In April 2013 we embarked on a new five-year term, so it is a good time to look back at our achievements. Thanks to the efforts made during the past five years to strengthen our research infrastructure, in September 2012 we opened for public use the K computer, which had earned the honor of being rated as the world’s fastest supercomputer. Another major achievement was the full start-up of the SACLA X-ray Free Electron Laser in March 2012. We have high expectations that these new facilities will contribute to the creation of a sustainable society by allowing research in areas such as new material development, the elucidation of biological processes, drug development, and earthquake and tsunami prediction. They also will contribute to the advancement of human society, and lead to research outcomes that will help invigorate industry. Simultaneously, we engaged in preparations for our new five-year term.

In 2012 we took a major step onto the world stage by hosting, together with the National Institute of Advanced Industrial Science and Technology, the first Global Summit of Research Institute Leaders. We brought together the heads of nearly 20 institutes from around the world to hold vigorous discussions on the role of science and technology in promoting a sustainable society, as well as the issues of brain circulation and brain drain, which are important for the development of human resources. I believe that one critical role of RIKEN is to carry out research that will be helpful in solving the issues that confront all of us, in partnership with the global scientific community. Today’s rapid globalization has given us renewed awareness of the importance of cooperation extending beyond the limits of research fields, institutes, regions, and nations in order to resolve our problems. For science and technology, this is particularly true. At RIKEN, we will endeavor to carry out world-leading research in close collaboration with our partners in Japan and throughout the world.

This brochure offers a view of RIKEN’s endeavors to help build a future of hope for humanity. Our objective is not only to push back the frontiers of science, but also to become an essential contributor to society. We will always keep an eye on where we are and never cease to improve our efforts. I ask for your support as we move forward in the company of researchers sharing the same high ideals.

NOYORI Ryoji (DEng)
President, RIKEN
RIKEN’s new organization

April 2013 marks the start of a new chapter at RIKEN. Our fresh organizational structure will allow us to make optimal use of our comprehensive strengths by promoting interdisciplinary collaborations—taking research to a whole new level in a range of areas including developmental biology, brain science, quantitative biology, bioresources, computational science, synchrotron radiation and accelerator-based science. To achieve our aim, the RIKEN Advanced Science Institute has been redistributed across RIKEN and a new chief scientist system incorporating both fixed-term and permanent research staff has been established.

For further information, please visit the RIKEN website: www.riken.jp/en/research/labs/
Strategic Research

Strategic research at RIKEN is spearheaded by seven centers that focus on emerging fields of critical importance.

The **Center for Emergent Matter Science** carries out advanced research combining physics, chemistry and electronics with the aim of harnessing the high energy efficiency of emergent materials.

The **Center for Advanced Photonics** seeks to make the invisible visible by performing cutting-edge research in photonics and to develop new ways to employ photonics technology in the service of society.

The **Center for Sustainable Resource Science** conducts research focusing on the utilization of carbon, nitrogen and metals based on a fundamental understanding of biological functions and chemical diversity with the aim of establishing a sustainable society.

The **Quantitative Biology Center** aims to gain an understanding of the control principles that regulate complex biological systems by developing innovative measuring, analysis and modeling technologies.

The **Center for Developmental Biology** conducts basic research aiming to elucidate the mechanisms of development, and uses these results to contribute to advances in regenerative medicine.

The **Brain Science Institute** pursues comprehensive research in a wide range of fields including medical science, biology, physics, engineering, information science, mathematical science and psychology.

The **Center for Integrative Medical Sciences** is seeking to develop personalized medicine for the prevention and treatment of illnesses, by understanding the mechanism of homeostasis in biological systems and how the breakdown of homeostasis leads to disease.
Research Infrastructure

RIKEN’s advanced research infrastructure allows scientists from around the world to enjoy access to various services and materials, enabling them to focus on performing excellent research.

The **BioResource Center** is engaged in the collection, preservation and distribution of bioresources with the aim of contributing to the development of scientific research.

The **Center for Life Science Technologies** aims to integrate RIKEN’s outstanding life science technologies in areas such as molecular imaging and genomics in order to promote innovation in the areas of drug development, medical care and health science.

The **Advanced Institute for Computational Science**, which operates the world-leading K computer, is an international research center dedicated to achieving breakthroughs in computing and computational science, focusing on the development of simulations to promote progress in medical science, materials development, disaster development, disaster prevention, manufacturing and basic physics.

