proposals aiming to develop new nonlinear data analysis, machine learning, and multivariate analysis are welcome.

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	Molecular basis of self-recognition and function	3	25
A02	Physiological or pathogenic responses triggered by self-recognition		

Research Outline of Research Areas

Photonic Computing Highlighting Ultimate Nature of Light
https://www.photoniccomputing.jp/

Number of Research Area	:	22A401	Term of Project :	FY2022-2026
Head Investigator	:	KAWANISHI Tetsuya		
Research Institution	:	Faculty of Science and Engineering, Waseda University		

1. Details of Research Area

To meet the ever-growing demands of information communication and processing and to support the sustainable development of an advanced information society, it is expected that new computing principles and technologies utilizing physical processes will be created. This research area which aims to create photonic computing by integrating optical science and technology with information science and technology, focusing on leveraging the "extreme performance of light." will explore various characteristics of light, such as high-speed propagation, low loss, wide bandwidth, multiplexing, and real-world interaction capabilities. This research area is organized into three research pillars, each with specific goals and content:

Research Pillar A (Planned Research A01, A02): "System architecture to benefit from the ultimate nature of light", which focuses on overcoming the architectural limits that hinder the use of light in computing and researching system architectures that fully utilize the inherent performance of light. Specific topics include photonic approximation computing that maximizes the high speed and multiplexing of light and task decomposition for optimal integration of photonic and electronic systems.

Research Pillar B (Planned Research B01, B02, B03): "Computing mechanism to exploit the ultimate nature of light", which aims to develop computing mechanisms that utilize the physical limits of light, such as its spatiotemporal multiplexing and multi-valued representation capabilities. Specific topics include photonic reservoir computing, the application of extreme light modulation in computing, and the creation of advanced optical functions such as optical decision-making.

Research Pillar C (Planned Research C01, C02): "Device fundamentals to benefit from the ultimate nature of light", which focuses on innovating device platforms to draw out the unexplored potential of light. Specific topics include integrated photonic devices for computing that utilize the multiplexing of light and the fusion of ultra-high-frequency electronics and photonics to overcome bottlenecks between optical and electronic systems.

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

We are soliciting original and pioneering research proposals related to photonic computing that leverages the extreme performance of light, targeting all three research pillars (A, B, and C). The fusion of photonics and computing is a rapidly advancing field, with efforts to realize optical matrix-vector operations through the progress of silicon photonics integration technology. Applications requiring functionalities and performances significantly different from traditional systems, such as digital twins and generative AI, are rapidly expanding, marking a crucial transformative period for creating new academic foundations supporting next-generation information processing infrastructures. The role of the solicited research is to expand and deepen research that leads to academic transformation, ranging from academic foundations to practical application deployment. However, the duration and funding for the solicited research are limited. Therefore, research proposals must be highly original and pioneering. Proposals should focus on one of the research pillars: A (computer science, applied systems, mathematical sciences), B (information physics, information optics, quantum science, nonlinear science), or C (optical devices, electronic devices, materials science), emphasizing the unique perspectives of "architectural limits (Pillar A)", "extreme performance (Pillar B)", or "unexplored potential (Pillar C)". Moreover, this research area requires a certain consideration of future applications even for fundamental research. This does not mean that research development must include content premised on social implementation but rather that the proposal should consider the relevance to applications and connections with other research. The research area encompasses a wide range of disciplines, including optical science, information science, computer science, electrical and electronic engineering, communication engineering, mathematical sciences, and materials engineering. Additionally, regarding application and use case studies, the research should have broad applicability beyond traditional computing and information communication technologies. An important role of the solicited research is to strengthen and develop researcher networks, including young researchers, by collaborating with diverse academic fields involved in this research area.

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
A03	System architecture to benefit from the ultimate nature of light	2.5	10
B04	Computing mechanism to exploit the ultimate nature of light	6	5
C03	Device fundamentals to benefit from the ultimate nature of light		

Research Outline of Research Areas

Macro coastal oceanography: integrated simulation for the material dynamics from the land through the open ocean
https://macrocoast.jp/

Number of Research Area	:	22A402	Term of Project :	FY2022-2026
Head Investigator	:	HASUMI Hiroyasu		
Research Institution	:	The University of Tokyo, Atmosphere and Ocean Research Institute		

1. Details of Research Area

The coastal zone environment is changing due to human activities. Global scale changes in the ocean associated with global warming affect the coastal zone, while the supply of various anthropogenic substances is increasing from the land. Rivers, which transport material from the land to the coastal zone, are also affected by global warming. For example, the intensity and frequency of flooding discharge are increasing in Japan. There is an increasing need for prediction and impact assessment for the coastal zone. Still, the current simulations cannot meet such a need because the influences from the land and the open ocean are not sufficiently considered. This Research Area aims to transform the coastal oceanography into a "macro"-scale framework to properly include the influences from the land and the open ocean. Thereby, we intend to realize such a simulation that can properly predict the ongoing changes in the coastal zone and assess the impact of such changes.

This Research Area focuses specifically on the dynamics of nutrients in the coastal zone around Japan. Nutrients are supplied to the coastal zone from the land and the deep open ocean, and both are rapidly changing under human influence. We aim to understand and predict it by properly considering its interaction with the land and the open ocean. One of our goals (the "milestone" of this Research Area) is to comprehensively answer the classical question: Which of the land and the open ocean is dominant in the supply of nutrients that sustains the biological production in the coastal zone?

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

Planned Research is grouped into A (focused on the coastal zone), B (focused on the open ocean), and C (focused on the land). Group A comprises A01 which is focused on physical processes, A02 which is focused on material dynamics, A03 which is focused on ecosystem processes, and A04 which develops an integrated simulation system from the land through the open ocean with an emphasis on the coastal zone. Group B includes B01 which is targeted at the subpolar region, B02 which is targeted at the subtropical region, and B03 which conducts simulations for the entire North Pacific. C01 deals with the terrestrial nutrient dynamics with a focus on its influence on the ocean. We expect Publicly Offered Research to complement and extend Planned Research and to contribute to the above-mentioned integrated simulation system and milestone. We welcome numerical modeling studies aiming at obtaining synthetic views based on the results by Planned Research. More specific themes are as follows:

A01, A02: Marine ecosystem modeling and fishery species habitat mapping utilizing the understanding of the nutrient transport obtained by Planned Research. **A03**: Modeling studies on the iron dynamics in coastal waters collaborating with the observations by Planned Research. **A04**: Studies assessing or validating the numerical modeling system developed by Planned Research by applying it to actual events. **B01**: Modeling studies on the dynamics of land-origin nutrients and their influence on biological productivity. Studies on the impact of land-origin nutrients on the marine ecosystem. **B02**: Modeling studies on the transport processes of nutrients in the Kuroshio region and around. Studies on the nutrient budget in the western North Pacific in long timescales. **B03**: Data assimilation studies that extend the understanding obtained by Planned Research to other oceanic regions. **C01**: Modeling studies assessing the impact of land water on the coastal marine ecosystems. Studies on the influence of land-origin freshwater and nutrients on the large-scale (over a broad area of coastal regions or from the coastal waters to the open ocean) physical ocean circulation, marine material cycles, and ecosystems.

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	Flow variability and material dispersion in the coastal zone	5 2	6 10
A02	Dynamics of land-origin material in the coastal zone		
A03	Utilization of land-origin nutrients by coastal ecosystem		
A04	Land-coastal zone-open ocean exchange of freshwater and material		
B01	Material exchange between the coastal zone and the subpolar ocean		
B02	Material exchange between the coastal zone and the Kuroshio region		
B03	Inverse modeling for coastal zone-open ocean interaction		
C01	Terrestrial material dynamics and its influence on the ocean		

Research Outline of Research Areas

The past, present, and future of "misbehaving climate" and humans
https://www.ritsumei.ac.jp/research/abbarel/

Abbreviated Name of Research Area	Misbehaving Climate and Humans		
Number of Research Area :	24A101	Term of Project :	FY2024-2028
Head Investigator :	NAKAGAWA Takeshi		
Research Institution :	Ritsumeikan University ・Research Centre for Palaeoclimatology		

1. Details of Research Area

Climate has three dynamic modes. The first is gradual 'climate change', such as so-called global warming. The second is 'extreme events', such as rare torrential rainfall. The third is a phenomenon in which the climate becomes persistently unstable and 'hazards' become more frequent. In this research area, we call this third mode 'misbehaving climate'. International organisations have reported that increased frequency of weather disaster have caused losses of millions of lives and several hundred trillion yen over the last few decades.

The project aims at reconstructing when in the past the climate was 'misbehaving' by analysing 'varves' (= annually layered sediments). Archaeological methods are then used to examine the temporal relationships between past 'misbehaving climate' and human history. We will also develop next-generation methods of age determination. By introducing climate modelling and disaster scenario analysis methods, the project aims to examine the mechanisms of 'misbehaving climate', its impact on human society, and to make effective countermeasures and recommendations for the future.

2. Call for Proposals

This research area consists of six research groups: A01 (chronology), A02 (palaeoclimate), B01 (Japanese archaeology), B02 (Maya archaeology and history), C01 (climate modelling) and C02 (impact and adaptation). In FY2024, calls for publicly offered research will be made by A02, B01, B02 and C02 groups.

A02 (Paleoclimate) invites applications for research to reconstruct the pattern and frequency of terrestrial disasters (e.g. wildfires and floods) by analysing existing varve samples such as those from Lake Suigetsu (samples will be provided). In order to correctly assess the impact of disasters on human history, the data density must be high enough to resolve 'human time scales' (several years to several decades). We look forward to applications from those willing to take on this challenge.

B01 (Japanese Archaeology) invites applications for archaeological research that examines whether there is a correlation between environmental change and human activities in any period from the Palaeolithic to the Yayoi period, using data on climate change recorded in the varved sediments of Lake Suigetsu, volcanic disasters and so on. In particular, we look forward to research that aims at examining the relationship between the coldest period of the Last Glacial Maximum, the rapid warming of the post-glacial period, the cooling of the Jomon period and after the Jomon sea advance, and human activities.

B02 (Maya Archaeology and History) invites applications for research related to archaeology, history and cultural anthropology, extending the perspective of 'misbehaving climate' to the Maya and other regions in Mesoamerica. The maximum limit for applications is 3 million yen per year for research requiring significant expenditure, such as excavations, and 2 million yen per year for other researches. We expect proposals to contribute to the diachronic study of the history of environment and civilisations in Mesoamerica, focusing on archaeology, public archaeology, environmental archaeology, zooarchaeology, archaeological sciences, history on colonial and modern times, and cultural anthropology on contemporary indigenous cultures.

C02 (Impacts and Adaptation) invites applications for following researches: 1) research on the social implementation of adaptation measures to the 'misbehaving climate' through policy scientific analysis of disaster prevention, mitigation measures, and land use policies; 2) research on the psychological basis of adaptation efforts and evacuation behaviour, etc., through analysis of the risk perception of the general public and administrative officials towards water-related disaster risks posed by the 'misbehaving climate'; and (iii) predictive assessment of the impact of a 'misbehaving climate' on the agriculture, forestry, fisheries and health sectors, as well as adaptation to it. We welcome research that will actively issue proposals to society.

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
A02	Reconstruction of the climatic stability/instability and tempo of disasters using varves.	2.5	2
B01	Correlation between climate change and human activities in Palaeolithic and Jomon periods		
B02	Collaboration with Mesoamerican archaeology, history and cultural anthropology	Excavation 3.0 Others 2.0	1 2
C02	The policy science of land use and disaster response in an era of 'misbehaving' climate	5.0	2
	Changing perceptions on the risk of water-related disasters posed by a 'Misbehaving Climate'		
	Impacts and adaptation of a 'Misbehaving Climate' on the agriculture, forestry, fisheries or health	7.0	2

Research Outline of Research Areas

Materia-Mind: Constructing a New Human Historical Science of the Co-creation of Material and Mind
http://materiamind.ridc.okayama-u.ac.jp

Number of Research Area	:	24A102	Term of Project :	FY2024-2028
Head Investigator	:	MATSUMOTO Naoko		
Research Institution	:	Research Institute for the Dynamics of Civilizations		

1. Details of Research Area

A crucial key to human evolution, the formation of civilization, and our future is the co-creative relationship between humans and objects. This Research Area will attempt to elucidate the mechanisms of the intertwining of environmental construction by humans and changes in human cognition, body, and behavior through trans-disciplinary collaborative research that transcends the boundaries of the humanities and sciences, based on quantitative, experimental, and advanced analysis using archaeological data spanning tens of thousands of years. By conceptualizing the state of things as "*materia*" as sensed and experienced by people, we will create a new Research Area that goes beyond the dualism that separates matter and mind in order to focus on materiality as the mother of the mind. From the perspective of the formation of the "*material-mind*," we will clarify how the major shift in cognitive abilities prompted the construction of complex societies or civilizations, a phenomenon unique to humans, pursue the limits and possibilities of human cognitive abilities, and propose a new model for an integrated understanding of where humanity came from and where it is going.

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

We aim to achieve the integration of related fields essential to elucidate the mutually constructed relationship between material, mind, and body and to create a new view of human beings, culture, and history. We seek empirical and theoretical research that complements and reinforces the following research groups and introduces new perspectives. A01: Case studies and innovative theoretical and methodological research centered on archaeology, anthropology, and other humanities and social science fields on the relationship between "technological innovation," "dynamics in arts and social complexity," and related "cognitive processes" in human history. The geographic area of study is not restricted. A02: Archaeology, natural geography, cultural anthropology, history, and other related areas that focus on ecological and social changes interconnected with natural disasters, migration, technological innovation, and cross-cultural contact. B01: Research on the relationship between the transformation of natural ecological environments and cultural landscapes and human activities and their historical changes, using GIS and remote sensing, etc.; research on the cognitive structures of people living in local societies and their transformations through ethnographic research. B02: Cognitive scientific research that explores the causal relationship between creative artifacts, songs, music, and other artistic expression and environment, cognition, and individual characteristics (cognitive archaeology, cross-cultural comparison, developmental and animal studies, statistical causal modeling research, etc.). C01: Genetic, neurophysiological, cognitive, and behavioral studies in humans and non-human animals on the interaction between genes and the social environment. Studies that contribute to the construction of theoretical models are also welcome.C02: Research on innovative analytical methods related to 3D data or the construction of evolutionary models based on 3D data. Publicly Offered Research will be assigned to the most closely related Research Group, but we also encourage active collaboration and joint research with other Research Groups.

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	Mutual Construction of Objects and Humans: Empirical and Theoretical Study of the Materia-Mind (Material & Mind Group)		
A02	Diachronic Studies of Entanglement and Enchainment between Environment and Humans through Interdisciplinary Fieldworks across the Pan-Pacific (Human & Environment Group)	1.5	4
B01	Elucidation of the "Cultural Evolution" Mechanism of Cognitive Behaviors in Human History through Ethnographic Studies (Behavior & System Group)	2	8
B02	Collaboration between Cognitive Science and Human History to Elucidate the Process of Creative Artifact Creation (Art & Emotion Group)	3	2
C01	Construction of a Materiamind Evolution Model Integrating Life Science and Material Cultural Studies (Genes & Culture group)	4.3	3
C02	Exploring Cultural Evolutionary Dynamics via Multi-Dimentional Representation and Modeling of Archaeological and Anthropological Data (Representation & Modeling Group)		

Research Outline of Research Areas

Ion Jamology: Materials design transformation by understanding non-equilibrium and collective ion flow
http://ion-jamology.jp

Number of Research Area	:	24A201	Term of Project :	FY2024-2028
Head Investigator	:	HITOSUGI Taro		
Research Institution	:	The University of Tokyo		

1. Details of Research Area

Ion jamology reveals the collective motion of ions in solids and develops new materials. In this Research Area, researchers in **materials science and mathematical science collaborate to establish material design guidelines for controlling the flow of ions.** Furthermore, we aim to advance mathematical sciences by tackling new challenges in modeling theories. We are developing high-performance batteries, catalytic materials, and hydrogen storage materials that will contribute to a carbon-neutral society.

We focus on jamology, which exemplifies the application of mathematical science. We employ mathematical models for particle interactions, such as the asymmetric simple exclusion process (ASEP) and cellular automata. We also apply principles of non-equilibrium statistical physics, e.g., jamming transitions, to gain insights into materials and promote the application of mathematical science to a wide range of fields in materials science. The initial step involves integrating this knowledge with research on batteries, catalytic materials, and hydrogen storage materials.

We are advancing three projects to foster this interdisciplinary research. We aim to promote mutual understanding of Planned Research A01, A02, and A03 through these projects.

1. Collective flow of ions (micro to mesoscale)
2. Pathway networks (meso and macroscale)
3. Overall optimization (connecting micro to macroscale)

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

- Researchers pursuing experimental research are *not* necessarily required to incorporate mathematical sciences at the application stage. We expect proposals that elucidate issues involving the collective motion of ions in fields such as batteries, ionics, catalysis, and hydrogen storage. Finally, we seek research topics that will contribute to establishing ion jamology through modeling and quantitative verification.
- Researchers in the mathematical sciences are encouraged to explain the relationship between mathematics and ionic flow in ways that are understandable to experimentalists. Research proposals based on materials simulations are also welcome.

We look forward to receiving the following proposals.

A01・Computation and Mathematics: Research on applying mathematical sciences, represented by materials simulation, graph theory/discrete geometry, statistical machine learning, stochastic processes, etc. We strongly hope for many applications from mathematical scientists interested in materials science.

A02・Materials Synthesis: (a) Synthesis of model materials to obtain precise physical properties and structural information, (b) Development of batteries, solid catalysts, and hydrogen storage materials using new synthesis methods, (c) Development of composite materials by controlling hierarchical structures such as bulk, surfaces, and interfaces.

A03・Advanced Measurements: Measure collective ionic motion in solid ionic conductors, battery materials, catalysts, and hydrogen storage materials. For instance, (a) Development of *operando* measurement techniques for clarifying ionic, electronic, and lattice interactions, (b) Advanced measurements to complement planned research, (c) Development of measurement and analysis infrastructures.

We expect proposals that actively promote joint research. We also welcome applications from young researchers enthusiastic about exploring new fields.

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	Mathematical and computational simulation analysis for the construction of ion jamology	300	5
A02	Creation of new materials and development of new functions based on ion jamology	400	5
A03	Advanced measurements to elucidate ion jamology	400	5

Research Outline of Research Areas

Integrated Science of Synthesis by Chemical Structure Reprogramming
https://srep.kuchem.kyoto-u.ac.jp/

Number of Research Area	:	24A202	Term of Project :	FY2024-2028
Head Investigator	:	TOBISU Mamoru		
Research Institution	:	Osaka University, Graduate School of Engineering		

1. Details of Research Area

This research area aims to pioneer the innovative concept of **Chemical Structure Reprogramming (SReP)** as a new paradigm-shifting approach to crafting intricate substances. SReP is defined as methodological framework facilitating the modification of molecular architectures by substitution, insertion, or elimination of atom(s) on demand. The implementation of SReP holds promise of streamlining the synthesis of diverse chemical structures, which circumvents the tedious processes of traditional synthesis, and unlocks avenues to previously inaccessible molecular configurations. Within this research domain, we aim to advance and refine SReP methodologies through interdisciplinary collaboration spanning organic chemistry, inorganic chemistry, polymer chemistry, and supramolecular chemistry.

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

This research area seeks to forge a SReP methodology by fostering collaborative endeavors among researchers specializing in diverse domains: organic chemistry (A01), inorganic chemistry (A02), macromolecular chemistry (A03), and physical chemistry (A04). To reshape the landscape of synthetic science without the constraints of conventional academic boundaries, we invite publicly offered research from multifaceted backgrounds. We invite proposals that offer clear and specific insights into the synthetic methodologies and their innovative contributions to the SReP of target substances. We encourage applicants to propose the distinctive synthetic methods and to elucidate their novelty. Furthermore, recognizing the transformative potential of collaborative synergy, we urge researchers to include feasible collaboration avenues with peers in related fields.

The objective of **Group A01** is to pioneer SReP methodologies tailored to organic molecules. We invite proposals aimed at innovating new reactions that challenge the confines of conventional organic synthesis. These may include skeletal editing via elimination, insertion, or substitution of atom(s), isomerization and rearrangement of molecular skeleton, epimerization independent of thermodynamics, isotope labeling of molecular skeleton, among others. We welcome diverse approaches to realizing the SReP method, which spans homogeneous or heterogeneous catalysis, photochemical reactions, electrochemical reactions, and beyond.

Group A02 is dedicated to advancing SReP methodologies tailored to inorganic materials, encompassing metal complexes, metal clusters/nanoparticles, and oxide clusters. We seek proposals that confront the longstanding challenge of precisely controlling metal species, geometric arrangements, and nucleus numbers, which would enable post-synthesis editing of inorganic materials. We particularly encourage proposals exploring SReP methods grounded in molecular chemical approaches, which are poised for collaboration with Group A01.

