International Research & Training
Exchange Fair

“Closing the Gap”

The ASCB is a great venue for the exhibition of science at its best. Now, 54 years since its first meeting, a meeting is held once a year that brings together on average 9,000 participants. In order to reach an even wider audience, the International Affairs Committee (IAC) collects information on scientific activities in various countries to disseminate through the ASCB. The purpose is to raise awareness, to increase communication, and to promote exchange of science and scientists around the globe.

Why now? Although it may be relatively easy to learn about the universities and research institutes, and the research programs and funding agencies in a country such as the U.S., this is not always the case for a large number of countries, even though some of them have world-class centers of science and education. Many young, and not so young, scientists are perhaps unaware of the research activities and opportunities, as well as the simple fact that English is the lingua franca at many of the research centers around the globe. Many countries have built, and are building, highly sophisticated centers for education and research with the intent of attracting new blood. However, those outside of the respective countries are usually not aware of the new developments, the sources of funding, deadlines for applications, positions available, and the possibilities of obtaining funds for short- and long-term travel.

Our aim is to serve as a platform for the exchange and exhibition of scientific developments in all countries. This year we report on 21 countries. The respective reports include the current status of the scientific communities and websites for accessing information on funding and travel related opportunities. We hope that this information will help and encourage young scientists in the scientific programs around the globe. We shall soon report all new developments on IAC’s website [http://www.ascb.org/international-affairs](http://www.ascb.org/international-affairs).

How can you help? Please make use of the information in these reports and communicate with the appropriate agencies with respect to your interest in teaching, educating, pursuing graduate and postdoctoral research, collaborating, and joining the new departments and institutes. Write to the corresponding authors from the respective countries or submit your queries to me for more information. Write about your collaborations and your travel to those institutes that are unfamiliar to the larger community of scientists, and above all, contact us with your ideas and plans to promote science around the world.

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On behalf of the ASCB International Affairs Committee (IAC)
International Research & Training Exchange Fair

Featured in 2014

Australia  
New Zealand  
Austria

Brazil  
Canada  
China

Czech Republic  
European Research Council  
France

Ghana  
Hong Kong  
India
BIOMEDICAL RESEARCH HIGHLIGHTS AND OPPORTUNITIES IN AUSTRALIA AND NEW ZEALAND

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The Australian and New Zealand Cell Biology Societies and Meetings
Cell biology is a major research discipline in Australia and New Zealand and is supported by two prominent societies in the region - the Australia and New Zealand Society for Cell and Developmental Biology (ANZSCDB) [http://www.anzscdb.org/](http://www.anzscdb.org/) and the Australian Society for Biochemistry and Molecular Biology (ASBMB) [http://www.asbmb.org.au/](http://www.asbmb.org.au/). These societies support local state-based meetings that promote cell biology and together hold an annual national meeting under the auspices of COMBIO. At COMBIO eminent invited international leaders in the field give plenary presentations, symposium talks and meet one-to-one with student attendees to mentor and advise. Both societies provide travel scholarships to attend meetings, work in collaborative laboratories and early career awards to foster future leaders in the discipline.


Research Funding in Australia
The majority of funding for biomedical research within Australia is obtained through competitive peer-review mechanisms managed by two major Federal funding agencies - the National Health and Medical Research Council (NHMRC) and the Australian Research Council (ARC). Successful grant recipients (i.e. lead investigators) are typically based in Australia for the duration of the award, but chief investigators can carry out work overseas. Generally, most of the award schemes brokered by these two agencies accept new grant applications only once per year; grant submission dates cluster together early in the year (February-March) for both agencies (e.g. [www.nhmrc.gov.au/grants/calendar/index.htm](http://www.nhmrc.gov.au/grants/calendar/index.htm)). Each agency requires grant applications to be completed and submitted online via their respective web-based systems. New grant applications to the NHMRC must be submitted via the Research Grants Management System (RGMS); new grant applications to the ARC must be submitted via their Research Management System (RMS) web-based system.

While the primary focus of the NHMRC centers on medically relevant/health-related research at both the basic and clinical levels, the ARC supports both fundamental and applied research across all disciplines. As well as enabling support for direct research costs either as basic Project Grants (typically for individual investigators or small investigator teams and generally awarded for 3 years duration) or as Program Grants (consortium-type grants awarded to larger and generally more mature collaborative investigator teams to pursue well-established research programs), the NHMRC also offers Strategic Awards targeting priority research areas as well as Infrastructure Grants that help to support the costs of basic infrastructure and purchases of major items of equipment. Critically, the NHMRC also provides the mainstay of personnel funding/salary support for research academics in the life sciences across almost every level through a set of competitive People Support schemes that includes postgraduate Scholarships, Training (Postdoctoral) Fellowships (both basic and clinical), Career Development Awards as well as Senior Fellowship Awards.
The ARC funding covers a much wider spectrum of research topics under its National Competitive Grants Program (NCGP). However, through the ARC's commitment to foster the development of Australia's most talented researchers and support 'discovery' research leading to new ideas and/or the advancement of knowledge, over the past few years the ARC has seen a substantial increase in the number of biomedically focused research grant applications encompassing more technologically innovative and ambitious science through its Discovery Projects scheme. In parallel, the ARC's Linkage scheme centers on building Australia's research capability by expanding and enhancing research networks and collaborations, establishing national centers of research excellence and enabling international research collaborations. Notably, the ARC provides number of senior research fellowships under the banner of its Discovery schemes.

**International Partnership Funding**

Over recent years, as the Australian Federal government’s primary biomedical funding body, the NHMRC has formally partnered with a variety of external funding agencies both to leverage funding across agencies and allow foreign/private funding bodies to capitalize on the NHMRC’s significant infrastructure/expertise in grant review and administration within Australia. Such examples include the establishment of formal linkages with the Juvenile Diabetes Research Foundation International (JDRF) and managing the NHMRC–European Union (EU) Collaborative Research Grants scheme that helps enable Australian researchers to participate in international projects funded under the *Seventh Framework Programme of the European community for research and technology development* (FP7). Access to the Human Frontier Science Program (HFSP) that supports international/interdisciplinary collaborations in basic research is afforded via Australia’s membership in the program through the NHMRC.

The ARC also either supports or formally partners with a variety of external entities through its Special Research Initiatives scheme, such as the European Molecular Biology Laboratory (EMBL) to facilitate increased collaboration and scientific linkages between Australian and European scientists.

In addition to the NHMRC and the ARC, the Australian Academy of Science (AAS) [http://www.science.org.au/internat/] offers a number of awards such as Travelling Fellowships supporting Australian scientists to visit/study overseas and funding to host Research Conferences that encourage stronger international linkages in rapidly evolving research areas. In particular, the AAS has a strong history of working hard to promote increased International Activities through interactions with a variety of prestigious scientific organizations in overseas countries.

Numerous opportunities for bilateral international scientific exchange other than those already outlined are available via targeted international programs as well as private foundations and governmental organizations. One of the most well known programs is that of the Fulbright Scholarships offered through the Australian-American Fulbright Commission. Likewise, a number of strategic programs have now been established to specifically enable increased scientific exchange and collaboration between Australia and other countries, for example India, China, Japan and France.

**Centres for Cell Biology Research in Australia**

The prospects for scientific study, exchange, training and/or postdoctoral research within Australia are quite strong, offer a wide range of exciting opportunities and vary only marginally among different states around the country. While there are numerous research centers, institutes and universities that can offer unique opportunities for biomedical research and training in Australia, the Group of Eight (Go8) universities afford a high level of quality assurance for prospective students and postdoctoral scientists from overseas. The Go8 universities represent an alliance among Australia’s leading academic institutions which are genuinely committed to ensuring a world class research environment and internationally competitive research outcomes. Go8 members include: The University of Adelaide, The Australian National University, The University of Melbourne, Monash University, The University of New South Wales, The University of Queensland, The University of Sydney and The University of Western Australia. In addition, Australia now plays host to premier research institutes which have earned themselves strong international reputations for research excellence in cell biology. Such sites include the Institute for Molecular Bioscience (IMB) and Diamantina Institute in Queensland, the Walter and Eliza Hall Institute of Medical Research (WEHI) and
Bio21 Institute in Victoria, the Garvan Institute of Medical Research and Children’s Medical Research Institute (CMRI) in New South Wales, the Western Australian Institute for Medical Research (WAIMR) in Western Australia, and the Centre for Cancer Biology in South Australia.

**Research Funding in New Zealand**

Support for biomedical research in New Zealand is obtained mainly through competitive peer-reviewed schemes administered by the Health Research Council of New Zealand (HRC) which also only accepts grant submissions once per year. The HRC is the major government-funded agency responsible for coordinating health research and the career development of health research professionals in that country. The Marsden Fund administered by the Royal Society of New Zealand provides a substantial number of grants each year awarded for research excellence, including biomedical sciences and cellular/molecular/physiological biology. In addition, New Zealand is also a member country belonging to the Human Frontier Science Program (HFSP).

Specific New Zealand universities have links internationally (for example the University of Auckland is a member of the 15 country strong Universitas 21, the Association of Pacific Rim Universities and the Worldwide Universities Network). These relationships encourage international cell biology collaborations. For those interested in undertaking postgraduate studies or seeking a postdoctoral position, information may be obtained from the websites of the eight universities:

- Auckland University of Technology: [www.aut.ac.nz](http://www.aut.ac.nz)
- Lincoln University: [www.lincoln.ac.nz](http://www.lincoln.ac.nz)
- Massey University: [www.massey.ac.nz](http://www.massey.ac.nz)
- University of Auckland: [www.auckland.ac.nz](http://www.auckland.ac.nz)
- University of Canterbury: [www.canterbury.ac.nz](http://www.canterbury.ac.nz)
- University of Otago: [www.otago.ac.nz](http://www.otago.ac.nz)
- University of Waikato: [www.waikato.ac.nz](http://www.waikato.ac.nz)
- Victoria University of Wellington: [www.victoria.ac.nz](http://www.victoria.ac.nz)

Cell and molecular research is also being carried out within the Crown Research Institutes such as AgResearch ([www.agresearch.co.nz](http://www.agresearch.co.nz)), Environmental Science and Research ([www.esr.cri.nz](http://www.esr.cri.nz)), Industrial Research Ltd ([www.irl.cri.nz](http://www.irl.cri.nz)), Landcare Research ([www.landcareresearch.co.nz](http://www.landcareresearch.co.nz)), and National Institute of Water and Atmospheric Research ([www.niwa.co.nz](http://www.niwa.co.nz)).
**Cell Biology in Austria 2014**

The main places for research in cell biology in the Vienna region are the Vienna Biocenter, which is composed of four institutes (GMI - [http://www.gmi.oeaw.ac.at/](http://www.gmi.oeaw.ac.at/), IMBA - [http://www.imba.oeaw.ac.at/](http://www.imba.oeaw.ac.at/), IMP - [http://www.imp.ac.at/](http://www.imp.ac.at/), and MFPL - [http://www.mfpl.ac.at/](http://www.mfpl.ac.at/)), and IST Austria - [http://ist.ac.at/](http://ist.ac.at/) located close to Vienna.

For PhD students there are two programs on the Biocenter campus, and one at IST Austria.

The two programs of the Vienna Bio Center are the MFPL program (MFPL only - [http://www.mfpl.ac.at/phd-program/](http://www.mfpl.ac.at/phd-program/)) and the VBC program (campus-wide - [http://www.vbcphdprogramme.at/](http://www.vbcphdprogramme.at/)). The MFPL and VBC PhD programs hold two selection rounds each year. PhD studentships are generally for three years (maximum of four) and are paid from group leader funds.

The full funded PhD fellowships at IST Austria are generally for four years (maximum of five). Application deadline for students starting in September is January 15 ([http://ist.ac.at/graduate-school/phd-program/](http://ist.ac.at/graduate-school/phd-program/)).

Students may also apply for external fellowships, e.g. from the Austrian Academy of Sciences (DOC program - [http://stipendien.oeaw.ac.at/de/stipendium/doc-doktorandinnenprogramm-der-österreichischen-akademie-der-wissenschaften](http://stipendien.oeaw.ac.at/de/stipendium/doc-doktorandinnenprogramm-der-österreichischen-akademie-der-wissenschaften)) or Boehringer Ingelheim Funds ([http://www.bifonds.de/fellowships-grants/phd-fellowships.html](http://www.bifonds.de/fellowships-grants/phd-fellowships.html)).

Post-docs generally apply directly to individual labs. Funding is either from group leader funds or through competitive fellowships secured by the candidate (e.g. EMBO - [http://www.embo.org/programmes/fellowships/long-term.html](http://www.embo.org/programmes/fellowships/long-term.html), HFSP - [http://www.hfsp.org/funding/postdoctoral-fellowships](http://www.hfsp.org/funding/postdoctoral-fellowships), EU - [http://ec.europa.eu/research/mariecurieactions/index_en.htm](http://ec.europa.eu/research/mariecurieactions/index_en.htm), Austrian Science Fund - [http://www.fwf.ac.at/en/research-funding/fwf-programmes/meitner-programme/](http://www.fwf.ac.at/en/research-funding/fwf-programmes/meitner-programme/)). There is also one institutional program at MFPL ([http://www.mfpl.ac.at/vips/](http://www.mfpl.ac.at/vips/)), which is currently the only one of its kind in Austria.

IST Austria also offers postdoc fellowships through the ISTFELLOW program which is partially funded by the European Union ([http://ist.ac.at/research/postdoctoral-research/istfellow/](http://ist.ac.at/research/postdoctoral-research/istfellow/)). The two application deadlines for the ISTFELLOW program are September 15th and March 15th. Internally funded postdoc positions are also available.

There are also a variety of schemes to promote travel and collaboration abroad. In general I would recommend contacting individual group leaders or their host institutions for more information via their websites above.
Cell Biology in Brazil

Cell Biology is a dynamic field that goes much beyond the idea of a scientist poring over a microscope, an image that easily comes to our minds when we tell our students how the cell was first studied. To be a cell biologist today means to be aware of new conceptual and methodological approaches, which involve live cell imaging, ultrastructure, molecular biology, nanotechnology, genetics, biochemistry, computational biology among others, and that end up to blur the frontiers and result in the integration of areas.

In Brazil, Cell Biology research and teaching is largely developed inside public Universities and Research Institutes; being mainly funded by governmental agencies, which means applying for grants and fellowships most of time. Recently, efforts have been made to increase support and improve the quality of research and training. In that way, the funding coming from CNPq, CAPES, FINEP, and state foundations (FAPs) as FAPESP and FAPERJ has substantially augmented in the last two decades. Recently, new private research institutes have started to contribute to Cell Biology production and education as well. Though cell biologists are more concentrated in São Paulo and Rio de Janeiro, young teams are being formed from the south to north of the country, and the Brazilian Society for Cell Biology (SBBC) gathers these scientists during its own congresses, symposia and courses or during meetings of the Brazilian Federation for Experimental Biology (FESBE) and the Brazilian Society for Science Progress (SBPC).