The **SPRING-8 Center** is a world-leading photon science research complex, featuring the SPRING-8 synchrotron and SACLA X-ray Free Electron Laser facilities, which are dedicated to visualizing physical phenomena at unprecedented levels of detail.

The **Nishina Center for Accelerator-Based Science** has one of the world’s leading accelerator complexes, which is used to explore problems such as the origin of the elements in the universe and the fundamental structure of atomic nuclei. The Nishina Center is also well known for the discovery of element 113.
Innovation and Problem-solving Research

For research to benefit society, computational facilities and technology transfer services are required along with schemes for encouraging collaboration.

The **HPCI Program for Computational Life Sciences** promotes R&D activities making full use of the K computer and establishes new infrastructure to promote computational science and technology.

The **Center of Research Network for Infectious Diseases** is the headquarters of the J-GRID program. It supports a network of 13 research centers in Asia and Africa, which carry out research on infectious diseases.

The **Advanced Center for Computing and Communication** manages the computing and communications infrastructure within RIKEN and provides technical and R&D support for the supercomputer and bioinformatics programs.

The **Research Cluster for Innovation** provides a framework facilitating knowledge and technology transfer, enabling RIKEN to focus the full force of its diverse and inter-disciplinary capabilities on the grand challenges of our time.

The **Innovation Center** fosters collaborations with private companies, both to respond to the needs of industry and to ensure the transfer of RIKEN’s scientific achievements to commercial applications.

The **Biomass Engineering Program** is an innovative RIKEN program dedicated to developing new biomaterials and fostering green innovation in Asia and throughout the world.

The **Program for Drug Discovery and Medical Technology Platforms** is developing a system within RIKEN for facilitating the transfer of basic research on new drugs and medical technologies conducted at RIKEN and externally to the pharmaceutical industry and medical institutions.

The **Preventive Medicine & Diagnosis Innovation Program** provides support for the discovery of novel biomarkers of disease, with the aim of returning the fruits of RIKEN’s research in this field to society.
Interdisciplinary and Collaborative Research

RIKEN conducts interdisciplinary and collaborative research in various laboratories headed by distinguished researchers.

**Chief Scientist Laboratories** form the core of RIKEN’s cross-disciplinary research system. Chief Scientists use their experience and leadership abilities to help steer the direction of RIKEN’s research.

**Associate Chief Scientist Laboratories** are headed by young scientists with the character, drive and long-term vision needed to take the lead in pioneering new areas of scientific research.

**Distinguished Senior Scientist Laboratories** are set up and managed by particularly distinguished researchers with outstanding records and leadership ability.

**Initiative Research Units** are laboratories that provide non-Japanese scientists having outstanding research records the opportunity to pursue independent research and expand RIKEN’s activities into pioneering areas of research.

The **Global Research Cluster** seeks to push forward the frontiers of science through fostering integrated global research that transcends national and regional boundaries.
RIKEN centers and facilities in Japan

**Wako**
- Center for Emergent Matter Science
- Center for Advanced Photonics
- Brain Science Institute
- Nishina Center for Accelerator-Based Science
- Radioactive Isotope Beam Factory
- Advanced Center for Computing and Communication
- Research Cluster for Innovation
- Chief Scientist Laboratories
- Associate Chief Scientist Laboratories
- Distinguished Senior Scientist Laboratories
- Initiative Research Units
- Global Research Cluster

**Nagoya**

**Kobe**
- Center for Developmental Biology
- HPCI Program for Computational Life Sciences
- Center for Life Science Technologies
- Advanced Institute for Computational Science
- K computer

**Sendai**
- BioResource Center

**Tokyo**
- Center of Research Network for Infectious Diseases

**Yokohama**
- Center for Sustainable Resource Science
- Center for Integrative Medical Sciences

**Osaka**
- Quantitative Biology Center

**Harima**
- SPring-8 Center
- SPring-8 Synchrotron Radiation Facility
- SACLA X-ray Free Electron Laser Facility
RIKEN—A global presence

1. RIKEN–RAL Muon Facility
   Rutherford Appleton Laboratory (RAL), Oxfordshire, UK

2. RIKEN–Max Planck Joint Research Center
   Dortmund and Potsdam, Germany, and Wako, Japan

3. RIKEN BNL Research Center
   Brookhaven National Laboratory (BNL), Upton, USA

4. RIKEN–MIT Center for Neural Circuit Genetics
   Massachusetts Institute of Technology (MIT), Cambridge, USA

5. RIKEN–XJTU Joint Research Center
   Xi’an Jiaotong University (XJTU), Xi’an, China
6. RIKEN Beijing Representative Office  
Beijing, China