Group A03 is tasked with pioneering SReP methodologies tailored to a diverse array of macromolecular groups, spanning proteins, nucleic acids, sugars, biopolymers, synthetic polymers, coordination polymers, supramolecules, and two-dimensional layered materials. While conventional methods like the click reaction enable modification of macromolecules at their terminal site and their side chains, we invite proposals focused on substructural transformations of the macromolecular backbone itself—a challenge often elusive to traditional approaches.

Group A04 serves as a catalyst for the advancement of SReP within Groups A01-A03, leveraging cutting-edge measurement techniques, analyses, and simulations. We encourage proposals aimed at unraveling the intricate chemical structures and reaction mechanisms of newly developed SReP methods through the application of innovative physicochemical methods. This includes but is not limited to, time-resolved spectroscopic measurements (e.g., XAFS), large-scale quantum chemical calculations, high-resolution TEM imaging, advanced measurements (e.g., STM), and catalyst design utilizing informatics.

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	Organic Chemistry Group	2.5	11
A02	Inorganic Chemistry Group		8
A03	Macromolecular Chemistry Group		5
A04	Physical Chemistry Group		4

Research Outline of Research Areas

Habitable Japan: Sustainability of atmospheric and oceanic enviromnent as a survival basis of island country Japan
http://hotspot3.aori.u-tokyo.ac.jp/en/

Number of Research Area	:	24A203	Term of Project :	FY2024-2028
Head Investigator	:	OKA Eitarou		
Research Institution	:	Atmosphere and Ocean Research Institute, The University of Tokyo		

1. Details of Research Area

Under global warming, in the region surrounding Japan where the ocean warms at twice the global average rate, the Kuroshio large meander and marine heat waves (MHWs) are becoming normal, extreme heat/rainfall and typhoons are intensifying, and marine ecosystems are changing. Will mild climate and abundant water/fisheries resources persist as a basis of survival for those of us living in Japan in the future? To address this question, using state-of-the-art observations and numerical modeling, we will elucidate variations and changes of atmospheric/oceanic (A/O) circulation near Japan that can be sustained through local processes involving interactions of the surrounding ocean/land, but also through remote impacts coming from the tropics and from the Arctic, unveil their influence on extreme/abnormal weather, marine ecosystems, and fisheries resources, and explore the predictability. We will also clarify the impact of A/O variations near Japan on climate over the North Pacific and over the globe. We will further refine processes of heat/material exchanges between the atmosphere and the ocean across the sea surface and biological production/decomposition at the ocean surface. Through these efforts, we will create integrated A/O science and build a foundation for future predictions and projections.

Research Group A01 clarifies variations/changes of ocean currents around Japan and their impact on coastal MHWs and marine ecosystems (A01-1). We conduct shipboard observations in the Japan Sea (Jan. 2026) and in the North Pacific off the Sanriku coast and in the East China Sea southwest of Kyushu (both Jun.-Jul. 2026) to clarify the influence of oceanic fronts and MHWs on atmospheric circulation and rainfall (A01-1/A01-2). We will also be clarifying the mechanism sustaining large-scale A/O heat and cold waves around the East Asia and the North Pacific (A01-3). Research Group A02 will deploy profiling floats around the Kuroshio Extension to clarify biological production/decomposition (A02-4). We will also be conducting continuous observations at an island in the Japan Sea and another in the North Pacific to clarify the influence of aerosol particles generated from wave spray on heat/material exchanges across the sea surface (A02-5). We will additionally be creating a new data assimilation method that overcomes many discontinuities in the A/O fields to reproduce A-O-marine ecosystems coupling processes in the models (A02-6). Research Group A03 will evaluate the predictability of extreme oceanic events such as the Kuroshio large meander and MHWs, and clarify their impact on fisheries resources (A03-7). We will also take on prediction of monsoon modulating under global warming and that of extreme weather such as heavy rainfall/snowfall inherent in monsoon (A03-8). We will also further clarify variability and future change of mid-latitude climate that interact with the tropics and polar regions from a global perspective (A03-9).

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

Publicly Offered Research projects in this Research Area are expected to share the above question with Planned Research projects (A01-1 ~ A03-9), to conduct research in cooperation with one or more of them, and to complement and expand their research, thereby enriching research of the whole Research Area. Preferred themes include 1. Study to clarify mechanisms and make predictions regarding the impact of coastal to global oceanic variations/changes on marine ecosystems including fisheries resources, 2. Study on the influence of large-scale A/O variations on local weather such as the Fehn phenomenon, the Yamase winds, and urban weather, 3. Study on interaction between mid-latitude oceanic/tropospheric variations and stratospheric variations, 4. Study on rainfall over the ocean using satellite, shipboard, and float observations, 5. Observation sharing platforms with Planned Research projects to deepen understanding of basic processes, and 6. Data analysis, parameter estimation, and prediction for the atmosphere and the ocean using data assimilation and machine learning.

To apply results from this Research Area to society, we welcome studies regarding a survival basis on land that is not the direct target of Planned Research projects: 7. Study on the impact of A/O variations and changes on terrestrial resources and needs of human society (hydrology, terrestrial ecosystems, agriculture, health, energy, societal systems, etc.) and its prediction.

We seek to recruit 12 Publicly Offered Research projects. Three projects of up to 9M yen/year will be assumed to conduct observations. (The other nine projects of up to 3M yen/year may also conduct observations.) Applications from early-career and female scientists 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
A01	Understanding of mid-latitude A/O variability under global warming	9	3
A02	Development of new methods and identification of basic processes	3	9
A03	Prediction and sustainability evaluation of mid-latitude A/O variability		

Research Outline of Research Areas

Chimera Quasiparticles for Novel Condensed-Matter Science

https://chimera-qp.ee.es.osaka-u.ac.jp

Number of Research Area	:	24A204	Term of Project :	FY2024-2028
Head Investigator	:	MURAKAMI Shuichi		
Research Institution	:	Department of Physics, Tokyo Institute of Technology		

1. Details of Research Area

The discovery of various "quasiparticles" (quantum mechanical entities that behave like particles in matter) is one of the most important achievements in condensed matter physics, which has enabled us to understand complex physical phenomena in terms of a small number of quasiparticles. Phenomena related to crystal vibration, light, magnetism, polarization, and plasma can be described by phonons, photons, magnons, polaritons, and plasmons, respectively. If we can create a new species by combining various quasiparticles, we can freely realize desired physical properties and functions, which will bring about new developments in materials science. However, in most cases, quasiparticles behave independently due to differences in time and space scales. In this Research Area, we will create "chimeras" (hybrids) by "chemical reactions" between quasiparticles that have been studied independently, by introducing various schemes such as artificial structures, material design, and symmetry design, and clarify physical properties and functions of chimera quasiparticles. This will revolutionize the basis of physical properties research and form a new foundation for the realization of highly functional electronic, optical, quantum, and energy devices. The goal of this research field is to establish chimera quasiparticle science. Chimera quasiparticle science will drastically increase the number of combinations of quasiparticles, and enable the transfer of the properties of a single quasiparticle to another quasiparticle and the response of different physical quantities to an external field (cross response), which will enable discoveries and proposals of new physical phenomena that cannot occur with a single quasiparticle.

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

We are widely inviting research plans that contribute to the construction of chimera quasiparticle science as Publicly Offered Research. We ask that research plans include an explanation of how the plan will contribute to the objectives of the Research Area. We will not limit our research to the fields of the Planned Research, but will call for proposals from a wide range of fields. The main fields of research that are envisioned are: condensed matter physics, materials engineering, electrical and electronic engineering, nano-micro science, applied physical properties, applied physical engineering, physical chemistry, organic chemistry, polymer organic materials, inorganic materials science, information science, information engineering, and many more. We aim to broaden the scope of this research area through collaboration among different fields.
In addition, we welcome challenging proposals based on novel and original ideas. We also actively invite research that is complementary to the Planned Research, that promotes collaboration between research groups, and that spans multiple research groups. We also hope that active exchanges and discussions with researchers in the Research Area during the research period will lead to new research ideas that were not anticipated even at the time of application.
The Planned Research in this research area consists of five Research Groups listed below, and the Publicly Offered Research will belong to one of these five groups. However, this does not limit the content of the Publicly Offered Research. If it is difficult to decide which research item number your proposal belongs to, please tentatively specify one of the research item numbers.
Group A01: Propose a new theory of chimera quasiparticles, and provide interpretations and proposals to experiments.
Group B01: Explore the possibility of metamaterials as reaction fields for the generation of chimera quasiparticles.
Group B02: Investigate physics of chimera quasiparticles, in particular transport properties and kinetics.
Group B03: Conduct chimera quasiparticle science utilizing the properties of molecules and interfaces in molecular science.
Group C01: Elucidate the functionality of chimera quasiparticles from the viewpoint of electronics applications.
We call for experimental research with a larger budget (up to 3 million yen per year), as well as small-scale experimental, theoretical, and preparatory research based on new and original ideas with a small budget (up to 2 million yen per year).

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	Chimera Quasiparticles: Theory	3	11
B01	Chimera Quasiparticles: Architecture		
B02	Chimera Quasiparticles: Physics	2	11
B03	Chimera Quasiparticles: Molecular Science		
C01	Chimera Quasiparticles: Electronics		

Research Outline of Research Areas

Investigation on the Origin and Evolution of Matter in the Universe by Extremely Rare Events: Frontier of Creating a New Insight on the Matter in the Universe
https://www.lowbg.org/ugrp/

Number of Research Area	:	24A205	Term of Project :	FY2024-2028
Head Investigator	:	KISHIMOTO Yasuhiro		
Research Institution	:	Tohoku University, Research Center for Neutrino Science		

1. Details of Research Area

The universe has evolved from the high-temperature, high-density state to the present status. In this evolving universe, only a little is known about the origin of matter and its evolution: "Why there is no antimatter but only matter?", "What is the nature of dark matter?", "How heavy elements were created and diffused?". Thus, the origin of the matter in front of us remains completely unrevealed.

In this research area, we will elucidate these fundamental mysteries about the origin of matter by searching for extremely rare events, such as neutrino-less double beta decay, dark matter, and supernova neutrinos. Through exploration of the mysteries, we aim to gain new knowledge about matter and to gain a new insight on matter.

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

The goal of this research area is to conduct fundamental research on the mysteries mentioned above and to turn them into a consistent understanding throughout the history of the universe. Toward this goal, we will promote the investigations on Majorana nature of neutrino, the dark matter, and neutrino from supernovae and astronomical objects based on "extremely rare event technology (ERET)", and construct physics model behind them. ERET is a common foundation to detect extremely rare events. It is necessary to deepen and develop the technology for current and future experiments. Introduction and dissemination of the technology is also one of the main objectives of the research area. We welcome research proposals related to the technology.

We expect Publicly Offered Research proposals to collaborate with each Planned Research, to strengthen collaboration, and ones that was not covered in Planned Research: (1) Experimental research utilizing existing ERET (e.g., extremely low radiation environment and high sensitive measurements), (2) Aiming to expand and develop ERET, (3) Studies to improve the accuracy of relevant physical quantities and model calculations, including machine learning, (4) Research aiming at collaboration to related research areas, and (5) R&D aiming at expansion of theoretical research, cross-field and application. A representative of the relevant Planned Research will be assigned as a contact person to successful applicant. We expect active applications from those who are motivated to further activate the field through active discussions and joint research. In the case of research that encompasses multiple research items, the most closely related research item will be selected

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	Exploring the origin of matter in the universe with large liquid scintillator detector	Large scale experimental and theoretical research 4.50	2
A02	Development of the double beta decay detector to search for Majorana neutrinos		
B01	Frontier of dark matter axion search opened up by technologies on strong magnetic field, microwave and superconducting device	Experimental and relatively large-scale theoretical research 3.70	4
B02	Exploring the nature of dark matter with a large liquid xenon detector		
B03	Direction sensitive dark matter search with high precision tracking technologies		
C01	Frontier of Rare Events in the Universe: Investigating the Origin of Elements in the Universe with the Universal Supernova Neutrino Detector	Theoretical studies, small-scale experimental research 1.50	10
D01	Deployment of ultra-low radioactivity techniques		
E01	Theoretical research on the origin of matter and the evolution of the universe		
E02	Theoretical study of supernova neutrinos using all neutrino flavors		

Research Outline of Research Areas

Plasma-driven Seed Memory Operation: Frontier in Molecular Dynamics in Seeds driven by Plasma
https://plasma.ed.kyushu-u.ac.jp/plasma-seed-science/en/

Number of Research Area	:	24A206	Term of Project :	FY2024-2028
Head Investigator	:	KOGA Kazunori		
Research Institution	:	Kyushu University, Faculty of Information Science and Electrical Engineering		

1. Details of Research Area

Plants have difficulty moving from where they are rooted, so they have a high adaptive capacity to climate change. They are stored as a memory in the DNA modification of seeds and passed on to the next generation. Parental generations stressed by high temperatures result in the deteriorated quality of seeds. Low-temperature plasma converts external electrical energy into electron kinetic energy, producing light, ions, and chemically active molecules (reactive species) through electron collision with atoms/molecules. It has attracted much attention because of its ability to irradiate reactive species at high flux without damage. So far, we have found that three minutes of air plasma irradiation to seeds can recover the damage caused by high temperature through alteration in the DNA methylation that turns gene expression on and off. These results suggest that plasma irradiation for a short time scale can selectively modify memories stored in seeds.

To clarify this mechanism, three research groups were set up: A01 'plasma', A02 'seeds', and A03 'omics'. We will build physical and chemical reaction network models to to elucidate the molecular mechanism of DNA modification induced by plasma irradiation. The established field of "plasma seed science" aims to manipulate the plant memories that underlie seeds through plasma treatment.

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

The following describes the research groups and expectations for the publicly offered research established in plasma seed science.

[A01 'Plasma' Group: Science to a selective generation of reactive species]

In this research area, plasma irradiation in a wide gas pressure range from low to atmospheric pressure is being investigated. Research group A01 'Plasma' aims to improve reproducibility in plasma irradiation of seeds and to realize selective irradiation of active species and localized irradiation to seeds. To achieve this objective, it is essential to understand the physics and chemistry of complex molecular gas discharges. The publicly offered research is expected to contribute to creating new principles for controlling reactive species synthesis, gas-phase measurement to clarify the details of electron behavior and reactive species generation in plasmas, and a wide range of analysis using computational ~~science~~ approaches.

[A02 'Seed' Group: Science to deliver reactive species inside seeds]

Research group A02 'seeds' aims to understand and control physical and chemical processes and plasma-driven molecular transport from the seed coat to the cytoplasm through the cell wall and cell membrane. The expected publicly offered research includes new innovative measurements, analysis, and theoretical modeling to clarify molecular transport with chemical reactions from the seed surface to the inside of the cell and molecular biological studies to analyze each seed tissue. In addition, studies of model plants for a better understanding of the role of reactive species in intercellular signal transduction and molecular transport are also welcome.

[A03 'Omics' Group: Science to apply reactive species to DNA modification]

Research group A03 'omics' aims to create a foundation for seed memory manipulation based on understanding omics variation from DNA modification-related molecular mechanisms to phenotypes caused by plasma irradiation. The expected publicly offered research includes developing physical models of plasma-induced DNA modification using atomic and molecular simulations and bioinformatics research to construct an integrated chemical reaction network by connecting DNA modification-related transomics and chemical reaction networks in plasma. In addition, ~~research~~ to discover new molecular dynamics in transomics and to investigate the growth-promoting effects of plasma irradiation other than changes in DNA modifications are also welcome.

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	Plasma: Science to selective generation of reactive species	3	18
A02	Seed: Science to deliver reactive species inside seeds		
A03	Omics: Science to apply reactive species to DNA modification		

Research Outline of Research Areas

Generative Design to Unlock the Potential of Protein Function
https://p-func.kuchem.kyoto-u.ac.jp

Number of Research Area	:	24A207	Term of Project :	FY2024-2028
Head Investigator	:	HAYASHI Shigehiko		
Research Institution	:	Kyoto University, Graduate School of Science		

1. Details of Research Area

We aim at establishing design principles that enable conversion and creation of the molecular functions of proteins in a generative manner. To exploit the high potential of protein molecular functions, a methodology for molecular design of protein functions that follows given requirement definitions of the novel functions will be developed. To this end, more universal physicochemical approaches which are not constrained by evolutionary information are introduced. Namely, the transiently formed functional states that determine molecular functions are directly observed and analyzed by physicochemical approaches, and then the novel functions are designed based on the molecular understanding. A new field of research will be created by integration of theoretical predictions based on molecular simulations and data science, state-of-the-art spatiotemporal measurements such as time-resolved X-ray crystallography and spectroscopy, and creation of protein molecules through biochemistry and protein engineering. The development of novel functional proteins such as biomedical tools and useful enzymes will be demonstrated. Furthermore, the functional design scheme will be applied to artificial de novo proteins that do not exist in nature to endow them with completely novel molecular functions.

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

Proposals for Publicly Offered Research using a variety of theoretical and experimental physicochemical techniques are actively invited. In addition, complementary research proposals without a strong physicochemical basis, such as machine learning and directed evolution experiments, are also welcome. Proposals for research on molecular evolution toward the functional design are also welcome. Details of the research proposals of each research group are described below.

A01: Functional analyses and molecular design by computational chemistry. A02: Molecular design by data-driven approaches such as data assimilation and machine learning. A03: Protein design with theoretical and experimental de novo protein design techniques. B01: Measurement and technical development of time resolved structural biology. B02: Spaciotemporal measurements by biophysical techniques such as spectroscopy, high-speed AFM, NMR, HDX-MS, and single molecule observations. B03: Protein functional design by structural biology techniques such as X-ray crystallography, Cryo EM, and NMR. C01: Chemogenetics studies such as development of designer ligands. C02: Protein design by regulation of protein-protein interactions. Investigation of intrinsically disordered protein regions is also included. C03: Design of novel reporter and sensor proteins for cell state visualization. C04: Protein design of optogenetics and photo-manipulation tools. C05: Protein design of useful enzymes. Synthetic chemistry for development of caged compounds is also included. Proposals for interdisciplinary research with synthetic chemistry and complex chemistry in which chemically synthesized highly functional catalysts or complex molecules are combined with proteins, are also welcome. For research of Group B, how the elucidation of the functional state can contribute to the functional design should be considered. For research of Group C, not only what prominent features can be obtained, but also how to obtain them should be considered.

To encourage participation of diverse researchers, proposals for research plans with high efficiency that guarantee a good work-life balance are welcome.

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 analysis and design by computational chemistry	3	7
A02	Functional analysis and design by data-driven science		
A03	Theoretical and experimental design of functional de novo proteins		
B01	Measurement and development of time resolved structural biology		6
B02	Spaciotemporal measurements by biophysical techniques		
B03	Protein functional design by structural biology techniques		
C01	Experimental creation of tool proteins for chemogenetics		9
C02	Experimental creation for regulation of protein-protein interactions		
C03	Experimental creation of sensor proteins for cell visualization		
C04	Experimental creation of tool proteins for optogenetics		
C05	Experimental creation of useful enzymes		

Research Outline of Research Areas

Manipulating Genomes of Intracellular Symbiotic Organelles: Advancements in Technology, Applications for Fundamental Sciences, and Beyond.

https://www.agr.kyushu-u.ac.jp/cytoplasmicgenomeregulation/

Number of Research Area : 24A301 Term of Project : FY2024-2028
Head Investigator : ARIMURA Shin-ichi
Research Institution : University of Tokyo, Graduate School of Agricultural and Life Sciences

1. Details of Research Area

Endosymbiotic bacteria and their derived mitochondria and chloroplasts have their own internal genomes (cytoplasmic genomes). These are involved in fundamental life processes such as respiration, cell death, sex determination and photosynthesis, but the difficulty of genome modification has hindered their understanding and application. Our team is at the forefront of successful genome editing and gene transfer of plant organelles. These technologies will be utilized to carry out 'Research group A01: Development of freely available cytoplasmic genome regulation technology with expanded target organisms', 'Research group B01: Full understanding of the molecular basis of cytoplasmic genome behavior (maintenance, dynamics and expression)' and 'Research group B02: Elucidation of critical life processes in which cytoplasmic genomes are pivotal and challenge to their application'. Our overarching research aim is to make a quantum leap in every aspect of "technology, science, and application" in organelle biology.

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

This research area is open to organisms with symbiotic organelles, i.e. all eukaryotes, and we welcome research from a wide range of species, perspectives and disciplines. Not only mitochondria and chloroplasts, but also host-bacteria combinations that have an absolute symbiotic relationship within the cell are eligible. The implementation of openly proposed research will be supported by the research support team (genome editing, gene transfer, single organelle analysis, respiratory physiological activity measurement, photosynthesis and respiratory activity measurement, bioinformatics, protein structure analysis). Through the use of this support, it is expected that joint research with the planned research teams will be promoted and that inter-disciplinary joint research will be strongly promoted.

