Japan Science and Technology Agency

2020

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Message from the President

Hamaguchi Michinari
President
Japan Science and Technology Agency

In the 20th year of the 21st Century, we welcomed in the Reiwa era. We are living through the Fourth Industrial Revolution, where dramatic developments in AI, IoT and related technologies are bringing significant changes to both our economies and daily lives. This is also a time where we face the serious and diverse problems of microplastics pollution, climate change, refugee crises, and in Japan both an ageing and shrinking population.

The role of science was explored at the World Science Forum 2019 in Budapest, 20 years since the historic “Declaration on Science and Use of Scientific Knowledge” was made at the first conference in the series in 1999. I gratefully accepted an invitation to speak at the 2019 forum along with JST Vice President Saeki Koji and Executive Director Watanabe Myoko, and together we advocated “contribution to human well-being” as the ultimate value science should pursue. Subsequently “Science for Global Well-being” became the title of the first chapter of the new 2019 declaration. I was reminded of the responsibility Japan and we at JST have as guides towards this goal.

At the same time, recent data on Japan’s scientific capabilities have revealed various issues we must address regarding basic science capacity, creating disruptive innovation, linking academia and industry, and nurturing human resources. As an organization that plays a central role in Japan’s Science and Technology Basic Plan, we at JST will continue pursuing human well-being, creating tomorrow’s innovation, and driving Japan to lead the world in science.

Two new initiatives will launch in 2020: the Moonshot Research and Development program, funding radical solutions that break through the limits of conventional technology, and last December we held the Moonshot International Symposium of the international academic, public and private sectors gathered in Tokyo to formulate the most appropriate shared goals; FOREST (Fusion Oriented Research for disruptive Science and Technology) aims for creating disruptive innovation and provides stable long-term assistance for a wide variety of researchers.

It’s 2020, and JST is moving forward. JST will be a stream bringing innovation to Japan as a network-type research organization. We’re applying greater ingenuity to today’s most important challenges, and promoting widespread well-being for a better tomorrow.
About JST

JST plays a central role in Japan’s Science and Technology Basic Plan, based on science and technology targets issued by the government, to conduct strategic basic research, academia-industry collaboration and technology transfer, and in recent years to promote international joint research and the fostering of next generation human resources. JST also provides information services supporting R&D activities. Our comprehensive contribution stimulates real progress in science and technology and helps tackle a variety of social issues.

We continue to strengthen our close relationship with universities, research institutes and industry inside and outside Japan, create collaborative science and technology innovation and ensure the sustainable development of our society.

The Science and Technology Basic Plan, based on the Science and Technology Basic Law enacted in November 1945, aims to comprehensively and systematically advance Japan’s science and technology policy. The government formulates the basic plan based on forecasts for the next decade, putting into effect science and technology policies over a 5-year period.

The History

1957 Established Japan Information Center of Science and Technology (JICST)
1960 Japan Information Center of Science and Technology (JICST)
1961 Established Research Development Corporation of Japan (JRDC)
1967 Founded Japan Science and Technology Agency (JST)
1970 Japan Science and Technology Agency (JST)
1980 JST and JRDC were merged into Japan Science and Technology Corporation (JST)
1990 JST and JRC were merged into Japan Science and Technology Agency (JST)
2000 Founded Basic Science Research Support Program (RFSR)
2001 Opened National Museum of Emerging Science and Innovation (Miraikan)
2003 The former JST was reorganized as Japan Science and Technology Agency - Started 1st mid-term plan
2007 Successful reprogramming of human fibroblasts to IPS cells - Started 2nd mid-term plan in April
2010 Dr. Yamanaka Shinya for winning the Nobel Prize in Physiology or Medicine - Started 3rd mid-term plan in April
2012 Drs. Akasaki Isamu, Amano Hiroshi, and Nakamura Shuji for winning the Nobel Prize in Physics
2014 - Started 4th mid-to-long term plan
2016 JST 20th Anniversary in October - JST was reorganized as the National Research and Development Agency; Japan Science and Technology Agency