7. RIKEN Singapore Representative Office  
Biopolis, Singapore

8. RIKEN–USM Joint Laboratory for Bioprobe Discovery  
Universiti Sains Malaysia (USM), Penang, Malaysia

9. RIKEN–KIRIB Collaboration Research Center for Chemical Biology  
Korea Research Institute of Bioscience and Biotechnology (KIRIB), Ochang, South Korea
SPring-8 and SACLA

Harima
SPring-8 in Harima is the largest third-generation synchrotron radiation facility in the world and one of the most advanced facilities of its class. It is used by researchers from around the world to conduct advanced research in materials science, spectroscopic analysis, earth and planetary science, life science, environmental science and industrial applications.

Complementing SPring-8 is the new SACLA X-ray Free Electron Laser, which opened for research in March 2012. SACLA produces laser with very short wavelengths called x-ray laser which is a billion times brighter and its pulse width is a thousand times shorter in comparison with the light available from SPring-8, making it possible for scientists to observe phenomena that are too fast to be seen clearly by other methods and molecular structures that need to be crystallized for analysis using other characterization techniques.

Life Science Technology Platform

Yokohama/Kobe
RIKEN has a rich set of advanced facilities used for research in medicine and other areas of life sciences. The NMR facility in Yokohama—one of the world’s largest—operates ten nuclear magnetic resonance spectrometers, which are used for three-dimensional structural analysis of proteins and other molecules. These machines are, in addition to being used for medicine, used to promote technological innovation for building a better tomorrow. The Genome Network Analysis Service, also in Yokohama, offers gene expression analysis and genomic sequencing using high-throughput next-generation sequencers. And the molecular imaging facility in Kobe, equipped with microPET scanners and Cyclotrons for PET, as well as MRI and CT facilities, provides flexible services for analyzing the dynamics of various molecules in the body using experimental animals.
K computer

Kobe
The K computer is a key technology of national importance. In 2011, it became the first supercomputer in the world to achieve a LINPACK performance rating of 10 petaflops—equivalent to $10^{16}$ operations per second. It is being used as a platform for basic research as well as for industrial applications, in areas such as drug manufacture, new materials and energy, disaster prevention, manufacturing technology, and exploring the origin of matter and the universe, and thus contributing to the solution of problems confronting humanity.

Radioactive Isotope Beam Factory

Wako
The Radioactive Isotope Beam Factory in Wako is RIKEN’s next-generation heavy-ion research facility. It provides researchers with the most intense ion beams in the world. At its heart lies a superconducting ring cyclotron—the world’s largest—measuring 18 meters in diameter and weighing 8,300 tons. Recent upgrades to the facility allow for the generation of intense beams containing about 4,000 unstable nuclei, which range from hydrogen to uranium, making it possible to probe beyond the limits of the known nuclei.

BioResource Center

Tsukuba
The BioResource Center in Tsukuba, established in 2001, has quickly developed into one of the world’s most important repositories and distribution centers of biological resources for life science research. The center’s distinguished position derives from its capacity to handle a wide range of living strains of experimental animals and plants, cell lines of human and animal origins, genetic materials, microorganisms and the associated bioinformatics. The center is particularly notable for providing human induced pluripotent stem (iPS) cells.
In pursuit of science

Founded in 1917, RIKEN has a long and successful history of progressive and innovative scientific endeavor. From its beginnings as a private research foundation in Tokyo, RIKEN has grown to encompass five world-class campuses across Japan, as well as numerous research facilities and centers in Japan and around the world.

