



SÃO PAULO RESEARCH FOUNDATION



Laser in tungsten glass

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The São Paulo Research Foundation (FAPESP) is one of the leading scientific research funding agencies in Brazil.

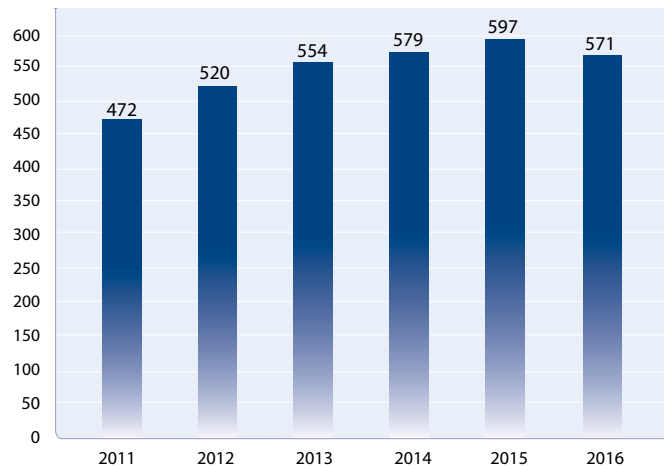
FAPESP was established by São Paulo State's 1947 Constitution, and created in 1962 with the mission of supporting scientific and technological research in the state. This support takes the form of fellowships awarded in Brazil or abroad, as well as research grants in all knowledge areas.

Fellowships and grants are awarded to researchers affiliated with public or private higher education and research institutions in São Paulo State, and to researchers employed by private enterprise. A number of programs award funding for large-scale scientific and technological research projects. FAPESP funds visiting fellowships for researchers from other countries who are invited by research institutions in São Paulo, and establishes cooperation agreements with universities and other entities abroad. It also issues joint calls for collaborative research proposals with foreign entities.

The 1989 São Paulo State Constitution required that 1% of the state's annual tax revenue (excluding the share allocated to city governments) be transferred to FAPESP and that its bylaws establish an investment fund to provide financial income for research funding, as a supplement to the funds transferred by the state treasury. Additional sources of revenue include joint research funding agreements with other institutions.

FAPESP's total revenue amounted to \$ PPP 675.5 million in 2016, and in the same year it invested \$ PPP 571.4 million in research.

EVOLUTION OF FAPESP EXPENDITURES* – 2011 - 2016



* In million of \$ PPP (purchasing power parity)

FELLOWSHIPS

www.fapesp.br/en/fellowships

FAPESP awards the following fellowships for researcher training at different levels, from undergraduate and graduate studies to doctorate and postdoc:

In Brazil

- Scientific initiation 12 months
- Master's 24 months
- Doctorate 36 months, renewable for a further 12
- Direct doctorate 48 months, renewable for a further 12
- Postdoctorate 36 or 48 months, depending on the type of project

Abroad

- Research Internships Abroad for recipients of FAPESP's fellowships to work abroad as research trainees for a short or medium period.
- Research Fellowships Abroad for researchers who hold PhDs and are affiliated with research institutions in São Paulo State, lasting up to 12 months.

Besides academic fellowships, FAPESP also awards the following in Brazil:

- Fellowships for technical training and participation in courses, both for university or high-school graduates and course attendees involved in support activities for research projects conducted by institutions in São Paulo State and funded by FAPESP.
- Fellowships for young investigators, research on education, scientific journalism, and innovative research in small business.



LEO RAMOS



Researcher handling
sample of artificial skin

RESEARCH GRANTS

www.fapesp.br/en/30

Regular Research Grants

Support for individual projects conducted by researchers with PhDs or the equivalent. Projects last 24 months, renewable for another six.

Thematic Projects

Support for research with ambitious goals, lasting up to five years, renewable for another 12 months. Projects are conducted by teams, sometimes multi-institutional, and produce results that are important to advance knowledge.

Other types of regular grant

- Organization of scientific or technological meetings
 - São Paulo School of Advanced Science (SPSAS): short courses on advanced research in all knowledge areas.
- Participation in scientific or technological meetings.
- Scientific publications.
- Visiting research grants.
- Repair of equipment used in research.

Grants awarded under programs

FAPESP also awards grants to research projects conducted under the aegis of programs geared to specific objectives, as described in the following pages.

