2008
Creation of New Intelligence
～For the Formation and Inheritance of
Intellectual Assets that Lead the World～
What Are Grants-in-Aid for Scientific Research?

Among the various types of research promotion measures undertaken by the government (the total budget for FY2007 is approximately 3.5 trillion yen), Grants-in-Aid for Scientific Research (KAKENHI) are “competitive research funds” awarded for “curiosity-driven research (research based on researchers’ creative ideas).”

Grants-in-Aid for Scientific Research cover all fields of the natural and social sciences and the humanities, and are awarded for a full range of creative and pioneering “curiosity-driven research” from basic to applied sciences.

Screening of grants is conducted through peer review (screening by specialists in related areas of expertise) by a total of approximately 6,000 judges.

Grants-in-Aid for Scientific Research in FY2007 amounted to 191.3 billion yen, accounting for approximately 5% of overall government expenses related to science and technology and approximately 40% of overall competitive research funds.
Grants-in-Aid for Scientific Research Nurture the Seeds of Genuine Technological Innovations

Most of the research supported by Grants-in-Aid for Scientific Research has been aimed at achieving long-term goals rather than short-term ones, and those awarded research activities have produced many innovative findings that have achieved a breakthrough in society. The Grants-in-Aid for Scientific Research extensively support even those research projects that received little attention in their early stages. These projects are now greatly helping us in our daily life.

Themes

“Photoelectrolysis of Organic Compounds”
(1966 – Particular Research)
Kenichi Honda (Professor emeritus, The University of Tokyo)

Creation of Novel Reactions by Irradiating with Light in the Course of Electrochemical Reactions

“Electrode Reaction with Light Excitation”
(1973 – Encouragement of Scientists (A))
Akira Fujishima (Professor emeritus, The University of Tokyo)

Reaction Mechanism on Photoexcited TiO2: Semiconductor

“High Density Information Recording using Magnetic Thin Film”
(1967 – Organization Research)
Shunichi Iwasaki
(President, Tohoku Institute of Technology)

Introduction of Magneto–Optical Effect into Magnetic Recording Process

“Growth of SSPE Virus in Cultures of Neural Cells”
(1981 – Scientific Research (C))
Kazuya Yamanouchi
(Professor emeritus, The University of Tokyo)

Pathogenesis of SSPE, a typical slow virus infection, was analyzed at the level of neural cells

“Studies on the mechanism of neutralization of infectivity of influenza A virus by antibodies”
(1983 – Scientific research (B))

A novel mechanism of neutralization of influenza virus infectivity by antibodies was found

Hiroshi Kida
(Professor, Hokkaido University)

“Research on a novel GTP-binding protein identified by the use of botulinum toxin”
(1988 – Scientific Research on Priority Areas)

Discovery of Rho and its signaling pathway regulating cell morphogenesis and movement

Shuh Narumiya (Professor, Kyoto University)

Results

“Discovery of the Electrochemical Photolysis of Water and its Development to Photocatalysis for the Environmental Improvement”

Glass and Tile with Self-cleaning Function
Practical Application of Self-sterilizing Tiles in Hospitals

“Invention of Perpendicular Magnetic Recording”

Realization of High Density information Storage System
Small size and large capacity Hard Disk Drive for Computer
High quality portable recorder for sound and image information, etc.

“Analysis of Pathogenesis of Prion Diseases”

Contributed to understanding of pathogenesis of bovine spongiform encephalopathy, BSE

“Molecular basis of ecology, evolution and pathogenicity of influenza viruses in nature, birds and mammals including humans”

The results of the studies have provided scientific base for the control of influenza in birds and mammals including humans

“Identification of molecular pathways leading to hypertension, oncogenesis and cancer metastasis and invasion”

Has elucidated one of the basic principles functioning in the cell, and had a big impact on basic and clinical medicine and drug development
Requirements for Applying for Grants-in-Aid for Scientific Research

<Eligibility requirements for researchers>
(1) Must be a researcher who belongs to a designated research institute and whose duties include a research activity at the research institute (regardless of whether person is paid or unpaid, or hired on a full-time or part-time basis; including those whose main duty is not a research activity)
(2) Must engage in a research activity of the research institute (excluding assistance for research)

<Eligibility requirements for research institutes>
(3) Must have its researcher perform the research activity as part of its activities if the grant is awarded
(4) Must manage the grant as an organization if it is provided