PRIVATE RESEARCH FOUNDATION AND CORPORATION PERIOD (1917–1958)
- RIKEN Foundation established in Tokyo with funding from an imperial donation, governmental subsidies and private contributions following a decree in 1915 by the 37th Imperial Diet of Japan
- RIKEN Foundation dissolved and replaced by KAKEN (Kagaku Kenkyusho) corporation

- KAKEN reorganized as RIKEN, a public corporation operated by the Japanese government
- Yamato Laboratory (now Wako Institute) established
- RIKEN’s ring cyclotron completed
- Harima Institute established in Hyogo to support shared use of the SPring-8 synchrotron radiation facility
- Brain Science Institute established in Wako
- RIKEN BNL Research Center established at Brookhaven National Laboratory, USA
- Yokohama Institute established, including the Plant Science Center and the SNP Research Center
- Center for Developmental Biology established in Kobe
- Discovery Research Institute established in Wako
- Kobe Institute established
- BioResource Center established in Tsukuba
- Research Center for Allergy and Immunology established in Yokohama
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>RIKEN reorganized as an Independent Administrative Institution</td>
</tr>
<tr>
<td>2005</td>
<td>Center for Intellectual Property Strategies established in Wako</td>
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<tr>
<td></td>
<td>Center of Research Network for Infectious Diseases established in Yokohama</td>
</tr>
<tr>
<td></td>
<td>SPring-8 Center established in Harima</td>
</tr>
<tr>
<td>2006</td>
<td>Next-Generation Supercomputer R&amp;D Center established</td>
</tr>
<tr>
<td></td>
<td>Singapore Representative Office opened</td>
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<tr>
<td></td>
<td>Nishina Center for Accelerator-Based Science established in Wako</td>
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<tr>
<td></td>
<td>Superconducting Ring Cyclotron completed in Wako</td>
</tr>
<tr>
<td>2007</td>
<td>Molecular Imaging Research Program established in Kobe</td>
</tr>
<tr>
<td>2008</td>
<td>Initial observation of element 113 by RIKEN</td>
</tr>
<tr>
<td>2009</td>
<td>Advanced Science Institute inaugurated in Wako</td>
</tr>
<tr>
<td></td>
<td>Omics Science Center, Systems and Structural Biology Center and Bioinformatics And Systems Engineering division (BASE) established in Yokohama</td>
</tr>
<tr>
<td></td>
<td>RIKEN Center for Genomic Medicine established in Yokohama (integrating the SNP Research Center)</td>
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<tr>
<td></td>
<td>Center for Molecular Imaging Science established in Kobe</td>
</tr>
<tr>
<td>2010</td>
<td>Research Cluster for Innovation established in Wako</td>
</tr>
<tr>
<td></td>
<td>Advanced Institute for Computational Science established in Kobe</td>
</tr>
<tr>
<td>2011</td>
<td>SACLA X-ray Free Electron Laser facility completed in Harima</td>
</tr>
<tr>
<td></td>
<td>Quantitative Biology Center established in Kobe</td>
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<tr>
<td></td>
<td>HPCI Program for Computational Life Sciences established in Kobe</td>
</tr>
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<td></td>
<td>RIKEN–Max Planck Joint Research Center established</td>
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<td></td>
<td>RIKEN–USM Joint Laboratory for Bioprobe Discovery established</td>
</tr>
<tr>
<td>2012</td>
<td>Confirmation of element 113 by RIKEN</td>
</tr>
<tr>
<td></td>
<td>RIKEN–XJTU Joint Research Center established</td>
</tr>
</tbody>
</table>
Raising an anti-tumor army from induced pluripotent stem cells
Researchers from the Center for Integrated Medical Sciences have succeeded for the first time in creating cancer-specific killer T lymphocytes from induced pluripotent stem cells. Hiroshi Kawamoto and his team are currently in the process of investigating how to translate these promising results into new therapy options and, ultimately, improved outcomes for cancer patients.

Clones of clones produce clones
Improving upon the technique that was used to create Dolly the sheep, Teruhiko Wakayama and coworkers from the Center for Developmental Biology have developed a method for producing healthy mouse clones that live a normal lifespan and can be sequentially cloned indefinitely. Serial recloning has the potential to ‘mass-produce’ valuable animal strains for research and agricultural applications.

Provision of seeds of model cereal plant
The BioResource Center became the second bioresource facility in the world to provide seeds of the model cereal plant *Brachypodium distachyon* to the international scientific community. In addition to the seeds, the center will provide the scientific community with the technology needed for the cultivation and genetic alteration of the plant.

Retinoic acid gradient visualized for the first time
Atsushi Miyawaki and his team from the Brain Science Institute have devised a new imaging technique that allowed them to visualize the distribution of retinoic acid in a live zebrafish embryo in real time. This measurement provided long-sought-after evidence that retinoic acid is a morphogen, and that it plays a critical role in brain development.
The twin aims of presenting the best of the research performed at RIKEN to the international community and increasing the awareness of RIKEN as an international leader in scientific research lie at the core of RIKEN’s science communication strategy.