Under research group A01, new technology development and technology licensing targeting cytoplasmic genomes will be carried out (key words: 'genome editing', 'molecular delivery', 'gene transfer', 'selection', 'mutation creation', etc.). Along with proposals aimed at solving the problems of rate-limiting elements in the areas of genome editing, drug delivery and genetic recombination, proposals for completely new approaches will also be accepted, with the expectation that they will contribute to the development of this research area. Research group B01 promotes basic research on the "genetics" of cytoplasmic genomes, including replication, dynamics, distribution, transmission, inheritance, repair, elimination, expression mechanisms and epigenetics of cytoplasmic genomes and nucleoids. We expect proposals for open research that combines "research to elucidate the mechanisms of maintenance and functional expression of cytoplasmic genomes themselves" and "research to investigate their physiological functions at the organelle, cellular and individual levels" (keywords: "gene expression", "maternal inheritance", "heteroplasmy" etc.) in a variety of organism species. Research group B02 is a study that includes both basic and applied research on phenotypic traits caused by the cytoplasmic genome and traits with large spillover effects on human society (keywords: 'mitochondrial diseases', 'photosynthesis', 'sex differentiation/regulation', 'male sterility', 'high functionality', etc.). In many diseases with mitochondrial dysfunction, efforts are expected to target their genomes for analysis, control and disease treatment. Applied research oriented towards the SDGs through cytoplasmic genome regulation is also expected.

The amount of applications is 15 for a single year of 3.5 million yen, with two types of application items: 'A01 control technology' and 'B01 and B02 genetic understanding and utilization development'. As we believe that one of the objectives that should be tackled with priority and proactively is "the elucidation, application and development of important life processes through the early utilization of previously established cytoplasmic genome editing technologies", we plan to increase the number of applications in the B01 and B02 groups. In order to maximise the interaction and results of the entire field, this field group plans to operate the field in an open manner, allowing participation in field meetings, etc. regardless of whether the research is adopted or not as an open call for research. We also expect active applications from researchers from various backgrounds, including female researchers and young 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	Development of cytoplasmic genome regulation technology	3.5	3
B01	Molecular basis of cytoplasmic genome behavior		12
B02	Impact of cytoplasmic genomes on life processes and their applications		

Research Outline of Research Areas

Biological cluster: dynamic assembly and functional properties of supramolecular complexes in cells
https://www.cluster-biology.f.u-tokyo.ac.jp/

Number of Research Area	:	24A302	Term of Project :	FY2024-2028
Head Investigator	:	FUKAGAWA Tatsuo		
Research Institution	:	Osaka University, Graduate School of Frontier Biosciences		

1. Details of Research Area

In cells, protein complexes are clustered to a higher order structure called "supramolecular complexes", which governs various cellular functions. In recent years, with advances in cryo-electron microscopy (EM) techniques, many studies have been conducted to elucidate the structures of molecular complexes reconstituted in vitro, but such studies alone often fail to understand how complexes function in cells. This is because in vitro complexes do not reflect with in vivo supramolecular complexes functioning in cells. In vitro complexes sometimes make a condensate. However, such disordered condensates do not reproduce the organized supramolecular complexes formed in cells. In this Research Area, we define "Biological Clusters" as functional "supramolecular complexes" and aim to clarify their formation mechanisms and functional properties, and understand how they generate cellular functions. The Planned Research will focus on supramolecular complexes constituting kinetochores, centromeres, chromosomes, and centrosomes, but the Publicly Offered Research will not be limited to these but will cover a wide range of supramolecular complexes formed in cells. The research will be conducted by analyzing the ultrastructure and molecular dynamics of supramolecular complexes, measuring physical quantities, and developing theory and computational science. We aim to establish a new cellular view of Biological Clusters by clarifying the mechanisms of formation of various Biological Clusters and the relationship between their acquired properties and cellular functions.

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

Research Group A01 aims to elucidate the molecular basis of various supramolecular complexes, from the structure of their basic units to the regulation of supramolecular complex formation and their cellular functions. The Planned Research will focus on kinetochores, centromeres, chromosomes, and centrosomes, but we welcome research that targets a wide range of important supramolecular complexes, including those involved in transcription, replication, various organelles, and nuclear membrane. Research on supramolecular complexes that function in special environments, such as neurons, aging and stress responses, and diseases, is also eligible.

Research Group A02 focuses on advanced high-precision imaging analysis to solve the structure of supramolecular complexes and elucidate their properties and molecular dynamics. In addition to cryo-ET (electron tomography) and super-resolution imaging, we encourage technologically advanced research for analyzing supramolecular complexes, such as atomic force microscopy, NMR, crosslinked mass spectrometry, deuterium exchange mass spectrometry, development of probes applicable to fluorescence microscopes and new techniques, and methodologies not envisioned in the Planned Research.

In research Group A03, we will measure physical quantities of supramolecular complexes and conduct mathematical analysis parallelly, to elucidate the functional properties of clusters and the elements involved in their formation. In particular, we envision research that attempts to explain complex formation based on simulations that mimic the intracellular environment and research that describes the physical properties of supramolecular complexes. We also welcome research proposals that attempt to demonstrate physical theories that could be applied to cell biology.

Publicly Offered Research proposals are expected to be complementary to the Planned Research and to promote mutually beneficial research through joint research. In the experimental field, research up to 5 million yen per year and exploratory research up to 3 million yen per year will be selected. Theoretical research up to 3 million yen per year is also selected.

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	Elucidation of the molecular basis of Biological Clusters and their relationship to cellular functions	Experimental study: 5 Exploratory experimental or theoretical study: 3	10 7
A02	Visualization of Biological Clusters and their molecular dynamics		
A03	Formation and characterization of Biological Clusters by physical and mathematical analysis		

Research Outline of Research Areas

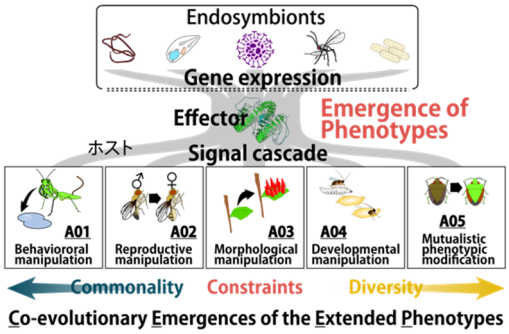
Co-evolutionary emergence of extended phenotypes
http://www.extended-phenotype.org/english/

Number of Research Area	:	24A303	Term of Project :	FY2024-2028
Head Investigator	:	KATSUMA Susumu		
Research Institution	:	The University of Tokyo, Graduate School of Agricultural and Life Sciences		

1. Details of Research Area

Conventional biology generally assumes that phenotypes (such as body shape and behavior) of an individual organism are determined by its own genetic information. On the other hand, there are many interesting phenomena in nature in which the genetic information of one organism can manipulate the phenotypes of different organisms. For example, a praying mantis parasitized by a hairworm jumps into the water, or a lepidopteran insect larva infected with a baculovirus climbs to the top of the tree; these are examples of parasites or viruses manipulating the behavior of the host for their benefit. The phenomenon, called "Extended Phenotypes," proposed by Richard Dawkins, should be realized through interactions between the operating and manipulated organisms based on their mutual genetic information across species. However, the molecular mechanisms underlying these phenomena are poorly understood. This Research Area will focus on the molecular mechanisms of "Extended Phenotypes" hidden in the interactions between various organisms. We will elucidate the delicate and diverse mechanisms of phenotypic regulation that are difficult to access through conventional biology. Overall, we aim to establish a new academic field called "co-evolutionary molecular developmental ecology" that spans from the micro to the macro.

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



"Extended phenotypes," which are the phenotypes created in another organism by the genetic information of one organism, have been attractive to not only scientists but also the general public, and there have been many reports on this phenomenon for a long time. However, many of these phenomena are observed in non-model organisms that are not amenable to molecular-level research, making it difficult to investigate the molecular mechanisms. In this Research Area on endosymbiont-induced "Extended Phenotypes," we aim to (1) identify effectors derived from endosymbionts, (2) identify host signaling pathways, and (3) elucidate the emergence of novel phenotypes. Research Groups fall into five categories: A01. Behavioral manipulation, A02. Reproductive manipulation, A03. Morphological manipulation, A04. Developmental manipulation, and A05. Mutualistic phenotypic modification. We call for Publicly Offered Research focused on endosymbiont-induced "Extended Phenotypes." You can submit your application to one of the Research Groups most closely related to your research subject. Research proposals to uncover the molecular mechanisms underlying unique biological phenomena via inter-organism interactions are highly welcome, even if the research subject has not yet been approached through molecular biology or biochemical methods. We also invite research proposals beyond experimental biology, including theoretical and mathematical approaches. Administrative Group is equipped to support foundational techniques for research advancement, such as various omics analyses, genome editing, recombinant protein production, and imaging analysis, with a strong emphasis on molecular biology approaches related to inter-organism interactions in non-model organisms. Collaborations with Planned Research are also encouraged.

In this Research Area, all Planned Research and Publicly Offered Research collaborate to advance 'Trans-Scale Biology,' aiming to create a new academic discipline that extends beyond individual organisms and comprehends the diversity of nature beyond the scope of conventional biology. We welcome applications from researchers who share this concept and are willing to promote it alongside Planned Research. Additionally, we enthusiastically encourage proposals from young and female researchers to promote diverse and inclusive science.

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	Behavioral manipulation	4.5	12
A02	Reproductive manipulation		
A03	Morphological manipulation		
A04	Developmental manipulation		
A05	Mutualistic phenotypic modification		

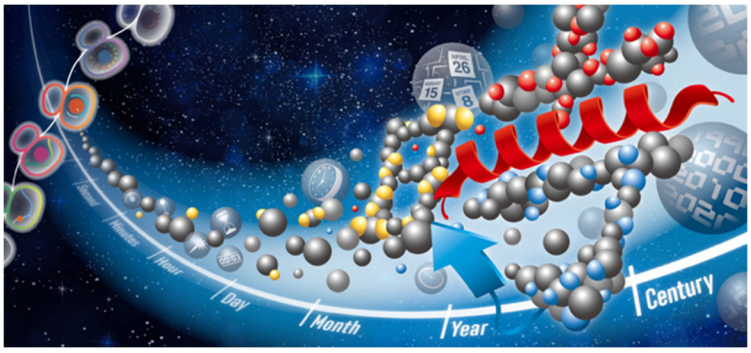
Research Outline of Research Areas

Chronoproteinology: Protein Machinery that drives "time" on various time scales
http://chronoproteinology.org

Number of Research Area	:	24A304	Term of Project :	FY2024-2028
Head Investigator	:	YOSHITANE Hikari		
Research Institution	:	Tokyo Metropolitan Institute of Medical Science		

1. Details of Research Area

The two former transformative research areas (B) "Chrono-Proteinology" and "Parametric Translation" have been combined into the transformative research areas (A) "Chrono-Proteinology". Biological rhythms are observed on different ranges of time scales from seconds to years (or centuries), such as the circadian rhythm with a 24-hour cycle, heartbeat, segmentation clock, seasonal response, and bamboo mass flowering. In this research area, we focus on rhythmic phenomena and timer-like mechanisms and aim to elucidate the molecular mechanisms that count the "times" in various processes. Particular attention is paid to protein dynamics, such as physical properties of specific proteins, enzyme activities, protein-protein interactions, post-translational modifications, conformational changes, and translational controls; given that, we have named this research area "Chrono-Proteinology". Researchers working on this topic across diverse species and a wide range of time scales are welcome to join.



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

Research group A01, " Chrono-Proteinology for circadian rhythms", will understand the molecular mechanisms that count the "time" and determine the 24-hour period in the circadian clockwork. We expect applications to explore the autonomous oscillation mechanism that does not depend on transcription and the period-determining mechanism that counts 24 hours in a temperature-compensatory manner.

Group A02, " Chrono-Proteinology for non-24-hours rhythms", will approach "time" on various time scales from seconds to years (or centuries). We look forward to applications not only for the description of biological rhythms and timers, but also for applications that explore the molecular mechanisms that count "time." We also welcome research proposals that span the A01 and A02 areas and focus on the relationship between 24-hour and non-24-hour rhythms.

Group B01, " Technology for parametric control to decode various "times", aims to develop technologies based on the perspective of "parametric control" developed by Group A03, " Parametric Translation for supporting Chrono-Proteinology". The unique approach of measuring and controlling translation efficiency provides a technical basis for research projects in this area. It is generally accepted that transcription factors and RNA levels determine the amount of protein synthesis. However, recent studies have shown that the protein amount produced from a single copy of RNA is dynamically regulated at the translation level. Considering that clocks counting days and years receive to temporal and seasonal cues from noisy and slowly changing environmental cycles, the translation control can tune the clocks to respond to the cues, as shown by Transformative Research Area (B) "Parametric Translation". We are looking for researchers who will pioneer technologies to decode the "time". The scope of technological development is not limited to quantification and manipulation of translation, but includes imaging techniques, functional analysis of protein structure and properties, information science and mathematical analysis.

Translated with DeepL.com (free version)

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	Chrono-Proteinology for circadian rhythms	4	6
A02	Chrono-Proteinology for non-24-hours rhythms	4	4
B01	Technology for parametric control to decode various "times	4	6

Research Outline of Research Areas

Emergence of Brain Functions from the Dynamic Connectome
https://plaza.umin.ac.jp/dynamic-brain/

Number of Research Area	:	24A305	Term of Project :	FY2024-2028
Head Investigator	:	IMAI Takeshi		
Research Institution	:	Kyushu University, Graduate School of Medical Sciences		

1. Details of Research Area

The connectome of the brain is not static but continuously changes during development and learning. Brain functions are achieved as "emergent phenomena" by which the information processing is qualitatively altered as a result of the dynamic changes in the connectome. However, the principles underlying these phenomena remain unknown. In this Research Area, we aim to quantitatively and comprehensively understand the dynamic changes in the connectome and the resulting functional changes at the level of neurons and neural circuits. We then use reconstitutive approaches to understand the principles and mathematical laws behind these changes.

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

Many studies have focused on the "elementary processes" of structural changes and functional changes in neural circuits. However, it remains unknown how the structural changes of neuronal circuits as a whole lead to functional changes. In this area, we will use high throughput connectomics technologies to elucidate the relationship between dynamic changes in the connectome and the emergent brain functions. Through quantitative, comprehensive, mathematical, and reconstitutive understanding of connectome and brain function data, we aim to understand the principles that govern emergent brain functions. Therefore, we welcome researchers who have conducted research on neural circuit development, synaptic plasticity, and brain function and behavior.

The Publicly Offered Researchs are expected to take advantage of the various platforms and resources provided by the support teams to advance their own research. Complementary approaches to the Planned Research are highly encouraged.

A01 and A02 will experimentally approach the emergent functions in the brain. Research topics will include dynamic changes of the connectome and functions during postnatal development, learning and plasticity, life events (e.g., pregnancy, birth, and rearing), adaptation to disease, aging, stress, etc. Our Research Area also includes systemic neuronal functions (e.g., visceral sensation and autonomic nervous system) and abnormalities found for neurological and psychiatric disorders. We also welcome research using a variety of model organisms other than the mouse. We strongly encourage studies that combine structural and functional changes of the neuronal circuits. We also welcome challenging approaches and technology development aimed at achieving our research goals.

In A03, we aim to reconstitute emergent brain functions based on the concept of "dynamic connectome". In addition to mathematical approaches at neuronal and circuit scales, our Research Area welcomes pioneering approaches incorporating theory, brain-inspired AI studies, and/or cultured systems.

The Publicly Offered Research with a maximum amount of 5 million yen will be awarded to projects that have already obtained results related to the emergent brain functions based on the dynamic connectome based on comprehensive measurement of brain functions, and are expected to make significant progress by joining this Research Area. The maximum amount of 3 million yen will be awarded to projects that are either novel or challenging, such as research that links (dynamic) connectome and emergent brain functions, or research related to technology development.

For the sake of convenience, the call is divided into the following three categories, but proposals that cross over into other categories are also welcome.

A01 aims to understand emergent functions at the neuronal level focusing on the control of synaptic strength and distribution, the regulation of spontaneous neural activity, and dendritic integration. A02 studies emergent functions at the circuit level, focusing on stepwise circuit reorganization in motor learning, spatial learning, and song learning. In A03, we aim to reconstitute the emergent brain functions using neural organoids and simulations of membrane potentials and molecular activity.

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	Emergence of neuronal functions	5	7
A02	Emergence of circuit functions	3	14
A03	Reconstitution of emergent brain functions		

Research Outline of Research Areas

Decioherting the epicode of chromatin, which controls cell fate decisions in organisms
https://www.bioreg.kyushu-u.ac.jp/ext/epicode/home-en/

Number of Research Area	:	24A306	Term of Project : FY2024-2028
Head Investigator	:	TACHIBANA Makoto	
Research Institution	:	Graduate School of Frontier Biosciences, Osaka University	

1. Details of Research Area

The aim of this research area is to show that the higher-order structure of chromatin, which was defined by multilayered parameters such as histone modifications, 3D arrangement of genomic DNA, and enhancer-promoter interactions, in other words, the "epigenetic code" (epicode), plays a fundamental role in cell fate determination. By this research activity, we would like to change the role of chromatin from the basis of transcription to a medium for cell fate control.

It has been revealed that chromatin, consisting of DNA and histones, is closely involved in the regulation of gene expression. However, how the changes in the higher-order structure of chromatin during organismal development and cell differentiation control stage-specific gene expression and determine cell differentiation direction is still not well understood. Recently, it has been shown that not only nuclear factors such as DNA-binding proteins but also various external factors such as signals from adjacent cells, hormones, and metabolic products dynamically change chromatin structure. However, research elucidating the relationship between cell differentiation and chromatin structure at the organismal level has not progressed sufficiently due to the limitations of analytical techniques.

Therefore, this research area aims to construct new chromatin analysis technology platforms that dramatically improve comprehensiveness and spatiotemporal resolution, such as live imaging of transcription and histone modifications, single-cell and spatial omics. Using these platforms, we will elucidate the roles of chromatin epicodes in various life events throughout life (nutritional environment response, long-term memory and aging, transgenerational information transmission, early embryo fate). By using diverse model organisms such as mice, zebrafish, fruit fly, and fission yeast, we will explore the universality and specificity of epicodes, and connect them to molecular-level structural analysis and mutant creation through *in vitro* reconstitution. This research area aims to open new horizons in life sciences by elucidating the epicodes of chromatin and clarifying the basis of cell fate determination mechanisms.

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

We expect participation in publicly offered research focusing on life events beyond the scope of the planned research and new methods of chromatin analysis to accelerate the achievement of our goal. We have already selected mice, zebrafish, fruit fly, and fission yeast as model organisms representing mammals, fish, invertebrates, and the simplest eukaryote with chromatin structure. In publicly offered research, to further explore the universality and specificity of epicodes, we welcome proposals targeting various species beyond these models. To elucidate the epicodes throughout the entire life cycle, we welcome proposals not limited to the life phenomena targeted by the planned research. Research proposals aiming to uncover the mechanisms of disease onset, unique life phenomena specific to certain organisms, or advance cutting-edge chromatin structure analysis techniques are welcome. The publicly offered research also aim to identify and nurture the next generation of researchers who will lead the field of epicode research. In this regard, we particularly welcome innovative and challenging research proposals from young researchers. We also emphasize gender equality and especially welcome applications from female researchers. Specific examples of the expected publicly offered research include: 1) Research on organisms not used in the planned research, such as plants or non-model organisms; 2) Research to decipher the epicodes involved in disease onset; 3) Research focusing on nuclear structures not targeted in the planned research; 4) Development of *in situ* chromatin analysis platforms with improved deep-tissue reach and resolution; 5) Research using AI to analyze diverse layers of chromatin structures; 6) Research using mathematical models to simulate cell fate determination by epicodes; 7) Research developing drugs to manipulate epicodes using natural or synthetic compounds; 8) Research aiming to develop or improve live-cell imaging technologies for epicodes; 9) Research developing innovative methods to introduce epicodes into organisms. These examples are not exhaustive, and we look forward to a wide variety of 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	Decioherting the epicode of chromatin, which controls cell fate decisions in organisms	3.8	15

Research Outline of Research Areas

Multicellular Neurobiocomputing: Understanding and Advancing towards Biological Supremacy
https://www.mnbc.riec.tohoku.ac.jp/en/

Number of Research Area	:	24A401	Term of Project :	FY2024-2028
Head Investigator	:	YAMAMOTO Hideaki		
Research Institution	:	Tohoku University, Research Institute of Electrical Communication		

1. Details of Research Area

"Biological supremacy" refers to "the ability of a biologically inspired system to solve a particular problem with learning efficiency, energy efficiency, and adaptability that are difficult to attain with conventional computing." Our brains are composed of bioelements called neurons. Despite their instability, the brain autonomously and adaptively performs advanced computations with high energy efficiency. This property does not manifest in a single cell and cannot be explained by the linear summation of cell properties. Brain functions are generated only when diverse neurons are intricately arranged and wired to form a multicellular network. In this Research Area, we aim to understand the physical substrate of such information processing through experiments on model animals and cultured cells, formulate the observations as mathematical models, and link this information to system applications. Focusing on sensory-motor control, which involves processing sensory inputs and generating time-series signals to control motor outputs, we aim to achieve results that are scientifically universal and technologically impactful.