List of Categories of Grants-in-Aid for Scientific Research

Grants-in-Aid for Scientific Research include the following categories in order to meet the various needs of researchers who are pursuing different kinds of curiosity-driven researches.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Specially Promoted Research</td>
<td>Internationally appraised research likely to produce outstanding results (Maximum of about 500 million yen per project, but no strict limit set; period: 3 – 5 years)</td>
</tr>
<tr>
<td>Scientific Research on Priority Areas</td>
<td>Specific areas of research that are expected to contribute to elevating the standard of Japanese scientific research, that should be addressed on a global scale, or that have an especially strong societal demand. This category of grants is aimed at facilitating the fluid and effective promotion of research in such areas. (For each area, about 200 to 600 million yen per year, but no strict limit set; period: 3 – 6 years)</td>
</tr>
<tr>
<td>Scientific Research on Innovative Areas</td>
<td>(Research in a proposed research area) Research aimed at developing a new research area proposed by a researcher or a researcher group that can lead to improvement or strengthening of the scientific level of Japan, through efforts such promotion of joint research and cultivation of research personnel (About 10 to 300 million yen per year; period: 5 years) (Research a proposed research project) Innovative and challenging research that may achieve a breakthrough in scientific research if the research project progresses although a successful outcome cannot be guaranteed (About 10 million yen per year; period: 3 years)</td>
</tr>
<tr>
<td>Scientific Research (S) or (A) or (B) or (C)</td>
<td>(S) Creative and pioneering research conducted by a researcher or a small group of researchers (About 50 to 200 million yen per project; period: 5 years) (A) (B) (C) Creative and pioneering research conducted by a researcher or a group of researchers (period 3 – 5 years) (Category set by the total applied for) (B) 5 to 20 million yen (C) Up to 5 million yen</td>
</tr>
<tr>
<td>Exploratory research</td>
<td>Uniquely original research in its early stage (Up to 5 million yen per project; period: 1 – 3 years)</td>
</tr>
<tr>
<td>Grant-in-Aid for Young Scientists (S) or (A) or (B)</td>
<td>(S) Research conducted alone by a young researcher (up to 42 years of age) (About 30 or less to about 100 million yen; period: 5 years) (A) (B) Research conducted alone by a young researcher (up to 37 years of age) (Period: 2 – 4 years; categories set by the total applied for) (A) 20 to 50 million yen (B) Up to 5 million yen (Start-up) Research conducted alone by a newly tenured researcher (period: 2 years; up to 1.5 million yen per year)</td>
</tr>
<tr>
<td>Encouragement of Scientists</td>
<td>Research conducted alone by an employee of an educational or research institution or a corporation or any other individual (Up to 1 million yen; Period: 1 year)</td>
</tr>
<tr>
<td>Grant-in-Aid for Special Purposes</td>
<td>Urgent and critical research subjects, experimental trials concerning research aid</td>
</tr>
<tr>
<td>Publication of Scientific Research Results</td>
<td>Support for publishing the results of highly significant research conducted by research groups and for disseminating such information internationally</td>
</tr>
<tr>
<td>Scientific Periodicals</td>
<td>Support for the periodic publication of academic journals so as to promote international exchange that academic societies or organizations consisting of multiple cooperative academic societies issue</td>
</tr>
<tr>
<td>Scientific Literature</td>
<td>Support for the publication of books on research results that individuals or research groups issue</td>
</tr>
<tr>
<td>Databases</td>
<td>Support for databases compiled for public use by individuals or research groups</td>
</tr>
<tr>
<td>Specially Designated Research Programs</td>
<td>Support for research conducted by private research institutes to satisfy specific scientific or social demands</td>
</tr>
<tr>
<td>Grant-in-Aid for JSPS Fellows</td>
<td>Support for research conducted by JSPS fellows, including foreign fellows (Period: up to 3 years)</td>
</tr>
<tr>
<td>Grant-in-Aid for Creative Scientific Research</td>
<td>Support for further cultivating the positive outcomes obtained from highly creative research conducted under the Grants-in-Aid for Scientific Research and other competitive research found programs (Period: 5 years; awarded by recommendation)</td>
</tr>
</tbody>
</table>

※ Application recruiting and screening are handled by JSPS.
※ New applications will not be accepted.