RIKEN is active on many different fronts to achieve these two objectives, and it employs a variety of channels for communicating with different audiences that exist both within Japan and overseas.

RIKEN’s website is its public face on the Internet and its primary channel for reaching a broad range of different audiences, which include the general public, the international scientific community and the internal RIKEN community. It has been designed to cater for the various needs of these different groups, and it provides the latest news updates, research highlights and general information regarding working at RIKEN and living in Japan.

To communicate with an even broader audience, RIKEN has developed a presence on social media by regularly posting on Twitter and YouTube in both English and Japanese.

Frequent press releases are issued to the Japanese and international media, ensuring that important research achievements are readily communicated to the public in a rapid and timely manner.

In addition, reports on outstanding research are published regularly in the magazine *RIKEN Research*, which is available online and is distributed in print format. The objective of this magazine is to showcase the very best of the research conducted at RIKEN to the international scientific community.

www.riken.jp/en

www.twitter.com/riken_en

www.rikenresearch.riken.jp
International Program Associate

The International Program Associate (IPA) offers non-Japanese nationals enrolled in, or about to enroll in, PhD programs at one of the many universities participating in RIKEN’s Joint Graduate School Program the chance to finish their PhD studies under the supervision of a senior RIKEN scientist.

To date, 105 IPAs have been accepted. In March 2012, IPAs hailed from 48 universities on four continents.

Tong Bu, a master’s graduate of the Chinese Academy of Sciences and the École Normale Supérieure de Cachan, joined the bioengineering laboratory of Mizuo Maeda at RIKEN as an IPA in October 2011 after originally coming to RIKEN for a six-month internship. “After a few months I decided to stay on to do a collaborative doctoral course between RIKEN and the University of Tokyo. Being an IPA provides me with the opportunity to conduct research at a prestigious research institute while also being educated at one of the top universities in the world.”

Bu, whose doctoral research at the University of Tokyo examines the bioapplications of metallic nanomaterials, relishes the open approach to research collaboration and free discussion at RIKEN. “I have the valuable chance to work with top scientists and learn from them. The free research environment here allows me to think independently. It gives me a great sense of accomplishment when I feel my ideas are respected and supported here.”

Another attraction is the advanced research infrastructure at RIKEN. Bu comments, “Not only does it have the most advanced experimental apparatus, it also has the best science administration system I’ve ever seen.”

IPAs can participate in the program for up to three years. Benefits include living expenses, a housing allowance and the airfare for a round trip between Japan and the student’s home country.

The program also aims to foster international cooperation and mutual understanding and respect for different countries’ cultures.

“As a foreigner I feel that RIKEN provides a very friendly living and working environment. I would encourage anyone considering studying for a PhD in Japan to think seriously about applying to become an IPA,” says Bu.

Further information

E-mail: ipa-info@riken.jp
Even the most talented researchers need some help to advance their scientific careers. Postdoctoral researchers often require such assistance when looking for placements in scientific establishments after completing their graduate studies.

RIKEN’s Foreign Postdoctoral Researcher (FPR) Program assists talented young non-Japanese researchers to gain a foothold in their chosen fields by providing opportunities for postdoctoral researchers to contribute to the outstanding achievements of RIKEN's ongoing research projects.

Philipp Gubler joined RIKEN via the FPR Program on completing his doctoral studies at the Tokyo Institute of Technology in March 2012. Originally from Switzerland, Gubler is a theoretical physicist with an interest in the strong nuclear interaction. As part of the Strange Nuclear Physics Laboratory led by Associate Chief Scientist Emiko Hiyama, Gubler's research explores what happens when matter is heated to extremely high temperatures. “While the study of this subject is technically very challenging, I look forward to making real progress during my time here at RIKEN,” says Gubler.

Applicants to the FPR Program need a doctoral degree and usually less than five years’ postdoctoral research experience. They are initially offered a one-year contract, which can be renewed for up to three years. A generous remuneration package is supplemented by an annual research budget of one million yen for the host laboratory.

“The research environment here is really attractive, and the FPR position gives me a lot of freedom to pursue my scientific goals,” says Gubler.

RIKEN realizes that it is not always easy to move to Japan to do research. Foreign researchers are encouraged to join various sports and recreational clubs to achieve a good work–life balance and develop relationships with their Japanese co-workers.