RESEARCH PROGRAMS

www.fapesp.br/en/31

FAPESP maintains several programs geared to strategic objectives, often at the knowledge frontier, in such fields as biodiversity, bioenergy, global climate change and eScience, as well as other multidisciplinary subjects.


According to their objectives, the programs are classified as:

- Research Infrastructure Programs
- Theme-Oriented Research Programs
- Application-Oriented Research Programs
(private enterprise or government)

RESEARCH INFRASTRUCTURE PROGRAMS

These support the refurbishment and modernization of laboratories in higher education and research institutions, the updating of library collections, and the acquisition of equipment. Their objectives also include fostering the implementation of new lines of scientific research in São Paulo State, and retention of young scientific leaders through the Young Investigators Awards.





Multichannel pipette

Young Investigators Awards

www.fapesp.br/yia

This aims at creating work opportunities for young researchers or groups of young researchers with outstanding potential, from Brazil or abroad, preferably in emerging research centers or institutions with a consolidated tradition, to create new lines of research. The program is designed to strengthen the research system in São Paulo State by supporting the creation of new groups and networks that focus on contemporary subjects of international relevance not yet covered by researchers in the state.

Other Infrastructure Programs

- Support for Research Infrastructure: Museums, Information & Document Depositories, and Biological Collections
- ANSP Network (Academic Network at São Paulo)
- Multiuser Equipment Program
- Technical Reserve for Institutional Research Infrastructure
- Technical Reserve for Connectivity to ANSP Network
- Scientific Eletronic Library Online (SciELO)

Amazon river flooding
in the region of Parintins,
state of Amazonas, Brazil



FAPESP Research Program on Global Climate Change

www.fapesp.br/en/4485

FAPESP's research program on global climate change aims at advancing knowledge in this field by incorporating scientific data and information on regional phenomena that affect climate on a global scale. It expects the results of selected research projects to assist science-based decision making, risk assessment, and mitigation and adaptation strategies.

The program also contributes to the development of appropriate technology for the future, having already supported development of the Brazilian Earth System Model (BESM), a climate model for the region with a special focus on the Amazon and South Atlantic and their influence on global climate change.

FAPESP eScience Research Program

www.fapesp.br/en/8437

The aim of FAPESP's research program on eScience is to integrate computational modeling and research and data infrastructure in several areas of knowledge.

The program supports the organization of research groups on algorithms, computational modeling and data infrastructure in networks with groups of scientists involved in other knowledge areas ranging from biology to social sciences.

THEME-ORIENTED RESEARCH PROGRAMS

FAPESP Bioenergy Research Program (BIOEN)

www.fapesp.br/en/bioen

BIOEN has three main goals: increasing sugarcane yields using molecular biology; evaluating and mitigating the environmental and socioeconomic impact of bioenergy production; and creating knowledge on bioenergy production and application processes to assure Brazil's leadership of research and production in the sector.

Launched in July 2008, the program supports networking between researchers in universities and research institutions and researchers in corporate R&D centers.

MAIN RESEARCH AREAS

- Biomass for bioenergy (focusing on sugarcane)
- Biofuel production processes
- Biorefineries and sugarcane-based chemicals
- Applications of ethanol in motor vehicles
- Socioeconomic and environmental impacts and land use.

THEME-ORIENTED RESEARCH PROGRAMS

BIOTA-FAPESP Research Program on Biodiversity

www.fapesp.br/en/biota

FAPESP's Research Program on Biodiversity Characterization, Conservation, Restoration & Sustainable Use (BIOTA-FAPESP) aims to catalogue and characterize biodiversity in São Paulo State, define mechanisms for its conservation, evaluate its economic potential, and foster its sustainable use.

The research themes include molecular genetics for species classification; evolutionary studies to understand the origin of the processes that promote, preserve or reduce biodiversity; and investigation of the human dimensions of biodiversity conservation and its sustainable use.

The data produced contributes to personnel training and the formulation of public policy for biodiversity conservation. Through its bioprospecting network, BIOTA-FAPESP also transfers knowledge for the development of new products and technologies for the private sector.

Created in 1999, the program has resulted to date in the discovery of more than 2,500 new species and the publication of about 2,140 scientific articles in indexed journals.