(FY 2008)
Categories for Grants-in-Aid for Scientific Research

Major categories for the Grants-in-Aid for Scientific Research are positioned as indicated in the figure below. These research categories are defined according to the situations such as the stage and scale of the research.

Review of Grants-in-Aid for Scientific Research (in Case of “Scientific Research”)

Appointent of judges

First-stage review (documentary examination)

Second-stage review (concerted review)

Peer review
(Review by multiple researchers in similar fields of specialization)

Appointment of judges

First-stage judges are deployed in 284 fields of specialization (approximately 4,100 people).

6 or 3 first-stage judges individually examine documents for each research project.

5-level assessment based on the “criteria for the first-stage review” → Scores and comments are entered.

Specialized-field committees (35 committees), each consisting of 12 to 22 second-stage judges, conduct concerted review (approximately 900 people).

Projects to be adopted are discussed and determined based on the scores given by first-stage judges.

PO serves as the MC.

Provision of the grants is informally for mally determined.

(December to January)

(February to March)

(April/June)

110 POs (Program Officers) at the Research Center for Science Systems, the Japan Society for the Promotion of Science (JSPS), take the lead in selecting judges from a database of judge candidates (approximately 40,000 people are registered).
The budget for Grants-in-Aid for Scientific Research has been expanded year by year to support a variety of curiosity-driven research. Further efforts have been made to expand the budget in order to satisfy the various needs of a number of researchers for the purpose of promoting learning.

### Trend in the Budget

![Budget Graph]

<table>
<thead>
<tr>
<th>Year</th>
<th>(Actual number)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td>451</td>
</tr>
<tr>
<td>1992</td>
<td>646</td>
</tr>
<tr>
<td>1997</td>
<td>1,125</td>
</tr>
<tr>
<td>2002</td>
<td>1,703</td>
</tr>
<tr>
<td>2007</td>
<td>1,913</td>
</tr>
</tbody>
</table>

### Trend in Number of Applications and Grants Awarded

![Applications and Grants Graph]

<table>
<thead>
<tr>
<th>Year</th>
<th>Applications (new and continuing projects)</th>
<th>Grants Awarded (new and continuing projects)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td>12,000</td>
<td>57,400</td>
</tr>
<tr>
<td>1992</td>
<td>16,500</td>
<td>68,600</td>
</tr>
<tr>
<td>1997</td>
<td>23,100</td>
<td>88,900</td>
</tr>
<tr>
<td>2002</td>
<td>21,000</td>
<td>108,100</td>
</tr>
<tr>
<td>2007</td>
<td>24,200</td>
<td>131,800</td>
</tr>
</tbody>
</table>

### Distribution by Research Area (based on number of projects)

![Distribution Chart]

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of Projects</th>
<th>FY 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human sciences</td>
<td>7.8%</td>
<td>3,831</td>
</tr>
<tr>
<td>Social sciences</td>
<td>11.9%</td>
<td>5,903</td>
</tr>
<tr>
<td>Mathematics and physics</td>
<td>5.0%</td>
<td>2,448</td>
</tr>
<tr>
<td>Environment, natural disasters, and energy sciences</td>
<td>3.1%</td>
<td>1,544</td>
</tr>
<tr>
<td>Earth and space sciences</td>
<td>3.3%</td>
<td>1,608</td>
</tr>
<tr>
<td>Material sciences</td>
<td>9.8%</td>
<td>4,827</td>
</tr>
<tr>
<td>Information technology, electrical and electronic engineering</td>
<td>6.4%</td>
<td>3,167</td>
</tr>
<tr>
<td>Hard-to-cure diseases, including cancer and AIDS</td>
<td>7.3%</td>
<td>3,601</td>
</tr>
<tr>
<td>Others</td>
<td>2.1%</td>
<td>1,062</td>
</tr>
<tr>
<td>Pharmacology</td>
<td>2.0%</td>
<td>990</td>
</tr>
<tr>
<td>Brain and neurological sciences</td>
<td>3.6%</td>
<td>1,773</td>
</tr>
<tr>
<td>Dentistry</td>
<td>3.9%</td>
<td>1,928</td>
</tr>
<tr>
<td>Structural and functional engineering</td>
<td>6.5%</td>
<td>3,223</td>
</tr>
<tr>
<td>Science and engineering</td>
<td>34.0%</td>
<td>16,817</td>
</tr>
<tr>
<td>Bioscience</td>
<td>44.1%</td>
<td>21,812</td>
</tr>
<tr>
<td>Total number of adopted projects</td>
<td></td>
<td>49,425</td>
</tr>
</tbody>
</table>