Life for non-Japanese researchers is facilitated by the many people at RIKEN who speak English and full-time staff who are able to help with any issues that may arise.

The FPR Program provides an excellent opportunity for young, non-Japanese postdoctoral researchers to play an active role in shaping RIKEN's projects and contributing to RIKEN's top-class achievements.

Further information
E-mail: fpr@riken.jp
RIKEN’s success as a research organization comes from the quality of our people. We have always strived to recruit the best and the brightest scientists into our ranks, and in recent years we have been actively pursuing ever greater internationalization with the conviction that science knows no borders. RIKEN is currently home to over 600 scientists from more than 50 different countries and areas of 5 continents.

RIKEN is a supportive, diverse and inclusive place to work. Our services make it easier for foreign researchers to adapt to working and living in Japan, and our help desks located on our different campuses provide information and assistance in English to help employees and their families fully utilize RIKEN’s many programs and benefits.

RIKEN’s Mutual Benefit Society, in which all full-time personnel are automatically enrolled, funds a diverse range of sports and culture clubs at RIKEN, sponsors numerous events and activities, and otherwise provides a framework for all RIKEN employees to interact, learn about Japan and forge new friendships.

We encourage our staff to maintain a healthy work–life balance, and are committed to ensuring that all of our people at RIKEN enjoy the best possible working environment. More information is available at: www.riken.jp/en/community

Summer Programs
The BSI Summer Program, focusing on neuroscience, enables graduate students to conduct research at the world-renowned Brain Science Institute through a two-month laboratory internship or through an intensive two-week lecture course featuring international experts. The Nishina School offers undergraduate and doctoral students from Peking University a unique opportunity to acquire hands-on experience in theoretical and experimental nuclear physics. The RCAI International Summer Program gives graduate students and postdoctoral researchers from around the world a chance to learn the most recent developments in immunology. And the Cheiron School in Harima offers students and young scientists from the Asia-Pacific region the chance to learn about synchrotron radiation science.

More programs
RIKEN offers many exchange and visiting scholar programs, and is active in developing new programs and agreements with research institutions around the world. Examples include an exchange program between RIKEN and Université de Strasbourg (France), and an agreement between RIKEN and the German National Academic Foundation to accept graduate students. RIKEN also accepts postdoctoral researchers and graduate students through the Japan Society for the Promotion of Science, as well as maintaining programs to accept undergraduate and graduate students from the Massachusetts Institute of Technology (MIT) in the USA and with Korean universities through the JISTEC Winter Institute.
RIKEN endeavors to cultivate a first-class international research hub by bringing together top-quality researchers and administrative staff from Japan and around the world, regardless of nationality or gender. RIKEN personnel are employed as either permanent or fixed-term research or administrative staff. Diversity is at the heart of RIKEN’s research environment, and this is no better illustrated than in the strong numbers of international and female staff who play a vital role in RIKEN’s success today.

Diversity of RIKEN scientists

- **Male**
  - 1,620
  - 350 Principal Investigators
  - 1,270 Other researchers

- **Female**
  - 317
  - 33 Principal Investigators
  - 284 Other researchers

- **Japanese**
  - 1,600
  - 335 Principal Investigators
  - 1,265 Other researchers

- **Non-Japanese**
  - 337
  - 48 Principal Investigators
  - 289 Other researchers

(As of March 2013)

International staff, visiting scientists and students at RIKEN

- **Total**
  - 636

- **Region**
  - Europe: 192
  - China: 141
  - Asia-Pacific (excl. China and Korea): 131
  - South Korea: 88
  - USA and Canada: 60
  - Oceania: 11
  - South America: 9
  - Africa: 4

(As of October 2012)
Budget profile

Diversifying funding streams

Due to its status as an independent administrative institution, RIKEN derives most of its funding from the Japanese government. However, always aware of the need to diversify its funding resources, RIKEN strives to seek out alternative funding from other bodies.

The largest proportion of RIKEN’s income is derived from government grants that fund RIKEN’s general operations and facility maintenance. Government subsidies for the operation and construction of major facilities, such as the SPring-8 Synchrotron Radiation and the SACLA X-ray Free Electron Laser facilities in Harima and the K computer in Kobe, constitute a significant proportion of the total income of the past several years.