4th Mid-to-Long term Plan (FY2017 - 2021)

<table>
<thead>
<tr>
<th>Year</th>
<th>Milestone</th>
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<tbody>
<tr>
<td>FY2017</td>
<td>Initial Budget: 124,054 Millions of Yen (FY2015)</td>
</tr>
<tr>
<td>FY2018</td>
<td>119,247</td>
</tr>
<tr>
<td>FY2019</td>
<td>113,876</td>
</tr>
<tr>
<td>FY2020</td>
<td>122,254</td>
</tr>
<tr>
<td>FY2021</td>
<td>124,054</td>
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R&D Strategy Planning 1%

Throughout dialogue with stakeholders and data analysis, JST formulates R&D strategies toward the future.

Funding Programs 81%

As a network-based research institute, JST promotes research and development leading to innovation and address economic & social issues throughout the implementation of research results and international joint researches.

- Strategic Basic Research
- International Collaborations
- Industry-Academia Collaboration and Technology Transfer

Public Engagement 6%

Promoting dialogue with various stakeholders toward co-creation of a future society. JST also fosters next generations talents in the fields of S&T as well as human resources who can contribute to S&T innovation.

- Promotion of “Science in your Society”
- Fostering the Next Generation Human Resources
- Miraikan
Funding programs

◆ Strategic Basic Research

High Impact R&D Toward the Future Society

This program promotes research and development from a basic research stage to a stage where industry can decide whether they could make a business successful (proof of concept: POC). To achieve it, we set goals focusing on clear targets, which realize economic and social impact and challenge technological difficulties.

Creation of New Technology Seeds by Strategic Basic Research Programs

Strategic Basic Research Programs (SBPRs) are intended to advance basic research aimed at achieving solutions for key issues Japan is facing, and to produce the seeds of creative, innovative technologies from new scientific knowledge that gives rise to innovation in science and technology leading to social and economic change. As such, the SBPRs seek to build research institutes (time limited research organizations spanning organizational boundaries) consisting of networks of researchers at universities, companies, and public research institutions. Researchers pursue their work, while building networks of other researchers, industrial concerns that will benefit from the fruits of research work, and interested parties in society at large, under the leadership of a Program Officer (Research Supervisor, etc.) performing the role of the institute director.


To maximize the outputs

To maximize the output of the SBPRs, in accordance with the characteristics of each Research Area, extensive management is implemented and organized, including outreach activities, progress support, fusion of multidisciplinary fields, international collaboration, social implementation or practical development, and human resource development.

Concepts for International Collaboration

The programs contribute to the achievement of the Strategic Objectives set by the Ministry of Education, Culture, Sports, Science and Technology. Therefore, while paying attention to securing national interests including appropriate protection and utilization of intellectual property, we are promoting internationalization as a means of maximizing output of the programs.

- Supplementary funding to support international activities
- Joint funding with funding agencies in countries with advanced science and technology
- Invitation of overseas researchers and dispatching of domestic researchers overseas
- Start-up support for PRESTO researchers
- Selection of Japanese researchers based overseas for PRESTO, participation of overseas research members for CREST

Achievements of International Joint Research

The SBPRs often organize joint workshops in collaboration with overseas funding agencies or research institutes to promote international joint research and networking. For example, Research Area on “Energy Management System (EMS)” organized total of six joint workshops with NSF (U.S.), RGN (Norway), and DFG (Germany). Participations of prominent researchers of respective countries nominated by funding agencies made the workshops attractive as excellent opportunities for fostering new inter-national collaborations.

In fact, many new research ideas came out among the participants turned real joint projects later and produced joint publications.

Establishing induced pluripotent stem (iPS) cells

Dr. Yamanaka Shinya started his research project for the theme “Generation of Ideal Pluripotent Stem Cells for Clinical Applications” under the Strategic Basic Research Programs in 2003. The professor took an approach completely different from ES cells promoted research aimed at establishing stem cells. The professor succeeded in establishing iPS cells from mouse skin cells in 2006 and from human skin cells in 2007 ahead of his international contemporaries. The result which had surprised the world earned him a 2012 Nobel Prize.