This pie chart shows the classifications of the adopted projects by category for the Grants-in-Aid for Scientific Research awarded in FY 2007 (newly adopted and continuing projects), excluding “Encouragement of Scientists,” “Grant-in-Aid for Publication of Scientific Research Results” and “Grant-in-Aid for JSPS Fellows” (49,425 projects in total). For the allocation of the Grants-in-Aid for Scientific Research, the number of the adopted projects and the allocated amounts are calculated according to the number of applications and the application value for each research area.
For Efficient Use of Grants-in-Aid for Scientific Research

While the Grants-in-Aid for Scientific Research can be used flexibly in order to allow research activities to be conducted smoothly, they are supported by valuable taxes collected from the general public. Therefore, various efforts have been made in order to ensure that they are properly used.

For smooth performance of research activities

◆ Grants for “new” projects can be used immediately after informal notification, and grants for “continuing” projects can be used from April 1.

◆ Breakdown of use (e.g., article cost, travel expenses, remunerations) of the initially set expenses can be freely changed to a reasonable extent.

◆ If a research activity planned to be performed within the current fiscal year cannot be completed within the year for an unexpected reason, the research period can be extended and the grant can be carried forward to the next fiscal year provided that the required procedure is followed.

◆ If a research activity is interrupted for childbirth or child-care, the research period can be extended and then the activity can be resumed provided that the required procedure is followed.

To ensure appropriate use

◆ A handbook that explains the rules on the use of the grants in an easy-to-understand manner is published and distributed to all the researchers and all the research institutes.

◆ Explanatory meetings and workshops for research institutions are regularly held every year on national and regional levels and at all the research institutions.

◆ The research institute to which the researcher belongs is required to manage the grant awarded and thus to help strengthen the management structure to ensure appropriate use of the grants.

◆ If the researcher commits a dishonest act such as fabrication or fraudulent use of a research paper, the grant will not be awarded for a specified period. In addition, if the researcher makes fraudulent use of a competitive research fund other than the Grants-in-Aid for Scientific Research, the grant will not be awarded for a specified period.

◆ If the research institute inappropriately manages the grant awarded, the research institute may be penalized.
Access to Research Results Supported by Grants-in-Aid for Scientific Research

Research results are available through the following means.

Retrieval of “Summary of Research Progress” on the website of Research Organization of Information and Systems, National Institute of Informatics (NII)

The “Summary of Research Progress” supported by Grants-in-Aid for Scientific Research is available using NII’s on-line search function (http://seika.nii.ac.jp) on its website.

Hard copies of “Research Reports” at Kansai-kan of the National Diet Library

When research supported by Grants-in-Aid for Scientific Research (excluding certain categories) is completed, researchers compile and submit “Research Reports” to the Kansai-kan of the National Diet Library, making them accessible to the general public.

HIRAMEKI・TOKIMEKI SCIENCE (Welcome to University Lab –Science That Inspires and Inspires)

Designed for students (mainly middle to high school students), who will be responsible for Japan’s future, this program is conducted in order to disseminate research achievements with the Grants-in-Aid for Scientific Research (KAKENHI), stimulate intellectual curiosity of the students and foster their fertile minds and intellectual creativity (in FY 2007, the program was conducted 112 times at universities throughout Japan).

For inquiries, please contact either

Scientific Research Aid Division, Research Promotion Bureau, Ministry of Education, Culture, Sports, Science & Technology
3-2-2 Kasumigaseki, Chiyoda-ku, Tokyo 100-8959
Tel: 03-5253-4111 (Reception) (ex. 4095, 4087, 4094, 4328, 4316, 4317) (Scientific Research Fund, etc.)
URL http://www.mext.go.jp/a_menu/shinkou/hojyo/main5_a5.htm

Research Program Department, Japan Society for the Promotion of Science (Research Aid Division I, Research Aid Division II)
8 Ichibancho, Chiyoda-ku, Tokyo 102-8472
Tel: 03-3263-4682, 4758, 4908, 0980, 1878, 4326, 4632 (Grant-in-Aid for Scientific Research Fund)
03-3263-4926, 4920 (Grant-in-Aid for Publication of Scientific Research Results)
03-3263-4254 (Grant-in-Aid for Creative Scientific Research)