Income by source 2013

- 55.33 billion Funding for operations
- 23.13 billion Subsidies for large-scale facilities
- 4.90 billion Commissioned projects income
- 0.37 billion Subsidies for facilities
- 0.37 billion Operational and non-operational income
- 0.34 billion Income from shared use of large-scale facilities

Total: ¥84.44 billion
RIKEN not only disseminates its research results each year in top-tier science journals, it also actively harnesses those discoveries and inventions with commercial potential and secures legal protection for its research achievements by registering many patents every year. The Technology Transfer Office (TTO) manages the RIKEN technology transfer portfolio and acts as a conduit between RIKEN and the private sector. Responsible for intellectual property patent applications, registrations, licenses and contracts, the TTO also collaborates with industry, acquires external and competitive funding, and supports RIKEN scientists in developing practical applications for their research.

**Patent applications and registrations**

- **Domestic patent rights held**
  - 2008: 199
  - 2009: 142
  - 2010: 136
  - 2011: 130
  - 2012: 155

- **Overseas patent rights held**
  - 2008: 614
  - 2009: 613
  - 2010: 602
  - 2011: 625
  - 2012: 678

**Contracts in place at the end of the fiscal year**

- **Domestic**
  - 2008: 280
  - 2009: 288
  - 2010: 272
  - 2011: 279
  - 2012: 277

- **Overseas**
  - 2008: 280
  - 2009: 288
  - 2010: 272
  - 2011: 279
  - 2012: 277

**Patent income (¥ million)**

- 2008: 80.71
- 2009: 66.72
- 2010: 120.61
- 2011: 60.56
- 2012: 55.38
Research output

World-class research

Cutting-edge, first-class research is at the heart of RIKEN’s activities. The institution has seen a steady rise in research publications over the past decade. Testifying to the exceptional quality of research carried out at RIKEN, the citation rates for articles published by RIKEN researchers exceed the international standard—the proportion of RIKEN papers rated in the top 10% of all articles published globally based on citations remains around 20%, and the proportion of papers in the top 1% of most highly cited articles is steady at more than 3% since 2007.

Source: Thomson Reuters Web of Science/Science Citation Index Expanded, May 2013
Essential Science Indicators has been updated as of May 1, 2013 to cover a 10-year-plus-two-month period (January 2003–February 2013).

More than 20% of papers by RIKEN ranked in the top 10% of all papers published worldwide
As RIKEN continues to grow, so does its network of collaborators at research institutions around the world. RIKEN actively supports research collaborations and the exchange of researchers, students and staff with universities and institutions all across the globe. The map above outlines the distribution of these reciprocal research arrangements, including the major institutions and universities that have a General Collaborative Agreement or Memorandum of Understanding (MoU) with RIKEN.

<table>
<thead>
<tr>
<th>Region</th>
<th>No. of partner countries and areas in each region</th>
<th>No. of collaboration agreements</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>2</td>
<td>68</td>
</tr>
<tr>
<td>South America</td>
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</tr>
<tr>
<td>Oceania</td>
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<td>21</td>
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<tr>
<td>Asia</td>
<td>11</td>
<td>161</td>
</tr>
<tr>
<td>Middle East</td>
<td>2</td>
<td>3</td>
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<tr>
<td>Europe</td>
<td>21</td>
<td>165</td>
</tr>
<tr>
<td>Africa</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>46</strong></td>
<td><strong>437</strong></td>
</tr>
</tbody>
</table>

(as of March 2013)
RIKEN directory

Japan

Wako
Center for Emergent Matter Science
Center for Advanced Photonics
Brain Science Institute
Nishina Center for Accelerator-Based Science
Advanced Center for Computing and communication
Research Cluster for Innovation
Chief Scientist Laboratories
Associate Chief Scientist Laboratories
Distinguished Senior Scientist Laboratories
Initiative Research Units
Global Research Cluster
2-1 Hirosawa, Wako,
Saitama 351-0198, Japan
Tel: +81-(0)48-462-1111
Fax: +81-(0)48-462-1554

Sendai
519-1399 Aoba, Aramaki, Aoba-ku, Sendai,
Miyagi 980-0845, Japan
Tel: +81-(0)22-228-2111
Fax: +81-(0)22-228-2122

Tsukuba
BioResource Center
3-1-1 Koyadai, Tsukuba,
Ibaraki 305-0047, Japan
Tel: +81-(0)29-836-9111
Fax: +81-(0)29-836-9109