Facts & Figures: 6,595

Number of citations for a paper in 2019: 14.48

*Aggregated data based on Scopus; targeting for papers published in the past 5 years (6.89 (Average of Japan))
Funding programs

International Collaborations
Our Department of International Affairs is committed to expanding the range of collaboration opportunities for our researchers, so ensuring continuous joint innovation and contribution to global challenges.

Research Partnership for Sustainable Development
SATREPS is part of Japan’s “Science and Technology Diplomacy,” collaboratively pursued by JST, which provides competitive research funds for the science and technology sector, and the Japan International Cooperation Agency (JICA), which provides Official Development Assistance (ODA). The program promotes international joint research based on the needs of developing countries in fields such as environment, energy, biological resources and disaster prevention, with the ultimate aim of social implementation of research outcomes in the foreseeable future. The program supports international cooperation and the acquisition of new knowledge to tackle global issues, advance science and technology, and create innovations. The program also contributes to capacity development4 of Japan and its partner countries.

Global Joint Research and S&T Diplomacy
In our world of rapidly expanding globalization, various cross-border problems are arising. For example, problems associated with the environment, energy, natural disasters, and infectious diseases cannot be tackled by any single country alone. To overcome these problems and maintain sustainable development, international cooperation is now a worldwide demand. Moreover, the advance of science and technology around the world is spectacular. Amid intense competition, in order for Japan to sustain and continue to develop its world-class science and technology capabilities, it is more important than ever before for the government to play its role in strategically supporting the international expansion of science and technology.

SATREPS contributes to solution challenges facing the world today through collaboration with a broad range of countries.

Global Joint Research and S&T Diplomacy

Research Partnership for Sustainable Development

Global Joint Research and S&T Diplomacy

SATREPS

SATREPS

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SATREPS
Funding programs

Industry–Academia Collaboration and Technology Transfer
Returning the research results of universities and research institutes to industry and society, and creating an environment for them to continuously generate innovation. In addition, we contribute to the establishment of a virtuous cycle system of human resources, knowledge and funds for the practical application of seeds.

R&D Support

- **Support for Formulation of Innovation Platforms:**
  Aiming to create an environment where research results are bridged to companies that generate innovation and where diverse challenges occur continuously, we bring together the human resources, knowledge and funds of industry, academia and government and support the formation of co-created fields.

- **Promotion for Technology Transfer and Support for University Start-ups:**
  We support R&D for the practical application of technology seeds that can be the sprouts of new industries and the creation of venture companies that can take quick and bold challenges. In addition, we invest in venture companies that put the R&D results of institutes to practical use.

Intellectual Property and Matching Supports
By comprehensively supporting universities' intellectual property management and funding operations, we contribute to the creation of innovation through utilization of intellectual property such as licensing and joint research and promote the increase of private investment. In addition, we offer industry-academia matching opportunities and nurture technology transfer personnel. We contribute to the development of academia-industry collaboration and technology transfer activities.

- **Budget for Industry-Academia Collaboration Programs**

Intellectual Property Utilization Support Program
Converting Research Output to IP
JST supports the acquisition of foreign patents by universities-self for applications for patents with a high likelihood of technology transfer activities or patent utilization in the future. JST provides comprehensive support for PCT applications and transfers to designated countries, including assistance with expenses and expert opinions from JST intellectual property specialists.

Supporting intellectual property management for R&D
By involving intellectual property management personnel in JST's R&D operations we can properly patent and plan the implementation of research results, leading to swifter commercialization.

Innovation JAPAN
To provide opportunities for matching high-quality technology seeds with the needs of industry, JST organizes a national-scale university knowledge fair named "INNOVATION JAPAN: University Exhibition Fairs".

New Technology Explanatory Meetings
To match academic researchers with industry, JST hosts the year-round meetings on which academic researchers give the presentations in front of industry named "New Technology Explanatory Meetings".