Vegetation in Serra da
Cantareira, São Paulo State

Flexible bioactive glass fiber mesh
for regeneration of soft and hard tissue.
Vitreous Materials Laboratory,
Federal University of São Carlos
(UFSCar), São Paulo State.

APPLICATION-ORIENTED RESEARCH PROGRAMS

Research, Innovation & Dissemination Centers (RIDCs)

www.cepid.fapesp.br/en/home

This program supports research centers of excellence in all knowledge areas for up to 11 years. Their mission is to develop fundamental or applied research at the cutting edge of knowledge with a significant commercial and social impact, contribute to innovation via technology transfer to private enterprise, and offer outreach activities to elementary and high school teachers, students and the general public.

The RIDC Program was launched in 2000. In the first call for proposals, 11 centers were selected and supported between 2011 and 2013. Currently and until 2014, FAPESP supports 17 RIDCs in areas such as biodiversity, cell therapy, photonics, neuroscience, and metropolitan studies, among others.

Total investment in the program under the present call amounts to US\$ 680 million per period, with FAPESP contributing US\$ 370 million and host institutions paying US\$ 310 million in researchers' and technicians' salaries. RIDCs also receive additional funding from partner firms and other research funding agencies. This is one of the largest investments in research programs by a research agency ever announced in Brazil.

APPLICATION-ORIENTED RESEARCH PROGRAMS

IN PARTNERSHIP WITH GOVERNMENT AND THE THIRD SECTOR

FAPESP Research Program in Public Policies

This program funds research undertaken with the aim of meeting concrete social needs and building closer ties between São Paulo State's science and technology system and society. Research in a wide array of fields – health, education, sanitation, housing, urban planning, agriculture, zotechnics, sociology and management, among others – is undertaken by researchers at higher education institutions and technical staff and agents of partner institutions: public-sector organizations – state and city government departments, and state-owned enterprises – and third-sector organizations such as co-ops, foundations and non-governmental organizations (NGOs). Research results must be used as inputs to socially relevant public policy formulation.

Projects are developed in two stages. The first stage, consisting of research followed by testing of implementation of the results in a pilot project, lasts 24 months and receives funding from FAPESP. The second stage consists of application and multiplication of the results achieved in the first stage, and is the responsibility of the partner institution.



EDUARDO CESAR

APPLICATION-ORIENTED RESEARCH PROGRAMS

IN PARTNERSHIP WITH PRIVATE ENTERPRISE

Innovative Research in Small Business Program (PIPE)

www.fapesp.br/en/299

FAPESP's PIPE program supports research by firms with up to 250 employees with the aim of promoting technological innovation, enhancing competitiveness, and increasing the presence of researchers in the productive sector.

Projects can be developed in two stages: demonstration of technological feasibility (stage 1); and development of the innovative process or product (stage 2). Firms can also receive support for product commercialization (stage 3) via joint funding from FAPESP and the Brazilian Innovation Agency (FINEP) under the PIPE-PAPPE Program. Awardee firms are not required to provide matching funds at any stage.

PIPE was established in June 1997 and approved its first projects in November 1997. Between its inception and August 2017, the program supported 1,885 research projects and FAPESP disbursed \$ PPP 18.4 million for PIPE-approved projects. In 2016 it contracted for 228 projects, which corresponds on average to 19 projects per month, or 0.9 per business day.



APPLICATION-ORIENTED RESEARCH PROGRAMS

EXAMPLES OF FIRMS SUPPORTED BY PIPE AND RESULTING INNOVATIONS:

Altave – Lighter than air

Altave was founded by qualified engineers and develops lighter-than-air vehicles, focusing on innovative services. Currently it is the only Brazilian maker of tethered aerostats, which are used mainly for monitoring and radio communications. At the 2016 Rio Olympics the security forces used 13 cameras on board four balloons produced by Altave to monitor the main competition venues and their surroundings from a height of some 200m.

Braincare – Intracranial pressure monitoring

Braincare is a medical technology company responsible for the development and commercialization of an innovative system to monitor intracranial pressure noninvasively. Its method significantly reduces the risks, costs and complications associated with this procedure, which is required in cases of trauma, hydrocephalus or stroke, for example. The system is portable and can be used during patient transfer or emergency care, as well as in clinics, hospital outpatient centers, intensive care units and surgical centers.