Yokohama
Center for Sustainable Resource Science
Center for Integrative Medical Sciences
1-7-22 Suehiro-cho, Tsurumi-ku, Yokohama, Kanagawa
230-0045, Japan
Tel: +81-(0)45-503-9111
Fax: +81-(0)45-503-9113

Nagoya
2271-130 Anagahora, Shimoshidami, Moriyama-ku, Nagoya,
Aichi 463-0003, Japan
Tel: +81-(0)52-736-5850
Fax: +81-(0)52-736-5854

Kobe
Center for Developmental Biology
2-2-3 Minatojima-minamimachi, Chuo-ku, Kobe,
Hyogo 650-0047, Japan
Tel: +81-(0)78-306-0111
Fax: +81-(0)78-306-0101

Center for Life Science Technologies
6-7-3 Minatojima-minamimachi, Chuo-ku, Kobe, Hyogo
650-0047, Japan
Tel: +81-(0)78-304-7111
Fax: +81-(0)78-304-7112

Advanced Institute for Computational Science
7-1-26 Minatojima-minamimachi, Chuo-ku, Kobe, Hyogo
650-0047, Japan
Tel: +81-(0)78-940-5555
Fax: +81-(0)78-304-4956

HPCI Program for Computational Life Sciences
7-1-26 Minatojima-minamimachi, Chuo-ku, Kobe, Hyogo
650-0047, Japan
Tel: +81-(0)78-940-5835
Fax: +81-(0)78-304-8785

Osaka
Quantitative Biology Center
OLABB, Osaka University, 6-2-3 Furuedai, Suita, Osaka
565-0874, Japan
Tel: +81-(0)6-6155-0111
Fax: +81-(0)6-6155-0112

Harima
SPRING-8 Center
1-1-1 Kouto, Sayo-cho, Sayo-gun,
Hyogo 679-5148, Japan
Tel: +81-(0)791-58-0808
Fax: +81-(0)791-58-0800

Tokyo
Center of Research Network for Infectious Diseases
Jimbocho 101 Bldg. 8th fl., 1-101, Kanda-jimbocho, Chiyoda-ku,
Tokyo 101-0051, Japan
Tel: +81-(0)3-3518-2952
Fax: +81-(0)3-3219-1061

Tokyo Liaison Office
Fukoku Seimei Building, 23rd floor (Room 2311),
2-2-2 Uchisaiwaicho, Chiyoda-ku, Tokyo
100-0011, Japan
Tel: +81-(0)3-3580-1981
Fax: +81-(0)3-3580-1980

Itabashi Branch
1-7-13 Kaga, Itabashi,
Tokyo 173-0003, Japan
Tel: +81-(0)3-3963-1611
Fax: +81-(0)3-3579-5940
Overseas

RIKEN Beijing Representative Office
1008, Beijing Fortune Building, No. 5,
Dong San Huan Bei Lu,
Chao Yang District, Beijing, 100004, China
Tel: +86-(0)10-6590-9192; Fax: +86-(0)10-6590-9897

RIKEN Singapore Representative Office
11 Biopolis Way, #07-01/02 Helios 138667, Singapore
Tel: +65-6478-9940; Fax: +65-6478-9943

RIKEN BNL Research Center
Building 510A, Brookhaven National Laboratory, Upton,
New York 11973, USA
Tel: +1-631-344-8095; Fax: +1-631-344-8260

RIKEN Facility Office at RAL
UG17 R3, Rutherford Appleton Laboratory,
Harwell Science and Innovation Campus,
Didcot, Oxfordshire
OX11 0QX, UK
Tel: +44-1235-44-6802; Fax: +44-1235-44-6881

RIKEN–MIT Center for Neural Circuit Genetics
MIT 46-2303N, 77 Massachusetts Avenue, Cambridge,
Massachusetts 02139, USA
Tel: +1-617-324-0305
Fax: +1-617-324-0976, +1-617-452-2588

RIKEN–KTRIB Collaboration Research Center for Chemical Biology
685-1 Yangcheonri, Ochang, South Korea

RIKEN–USM Joint Laboratory for Bioprobe Discovery
11800 Universiti Sains Malaysia, Pulau Pinang, Malaysia

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For further information, please contact:

RIKEN Global Relations and Research Coordination Office
2-1 Hirosawa, Wako, Saitama 351-0198, Japan
TEL: +81-(0)48-462-1225
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