Facts & Figures
12.9 billion (JPY) Collaborations Projects Funded by JST
1.1 billion (JPY) Royalty Income from Patents owned by JST

Representative programs include COI, OPERA, HIBHIKI, A-STEP, START, SUCCESS, etc.
For further information: https://www.jst.go.jp/EN/programs/index.html
Public engagement

Promotion of “Science in/for Society”

JST promotes activities such as constructive discussions involving various stakeholders, in order to support the co-creation of policy-making and novel solutions to societal challenges using Science, Technology and Innovation (STI).

Promotion of co-creation with various sectors

In association with six partner organizations, JST launched the “CHANGE” Initiative, an open platform for co-designing future society through open discussions. Through this network, JST aims to reflect social needs in R&D and create social innovation.

STI for SDGs’ Award

JST assigns the “STI for SDGs” Award to activities in a region which solve societal challenges with the outcomes of Science, Technology and Innovation (STI). Through the award, JST aims to contribute to the attainment of the SDGs, support and accelerate these award-winning activities, and spread good practices to other regions.

Fostering the Next Generation Human Resources

This program promotes students’ interest and ability in science, technology, and mathematics and fosters future scientists and engineers at international levels. As the part of this program, International Science Olympiads are continuously going to be held in Japan from 2020 the International Biology Olympiad, 2021 the International Chemistry Olympiad, 2023 the International Physics Olympiad and the International Mathematics Olympiad.

Miraikan - The National Museum of Emerging Science and Innovation

Miraikan is a place where we can understand the things happening in our world today from a scientific point of view, and have discussions while considering the future that awaits us. In addition to exhibitions that provide people with a chance to enjoy hands-on contact with science and technology, Miraikan’s colorful line-up of offerings includes experienced based classes, and talks. Visitors can experience the technological progress of today, from simple day-to-day questions, to the latest technologies, the global environment, space exploration and life science.

https://www.miraikan.jst.go.jp/en/

R&D strategy planning

Center for Research and Development Strategy (CRDS)

CRDS aims to serve as a public think tank, by providing analyses of domestic and international trends in science and technology and proposals for policy-making in our country.

We follow, overview and analyze the trends in the society and STI (science, technology and innovation) policies in Japan and abroad, extract issues to be tackled and formulate R&D and/or policy strategies. We strongly interact with public, academic and private sectors and other stakeholders in the society in order to bring the strategies into reality.


China Research and Sakura Science Center (CRSC)

CRSC is a public think tank that conducts in-depth research on China’s S&T policies, along with latest research trends, which drives Sino-Japan joint research, industry-academia-government collaboration and provides evidence to support S&T policy-making by the Japanese government.

In addition, through the “SAKURA SCIENCE Exchange Program”, CRSC invites young researchers and students on short-term visits to Japan - giving them opportunities to experience Japan’s cutting-edge S&T as well as its culture.


Center for Low Carbon Society Strategy (LCS)

LCS proposes social scenarios and strategies toward realizing “affluent low carbon society.” In response to the Paris Agreement, effective in 2016, science and technology based “affluent low carbon society,” which brings about sustainable economic and social development as well as CO2 emission reductions in Japan, should be realized. LCS draws up the vision of such a desirable society and proposes social scenarios and strategies that show pathways to the society through LCS’s social scenario research.

**Information platform and database service**

**Japan Information Platform for S&T**

JST provides information services supporting R&D activities. JST collects and organizes information on research articles, researchers, patents etc., and develops an infrastructure for providing access to the information. JST is also involved with Open Science activities aligned with the international trend.

**J-STAGE**

J-STAGE is an electronic journal platform for Japanese learned societies providing access to 5 million academic articles of more than 3,000 titles in the fields of basic sciences, life sciences, medical and health sciences, engineering and technology, interdisciplinary sciences, humanities and social sciences. Approximately 90% of the full-text articles are available for free.

**JaLC**

JaLC is a DOI Registration Agency (RA), officially authorized by the International DOI Foundation in March 2013 and the only organization providing DOI services in Japan. JaLC provides services assigning DOI to various contents including academic papers, books, research data etc. and managing the contents’ information. By collecting data about academic content published in Japan, JaLC contributes not only to dissemination and use of the content domestically but also to expanding Japan’s presence in the international academic community by providing global access to research results.