The Brazilian Society for Cell Biology (Sociedade Brasileira de Biologia Celular SBBC)

SBBC was founded in 1978 by Professor Luiz Carlos U. Junqueira, who planned the first Cell Biology meeting. Since that time, 24 other symposia and congresses have been organized, and those first hundred cell biologists turned out to be more than 2000 affiliated in 30 years. In 1990, Prof. Gregorio Montes made an effort to make SBBC exist as a non-profitable entity that would be able to apply for governmental funding and represent the community. Under the leadership of Professors Eduardo Katchburian and Estela Bevilacqua, SBBC bylaws were revised and rewritten to catch up with a society that needed to be more integrative and could be considered a forum for cell biology in research, education and ethics. The next step would be to insert the Brazilian Society in the international scenario and that task was accomplished by the 21st century presidents, Luiz Eurico Nasciutti, Estela Bevilacqua, Hernandes F Carvalho, Vilma Martins and Wilson Savino. Under their guidance, excellent biennial meetings have been organized, creating the opportunity to put together lively groups of students, the best cell biologists in the world and great scientists that built the concepts of cell biology in Brazil.

Currently, SBBC board is working hard to represent the community at different instances of discussion that involve governmental policies; to increase the collaboration among Brazilian cell biologists from distant areas in the country; to stimulate the multidisciplinary approach through activities during the meetings. Finally, the SBBC has spared no efforts in connecting the Brazilian Cell Biology researchers with the international community. A reflection of that was the success of the International Cell Biology Congress in 2012 and the XVII Meeting in 2014.

Based on these premises and on the fact that Cell Biology in Brazil will be able grow much faster than in the last 30 years, we believe that young cell biologists will face the challenge of answering old and new questions with modern techniques in a science without borders.
International Exchange Opportunities

In the recent years, research funding agencies have emphasized the need and the importance of international exchange. As a consequence, several fellowships were launched with the specific purpose of encouraging international cooperation. These fellowships cover different levels of training, and more details can be obtained at their respective websites.

The major funding institutions that have fellowships for international researchers are:

- **Coordination for the Improvement of Higher Level -or Education- Personnel (CAPES)**
  
  www.capes.gov.br

- **National Council for Scientific and Technological Development (CNPq)**
  
  http://www.cnpq.br/view/-/journal_content/56_INSTANCE_0oED/10157/100343

- **State funding agencies (Fundações de Amparo à Pesquisa Estadual FAPs)**
  
  These are funded and managed by each State of the Federative Republic. A comprehensive list can be found at: http://www.confap.org.br/asfaps.php

In particular, the CNPq and CAPES agencies have joined efforts in the Science Without Frontiers Program aimed at promoting international exchange and mobility. These fellowships cover 12-36 months visit and include stipend, grant money, airline fees and accommodation aid. Application details and deadlines can be found at: http://www.cienciasemfronteiras.gov.br/web/csf-eng/motivation

Some State Funding Agencies also have their own Visiting Research Fellow Grants that will cover the costs of an extended visit from a foreign researcher with a PhD for a period of one year. Application details and deadline vary for each State Funding Agency. Examples of these fellowships for some States:

- Minas Gerais: www.fapemig.br

Finally, some Universities also provide short duration fellowships for visiting researchers and professors. Most of the above require the sponsorship of a Brazilian researcher, but the extent of the co-sponsor´s responsibilities will vary depending on the fellowship.

Written by SBBC board of directors
Cell Biology in Canada 2014

For Undergraduates/Graduates

Canadian Institute of Health Research (CIHR):

- **Graduate Scholarships Master's Awards**
  
  **Description**
  
  The Canada Graduate Scholarships Master's Awards are intended to provide special recognition and support to students who are pursuing a Master's degree in a health related field at a Canadian institution. These candidates are expected to have an exceptionally high potential for future research achievement and productivity.

  Some Canada Graduate Scholarship recipients may be considered for the honour of having their scholarship named a “Canada Graduate Scholarship to Honour Nelson Mandela”, should CIHR deem their application to be aligned with at least one of five themes championed by Mandela: national unity; democracy; freedom and human rights; leadership; children’s participation in society; and children’s health.

  For detailed information, visit Tri-Agency Harmonization of the Canada Graduate Scholarships.

- **Funds Available**
  
  CIHR and external partners financial contributions for this initiative are subject to availability of funds. Should CIHR or external partners funding not be available or be decreased due to unforeseen circumstances, CIHR and their partners reserve the right to reduce, defer or suspend financial contributions to awards received as a result of this funding opportunity.

  - The total amount available for this funding opportunity is $7M, enough to fund approximately 400 awards.
  - Trainee stipend: $17,500 per annum.

- **Objectives**
  
  The specific objective of the Government of Canada's Canada Graduate Scholarships program is to help ensure a reliable supply of highly qualified personnel to meet the needs of Canada's knowledge economy.

- **Eligibility**
  
  Eligibility criteria for all CIHR research funding programs apply. The business office of the institution of an eligible Nominated Principal Applicant generally administers CIHR funds. Refer to the Individual Eligibility Requirements regarding the eligibility requirements for individuals and institutions.

  For detailed information on eligibility, visit Tri-Agency Harmonization of the Canada Graduate Scholarships.

- **New Investigator Salary Award: Winter 2014 Priority Announcement (Specific Research Areas)**
  
  **Description**
  
  Priority Announcements on New Investigator Salary Award competitions offer additional sources of funding for highly rated applications that are relevant to specific CIHR research priority areas or mandates. Applications are submitted through the "201412MSH" competition of the New Investigator Salary Award: 2014-2015 funding opportunity.

  The New Investigator Salary Award program is designed to provide outstanding New Investigators the opportunity to develop and demonstrate their independence in initiating and conducting health research through provision of a contribution to their salary. A New Investigator is defined as a researcher who has held a full time research appointment for a period of 0 to 60 months as of the December competition deadline.
Funds Available
CIHR's and partner contribution to the amount available for this initiative is subject to availability of funds. Should CIHR or partner funding levels not be available or are decreased for some unforeseen circumstances, CIHR and partner reserve the right to defer or suspend payments to awards received as a result of this funding opportunity.

Funds Available for Research in All Areas
Funds are available for applications in all areas of research that address any important health problem or issue through the "201412MSH" competition of the New Investigator Salary Award: 2014-2015 funding opportunity.

Funds Available for Research in Specific Areas
In this competition, funds are available to encourage and support applications in specific areas that are aligned with CIHR's research priority areas and mandates. Information on the research areas to be funded as well as the maximum amounts per award that can be requested is found in the "Objectives" section.

- Inflammatory Bowel Disease
- Ontario HIV Treatment Network
- Research in First Nations, Inuit and/or Métis Health
- Transfusion Science

Natural Sciences and Engineering Research Council of Canada (NSERC):
- Undergraduate Student Research Awards Program
  Undergraduate Student Research Awards (USRA) are meant to stimulate your interest in research in the natural sciences and engineering.
  Eligibility: be a Canadian citizen or a permanent resident of Canada; be registered, at the time you apply, in a bachelor's degree program at an eligible university; and have obtained, over the previous years of study, a cumulative average of at least second class (a grade of "B" or "B-," if applicable) as defined by your university.

For Postdocs

Canadian Institute of Health Research (CIHR):

- Science Policy Fellowships (Winter 2014 Competition)

Natural Sciences and Engineering Research Council of Canada (NSERC):
- Postdoctoral Fellowships Program
  The Postdoctoral Fellowships Program provides support to a core of the most promising researchers at a pivotal time in their careers.
  Eligibility: be a Canadian citizen or a permanent resident of Canada

Mitacs:
- Mitacs-Accelerate Fellowship
Mitacs-Accelerate is Canada’s premiere research internship program. It connects companies with over 50 research-based universities through graduate students and postdoctoral fellows, who apply their specialized expertise to business research challenges. Interns transfer their skills from theory to real-world application, while the companies gain a competitive advantage by accessing high-quality research expertise.
Link: http://www.mitacs.ca/accelerate

- **Mitacs Elevate fellowship**
  The Mitacs Elevate Postdoctoral Fellowship program supports recent PhD graduates to work on a joint industry-academia research project for two years. Fellows lead the collaboration and spend about half of their time at the university and half at the company. In addition, Mitacs provides the fellows with business skills training so they are well positioned to take on R&D leadership roles at the end of the program.
  Link: http://www.mitacs.ca/elevate
CELL BIOLOGY IN CHINA

Chinese Society for Cell Biology (CSCB) was funded in 1980 and has over 7,000 members working at more than 200 universities and 40 institutes of the Chinese Academy of Sciences and Chinese Academy of Medical Sciences.

CSCB is dedicated to the goals of facilitating the exchange of knowledge and innovation through conferences and journals, establishing research collaborations, providing training and development opportunities to students and young science professionals, and spreading the basic scientific knowledge to the general public about cell biology and biomedicine in order to improve civic education. In addition, Chinese cell biologists are very interested in collaboration and communication, within China and internationally. A couple hundred of cell biology labs in China have the capacity to accept foreign students or postdocs. Most of them are well equipped with relatively advanced instruments such as confocal microscopes, flow cytometers, electron microscopes, 2DE system, etc. And most updated techniques like RNAi, tandem affinity purification are routinely performed.

Also, distinguished scholars are particularly welcomed to collaborate on research projects or to deliver advanced lectures. Most national or provincial key laboratories have all essential and sometimes advanced teaching facilities, including multiple medium-interactive teaching systems or remote education facilities. In some cases special funds are available to provide teaching materials and to cover international collaborators’ accommodation and travel expenses. The CSCB office will be helpful for both foreign and Chinese sides to find suitable partners.

CSCB has 4 working committees and 12 specialized committees:

**Working committees:**
- The Youth Working Committee
- The Academic Working Committee
- The Science Popularization & Education Working Committee
- The Management Committee for Cell Biological Development Fund

**Specialized committees:**
- The Chromosome, Genomics and Protein Committee
- The Cell Ultrastructure and Function Committee
- The Cell Differentiation and Development Committee
- The Cell Signal Transduction Committee
- The Immune Cell Biology Committee
- The Medical Cell Biology Committee
- The Cell Engineering and Transgenic Organisms Committee
- The Neuralcytology Committee
- The Functional Genomics and System Biology Committee
- The Botanical Organogenesis Committee
The Stem Cell Biology Committee

The Regeneration of Cell Biology Committee

Since its advent, CSCB has consistently achieved its established goals. Through national conferences, which are held once every two years, and specialized meetings, CSCB has created a platform for all its members to participate in academic exchange. The biennial conference is widely recognized as the most important event for CSCB members. It takes place in different cities within China, with about more than 1500 attendees each time. By taking this opportunity, people present their research achievement, find collaborators, join different training courses, and enjoy various social activities during the meeting.

Shanghai Institute of Biochemistry and Cell Biology

Shanghai Institute of Biochemistry and Cell Biology (SIBCB) established in May 2000 is the merger of Shanghai Institute of Biochemistry (founded in 1958) and Shanghai Institute of Cell Biology (founded in 1950). The SIBCB is a member of Shanghai Institutes for Biological Sciences (SiBS) under the Chinese Academy of Sciences (CAS). Dr. Xiaolong Liu is the Director.

The SIBCB is one of the leading institutions in the field of the life sciences in China. The scientists in SIBCB have accomplished several scientific achievements over the last century, including the total synthesis of crystalline bovine insulin, the total synthesis of yeast alanine tRNA, the artificial propagation of domestic fresh-water fish and artificial monogenesis of oocytes.

The main missions of SIBCB are to conduct human-health-relevant cutting-edge research, nurture research talents, and foster an innovative and inspiring research culture, aiming to become one of the top world-class research institutions.

SIBCB currently has 60 Principal Investigators (PI) leading their independent research groups, 25 postdoctoral fellows, 398 graduate students, 333 research scientists and technical staff, and 20 administrative staff. Among the 60 PIs, ten are members of the Chinese Academy of Sciences or Chinese Academy of Engineering, 26 are supported by CAS “Hundred Talent Program”, 17 have obtained the National Science Fund for Distinguished Young Scholars.

The research at SIBCB focuses on protein sciences, gene, RNA, epigenetic regulation, signal transduction, cell and stem cell biology, cancer and other diseases. In addition, SIBCB is also actively involved in translational research using animal models and drug-target-oriented small molecule screening.

SIBCB has been actively seeking national and international academic collaborators. It has established more than 22 partnerships with institutions, universities, and organizations world-wide including Max-Plank Society of Germany, Asian-Pacific International Molecular Network (A-IBMN), RIKEN of Japan and the University of Toronto of Canada. To promote scientific exchanges between China and other countries, SIBCB has been collaborating with Nature Publishing Group in issuing the peer-reviewed international journal Cell Research monthly, which is considered as a highly respected journal in molecular cell biology field.

Institute of Biophysics, Chinese Academy of Sciences (IBPCS)

Founded in 1958, IBPCS is China’s leading national research center for protein science, brain and cognitive sciences. The institute focuses its effect on basic research targeting world-class frontier sciences, innovation and development in scientific methods and instruments, and training of new generation of scientists. It also serves as a think-tank for the government in the related fields. The institute currently has two National Laboratories, i.e., the National Laboratory of Biomacromolecules and the State key Laboratory of Brain and Cognitive Sciences. The National Laboratory of Protein Science, approved by the Ministry of Science and Technology of China in 2006, is under construction. The institute has developed five research centers, namely Center for Structural & Molecular Biology, Center for Computational & Systems Biology, Center for Brain & Cognitive Sciences, Center for Infection & Immunity, and Center for Brain Mapping. The institute hosts 390 faculty and staff, including 9 CAS Academicians and 65 principal investigators. Currently, there are
488 graduate students enrolled in different programs at the institute. About half of them are Ph.D. candidates. There are 48 postdoctoral fellows from various part of the world working here.

**Guangzhou Institutes of Biomedicine and Health (GIBH)**

Guangzhou Institutes of Biomedicine and Health (GIBH) was established in 2003 by the Chinese Academy of Sciences in partnership with the City of Guangzhou and the Province of Guangdong. GIBH is located at 190 Kai Yuan Avenue, Science Park, which is a newly constructed campus with five buildings containing state of the art, fully equipped research laboratories. Currently, the institute employs approximately 350 staff members as well as mentors 230 students with an annual operating budget of $20M. Unlike other institutes throughout China, in addition to championing basic science and academic exploration, a primary objective for GIBH is drug discovery research and the advancement of new therapeutics into clinical trials. The mission of GIBH is to serve the citizens of China and the world through discovery, learning and engagement by integrating both biological and chemical sciences for the improvement of human health.

GIBH consists of three primary departments including: (1) Stem Cell Biology & Regenerative Medicine (iSCBRM); (2) Chemical Biology (iCB); and (3) Infection & Immunity (I3). Additionally, a new Drug Discovery Pipeline (DDP) was created in 2009 to broaden the benefit from the core departments and to promote applied science with an emphasis on drug development.

Various positions at GIBH are currently available. Whether it's pursuing original science in the laboratory or research and development of new medicines, GIBH offers opportunities to develop and expand your career while making a true difference in the scientific community. Please visit our website at [http://www.gibh.cas.cn/](http://www.gibh.cas.cn/) or [http://english.gibh.cas.cn/](http://english.gibh.cas.cn/).