This Research Area consists of the four Research Groups: Information Science (A01), Bioengineering (A02), Systems Neuroscience (A03), and Hardware Applications (A04). Collaborations between the Groups are organized under the following three domains: (1) Multicellular Modelling, (2) Multicellular Hardware, and (3) Multicellular Wetware. Furthermore, we establish four Shared Platform Centers to accelerate each research and the collaborations between them: the Microfabrication Center, Biomaterials/Open Database Center, Model Animal Experiment Center, and System Implementation Center. Through these efforts, we aim to build a theoretical foundation for information representation and processing in multicellular networks and pursue biological supremacy for future generations of information communication technology.

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

The Publicly Offered Research consists of four groups. The first group is the theoretical and data science group, which will invite proposals on, for example, neural network models and estimation of functional connectivity dynamics based on data-driven modeling; research on biologically-plausible recurrent neural networks and their learning rules; neural data analysis to understand and model multicellular dynamics, including spontaneous activity; software development for general-purpose simulators and remote biological experiments; and machine learning applications of mathematical models. The second group is the bioengineering group, which will invite innovative research proposals related to the manipulation of cultured neurons; brain organoid technology; bioelectronics research for measuring neural activity with high sensitivity and/or ultralow power consumption; and computing and drug discovery applications of cultured neuronal networks. The third group is the biology group, which will invite research on novel topics, including physiological studies on synaptic plasticity and neural circuit development as the neural basis of learning in multicellular systems; research on the functional linkage between the neocortex and subcortical regions; research on behavioral control using diverse types of synaptic transmission; and systems-level studies on multisensory integration and sensory-motor control that can also lead to robot control. Research on multicellular neurobiocomputing using model animals such as nematodes, flies, and zebrafish will also be invited. The fourth group is the hardware group, which will invite wide-ranging research on the implementation of multicellular models on FPGA, ASIC, and analog circuits; device and material research for model implementation; physical reservoir applications; applications to autonomous control of robots; and control of external devices based on neural activity at the cellular level. Finally, research proposals aiming at the realization of biological supremacy that concerns topics other than the abovementioned ones, and those that span multiple items, are also invited.

In all the groups, we expect proposals that will lead to collaboration with members of the Planned Research belonging to the same or different Research Groups.

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	Theory of Multicellular Neurobiocomputing	2.5	5
A02	Multicellular Neurobiocomputing in Artificial Systems	5	14
A03	Multicellular Neurobiocomputing in Biological Systems		
A04	Hardware Applications of Multicellular Neurobiocomputing		

Research Outline of Research Areas

Global Antarctic Science: connecting the chain of changing huge ice sheet and global environments
http://glaces.lowtem.hokudai.ac.jp

Number of Research Area	:	24A402	Term of Project :	FY2024-2028
Head Investigator	:	AOKI Shigeru		
Research Institution	:	Hokkaido University, Institute of Low Temperature Science		

1. Details of Research Area

On-going global warming may locally destabilize the Antarctic ice sheet beyond a critical threshold, causing the global sea level rise beyond a rate previously thought. The disintegration of the Antarctic ice sheet could be the first domino to fall, leading to cascades of global tipping point elements. Conversely, the atmosphere, which has become wetter on a global scale, can increase the amount of snowfall on the Antarctic ice sheet, counteracting the mass loss. The time scales required for the changes in these components are completely different; hundreds to tens of thousands of years for the ice sheets and a few hours to a few years for the atmosphere. The complexity of the interactions among phenomena of such different spatial and temporal scales is a factor that prevents improvements in the future predictions. In this Research Area, we focus on the "short-term" from post-Industrial Revolution and "long-term" from hundreds of thousands of years ago. We elucidate the processes by which Antarctic change and its global cascades are activated in various climatic conditions. By combining innovative observations, sample analysis and numerical simulations, we aim to establish a new Research Area of "Global Antarctic Science" that comprehensively studies the interactions between the Antarctic ice sheet and the global climate system over a wide time range into the near future, thereby contributing to new developments in climate and environmental science.

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

In Publicly Offered Research, we welcome proposals that will directly collaborate with the Research Groups of A01-A03. Research Area focuses on the various processes among Antarctic ice sheet and surrounding ocean/sea ice and atmosphere. This includes research on the formation and changes of Antarctic Bottom Water and research on cycles of materials such as nutrients and iron. We welcome research using sample analysis and numerical experiments to investigate the actual state and mechanism of the historical changes in the Antarctic and global environment on the long-term scale.

We also welcome proposals for the following Research Groups of B01-B03, which complement and/or expand on A01-03.
B01: In order to clarify the climate system interaction in the Antarctic region and its global impact, comparative research with the Arctic region is effective. We look forward to research that will clarify the commonality and uniqueness of the interaction process, as well as the mutual influence between the two poles.
B02: We welcome research using satellites remote sensing and new analysis algorithms. We also hope for proposals of new models such as isotope models, ecosystem models, earth system models, etc., and theoretical research from new perspectives.
B03: Environmental research in Antarctica requires innovative development and application of methods based on new ideas. We hope that the development of in-situ observational methods without constant human instructions and the creation of unprecedented paleoenvironmental indicators will lead to research breakthroughs.

We set two categories of budget: one for theoretical and/or relatively small-scale research and one that requires more costs for equipment, analysis, personnel expenses, etc. We welcome proposals from a wide range of researchers; from experienced researchers in the Antarctic-related research to young researchers who will conduct related research for the first time. For proposals that require observations in the Antarctic region, however, please bear in mind that acceptance or rejection in this Publicly Offered Research does not imply whether they can be implemented in the Japanese Antarctic Research Expedition.

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	Revealing key processes and multi-sphere interactions driving the present variability of Antarctic Ice Sheet	3 1.4	4 12
A02	Under-ice observations using oceanic autonomous robotic system		
A03	Revealing the variability and interaction of Antarctic Ice Sheet and global climate on long time scales		
B01	Comparative study of the northern- and southern-hemisphere polar regions and oceans		
B02	Various satellite observations, theories and numerical modeling		
B03	Development and application of innovative method and technique		

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 (Research Proposal Document) in the Academic Deliberation Council for Science and Technology of MEXT. Moreover, the review takes place behind closed doors.

As applicants provide unpublished research results and research ideas, and other information in their Research Proposal Documents on the premise that the review will be conducted privately, JSPS asks reviewers to maintain their confidentiality obligations, including the following.

- In order to protect the intellectual property of the applicants and ensure fairness of the peer review system, reviewers must not disclose the content of the Research Proposal Documents or any other information, in whatever form, that they learn in the course of the review to any outside parties including their superiors, colleagues, or subordinates.
- Reviewers must not use any information that they learn in the course of the review for their own benefit.
- Reviewers have the obligation to keep the review materials under strict control.

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/B), 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 FY2025 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.

(i) In reviews in the first stage, a few reviewers who are assigned to a proposal according to research group will conduct document reviews.

(ii) In reviews in the second stage, all reviewers will conduct document review with referring comments made by other reviewers in the first stage.

In the review process, the reviewers can utilize, as necessary, the “researchmap” and the Grants-in-Aid for Scientific Research Database (KAKEN)See “III. Instructions for Prospective Applicants 6. Registration of the Researcher Information in ‘Researchmap’.”

(3) Notification of the Review Results

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

1) MEXT will issue a notification to the PIs and the research institutions via the electronic application system on whether the research area have been adopted or not, based on the results of the review.

2) For Principal Investigators who had requested the disclosure of the first stage review results in the event that their research proposals were not adopted, MEXT will disclose the approximate ranking within each committee dedicated to the particular research area, the raw scores (average scores), and the "standard-format opinions." Disclosure will be made on the electronic application system.

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 any 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 "III. Instructions for Prospective Applicants 2. Restriction on Parallel Grant Application/Receipt").

(i) At the time of the proposal submission, a researcher needs to have been approved by his/her research institution(*1) 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(*2).

< **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 nor 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.)

*1 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).

*2 JSPS Fellows (DC) are deemed to have met the application requirements by being nominated as a JSPS Fellow (DC), notwithstanding the items a) through c) in (i) above. However, please check with your research organization regarding the requirements that it must meet.

(Reference) Requirements that the research institution must meet (see "IV. Instructions for Administrative Staff of Research Institution 2. Issues to Be Completed Beforehand by the "Research Institution"):

< 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 using the KAKENHI or other Competitive Research Funds.

<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 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 aged 39 or under or less than 8 years after Ph.D. acquisition (including an individual who has acquired a Ph.D. within the past 8 years excluding periods of maternity and/or childcare leave taken after his/her Ph.D. acquisition) as of April 1 of each fiscal year (hereinafter referred to as a “KAKENHI-employee young researcher”), 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 no longer meets the requirements for a KAKENHI-employee young researcher. 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)

URL:https://warp.ndl.go.jp/info:ndljp/pid/12367425/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 enables 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)

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

<Important Point 2>

If a JSPS Research Fellow (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. In making applications, he/she can apply even if the proposed research period outlasts the tenure of his/her JSPS fellowship.

(i) Publicly Offered Research of Transformative Research Areas (A)

(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) (Excluding CPD)

JSPS Fellows (DC) can apply for KAKENHI as Principal Investigators (PI) only for the Grant-in-Aid for JSPS Fellows and Fostering Joint International Research, but only from the host research institutions. JSPS Fellows (DC) can also participate in research projects under every research category as Co-Is. As JSPS Fellows (DC) are supposed to seek the acquisition of Ph.D. as doctoral students, their host researchers or PIs of said KAKENHI research projects and their affiliated institutions should take sufficient care, so that JSPS Fellows (DC) will not be burdened with excessive responsibilities in performing these research projects. The Researcher Number is required if JSPS Fellows (DC) apply for other research categories that they can apply for and receive grants in parallel with Grant-in-Aid for JSPS Fellows as PIs or Co-Is.

Please note that students (see Note), such as graduate students and other students excluding the abovementioned JSPS Fellows (DC), as well as International Research Fellows cannot apply for KAKENHI grants even if they are tasked with the job of conducting research activities at their affiliated research institutions or other research institutions.

(Note) 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.

<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 research institution, the research 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 proposal document 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.

*Registration of researcher information in e-Rad and linkage to the electronic application system regarding the implementation of research integrity measures

Starting from the FY2025 call for proposals, research integrity information registered in e-Rad will be linked to the electronic application system, and you will be requested to enter the necessary information in your Research Proposal Document based on the e-Rad registered research integrity details. **Please note, in particular, that you cannot make application if the Principal Investigator and/or Co-Investigators have not registered in e-Rad the status of pledge regarding their research integrity information for their affiliated institution. Therefore, please make sure to confirm the registration status of the relevant information in advance.** For details, please check carefully the Supplement to the Application Procedures for Grants-in-Aid for Scientific Research.

(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.

(Reference) "Grant-in-Aid for Research Activity Start-up"

The "Grant-in-Aid for Research Activity Start-up" is aimed at supporting researchers who are not able to apply for this round of call for proposals, such as those who are newly obtaining research position, and those who are returning from their leave of absence for childcare, etc. after the regular submission deadline.
The FY2025 Call for Proposals in this category is scheduled for March 2025, and the provisional conditions of the eligibility for application is as follows:

(A) An individual who obtains eligibility for KAKENHI application on or after September 19, 2024, and has not submitted an application under the call for proposals for the following research categories (*1) announced by MEXT and JSPS.

(B) An individual who has not submitted an application under the call for proposals for the following research categories (*1) announced by MEXT and JSPS because he/she was on maternity leave or was raising a preschooler (*2) in FY2024.

(*1) FY2025 Grants-in-Aid for Specially Promoted Research, Transformative Research Areas, Scientific Research, Challenging Research, and Early-Career Scientists
(*2) Including the period of childcare leave.

(For details, refer to the Application Procedures for "Grant-in-Aid for Research Activity Start-up" to be announced in March 2025.)
Since the registration to the e-Rad system is handled by the research institution, researchers who may come to fall under the category (A) above, should act accordingly by contacting the administrative section of their respective research institutions.

(Note) JSPS Research Fellows (PD, RPD, CPD, or DC) are not eligible for application to the "Grant-in-Aid for Research Activity Start-up," even if they satisfy the above application conditions.

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 with the basic concepts outlined above and by taking into consideration the purpose, characteristics and other factors of each KAKENHI research 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 "Attached Table 3 Table of Restriction on Parallel Grant Application/Receipt "**

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 Research Funds" (see "I. Outline of the Grants-in-Aid for Scientific Research-KAKENHI 5. "Guidelines on the Proper Implementation of Competitive Research Funds," etc."), 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)"

・In case that there are no projects of Publicly Offered Research for which grants have 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 FY2025 in Publicly Offered Research, it is not possible to apply for another project.

[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, or an applicant who is the PI of the prospected on-going project in FY2025 intends to submit new research proposal as PI the following rules (cases A to D) of restrictions on parallel grant application /receipt apply.

Cases in which a researcher carried over all or prat of a KAKENHI grant (Series of Single-year Grants) to the next fiscal year, or 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 and on-going Publicly Offered Research of "Grant-in Aid for Scientific Research for Transformative Research Areas" (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 FY2025 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 FY2025 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

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 FY2025 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. In particular, note that if a PI of a Planned Research project in the Transformative Research Areas is selected as PI for a Specially Promoted Research, such Planned Research project is not allowed to replace its PI and must be abolished. The relative priority of the research categories is indicated by the marks "■" and "□" in the Table.

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" (see "I. Outline of the Grants-in-Aid for Scientific Research-KAKENHI　5. "Guidelines on the Proper Implementation of Competitive Research Funds," etc.").

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 Attached Table 3 "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 after the deadline for submitting (sending) the Research Proposal Document under the other research category.**

Example: A researcher cannot apply for Grant-in-Aid for Challenging Research (Pioneering) as PI after applying for Grant-in-Aid for Transformative Research (A) (Planned Research) as PI (even if he/she withdraws the application for Grant-in-Aid for Transformative Research (A) (Planned Research) after the deadline for submitting (sending) the Research Proposal Document).

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 "Attached Table 3 Table of Restriction on Parallel Grant Application/Receipt,"

the participation 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-FY2025 (MEXT)"). The following points should be noted

A The PIs of the research projects of the "Transformative Research Areas Administrative Group" 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-Is of the research projects of the "Transformative Research Areas Administrative Group" 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 "Attached Table 3 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 FY2025" for the research categories for which the call for proposals is announced by JSPS, applicants should refer to the "Attached Table 3 Table of Restriction on Parallel Grant Application/Receipt.".

vii)As for the restrictions on parallel grant application/receipt for JSPS Fellows (PD, RPD, or CPD), the applicant should read the description in the section "Grant-in-Aid for JSPS Fellows (JSPS Research Fellow)" of the "Attached Table 3 Table of Restriction on Parallel Grant Application/Receipt," even if he/she does not receive the "Grant-in-Aid for JSPS Fellows."

viii)If an individual is granted his/her application in those research categories for which the rule of restrictions on parallel grant application/receipt applies ("Specially Promoted Research," "Planned Research" of the "Transformative Research Areas" (including the research projects of the "Administrative Group"),"" "Scientific Research (S/A)," "Challenging Research (Pioneering)" and "Grant-in-Aid for Research Activity Start-up", International Collaborative Research), 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 (PD, RPD, or CPD), during the period of his/her term, cannot submit any research proposals to those research categories for which the rules 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 rules of restrictions on parallel grant application/receipt. The applicant should check against such possibility before submitting the research proposal document.

ix)**There are no restrictions on parallel grant application/receipt between KAKENHI and other competitive research funds schemes.** Still, applicants should read the description in the column

“Elimination Unreasonable Duplication and/or Excessive Overconcentration in the Grant Allocation” (see "I. Outline of the Grants-in-Aid for Scientific Research-KAKENHI 5. “Guidelines on the Proper Implementation of Competitive Research Funds,” etc.”).

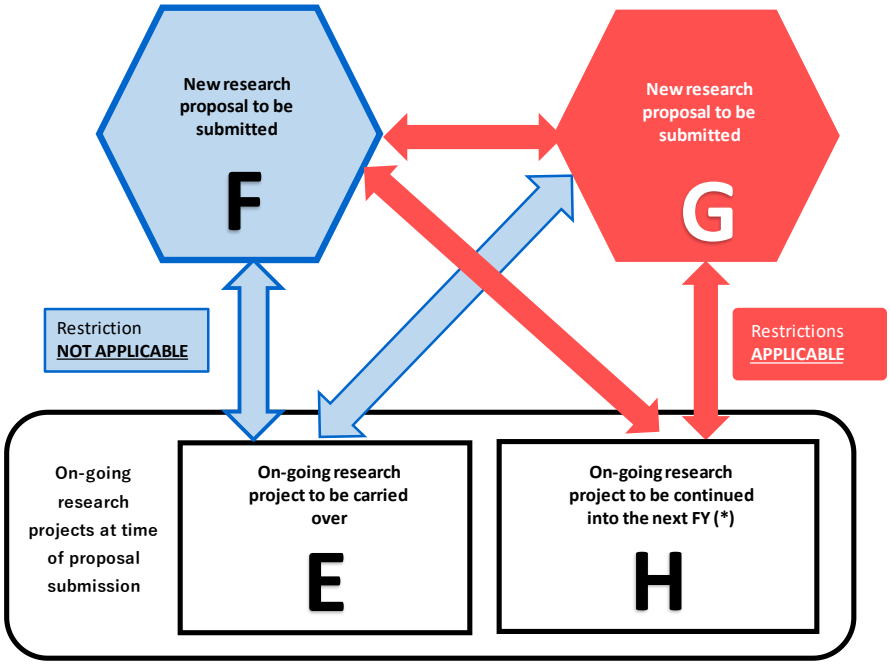
(5) Special Provisions for the Restriction on Parallel Grant Application/Receipt

(Handling of the Restrictions on Parallel Grant Application/Receipt in Relation to carry-over of KAKENHI (Series of Single-year Grants) to the following fiscal year)

(i) When a PI of an on-going project of KAKENHI (Series of Single-year Grants) carries over all or parts of the grant to be used in the following fiscal year, **the restriction on parallel grant application/receipt does not apply** between the project approved for carry-over and the new research proposal he/she intends to submit.

(ii) 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.

Figure 1: Image of restrictions on parallel grant application/receipt in relation to carry-over of Kakenhi (Series of Single-year Grants) to the following fiscal year



Whereas: "E" is an on-going research project to be carried over to the next fiscal year; and "F" is a new research proposal to be submitted. In this case, the restriction on parallel grant application/receipt does not apply between E and F. However, if the researcher intends to submit a research proposal for a different research proposal "G" (in addition to F) for this call for proposals, the restriction on parallel grant application/receipt does not apply between E and G, but shall apply between F and G. Furthermore, if the researcher has an on-going research project "H" (in addition to E) which will be continued into the next fiscal year, restrictions on parallel grant application/receipt shall apply between F and H. Similarly, if the researcher intends to submit a research proposal for G, restrictions on parallel grant application/receipt shall also apply between G and H.

* Here, the same research project as E to be conducted in the fiscal year following the fiscal year in which it is to be carried over will fall under H. (For example, if a research

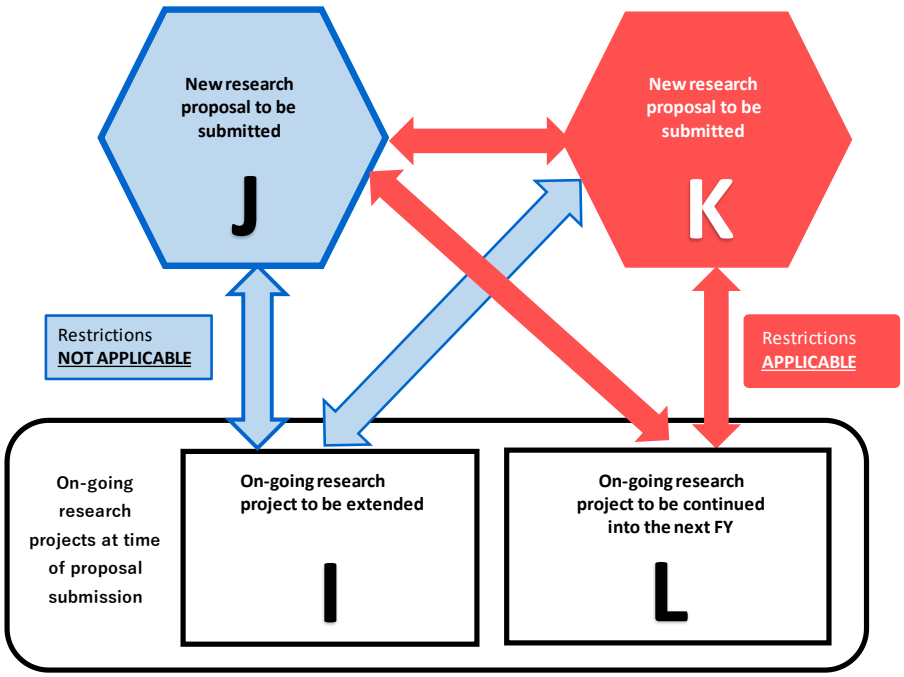
project is an on-going project that will be continued into FY2025, the research project to be carried over will fall under E in Figure 1 during FY2024, and will fall under H in FY2025.)