**National Biosciences Database Center (NBDC)**

NBDC promotes the integrated use of life science database resources and provides a database portal website, with an aim to maximize the value of research data. NBDC aims to promote the widespread sharing of results of life science research across the researcher community, enabling researchers to pursue their research effectively and efficiently.
Moonshot Research and Development

“Moonshot Research and Development” is a bold new R&D program from JST that aims to create disruptive innovation in Japan. To solve issues facing future society, JST is driving R&D projects to achieve the Moonshot goals, with the Program Directors (PDs) responsible for the whole R&D projects regarding their respective Moonshot Goals. JST handles Moonshot Goal 1,2,3, and 6.

- **Moonshot Goal 1**
  Realization of a society in which human beings can be free from limitations of body, brain, space, and time by 2050.

- **Moonshot Goal 2**
  Realization of ultra-early disease prediction and intervention by 2050.

- **Moonshot Goal 3**
  Realization of AI robots that autonomously learn, adapt to their environment, evolve in intelligence and act alongside human beings, by 2050.

- **Moonshot Goal 6**
  Realization of a fault-tolerant universal quantum computer that will revolutionize economy, industry, and security by 2050.

JST’s STI for SDG activities

Science, Technology and Innovation for the Sustainable Development Goals (STI for SDGs)

In order for science and technology innovation to contribute to the SDGs (STI for SDGs), various stakeholders from universities, R&D institutes, NGOs and the private sector should work with policymakers and the market to create shared value and a new social trend of responsibility. The “Office of STI for SDGs” plans basic policies on STI for SDGs at JST, cooperates with related organizations inside and outside Japan, distributes relevant information worldwide, and holds events to strengthen cooperation with a range of stakeholders. JST will throughout its organization contribute to achieving the SDGs with a wide range of functions including think tank, R&D funding, academia-industry collaboration, next-generation human resource development, and science communication.

Booth at AAAS 2019 Annual Meeting: "Japan’s Practices for Implementing the SDGs."

Dr. Nakamura (one of the UN 10-Member Group of high-level representatives, and senior advisor/former president of JST) moderates a special event at the Fourth Multi-Stakeholder Forum on STI for SDGs.

Local STI for SDGs subcommittee meeting in Kyoto, June 2019.

JST’s STI for SDG activities

Please visit our website to learn more about activities including our strategy on STI for SDGs and research outcomes.

Science, Technology and Innovation (STI) for Implementing the SDGs:

JST Channel:
https://www.youtube.com/playlist?list=PLsYe6sEHrQFSAFLAmrXJeuD9GJ

Three pillars of JST’s strategy on STI for SDGs.

Example of research outcome.
Overseas branch offices

The JST overseas offices are strategically located to capture the latest science and technology trends in their respective regions, actively promote the global activities of JST-funded Japanese researchers and leverage global networks to enhance and internationalize Japan’s S&T.

**Paris Office**
(Established in 1984)

Address
28, rue de Berri, Paris, 75008, France
Tel: +33-1-4939-3888 Fax: +33-1-4935-3881
https://www.jst.go.jp/inter/paris/index.html

We are JST’s first-established overseas office, responsible for a wide range of countries within Europe and Africa. We negotiate and coordinate with relevant organizations and support the growth of JST’s European operations, where science cooperation is often multi-layered and complex. We also play a vital role in transmitting local information back to JST headquarters, and are actively expanding our network of related organizations in order to improve Japan’s S&T presence in Europe.

**Beijing Office**
(Established in 2002)

Address
Beijing Fortune Bldg., No. 5, Qiong San Huan Bei Lu, Chaoyang District, Beijing, 100004 China
Tel: +86-10-6506-8273 Fax: +86-10-6506-8270
https://www.jst.go.jp/inter/beijing/index.html

The Beijing office communicates with Chinese-government agencies in the cooperation of international joint research programs, and supports activities such as the Japan-China University Fair & Forum and “Japan Window” – a website and public media account providing information about Japan in Chinese language. We cooperate to hold the China-Japan Science and Technology Forum, and work to enhance JST’s presence by participating in central and local government events.