Chinese government attaches great importance to international cooperation. The Ministry of Science and Technology of China, the Ministry of Education, the National Natural Science Foundation of China, the State Administration of Foreign Experts Affairs, and the Chinese Academy of Sciences all have programs that support international cooperation and exchange. IBPCAS has developed a network of cooperation with 16 countries throughout the world. The institute has established 6 joint research centers or laboratories with international institutions and companies. The institute developed guest professors program and annually organizes several international conferences/meetings and over 50 seminars presented by invited international scholars.
Cell Biology in Czech Republic

At the present time, cell biology enjoys a robust position within Czech universities, the Life Science Institutes of the Czech Academy of Sciences, as well as the Ministerial Life Science Research Institutes (links to major universities and Academy of Sciences institutes are provided below). However, it has to be emphasized that the major improvement and massive performance of Czech cell biology (as well as the majority of other life science disciplines) occurred only gradually after democratic changes associated with the Velvet Revolution at the end of 1989. Indeed, the possibility to visit (work in) “Western” laboratories was rather exceptional prior to these changes. The Czech currency was not convertible (unlike today when it is fully convertible) so that laboratory supplies and new instruments from the “West” were difficult to obtain. Curiously enough, even access to literature proved tricky because even photocopying facilities were “regulated.”

The history of Czech cell biology deserves to be remembered, but only the present and future are what matters. Today, Czech cell biologists live in a completely different world and there are a variety of local and international “avenues” available for their scientific endeavors. Czech undergraduate and postgraduate students can freely leave for “Western” faculties/institutions and cell biology investigators can work in “Western” laboratories. As a consequence, up-to-date cell biology knowledge, including new technologies, has been incrementally brought back to the home country on a rather massive scale. Importantly, the number of foreign PhD students and investigators in cell biology that study/work in the Czech Republic has been gradually increasing, especially over the past decade when the rise has been exponential. The democratic changes also resulted in the complete revision of local science policies and led to the establishment of grant systems based on the “Western” model.

The Czech Science Foundation (links to major grant and fellowship providers are given below) is the principal provider of grants devoted to basic research and encompasses most cell biology projects. The Technology Agency of the Czech Republic supports application projects in which companies also have to participate. Numerous projects are supported by the Ministry of Education, via direct support, or via support through universities or the Czech Academy of Sciences. Recently, several Scientific Centers have been established (e.g. in Brno, Olomouc, České Budějovice and Vestec) thanks to financing coming mainly from the European Union (EU). Cell biologists can apply for a variety of competitive foreign grants. These also include installation grants for which both Czechs and foreigners can apply in order to establish themselves in the Czech Republic. Today, regular collaboration between Czech cell biology groups has become the norm and numerous Czech cell biology laboratories participate in various international, and particularly European, joint bilateral or multilateral projects.

Importantly, current science policy in the Czech Republic places great emphasis on PhD studies. Despite minor differences, the rules are very similar at various universities, and support for PhD students based not only at various university faculties (e.g. http://www.lf1.cuni.cz/en/doctoral-
studies1), but also at the institutes of the Czech Academy of Sciences, as well as ministerial research institutes, has been implemented. For instance, Charles University in Prague, which also has faculties in Pilsen and Hradec Králové, became a center of education and science for the whole region for postgraduate studies. The “Biology and Pathology of the Cell” Commission of Charles University, oversees students in cell biology, as well as a number of students from overlapping disciplines.

**Czech Society for Cell Biology, z.s.**

The Czechoslovak Biological Society was established already in 1922. Due to the ongoing extensive specialization that was taking place in the life sciences, an imminent need emerged to establish a society specialized for research on the cell. Historically, scientists approached the understanding of cell function in three ways. Biochemists and molecular biologists tend to look at the mechanisms of reactions that occur under cell-free conditions, often from purified components. Geneticists have isolated mutants that affect cell function and use the resulting phenotypes to deduce the function *in vivo* of particular proteins. Finally, morphologists and structural biologists have tended to observe meticulously the structure of the cell and its constituents under varying conditions, and utilize changes in structure to deduce the functional role of various cellular regions, macromolecular complexes or individual macromolecules. Over the last several decades, a synthesis of all of these disciplines has been steadily emerging under the term "cell biology." Cell biologists combine all these approaches in order to understand the problems associated with cell function.

The Czech Society for Cell Biology, z.s. ([www.cscb.cz; links to selected local and European/International Scientific Organizations are provided below](http://www.cscb.cz)) was established as the independent Society in 2014. The Society has grown out of the Cell Biology Section of the Czechoslovak Biological Society, with the continuity of its aims being preserved. The Society is involved in research progress in all disciplines of cell biology. The Society has extensive teaching activities that include both undergraduate and postgraduate students. The Society also helps to promote the careers of early career investigators, and is involved in the organization of lecture courses, as well as local and international symposia, workshops and practical courses.

Ivan Raška, Chairman, Czech Society for Cell Biology, z.s.
Institute of Cellular Biology and Pathology
First Faculty of Medicine, Charles University in Prague ([http://lge.lf1.cuni.cz/](http://lge.lf1.cuni.cz/))

**Links:**

**Czech Cell Biology at Universities and Academy of Science of the Czech Republic** (4 largest universities are mentioned; Charles University in Prague has also faculties in Pilsen and Hradec Králové)

Major Czech Grants & Fellowships

Czech Science Foundation  http://www.gacr.cz/en/
Fulbright Commission  http://www.fulbright.cz/

International Grants & Fellowships

EMBO  http://www.embo.org/funding-awards
FEBS  http://www.febs.org/index.php?id=81
European Science Foundation - ESF  http://www.esf.org/
Human Frontier Science Program - HFSP  http://www.hfsp.org/funding
Wellcome Trust  http://www.wellcome.ac.uk/index.htm
Norway Grants  http://eeagrants.org/
NATO  http://www.nato.int/cps/en/natolive/78209.htm
EU  http://ec.europa.eu/rea/funding_opportunities/index_en

Major Czech Life Science Societies

Czechoslovak Biological Society  http://www.icsbs.cz/
Czech Society for Biochemistry and Molecular Biology  http://www.csbmb.cz/
Czechoslovak Society for Microbiology  http://www.cssm.info/english
Czechoslovak Microscopy Organization  http://www.microscopy.cz
Czech Physiological Society  http://cfs.lf1.cuni.cz/
Society of Medical Genetics  http://www.slg.cz/
Czech Society of Pathologists  http://www.patologie.info/
Union of Czech Mathematicians and Physicists  http://www.jcmf.cz/?q=en
(biophysics)

Chosen International Cell Biology, Molecular Biology and Biochemistry Organizations

International Federation for Cell Biology (IFCB)  http://wp.ifcbiol.org
European Molecular Biology Organization (EMBO)  http://www.embo.org
Federation of European Biochemical Societies (FEBS)  http://www.febs.org
The European Research Council (ERC) is the first pan-European funding body designed to support investigator-driven frontier research and stimulate scientific excellence across Europe.

The ERC aims to support the best and most creative scientists to identify and explore new opportunities and directions in any field of research (Physical Sciences and Engineering, Life Sciences and Social Sciences and Humanities). There are no thematic priorities. In particular, it encourages proposals which cross disciplinary boundaries; address new and emerging fields and introduce unconventional and innovative approaches. Since 2007, it has funded some 4,000 research projects throughout Europe, and has become a “benchmark” of the competitiveness of national research systems, complementing existing funding schemes at national and European levels.

The ERC awards long-term grants to individual researchers of any nationality and age who wish to carry out their research projects in a host organisation based in Europe. Excellence is the sole criteria for evaluation.

Many ERC projects in Cell Biology address key societal challenges. The projects presented in this brochure are investigating: the role of the cortex in cellular morphogenesis; the role of integrins in the development of cancer cells; the transition from single to multi-cellular organisms at the interface between physics, fluid dynamics and cell biology; the role of mitosis in chromosome formation; why some people age earlier than others; and why they develop cancer and how the endodermis helps plants grow in stressful situations such as an adverse climate.
The role of the cortex in cellular morphogenesis

The cortex is central to the functioning of the cells, but we know very little about how it behaves.

Dr Paluch’s ERC-funded research is a cross-disciplinary project at the interface between molecular cell biology and biophysics. Dr Paluch’s ERC project takes a technically sophisticated approach to a fundamental question in cellular biology: the significance of the cellular cortex for cell morphogenesis. The cell cortex is a cytoskeletal network that lies under the plasma membrane and is vital to determining the shape of most animal cells. The cortex enables the cell to resist external stresses and to carry out mechanical functions. As such, the cortex is key to normal physiology, especially during cell deformation processes such as cell division and cell locomotion. Disregulation of cortex function has also been involved in cancer progression. Cortex mechanics are central to its physiological functions, which rely on the cortex’s ability to exert force and contract. Dr Paluch’s research looks at the control of the physical properties of the cortex because she argues that cortex function in cell physiology cannot be understood, or studied, in isolation from its mechanics. The cortex is intrinsic to cellular morphogenesis, but previous research has failed to adequately track how it is assembled, regulated, and how its mechanical properties are determined. Until now.

Dr Paluch’s MORPHOCORDIV project seeks to understand more about how the cortex works and how it affects cells’ morphological behaviour, particularly during cytokinesis, the final step of cell division. The focus of the project is to investigate the intrinsic morphogenetic potential of the cortex: what cellular shapes can emerge as a consequence of the basic mechanical properties of the cortex, without additional intra- and extra-cellular processes. Central to this investigation is the regulation and role of specific mechanical properties of the cortex, in particular cortex tension, the rate of turnover and the elasticity of the cell. By combining cell biology, quantitative imaging and theoretical modelling Dr Paluch and her team are examining what happens to the process of cell division when these variables are altered.

This ERC-funded project is investigating the founding principles of cell morphogenesis by exploring what happens to cells when you regulate and alter key physical parameters and how fine-tuning these parameters can lead to unity in apparently disparate morphogenetic behaviours. By revealing the intrinsic shape-generating potential of the cortex Dr Paluch and her team aim to reach a greater understanding of how this potential is used and controlled during cell division. The principles unveiled by this project will help understand cell shape control during cell and tissue morphogenesis.

Principal Investigator: Dr Ewa Paluch
Host Institution: University College London (UK)
ERC Project: The inherent morphological potential of the actin cortex and the mechanics of shape control during cell division (Morphocordiv)
ERC Call: Starting Grant 2012
ERC Funding: €1.5 million for five years
Researcher’s web page: http://www.ucl.ac.uk/lmcb/research-group/ewa-paluch-research-group
The role of integrins in the development of cancer cells

Dr Ivaska’s ERC-funded project investigated the role of integrins in cancer progression and metastasis. Integrins are receptors that mediate the interactions between a cell and its surroundings. Dr Ivaska’s research explored the role of integrins in the development of cancers, specifically the tumorigenesis process. In tumorigenesis, the integrins regulate cell proliferation and migration, and are vital to cell division.

Mortality amongst cancer patients is predominantly caused by the invasion of malignant cells and the spreading of cancer to other parts of the body, known as metastasis. In order to better understand this process, Dr Ivaska and her team worked on integrin signalling processes and how shared integrin functions impacted upon cell division and motility. A clearer understanding of this process is vital to our awareness of how cancer cells move and progress towards increasing malignancy. Dr Ivaska’s founding thesis for her project is that only when we know more about this process can we begin to seek rational strategies for cancer therapy which focus on targeting cancer proliferation and dissemination at the cellular level.

In order to achieve this, Dr Ivaska and her team examined three interlinked processes in the development of cancer which involve integrin signalling, an area that has received very little scientific attention. Firstly, they looked at the role of integrins in cell division (a process known as cytokinesis). Their hypothesis was that as coordination between the cytoskeleton and the membranes is needed both for cell division and motility, there should be shared integrin functions which regulate both processes. Secondly, they explored integrin signalling as a dynamic process at the point of cell invasion. The rationale for this investigation was that a regulated study of integrin-protein complexes at this stage would reveal more about how movement of cancer cells in tissues is dictated. Finally, they examined segments of integrins as the foundations for integrin signalling, looking particularly at how the interaction of integrins and proteins within the membrane changes signalling behaviour.

The Cancer Signalosomes project used state-of-the-art techniques to gain a novel mechanical insight into the diverse roles integrins play in cancerous cells. The team relied on innovative techniques in their investigations, such as RNAi cell arrays for detecting integrin traffic, cell motility and multiplication; laser-micro-dissection and protein-protein interaction screens. The aspiration was for a more rigorous understanding of how cancer proliferates throughout the body, and the role of integrins in this degenerative process.

Principal Investigator: Dr Johanna Ivaska
Host Institution: Valtion Teknillinen Tutkimuskeskus (Finland)
ERC Project: Spatially and temporally regulated membrane complexes in cancer cell invasion and cytokinesis (Cancer signalosomes)
ERC Call: Starting Grant 2007
ERC Funding: €1.5 million for five years
Researcher’s web page: http://www.btk.fi/research/researchgroups/ivaska/
The transition from single to multi-cellular organisms

What happens in the transition from single to multi-cellular organisms? Prof Goldstein’s ERC-funded research seeks to find out.

Prof Goldstein’s BIOCOMPLEX project is at the interface between physics, fluid dynamics and cell biology. His research combines theoretical principles and microscopic analysis in order to better understand nothing less than the scaling laws governing the size of cellular life. Central to understanding the move from single to multi-cellular organisms is an in-depth awareness of the effects of this process on microscopic life in fluid environments, investigated from both a theoretical and an empirical perspective. Prof Goldstein’s contention is that by studying transportation and sensing in complex multi-cellular organisms we will reach a finer comprehension of how these processes impact upon the transition from single to multi-cellular organisms.

Prof Goldstein and his team are tracking these processes in algae so that they can map out what these transitions tell us about evolutionary processes. In addition to this, they are exploring the dynamics of organisms: how they enable motility and nutrient transport for example. A second strand of this investigation is cytoplasmic streaming in both aquatic and terrestrial plants, specifically how the process by which fluid circulates constantly in a cell can teach us more about cellular characteristics. The role of metabolism in this fluid movement is also something of interest for the BIOCOMPLEX project. Once these areas have been examined, Prof Goldstein and his team will investigate the implications of their discoveries for internal transport, homeostasis and large cell division.

ERC funding enables this research to illuminate the quantitative physical basis for a fundamental theoretical concept: the elementary steps along the path towards biological complexity.

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Principal Investigator: Prof. Raymond E. Goldstein
Host Institution: University of Cambridge (UK)
ERC Project: Physical aspects of the evolution of biological complexity (BIOCOMPLEX)
ERC Call: Advanced Grant 2009
ERC Funding: €2.5 million for five years
Researcher’s web page: http://www.damtp.cam.ac.uk/user/gold/
Mitosis and chromosomes

Mitosis is a vital process by which cells divide. Prof Maiato’s ERC-funded research aims to understand more about its impact upon the fidelity of chromosome segregation, in particular how the gain or loss of a chromosome can cause cancers or birth defects.

Mitosis is mediated by a specialized microtubule (MT)-based structure known as the mitotic spindle. Mitotic spindle dynamics are controlled by the kinetochore (KT) at the interface between MTs and chromosomes, which regulates MT turnover and corrects defects during cell division. Once corrected, KTs stably attach to MTs to drive chromosome segregation into two genetically identical daughter cells. Understanding the relationship, and mapping the interactions, between these two vital components of cellular mechanics will help us to understand more about the origin and progress of cancers or birth defects.

Prof Maiato’s research concentrates on a fundamental question: the need for a greater understanding of how the KT is regulated during mitosis to ensure the fidelity of the process. Prof Maiato and his team are looking at the interaction of the KT and the mitotic spindle MTs in space and time in order to reach a greater understanding of how the two components affect chromosome segregation. To achieve this, they are using biochemical techniques and genome-wide RNAi screens, combined with state-of-the-art technologies such as live-cell microscopy and pilot laser microsurgery to investigate the role played by selected genes in this process. These experimental approaches will be complemented by an investigation of the impact caused by chromosome segregation errors in mammalian modelling systems in vivo.