(Handling of the Restrictions on Parallel Grant Application/Receipt in Relation to Extension of the Research Period of KAKENHI (Multi-year Fund))

(i) When a PI of an on-going project of KAKENHI (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.

(ii) 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.

Figure 2: Image of restrictions on parallel grant application/receipt in relation to extension of the research period of KAKENHI (Multi-year Fund))



Whereas: "I" is an on-going research project in the final fiscal year of the research period, and the researcher intends to extend the research period (not including cases where researcher suspends the research for maternity/childcare leave, etc.); and "J" is a new research proposal to be submitted. In this case, the restriction on parallel grant application/receipt does not apply between I and J. However, if the researcher intends to submit a research proposal for a different research proposal "K" (in addition to J) for this call for proposals, the restriction on parallel

grant application/receipt does not apply between I and K, but shall apply between J and K. Furthermore, if the researcher has an on-going research project “L” (in addition to I) which will be continued into the next fiscal year, restrictions on parallel grant application/receipt shall apply between J and L. Similarly, if the researcher intends to submit a research proposal for K, restrictions on parallel grant application/receipt shall also apply between K and L.

Attached Table 3　Table of Restrictions on Parallel Grant Application/Receipt for "Grant-in-Aid for Transformative Research Areas（A/B）"

1) Type "Principal Investigator (New Proposal/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 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 FY2025(continued research project) mentioned in Column A" applies as Principal Investigator for mentioned in Column B.

Column A				Column B	Transformative Research Areas (A)						Transformative Research Areas (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 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									
					Administrative group	Planned research	Planned research *2	Publicly offered research	Planned research *2	Publicly offered research	Administrative group	Planned research	Planned research *2	Planned research *2			General	General	General	Early-Career Scientists	Pioneering	Exploratory
					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
					PI	PI	PI	PI	PI	PI	PI	PI	PI	PI	PI	PI	PI	PI	PI	PI	PI	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 *1	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).
■: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.
◆:The researcher can only apply for one reserch project mentioned in Column B in addition to the 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.
Note that if a PI of a Planned Research project in the Transformative Research Areas is selected as PI for a Specially Promoted Research, such Planned Research project is not allowed to replace its PI and must be abolished.
*1 Research projects in Innovative Areas (Publicly Offered Research) are subject to the restriction on parallel grant application/receipt similar to the restriction which applies to those in Transformative Research Areas (A) (Publicly Offered Research).
*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."

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 FY2025 (continued research project) mentioned in Column A" participates in a research project mentioned in Column B as Co-Investigator.

Column A				Column B	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							
					New Research Area		Continued		New Research Area		Continued				General	General	General	Pioneering	Exploratory
					Administrative group	Planned research	Planned research *2	Planned research *2	Administrative group	Planned research	Planned research *2	Planned research *2							
					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
					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
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 *1					—												
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 Research projects in Innovative Areas (Publicly Offered Research) are subject to the restriction on parallel grant application/receipt similar to the restriction which applies to those in Transformative Research Areas (A) (Publicly Offered Research).
*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 FY2025 (continued research project) mentioned in Column A" applies as Principal Investigator for mentioned in Column B.

Column A \ Column B				Transformative Research Areas (A)						Transformative Research Areas (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 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									
				Administrative group	Planned research	Planned research *1	Publicly offered research	Planned research *1	Publicly offered research	Administrative group	Planned research	Planned research *1	Planned research *1			General	General	General		Pioneering	Exploratory
				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
				PI	PI	PI	PI	PI	PI	PI	PI	PI	PI	PI	PI	PI	PI	PI	PI	PI	PI
Transformative Research Areas (A)	Planned research	New Proposal	Co-I		—	—	—	×					×	□							
		Continued	Co-I			—	—	▲					▲	□							
Transformative Research Areas (B)	Planned research	New Proposal	Co-I					×			—	—	×	□							
		Continued	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 FY2025 (continued research project) mentioned in Column A" participates in a research project mentioned in Column B as Co-Investigator.

Column A \ Column B				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							
				New Research Area		Continued				New Research Area		Continued								
				Administrative group	Planned research	Planned research *1	Planned research *1	Administrative group	Planned research	Planned research *1	Planned research *1			General	General	General	Pioneering	Exploratory		
				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
				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**	**Co-I**	**Co-I**
Transformative Research Areas (A)	Planned research	New Proposal	Co-I		—	—	×				×									
		Continued	Co-I			—	▲				▲									
Transformative Research Areas (B)	Planned research	New Proposal	Co-I				×		—	—	×									
		Continued	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 particiapte 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 FY2025 (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	Transformative Research Areas (A)			Transformative Research Areas (B)	
				Administrative group	Planned Research	Publicly offered research	Administrative group	Planned Research
				New Proposal	New Proposal	New Proposal	New Proposal	New Proposal
				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 Fellow)*1		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 FY2025 (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	Transformative Research Areas (A)	Transformative Research Areas (B)
				Planned Research*2	Planned Research*2
				New Proposal	New Proposal
				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 This restriction on parallel grant application/receipt does not apply if the researcher continues to use the Grant-in-Aid for JSPS Fellows (JSPS Research Fellow) in the case that he/she has declined a JSPS Research Fellowship and become disqualified and thus he/she remains eligible to apply for KAKENHI grants.
*2 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, if the research plan involves traveling abroad, etc., applicants should carefully determine the feasibility of the plan.
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.

For submission of a research proposal, the applicant (PI) has to complete the relevant Research Proposal Document. The Research Proposal Document consists of two parts: "Items to be entered in the Website" and "Forms to be uploaded as an attached file."
The PI (applicant) should 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.
Preparation and submission of the KAKENHI Research Proposal Document should follow the procedures detailed below.

(1) Preparation of KAKENHI Research Proposal Document

For the preparation of the KAKENHI research proposal document, **the applicant must first access the Electronic Application System using his/her e-Rad ID and Password.**

On the Research Proposal Document

The KAKENHI Research Proposal Document consists of the following two parts:

Items to be entered in the Website:

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

Forms to be uploaded:

A part containing such entries as "Research Objectives, Research Method, etc." to be prepared by downloading the form 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), 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.)**

Research category Application Section	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 (details of research expenditure and their necessity, 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.

(Reference) Revision of the Research Proposal Document

Starting from the FY2019 call for proposals, the "Research Achievements of the Principal Investigator (PI) and Co-Investigator(s) (Co-I(s))" column in the Research Proposal Document was revised as the "Applicant's Ability to Conduct the Research and the Research Environment" column, based on the idea that "research achievements are necessary to confirm the applicant's ability to conduct the research under the research plan for application, and the exhaustive description of such achievements will not be required."

In addition, starting from the FY2025 call for proposals, the new item, "Rating element for the internationality of the research project" to the Scientific Research (A, B, and C) will be added in order to promote scientific research with significant international ripple effects, and a description about what sort of internationality the research project has will be required in the column, "1. Research Objectives, Research Method, etc." in the Research Proposal Document.

Please read the Supplement to the Application Procedures "Forms/Procedures for Preparing and Entering a Research Proposal Document" carefully in preparing a Research Proposal Document.

(2) Electronic Submission of the Research Proposal Document

i) An applicant should prepare his/her Research Proposal Document (PDF file) by entering the "Items to be entered in the Website" and by uploading the separately prepared "Forms to be uploaded as an attached file" to the Electronic Application System, following the instructions in the "FY2025 Procedures for Preparing and Entering a Research Proposal Document" and "FY2025 Procedures for Preparing and Entering a Research Proposal Document (Items to be entered in the Website)."

ii) The Research Proposal Documents are collected and submitted to JSPS by the research institution to which the PIs (applicant) belong. Therefore, the applying PI **should submit his/her**

Research Proposal Document to the administrative section of his/her research institution by the deadline set by the institution. (It is not allowed to submit the Research Proposal Document directly to JSPS.)

Before submission, the applying PI should carefully check the contents of the Research Proposal Document (PDF file) he/she prepared, and subsequently proceed to the "Check Completed and Submission" stage of the submission process. (This amounts to submitting the Research Proposal Document (PDF file) to the administrative section of his/her research institution.) After the "Approval" process by his/her institution, no further corrections or modifications to the submitted Research Proposal Document (PDF file) are possible after the due date of submission (transmission) to JSPS. (See "IV. Instructions for Administrative Staff of Research Institution 4. Submission and Other Matters of the Research Proposal Document (Preparing the Research Proposal Document).")

iii) The personal information contained in the Research Proposal Document and any personal information registered in Electronic Application System will be used for purposes such as the elimination of unreasonable duplication and/or excessive concentration in the allocation of competitive research funds, the appropriate funding of KAKENHI grants, and to conduct questionnaires on scientific technology policies including KAKENHI grants (this includes providing the data to external contractor(s) in charge of electronic processing and management of the KAKENHI data). Any such information will also 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 planned to be made public," as laid down in Article 5, paragraph 1, item 1 of the "Act on Access to Information Held by Incorporated 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 (including ii) above) with full understanding of the information handling (utilization, provision and disclosure) stated above.

(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 research expenditure for any of the fiscal years in its research period **less than 100,000 yen**.

2. Eligibility of the Project Members

The PI may organize a research team with appropriate combination of Co-Investigator(s) (Co-I), and Research Collaborator(s), 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.) When organizing a research team comprised of multiple members, the PI should ensure that the team has an appropriate system toward the achievement of research objectives, for example by giving due consideration to diversity.

As is the case for PI, **Co-Investigator(s) is also subject to verification of their KAKENHI eligibility by their respective research institutions by the time of proposal submission (see "Ⅲ. Instructions for Prospective Applicants 1. Procedures to Be Completed Prior to Application (1) Ascertainment of the Eligibility for KAKENHI Application").**

On the other hand, to be a Research Collaborator(s), registration to the e-Rad system is not a requirement.

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", "Scientific Research on Innovative Areas (Research in a Proposed Research Area)" and "International Leading Research" replacements of PI may be accepted by going through required procedures.

(B) **<u>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.</u>**

(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 research funds.

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

(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 research funding.

About the Process of Participation of Co-Investigator in Project Members

A consent process to become a Co-Investigator is conducted via the electronic application system if the applicant adds a Co-Investigator to project members. Following processes for both Principal Investigator and Co-Investigator(s) are necessary in the application process.

[Actions to be taken by the Principal Investigator]

・The Principal Investigator must enter the information on the researcher whom he/she wants to add to the project members in the "Project Members List" column on the "Application Information Input" screen, request the researcher to become a Co-Investigator, and obtain a consent from the Co-Investigator-to-be by the time of submitting (sending) the Research Proposal Document to his/her research institution.

[Actions to be taken by the researcher who is requested to become a Co-Investigator]

・If the researcher is requested to become a Co-Investigator by the Principal Investigator via the electronic application system, the researcher must select “Consent” or “Dissent” after confirming the contents to be consented.

Procedures to be Performed by the Principal Investigator	**Procedures to be Performed by the Co-Investigator-to-be**	**Procedures to be Performed by the Research Institution to which Co-Investigator-to-be belongs**
① Request to become a Co-Investigator →	② Give a consent to become a Co-Investigator →	③ Give a consent to become a Co-Investigator as a standpoint of the research institution
The Principal Investigator requests to the researcher who is to be requested to become a Co-Investigator to participate in the project as a Co-Investigator via the electronic application system.	The Co-Investigator-to-be is requested to participate in the project as a Co-Investigator from the Principal Investigator via the electronic application system and then the Co-Investigator-to-be selects a consent (or a dissent).	The information consented by the Co-Investigator-to-be is shown via the electronic application system and then the research institution also conducts the process such as giving consent to him/her.

・The organization of the project members should be completed through all necessary procedures mentioned above to be carried out with the approximate target of **two weeks prior to the deadline for the submission of the application documents set by JSPS**. (All application procedures are workable on the system after two weeks prior to the deadline for the submission of the application documents. To submit (send) application documents to the research institution to which the Principal Investigator belongs, it is necessary to obtain consents from all the Co-Investigators-to-be.

* Please refer to the KAKENHI (Grants-in-Aid for Scientific Research) Electronic Application System Operation Manual for the detailed information such as operating environments, operating methods, and so on.
URL: https://www-shinsei.jsps.go.jp/kaken/topkakenhi/shinsei_ka.html
* After the researcher has given a consent to become a Co-Investigator, the information on the Co-Investigator-to-be will be shown to the research institution to which he/she belongs via the electronic application system, and then it will be necessary to obtain a consent, etc. from the research institution as well.

*Since the Principal Investigator cannot submit (send) the Research Proposal Document to his/her research institution until the research institution to which the Co-Investigator-to-be belongs gives the consent, etc., be sure to finish the process in time for the deadline of the submission.

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, the following people can also participate in the research project as a Research Collaborator: a postdoctoral researcher, a graduate student, a research assistant (RA), JSPS Research Fellows (PD, RPD, CPD or DC) 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)

* 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 (excluding "Platforms for Advanced Technologies and Research Resources"), 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, International Leading Research , International Collaborative Research(including the Fostering Joint International Research (B) before name change), 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, Transformative Research Areas (Platforms for Advanced Technologies and Research Resources), Scientific Research on Innovative Areas (Research in a Proposed Research Area) (Platforms for Advanced Technologies and Research Resources), Fostering Joint International Research (including the Joint International Research(A) before name change). As for the research category of Fostering Joint International Research (including the Joint International Research(A) 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 of the Liaison Meeting of Related Offices and Ministries on Competitive Research Funds)
URL: 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

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 funded 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 points to note

(i) No garbled characters and so on

The electronic form of the Research Proposal Document (PDF files) submitted through the electronic application system will be used as they appear in the review. It is the PI's

responsibility to check whether the contents of the Research Proposal Document converted to the PDF file are complete (missing characters, charts, garbled characters, etc.) before submitting. Research Proposal Documents using colored figures and text will be used as they appear in the review.

(ii)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 number of pages instructed for each column is met. For example neither following case 1 in which the total number of pages is different nor following case 2 in which the total number of pages is same but the number of pages instructed for each column are different are inconformity with prescribed format.

(Example) Forms to be Uploaded: Grant-in-Aid for Transformative Research Areas (A) (Publicly Offered Research) (Form S-74)

	Number of page(s) of each column			Total Number of Pages
	"Research Objectives, Research Method, etc." Column	"Applicant's Ability to Conduct the Research and the Research Environment" Column	"Issues Relevant to the Protection of Human Right and Compliance with Laws and Regulations" Column	
Correct Number of Pages	**5**	**2**	**1**	**8**
Incorrect Number Case 1	4	2	1	7
Incorrect Number Case 2	6	1	1	8

For application forms, etc. under each research category, see "III. Instructions for Prospective Applicants 3. Preparation of the KAKENHI Application Form (Research Proposal Document), etc. (1) Preparation of KAKENHI Research Proposal Document."

4. 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.

At the time of formal application for grant delivery, we will confirm via the electronic application system whether the Principal Investigator and Co-Investigator(s) have completed research education ethics coursework, etc.

[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 resolve 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 JSPS]

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

* URL: https://www.jsps.go.jp/file/storage/general/j-kousei/data/rinri.pdf

5. Completion of Research Ethics Education Coursework, etc.

Principal Investigator (PI) and Co-Investigator(Co-I) taking part in a research funded by 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 FY2025 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 institution 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 institutions based on the “Guidelines for Responding to Misconduct in Research” (adopted by 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 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 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 MEXT on August 26, 2014), and report the PI to the effect 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 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.

6. Registration of the Researcher Information in “Researchmap”

The “researchmap (URL: 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/

7. 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 participation of more than 8,000 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 (153,000 entries as of FY2023) and has utilized it so as to select the fair and reviewers. In order to keep the information in this Database updated at all times, JSPS makes a request every year to update the registered information through your affiliated research institutions. Kindly cooperate in updating the information in accordance with the Spending Rules for researchers (supplementary conditions or funding conditions).

IV.Instructions for Administrative Staff of Research Institution

(Omitted)

V. Other Relevant Issues

1. Support through 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 Transformative Research 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, or International Joint Usage / Research Center 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: ・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 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
	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.

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 links on the site below:
URL : https://www.mext.go.jp/a_menu/shinkou/hojyo/mext_01901.html

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.
The government also addresses the need to promote the implementation and common use of research facilities and equipment, to establish a framework for the introduction, renewal, and utilization of organizational research facilities (core facilities), and to formulate and publicize policies for the internal and external sharing of research facilities and equipment in the Comprehensive Package to Strengthen Research Capacity and Support Young Researchers (January 23, 2020, Council for Science, Technology, and Innovation) and the Sixth Science, Technology, and Innovation Basic Plan (Cabinet Decision on March 26, 2021).
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.

○ "Reform of Competitive Research Funds: Towards a Sustained Output of Research Achievements (Interim Report)"
(June 24, 2015, Competitive Research Fund Reform Review meeting)
URL: https://www.mext.go.jp/b_menu/shingi/chousa/shinkou/039/gaiyou/1359306.htm

○"The Sixth Science, Technology, and Innovation Basic Plan (Cabinet Decision on March 26, 2021)"
URL: https://www8.cao.go.jp/cstp/kihonkeikaku/6honbun.pdf

○Unified Rules for Administrative Procedures, Etc. Pertaining to Competitive Research Funds
(March 5, 2021, Agreement of the Liaison Meeting of Related Offices and Ministries on Competitive Research Funds; revised on May 24, 2023)
URL: https://www8.cao.go.jp/cstp/compefund/toitsu_rule_r50524.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 with 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 interim/ex-post assessment of Scientific Research on Innovative Areas (Research in a Proposed Research Area) and Transformative Research Areas (A). 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 of the research achievements in the area of life science produced in Japan in the 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. JSPS would like researchers to understand in advance that, in response to the 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.dbcls.jp/guidelines/data-sharing-guidelines

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 Center 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.

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 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 upgrading program representative agencies

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

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

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.

In Japan, export controls (*1) are carried out under the 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.

(*1) 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).

Please note in particular that 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 oversea groups. Please also bear in mind that the provision of technologies, etc. acquired in KAKENHI-funded projects or the provision of technologies, etc. already in possession with the use of KAKENHI may also be subject to restrictions.

Pursuant to the Foreign Exchange Act, exporting "List Rules" cargo or providing "List Rules" technology to a foreign country requires the development of a security export control system (*2). Therefore, JSPS may, by the time of official grant decision, confirm whether the provision of cargo and technology subject to export controls under the Foreign Exchange Act is planned in KAKENHI-funded projects and whether a control system has been established if there is an intent to provide them.

In case there is an intent to provide them but no control system has been established, JSPS requires the development of such system by the time of the provision or by the end of the relevant project,

whichever is earlier. JSPS may also report the status of confirmation to the Ministry of Economy, Trade and Industry at its request.
In addition, any violation of the Foreign Exchange Act regulations with regard to technologies, etc. acquired in KAKENHI-funded projects may result in no official grant decision being made or cancellation of grant delivery.

(*2) Exporters or persons conducting similar transactions are obliged to observe "compliance standards for exporters and persons conducting similar transactions" as prescribed in Article 55-10, Paragraph 1 of the Foreign Exchange Act. The security export control system as referred here means an internal control system of an organization to prevent illegal export, etc. through proper export of "List Rules" cargo or proper provision of "List Rules" technology to a foreign country, based on the control system prescribed in the "compliance standards for exporters and persons conducting similar transactions."