BrP – Advanced photonics

BrPhotonics offers optoelectronic devices for integrated transceivers and subsystems. Through advanced technologies BrP envisions the convergence of photonics and microelectronics to enable transmission at 100 Gb/s and beyond over optical links with lower power consumption and higher density.

BR3 – Pest and endemic disease control

BR3 develops technologies in chemistry and biotechnology for application in agriculture and public health. In 2001 it launched Fegatex, a fungicide based on an active ingredient never used before anywhere in the world. It is registered as a plant health management product for use in the following crops: potato, coffee, carrot, citrus, drybean, apple, corn, soybean and tomato. BR3 has also developed a line of larvicides for control of dengue, malaria and filariasis vectors based on technology licensed by FIOCRUZ. DengueTech is the most effective biological insecticide against dengue, Zika and chikungunya vectors.

BUG – Biological control

BUG Agentes Biológicos was one of 36 startups rated Technology Pioneers by the World Economic Forum and one of the most innovative companies in the world by Fast Company magazine. Founded by graduate students at the University of São Paulo's Luiz de Queiroz College of Agriculture (ESALQ/USP), with support from FAPESP's PIPE program, Bug produces and sells biological control agents such as wasps that parasitize the eggs of sugarcane borers and the velvetbean caterpillars that attack soybeans. It currently produces four types of wasp that combat pests in sugarcane, soybeans, melons and corn, among other crops, and has customers throughout Brazil.

APPLICATION-ORIENTED RESEARCH PROGRAMS

EXAMPLES OF FIRMS SUPPORTED BY PIPE AND RESULTING INNOVATIONS:

Medecell – Pain relief

Transcutaneous electrical nerve stimulation (TENS) is a well-known therapy for pain relief. However, its use requires attendance at a medical clinic or health center. TANYX® is a low-cost disposable solution created by Medecell, with support from FAPESP's PIPE program. It can be used by patients in their own home or workplace, when prescribed by a healthcare professional.

I.Systems – Industrial process control

Using exclusive software based on the state of the art in advanced control and artificial intelligence, I.Systems delivers enhanced industrial process stability and efficiency. In little more than five years it has notched up more than 60 applications in different types of equipment belonging to more than 25 customers in a range of industries.

In Vitro Brasil – In vitro fertilization

In Vitro Brasil was founded in 2002 to meet growing demand for in vitro production of bovine embryos. Over the years it has partnered with other firms and built a solid customer base in Brazil and abroad while extending its scope to other animals. Support from FAPESP's PIPE program enabled it to develop embryo vitrification technology, one of its foremost competitive advantages. The technology developed by In Vitro Brasil serves directly to improve the quality of Brazilian dairy and beef cattle and to increase production.

Nanox – Bactericidal plastic packaging

Nanox is a company founded by researchers at one of FAPESP's Research, Innovation & Dissemination Centers (RIDCs) who developed bactericidal materials for plastic food packaging that have been approved by the FDA for sale in the United States. It was selected by the Global Entrepreneurship Lab (G-LAB) at MIT's Sloan Business School for assistance in developing a business plan for the US market.

XMobots – Remotely piloted aircraft systems

XMobots develops and manufactures remotely piloted aircraft (RPA) systems, also known as UAVs or drones. The main applications are in precision agriculture, topography, deforestation surveillance etc.

Pharmaceutical industry
production line

APPLICATION-ORIENTED RESEARCH PROGRAMS

IN PARTNERSHIP WITH PRIVATE ENTERPRISE

Research Partnership for Technological Innovation Program (PITE)

www.fapesp.br/en/300


Launched in 1995, FAPESP's Research Partnership for Technological Innovation Program (PITE) supports research projects in academic or research institutions developed in cooperation with researchers employed by companies in research centers in Brazil or abroad and cofunded by the companies concerned.

Because these are collaborative projects, their results should contribute to knowledge creation or technological innovation of interest to the partner companies, as well as contributing to the advance of knowledge and the training of highly qualified personnel.

Partner companies must cofund research projects directly or via third parties. FAPESP's funding goes solely to partner higher education and research institutions.