Central to this project is the exploration of how the addition or subtraction of a chromosome affects an essential process for life, with strong implications for human health. This knowledge will be critical for our understanding of how cancer cells develop, but it will also allow us to devise ways to control the process, with the ultimate aim of leading cancer cells to “commit suicide”.

Principal Investigator: Prof. Helder Martins Maiato
Host Institution: Instituto de Biologia molecular e Celular (Portugal)
ERC Project: Spatiotemporal regulation of chromosome segregation fidelity (PRECISE)
ERC Call: Starting Grant 2010
ERC Funding: €1.5 million for five years
Researcher’s web page: http://www.ibmc.up.pt/cid/

Human cancer cells with unstable kinetochore-microtubule attachments after de-regulation of CLASP2 phosphorylation
Ageing, cancer and the length of your chromosomes

The answer to why some people age earlier than others, and why they develop cancer, could lie at the very end sections of our DNA: in the telomeres.

In human cells, DNA is formed into chromosomes which have long sections of DNA at their ends, called telomeres. The main role of telomeres is to protect the ends of the chromosomes, just like plastic ends of shoelaces. Each time a cell divides, the telomeres shorten. Without them, the main part of the chromosome containing our life-giving genes would become shorter, thus preventing our cells from functioning properly. Telomere shortening is known to be associated with cancer, ageing and loss of stem cell function.

The aim of the TEL STEM CELL project was to determine the role of telomere length regulators (such as specific proteins and genes) in cancer, ageing and stem cell biology. For this purpose, normal mice are compared with “knockout” mice: genetically engineered mice that lack the particular gene which the project studies.

In 2009, Professor Blasco’s team showed for the first time that a telomere-binding protein can suppress tumour formation and stop premature ageing of tissues. A gene called TRF1 commands the production of a telomere binding protein and Professor Blasco’s group proved that mice without this gene aged quicker and were more prone to develop cancer. A year later similar functions were demonstrated for other telomere-binding proteins. TPP1, for example, was shown to play an essential role in telomere elongation by recruiting the protein telomerase to the chromosome ends.

Unexpectedly, Blasco’s team also discovered that RAP1 - the most conserved telomere binding protein in evolution - is dispensable for telomere protection in mammals. Instead, the main function of RAP1 is to bind along chromosome arms and regulate gene expression. More recently, Blasco’s group found that RAP1 is a key regulator of metabolism. Indeed, mice with no expression of RAP1 were obese and developed signs of metabolic syndrome. This has opened an unprecedented link between telomeres and metabolism.

The project has also studied the effect of telomere-length regulators on stem cell behaviour and pluripotency, in order to better identify the role played by stem cells in ageing and cancer. Blasco has succeeded in generating mice deficient in the “Tin2” regulator, which can cause diseases such as aplastic anaemia and pulmonary fibrosis. The group plans to study the role of Tin2 in disease as well as its potential as a therapeutic target.

Professor Maria A. Blasco has made major contributions to the field of telomeres and telomerase. She is one of the leading experts in telomere science and has authored over 150 scientific papers. She has received the EMBO Gold Medal and was appointed to the EMBO Council in 2008.

Principal Investigator: Prof. Maria Blasco

Host Institution: Fundación Centro Nacional de Investigaciones Oncológicas (Spain)

ERC Project: From telomere chromatin to stem cell biology (TEL STEM CELL)

ERC Call: Advanced Grant 2008

ERC Funding: €2 million for five years

How plants stay fit

Any diet advice tells us we are healthier when we are selective: choosing nutritious options and avoiding toxins. The same concept applies to plants. They may not have a conscience but they do have an endodermis, or selective “inner skin”, in their roots. This useful layer filters nutrients from toxins, determining how well the plant grows. Starting grantee Niko Geldner studies how this cell layer helps plants grow in stressful situations - with less water, less nutrients or a worse climate. His results could have practical implications for improving crops’ productivity without the need for fertilisers and helping them survive in a changing climate.

The endodermis is found in the roots of all plants and is a thick cell layer around the central nerve. Scientists have known about it for around 150 years, as a crucial part of the root for selecting nutrients. However, not much research had previously been done on the mechanisms involved, particularly at the molecular or genetic level. On receiving their ERC grant, Niko Geldner and his team were determined to discover more.

The group’s first success was to identify some genes which build the endodermis, already going further than any earlier studies. They then used this information to create the first mutant plants with a defective endodermis, in order to study the role of the endodermis in plants’ growth and basic survival. Based on all previous research, the expectation was that the mutant plants would simply die, due to lack of nutrition and absorption of toxins - but the results were quite different.

Surprisingly the mutant plants grew quite well under normal conditions of light, moisture and temperature. However, as soon as they were exposed to any slight adjustment in their environment, they began to show signs of stress – wilting, their leaves turning brown or reduced growth. So the plants could survive without the endodermis in ideal conditions, but the cell layer was essential in helping them cope with changing environmental factors.

“These results opened up a whole new array of questions for us,” Geldner commented, “We now want to continue our research to ask what the endodermis is really there for and how it helps plants adapt to unexpected fluctuations in their surroundings.”

Geldner is also keen to focus more on the applications of his research for better agricultural processes. He believes building on the results of this project could help crop farmers deal with the ever-growing problems of poor soil and more extreme weather. “At the moment people often throw fertiliser on crops, giving them tens more nutrients, because they don’t understand why they are failing under different conditions. Understanding the selectivity of the endodermis could provide solutions to these problems.”

Niko Geldner made great advances in our knowledge of plant genetics and cell biology during his grant, but he is not going to stop there – he already has extensive plans for the future. He describes the ERC calls as a “fantastic system” which really gave him time to fully develop his ideas - and has left him with far more questions than when he began.

Principal Investigator: Dr Niko Geldner
Host Institution: Université de Lausanne (Switzerland)
ERC Project: Plant endomembrane trafficking in physiology and development (PLANT-MEMB-TRAFF)
ERC Call: Starting Grant 2007
ERC Funding: €2 million for five years
Researcher’s web page: http://www.unil.ch/dbmv/page49637_en.html
“The European Research Council has, in a short time, achieved world-class status as a funding body for excellent curiosity-driven frontier research. With its special emphasis on allowing top young talent to thrive, the ERC Scientific Council is committed to keeping to this course. The ERC will continue to help make Europe a power house for science and a place where innovation is fuelled by a new generation.”

Jean-Pierre Bourguignon
ERC President and Chair of its Scientific Council
The ERC funding strategy

The European Research Council (ERC) is the first pan-European funding body designed to support investigator-driven frontier research and stimulate scientific excellence across Europe.

Under the new EU research programme "Horizon 2020", the ERC has a total budget of over €13 billion for the period 2014-2020 available for individual researchers.

The ERC aims to support the best and most creative scientists to identify and explore new opportunities and directions in any field of research (Physical Sciences and Engineering, Life Sciences and Social Sciences and Humanities), without thematic priorities. In particular, it encourages proposals which cross disciplinary boundaries; address new and emerging fields; and introduce unconventional and innovative approaches.

The ERC awards long-term grants to individual researchers of any nationality and age from anywhere in the world who wish to carry out their research projects in a host organisation based in Europe. Excellence is the sole evaluation criterion.

General features of ERC funding

- Long-term individual grants
- One researcher, one host institution, one project
- No consortia, no co-financing
- Open to any field of research, no thematic priorities
- Ground-breaking, high-risk/high-gain, research projects
- Host organisations based in an EU Member State(1), an Associated country(2) or an International European Interest Organisation(3)
- Sole evaluation criterion: scientific excellence of researcher and research proposal
- International peer review evaluation process based on 25 different panels
- Simple procedures that combine flexibility with accountability
- There are restrictions on resubmission: apply only if your project is ready

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1 EU Member States
Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom.

2 Associated Countries
The list of H2020 Associated Countries will be available on the Participant Portal: http://ec.europa.eu/research/participants/portal

3 International European Interest Organisation
A definition of an International European Interest Organisation is available at: http://erc.europa.eu/faq
ERC Starting Grant

ERC Starting grants are designed to support outstanding researchers of any nationality who are starting to develop an independent career and intend to establish their own research team or programme in Europe.

The ERC Starting grant supports young researchers making the transition from working under a supervisor to becoming independent researchers. Investment in research careers right from the beginning will foster the next generation of research leaders in Europe.

**Size of the grant:** up to €2 million
**Duration:** up to five years

In order to apply, researchers must have:
- > 2-7 years of experience since completion of PhD
- > a scientific track record showing great promise
- > a ground-breaking research proposal

For further details: [http://erc.europa.eu/starting-grants](http://erc.europa.eu/starting-grants)

ERC Consolidator Grant

ERC Consolidator grants are designed to support researchers of any nationality at the stage of consolidating their own research team or programme. This grant scheme will strengthen recently created independent and excellent research teams.

The ERC Consolidator grant is a way of addressing the fact that researchers face challenges when they are consolidating their independent careers in Europe. The current situation limits or delays the emergence of the next generation of researchers in Europe. This grant offers researchers a unique opportunity to consolidate their position.

**Size of the grant:** up to €2.75 million
**Duration:** up to five years

In order to apply, researchers must have:
- > 7-12 years of experience since completion of PhD
- > a promising track record of early achievements in their research field and career stage
- > a ground-breaking research proposal

For further details: [http://erc.europa.eu/consolidator-grants](http://erc.europa.eu/consolidator-grants)

ERC Advanced Grant

ERC Advanced Grants provide an opportunity to well-established and outstanding scientists of any nationality to pursue innovative, high-risk research that opens new directions in a field of their choice.

The ERC supports frontier research that opens new directions and breakthroughs and encourages unconventional approaches and investigations at the interface between disciplines.

**Size of the grant:** up to €3.5 million
**Duration:** up to five years

In order to apply, researchers must have:
- > an exceptional scientific leadership profile
- > an excellent scientific track record of recognised achievements in the last 10 years
- > a ground-breaking research proposal

For further details: [http://erc.europa.eu/advanced-grants](http://erc.europa.eu/advanced-grants)
Proof of Concept Grant

ERC-funded frontier projects can produce innovations with economic or social potential. The Proof of Concept grant provides additional funding to ERC grant holders to ensure that excellent ideas do not disappear for lack of investment.

The ERC Proof of Concept grant is a practical way of addressing the fact that researchers find it difficult to attract investors when a concept is in the pre-development stage. Early backing for a concept will support researchers as they bring their ideas to the market. The funding can cover activities such as Intellectual Property Rights, mapping out commercial and business opportunities and technical validation.

Open to ERC grant holders only.
Size of the grant: up to €150 000
Duration: up to 18 months
In order to apply, the researchers must:
> demonstrate that the idea funded by the original ERC grant has innovation potential and significant economic or social benefits.

For further details:
http://erc.europa.eu/proof-concept

ERC Synergy Grant (Pilot)

The ERC Synergy grant is a pilot grant scheme that supports small teams of scientists who wish to jointly address research problems at the frontiers of knowledge bringing together complementary skills, disciplines and resources.

It is increasingly recognised that for complex scientific problems, collaboration between different researchers and their teams, often on an interdisciplinary basis and using shared facilities, can lead to outstanding new ideas and unexpected discoveries.

Size of the grant: up to €15 million
Duration: up to six years
In order to apply, the teams must:
> be composed of 2 to 4 scientists and their research teams
> jointly address complex research topics
> demonstrate that the synergy effects from working collaboratively are fundamental to their project
> a ground-breaking research proposal

For further details:
http://erc.europa.eu/synergy-grants

Calls for proposals
Calls for proposals for the ERC grant schemes are published annually on the ERC website, the Horizon 2020 Participant Portal and in the Official Journal of the European Union. Grant applications can be submitted only in response to a call for proposals via the Electronic Proposal Submission Service (EPPS) within the deadline specified in each call.

http://erc.europa.eu/callforproposals

Non-European researchers
A specific section for non-European researchers is available at:
http://erc.europa.eu/non-european-researchers

ERC National Contact Points
National Contact Points (NCPs) have been set up by national governments to provide information and support to applicants. The list of NCPs can be found at:
http://erc.europa.eu/ncp

ERC Newsletter
Published quarterly, the electronic newsletter contains information about the ERC, its activities, its presence at events worldwide, its grantees and their research. Subscribe at:
http://erc.europa.eu/keep-updated-erc

Further information
http://erc.europa.eu
http://ec.europa.eu/horizon2020

Follow us on:
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Campus-France, a national agency for the promotion of French higher education, offers general information about study opportunities in France. You can customize the search for a suitable programme by selecting language, discipline and the level of education; bachelor (licence), master or PhD (doctoral). You will also find information about possible financial support.

Tuition fees for higher education are very reasonable (~400 €/year) and this, combined with an increasing institutional openness, has turned France into a very attractive country for study. A number of Universities have created an "international contact" acting as a portal for more detailed information.

for more information about study- and research opportunities in France

www.sbcf.fr study in France
www.campusfrance.org/en

study cell biology in France
french society for cell biology
There are three ways to enter higher education in France:
1) sign up for a bachelor or master course
2) sign up for a very limited number of “open” PhD programs
3) get to know French scientists and prepare a PhD project

Consult our website for information about English-taught courses and PhD programs (“study in France” on www.sbcf.fr). You will also find lots of information about the 150 research teams affiliated with the French Society for Cell Biology (“equipes affiliées” on www.sbcf.fr)

If you wish to search the database you will have to create an account first. For this you select the English version and click on “Create account”.

Fill out the requested information and finish with “Register”. Once registered you can search the list (“chercher une équipe”) of affiliated labs for surnames (authors you have spotted in the literature), disciplines, subjects or towns.
RECENT INNOVATIVE OPPORTUNITIES IN CELL BIOLOGY, GHANA AND AFRICA

Learning cell biology is accomplished mostly at the tertiary level of education in Ghana and in Africa. This is because of the availability of faculty and facilities. An example of this state of interaction is found in the University of Ghana in Accra, a premier university of the country (www.ug.edu.gh). Academic and research institutions in Ghana offer opportunities for conducting research in the area of cell biology in infectious diseases. Within this context there are training opportunities in bioscience and biomedical research for faculty, undergraduate and graduate students (global exchanges possibilities for ASCB members).

Cell Biology initiatives, Research Exchanges and Training Prospects

The University of Ghana and the Kumasi Center for Collaborative Research (www.kccr-ghana.org), of the Kwame Nkrumah University for Science and Technology hosted five cell biology training courses (July 2009, July 2010, July 2011 and July 2012, June, 2013) organized by the American Society for Cell Biology (ASCB) with support from sponsors such as Carnegie Corporation, Olympus Company, Carl Zeiss Inc., Howard Hughes Medical Institute. The participants (over 120 in number) in these courses came from various institutions and universities in the West African Sub region and several countries in Africa. Universities in Ghana offer research facilities and learning opportunities. These initiatives and others help develop training and career development opportunities for cell biologists and faculty (exchange possibilities for foreign students and faculty).