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)
URL: http://www.meti.go.jp/policy/anpo/

○Ministry of Economy, Trade and Industry: "Handbook on Security Trade Control"
URL: https://www.meti.go.jp/policy/anpo/seminer/shiryo/handbook.pdf

○Center for Information on Security Trade Controls
URL: https://www.cistec.or.jp/index.html

○"Guidance for the Control of Sensitive Technologies for Security Export for Academic and Research Institutions 3rd Edition"
URL:
https://www.meti.go.jp/policy/anpo/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)
URL: 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. Securing University Research Administrators (URAs) and other Management Personnel

The Sixth Science, Technology, and Innovation Basic Plan (Cabinet Decision on March 26, 2021) identifies the importance of efforts to improve the security of professional quality and treatment so that the positions of University Research Administrators (URAs) and other management personnel will become attractive. The Comprehensive Package to Strengthen Research Capacity

and Support Young Researchers (January 23, 2020, Council for Science, Technology, and Innovation) also addresses the need to establish career paths for management personnel, URAs, engineers, etc. In light of these initiatives, research institutions are encouraged, to the extent possible, to secure certain lengths of fixed-term employment (of about five years or longer) for URAs and other management personnel (who are currently hired or will be hired newly by research institutions) when engaging them in the management of KAKENHI research programs, by using not only KAKENHI, but also funds such as indirect expenses and basic costs under other external funds, and donations, for example.

In addition, please make active efforts to provide support in securing career paths for these management personnel, for example, enrolling them in URA training, etc. Also consider utilizing the indirect expenses for such efforts.

11. Promoting Efforts to Support Gender Equality and Foster Human Resources

The Science, Technology, and Innovation Basic Plan (Cabinet Decision on March 26, 2021), the Basic Plan for Gender Equality (Cabinet Decision on December 25, 2020), and Education and Human Resource Development Policy Package toward the Realization of Society 5.0 (Decision by the Council for Science, Technology and Innovation on June 2, 2022) aim to create research environments that make it easier for both men and women to continue their research activities when life events occur, such as childbirth, childcare, and nursing care, as well as to promote the appointment of excellent female researchers as project leaders, among other measures. Another goal is to increase the proportion of female students in middle and high school who advance to master's and doctoral courses especially in the science and engineering fields through initiatives to communicate the fascination of these areas to female students in middle and high school, their parents, and their teachers, thereby overcoming the current situation with a low percentage of female students going to doctoral courses in natural science and increasing the number of potential bearers of knowledge in Japan.

In addition, if due consideration is not paid to sexual differences in research and development processes that require such consideration, it may cause inappropriate impact at the stage of social implementation. As such, research and technological development that properly give attention to sexual differences, such as those in physique and the structure and functioning of bodies, are needed.

In light of these points, in KAKENHI-funded projects, JSPS will take into account efforts to promote the participation and advancement of female researchers and expand the range of human resources that will play a role in science and technology in the future.

To advance science, it is important to secure an environment that allows diverse researchers to exercise their potentials and advance their activities. In September 2023, 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! (URL: https://cheers.jsps.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.

12. "HIRAMEKI☆TOKIMEKI SCIENCE – Welcome to a University Lab – Science That Inspires and Inspirits"

The “HIRAMEKI☆TOKIMEKI SCIENCE” program is designed to offer opportunities to gain a deeper understanding of the meaning of science and its roles in daily life to society, as part of efforts to give back to society and promote KAKENHI-funded research achievements.
Based on their KAKENHI-funded academic studies, researchers themselves communicate the fun and fascination of scientific pursuit directly to the younger generation in an easy-to-understand manner. They thus instill intellectual curiosity and a rich sense of creativity in pupils in their fifth and sixth years of elementary school and students in middle and high school, who will go on to shoulder the future of Japan. As we are looking for such experience-based programs, regardless of areas of research, please take advantage of this opportunity.

URL: https://www.jsps.go.jp/j-hirameki/

Attached Table 4　Grants-in-Aid for Scientific Research-KAKENHI-

“Review Section Table”

March 9, 2022

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 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 Basic Section offers some examples related to the research contents. They are to help applicants understand the content of the Basic Section, so applicants are allowed to submit proposals even if the content is not given as 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 Medium-sized Section. However, applicants are allowed to submit proposals even if the content does not fall under the Basic Sections included in the Medium-sized Section. It should be noted that some Basic Sections are included in several Medium-sized Sections, so applicants can select the Medium-sized Section that they consider 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, applicants are allowed to submit proposals even if the content does not fall under the Medium-sized Sections included in the Broad Section. It should be noted that some Medium-sized Sections are included in several Broad Sections, so applicants can select the Broad Section that they consider 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	Pathophysiologic 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

(Attachment 1)

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	１４，１５	Ｂ
90010	Design-related	１，２３，６１	Ａ，Ｃ，Ｊ
90020	Library and information science, humanistic and social informatics-related	２，６２	Ａ，Ｊ
90030	Cognitive science-related	１０，６１	Ａ，Ｊ
90110	Biomedical engineering-related	９０	Ｄ，Ｉ
90120	Biomaterials-related	９０	Ｄ，Ｉ
90130	Medical systems-related	９０	Ｄ，Ｉ
90140	Medical technology assessment-related	９０	Ｄ，Ｉ
90150	Medical assistive technology-related	９０	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 Philosophy in general, Ethics in general, Western philosophy, Western ethics, Japanese philosophy, Japanese ethics, Applied ethics, etc.	1	A
01020	Chinese philosophy, Indian philosophy and Buddhist philosophy-related Chinese philosophy/thought, Indian philosophy/thought, Buddhist philosophy, Bibliography, Philology, etc.	1	A
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.	1	A
01040	History of thought-related History of thought in general, History of Western thought, History of Eastern thought, History of Japanese thought, History of Islamic thought, etc.	1	A
01050	Aesthetics and art studies-related Philosophy of art, Aesthetics, Music theory, Theatrical theory, Miscellaneous art studies, etc.	1	A
01060	History of arts-related Japanese art, Eastern art, Western art, Contemporary art, Craft, Design, Architecture, Costume, Photography, etc.	1	A
01070	Theory of art practice-related Art expression, Arts management, Art policy, Art production, etc.	1	A
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.	1	A
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.	2	A
02020	Chinese literature-related Chinese literature, Bibliography, Philology, Literary theory, etc.	2	A
02030	English literature and literature in the English language-related English literature, American literature, Literature in the English language, Literary theory, Bibliography, Philology, etc.	2	A
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.	2	A
02050	Literature in general-related Literature in other languages and areas, Literary theory, Comparative literature, Bibliography, Philology, Literature education, etc.	2	A
02060	Linguistics-related Phonetics/phonology, Semantics/pragmatics, Morphosyntax, Sociolinguistics, Contrastive linguistics, Psycholinguistics, Neurolinguistics, Historical linguistics, Corpus linguistics, Endangered and minority languages, etc.	2	A
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.	2	A
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.	2	A

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
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.	2, 9	A
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.	2, 9	A
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, Global history, Environmental history, History of emotions, etc.	3	A
03020	Japanese history-related History of ancient Japan, History of medieval Japan, History of early modern Japan, History of modern Japan, History of local Japan, History of external relations, History of culture and religion, History of Japanese environment, History of Japanese city, Research in historical materials, etc.	3	A
03030	History of Asia and Africa-related Chinese history, 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, Research in historical materials, etc.	3	A
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.	3	A
03050	Archaeology-related Archaeology in general, Prehistoric archaeology, Historical archaeology, Japanese archaeology, Ancient civilizations, History of material culture, Experimental archaeology, Information archaeology, Study of buried cultural property, Ecological archeology, etc.	3	A
03060	Cultural assets study-related Dating methods, Material analysis, Production techniques, Conservation science, Archaeological prospection, Plant and animal residues, Human remains, Cultural heritage, Cultural property policy, Restoration of cultural properties, etc.	3	A
03070	Museology-related Museum displays and exhibitions, Museum management, Museum collections and documentation, Museum conservation and preservation, Museum education and learning, Museum informatics and media studies, Museum finance and administration, History of museums and museology, etc.	3	A
04010	Geography-related Geography in general, Land use, Landscape, Environmental system, Geomorphology, Climatology, Hydrology, Cartography, Geographic information system, Regional planning, etc.	4	A
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.	4	A
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.	4	A

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
80010	Area studies-related Area studies in general, Cross-regional comparative studies, Aid, Social development, Interregional exchange, Environment, Transnationalism, Globalization, Refugees, Conflict, etc.	4, 6	A
80020	Tourism studies-related Tourism studies in general, Tourism resources, Tourism policy, Tourism industry, Tourist area, Tourists, Tourism culture, Tourism media, Sustainable tourism, Tourism ethics, etc.	4, 7, 8	A
80030	Gender studies-related Gender studies in general, Feminism, Men's studies, Sexuality, Queer studies, Labor, Violence, Prostitution, Reproductive technology, Gender equality, etc.	4, 6, 8	A
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.	5	A
05020	Public law-related Constitutional law, Administrative law, Tax law, etc.	5	A
05030	International law-related Public international law, Private international law, International human rights law, International economic law, EU law, etc.	5	A
05040	Social law-related Labor law, Economic law, Social security law, Education law, etc.	5	A
05050	Criminal law-related Criminal law, Criminal procedure, Criminology, Criminal justice policy, Juvenile law, Law and psychology, etc.	5	A
05060	Civil law-related Civil law, Commercial law, Civil procedure, Insolvency law, Alternative dispute resolution, etc.	5	A
05070	New fields of law-related Environmental law, Medical law, Information law, Consumer law, Intellectual property law, Law and gender, Legal profession, etc.	5	A
06010	Politics-related Political theory, History of political thought, Political history, Political process, Political participation, Political economy, Public administration, Local government, Comparative politics, Public policy, etc.	6	A
06020	International relations-related Theory of international relations, International history, Foreign policy, International security, International political economy, Global governance, International cooperation, Peace research, etc.	6	A
07010	Economic theory-related Microeconomics, Macroeconomics, Game theory, Behavioral economics, Experimental economics, Economic theory, Evolutionary economics, Economic institutions, Economic systems, etc.	7	A
07020	Economic doctrines and economic thought-related Economic doctrines, Economic thought, Social thought, Economic philosophy, etc.	7	A
07030	Economic statistics-related Statistical system, Statistical research, Economic statistics, Big data, Econometrics, Financial econometrics, etc.	7	A
07040	Economic policy-related Economic policy, Industrial organization, International economics, Development economics, Environmental and resource economics, Japanese economy, Regional economy, Urban economics, Transportation economics, Spatial economics, etc.	7	A

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
07050	Public economics and labor economics-related Public finance, Public economics, Health economics, Labor economics, Social security, Education economics, Law and economics, Political economy, Demography, etc.	7	A
07060	Money and finance-related Monetary economics, Finance, International finance, Corporate finance, Financial engineering, Insurance, etc.	7	A
07070	Economic history-related Economic history, Business history, Industrial history, etc.	7	A
07080	Business administration-related Organization theory, Corporate strategy, Organizational behavior, Corporation theory, Corporate governance theory, Human resource management, Technology/Innovation management theory, International business, Management information, Business administration in general, etc.	7	A
07090	Commerce-related Marketing, Consumer behavior, Distributive sciences, Logistics, Commerce in general, etc.	7	A
07100	Accounting-related Financial accounting, Management accounting, Auditing, Accounting in general, etc.	7	A
08010	Sociology-related Sociology in general, Community, Family, Labor, Stratification, Culture, Media, Ethnicity, Social movements, Social research, etc.	8	A
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.	8	A
08030	Family and consumer sciences, and culture and living-related Dress and fashion, Diet habits, Housing, Family resource management, Family relations, Lifestyle, Culture and living, Family and consumer education, Family and consumer sciences in general, etc.	8	A
09010	Education-related History of education, Philosophy of education, Curriculum and pedagogy, Teacher and trainer, School education, Social and community education, Institutions and administration, Comparative education, Educational administration, etc.	9	A
09020	Sociology of education-related Sociology of education, Socialization, Educational community, Destination and career formation, Class disparities, Gender, Education policy, Globalization and development, etc.	9	A
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.	9	A
09040	Education on school subjects and primary/secondary education-related Education of individual subjects, Lessons of each subject area, Instructional guidance, Teacher education, Special activities, Integrated studies, Moral education, etc.	9	A
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.	9	A

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
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.	9	A
09070	Educational technology-related Curriculum development, Teaching-learning support systems, Utilization of media, Utilization of ICT, Teacher's education, Information literacy, etc.	9	A
09080	Science education-related Science education, Science communication, Scientific literacy, Science and society, STEM education, etc.	9	A
10010	Social psychology-related Social psychology in general, Self, Group, Attitude and behavior, Affection/emotion, Interpersonal relation, Social issues, Culture, etc.	10	A
10020	Educational psychology-related Educational psychology in general, Development, Family, School, Clinical practice, Personality, Learning, Assessment and evaluation, etc.	10	A
10030	Clinical psychology-related Clinical psychology in general, Psychological disorder, Assessment, Psychological intervention, Training, Mental health, Crime and delinquency, Community, etc.	10	A
10040	Experimental psychology-related Experimental psychology in general, Sensation, Perception, Attention, Memory, Language, Emotion, Learning, etc.	10	A
11010	Algebra-related Group theory, Ring theory, Representation theory, Algebraic combinatorics, Number theory, Arithmetic geometry, Algebraic geometry, Algebraic analysis, etc.	11	B
11020	Geometry-related Differential geometry, Riemannian geometry, Symplectic geometry, Complex geometry, Topology, Differential topology, Low dimensional topology, etc.	11	B
12010	Basic analysis-related Functional analysis, Complex analysis, Probability theory, Harmonic analysis, Operator theory, Spectral analysis, Operator algebras, Algebraic analysis, Representation theory, etc.	12	B
12020	Mathematical analysis-related Functional equations, Real analysis, Dynamical system, Variational method, Nonlinear analysis, Applied analysis, etc.	12	B
12030	Basic mathematics-related Mathematical logic and foundations, Information theory, Discrete mathematics, Computer mathematics, History of mathematics, etc.	12	B
12040	Applied mathematics and statistics-related Numerical analysis, Mathematical modelling, Optimal control, Game theory, Statistical mathematics, etc.	12	B
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.	13	B
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.	13	B
13030	Magnetism, superconductivity and strongly correlated systems-related Magnetism, Strongly correlated electron systems, Superconductivity, Quantum fluids and solids, Molecular solids, etc.	13	B
13040	Biophysics, chemical physics and soft matter physics-related Physics of biological phenomena, Physics of biological matters, Liquids and glasses, Soft matters, Rheology, etc.	13	B

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
14010	Fundamental plasma-related Basic plasmas, Magnetized plasmas, Laser plasmas, Strongly coupled plasmas, Plasma diagnostics, Astrophysical and space plasmas, etc.	14	B
14020	Nuclear fusion-related Plasma confinement, Plasma control, Plasma heating, Plasma diagnostics, Edge plasma, Plasma wall interaction, Inertial fusion, Fusion material, Fusion system, etc.	14	B
14030	Applied plasma science-related Plasma processing, Plasma material science, General plasma applications, etc.	14	B
80040	Quantum beam science-related Accelerators, Beam physics, Radiation detectors, Beam control, Applied quantum beam science, etc.	14, 15	B
15010	Theoretical studies related to particle-, nuclear-, cosmic ray and astro-physics Particle physics, Nuclear physics, Cosmic-ray physics, Astrophysics, Relativity, Gravity, etc.	15	B
15020	Experimental studies related to particle-, nuclear-, cosmic ray and astro-physics Particle physics, Nuclear physics, Cosmic-ray physics, Astrophysics, Relativity, Gravity, etc.	15	B
16010	Astronomy-related Theoretical astronomy, Radio astronomy, Optical/infrared astronomy, X-ray/γ-ray astronomy, Astrometry, Solar physics, Exoplanet astronomy, etc.	16	B
17010	Space and planetary sciences-related Solar-terrestrial physics, Aeronomy, Planetary science, Exoplanetary science, Extraterrestrial material science, etc.	17	B
17020	Atmospheric and hydrospheric sciences-related Climate system, Atmospheric science, Ocean science, Limnology, Glaciology, Paleoclimatology, etc.	17	B
17030	Human geosciences-related Geoenvironmental science, Natural disaster science, Geospatial information science, Quaternary research, Earth resources science, etc.	17	B
17040	Solid earth sciences-related Solid earth geophysics, Geology, Earth's interior material science, Solid earth geochemistry, etc.	17	B
17050	Biogeosciences-related Origin and evolution of life, Extremophile biology, Biogeochemistry, Paleoenvironmental science, Paleontology, etc.	17	B
18010	Mechanics of materials and materials-related Structural mechanics, Fatigue, Fracture, Biomaterials, Material design, Material characteristics, Material evaluation, etc.	18	C
18020	Manufacturing and production engineering-related Machining, Non-traditional machining, Ultraprecision machining, Machine tools, Manufacturing systems, Precision metrology, Process planning, etc.	18	C
18030	Design engineering-related Mechanical design, Product design, Design theory, Design for reliability, Optimal design, Computer-aided design, etc.	18	C
18040	Machine elements and tribology-related Machine elements, Mechanisms, Tribology, Actuators, Micromachines, etc.	18	C
19010	Fluid engineering-related Fluid machinery, Flow measurement, Computational fluid dynamics, Turbulence, Multiphase flow, Compressible flow, Incompressible flow, etc.	19	C

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 Heat transfer, Convection, Combustion, Thermophysical properties, Refrigeration and air-conditioning, Heat engine, Energy conversion, etc.	19	C
20010	Mechanics and mechatronics-related Kinematics, Kinetics, Vibration, Acoustics, Automation, Biomechanics, Instrument and control applications, Mechatronics applications, etc.	20	C
20020	Robotics and intelligent system-related Robotics, Intelligent system, Human mechanical system, Human interface, Planning, Intelligent spatial system, Virtual reality, Augmented reality, etc.	20	C
21010	Power engineering-related Electrical energy-related, Energy conservation, Power system engineering, Electric machinery, Power electronics, Effective utilization of electric energy, Electromagnetic compatibility, Wireless power transfer, etc.	21	C
21020	Communication and network engineering-related Information theory, Nonlinear theory, Signal processing, Communication systems, Modulation/demodulation, Antennas, Networks, Multimedia, Cryptography/security, etc.	21	C
21030	Measurement engineering-related Measurement theory, Measuring instruments, Applied wave metrology, Measurement systems, Signal processing, Sensing, etc.	21	C
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.	21	C
21050	Electric and electronic materials-related Semiconductor, Dielectric materials, Magnetic materials, Organic materials, Superconductor, Composite materials, Thin films, Functional materials, Thick films, Fabrication/characterization methods, etc.	21	C
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, Process technology, Implementation technology, etc.	21	C
22010	Civil engineering material, execution and construction management-related Concrete, Steel, Composite material, Wood, Pavement material, Repair and reinforce material, Execution, Maintenance, Construction management, etc.	22	C
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.	22	C
22030	Geotechnical engineering-related Soil mechanics, Foundation engineering, Rock engineering, Engineering Geology, Ground behavior, Geotechnical structures, Geo-disaster prevention, Geo-environment, Tunnel engineering, etc.	22	C
22040	Hydroengineering-related Hydraulics, Environmental hydraulics, Hydrology, River engineering, Water resource engineering, Coastal engineering, Port and harbor engineering, Ocean engineering, etc.	22	C
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.	22	C
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.	22	C
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.	23	C

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
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.	23	C
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.	23	C
23040	Architectural history and design-related Architectural history, Urban history, Architectural theory, Design, Landscape, Preservation, Renovation, etc.	23	C
24010	Aerospace engineering-related Thermo-fluid dynamics, Structural mechanics, Propulsion, Aerospace craft design, Production engineering, Aircraft system, Aerodynamics, Spacecraft system, Space utilization, etc.	24	C
24020	Marine engineering-related Navigation, Structural mechanics, Structural design, Production technology, Marine propulsion, Marine transport, Marine development, Underwater engineering, Polar engineering, Marine environmental technology, etc.	24	C
25010	Social systems engineering-related Social systems, Industrial engineering, Operations research, Industrial management, Reliability engineering, Policy science, Regulatory science, Quality control, etc.	25	C
25020	Safety engineering-related Safety engineering, Safety system, Risk engineering, Risk management, Work safety, Industrial safety, Product safety, Safety information, Human engineering, Liability engineering, etc.	25	C
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.	25	C
26010	Metallic material properties-related Electric and magnetic properties, Metastable states, Diffusion, Phase transformation, Phase diagram, Lattice defect, Mechanical properties, Thermal and optical properties, Materials computational science, Microstructure analysis, etc.	26	D
26020	Inorganic materials and properties-related Functional ceramics, Glass, Engineering ceramics, Carbon-based materials, Crystal structure analysis, Microstructure, Electric properties, Mechanical properties, Physical and chemical properties, Grain boundary, etc.	26	D
26030	Composite materials and interfaces-related Functional composite materials, Structural composite materials, Biocompatible composite materials, Polymer composite, Surface treatment, Bonding and joining, Interface properties, Gradient function, etc.	26	D
26040	Structural materials and functional materials-related Infrastructural materials, Structural materials, Functional materials, Medical welfare materials, Reliability, Sensor materials, Energy materials, Battery materials, Environmental materials, etc.	26	D
26050	Material processing and microstructure control-related Processing and molding, Molding, Weld joining, Crystal microstructure control, Laser processing, Precision processing, Polishing, Powder metallurgy, Coating, Corrosion and protection, etc.	26	D
26060	Metals production and resources production-related Separation and purification, Melting and solidifying, Crystal growth, Casting, Scarce resources substitution, Low environment impact, Recycle, etc.	26	D
27010	Transport phenomena and unit operations-related Phase equilibrium, Transport properties, Fluid-phase unit operation, Adsorption, Membrane separation, Stir mixing, Powder and particle, Crystallization, Film formation, Supercritical, etc.	27	D