**Washington, DC Office**
(Established in 2004)

Address
2001 L Street NW, Suite 1010, Washington, D.C. 20036 U.S.A.
Tel: +1-202-336-0077 Fax: +1-202-728-3197
https://www.jst.go.jp/inter/washington/index.html

At the Washington, DC Office our mission is to strengthen scientific cooperation between JST and our counterpart organizations, JST and local scientists and researchers, as well as to study and analyze STI policies and R&D trends in the US. The office has also helped support various scientific collaborative arrangements with other countries in the Americas.

**Singapore Office**
(Established in 2009)

Address
18 Biopolis Way, #07-12 Halos, Singapore 138667
Tel: +65-6476-0707 Fax: +65-6476-0708
https://www.jst.go.jp/inter/singapore/index.html

South and Southeast Asia, home to more than 2 billion people, have achieved remarkable growth in recent years. Located among areas of diverse culture and history, the Singapore office strives to connect Japanese universities, research institutes and companies with these areas for the promotion of JST’s operations in Asia. We are actively promoting student exchange program Sakura Science in addition to collaborative research programs offered by JST including e-ASIA, SATREPS, and CHIRP.

**CNRS 80th anniversary symposium November 2019, Paris**

On the occasion of an international symposium commemorating the 80th Anniversary of the French Center for Scientific Research (CNRS), JST senior vice-president Dr. Saeji participated in panel discussions on international cooperation in research, exploring the joint issues of cooperation and competition.

**OECD workshop June 2019, Oslo**

We participated in a workshop on global public goods organized by the Organization for Economic Co-operation and Development (OECD). JST advisor Dr. Nakamura spoke on the importance of contributing to the realization of the SDGs using S&T and international cooperation. He introduced JST’s SATREPS development research program as a key example.

**Forum on ICT solutions to an aging society November 2019, Shenzhen**

In collaboration with the China Science and Technology Association (CAST). JST held a China-Japan Science and Technology Forum on the theme of ‘ICT solutions to an aging society’. The forum was held in cooperation with the local government and several academic institutions, and attracted a large number of visitors including Japanese government officials, JST project participants, and other leading academia and industry representatives. The impressive presentations and booths reflected the power of collaboration in tackling key issues of mutual interest.

**NSF 70th anniversary February 2020, Virginia**

JST president Dr. Hasagawa was invited to the NSF 70th Anniversary Symposium & Reception. It provided a welcome opportunity for networking with NSF director Dr. Cordova and other distinguished participants, and to learn more about NSF’s rich history. Dr. Hasagawa delivered a short speech at the reception reaffirming his support for JST/NSF collaboration.

**Connecting to Japanese researchers May 2019, Massachusetts and North Carolina**

JST set up special meetings in the cities of Boston and Raleigh to promote funding programs available in Japan, inviting Japanese researchers including PhD students, postdoctoral researchers and company researchers. We were joined by representatives of other funding agencies including from the JSPS Washington Office and AMED Washington Office.

**Singapore office 10th anniversary celebration January 2020, Singapore**

We celebrated our 10th anniversary with an event enjoyed by approximately 150 attendees from both Japan and Singapore. Greetings were given by Mr. Koji Sasaki, senior vice president of JST, the Guest of Honour Mr. Lim Chuan Poh, former chairman of ASTAR, and Mr. Jun Yamazaki, Japan’s ambassador to Singapore, followed by keynote addresses by Prof. Teruo Kishi, science and technology advisor to Japan’s Ministry of Foreign Affairs, and Prof. Subra Suresh, president of NTLI.

**Progress report and mid-term evaluation May 2019, Hyderabad, India**

We held a workshop and mid-term evaluation meeting for our international collaborative projects at India’s IIT Hyderabad university, with both Japanese and Indian PIs participating to present their research results. The event was a valuable opportunity to explore the possibility of collaboration with the SATREPS research for development program.