Recent Innovative Opportunities

These training activities and many more, with mentorships, and long-term collaboration with international organizations (with the ASCB), budding cell biologists in Africa are using the
knowledge and the skills acquired to establish a culture of cell biology at their various institutions, enhancing both teaching and research. An example is the innovative training activities started by the ASCB, leading to the winning of a grant by a team of ASCB past training alumni at the University of Ghana from the World Bank World Bank’s African Centers’ of Excellence (ACE) initiative to fund the establishment of the West African Centre for Cell Biology of Infectious Pathogens (WACCBIP), www.waccbip.org, at the University of Ghana for Masters and PhD level training and research focused on cell and molecular biology of common diseases including malaria and tuberculosis. This objectives of the centre are to serve as a core facility with state-of-the-art biomedical laboratories to support infectious diseases research in the sub-region, train high level health professionals and academics on modern molecular methods for infectious disease research through Masters and PhD programs, increase research output by enhancing collaboration among biomedical scientists, provide an e-learning platform to promote teaching, research, between cell biology and health in Africa. This progress opens a blossoming future for cell biology in Ghana and Africa.

We wish you success in your time with us

Richard Harry Asmah, School of Biomedical and Allied Health Sciences, College of Health Sciences, University of Ghana,

Email rhasmah@chs.edu.gh)
BIOMEDICAL RESEARCH IN HONG KONG

Hong Kong is a dynamic city that hosts eight institutions of higher education: City University of Hong Kong (CityU), Hong Kong Baptist University (HKBU), Lingnan University (LU), The Chinese University of Hong Kong (CUHK), The Hong Kong Institute of Education (HKIEd), The Hong Kong Polytechnic University (PolyU), The Hong Kong University of Science and Technology (HKUST) and The University of Hong Kong (HKU).

In Hong Kong, research has continuously been nurtured by the University Grants Committee and its Research Grants Council (RGC). However, research disciplines have been developed only in recent years in Hong Kong, thanks to the establishment of the RGC in 1991. In this role, the UGC works with Institutions, the Administration and the Community to promote excellence in the higher education sector, with a view to establishing Hong Kong as the education hub of the region and to nurturing high quality people to promote the economic and social development of Hong Kong. These collective efforts have led to the present culture of research which is robust, diversified and flourishing.

The three largest universities have achieved international recognition that has been confirmed by the latest rankings. HKU, founded in 1910 and the oldest tertiary education institution in Hong Kong, is currently ranked 26th in the overall rankings; HKUST is 34th and CUHK is 39th, according to the recently released 2013 QS World University Rankings.

HKU (http://www.hku.hk/) has established its reputation for research excellence and has gained the position of the most successful university in Hong Kong in terms of securing competitive research funding from the Research Grants Council (RGC). HKU has made major contributions in the field of cellular and molecular virology, highlighted by the discovery of the coronavirus responsible for the SARS outbreak in 2003. Work in the area of host-pathogen interactions has led to the emergence of a cluster of laboratories that participate in a so-called "Area of Excellence" scheme, focusing on influenza pathogenesis. Other areas of investigation are tumor biology and neurobiology of ageing and degeneration. HKU has entered a long-term collaboration with Institut Pasteur (France) that led to the establishment of the HKU-Pasteur Research Pole, which has a strong cell biology focus with the goal to understand how viruses exploit the cell during the early (entry) and late (assembly and budding) stages of the viral life cycle (http://www.hkupasteur.hku.hk/). Stem cell and regenerative research has recently become a major research focus. Recognized as one of the research centres in the Faculty of Medicine at HKU, the Stem Cell and Regenerative Medicine Consortium (SCRMC) currently enrolls over 150 members, of which 70 are faculty members at the level of Assistant Professor or above. Its mission is to establish a program in Regenerative Medicine that functions as a stem cell hub for attracting regional and foreign talents, and to serve as a bridge between China and Western countries. An area of particular interest is human pluripotent stem cell (i.e. human embryonic stem cell and induced pluripotent stem cell). For additional information about SCRMC, please see http://www.med.hku.hk/stemcell or contact stemcell@hku.hk. Recently, the Faculty of Medicine at the University of Hong Kong has established a Faculty Core Facility housing multiple high performance live cell imaging microscopes and cell sorters for communal use.

HKUST (http://www.ust.hk/eng/index.htm), was founded in 1991 and has quickly become one of the top universities; it has a strong emphasis on neurobiology with groups working on growth factors, synaptogenesis, neuronal differentiation and degeneration. Other groups are active in cell signaling through G-protein coupled receptors and vesicular transport. It organizes summer courses and runs a Joint Universities Summer Teaching Laboratory (JUSTL) program is an 8 week intensive research experience for Hong Kong postgraduate students at the Marine Biological Laboratory (MBL) in Woods Hole, Massachusetts, USA. Program activities are centered on a Croucher Foundation-funded summer laboratory located at the MBL. JUSTL program participants conduct individual research projects, attend lectures and seminars, as well as undergo training in specialist techniques. The JUSTL program is scheduled to run for the months of June and July 2010. This is to coincide with the MBL’s three prestigious summer courses: Embryology, Physiology and Neurobiology. The JUSTL laboratory will be located within the "Neuroimaging Cluster", a group of regular MBL summer scientists (http://ihome.ust.hk/~aequorin/justl/html/information.html).
CityU (http://www.cityu.edu.hk/) assumed full university status in 1994 and has become the 12th ranked university in Asia according to the 2013 QS Asia University Rankings. The Department of Biology and Chemistry was established in 1993 and each year offers studies and research in fundamental and applied aspects of life, molecular and environmental sciences. The Department strongly fosters interdisciplinary research and development activities. Recent acquisition of equipment highlighted the multidisciplinary nature of experimental and theoretical research. Examples include the first regional installation of an atomic force microscope coupled to an optical microscope, which can be used to examine the surface structures of cells and organism at the nanoscale. Areas of research include the study of the relationship of the architecture of mammalian cell nucleus and the regulation of gene expression. Live-cell imaging techniques and classical biochemical approaches are used to investigate protein localization and interactions in the cell nucleus.

Although there are no specific PhD programs in Cell Biology, Hong Kong has launched an International PhD Program to attract a highly talented pool of students. The application period opens every year in September and closes in December. There is one call every year. Established in 2009 by the Hong Kong Research Grants Council (RGC), the Hong Kong PhD Fellowship Scheme aims to attract the outstanding students in the world to pursue their PhD degree programs in Hong Kong’s institutions. The Fellowship provides a monthly stipend of HK$20,000 (approximately US$2,600) and a conference and research-related travel allowance of HK$10,000 (approximately US$1,300) per year for a period of three years. One hundred thirty five PhD Fellowships have been awarded for the 2010/11 academic year. For awardees that need more than three years to complete the PhD degree, additional support may be provided by the chosen institutions. For details, please contact the institutions concerned directly. For more information, please visit the University Grant Committee website. (http://cerg1.ugc.edu.hk/hkpfs/index.html).

HKU-Pasteur Research Pole offers an annual Master Class in Cell Biology for postgraduate students, which is organized in the spring and includes both lectures and practical sessions. The course attracts renowned scientists who present their most recent studies in the field and provides a special environment where students can closely interact with leading scientists in an informal atmosphere (for more details, see: http://www.hkupasteur.hku.hk/index.php/Teaching/Courses/category/cell_biology).

In 2009, the Hong Kong government set up a Research Endowment Fund of $18 billion (USD$1=HKD$7.7) to reaffirm its continued support to Research & Development; HKD$4 billion of this fund has been deployed to establish the so-called Theme-Based Research Scheme (TBRS) for financing the development focused efforts on highly selected themes of strategic importance to the long-term development of Hong Kong and China. After a series of selection processes, “Stem Cell” and “Infection Diseases” have been selected to receive financial support.

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BIOSCIENCE IN INDIA

S. Mayor and K. VijayRaghavan

Biosciences in India is at a threshold of a huge expansion: this is what we have been hearing for a long time. While it is clear that the growing economy and a laudable focus on basic sciences by the government has ensured a surfeit of jobs and opportunities for research (some information regarding these opportunities are provided below), it is also a reality that there is a real lack of qualified people applying for these jobs. For a country the size of India and with a science-oriented education system, this is indeed surprising.

Modern biological sciences in India has a long history: contemporaries of the Nobel laureate in Physics, CV Raman, circa 1930 (the physicist who discovered the 'Raman Effect': and was fascinated by the properties of Light and its interaction with matter- in particular with living matter), include JC Bose, a polymath whose comparisons between the physical properties of muscle and plants lead to a new discoveries in plant sciences, such as theories for the ascent of sap, as well as a connection between the excitability of plant and animal tissue ⁴. And it is not a coincidence that the sense of self-confidence that physicists in India have enjoyed, allowed them to make huge contributions to the development of biological sciences in India. GN Ramachandran, a physicist, after whom is named the Ramachandran plot, a graphical way to categorize the dihedral angles $\psi$ against $\varphi$ of amino acid residues in protein structure, that shows the possible conformations of $\psi$ and $\varphi$ angles for a polypeptide backbone in existing proteins, was a pioneer in every sense. His study of protein structure by X-ray crystallography in the early 1950’s in newly Independent India at Madras University was a remarkable effort. He also began the Molecular Biophysics Unit at the Indian Institute of Science at Bangalore in 1970. He is considered one of the founding pillars of Structural Biology in India and has spawned a vibrant tradition of Protein science in India. It is then no coincidence that with an emphasis on the study of mathematics and computer science, the growth of Bioinformatics in protein structure prediction and analysis is a natural outcome; much of research and education in the Biological sciences in India emphasizes this aspect of Structural Biology.

In the first three decades after independence in 1947, Biochemistry grew seeded by pioneers at the Indian Institute of Science, the Christian Medical College in Vellore and in laboratories in Kolkata. Delhi University was an important centre for plant embryology. Bacterial and yeast genetics and Drosophila neurobiology grew at the Tata Institute in Mumbai. These centres spread their intellectual progeny to other locations all over the world. Yet, within India there are only a few pockets of excellence. Biophysical and biochemical approaches dominate the research landscape, reflecting the early and wide start of these approaches to address questions in biology ². Although this was the case until recently, Biological Sciences in India is going through a renaissance of sorts ³. The situation is changing rapidly; in the past five years, the opportunities for research in Biological Sciences have grown tremendously.

From 2007 to 2012 (the end of the current 5 year plan), India has seen a fourfold increase in science and technology funding. This has raised research support from 0.8% to 1.3% of GDP. Support for basic research has increased threefold in this period. The current five-year support cycle ends in 2012 March has seen a support for life sciences of about US$ 2 billion. The next five year cycle can expect a doubling of this.

Major funds have been announced for infrastructure development by the Departments of Science and Technology and the Department of Biotechnology. A new Department of Health Research has been created by the government, intended to boost biomedical and clinical research. Life science research has seen a major share of these increases. Support for life science research has increased 16-fold in the past 20 years. The Indian Parliament has this year approved a new National Science and Engineering Research Board (NSERB), with a mandate similar to the US National Science foundation with an initial injection of about US $ 330 million for the first year. The NSERB’s mandate is to primarily help in rejuvenating science in the University system. Understanding that research rests on a strong foundation in education, the government has increased support for education from 7.5 to 20% of GDP to increase the access to a decent education for a majority of its citizens, having just passed a Right to Education (signifying that education a fundamental right and its access is a Government responsibility).
A host of new institutions for research and education have also been created, including 30 new centrally funded universities, 8 new Indian Institutes of Technology, and 5 Indian Institute of Science Education and Research (ISER) modeled on the well-known Indian Institute of Science in Bangalore. The Department of Biotechnology has created major research clusters: For Agribiotech in Mohali near Chandigarh, for Translational Research and Biotech research training and education in the National Capital region and for Stem cell biology in Bangalore. The Department of Biotechnology of has been actively involved in stimulating the biotech industry. While still small the trend of growth indicates many opportunities related to research in the Life sciences, including a huge incentive to create start-ups as well as encourage entrepreneurship. The Council for Scientific and Industrial Research (CSIR) laboratories have also been given a huge fillip in terms of investment: its current yearly budget is about $300 million. While the ambit of this agency is to encourage research that has a more applied angle in all fields of science and engineering, in the biological sciences it is spearheading a huge focus on genomics and biomarker and drug discovery.

Given all these incentives and opportunities there is a tremendous surge in the number of jobs that have become available for the researcher who wishes to pursue a career in India. The government is gambling on bringing back young scientists to help grow Biosciences in India \(^1\), unlike the strategy adopted by our neighbour, China, where huge incentives are being offered to attract established scientists at mid-level positions to relocate to its shores. A new independent portal, www.IndiaBiosciences.org \(^5\) has been set up 'for Indian biologists (junior and senior, working in India or abroad) to unite as a community- to find and exchange information, to make new contacts and find collaborators, to share perspectives, to attract a new generation of young people to scientific careers, and to welcome back talented Indians who previously might have established their careers abroad'.

However, despite all these incentives, a major factor that is holding back Indian Bioscience is the lack of a trained and motivated research manpower. This too may be set to change. Internationally many researchers are helping in this endeavour. Meetings to attract and inform scientists interested in India are being held in almost every major centre of biomedical research. Many scientists of Indian and non-Indian origin have taken up the gauntlet of helping to attract researchers to India. This is already having a very major impact in India, and helping to recruit talent to Indian research institutes. There are now several major science fellowship programmes to attract starting as well as mid-level scientists to these opportunities. These include the Ramalingaswami (from the Department of Biotechnology) and Ramanujan fellowships (from the Department of Science and Technology) and those from the Wellcome Trust- DBT India Alliance. In addition special schemes from the Wellcome Trust-DBT are in place to promote a national postdoctoral culture, necessary for any major scientific endeavour to succeed today.

Here nationally or internationally trained PhDs will be able to spend up to two years, if they wish, a collaborators laboratory anywhere in the world, and the balance of the 4- year fellowship in the mentor’s laboratory in India. This will allow senior Indian scientists to develop scientific programmes where they can rely on leadership from within their group and secondly, graduate students can augment their learning experiences from senior postdoctoral researchers. Many young scientists are also taking up careers in science management and establishing state of the art core facilities as alternative careers to becoming PI and running research laboratories, fuelled by the successes of some good role models.

Considering the Wellcome Trust DBT India alliance schemes as an example of how much difference these new incentives are making to attract top quality scientists to India may be an important lesson, and point to the challenges ahead. While many of the Alliance schemes have been put into place just to aid such transformations and are already making an impact in one year of its existence, the ability of the Alliance to find suitable candidates however, remains hugely undersubscribed at the moment. The Alliance has an annual budget of about 20 million USD which can fund up to 70 fellowships a year at all levels. In the first year only 24 fellowships across all the categories were awarded. Subsequently several changes to the eligibility conditions have been made and The Alliance expects to fund at least double the number of awards in the second and third years. In terms of building up trained manpower capacity at Indian institutions, the international affairs committee of the ASCB has also taken a lead in augmenting Teaching and Research initiatives in India (see ASCB August 2010 Newsletter) and are looking for members to take the plunge.
In addition to all the above, located around creating capacity in a typical mould of a Global bioscience research community, Bioscience research in India affords unique opportunities that are worth mentioning. With its tremendous biodiversity and varied biogeography, there is a wealth of new biology waiting to be discovered. The discovery of new species of amphibians, primates and insects is a frequent occurrence, and are not even newsworthy these days. Marine ecology and its attendant biology is also a hugely untapped area of study for the intrepid cell biologist. The scientific base behind the many vibrant traditional medicine practices (currently submerged in rhetoric and commercial hype) intertwined with a unique knowledge of the efficacy and potency of plant extracts to treat diseases, is also a rich resource.