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
27020	Chemical reaction and process system engineering-related Reaction operation, Novel reaction process, Reaction mechanism, Reactor design, Materials synthesis process, Microreactor, Process control, Process system design, Process informatics, etc.	27	D
27030	Catalyst and resource chemical process-related Catalyst preparation, Catalytic function, Energy conversion process, Energy technology, Resources effective utilization technology, Catalytic material, Active site analysis, etc.	27	D
27040	Biofunction and bioprocess engineering-related Biocatalyst engineering, Biofunction engineering, Food engineering, Medicochemical engineering, Bioproduction process, Bioreactor, Bioseparation, Biosensor, Biorefinery, etc.	27	D
28010	Nanometer-scale chemistry-related Nanoparticle chemistry, Mesoscopic chemistry, Nanostructure control, Self-assembly, Nanocarbons, Molecular devices, Nanointerface function, Nanospace function, etc.	28	D
28020	Nanostructural physics-related Physics in nanoscale materials and structures, Nanoprobes, Quantum dots, Quantum devices, Electron devices, Spin devices, Nano optical device, Nanotribology, Nanocarbon physics, etc.	28	D
28030	Nanomaterials-related Creation of nanomaterials, Analysis of nanomaterials, Nanosurfaces and nanointerfaces, Functional nanomaterials, Nanoparticles, Carbon nanomaterials, Two-dimensional materials, Nanocrystalline materials, Nanocomposites, Nanofabrication process, etc.	28	D
28040	Nanobioscience-related Biomolecular devices, Molecular manipulation, Molecular imaging, Nanomeasurements, Nanosynthesis, Single molecule science, Nano-bio interfaces, Biomolecular array, Genome engineering, etc.	28	D
28050	Nano/micro-systems-related MEMS, NEMS, BioMEMS, Nano/micro-fabrication, Nano/micro-chemical systems, Nano/micro-biosystems, Nano/micro-mechanics, Nano/micro-sensors, etc.	28	D
29010	Applied physical properties-related Magnetic materials, Superconductors, Dielectrics, Fine particles, Liquid crystals, New functional materials, Molecular electronics, Bioelectronics, Spintronics, etc.	29	D
29020	Thin film/surface and interfacial physical properties-related Thin-film engineering, Surface and interfacial engineering, Surface science, Vacuum, Measurement, Analysis, Nanoscopic technology, Advanced equipment, Electronics application, etc.	29	D
29030	Applied condensed matter physics-related Elementary quantities, Standards, Units, Physical quantity measurements and detection, Energy conversion, etc.	29	D
30010	Crystal engineering-related Metal, Semiconductor, Ceramics, Amorphous, Crystal growth, Artificial structures, Device structure, Crystal characterization, Plasma process, etc.	30	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, Quantum optics, etc.	30	D
31010	Nuclear engineering-related Reactor physics, Nuclear safety, Thermal-hydraulics and structure, Fuel material, Nuclear chemistry, Nuclear life cycle, Radiation safety, Radiation engineering, Fusion reactor engineering, Nuclear social environment, etc.	31	D
31020	Earth resource engineering, Energy sciences-related Resource prospecting, Resource development, Resource cycle, Resource economy, Energy system, Environmental load, Renewable energy, Natural resources and energy policy, etc.	31	D

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
32010	Fundamental physical chemistry-related Gas, Liquid, Solid, Nanomaterials, Bio-related materials, Structure and properties, Chemical reactions, Spectroscopy, Theoretical calculation, Data science, etc.	32	E
32020	Functional solid state chemistry-related Molecular materials, Inorganic compounds, Hybrid compounds, Colloids, Surface/interface, Electrical properties, Optical properties, Magnetic properties, Energy conversion, Catalysis, etc.	32	E
33010	Structural organic chemistry and physical organic chemistry-related Chemistry of organic crystals, Molecular recognition, Supermolecules, Functional organic molecules, Extended π-electron molecules, Organoelement chemistry, Reaction mechanism, Molecular chirality, Theoretical organic chemistry, etc.	33	E
33020	Synthetic organic chemistry-related Development of reactions, Reaction mechanism, Selective reactions, Asymmetric synthesis, Development of catalysts, Biocatalysis, Sustainable organic synthesis, Natural product synthesis, Process chemistry, etc.	33	E
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.	34	E
34020	Analytical chemistry-related Spectrometric analysis, Advanced measurements, Surface/interface analysis, Separation analysis, Analytical reagents, Radiochemical analysis, Electrochemical analysis, Bioanalysis, New analysis methods, etc.	34	E
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.	34	E
35010	Polymer chemistry-related Polymer synthesis, Polymer reactions, Functional polymers, Self-assembled polymers, Non-covalent polymers, Chiral polymers, Bio-related polymers, Polymer properties, Polymer structures, Polymer interface, etc.	35	E
35020	Polymer materials-related Properties of polymer materials, Synthesis of polymer materials, Functional polymer materials, Environmentally friendly polymer materials, Liquid crystal polymers, Gel, Biopolymers, Polymer composites, Polymer processing, etc.	35	E
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.	35	E
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.	36	E
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.	36	E
37010	Bio-related chemistry Bioorganic chemistry, Bioinorganic chemistry, Biological reaction engineering, Biofunctional chemistry, Biofunctional materials, Biotechnology, etc.	37	E

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
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.	37	E
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.	37	E
38010	Plant nutrition and soil science-related Plant metabolism and physiology, Nutritional elements in plants, Soil classification, Soil physical chemistry, Soil organisms, etc.	38	F
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.	38	F
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.	38	F
38040	Bioorganic chemistry-related Bioactive substances, Signal molecules, Natural products chemistry, Biosynthesis, Structure-activity relationship, Synthetic organic chemistry, Chemical biology, etc.	38	F
38050	Food sciences-related Food function, Food chemistry, Nutritional chemistry, Food analysis, Food engineering, Food safety, Functional food, Nutritional epidemiology, Clinical nutrition, etc.	38	F
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.	38	F
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.	39	F
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.	39	F
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.	39	F
39040	Plant protection science-related Plant pathology, Clinical plant science, Agricultural insect pest, Natural enemy, Weed, Agricultural chemicals, Integrated pest management, etc.	39	F
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.	39	F
39060	Conservation of biological resources-related Conservation biology, Biodiversity conservation, Conservation of phylogenetic diversity, Genetic resources conservation, Ecosystem conservation, Conservation of microorganisms, Impacts of non-native species, etc.	39	F
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.	39	F

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
40010	Forest science-related Forest ecology, Forest biodiversity, Forest genetics and breeding, Silviculture, Forest protection, Forest environments, Erosion control, Forest utilization, Forest planning, Forest policy, etc.	40	F
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.	40	F
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.	40	F
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.	40	F
41010	Agricultural and food economics-related Food economy, Agricultural production economy, Agricultural policy, Food system, Food marketing, International agricultural development, Trade of agricultural commodities and livestock products, Rural resources and environment, etc.	41	F
41020	Rural sociology and agricultural structure-related Farm organization, Farm management, Agricultural structure, Agricultural market, Agricultural history, Rural society, Rural life, Agricultural cooperative, etc.	41	F
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.	41	F
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.	41	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.	41	F
42010	Animal production science-related Breeding/genetics, Reproduction, Nutrition/feeding, Anatomy/physiology, Product, Environment, Behavior, Therapy, Grassland, Grazing, etc.	42	F
42020	Veterinary medical science-related Basic veterinary science, Pathological veterinary science, Applied veterinary science, Clinical veterinary science, Animal nursing, Animal welfare, Wildlife, etc.	42	F
42030	Animal life science-related Homeostasis, Cellular function, Biological defense, Integrated genetics, Development/differentiation, Biotechnology, etc.	42	F
42040	Laboratory animal science-related Genetic engineering, Developmental engineering, Animal models of disease, Facility management, Laboratory animal welfare, Laboratory animal-related technology, Bioresource, etc.	42	F
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, Regulation of RNA function, etc.	43	G

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
43020	Structural biochemistry-related Proteins, Nucleic acids, Lipids, Carbohydrates, Biological membrane, Molecular recognition, Denaturation, Three-dimensional structural analysis, Three-dimensional structural prediction, Molecular dynamics, etc.	43	G
43030	Functional biochemistry-related Enzymes, Sugar chain, Bioenergy conversion, Biological trace elements, Physiologically active substances, Cell signaling, Membrane transport, Proteolysis, Molecular recognition, Organelle, etc.	43	G
43040	Biophysics-related Structure biology, Physical property of biomolecules, Biomembrane, Photobiology, Molecular motor, Biometrics, Bioimaging, Systems biology, Synthetic biology, Theoretical biology, etc.	43	G
43050	Genome biology-related Genome organization, Genome function, Genome diversity, Molecular evolution of genome, Genome repair/maintenance, Trans-omics, Epigenome, Gene resource, Genome dynamics, etc.	43	G
43060	System genome science-related Network analyses, Synthetic biology, Biological databases, Bioinformatics, Genome analysis technology, Genome biotechnology, etc.	43	G
44010	Cell biology-related Cytoskeleton, Proteolysis, Organelle, Nuclear structure and function, Extracellular matrix, Signal transduction, Cell cycle, Cell motility, Cell-cell interaction, Cellular genetics, etc.	44	G
44020	Developmental biology-related Cell differentiation, Stem cells, Regeneration, Germ layer formation, Morphogenesis, Organogenesis, Fertilization, Germ cells, Developmental genetics, Evolution and development, etc.	44	G
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.	44	G
44040	Morphology and anatomical structure-related Morphology, Comparative morphology, Morphological modeling, Ultrastructure, Morphological image analysis, Tissue organization, Microscopic technology, Imaging, etc.	44	G
44050	Animal physiological chemistry, physiology and behavioral biology-related Metabolic physiology, Neurophysiology, Neuroethology, Behavioral physiology, Animal physiological chemistry, Chronobiology, Comparative physiology, Comparative endocrinology, Behavioral genetics, etc.	44	G
45010	Genetics-related Molecular genetics, Cellular genetics, Developmental genetics, Behavioral genetics, Population genetics, Quantitative trait, Population genomics, Genome-wide association study, Genetic diversity, Epigenome diversity, etc.	45	G
45020	Evolutionary biology-related Molecular evolution, Evolutionary genetics, Phenotypic evolution, Evolutionary developmental biology, Evolution of ecological traits, Evolution of behaviors, Experimental evolution, Coevolution, Speciation, Evolutionary theory, etc.	45	G
45030	Biodiversity and systematics-related Taxonomic characters, Taxon, Classification system, Molecular phylogeny, Phyletic evolution, Speciation, Natural history, Biogeography, Rare species conservation, Biodiversity, etc.	45	G
45040	Ecology and environment-related Chemical ecology, Molecular ecology, Physiological ecology, Evolutionary ecology, Behavioral ecology, Population ecology, Community ecology, Conservation ecology, Biological interactions, Material cycles in ecosystems, etc.	45	G
45050	Physical anthropology-related Morphology and function, Bioarchaeology, Biological mechanism, Genome, Evolutionary genetics, Behavior, Ecology, Comparative cognition, Primates, Growth and aging, etc.	45	G

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
45060	Applied anthropology-related Physiological anthropology, Ergonomics, Forensic anthropology, Medical anthropology, Physiological polymorphisms, Environmental adaptability, Somatic and physiological function, Anthropometry and bioengineering, Lifestyle, etc.	45	G
46010	Neuroscience-general-related Neurochemistry, Neuron, Glia, Genome, Epigenetics, Neurobiology, Information processing, Synapse, Neurogenesis, etc.	46	G
46020	Anatomy and histopathology of nervous system-related Neural development, Anatomy of nervous system, Neural network structure, Neuropathology, etc.	46	G
46030	Function of nervous system-related Neurophysiology, Neuropharmacology, Neurotransmission, Neuroinformatics, Behavioral neuroscience, Neural system physiology, Cerebral blood flow, Autonomic nervous system, etc.	46	G
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.	47	H
47020	Pharmaceutical analytical chemistry and physicochemistry-related Environmental analysis, Bioanalysis, Physicochemistry, Biophysics, Structural biology, Radiochemistry, Bioimaging, Drug formulation design, Computer science, Information science, etc.	47	H
47030	Pharmaceutical hygiene and biochemistry-related Environmental hygiene, Healthful nutrition, Disease prevention, Toxicology, Drug metabolism, Host defense, Molecular biology, Cell biology, Biochemistry, etc.	47	H
47040	Pharmacology-related Pharmacology, Pharmacogenomics, Applied pharmacology, Signal transduction, Drug interactions, Drug response, Pharmacotherapy, Pharmacotoxicology, etc.	47	H
47050	Environmental and natural pharmaceutical resources-related Environmental resource science, Natural products chemistry, Bioactive natural compounds, Medicinal resources, Medicinal foods, Pharmaceutical microbiology, etc.	47	H
47060	Clinical pharmacy-related Pharmacokinetics, Medical informatics, Social pharmacy, Clinical pharmacy, Pharmaceutics, Regulatory science, Education for the pharmacist, etc.	47	H
48010	Anatomy-related Macroscopic anatomy, Histology, Embryology, etc.	48	H
48020	Physiology-related General physiology, Pathophysiology, Comparative physiology, Environmental physiology, etc.	48	H
48030	Pharmacology-related Genomic pharmacology, Molecular and cellular pharmacology, Pathological pharmacology, Behavioral pharmacology, Pharmacology for drug discovery, Clinical pharmacology, etc.	48	H
48040	Medical biochemistry-related Biofunctional molecular and medical biochemistry, Genome medical sciences, Human genetics, Disease model, etc.	48	H
49010	Pathological biochemistry-related Molecular pathology, Metabolic disorders, Molecular diagnosis, etc.	49	H
49020	Human pathology-related Molecular pathology, Cyto- and histo-pathology, Diagnostic pathology, etc.	49	H
49030	Experimental pathology-related Disease models, Pathological regulation, Tissue regeneration, etc.	49	H

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
49040	Parasitology-related Parasite, Vector organism, Parasite pathogenicity, Epidemiology of parasites, Control of parasite infections, etc.	49	H
49050	Bacteriology-related Bacterium, Fungus, Antimicrobial resistance, Bacterial pathogenicity, Epidemiology of bacteria, Control of bacterial infections, etc.	49	H
49060	Virology-related Virus, Prion, Viral pathogenicity, Epidemiology of viruses, Control of viral infections, etc.	49	H
49070	Immunology-related Immune system, Immune response, Inflammation, Immune-related disorder, Immune regulation, etc.	49	H
50010	Tumor biology-related Cancer and gene, Tumor development, Invasion, Metastasis, Cancer microenvironment, Cancer and signal transduction, Characteristics of cancer cells, Cancer and immune cells, etc.	50	I
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.	50	I
51010	Basic brain sciences-related Brain-machine interface, Model animal, Computational brain science, Brain information decoding, Control technologies, Brain imaging, Brain biometrics, etc.	51	I
51020	Cognitive and brain science-related Social behavior, Communication, Emotion, Decision making, Consciousness, Learning, Neuroeconomics, Neuropsychology, etc.	51	I
51030	Pathophysiologic neuroscience-related Clinical neuroscience, Dolorology, Sensory impairment, Movement disorder, Neurological disorder, Neurogenesis, Neuroimmunology, Cellular degeneration, Disease model, etc.	51	I
52010	General internal medicine-related Psychosomatic medicine, Laboratory medicine, General practice, Geriatrics, Psychosomatic internal medicine, Oriental medicine, Palliative medicine, etc.	52	I
52020	Neurology-related Neurology, Neurofunctional imaging, etc.	52	I
52030	Psychiatry-related Clinical psychiatry, Biological psychiatry, Forensic mental health, etc.	52	I
52040	Radiological sciences-related Diagnostic radiology, Therapeutic radiology, Radiation biology, Radiological technology, etc.	52	I
52050	Embryonic medicine and pediatrics-related Fetal medicine, Neonatal medicine, Pediatrics, etc.	52	I
53010	Gastroenterology-related Upper digestive tract, Lower digestive tract, Liver, Biliary tract, Pancreas, etc.	53	I
53020	Cardiology-related Ischemic heart disease, Valvular heart disease, Arrhythmia, Cardiomyopathy, Heart failure, Peripheral arterial disease, Arteriosclerosis, Hypertension, etc.	53	I
53030	Respiratory medicine-related Respiratory medicine, Asthma, Diffusive lung disease, COPD, Lung cancer, Pulmonary hypertension, etc.	53	I
53040	Nephrology-related Acute renal failure, Chronic kidney disease, Diabetic nephropathy, Hypertension, Aqueous electrolyte metabolism, Artificial dialysis, etc.	53	I

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
53050	Dermatology-related Dermatology, Cutaneous immune disease, Cutaneous infection, Cutaneous tumor, etc.	53	I
54010	Hematology and medical oncology-related Hematological oncology, Medical oncology, Hematological immunology, Anemia, Thrombosis and hemostasis, Chemotherapy, etc.	54	I
54020	Connective tissue disease and allergy-related Connective tissue disease, Allergy, Clinical immunology, Inflammation, etc.	54	I
54030	Infectious disease medicine-related Infection diagnostics, Infection therapeutics, Host defense, International infection science, etc.	54	I
54040	Metabolism and endocrinology-related Energy balance, Glucose metabolism, Lipid metabolism, Purine metabolism, Bone metabolism, Electrolyte balance, Endocrinology, Neuroendocrinology, Reproductive endocrinology, etc.	54	I
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.	55	I
55020	Digestive surgery-related Upper gastrointestinal surgery, Lower gastrointestinal surgery, Hepatic surgery, Biliary surgery, Pancreatic surgery, etc.	55	I
55030	Cardiovascular surgery-related Coronary artery surgery, Heart valve surgery, Surgery for myocardial disease, Aortic surgery, Vascular surgery, Congenital heart surgery, etc.	55	I
55040	Respiratory surgery-related Lung surgery, Mediastinal surgery, Chest wall surgery, Respiratory tract surgery, etc.	55	I
55050	Anesthesiology-related Anesthesiology, Perioperative management, Pain management, Resuscitology, Palliative medicine, etc.	55	I
55060	Emergency medicine-related Intensive care medicine, Emergency resuscitation science, Trauma surgery, Disaster medicine, Disaster medical care, etc.	55	I
56010	Neurosurgery-related Neurosurgery, Spine and spinal cord diseases, etc.	56	I
56020	Orthopedics-related Orthopedics, Rehabilitation medicine, Sports medicine, etc.	56	I
56030	Urology-related Urology, Male genitalia science, etc.	56	I
56040	Obstetrics and gynecology-related Obstetrics, Reproductive endocrinology, Gynecologic oncology, Female health care medicine, etc.	56	I
56050	Otorhinolaryngology-related Otorhinolaryngology, Head and neck surgery, etc.	56	I
56060	Ophthalmology-related Ophthalmology, Ophthalmological optics, etc.	56	I
56070	Plastic and reconstructive surgery-related Plastic surgery, Reconstructive surgery, Aesthetic plastic surgery, etc.	56	I