Some of the partner companies under the PITE program:

Aché Laboratórios Farmacêuticos, Agilent Technologies Brasil, AstraZeneca do Brasil Ltda., Braskem S.A., CI&T Software S.A. , Companhia Brasileira de Metalurgia e Mineração, Companhia Siderúrgica Nacional, Cooperativa de Produtores de Cana-de-Açúcar, Açúcar e Álcool do Estado de São Paulo (Copersucar), Cooperativa dos Cafeicultores e Citricultores de São Paulo (Coopercitrus), Empresa Brasileira de Aeronáutica S.A. – Embraer, Fundação Grupo Boticário de Proteção à Natureza, GlaxoSmithKline (GSK), IBM Brasil Indústria Máquinas e Serviços, Itaotec Philco, Microsoft, Natura, Petróleo Brasileiro S.A. – Petrobras, Suzano Papel e Celulose, Vale S.A., Sabesp, and others.



Calorimetric reactor

APPLICATION-ORIENTED RESEARCH PROGRAMS

IN PARTNERSHIP WITH PRIVATE ENTERPRISE

Engineering Research Centers

An important initiative that was made possible by PITE and demonstrates the long-term commitment of companies and research institutions was the creation of Engineering Research Centers supported for up to ten years in strategic areas for the technological development of São Paulo State.

FAPESP has signed agreements with Peugeot Citroën do Brasil, GlaxoSmithKline Brazil (GSK), BG Brazil and Natura to establish six engineering research centers that will conduct research geared to applications in energy, sustainable chemistry, internal combustion engines, neuroscience, and behavioral science.

FAPESP and the partner companies in all five existing centers will share investment totaling more than \$ PPP 121.6 million for between five and ten years.

The institutions that host the centers will pay operating expenses and salaries.

The research concerned fuels a medium- to long-term dialogue between universities and private enterprise to increase São Paulo State's competitiveness in these areas.

APPLICATION-ORIENTED RESEARCH PROGRAMS

Professor Urbano Ernesto Stumpf Engineering Research Center

Hosted by the Mechanical Engineering School at the University of Campinas (Unicamp) as a partnership between FAPESP and Peugeot Citroën do Brasil. Its main goals are developing internal combustion engines adapted or designed specifically to run on biofuel and studies of biofuel sustainability.

Sustainable Chemistry Research Center

Hosted by the Chemistry Department of the Federal University of São Carlos (UFSCar) as a partnership between FAPESP and GlaxoSmithKline (GSK) Brazil. Its main goal is promoting the development and effective use of sustainable chemistry by combining academic research, the pharmaceutical industry's know-how and expertise in biotechnology to surmount current challenges in organic synthesis.

Center for Applied Research in Human Wellbeing and Behavior

Hosted by the Psychology Institute at the University of São Paulo (USP) as a partnership between FAPESP and Natura. Its focus is on neuroscience, positive psychology, social psychology, neuroimaging, neuropsychophysiology, psychometry, population studies and longitudinal studies.

Natural Gas Innovation Research Center

Hosted by USP's Engineering School (Politécnica) as a partnership between FAPESP and BG Brazil. It prioritizes research in three areas: engineering, physical chemistry, and energy policy and economics. It seeks to increase the share of natural gas in São Paulo State's energy balance, foster biogas production, increase energy efficiency, and reduce greenhouse gas emissions, among other goals.

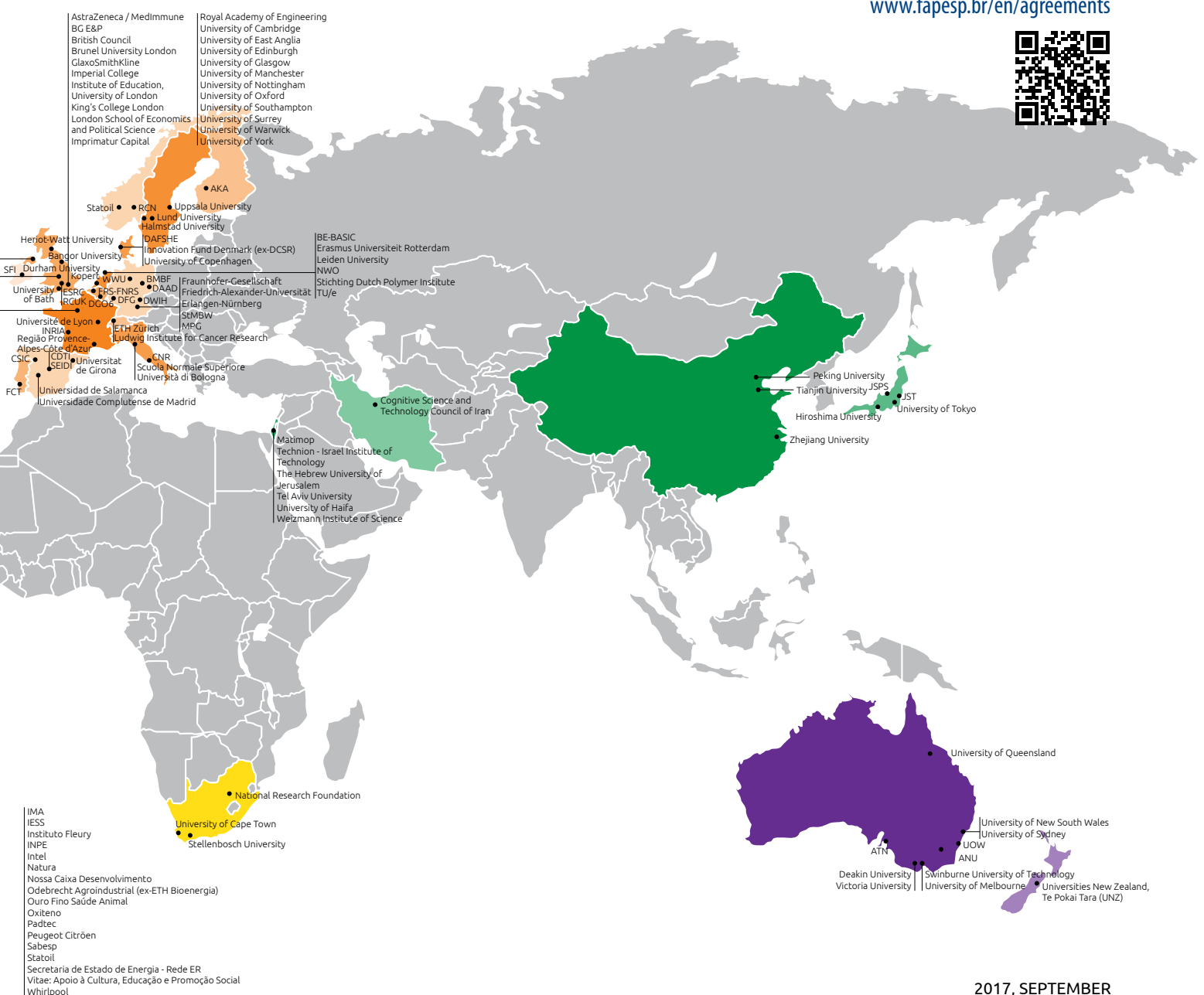
Centre of Excellence for Research in Target Discovery

Hosted by Butantan Institute as a partnership between FAPESP and GSK Brazil. Its main goal is to identify molecular targets and signaling paths involved in several diseases, using natural products in the validation of therapeutic targets with the aim of developing new drugs.

PARTNERSHIPS AND AGREEMENTS IN BRAZIL AND ABROAD

In carrying out its mission of support for scientific and technological research FAPESP enters into cooperation agreements with a large number of institutions in Brazil and abroad. Partner institutions include research funding agencies, higher education and research institutions, companies, and multilateral associations and institutions.





- IMA
- IESS
- Instituto Fleury
- INPE
- Intel
- Natura
- Nossa Caixa Desenvolvimento
- Odebrecht Agroindustrial (ex-ETH Bioenergia)
- Ouro Fino Saúde Animal
- Oxiteno
- Padtec
- Peugeot Citröen
- Sabesp
- Statoil
- Secretaria de Estado de Energia - Rede ER
- Vitae: Apoio à Cultura, Educação e Promoção Social
- Whirlpool



www.fapesp.br/en



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Research supported by FAPESP can be consulted at
FAPESP Grant Database (www.bv.fapesp.br/en)

More about the research results in the
Agência FAPESP (www.agencia.fapesp.br/en)