While these traditional health practices have resulted in a personalised medical practice that rivals the prophecies of the futuristic ideas of genomic medicine, an understanding of its empirical basis from a physiological, cellular and molecular perspective remain largely unexplored. An important focus of any scientific understanding of these medical practices must involve a detailed understanding of the history and theoretical foundations of these practices. An acknowledgement of this rich heritage has resulted in the formation of a new department focused on the study of these traditional practices providing a detailed compendium of a very elaborate pharmacopeia of Ayurvedic, Unani and Siddha practices. In addition many commercial entities are using a traditional practice-based bias to explore new drugs for contemporary diseases.

Given the many new opportunities, the future looks bright for the Biosciences in India, especially if there are people ready to take the plunge. A cultural transformation is taking place, in new institutions and old, which welcomes new researchers into an environment of collective effort towards broadening the base of quality science. It’s a good time to dive in!

References:
5 http://www.indiabioscience.org/.

Acknowledgements:
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Lohia from the Wellcome Trust-DBT alliance for help with some of the facts and figures, and many friends
and colleagues for their unstinting and generous help in driving many of the initiatives mentioned.
Cell biology in Ireland

In Ireland, cell biology research and teaching is carried out within public Universities and Institutes of Technology. The principal locations for cell biology research are in Dublin, Cork and Galway, with the institutions listed below being of particular relevance for cell biology:

Trinity College Dublin (www.tcd.ie);
University College Dublin (www.ucd.ie);
Dublin City University (www.dcu.ie);
University College Cork (www.ucc.ie);
National University of Ireland Galway (www.nuigalway.ie);
National University of Ireland Maynooth (www.nuim.ie);
Royal College of Surgeons in Ireland (www.rcsi.ie).

Ireland has particular strengths in the areas of immunology, systems biology, cell signalling and chromosome biology, with the research in these areas being spread around the country. Why not google ‘Ireland’ and your theme of interest??

Funding

Some core funding is available for research within these third-level institutions, but the bulk of the cell biology research is supported by competitive national and international research grants. Key agencies funding cell biology are Science Foundation Ireland, which invests in research that generates new knowledge, leading edge technologies and competitive enterprises in the fields of science and engineering underpinning biotechnology; the Health Research Board, which supports clinical and applied biomedical research; and the UK-based Wellcome Trust, which funds basic and clinical biomedical research. Cell biology researchers also have access to the European Commission’s Framework programme for research and innovation -Horizon 2020 – which can provide major support for individuals and collaborative group projects, with a particular emphasis on researcher mobility.

Science Foundation Ireland: www.sfi.ie
Health Research Board: www.hrb.ie
Wellcome Trust: www.wellcome.ac.uk
**Opportunities in Ireland**

As Ireland is a small, open economy keen to interact with international collaborators and institutions, Irish national funding supports researchers of all nationalities. EU mobility awards have some restrictions as to nationality.

Personal support for highly-qualified applicants is available from the Irish Research Council (www.research.ie), the European Molecular Biology Organisation (www.embo.org), the Irish Cancer Society (www.cancer.ie), the European Commission (ec.europa.eu/research/mariecurieactions), the European Research Council (erc.europa.eu) and several other, smaller funding bodies. Short term visits can be funded through a variety of sources, including the Fulbright Fellowship programme (www.fulbright.ie), EMBO, SFI, among others.

Researchers considering studentships or postdoctoral training in Ireland should contact prospective supervisors directly to find out about what’s available.
Israel – Academic MSc and PhD Programs in Cell Biology

1. Ariel University, Ariel
   http://www.ariel.ac.il/sciences/en

2. Ben-Gurion University of the Negev, Beer-Sheva
   Department of Life Sciences
   http://in.bgu.ac.il/en/natural_science/Pages/default.aspx

3. Bar-Ilan University, Ramat Gan
   The Goodman Faculty of Life Sciences
   http://life-sciences.biu.ac.il/en

   The Faculty of Medicine in the Galilee, Safed
   http://medicine.biu.ac.il/en

4. University of Haifa, Haifa
   Faculty of Natural Sciences

5. Tel-Aviv University, Tel Aviv
   The Wise Faculty of Life Sciences
   http://www.tau.ac.il/lifesci/index-eng.html

   The Sackler Faculty of Medicine
   http://medicine.tau.ac.il/english/
6. The Hebrew University of Jerusalem, Jerusalem

The Silberman Institute of Life Sciences

http://bio.huji.ac.il/eng/

The Faculty of Medicine

https://medicine.ekmd.huji.ac.il/en/home/pages/home.aspx

7. The Technion, Haifa

The Technion Biology Faculty

http://biology.technion.ac.il/

The Rappaport Faculty of Medicine

http://md.technion.ac.il/

8. The Weizmann Institute of Science, Rehovot

The Feinberg Graduate School

http://wws.weizmann.ac.il/feinberg/content/feinberg-graduate-school
Welcome to the Netherlands

The Netherlands is a small, flat, water-rich country in the heart of Western Europe, close to Great Britain, Germany and France. It is friendly, open and internationally oriented. The Netherlands offers high living standards, with a highly educated general public and excellent health care and education systems. It is not only well known for the Royal Family, tulips, Amsterdam and beer, but also for arts, culture, technology and science. Important cell biological discoveries started with the development of the first microscope and have continued over the centuries. The country scores very highly on international rankings and even more so when the size of its population is taken into account.

Cell Biology in the Netherlands

Top level Cell Biological research is done at various Departments of Biology or Medical Faculties of the Universities of Amsterdam, Groningen, Leiden, Maastricht, Nijmegen, Rotterdam, Utrecht and Wageningen and of the Technical Universities of Delft, Eindhoven and Twente. In addition, cell biological research is an important pillar in various institutes, such as the Hubrecht Institute for Developmental Biology, the Netherlands Institute for Neuroscience (NIN) and the Netherlands Cancer Institute (NKI). All of these Departments and Institutes have PhD programs and continuously recruit PhD students and post-docs.

Studying Cell Biology

Cell Biology can be studied at the BSc level at Biology or related faculties in Amsterdam, Groningen, Leiden, Nijmegen, Utrecht and Wageningen. In addition, recently developed BSc studies Nanobiology or Biomedical Technology at the Erasmus MC in Rotterdam and the Technical Universities of Delft, Eindhoven or Twente provide excellent training in Cell Biology.

At the MSc level Cell Biology can be studied at the same
Universities, but also at Medical Faculties, such as the MSc program Molecular Medicine at the Erasmus MC in Rotterdam, which provides a number of fellowships for MSc students.

In addition, there are always positions available for MSc students that want to be trained in cell biology during an internship in a lab in one of these departments.

**Funding in the Netherlands**

*National funding*

Netherlands Organization for Scientific Research (NWO) has divisions that fund research in Earth and Life Sciences (ALW), Health (ZonMW), Chemistry (CW), Physics (FOM) and Technology (STW).

Various more patient oriented funding agencies, such as the Cancer Foundation (KWF), Kidney Foundation, etc.

*European funding*

European Commission science funding program Horizon 2020

European Research Council (ERC)

*Fellowships*

Dutch NWO-fellowships, VENI, VIDI, VICI

European Commission: Marie Curie Actions

European Molecular Biology Organization (EMBO)

Human Frontiers Research Program (HFSP)

*More information*

For more information contact people at one of the above mentioned research groups, departments or faculties. You can also contact me, Dr. Gert Jansen, Dept. of Cell Biology, Erasmus MC, Rotterdam, vice-director of the MSc program Molecular Medicine (g.jansen@erasmusmc.nl).
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http://www.visitportugal.com/en

Doing Cell Biology in Portugal
If you want to do your pre-doctoral, doctoral or postdoctoral studies or are looking for a place where to launch your independent scientific career, you will find:

• A series of funding options available both from national and European sources
• An internationalized science community
• Rapidly evolving science infrastructure that creates new opportunities

Important websites:

National funding - Public Funds:
  - Doctoral and Postdoctoral fellowships
  - FCT Investigator positions for PhDs to foster scientific careers in Portugal
  - R&D Project Grants that include human resource funds for MSc and PhDs

National funding - Private Foundations:
- Luso-American Foundation: http://www.flad.pt/?no=0000002
- Fundação Calouste Gulbenkian: http://www.gulbenkian.pt/index.php?&langId=2

European Funding:
European Molecular Biology Organization: http://www.embo.org/
Marie Curie actions: http://ec.europa.eu/research/mariecurieactions/
European Research Council: http://erc.europa.eu/
Centralized information on available jobs, opening of calls and science initiatives:
EURAXESS - Researchers in Motion: http://ec.europa.eu/euraxess/;
http://www.euraxess.pt/jobs/research/ (Opportunities in Portugal)
Eracareers – The researcher’s mobility portal: http://www.eracareers.pt
Health Cluster Portugal: http://healthportugal.com

Major Institutions doing Cell Biology:
Institute for Cell and Molecular Cell Biology, IBMC, Porto:
http://www.ibmc.up.pt/
Institute of Molecular Pathology and Immunology of the University of Porto, IPATIMUP: http://www.ipatimup.pt/
Institute Gulbenkian de Ciência, IGC, Oeiras:
http://www.igc.gulbenkian.pt/
Instituto de Medicina Molecular, IMM; Lisbon: http://imm.fm.ul.pt/
Champalimaud Foundation, Lisbon:
Instituto de Tecnologia Química e Biológica, ITQB, Lisbon:
http://www.itqb.unl.pt
Life and Health Sciences Research Institute, ICVS, Braga: http://www.icvs.uminho.pt/
Centro de Biomedicina Molecular e Estrutural, CBME, Faro: http://www.cbme.ualg.pt/
Center for Neuroscience and Cell Biology, CNC, Coimbra: http://www.cnbc.pt/
Research Center for Biodiversity and Genetic Resources http://cibio.up.pt/cibio.php

Cell Biology PhD Programs:
Graduate Program in the Areas of Applied and Basic Biology - GABBA, Porto:
http://gabba.up.pt/
Molecular and Cell Biology, ICBAS/IBMC/FCUP, Porto: http://www.mcbiology.up.pt/
Integrative Biology and Biomedicine, IGC, Oeiras:
http://www.igc.gulbenkian.pt/pages/facilities.php/A=232___collection=article
Experimental Biology and Biomedicine, CNC, Coimbra:
Molecular Biosciences, ITQB, Lisbon:
http://www.itqb.unl.pt/education/phd-molecular-bioscience
LisbonBioMed PhD Program:

Opportunities for research spin-offs and business initiatives:
UPTEC – science and technology Park of University of Porto:
ADI, Innovation Agency: http://www.adi.pt/uk%5Cindexuk.htm
Cell biology in Russia, how it may be viewed, formally started with the founding of the Russian Academy of Sciences (1724), Saint-Petersburg (1724) and Moscow (1755) universities.

Who knows what the cell biology was at that time and when it first started on Earth - deep philosophical enigma.

Russia contributions in the field of cell biology (to mention a few) include the discovery of primary motor cortex giant pyramidal neurons (Vladimir Betz, 1874), lithotrophy and chemosynthesis (Sergey Winogradsky, 1887), viruses (Dmitry Ivanovsky, 1892), double fertilization in plants (Sergey Navashin, 1898), phagocytosis (1882), pioneering research of immune system and probiotics (Ilya Mechnikov, Nobel Prize in Medicine 1908); conception of cytoskeleton (Nikolai Koltsov, 1903).

Around 1990, after the collapse of the Soviet Union, funding of the cell biology research, as well as funding of scientific research in general, had almost stopped, which resulted in scientific hibernation and the dramatic decrease of overall scientific activities. The logical consequence was the large scale departure of Russian researchers to take research positions abroad.

Modern Russia gradually overcomes some of these problems and struggles to restore traditions of the German-Russian school, on which the Russian scientific tradition is founded, while making accommodation in an attempt to accept the American scientific tradition. To speed up this revitalization, the Russian government recently launched several new programs, for example:

- “Mega-Grants”, intended to encourage high-profile expatriate scientists to return home and to recruit world-class foreign specialists;
- “Scientific and Scientific-Pedagogical Personnel of the Innovative Russia (2009-2013)”, to create appropriate conditions for the effective inheritance in science and to attract young talented Russian students into the scientific fields;
- "ScolTech Center for Stem Cell Research" (Skolkovo) - a project to unite leading researchers of varied scientific disciplines (chemistry, biology, medicine, computer science etc.) and to achieve overall progress in basic and applied research of stem cells;
- "National University Research Project" – a project intended to create a network of world-class research universities, equally efficiently realizing educational and scientific activity on the basis of principles of integration of science and education.

The cell biology research centers of primary importance in Russia include universities subordinated to the Ministry of Education and Sciences of the Russian Federation and scientific research institutes supervised by the Russian Academy of Sciences (RAS).
such as:
1) Lomonosov Moscow State University [www.msu.ru](http://www.msu.ru)
2) Saint Petersburg State University ([http://eng.spbu.ru](http://eng.spbu.ru))
3) Novosibirsk State University ([http://www.nsu.ru](http://www.nsu.ru))
4) Tomsk State University ([http://inter.tsu.ru](http://inter.tsu.ru))

Information about international internships, research, grants and other activities can be found in International Relation Offices sections of the corresponding web-pages.

**Main research institutes of the Russian Academy of Sciences relevant to cell biology:**

1. Institute of Cytology ([http://www.cytspb.rssi.ru](http://www.cytspb.rssi.ru))
2. Vavilov Institute of General Genetics ([http://www.vigg.ru](http://www.vigg.ru))
4. Engelhardt Institute of Molecular Biology ([http://www.eimb.ru](http://www.eimb.ru))
5. Institute of Molecular Genetics ([http://old.img.ras.ru](http://old.img.ras.ru))
6. Institute of Chemical Biology and Fundamental Medicine, Siberian Branch ([http://www.niboch.nsc.ru](http://www.niboch.nsc.ru))
7. Institute of Cytology and Genetics, Siberian Branch ([http://www.bionet.nsc.ru](http://www.bionet.nsc.ru))
SINGAPORE’S BIOMEDICAL RESEARCH

In order to enhance its capabilities in research and development, to sustain the country's economic prosperity and to create a more value-added and knowledge-based economy, Singapore has devoted significant resources during the past decade to build a critical mass in cutting-edge research and development in the biomedical sciences. In line with the goal of government to deliver the economic impact and the global trends, the next phase of research will have more translational focus and clinical and industry relevance while sustaining the core excellence of basic research in cell biology, molecular biology, and genomics so that a proper balance between basic research, translational research, clinical research, industry collaboration and application is achieved.

The initiating project of Singapore’s biomedical efforts was the creation of the Institute of Molecular and Cell Biology (IMCB) (http://www.imcb.a-star.edu.sg/php/main.php) in 1987. Originally a part of the National University of Singapore (NUS) (http://www.nus.edu.sg/), IMCB later became an autonomous research institute (RI) of the Agency for Science, Technology and Research (A*STAR) (http://www.a-star.edu.sg/). Since 2000, the Singapore government and A*STAR have devoted much more resources to strengthen the biomedical research community through the establishment of other RIs and consortia/centers under the umbrella of Biomedical Research Council (BMRC) (http://www.a-star.edu.sg/AboutASTAR/BiomedicalResearchCouncil/tabid/64/Default.aspx). These other RIs and consortia include the Genome Institute of Singapore (GIS), Institute for Medical Biology (IMB), Institute of Bioengineering and Nanotechnology (IBN), Bioprocessing Technology Institute (BTI), Bioinformatics Institute (BII), Singapore Institute for Clinical Sciences (SICS), Singapore Immunology Consortium (SlgN), Singapore Bioimaging consortium (SBIC), Experimental Therapeutics Center (ETC), and the p53 Lab. The majority of these biomedical activities are concentrated in Biopolis (http://www.onenorth.sg/hubs_biopolis.aspx), a biomedical hub that also hosts common shared facilities/resources and other research efforts such as the Novartis Institute for Tropical Diseases (http://www.novartis.com/research/nitd/index.shtml), the recently established Chugai Pharmabody Research Pte. Ltd., and the soon to be opened Procter & Gamble (P&G) innovation centre Singapore.