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
57010	Oral biological science-related Oral anatomy, Oral histology and embryology, Oral physiology, Oral biochemistry, Pharmacology for hard tissues, etc.	57	I
57020	Oral pathobiological science-related Oral infectious diseases, Oral pathology, Oral experimental oncology, Immunity and inflammation, Laboratory medicine, etc.	57	I
57030	Conservative dentistry-related Operative dentistry, Endodontology, Periodontology, etc.	57	I
57040	Regenerative dentistry and dental engineering-related Regenerative dentistry, Biomaterial science, Dental materials science, Oral and maxillofacial prosthetics, Oral implantology, etc.	57	I
57050	Prosthodontics-related Prosthodontics, Oral rehabilitation, Gerodontology, etc.	57	I
57060	Surgical dentistry-related Oral and maxillofacial surgery, Oral maxillofacial reconstructive surgery, Dental anesthesiology, Psychosomatic medicine dentistry, Dental radiology, etc.	57	I
57070	Developmental dentistry-related Orthodontics, Pediatric dentistry, etc.	57	I
57080	Social dentistry-related Dental hygiene, Preventive dentistry, Oral health administration and management, Dental education, Forensic odontology, etc.	57	I
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.	58	I
58020	Hygiene and public health-related: including laboratory approach Hygiene, Public health, Epidemiology, Global health, etc.	58	I
58030	Hygiene and public health-related: excluding laboratory approach Hygiene, Public health, Epidemiology, Global health, etc.	58	I
58040	Forensics medicine-related Forensic medicine, Forensic pathology, Forensic toxicology, Forensic genetics, Suicide, Abuse, Clinical forensic medicine, Sudden death, etc.	58	I
58050	Fundamental of nursing-related Fundamental of nursing, Nursing education, Nursing administration, Nursing ethics, Global nursing, etc.	58	I
58060	Clinical nursing-related Critical care and emergency nursing, Perioperative nursing, Nursing of chronic illness, Oncology nursing, Psychiatric nursing, Palliative care nursing, etc.	58	I
58070	Lifelong developmental nursing-related Women's health nursing, Maternal nursing, Midwifery, Family health nursing, Child health nursing, School nursing, etc.	58	I
58080	Gerontological nursing and community health nursing-related Gerontological nursing, Community health nursing, Public health nursing, Disaster nursing, Home care nursing, etc.	58	I
59010	Rehabilitation science-related Rehabilitation medicine, Rehabilitation nursing, Rehabilitation medical care, Physicotherapeutics, Occupational therapy, Assistive technology, Speech and language therapy, etc.	59	I

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 Sports physiology, Sports biochemistry, Sports medicine, Sports sociology, Sports management, Sports psychology, Sports education, Training science, Sports biomechanics, Adapted sports science, etc.	59	I
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.	59	I
59040	Nutrition science and health science-related Nutritional physiology, Nutritional biochemistry, Nutritional education, Clinical nutrition, Functional food, Lifestyle-related disease, Health promotion, Aging, etc.	59	I
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.	60	J
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.	60	J
60030	Statistical science-related Statistics, Data science, Modeling, Statistical inference, Multivariate analysis, Time series analysis, Statistical quality control, Applied statistics, etc.	60	J
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.	60	J
60050	Software-related Programming language, Programming methodology, Operating system, Parallel and distributed computing, Software engineering, Virtualization technology, Cloud computing, Software dependability, Software security, etc.	60	J
60060	Information network-related Network architecture, Network protocol, Internet, Mobile network, Pervasive computing, Sensor network, IoT, Traffic engineering, Network management, Service platform technology, etc.	60	J
60070	Information security-related Cryptography, Tamper resistance technology, Authentication, Biometrics, Access control, Malware countermeasure, Countermeasures against cyber attacks, Privacy protection, Digital forensics, Security evaluation and authorization, etc.	60	J
60080	Database-related Data model, Database system, Multimedia database, Information retrieval, Content management, Metadata, Big data, Geographic information system, etc.	60	J
60090	High performance computing-related Parallel processing, Distributed processing, Cloud computing, Numerical analysis, Visualization, Computer graphics, High performance computing application, etc.	60	J
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.	60	J
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.	61	J
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.	61	J

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
61030	Intelligent informatics-related Search, Inference, Machine learning, Knowledge acquisition, Intelligent system, Intelligent information processing, Natural language processing, Data mining, Ontology, Agent system, etc.	61	J
61040	Soft computing-related Neural network, Evolutionary computation, Fuzzy theory, Chaos, Complex systems, Probabilistic information processing, etc.	61	J
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.	61	J
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.	61	J
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.	62	J
62020	Web informatics and service informatics-related Web system, Semantic web, Web mining, Social network analysis, Service engineering, Educational service, Medical service, Welfare service, Social service, Information culture, etc.	62	J
62030	Learning support system-related Media literacy, Learning media, Social media, Learning content, Learning management, Learning support, Remote learning, e-Learning, etc.	62	J
62040	Entertainment and game informatics-related Music information processing, 3D content, Animation, Game programming, Network entertainment, Media art, Digital museum, Experience design, etc.	62	J
63010	Environmental dynamic analysis-related Global warming, Environmental change, Water and material cycle, Ocean, Land, Polar regions, Environmental measurements, Environmental model, Environmental information, Remote sensing, etc.	63	K
63020	Radiation influence-related Radiation, Measurement, Control, Repair, Biological effects, Risk, etc.	63	K
63030	Chemical substance influence on environment-related Toxicology, Toxic substance to human, Trace chemical substance, Endocrine disruptor, Repair, etc.	63	K
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.	63	K
64010	Environmental load and risk assessment-related Environmental analysis, Environmental load analysis, Environmental monitoring, Pollution dynamics assessment, Evaluation of radioactive substances dynamics, Environmental modeling, Exposure assessment, Toxicity evaluation, Environmental assessment, Chemical substance management, etc.	64	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.	64	K

Basic Section	Examples of related research content	Medium-sized Sections and Broad Section corresponding Basic Sections	
		Medium-sized Section	Broad Section
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.	64	K
64040	Social-ecological systems-related Biodiversity, Conservation biology, Natural capital, Impact of climate change, Impact analysis on ecosystem, Ecosystem management, Ecosystem restoration, Ecosystem services, Natural tourism resources, Regional environmental planning, etc.	64	K
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.	64	K
64060	Environmental policy and social systems-related Environmental philosophy and ethics, Environmental laws, Environmental economics, Environmental information, Environmental education, Environmental activities, Environmental management and governance, Social and public system, Consensus forming, Sustainable development, etc.	64	K
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.	1, 23, 61	A, C, J
90020	Library and information science, humanistic and social informatics-related Library science, Information services, Information organizing, Information retrieval, Bibliometrics, Information resources, Information ethics, Digital humanities, Social Informatics, Digital archives, etc.	2, 62	A, 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.	10, 61	A, J
90110	Biomedical engineering-related Medical imaging, Medical modeling, Biological simulation, Biometrics, Artificial organs, Tissue engineering, Biophysical properties, Biocontrol, Biomechanics, Nanobio systems, etc.	90	D, I
90120	Biomaterials-related Biofunctional materials, Tissue engineering materials, Biocompatible materials, Nanobio materials, Drug delivery systems, Stimuli-sensitive materials, Genetic engineering material, etc.	90	D, I
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.	90	D, I
90140	Medical technology assessment-related Regulatory science, Safety evaluation, Clinical study, Medical technology ethics, Medical devices, etc.	90	D, I
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.	90	D, I

(Attachment 2)

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	１４，１５	B
90010	Design-related	１，２３，６１	A，C，J
90020	Library and information science, humanistic and social informatics-related	２，６２	A，J
90030	Cognitive science-related	１０，６１	A，J
90110	Biomedical engineering-related	９０	D，I
90120	Biomaterials-related	９０	D，I
90130	Medical systems-related	９０	D，I
90140	Medical technology assessment-related	９０	D，I
90150	Medical assistive technology-related	９０	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
９０	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, History of Islamic thought, etc.
01050	Aesthetics and art studies-related Philosophy of art, Aesthetics, Music theory, Theatrical theory, 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.

(Broad Section A)

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, 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, Global history, Environmental history, History of emotions, etc.
03020	Japanese history-related
	History of ancient Japan, History of medieval Japan, History of early modern Japan, History of modern Japan, History of local Japan, History of external relations, History of culture and religion, History of Japanese environment, History of Japanese city, Research in historical materials, etc.
03030	History of Asia and Africa-related
	Chinese history, 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, 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, Ancient civilizations, History of material culture, Experimental archaeology, Information archaeology, Study of buried cultural property, Ecological archeology, 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 property policy, Restoration of cultural properties, etc.
03070	Museology-related
	Museum displays and exhibitions, Museum management, Museum collections and documentation, Museum conservation and preservation, Museum education and learning, Museum informatics and media studies, Museum finance and administration, History of museums and 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.

(Broad Section A)

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, Social development, Interregional exchange, Environment, Transnationalism, Globalization, Refugees, Conflict, etc.
80020	Tourism studies-related
	Tourism studies in general, Tourism resources, Tourism policy, Tourism industry, Tourist area, Tourists, Tourism culture, Tourism media, Sustainable tourism, Tourism ethics, etc.
80030	Gender studies-related
	Gender studies in general, Feminism, Men's studies, 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, Political process, Political participation, Political economy, Public administration, Local government, Comparative politics, Public policy, etc.
06020	International relations-related
	Theory of international relations, International history, Foreign policy, International security, International political economy, Global governance, International cooperation, Peace research, etc.
80010	Area studies-related
	Area studies in general, Cross-regional comparative studies, Aid, Social development, Interregional exchange, Environment, Transnationalism, Globalization, Refugees, Conflict, etc.

(Broad Section A)

80030	Gender studies-related
	Gender studies in general, Feminism, Men's studies, 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, Economic statistics, Big data, Econometrics, Financial econometrics, etc.
07040	Economic policy-related
	Economic policy, Industrial organization, International economics, Development economics, Environmental and resource economics, Japanese economy, Regional economy, Urban economics, Transportation economics, Spatial economics, 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, Demography, 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
	Organization theory, Corporate strategy, Organizational behavior, Corporation theory, Corporate governance theory, Human resource management, Technology/Innovation management theory, International business, Management information, Business administration 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 resources, Tourism policy, Tourism industry, Tourist area, Tourists, Tourism culture, Tourism media, Sustainable tourism, Tourism ethics, 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, Stratification, Culture, Media, Ethnicity, Social movements, Social research, 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.

(Broad Section A)

08030	Family and consumer sciences, and culture and living-related
	Dress and fashion, Diet habits, Housing, Family resource management, Family relations, Lifestyle, Culture and living, Family and consumer education, Family and consumer sciences in general, etc.
80020	Tourism studies-related
	Tourism studies in general, Tourism resources, Tourism policy, Tourism industry, Tourist area, Tourists, Tourism culture, Tourism media, Sustainable tourism, Tourism ethics, etc.
80030	Gender studies-related
	Gender studies in general, Feminism, Men's studies, 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, Teacher and trainer, School education, Social and community education, Institutions and administration, Comparative education, Educational administration, etc.
09020	Sociology of education-related
	Sociology of education, Socialization, Educational community, Destination and career formation, Class disparities, Gender, Education policy, 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, Lessons of each subject area, Instructional guidance, Teacher education, Special activities, Integrated studies, Moral education, 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, STEM education, 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.

(Broad Section A)	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, History of 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.

(Broad Section B)

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 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 Theoretical astronomy, Radio astronomy, Optical/infrared astronomy, X-ray/γ-ray astronomy, Astrometry, Solar physics, Exoplanet 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
	Machining, Non-traditional machining, Ultraprecision machining, Machine tools, Manufacturing systems, Precision metrology, Process planning, etc.
18030	Design engineering-related
	Mechanical design, Product design, Design theory, Design for reliability, Optimal design, Computer-aided design, 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, Biomechanics, Instrument and control applications, Mechatronics applications, 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, Wireless power transfer, etc.
21020	Communication and network engineering-related
	Information theory, Nonlinear theory, Signal processing, 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, 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, Functional materials, Thick films, Fabrication/characterization methods, etc.

(Broad Section C)

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, 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, 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, Geotechnical structures, Geo-disaster prevention, Geo-environment, Tunnel engineering, 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 mechanics, Propulsion, Aerospace craft design, Production engineering, Aircraft system, Aerodynamics, Spacecraft system, Space utilization, etc.
24020	Marine engineering-related
	Navigation, Structural mechanics, Structural design, Production technology, Marine propulsion, Marine transport, Marine development, Underwater engineering, Polar engineering, Marine environmental technology, etc.

(Broad Section C)

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, Industrial 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, Metastable states, Diffusion, Phase transformation, Phase diagram, Lattice defect, Mechanical properties, Thermal and optical properties, Materials computational science, Microstructure analysis, etc.
26020	Inorganic materials and properties-related
	Functional ceramics, Glass, Engineering ceramics, Carbon-based materials, Crystal structure analysis, Microstructure, 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, Bonding and joining, Interface properties, Gradient function, etc.
26040	Structural materials and functional materials-related
	Infrastructural materials, Structural materials, Functional materials, Medical welfare materials, Reliability, Sensor materials, Energy materials, Battery materials, Environmental materials, etc.
26050	Material processing and microstructure control-related
	Processing and molding, Molding, Weld joining, Crystal microstructure control, Laser processing, Precision processing, Polishing, Powder metallurgy, Coating, Corrosion and protection, etc.
26060	Metals production and resources production-related
	Separation and purification, Melting and solidifying, Crystal growth, Casting, Scarce resources substitution, Low environment impact, Recycle, 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, Fluid-phase unit operation, Adsorption, Membrane separation, Stir mixing, Powder and particle, Crystallization, Film formation, Supercritical, etc.
27020	Chemical reaction and process system engineering-related
	Reaction operation, Novel reaction process, Reaction mechanism, Reactor design, Materials synthesis process, Microreactor, Process control, Process system design, Process informatics, etc.
27030	Catalyst and resource chemical process-related
	Catalyst preparation, Catalytic function, Energy conversion process, Energy technology, Resources effective utilization technology, Catalytic material, Active site analysis, etc.

(Broad Section D)

27040	Biofunction and bioprocess engineering-related
	Biocatalyst engineering, Biofunction engineering, Food engineering, Medicochemical engineering, Bioproduction process, 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
	Nanoparticle chemistry, Mesoscopic chemistry, Nanostructure control, Self-assembly, Nanocarbons, Molecular devices, Nanointerface function, Nanospace function, etc.
28020	Nanostructural physics-related
	Physics in nanoscale materials and structures, Nanoprobes, Quantum dots, Quantum devices, Electron devices, Spin devices, Nano optical device, Nanotribology, Nanocarbon physics, etc.
28030	Nanomaterials-related
	Creation of nanomaterials, Analysis of nanomaterials, Nanosurfaces and nanointerfaces, Functional nanomaterials, Nanoparticles, Carbon nanomaterials, Two-dimensional materials, Nanocrystalline materials, Nanocomposites, 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-chemical systems, Nano/micro-biosystems, 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, Liquid crystals, New functional materials, Molecular electronics, Bioelectronics, Spintronics, etc.
29020	Thin film/surface and interfacial physical properties-related
	Thin-film engineering, Surface and interfacial engineering, Surface science, Vacuum, Measurement, Analysis, Nanoscopic technology, Advanced equipment, Electronics application, 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
	Metal, Semiconductor, Ceramics, Amorphous, Crystal growth, Artificial structures, Device structure, Crystal characterization, Plasma process, etc.
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, Quantum 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, Nuclear safety, Thermal-hydraulics and structure, Fuel material, Nuclear chemistry, Nuclear life cycle, Radiation safety, Radiation engineering, Fusion reactor engineering, Nuclear social environment, etc.

(Broad Section D)

31020	Earth resource engineering, Energy sciences-related
	Resource prospecting, Resource development, Resource cycle, Resource economy, Energy system, Environmental load, Renewable energy, Natural resources and energy 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
	Gas, Liquid, Solid, Nanomaterials, Bio-related materials, Structure and properties, Chemical reactions, Spectroscopy, Theoretical calculation, Data science, etc.
32020	Functional solid state chemistry-related
	Molecular materials, Inorganic compounds, Hybrid compounds, Colloids, Surface/interface, Electrical properties, Optical properties, Magnetic properties, Energy conversion, Catalysis, 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
	Chemistry of organic crystals, Molecular recognition, Supermolecules, Functional organic molecules, Extended π-electron molecules, Organoelement chemistry, Reaction mechanism, Molecular chirality, Theoretical organic chemistry, etc.
33020	Synthetic organic chemistry-related
	Development of reactions, Reaction mechanism, Selective reactions, Asymmetric synthesis, Development of catalysts, Biocatalysis, Sustainable organic synthesis, Natural product synthesis, Process chemistry, etc.

(Broad Section E)

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, Functional polymers, Self-assembled polymers, Non-covalent polymers, Chiral polymers, Bio-related polymers, Polymer properties, Polymer structures, Polymer interface, etc.
35020	Polymer materials-related
	Properties of polymer materials, Synthesis of polymer materials, Functional polymer materials, Environmentally friendly polymer materials, Liquid crystal polymers, 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.

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, Genetic resources conservation, Ecosystem conservation, Conservation of microorganisms, Impacts of non-native species, 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.

(Broad Section F)

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 utilization, 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, Agricultural policy, 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.
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.
42020	Veterinary medical science-related
	Basic veterinary science, Pathological veterinary science, Applied veterinary science, Clinical veterinary science, Animal nursing, Animal welfare, Wildlife, etc.
42030	Animal life science-related
	Homeostasis, Cellular function, Biological defense, Integrated genetics, Development/differentiation, Biotechnology, 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.

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, Regulation of RNA function, etc.
43020	Structural biochemistry-related 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 Enzymes, Sugar chain, Bioenergy conversion, Biological trace elements, Physiologically active substances, Cell signaling, Membrane transport, Proteolysis, Molecular recognition, Organelle, etc.
43040	Biophysics-related Structure biology, Physical property of biomolecules, Biomembrane, Photobiology, Molecular motor, Biometrics, Bioimaging, Systems biology, Synthetic biology, Theoretical biology, etc.
43050	Genome biology-related 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 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, 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, 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 Morphology, Comparative morphology, Morphological modeling, Ultrastructure, Morphological image analysis, Tissue organization, 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, Comparative endocrinology, Behavioral genetics, 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 Molecular genetics, Cellular genetics, Developmental genetics, Behavioral genetics, Population genetics, Quantitative trait, Population genomics, Genome-wide association study, Genetic diversity, Epigenome diversity, etc.
45020	Evolutionary biology-related Molecular evolution, Evolutionary genetics, Phenotypic evolution, Evolutionary developmental biology, Evolution of ecological traits, Evolution of behaviors, Experimental evolution, Coevolution, Speciation, Evolutionary theory, etc.

(Broad Section G)

45030	Biodiversity and systematics-related
	Taxonomic characters, Taxon, Classification system, Molecular phylogeny, Phyletic evolution, Speciation, Natural history, Biogeography, Rare species conservation, Biodiversity, etc.
45040	Ecology and environment-related
	Chemical ecology, Molecular ecology, Physiological ecology, Evolutionary ecology, Behavioral ecology, Population ecology, Community ecology, Conservation ecology, Biological interactions, Material cycles in ecosystems, etc.
45050	Physical anthropology-related
	Morphology and function, Bioarchaeology, Biological mechanism, Genome, Evolutionary genetics, Behavior, Ecology, Comparative cognition, Primates, Growth and aging, etc.
45060	Applied anthropology-related
	Physiological anthropology, Ergonomics, Forensic anthropology, Medical anthropology, Physiological polymorphisms, Environmental adaptability, Somatic and physiological function, Anthropometry and bioengineering, Lifestyle, 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.

(Broad Section H)

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.
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, Cancer and immune 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.

(Broad Section I)

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
	Psychosomatic medicine, 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.

(Broad Section I)

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, Medical 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.

(Broad Section I)

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.

(Broad Section I)

58050	Fundamental of nursing-related
	Fundamental of nursing, Nursing education, Nursing administration, Nursing ethics, Global nursing, 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, Home care nursing, etc.

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, Physicotherapeutics, 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, 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 cyber 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.

(Broad Section J)

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.
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, 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, 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, Ocean, Land, Polar regions, 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, Pollution dynamics assessment, Evaluation of radioactive substances dynamics, Environmental modeling, 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, Natural capital, Impact of climate change, Impact analysis on ecosystem, Ecosystem management, Ecosystem restoration, Ecosystem services, Natural tourism resources, Regional environmental planning, 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 activities, Environmental management and governance, Social and public system, Consensus forming, 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)

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 Aid 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:03-6734-4183 Switchboard:03-5253-4111 (Internal line:4183)
Grant-in-Aid for Transformative Research Areas (A) (Publicly Offered Research)	Grants-in-Aid for Scientific Research Team	Direct phone:03-6734-4094, 03-6734-4087 Switchboard:03-5253-4111 (Internal line: 4094, 4087)

* 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

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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)

(3) For inquiries concerning the use of the Cross-ministerial Research and Development Management System (e-Rad)

e-Rad Help Desk:

Telephone: 0570-057-060 (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 number is 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)"

Office of 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

(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
E-mail: jinken@mext.go.jp

(6) For matters related to use of support by Platform formed by "Foundation of Scientific Research Support"

Scientific Research Aid Team, Scientific Research Aid Division, Research Promotion Bureau, MEXT
Telephone: 03-6734-4090

(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"

Executive Office, IBBP Center, Inter-University Research Institute Corporation National Institutes of Natural Sciences
Telephone: 0564-59-5930, 5931

(9) For matters related to the "National BioResource Project"

National BioResource Project (NBRP) Executive Office
(established in the Research Organization for Information and Systems, National Institute of Genetics)

Telephone: 055-981-6809

(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

(12) 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 (1)).

(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

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