In addition to biomedical research activities in Biopolis, there has been a major growth of research activity in the National University of Singapore, particularly in the Department of Biological Sciences (http://www.dbs.nus.edu.sg/) and various departments in the Yong Loo Lin School of Medicine (http://medicine.nus.edu.sg/corporate/). In addition, a few research centers and institutes were also created and are located in the NUS such as the Cancer Science Institute of Singapore (http://www.csi.nus.edu.sg/web/Common/homepage.aspx), the Mechanobiology Institute (http://www.dbs.nus.edu.sg/mechano/), the Temasek Life Sciences Laboratory (http://www.tll.org.sg/), and the NUS Centre for Biolmaging Sciences (http://cbis.nus.edu.sg/). The collaboration between Singapore government (with participation of A*STAR) and Duke Medical School has created Duke-NUS Graduate Medical School (http://www.duke-nus.edu.sg/web/index.php) which hosts vibrant basic and clinical research programs to facilitate the training of graduate medical students. The Nanyang Technology University (NTU) (http://www.ntu.edu.sg/Pages/index.php) has a well-established School of Biological Sciences (http://www.sbs.ntu.edu.sg/Pages/Home.aspx) and a new medical school at NTU has been created and has just taken in the first cohort of students while building up capability in basic and clinical research (http://www.lkcmedicine.ntu.edu.sg/Pages/index.aspx). This new medical school is a partnership with Imperial College of Medicine.

In addition to A*STAR and the universities, there are also other research institutes and centers primarily based in hospitals such as National Cancer Centre Singapore (NCC) (http://www.nccs.com.sg/), the Singapore Eye Research Institute (http://www.seri.com.sg/), and the National Neuroscience Institute (http://www.nni.com.sg/). In addition to the two medical schools with strong partnership with Duke University and Imperial College of Medicine, several partnering research initiatives have been established such as Singapore-MIT Alliance for Research and Technology (SMART) (http://smart.mit.edu/).

The public research programs are primarily supported by A*STAR under the Ministry of Trade and Industry, the National Research Foundation (NRF) (http://www.nrf.gov.sg/nrf/default.aspx) under the Prime

Due to the strong support of the government and the presence of superb infrastructure, there have been numerous home-grown scientists in Singapore who have been contributing significantly and consistently to the advancement of cell biology and other related areas. They include Drs Fred Berger, Edward Manser, Thomas Leung, Graeme Guy, Xiaohang Yang, Haiwei Song, Kong Peng Lam, Uttam Surana, Byrappa Venkatesh, Lian Hui Zhang, Yue Wang, Walter Hunziker, Qi Zeng, Wanjin Hong, Yijun Ruan, Patrick Tan, Huck Hui Ng, Qiang Yu, Gregory Jedd, Toshie Kai, Naweed Naqvi, Davis Ng, Toshiro Ito, Ding Jeak Ling, Hanry Yu, Bor Luen Tang, Yu Hao, Liou Yih-Cherng, Markus Wenk, Kanaga Sabapathy, Tuck Wah Soong, and Barry Halliwell. The major contributions in cell biology by these Singapore scientists are in the areas of PAK protein kinases and their regulatory pathways in Rho GTPase signaling, cell polarity of mammalian cells and model organisms, identification and functional characterization of SNAREs and other molecules in protein secretion and endocytosis in mammalian cells, structural biology of translational control and mRNA decay, cell signaling pathways, PRL-3 phosphatase in cancer metastasis, protein complexes in asymmetric cell division of fly, pattern formation in zebrafish, fungal pathogenesis, molecular machineries and mechanisms of cell cycle in yeast *S. cerevisiae* and *S. pombe*, comparative genomics, plant development, microbial quorum sensing mechanism, cancer and stem cell genomics, epigenetic regulation of stem and cancer cells, molecular and cellular immunity, lipidomics, and free radicals and antioxidants in biological systems. Their works have been published in prominent journals such as Nature, Science, Cell, Cancer Cell, Developmental Cell, Current Biology, Molecular Cell, Nature Cell Biology, Genes & Development, EMBO Journal, Journal of Cell Biology, PLoS Biology, Cancer Research, Molecular Biology of the Cell, Molecular and Cellular Biology, Journal of Biological Chemistry, and Journal of Cell Science. Recently, there have been a surge of prominent scientists who have relocated to Singapore and they include Jean Paul Thiery, Philip Ingham, Stephen Cohen, Bing Lim, Yoshiaki Ito, David Lane, Birgit Lane, Alan Colman, Colin Stewart, Brian Burke, Frank Eisenhaber, Daniella Rhodes, Alex Law, James Tam, Paul Matsudaira, Xin-Yuan Fu, Michael Kemeny, Daniel Tenen, Michael Sheetz, Yoichi Taya, Patrick J. Casey, David Virshup, Shirish Shenolikar, and George J. Augustine, creating a vibrant and visible community of scientists working in cell biology and its associated research fields.

The current focus to recruit young and promising scientists to Singapore is evidenced by the prominent NRF Fellowship (http://www.nrf.gov.sg/nrf/otherprogrammes.aspx?id=142), which aims to attract the best young scientists to Singapore to conduct independent research. To facilitate the collaboration between basic scientists and medical doctors and to enhance translational research, A*STAR and NMRC have established several programs such as the Singapore Translational Research Award and the Clinical Scientist Award programs.

Training the next generation of scientists is another important aspect in Singapore’s biomedical efforts. A*STAR Graduate Academy (A*GA) (http://www.a-star.edu.sg/AboutASTAR/ASTARGraduateAcademy/tabid/74/Default.aspx) has recruited over 1000 Singaporean scholars who are at various stages of pursuing doctoral studies in major research universities in the US, UK, and locally in A*STAR RIs, NUS and NTU. Some scholars have already returned to Singapore to contribute ongoing research in A*STAR. Working with NUS and NTU, A*STAR has established an attractive Ph.D. program called the Singapore International Graduate Award (SINGA) (https://www.singa.a-star.edu.sg/). The program aims to recruit international students to pursue Ph.D. training in A*STAR RIs, NUS and NTU. A prominent and high-profile graduate program called the NUS Graduate School for Integrative Sciences and Engineering (NGS) (http://www.nus.edu.sg/ngs/) was established at the university level to attract the very best Ph.D. students both locally and internationally. Similarly, various Ph.D. fellowship programs are also available at NTU (http://admissions.ntu.edu.sg/graduate/scholarships/Pages/ResearchScholarship.aspx). The collective efforts of A*STAR, NUS and NTU will have huge impact in training the future scientists and nurturing future leaders to sustain the momentum in biomedical research and future clinical and translational research.
A*STAR, NRF, NUS and NTU have established several successful collaborations with overseas institutes such as Duke University, Imperial College of Medicine, and the Massachusetts Institute of Technology (MIT), resulting in the creation of the Duke-NUS graduate medical school, Lee Kong Chian School of Medicine at NTU, and the Singapore-MIT Alliance for Research and Technology (SMART) Centre (http://web.mit.edu/smart/). A*GA’s ongoing overseas Ph.D. scholarship program is teamed up with several overseas universities such as Imperial College London, University of Cambridge, University of Oxford, University of Dundee, Karolinska Institutet, Carnegie Mellon University and University of Illinois at Urbana-Champaign. Other international partnerships such as joint grant calls have also been established (http://www.a-star.edu.sg/Partnerships/ASTARCollaborations/tabid/172/Default.aspx).
South Korea is an example of a country that was able to develop swiftly to become part of the cutting-edge science and technology research world, after overcoming the recent global financial difficulties. Now, more than 40 universities and institutions around the country host international scholars including both students and faculties to achieve excellence in Biomedical Science and Technology. Korean National Research Foundation (NRF), the Korean Government driven research funding agency, has successfully launched various funding programs to support collaborations between South Korean researchers and international scholars from North America, Europe, and Asia etc.

There are 22 national universities and about 130 private universities with Biomedical Graduate Programs in South Korea. Seoul National University (SNU: http://biosci.snu.ac.kr/, http://oia.snu.ac.kr/study/03.jsp) is the first national university founded in South Korea. SNU has made major contributions in the field of Molecular and Cellular Biology, highlighted by micro RNA research. Other national universities are established in each province:

- Kyungpook NU (http://en.knu.ac.kr/)
- Chonnam NU (http://altair.chonnam.ac.kr/~biology/vol2/)
- Chungnam NU (http://sbb.cnu.ac.kr/bk21plus/eng/)
- Chungbuk NU (http://biology.chungbuk.ac.kr/)
- Gyeongsang NU (http://eng.gnu.ac.kr/main/)
- Pusan NU (http://international.pusan.ac.kr/) and Jeju NU (http://www.jejunu.ac.kr/_2014/eng/acad/01.jsp?dcode=700&hcode=702).

KAIST (Korea Advanced Institute of Science and Technology: http://www.kaist.ac.kr/html/en/), a world-renowned both undergraduate and graduate education, and research institute directly funded by Korean government, hosts vibrant basic biomedical research programs such as Brain Science and Engineering. GIST (http://ewww.gist.ac.kr/, https://life1.gist.ac.kr/eng) Gwangju Institute of Science and Technology, another government-funded institute, is located in Gwangju, the largest city in southwestern Korea. A couple of research institutes have been added to the list of Korean government-funded advanced institutes of Science and Technology: DGIST (Daegu Gyeongbuk Institute of Science and Technology: http://brain.dgist.ac.kr/eng) and UNIST (Ulsan National Institute of Science and Technology: http://jkbkim.unist.ac.kr, http://hsscrc.unist.ac.kr). These institutes have been actively recruiting students and faculties all around the world. POSTECH (http://www.postech.ac.kr/life/st, http://www.postech.ac.kr/international/eng/main.php) is the highly competitive research institute provided by POSCO, one of the largest steel companies in the world. DGIST, UNIST and POSTECH are all located near each other within 1 hr drive in southeastern area of the peninsular, and also easily reached by the fast-track train from Seoul, the capital city of South Korea. Some other research centers supported by government funding are KRIBB (Korea Research Institute of Bioscience and Biotechnology: http://www.kriibb.re.kr/), KIST (Korea Institute of Science and Technology: http://eng.kist.re.kr/kist_eng/main/) and Institute Pasteur Korea (http://www.ip-korea.org).

There are approximately 40 universities and institutes in Seoul vicinity where active and dynamic research efforts always take place. Yonsei University (http://www.yonsei.ac.kr/eng/), founded in 1886 by western missionaries, is the oldest University in South Korea. There are three major biomedical research institutions, in addition to the School of Medicine: Dept. of Biochemistry, of Biotechnology, and Systems Biology, which are interested in Human Genome Projects, Drug Delivery System, Epigenetics, Plant Pathology etc. Korea University (http://lifesci.korea.ac.kr/) focuses on the signaling mechanism and roles of eicosanoids, bioactive lipid molecules, in the pathogenesis of human diseases. Ewha Womans University (http://oga.ewha.ac.kr/) is the largest Women’s University in South Korea. Since Sue Goo Rhee, the discoverer of peroxiredoxin and related reactive oxygen species scavengers, joined the university last in early 2000, Ewha thrives in various Biomedical Science fields, especially in molecular pathology mediated by oxidative stress. Hanyang University (http://www.dic.hanyang.ac.kr/) currently hosts most international students in Korea. Hanyang medical school and other faculties from Life Science and Bioengineering department launched Biomedical Engineering Graduate Program (http://www.dic.hanyang.ac.kr/), especially focusing Custom Therapy utilizing iPS technology. Some other universities running competitive research programs in Seoul Vicinity are Cha University (http://www.cha.ac.kr/), Sogang University (http://home.sogang.ac.kr/sites/elifescien), Sookmyung Women’s University (http://c.sookmyung.ac.kr/contents/contents.jsp?cmsCd=CM0438),
Bioscience Research in South Korea

Sungkyunkwan University (http://www.skku.edu/index_pc.jsp), Konkuk University (http://www.konkuk.ac.kr/Administration/Abroad/), Sejong University (www.sejong.ac.kr/), Ajou University (http://www.ajou.ac.kr/english/intro/main.jsp) and Dankook University (http://global.dankook.ac.kr/), University of Seoul (www.uos.ac.kr).

These private and public universities offer strong research and education programs in fundamental and applied biological sciences, and have experience to host international scholars around the world. You can find more universities in the web site: http://en.wikipedia.org/wiki/List_of_universities_and_colleges_in_South_Korea

Korean academic year starts March, and there are four semesters a year including Summer (late June to August) and Winter (late December to February) semesters. There is usually one call (March) a year for undergraduate programs and two calls (March and September) for graduate programs. The application period is usually a couple of months before the start of each call. Tuition ranges from $2,000 to $5,000 per semester. Various funding programs can be arranged through academic advisors in each school, depending on the applicant’s merit and background. More information can be found in the university websites.

Post-doctoral training opportunity is also available and the advertisement for these positions is often posted in http://bric.postech.ac.kr/ and http://hibrain.net/. Many young and enthusiastic faculty members eagerly recruit international post-doctoral researchers with strong research and communication skills around the world. Individual direct contact with these faculties with early career is highly recommended to find out funding and housing.

The public research programs are primarily supported by the National Research Foundation (NRF: www.nrf.re.kr) Global Research Laboratory (GRL) program and World Class University (WCU) program are successful examples of international collaboration supporting funds. GRL program has been designed to promote international collaborative research between Korean and foreign laboratories. A proposal submitted for the GRL program should address a research topic which requires Korean and foreign research partners to engage in close collaboration for the attainment of significant scientific and technological goals. The maximum funding term is 6 years and the annual budget is up to KRW 500,000,000 (US$ 400,000) per year. In order to apply the international collaboration funding awards in future, the actual research collaboration with Korean researchers is highly encouraged.

South Korea is an attractive place to visit, in order to meet enthusiastic scholars and find out current research trends in East Asia. Korean Society of Molecular and Cellular Biology (KSMCB: www.ksmcb.or.kr) and Korean Society of Biochemistry and Molecular Biology (KSBMB: www.biochem.or.kr) hold annual international conferences every October and May, respectively, gathering at least 4,000 students, post-docs and faculties, and the number of participants continue to grow. At the International Conference of KSMCB held in October, 2013, attendants were from 30 different countries. The next International Conference of KSMCB will be held in October 21 to 23, 2014, at COEX in Seoul. Jennifer Lippincott-Schwartz, Ph.D. (National Institutes of Health, USA), Barry Ganetzky, Ph.D. (University of Wisconsin, USA), Peter J. Park, Ph.D. (Harvard Medical School, USA), and others will give plenary lectures. Hopefully, we can meet ASCB attendants in these exciting meetings in Seoul, again to share prosperous research resources with other Biomedical scholars around the world.

Molecules and Cells (Mol. Cells) is an international on-line open-access journal devoted to the advancement and dissemination of fundamental knowledge in molecular and cellular biology. Reports on a broad range of topics of general interest to molecular and cell biologists are published. It is published monthly by the Korean Society for Molecular and Cellular Biology. This journal is indexed in Science Citation Index, Scopus, Current Contents®/Life Science, Sci-search®, Research Alert®, Index Medicus, Chemical Abstract Service, and PubMed. This journal was supported by the Korean Federation of Science and Technology Societies Grant funded by the Korean Government.

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Cell Biology in Taiwan

In Taiwan, there are approximately 50 Universities and Research Institutes comprised of about 230 departments and divisions with programs related to Cell Biology. To promote researches in the field of cellular and molecular biology in Taiwan, “the Chinese Society of Cell and Molecular Biology (CSCMB)” was instituted in 1989. Currently there are about 6,000 members and the President of the society is Dr. Lu-Hai Wang, vice president of National Health Research Institutes in Taiwan.

To promote interactions among researchers, CSCMB holds annual symposia including “Symposium on Recent Advances in Cellular and Molecular Biology” in winter and “Joint Annual Conference of Biomedical Sciences” in spring. Furthermore, CSCMB also holds “Across the Taiwan Strait Symposium on Cell Biology” twice in three years to promote interactions among scientists between Taiwan and Mainland China. In addition, CSCMB has also hosted and participated in “International Congress of Cell Biology” and “Congress of The Asian Pacific Organization for Cell Biology” taking place every four years.

In order to encourage outstanding young researchers, CSCMB provides awards for Ph.D. students and postdoctoral fellows to attend international conferences. In addition, there are two mechanisms to apply grants for international collaborations from National Science Council in Taiwan. One is providing international transportation and living expenses; the other is a joint proposal, of which cost sharing is based on a cooperative agreement. Basically, researchers abroad need to identify collaborating researchers in Taiwan to apply for such grants. Furthermore, National Science Council in Taiwan also provides opportunities for foreign researchers to visit Taiwan for a period from two months to one year. The collaborating researchers in Taiwan are responsible for applying for such funding. The officers of CSCMB from various universities and institutes are listed on the right:

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BIOMEDICAL RESEARCH IN TURKEY

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EDUCATION IN TURKEY

Turkish universities offer high quality studies and are an integral part of the European education space. There are increasing number of universities offering programs taught in English. Turkey is part of Bologna Process since 2001 and also a member of many different international platforms.

According to The Times Higher Education BRICS & Emerging Economies Rankings 2014 (1), there are 7 Turkish universities in the top 100-university list, and 3 of them are in the top 10. In addition, 9 Turkish universities took place among the top 800 world universities ranking by Quacquarelli Symonds (QS) in the UK and 19 Turkish universities took place among the top 1000 world universities ranking by METU Informatics Institute.

CELL BIOLOGY RESEARCH IN TURKEY

The faculty, graduate students, and undergraduates carry out research encompassing a wide array of disciplines ranging from molecular biology and genetics to biomaterials and tissue engineering, nanotechnology, microbiology, immunology and vaccine development, molecular biophysics, ecology, evolutionary biology and conservation. Collaborative national and international networks allow for the sharing of ideas and technology, thereby greatly enhancing research potential and productivity in Turkey. When compared with the past; it is clearly seen that state and private universities as well as institutions, which are mainly founded by the Turkish government, use their resources for researches more than before. More private institutions are also becoming supportive for R&D studies in Turkey. Number of very well equipped research centers is also increasing significantly in the country.

Research in Turkey has also become increasing interdisciplinary and international, as shown by a 2011 study conducted by Elsevier (2). Collaborations between Turkey, European countries and US are becoming more efficient.
Statistics comparing the citations per publications show that the number of cited articles from Turkey has been strikingly increased (3).

Turkey is one of the most successful countries in the EU 7th Framework Programme among both Member States and Associated Counties for the applications of Reintegration Grants (4). Since the inviting research environment in Turkey impresses both Turkish and foreign researchers, they are settling to Turkey for their future research activities. This appears to be achieved by the attempts of modern institutions of scientific community.

THE SCIENTIFIC AND TECHNOLOGICAL RESEARCH COUNCIL OF TURKEY (TUBITAK)

TUBITAK is responsible for the development and coordination of scientific research in line with the national targets and priorities. More than 2,500 researchers work at the 15 different research institutes and research centers attached to TUBITAK, where both contract-based and targeted nation-wide research is conducted. TUBITAK represents Turkey in international research efforts including memberships in European Science Foundation and the European Union Framework Programmes for Research and Technological Development. There are several organizations under TUBITAK, which encourage and promote international research activities.

Besides providing grants for research and fellowships at different educational levels, the Council also organizes and promotes symposia, seminars, and congresses.

BECOMING AN INTERNATIONAL STUDENT IN TURKEY

There are more than 500 international study programmes and courses in Turkey. Foreign students’ applications are accepted by the relevant universities within the limits of reserved places for foreigners. Applications are evaluated by the relevant universities, making sure that reserved places per country are not more than 20% of the total reserved places for foreigners.

Foreign students who would like to start off to a graduate program must take the Entrance Examination for Academic Staff and Graduate Studies (ALES) or international examination (e.g. GRE, GMAT) the equivalency of which is recognized by the relevant universities make the evaluation of these scores. International students may simply apply directly to universities with their international exam records.

Undergraduate Scholarship Programme for International Students

TUBITAK grants undergraduate scholarships for international students who are medal winners at any the International Science Olympiads (5).

Graduate Scholarship Programme for International Students

TUBITAK grants scholarships for international students seeking to pursue a graduate degree in Turkey in the fields of Natural Sciences, Engineering and Technological Sciences, Medical Sciences, Agricultural Sciences, Social Sciences and Humanities (6).
Graduate Scholarship Programme For The Least Developed Countries

TUBITAK aims to give scholarships for graduate students from the Least Developed Countries (LDCs) in the fields of Natural Sciences, Engineering and Technological Sciences, Medical Sciences, Agricultural Sciences, Social Sciences and Humanities in Turkish Universities for improving science and technology capacity of LDCs and building scientific and socio-economic bridge between LDCs and Turkey (7).

As a member of the United Nations and an emerging economy, Turkey is committed to the cause of Least Developed Countries (LDCs) in the international arena and is ready and willing to do its part in assisting in their development process. As a part of these responsibilities, Turkey generated and declared an international aid programme for LDCs (The Economic and Technical Cooperation Package of Turkish Government for LDCs). One significant item of the programme is regarding to science and education fields. In this context, The Scientific and Technological Research Council of Turkey (TUBITAK) will give master and doctorate scholarships for citizens of LDCs. Turkey and TUBITAK aims to generate and promote closer educational and scientific relations between Turkey and LDCs.

FUNDING OPPORTUNITIES FOR BIOMEDICAL RESEARCHES

Incoming researchers can benefit from a variety of TUBITAK programmes such as Program code 2215 and 2216 and international programmes such as FP7. The scholarship and grant programmes that scientists can benefit in Turkey should be evaluated as a whole package in order to analyze the situation better.

Fellowships for Visiting Scientists and Scientists on Sabbatical Leave (8)

TUBITAK grants fellowships for international scientists/researchers who would like to give workshops/conferences/lectures, or conduct R&D activities in Turkey in the fields of Natural Sciences, Engineering and Technological Sciences, Medical Sciences, Agricultural Sciences, Social Sciences and Humanities. The program aims to promote Turkey’s scientific and technological collaboration with countries of the prospective fellows.

Three types of visit are granted within this program:

i-Visiting Scientists/researchers on Short-term (up to 1 month):
Short-term fellowships fund is available for the following activities in Turkey:

a) Conducting workshops/conferences/seminars etc.
b) Giving tutorials/lectures etc.
c) Participating in R&D activities
d) Organizing technical meetings for scientific and technological collaboration

ii-Visiting Scientists/researchers on Long term (up to 12 months):
Long-term fellowships fund is available for the following activities in Turkey:

a) Conducting research and development (R&D),
b) Teaching graduate/undergraduate courses etc.

iii-Scientists/researchers on SABBATICAL LEAVE (from 3 months to 12 months):
Scholars or academic staff on SABBATICAL LEAVE planning to come to any Turkish university/institution is also funded for the following activities in Turkey:

a) Conducting research and development (R&D)
b) Teaching graduate/undergraduate courses etc.

Requirements for Beneficiaries:
Fellows can be citizen of any country.
Fellows should have a PhD degree (or equivalent) or have at least five years of research experience.
Fellows should be invited by a hosting institution in TURKEY, which can be universities, research institutions, or industrial companies with a R&D unit.
Fellows on Sabbatical leave should be invited for duration of at least 3 months.

Fellowship Details:
A monthly stipend of up to 3,000 US$ for Visiting Scientists.
A monthly stipend of up to 3,500 US$ for Visiting Scientists on Sabbatical Leave.
Travel costs (round trip) and health insurance premiums.
Duration of the fellowship varies from one week to 12 months.
Fellows must use their fellowships within six months of having been notified of the fellowship.
The amount of the monthly stipend will be determined based on the academic titles of fellows.

How to Apply: Applications should be submitted by host scientist/institution. All applications must be submitted electronically via TÜBİTAK application portal, which can be reached at http://e-bideb.tubitak.gov.tr/. All required documents must also be uploaded electronically.

Application Deadlines: Applications are accepted on a rolling basis.
Find a hosting institution; You may visit the web site below, which is numbered as “9”, to search hosting institutions/centers in Turkey.

Research Fellowship Programme for International Researchers (9)

TUBITAK grants fellowships for international highly qualified PhD students and young post-doctoral researchers to pursue their research in Turkey in the fields of Natural Sciences, Engineering and Technological Sciences, Medical Sciences, Agricultural Sciences, Social Sciences and Humanities. The program aims to promote Turkey’s scientific and technological collaboration with countries of the prospective researchers. Preference will be given to candidates who demonstrate the potential to contribute significantly to Turkey’s goal of international cooperation in scientific and technological development.

TUBITAK International Industrial R&D Projects Grant Programme (10)

The objective of the program is to create market focused R&D Projects between European countries and to increase cooperation between Europe wide firms, universities and research institutions, by using cooperation webs such as EUREKA.
EUROPEAN FUNDS FOR INCOMING RESEARCHERS

TUBITAK EU Framework National Coordination Office coordinates the EU FP7 activities.

Under FP7-PEOPLE Programme, there are:

**Intra-European Fellowships (11)**

This action provides financial support for advanced training and trans-national mobility, for a period of 12 to 24 months (full-time equivalent), for individual projects presented by experienced researchers from Member States or Associated countries in liaison with a host organisation from another Member State or Associated country.

**International Incoming Fellowships (12)**

The action provides financial support to individual research projects presented by the incoming experienced researchers in liaison with a legal entity ("host organisation") in a Member State or an Associated country, as well as possibly a "return host organisation" if the researcher’s country of origin is an International Cooperation Partner Country.

**Co-Funding Of Regional, National And International Programmes (13)**

Doctoral programmes address the development and broadening of the research competencies of early-stage researchers.

**Other programmes aiming to fund and support international collaborations(14):**

*The Support Programme for the Initiative to Build Scientific and Technological Cooperation Networks and Platforms*
*International Industry R&D Network Support (including EUREKA)*
*European Cooperation in Science and Technology Programme (COST)*
*Bilateral Cooperation Programmes (Belarus, Bulgaria, China, France, Germany, Greece, Hungary, India, Italy, Korea, Macedonia, Mongolia, Pakistan, Romania, Russia, Slovakia, Slovenia, Tunisia, Ukraine, USA)*
*International Research Staff Exchange Scheme-IRSES*
*Industry-Academia Partnership Pathways- IAPP*
*Project Brokerage Events Funding Programme*
*Technology Transfer Programme for SMEs*

**7th Framework Programme includes following support programmes(14):**

*Career Integration Grants- CIG (former International Reintegration Grants-IRG),*  
*International Incoming Fellowships-IIF*  
*Intra-European Fellowships-IEF*
The followings are short-term visiting programmes (14):

* Global Researcher Programme
* Visiting Scientists Fellowship Programme

FULLBRIGHT SCHOLAR PROGRAMS (15)

Please also visit “http://www.fulbright.org.tr/default.aspx” if you are thinking about getting a scholarship in Turkey either as a student or as a scientist.

TURKISH MOBILITY CENTERS

The aim of these mobility centers are to help and inform the foreign researchers in Turkey and Turkish researchers going abroad, with visa, residence, work permit, social security, health, taxation, language courses, etc. issues.

The followings are 6 mobility centers in Turkey under ERA-MORE Network:

• Bogazici University, Istanbul
• Ege University, Izmir
• Gaziantep University, Gaziantep
• Istanbul Technical University, Istanbul
• Middle East Technical University, Ankara
• TUBITAK, Ankara

Researcher’s Mobility Portal-Turkey

A portal was established under the TR-MONET project and it is intended to help researchers to identify training and job opportunities throughout Europe with this portal. Moreover, the Portal offers information on fellowships and grants, research job vacancies and practical information and there are links from the European Portal to 31 National mobility portals and to contact information of ERA-MORE mobility centres. The Portals can be reached from the following address:

http://www.tubitak.gov.tr/eracareers/

TUBITAK HAS BILATERAL COLLABORATION PROGRAMMES WITH (10)...

2501 – w/ National Science Foundation (NSF)
2502 – w/ Bulgaria Science Academy
2503 – w/ Belarus National Science Academy (NASB)
2505 – w/ France National Science Research Center (CNRS)
2506 – w/ Indian Science and Industry Research Council (CSIR)
2507 – w/ Germany Research Council (DFG)
2508 – w/ Slovenia Research Institution (ARRS)
2513 – w/ Slovakia Science Academy (SAS)
2523 – w/ Korea National Research Foundation (NRF)
2525 – w/ Germany Education and Research Ministry (BMBF)
2526 – w/ Mongolia Academy of Science (MAS)
MULTICENTRAL COLLABORATION PROGRAMMES

Turkey actively participates the programmes of following international institutions:

- COST (European Cooperation in Science and Technology)
- EMBO (European Molecular Biology Organisation)
- ICGEB (International Centre for Genetic Engineering and Biotechnology)

MORE OPPORTUNITIES TO COLLABORATE:

- A cooperation protocol between The Scientific and Technological Research Council of Turkey (TUBITAK) and the French National Research Agency (ANR) on joint calls for collaborative research projects has been signed.
- 2014 has been declared as Turkish-German Year of Science: A Memorandum of Understanding was signed by the two ministers that aims to encourage cooperation in the fields of Science, Technology and Education between the two countries. In addition, two more agreements were signed between The Scientific and Technological Research Foundation of Turkey and the German Research Foundation and between the Higher Education Council of Turkey and the German Academic Exchange Service to increase the scientific and educational cooperation between the institutions.

WHY IS TURKEY GETTING MORE ATTRACTIVE FOR RESEARCHERS AND STUDENTS?

- The vision of Turkey during the upcoming National Science, Technology and Innovation Strategy (UBTYS) 2011-2016 is to contribute to new knowledge and develop innovative technologies to improve the quality of life by transforming the former into products, processes, and services for the benefit of the country and humanity (16). Because of that, many recent programs, some of them are listed above, have been established to attract more collaborations between Turkish and foreigner scientists / students. The programs offer different opportunities for promising studies; aim to provide scientific bridge between Turkey and other countries.
- If you are planning to visit universities in Turkey as a student, you may go to the following website and hear from international students about how their experience was in Turkey: www.studyinturkey.gov.tr
SOURCES: