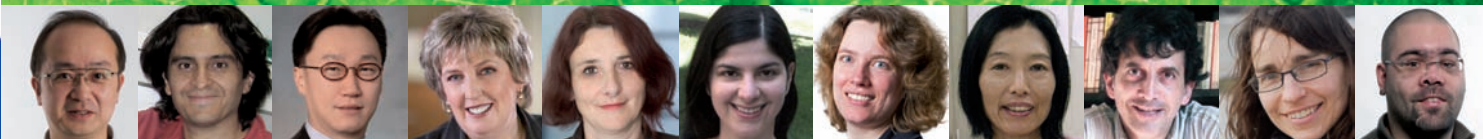


FY 09

APRIL 2009 - MARCH 2010

ANNUAL REPORT



HUMAN FRONTIER SCIENCE PROGRAM



HUMAN FRONTIER SCIENCE PROGRAM

The Human Frontier Science Program is a unique program funding basic research of the highest quality at the frontier of the life sciences that is innovative, risky and requires international collaboration. Special emphasis is given to the support and training of independent young investigators, beginning at the postdoctoral level. The Program is implemented by an international organization, supported financially by Australia, Canada, France, Germany, India, Italy, Japan, the Republic of Korea, New Zealand, Norway, Switzerland, the United Kingdom, the United States of America, and the European Union. Since 1990, more than 5000 awards have been made to researchers from 69 countries. Of these, 16 HFSP awardees have gone on to receive the Nobel Prize.



APRIL 2009 - MARCH 2010

ANNUAL REPORT

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The following documents are available on the HFSP website
www.hfsp.org

Joint Communiqués
(Tokyo 1992, Washington 1997, Berlin 2002, Berne 2004, Ottawa 2007):
http://www.hfsp.org/pubs/Pubs_reports_top.php

Statutes of the International Human Frontier Science Program Organization:
<http://www.hfsp.org/about/Aboutstatutes.php>

Guidelines for the Participation of New Members in the HFSP:
http://www.hfsp.org/about/AboutNew_Mem.php

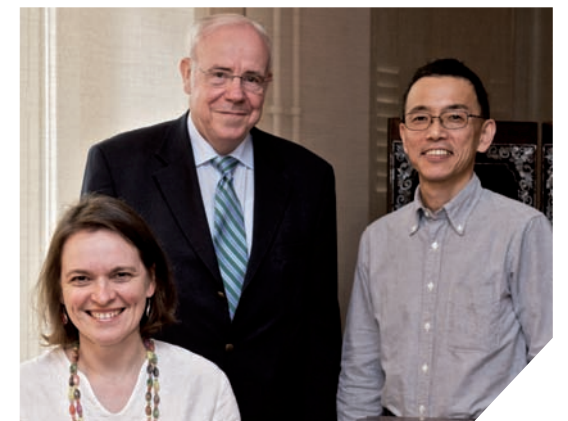
General Reviews of the HFSP (1996, 2001, 2006-2007):
http://www.hfsp.org/pubs/Pubs_reports_top.php

Updated and previous lists of awards, including titles and abstracts:
<http://www.hfsp.org/awardees/Awards-index.php>

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introduction

Introduction
Message of the Secretary General
Highlights in FY 2009
Board of Trustees
Council of Scientists
Secretariat



Ernst-Ludwig Winnacker (Secretary General),
Toru Nakahara (Deputy Secretary General), Front: Jill Husser

introduction

The Human Frontier Science Program (HFSP) promotes fundamental research in the life sciences with special emphasis on novel and interdisciplinary research, international and in particular intercontinental collaboration and support for young investigators. Since its establishment in 1989, HFSP has demonstrated the value of creating a framework for competitive, collaborative, international research of the highest caliber and of providing young scientists with the opportunity to emerge as talented researchers capable of shaping the science of the future.

The International Human Frontier Science Program Organization (HFSP/O) implements the Program through the following mechanisms of research support, details of which can be found in Chapters 1 and 2 of this report:

- Long Term Fellowships – for young scientists within three years of obtaining their PhD who wish to broaden their scientific experience in a foreign laboratory.
- Cross-Disciplinary Fellowships – modeled on the Long-Term Fellowships but specifically for scientists with PhDs in non-biological disciplines who seek training in the life sciences.
- Career Development Awards – for former HFSP Fellows who return to their home countries to help them set up their own independent laboratories.
- Young Investigator Grants – grants for interdisciplinary teams of young researchers within the first five years of their first independent positions, who are located in different countries.
- Program Grants – for interdisciplinary teams of researchers in different countries at any stage of their careers.

Since 1990, 832 Research Grants involving 3174 scientists, 2,443 Long-Term, 60 Cross-Disciplinary Fellowships and 157 Career Development Awards have been awarded. Researchers from nearly 70 countries have received HFSP funding so far.

The focus of research supported by HFSP is on the complex mechanisms of living organisms, ranging from the biomolecular level to that of behaving organisms. The life sciences have undergone a revolution in recent years, emerging as a leading scientific area with a convergence of interest from other disciplines such as physics, mathematics, chemistry, computer science and engineering on solving biological questions. HFSP aims to stay at the forefront of research by involving scientists from outside the life sciences as part of research collaborations and as postdoctoral fellows. To this end, the Young Investigator and Program Grants are specifically geared to fostering interactions between scientists from different disciplines and this is a major factor in the review of applications in these programs. In addition, HFSP has extended its commitment to interdisciplinary research by introducing Cross-Disciplinary Fellowships to equip young scientists from outside biology with the skills needed to tackle problems in the life sciences.

A program dedicated to the frontiers of science must support the next generation of researchers, who are in the strongest position to open new avenues of research. Several of the HFSP programs are specifically targeted towards early career scientists: the Fellowship programs, Career Development Award and Young Investigator Grant. In addition, Program Grant teams are

The HFSP/O is financed and managed by representatives of the Management Supporting Parties (MSPs). The MSPs are those countries that directly fund the HFSP Programs plus the European Union, which represents the EU countries that do not contribute directly. The MSPs are: Australia, Canada, France, Germany, India, Italy, Japan, the Republic of Korea, New Zealand, Norway, Switzerland, the United Kingdom, the United States of America and the European Union. Japan provided about 50.9% of the 61.32 million USD annual budget for FY 2009.

highlights FY 2009



Former Prime Minister Nakasone making a presentation to former President Masao Ito and Secretary General Torsten Wiesel

encouraged to include young scientists with the result that a significant number of scientists under the age of 40 participate in this program. Taking these researchers together, approximately 70% of annual HFSP funds are awarded to early career researchers.

The HFSP/O is governed by a Board of Trustees (Board) consisting of representatives of the MSPs. The Board is advised by a scientific advisory body, the Council of Scientists (Council) and the Organization is run from the Secretariat in Strasbourg, France.

- Professor Akito Arima took up the position of President of HFSP/O, as successor of Professor Masao Ito, on 1 April 2009.
- Professor Ernst-Ludwig Winnacker took up the position of Secretary General of HFSP/O, as successor of Professor Torsten Wiesel, on 1 July 2009.
- 20th anniversary celebrations were held in association with the 9th Awardees meeting at the National Center for Sciences, Tokyo, Japan, on 1-4 June 2009.
- A meeting on the Frontiers of Biology was held in Strasbourg on 3-6 March 2010.
- The first recipient of the HFSP Nakasone Award was Dr. Karl Deisseroth, Stanford University, USA.

message from
the Secretary General,
Ernst-Ludwig
Winnacker



Ernst-Ludwig Winnacker, Secretary General of HFSP

The year 2009 saw significant events and changes for HFSP. In the spring of 2009, HFSP celebrated its 20th anniversary during the annual awardees meeting held in Tokyo in the presence of former Prime Minister Nakasone. Professor Akito Arima took up office as President and I became Secretary General. In August 2009, Toru Nakahara began his tenure as Deputy Secretary General, following his predecessor Kazuo Shimomura. Patrick Vincent, Director of Finance, left for the Okinawa Institute for Science and Technology and was succeeded by Isabelle Coquard, our financial manager.

STANDING ON THE SHOULDERS OF GIANTS

On July 1st, Prof. **Torsten Wiesel** passed the baton of Secretary General of the Organization on to me. If it is true that we are all standing on the shoulders of giants, Torsten certainly is one of them. The world knows him as a great scientist who won the Nobel Prize in Physiology or Medicine in 1981. Many of us got to know him as a personality with a flair for detecting scientific excellence and commitment to supporting it accordingly. He left an office breathing an atmosphere of professionalism, empathy and efficiency, which is unprecedented. It will not be easy to step into the shoes of someone like Torsten.

At the same time Prof. **Masao Ito** left HFSP as its President, after serving in this function for eight years. Masao Ito was the founder of the Brain Science Institute of RIKEN. Under his visionary leadership, it developed into one of the leading brain science research institutes in the world. His own research field was and is the neural circuitry of the cerebellum and, in particular, the role of Purkinje cells in the cerebellum's activity.

Yasuhiro Nakasone, Prime Minister of Japan from 1982 to 1987, conceived the idea of HFSP and proposed it to his colleagues at the G7-summit in Venice in 1987. The HFSP Board of Trustees at their meeting in December 2009 formally established the HFSP Nakasone Award for frontier science in honour of Prime Minister Nakasone's farsighted and inspired contributions to the existence of HFSP. Prime Minister Nakasone received Deputy Secretary General Toru Nakahara and myself twice this year, when we informed him about details of the award and asked for permission to name it after him, to which he happily agreed.

LOOKING AHEAD AND INTO THE FUTURE

The work of the Board of Trustees, the Council of Scientists and the Secretariat fully reflects our joint efforts to secure the institutional and financial future of HFSP. Several elements of these efforts deserve to be highlighted; the development of a Strategic Outlook, the organisation of a Frontiers conference, an outside review of our work, the completion of selection of 2010 awardees and an analysis of the future of the HFSP Journal.

A Strategic Outlook was deemed necessary to analyze the strengths and weaknesses of HFSP and to adapt its procedures and instruments to the increasingly quantitative nature of biology. After approval by the Board of Trustees, the Strategic Outlook will be published on our web site and thus will be open to public scrutiny. In the same spirit, the Secretariat organized a Frontiers meeting to try to answer the question: what are the frontiers of the life sciences today? The meeting, which assembled some 30 key scientists from all around the world, came to the conclusion that the analysis of complex living systems is more amenable to scientific analysis today than ever before. Details of their conclusions can be found in Chapter 3 and in the Strategic Outlook.

As one of the weaknesses of our work, we recognized a lack of competitiveness of our fellowship and grant programs. In many countries around the world we observe a change in the status of postdoctoral fellows to salaried employees. This results in a certain degree of attrition from the HFSP fellowship program in favour of other better remunerated alternatives. The Board of Trustees has thus agreed to an increase of our fellowships by 7.3% for single fellows and an additional 2.7% for fellows with children. This increase will require HFSP to reduce the number of fellowships from 120 to approximately 90. In turn, this change is accompanied by a decrease in the success rate from 18 to about 13%.

At the Tokyo Awardees meeting, the idea was proposed to honour the Program's founder by the introduction of a HFSP Nakasone Award, to be presented each year at the HFSP awardees meeting. A first call for nominations resulted in a number of outstanding candidates. Nominations were reviewed by a subcommittee of the HFSP Council of Scientists. It decided to award the first HFSP Nakasone Award to Prof. Karl Deisseroth, of Stanford University, for his pioneering work in developing

"optogenetic" methods for studying neuronal circuits.

At its March meeting, the Board of Trustees of HFSP was asked by HFSP Publishing (HFSP) whether HFSP would be willing to renew its support of the HFSP Journal. Unfortunately the efforts of HFSP, although well intended, did not lead to the expected success. Alternative methods of communication apparently have overtaken the need for new journals. After extensive discussion, the Board declined to continue its support of the Journal. At the same time, it approved proposals of the Secretariat to introduce other means of communication, for example by the foundation of an alumni network. In fact, a first meeting of Canadian awardees will take place towards the end of July 2010.

In March 2010, we received the preliminary results of a study by two British institutions, the Manchester Institute of Innovation Research and Evidence Ltd. (a Thomson Reuters business), concerning analyses of the output of our funding efforts. We were happy to see that these recent surveys were extremely positive, showing, among other things, that HFSP has considerable impact on the career of awardees as well as on the scientific reputation of their host institutions.

I want to conclude this message by thanking the scientific community for their continued efforts to support our programme through participation in our review committees and Council. A funding organization is as good as the quality of its peer review. We will do everything possible to continue to live up to the high standard of our efforts.

Finally, I want to convey to you my pleasure at being able to work in my current position as Secretary General of HFSP. HFSP is in the unique position of being a truly intercontinental funding organization. I am grateful to the governments of Japan and those of the other MSPs for supporting such a wonderful endeavour. It is true, that, notwithstanding these efforts, we have been observing in recent years a certain erosion of our support from some member states. I sincerely hope that the outstanding quality of our work will convince all of our members to declare their continued and generous support for the years 2011 to 2013 during the upcoming Intergovernmental Conference in Canberra.

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HFSP Fellowship Program

- I.1 Introduction
- I.2 Long-Term and Cross-Disciplinary Fellowships
- I.3 Long-Term and Cross-Disciplinary Fellowships 2010
- I.4 Short-Term Fellowships
- I.5 Career Development Awards
- I.6 Career Development Awards in 2010
- I.7 The 2010 Review Committee for Fellowships



Left to right: Marie-Claude Perdigues, Guntram Bauer and Carine Schmitt



INTRODUCTION

The Fellowship program provides post-doctoral training opportunities for talented young scientists in the world's best laboratories and at the same time facilitates the mobility of young scientists between countries. With the increased complexity of science and scientific methodology, the process of learning new approaches requires longer periods of research experience before the young investigator can achieve independence. Applicants for HFSP Fellowships are encouraged to seek training in new fields in order to broaden their scientific experience. Upon completion of the fellowship, these well-trained scientists are expected to be able to promote truly frontier research in the life sciences.

HFSP support facilitates two important career steps. The first is the mandatory change in host country for HFSP Long-Term and Cross-Disciplinary Fellows. The second is on return to the home country, when the former fellow can apply for a Career Development Award, a critical step for the establishment of an independent laboratory. To that end, the possibility of a deferral for the final fellowship year offers maximum flexibility for career advancement.

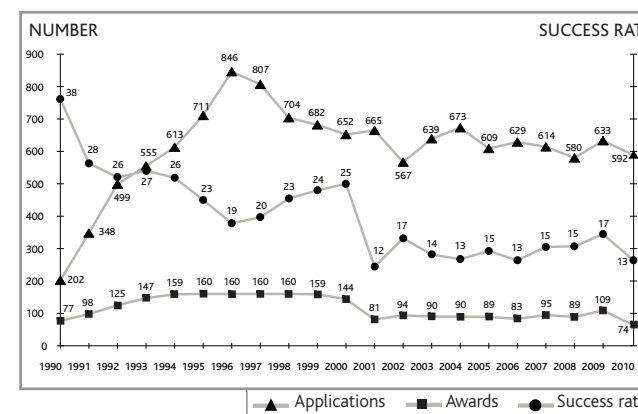


LONG-TERM AND CROSS-DISCIPLINARY FELLOWSHIPS

Long-Term Fellowships are intended to encourage young researchers with a background in the life sciences to seek additional research expertise and training in other fields within biology. Applicants who propose a significant change in research direction and whose research project is original and represents a departure from their Ph.D work or previous research are particularly encouraged. Statistics relating to applications to this program are shown in Fig. 1-1.

Cross-Disciplinary Fellowships are intended for postdoctoral fellows with a Ph.D. degree in the physical sciences, chemistry, mathematics, engineering, computer sciences etc. who wish to receive training in the life sciences. The first awards in this category were made in 2005 and since then the applications for this program have accounted for about 7-10% of the annual fellowship submissions (Table 1-1). Applicants for this program are encouraged to propose a significant change in discipline (e.g. from physics to cell biology) but should demonstrate how their specific expertise will bear on the biological question under study and how the host laboratory will benefit from their particular skills. The program mainly attracts applicants from chemistry and physics. Applications from engineers, biophysicists, mathematicians and computer scientists are also regularly submitted. This range of expertise is exceptional for a fellowship program that supports research in fundamental biological research. The broad acceptance of the Cross-Disciplinary Fellowships outside the life sciences shows that HFSP's aim to provide a bridge across disciplinary boundaries is indeed being fulfilled.

Fig. 1-1
Long-Term Fellowship applications, awards and success rates 1990-2010.



Awardees in both programs are required to be within three years of receiving their Ph.D. at the time of application. They are expected to have at least one first author publication and must not have worked in the host institution for more than 12 months at the start of their fellowship.

Fellows in both programs receive identical support for three years, and those who wish to extend their research training have the possibility to defer the start of their third year for up to two years while being supported through other funding sources. The third and final year of support can either be used in the host laboratory or for a final year of postdoctoral training in a laboratory in the home country. The fellowship provides an annual stipend and a research and travel allowance. HFSP fellows with children also qualify for a child allowance.

The lists of Long-Term and Cross-Disciplinary Fellows who started their project in FY 2009 are given in Appendix 4.

Table 1-1:

Annual number of reviewed fellowship applications and awards (Numbers for award year 2010 may still be subject to change).

Long-Term Fellowships (since 2002)

Award year	Number of		Success rate (%)	Female awardees	
	applications	awards		Number	(%)
2002	567	94	17	27	29
2003	639	90	14	29	32
2004	673	90	13	29	32
2005	609	89	15	22	25
2006	629	83	13	29	35
2007	614	95	15	32	34
2008	580	89	15	32	36
2009	633	109	17	39	36
2010	592	74	13	32	43
TOTAL	5536	813	15	271	33

Cross-Disciplinary Fellowships (since 2005)

Award year	Number of		Success rate (%)	Female awardees	
	applications	awards		Number	(%)
2005	65	12	18	1	8
2006	55	10	18	2	20
2007	54	5	9	0	0
2008	56	11	20	1	9
2009	39	10	26	2	20
2010	55	12	22	2	17
TOTAL	324	60	19	8	13



LONG-TERM AND CROSS-DISCIPLINARY FELLOWSHIPS 2010

At its meeting in March 2010, the Board recommended 86 awards for the coming fiscal year. Of the 647 applications for award year 2010, 42% of the applications were made by female candidates. Table 1-2 gives an overview of the distribution of the 2010 applicants and fellows according to their nationality and Fig. 1-2 an overview of the distribution of the 2010 awardees according to their host country.

The call for applications is announced annually in major scientific journals. The electronic newsletters of scientific societies and organizations and internet lists were also used to publicize the call. The deadline for the electronic submission of fellowship applications was 10 September 2009. All applications were screened by the Secretariat for compliance with formal criteria and with the scientific scope of the Program. Each application was assigned to two members of the Review Committee for a first evaluation during which the committee members each ranked around 50-60 applications. The Secretariat then ranked the applications on the basis of this evaluation. In the discussions during the Review Committee meeting on 18-20 January 2010, the top applications were scored again by the entire committee and the most highly qualified candidates were recommended for funding.

Fig. 1-2:
Host country distribution of Long-Term and Cross-Disciplinary Fellowship awardees for FY 2010 as decided by the Board in March 2010

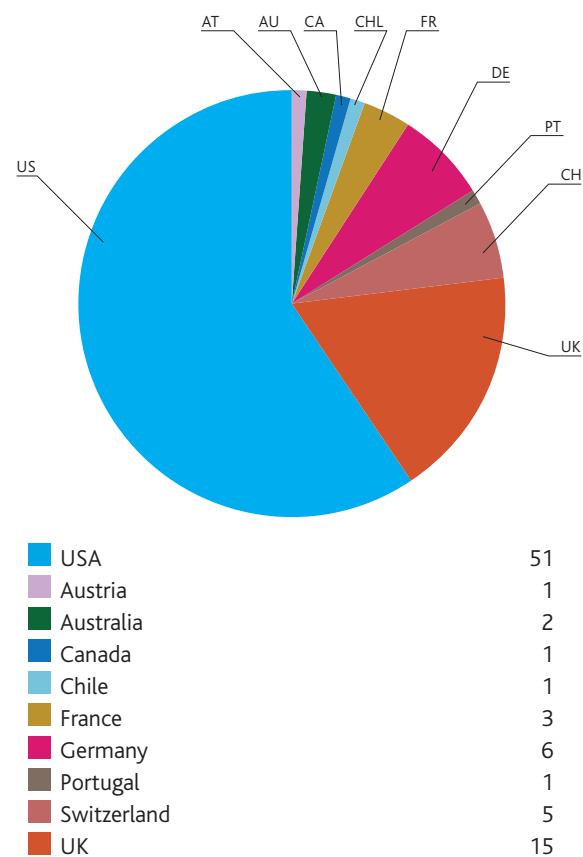


Table 1-2:
Nationality of Long-Term and Cross-Disciplinary Fellowship applicants and awardees for FY 2010 as decided by the Board in March 2010

Nationality	Total applicants	Total awardees	LTF applicants	LTF awardees	CDF applicants	CDF awardees
Australia	10	2	6	1	4	1
Canada	20	2	19	2	1	0
EU	121	16	111 (a)	14 (a')	10 (c)	2 (c')
France	77	6	73	6	4	0
Germany	73	12	68	10	5	2
India	40	4	35	3	5	1
Italy	35	4	31	4	4	0
Japan	47	4	47	4	0	0
Korea	15	3	13	3	2	0
New Zealand	4	1	4	1	0	0
Norway	0	0	0	0	0	0
Switzerland	8	2	8	2	0	0
UK	18	2	17	2	1	0
USA	25	4	20	3	5	1
Others	154	24	140 (b)	19 (b')	14 (d)	5 (d')
TOTAL	647	86	592	74	55	12

Long-Term Fellowship applicants:

(a) EU:

6 Austria, 4 Belgium, 1 Bulgaria, 1 Cyprus, 1 Czech Republic, 1 Denmark, 1 Estonia, 4 Finland, 8 Greece, 7 Hungary, 4 Ireland, 9 Netherlands, 5 Poland, 10 Portugal, 3 Romania, 2 Slovakia, 3 Slovenia, 39 Spain, 2 Sweden

(b) Others:

2 Algeria, 8 Argentina, 1 Bangladesh, 7 Brazil, 3 Chile, 21 China, 2 Colombia, 1 Cuba, 1 Hong Kong, 1 Indonesia, 1 Iran, 29 Israel, 1 Lebanon, 2 Malaysia, 5 Mexico, 1 Niger, 2 Nigeria, 2 Pakistan, 2 Peru, 2 Russia, 1 Serbia, 2 Singapore, 1 South Africa, 3 Chinese Taipei, 3 Turkey, 1 Ukraine, 1 Zimbabwe, 34 dual nationality

Cross-Disciplinary Fellowship applicants:

(c) EU:

2 Belgium, 1 Hungary, 3 Netherlands, 1 Slovenia, 3 Spain

(d) Others:

2 China, 5 Israel, 1 Mexico, 1 Nepal, 1 Russia, 4 dual nationality

Long-Term Fellowship awardees:

(a') EU:

1 Austria, 1 Denmark, 1 Estonia, 1 Finland, 1 Greece, 1 Ireland, 2 Netherlands, 1 Poland, 2 Portugal, 1 Romania, 2 Spain

(b') Others:

5 China, 7 Israel, 1 Lebanon, 1 Malaysia, 5 multiple nationality (France/Algeria, France/Madagascar, Germany/Chile/Austria, Ireland/UK, Netherlands/Australia)

Cross-Disciplinary Fellowship awardees:

(c') EU:

1 Belgium, 1 Netherlands

(d') Others:

2 Israel, 1 Russia, 2 dual nationality (Canada/USA, Israel/USA)

1.4

SHORT-TERM FELLOWSHIPS

The Short-Term Fellowship program enables researchers early in their career to spend two weeks to three months working in a laboratory in another country to learn new techniques or establish new collaborations. The program enables fellows to develop new techniques or to use instruments or techniques not available in their home country. Preference is given to young researchers early in their career. Applicants are expected to have a doctoral degree or equivalent research experience. Former Long-Term or Cross-Disciplinary Fellows can use this support to complete work initiated under their past HFSP fellowship. The fellowship provides travel and per diem support.

Short-Term Fellowship applications are accepted throughout the year. Each application is examined by several external mail reviewers who are experts in the field of research. The final decision is taken by the Chair of the Review Committee for Fellowships (a list of FY 2008 Awardees is given in Appendix 5). The main criteria are the scientific originality and excellence of the proposal, the accomplishments and potential of the candidate, the quality of the host environment, and the training potential of the fellowship experience. The overall benefit of international exchange in the achievement of the aims of the research project is also considered.

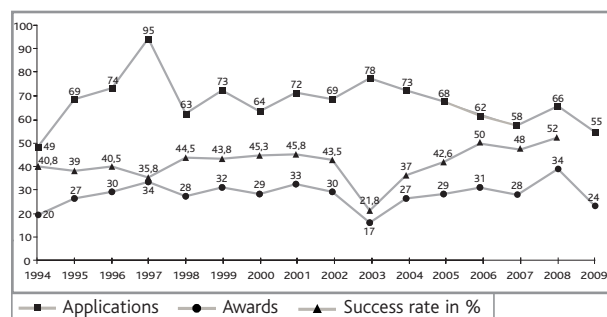
Because the Short-Term Fellowship program is a rolling program without a specific submission deadline, the date of application, selection for award and payment of award may not occur in the same fiscal year. Thus, it is possible to apply in one fiscal year but be awarded the fellowship and be paid in the following fiscal year (in the case of a submission at the end of the fiscal year).

The number of applications received during each fiscal year since 1994 and the number of awards made among these applications is shown in Fig. 1-3. The figure also indicates the success rate for this program. The average female success rate is 36%.

In fiscal years 1990 to 1993, a total of 89 Short-Term Fellowships were awarded. The exact number of eligible applications is not available for this period, since in 1989 and 1990 only awardees were registered in the database.

The HFSP Board of Trustees decided to discontinue the Short Term Fellowship Program as of 1 April 2010.

Fig. 1-3: Short Term Fellowship applicants, awardees and success rates from the same fiscal year (1994-2009) as of 31 March 2010. A further eleven applications are still under review, some of which may be awarded the fellowship. Thus, it is not yet possible to calculate a success rate for applicants of FY 2009.



1.5

CAREER DEVELOPMENT AWARDS

The Career Development Award provides 300,000 USD of support over three years and is open only to former HFSP Fellows who have completed at least two years of tenure in the host laboratory. Applicants must either be in the process of obtaining or already hold a position in the home country in which they are able to conduct independent research.

The first Career Development Awards were made in March 2003. Since the inception of this award, 362 applications from 28 different countries have been submitted and 157 young scientists have received the award. Each year this network expands as more and more fellows continue their career in the home country (Table 1-3). The list of award recipients for FY 2009 is given in Appendix 6.

It is often difficult for young investigators to obtain independent funding to pursue their own line of research early in their career. To this end, HFSP initiated the Career Development Award which facilitates the fellow's transition from postdoctoral researcher to independent scientist, providing further prospects for becoming an established investigator in the home country. The support helps young investigators develop their own research program, thus building a culture of independent young researchers worldwide who are open to new ideas and international collaboration.

The objective of the award is to enable former Long-Term or Cross-Disciplinary Fellows to establish their own independent research team after return to the home country. Awardees have the opportunity to intensify their international collaborations and experimental endeavors on emerging subjects in the life sciences by drawing on their experience of neighboring disciplines during their HFSP fellowship. Unlike fellowship stipends that are awarded to outstanding candidates to carry out a specific project, this award is meant to support the initiation of an independent research program that builds on the accomplishments of the fellowship tenure but also includes new elements of international collaboration.

Table 1-3: CDA applications and awards since the beginning of the program

Award year	Number of		Success rate (%)	Female awardees	
	applications	awards		Number	(%)
2003	22	8	36		
2004	41	17	41	5	29
2005	47	18	38	2	11
2006	51	29	57	6	21
2007	48	24	50	6	25
2008	57	21	37	5	24
2009	49	25	51	2	8
2010	47	16	34	2	13
TOTAL	362	157	43	28	18

1.6

CAREER DEVELOPMENT AWARDS IN 2010

Fig. 1-4:
Distribution of nationalities of CDA awardees for FY 2010



Australia	2
Austria	2
Canada/USA	1
Denmark	1
France	3
Germany	1
Israel	3
Japan	1
Taiwan China	1
UK	1

Current fellows receive the information about the call for applications by email. By the deadline on 12 November 2009, a total of 47 applications were received. Former fellows from award years 2003-2007 were eligible to apply. Applications were assigned for review to two members of the Council who ranked and commented according to the selection criteria set out in the application guidelines. Each application was also sent to at least two external mail reviewers who were asked to provide written comments. After initial ranking by the two Council members and further discussions during the meeting on 1-2 March 2010, 16 applications were recommended for funding. The Board approved the funding of 16 applications. Fig 1-4 gives an overview of the nationality of 2010 awardees.

1.7

THE 2010 REVIEW COMMITTEE FOR FELLOWSHIPS



Paul de Koninck, Chair of the Fellowship Review Committee

CHAIR

Paul DE KONINCK, Laval University Robert-Giffard, Beauport, Canada

VICE-CHAIR

Suzanne EATON, Max Planck Institute of Molecular Cell Biology and Genetics, Dresden, Germany

AUSTRALIA

Kum Kum KHANNA, The Queensland Institute of Medical Research, Brisbane

CANADA

David DANKORT, McGill University, Montreal

EUROPEAN UNION

Felix RITORT, University of Barcelona, Spain
Isabelle VERNOS, Centre for Genomic Regulation, Barcelona, Spain

FRANCE

Marie-Anne FELIX, Université Paris Diderot
Ludger JOHANNES, Curie Institute, Paris
Christophe MULLE, Université de Bordeaux 2

GERMANY

Jörg ENDERLEIN, Georg August University, Göttingen

INDIA

Vijayalakshmi RAVINDRANATH, Indian Institute of Science, Bangalore

ITALY

Maria Pia COSMA, Telethon Institute of Genetics and Medicine, Naples

JAPAN

Osamu NUREKI, Tokyo Institute of Technology, Kanagawa
Yoko YAMAGUCHI, RIKEN Brain Science Institute, Wakoshi

REPUBLIC OF KOREA

Narry KIM, Seoul National University

NEW ZEALAND

Joanna PUTTERILL, University of Auckland

NORWAY

Finn-Eirik JOHANSEN, University of Oslo

SWITZERLAND

Jean PIETERS, University of Basel
Ariel RUIZ i ALTABA, University of Geneva

UK

Jane CLARKE, University of Cambridge
Laurence HURST, University of Bath

USA

Cecilia CLEMENTI, Rice University, Houston
Barbara FINLAY, Cornell University, Ithaca
Jen SHEEN, Harvard Medical School, Boston

OTHER

Mingjie ZHANG, Hong Kong University of Science and Technology, Kowloon, Hong Kong China
Orly REINER, Weizmann Institute of Science, Rehovot, Israel

Wanjin HONG, National University of Singapore

DELEGATE FROM THE COUNCIL OF SCIENTISTS

Jean-David ROCHAIX, University of Geneva, Switzerland

HFSP Research Grant Program

- 2.1 Overview of the Grant Program
- 2.2 Young Investigator Grants
- 2.3 Program Grants
- 2.4 Awards in 2010
- 2.5 The 2010 Review Committee for Research Grants



Left to right: Geoff Richards, Armelle Koukoui and Carole Asnaghi

2.1

OVERVIEW OF THE GRANT PROGRAM

Research Grants are awarded for innovative collaborative projects of fundamental research carried out by a team of two to four scientists from different countries. Somewhat rarely a team is selected with five members, but the majority of larger teams have a weak link or show a redundancy in expertise so that the overall research plan is not convincing. Teams must be international and preferably intercontinental. In addition to these basic criteria, emphasis is placed on the innovative nature of the collaboration often involving novel combinations of expertise. Grants are awarded for a period of three years to teams who propose to combine their expertise to approach problems in the life sciences that could not be answered by individual laboratories. Particular attention is given to collaborations that bring together scientists from different disciplines (e.g. biology, chemistry, physics, mathematics, computer science and engineering). Applicants are expected to develop new lines of research and so as to

encourage novel ideas and innovative approaches, preliminary results are not required.

The Principal Applicant's laboratory must be located in one of the member countries while the other team members may be situated anywhere in the world.

Two types of grant were awarded in FY 2010: Young Investigator Grants for groups of young scientists establishing their research groups, and Program Grants for scientists at any stage of their careers. The applications are processed in parallel but the grant review committee in January examines and ranks each group separately.

THE MOVING FRONTIERS

The biggest challenge for the review committee is to identify novel frontier research applications often incorporating diverse expertise from both the biological and physical sciences. For this the committee must include members familiar with disciplines such as chemistry, physics, mathematics and engineering in addition to the more traditional biological sciences. The range of applications is such that the committee may lack the expertise necessary to assess the contribution of some of the team members. For this reason we may solicit opinions from mail reviewers working in departments that are unfamiliar with the Program. Fortunately, not only do we observe the same willingness to help in the review process from such experts as those in more traditional biological departments, but also we often receive spontaneous remarks confirming the originality and interest of the project. In some cases however these specialist reviewers point out that the 'innovative' approach is routine in their discipline and that furthermore the applicants' approach is superficial.

2.2

YOUNG INVESTIGATOR GRANTS

The concept of novelty is related to the speed at which certain fields or techniques advance. A novel technology (microscopy, labeling, transgenic models, bioinformatics programs, etc.) may become commercially available within two or three years of its first appearance in the HFSP competition and will start to appear as a tool in a large number of applications. Similarly a project considered cutting-edge one year may be considered as routine a couple of years later. In fact, in the absence of technological breakthroughs, fields can appear to stagnate for a year or two while teams concentrate on exploiting the last wave of innovation. This may well be high quality science destined for major journals, but the committee members must have sufficient stature so as to decide whether an approach has become standard or is truly innovative.

We continue to observe a growing willingness to collaborate at the international level. Teams now have every opportunity to exchange on a daily basis via the web to ensure that the collaboration is effective. Nonetheless, despite this ease of communication, successful teams seem increasingly inclined to organize regular meetings to discuss problems face to face. The overall impression is that scientists are learning the interest of making such collaborations reality (rather than continuing their ongoing projects in parallel). This aspect is considered very seriously by the review committee which gives considerable weight to the details of interactions between the team members that are presented in the full application. With the expansion of HFSP membership in recent years the possible combinations have increased considerably (notably because of the role of the Principal Applicant in choosing team members) and we expect to see significant changes in the profiles of collaborations in the coming years.

The Young Investigator Grant scheme was introduced in the 2001 award year to encourage collaboration between young scientists who are within five years of obtaining their first independent positions. Young Investigator Grant teams receive 250 thousand USD per year for two members, 350 thousand USD for three members, and 450 thousand USD for four or more. Local collaborations in the same country are permitted but teams only receive funds equivalent to 1.5 team members if the collaboration is truly interdisciplinary. This measure aims to facilitate the formation of teams involving scientists from different disciplines since it is often difficult for scientists, especially younger investigators, to find appropriate partners internationally. In the 2010 award year, applications from Young Investigators represented about 21% of the letters of intent received. While these applications were consistently more successful between 2006 and 2008, in 2009 and again in 2010 they had a similar success rate to those submitted for Program Grants.

2.3

PROGRAM GRANTS

These are awarded to teams of independent researchers at any stage of their careers. The research team is expected to develop new lines of research through the collaboration. Applications including independent investigators early in their careers are encouraged. Priority is given to new, innovative research projects for which preliminary results may not necessarily be available. Since 2004, the amount awarded depends on the size of the team and is currently 250 thousand USD for two members, 350 thousand USD for three members, and 450 thousand USD for four or more team members. The rules concerning team members from the same country are the same as for the Young Investigators. The quality of applications in this competition has been boosted by the arrival of a cohort of younger investigators more familiar with interdisciplinary research, many of who have now established their laboratories more than five years ago and are no longer eligible for the Young Investigator competition.

2.4

AWARDS IN 2010

Awardees starting their research work in FY 2010 were selected among the applications received in reply to the call published in the international scientific journals Science and Nature and on the HFSP website. The call was also publicized via the web sites or newsletters of relevant scientific societies. A two-step review process was used. Guidelines and application forms for both the letter of intent (the first step) and for full applications (the second step) were provided on the web, and the submission and review of applications were entirely electronic. The deadline for letters of intent was 31 March 2009. After an unexplained drop in the number of letters of intent in 2009, in 2010 and 2011 (currently in progress), interest has returned to the 2007 and 2008 levels. (Fig. 2-1).

The 675 letters of intent received were initially screened on the basis of formal eligibility. Only a few letters of intent were rejected on these grounds. Since 2005, triage has been introduced to reduce the response time for inappropriate applications; a small scientific committee including the Chair and Vice-Chair of the Review Committee screened the letters of intent and those that did not meet the scientific aims of the Program, 61 applications in all, did not enter the full review process. The Principal Applicant was informed as soon as possible so that the team might apply for funding elsewhere. Each remaining letter of intent was evaluated by two Review Committee members. The top-scoring projects were examined by a Selection Committee consisting of previous and past members of the Review Committees. The Selection Committee met from 1 July to 3 July to discuss almost half of the original submissions (294 applications) and following these discussions, 84 applicants were invited to submit a full application. Teams that were not asked to submit full applications were given brief feedback concerning the selection procedure, the evaluation criteria and the general classification of their application.

Invitations were sent out immediately after the Selection Committee meeting with the deadline for submission of full applications on 15 September 2009. All 84 teams submitted full applications. Each full application was evaluated by mail (external) reviewers who submitted a written report and by two members of the Review Committee for Research Grants. Scientific

merit, innovation and interdisciplinarity were the most important criteria in the evaluation of the projects. Internationality, and especially intercontinentality, and the participation of researchers early in their careers also ranked highly, not only in the case of Young Investigator but also in Program Grant applications. The Young Investigator applications were reviewed separately in the same manner as Program Grants. The Review Committee met on 25-27 January 2010 in Strasbourg to discuss the 84 full applications and recommended 34 for awards, 9 Young Investigator and 25 Program Grants. The final selection of awards was made by the Council of Scientists (Council) and financial considerations (budgetary restrictions) were taken into account by the Board of Trustees (Board) before the recommendations were approved. Both awardees and unsuccessful applicants received feedback from the committee in the form of a short summary.

Fig. 2-1 shows the number of applications and awards between award years 2002 and 2010. Between 1990 and 2001 there was a single step procedure with an average success rate of about 13%. This was simplified from 2002 onwards by the introduction of shorter letters of intent where applicants outline their collaboration and project. Following an initial review by members of the grant review committee, a smaller Selection Committee invites full applications for the more promising proposals. The numbers of applications and awards using this two step procedure from 2002 onwards are shown in Table 2-1.

Fig. 2-1:
Research Grant applications and awards

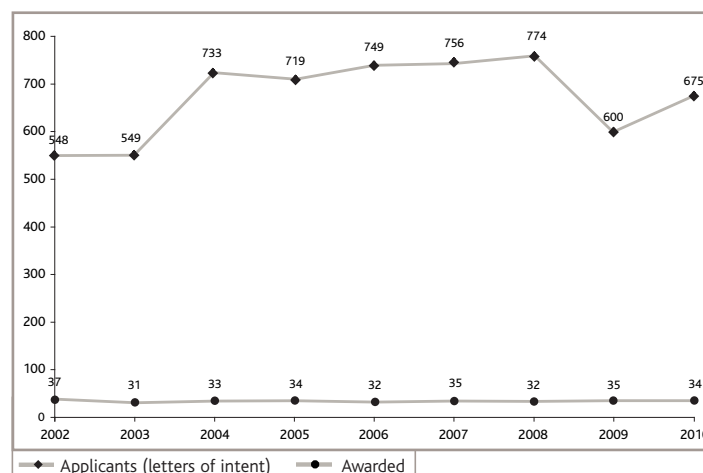
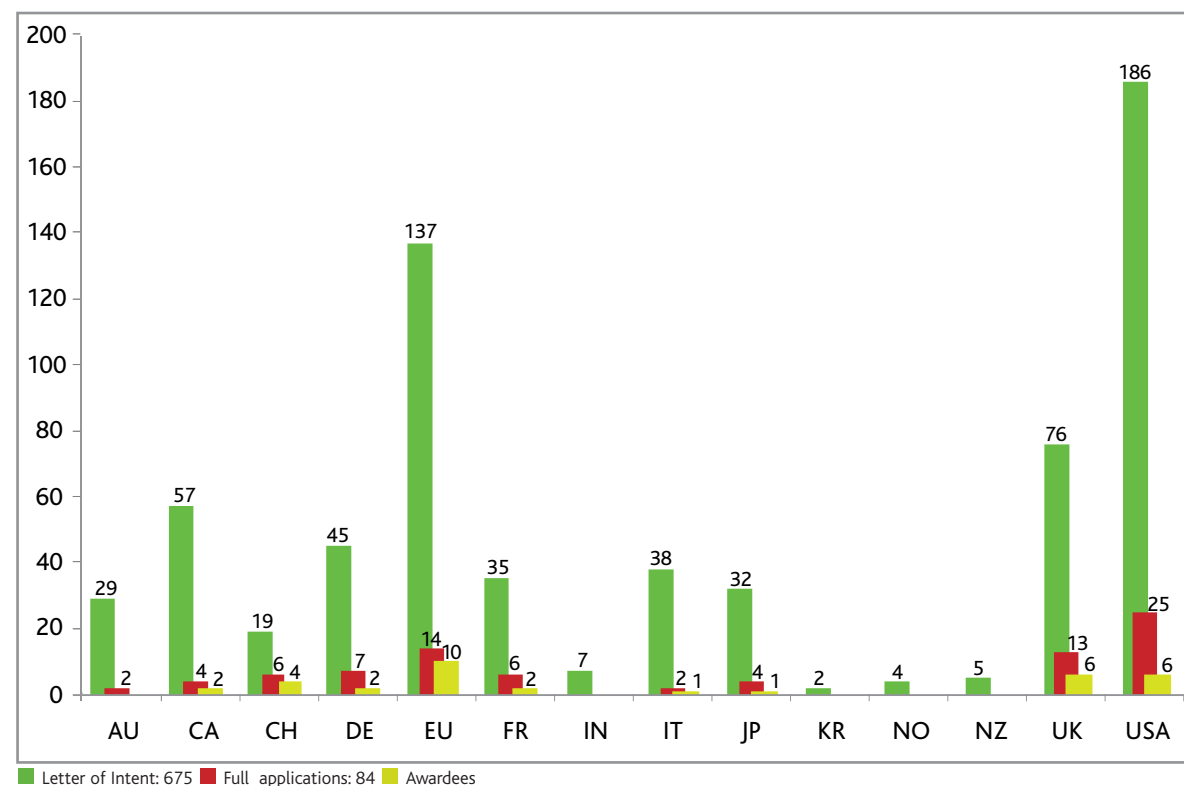


Table 2-1:
Research Grant applications and awards each year since 2002 (two step procedure)

Award year	Letters of intent	Full applications invited	Awards	Success rate* (%)	Total cost in their 1 st year (USD million)
2002	548	72	37	51.4	12.35
2003	549	80	31	39.0	10.85
2004	733	67	33	49.2	11.75
2005	719	86	34	39.5	12.75
2006	749	80	32	40.0	11.05
2007	756	80	35	44.3	12.70
2008	774	88	32	36.8	10.65
2009	600	88	35	39.8	12.1
2010	675	84	34	40.5	11.25
TOTAL			832**		

* based on full applications ** grand total of awards (1990-2010)

Fig. 2-2:
Countries in which Principal Investigators are working



(a) EU Letter of Intent

7 Austria, 12 Belgium, 2 Czech Republic, 6 Denmark, 1 Estonia, 7 Finland, 6 Greece, 2 Hungary, 9 Ireland, 25 The Netherlands, 2 Poland, 9 Portugal, 2 Slovenia, 31 Spain, 16 Sweden

Non MSPs: 3 Israel (CDA Awardees)

(b) EU Invited

2 Austria, 1 Denmark, 1 Hungary, 4 The Netherlands, 3 Portugal, 1 Slovenia, 2 Spain

Non MSP: 1 Israel (CDA Awardee)

(c) EU Awarded

2 Austria, 1 Denmark, 1 Hungary, 2 The Netherlands, 3 Portugal, 1 Spain

Table 2-2:
Gender distribution in award year 2010

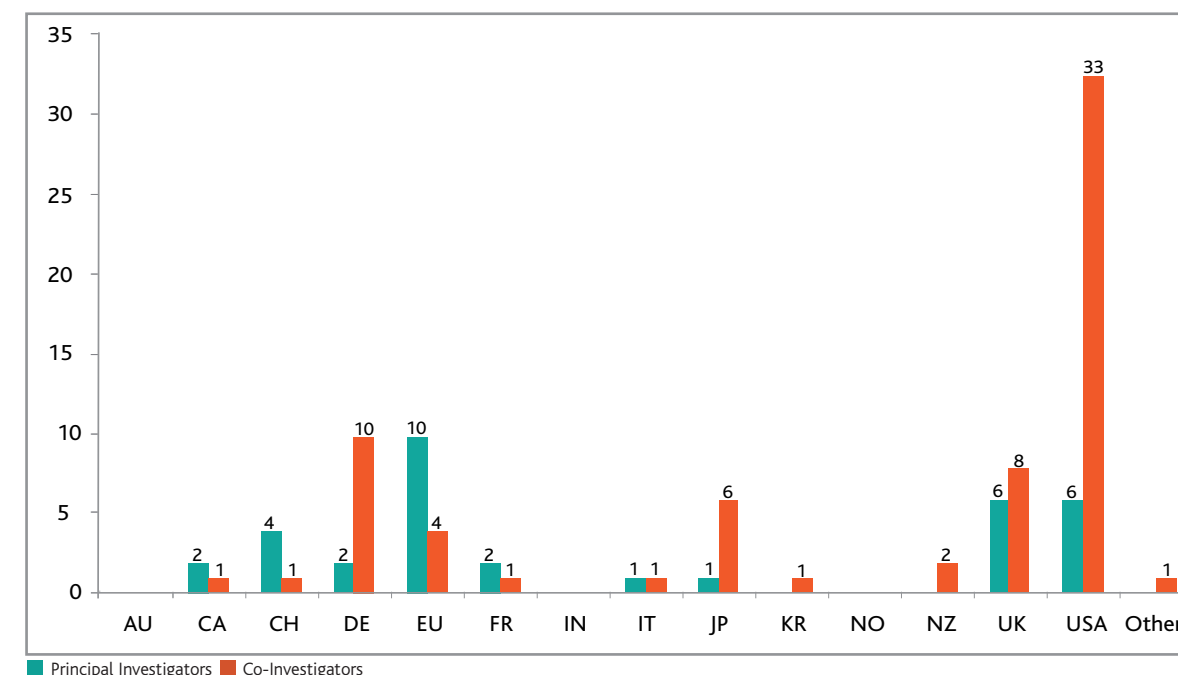
		Letters of intent		Invited applications	
		Program	Young	Program	Young
Female	No. scientists	333	120	31	31
	%	19.9	31	17.4	40.3
Male	No. scientists	1335	269	147	46
	%	79.9	69	82.6	59.7
TOTAL	No. scientists	1670*	389	178*	77

* Program: 2 info refused

Table 2-3:
The distribution of female scientists in recommended applications in award year 2010 is the following:

	Total	Female	% Female	(2009)	Female PI	(2009)
Program	80	16	20	10.7	5	3
Young	23	8	34.8	29.6	3	3
TOTAL	103	24	23	15.3	8	6

Fig. 2-3:
Countries in which awardees are working



Principal Investigators

EU: 2 Austria, 1 Denmark, 1 Hungary, 2 The Netherlands, 3 Portugal, 1 Spain

Co-Investigators

EU: 1 The Netherlands, 3 Spain
Non MSPs: 1 Singapore

FIGS. 2-2, 2-3, TABLE 2-4 :
DISTRIBUTION OF AWARDS PER COUNTRY

Fig 2-2 shows the distribution of Principal Investigators for the 2010 awards among various countries and Fig. 2-3 shows the total number of scientists in different countries participating in the international teams. The largest number of applications came from Principal Investigators in the USA and more than one third of successful applicants (all team members) were working in the USA.

Table 2-4:
Number of applicants and awardees listed by country of institution

	Letter of intent			Invited			Awardees		
	PG	YI	TOTAL	PG	YI	TOTAL	PG	YI	TOTAL
PG=Program Grants YI=Young Investigators									
Australia	60	13	73	3	0	3	0	0	0
Canada	84	28	112	3	5	8	2	1	3
France	89	15	104	8	4	12	3	0	3
Germany	124	24	148	19	8	27	10	2	12
India	20	4	24	1	0	1	0	0	0
Italy	88	12	100	6	1	7	1	1	2
Japan	128	16	144	15	4	19	5	2	7
Korea	11	5	16	1	1	2	1	0	1
New Zealand	13	2	15	2	0	2	2	0	2
Norway	9	1	10	0	0	0	0	0	0
Switzerland	42	9	51	9	2	11	5	0	5
UK	160	36	196	24	8	32	9	5	14
USA	460	117	577	61	27	88	32	7	39
EU	259(a)	70(a)	329(a)	19(b)	10(b)	29(b)	9 (c)	5(c)	14(c)
Non MSPs	123(a')	37(a')	160(a')	7(b')	7 (b')	14 (b')	1(c')	0	1(c')
TOTALS	1670	389	2059	178	77	255	80	23	103

(a) Others from EU Letter of Intent

PG: 10 Austria, 18 Belgium, 1 Croatia, 5 Czech Republic, 14 Denmark, 1 Estonia, 11 Finland, 16 Greece, 5 Hungary, 14 Ireland, 53 The Netherlands, 5 Poland, 11 Portugal, 4 Slovenia, 61 Spain, 30 Sweden
YI: 5 Austria, 7 Belgium, 2 Czech Republic, 5 Denmark, 1 Finland, 3 Greece, 2 Hungary, 2 Ireland, 10 The Netherlands, 2 Poland, 7 Portugal, 3 Slovakia, 12 Spain, 9 Sweden

(b) Others from EU Invited

PG: 1 Austria, 3 Denmark, 1 Greece, 5 The Netherlands, 2 Portugal, 1 Slovenia, 5 Spain, 1 Sweden
YI: 2 Austria, 2 Hungary, 3 The Netherlands, 2 Portugal, 1 Spain

(c) Others from EU Awardees

PG: 1 Denmark, 2 The Netherlands, 2 Portugal, 4 Spain
YI: 2 Austria, 1 Hungary, 1 The Netherlands, 1 Portugal

(a') Non MSPs Letter of Intent

PG: 6 Argentina, 1 Belarus, 5 Brazil, 5 Chile, 10 China, 3 Chinese Taipei, 2 Colombia, 1 Egypt, 1 Gambia, 4 Hong Kong China, 1 Iran, 54 Israel, 2 Kenya, 1 Lebanon, 1 Malawi, 3 Mexico, 1 Nigeria, 3 Russia, 8 Singapore, 3 South Africa, 2 Thailand, 1 Turkey, 3 Ukraine, 1 Uruguay, 1 Venezuela.
YI: 2 Argentina, 3 Brazil, 2 Chile, 2 China, 8 Chinese Taipei, 1 Gabon, 1 Grenada, 1 Hong Kong, China, 14 Israel, 1 Singapore, 1 South Africa, 1 Thailand

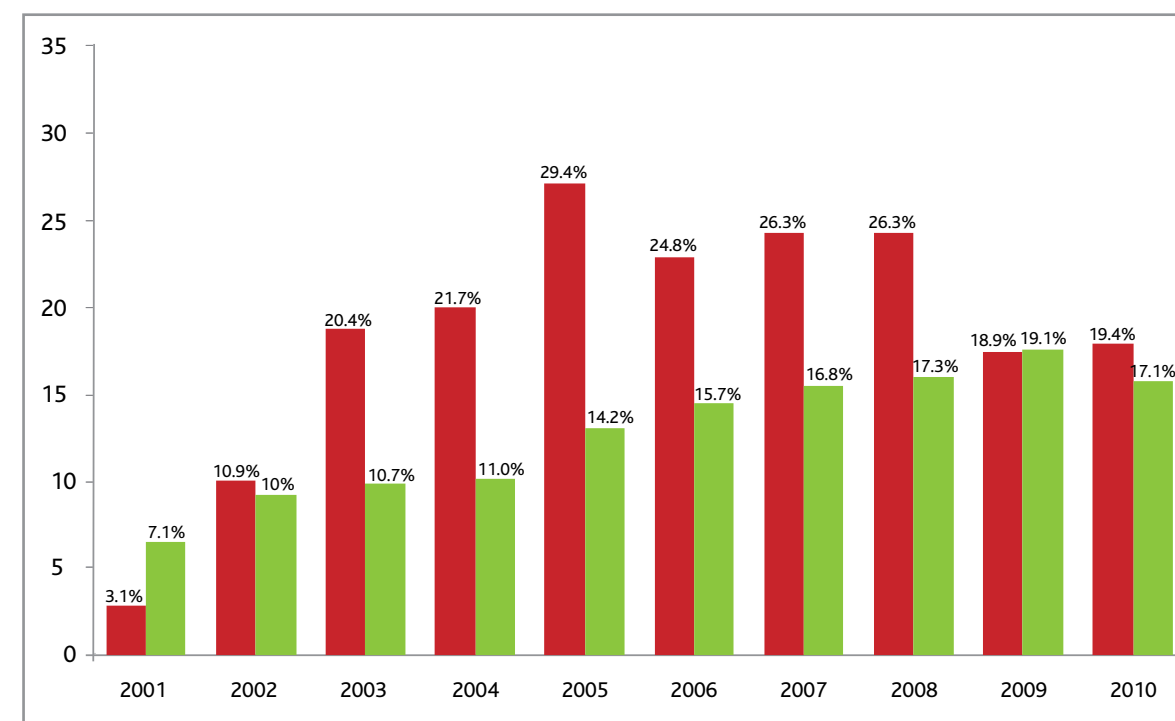
(b') Non MSPs Invited

PG: 1 Brazil, 4 Israel, 1 Lebanon, 1 Singapore
YI: 1 Chile, 1 Chinese Taipei, 5 Israel

(c') Non MSPs Awardees

PG: 1 Singapore

Fig. 2-4:
Interdisciplinarity in Research Grants



■ Awarded ■ All applicants

% scientists from non-biological disciplines participating in Research Grants

Since 2001 HFSP has emphasized the importance of interdisciplinarity in the grants program. The analysis of interdisciplinarity has been based on the titles of the institutions of individual applicants and awardees and for consistency this approach has been retained in Fig. 2-4 although new interdisciplinary centers mostly carry a classical 'biology' element in their title. Amongst all applicants the percentage of scientists coming from institutes outside the life sciences steadily increased from 7.1% in 2001 to 19.1% in 2009. In the recommended category this group averaged 26.7% from 2005 to 2008, up from 3.1% in 2001.

The 2008 review committee asked for more freedom in weighting the innovative, international and interdisciplinary components when assessing applications. The 2009 and 2010 Selection Committees selected teams for their innovation and the apparent interdisciplinarity of the project (which has sometimes proved artefactual). In January 2009 the full committee recognized the impact of this change which was reflected in the reduction in the percentage of scientists coming from institutes outside the life sciences to about 19% in the awarded category, which lead to a close match between 'input' and 'output' In 2010 the figures are 19.4% and 17.1% respectively, reasonably similar to 2009. This may well represent an equilibrium point for the program and although interdisciplinarity will be followed in the coming cycles, it will no longer be featured in the annual report.

2.5

THE 2010 REVIEW COMMITTEE FOR RESEARCH GRANTS



Jennifer Stow, Chair of the Research
Grant Review Committee

CHAIR

Jennifer STOW,
University of Queensland, Brisbane, Australia

VICE-CHAIR

Edward BAKER,
University of Auckland, New Zealand

AUSTRALIA

Robert SAINT, University of Melbourne, Victoria

CANADA

Paul WISEMAN, McGill University, Montreal

FRANCE

Cécile SYKES, Institut Curie, Paris

GERMANY

Michael BRECHT, Humboldt-University, Berlin

INDIA

Gautam DESIRAJU, Indian Institute of Science,
Bangalore

Jyotsna DHAWAN, National Center for Biological
Sciences, Bangalore

ITALY

Lucia BANCI, University of Florence, Sesto Fiorentino

Alessandro TREVES, SISSA (International School for
Advanced Studies), Trieste

JAPAN

Naoki SUGIMOTO, Konan University, Kobe

Tetsuji KAKUTANI, National Institute of Genetics,
Mishima

REPUBLIC OF KOREA

Yunje CHO, Pohang University of Science and
Technology, Hyoja Dong

NEW ZEALAND

John David FRASER, University of Auckland School
of Medicine

NORWAY

Aurora MARTINEZ, University of Bergen

SWITZERLAND

Carl PETERSEN, Brain Mind Institute (EPFL), Lausanne

UK

Declan BATES, University of Leicester

USA

Dora ANGELAKI, Washington University, St Louis

Cheng-Ming CHIANG, UT Southwestern Medical
Center, Dallas

Herbert LEVINE, University of California, San Diego

Claire WALCZAK, Indiana University, Bloomington

EUROPEAN UNION

Frederick C. MACKINTOSH, Vrije University,
Amsterdam, The Netherlands

Maria SANCHEZ-VIVES, Hospital Clínic of Barcelona,
Spain

DELEGATE FROM THE COUNCIL OF SCIENTISTS

Francesco LACQUANITI, University of Rome, Italy

chapter 3

Program Highlights

- 3.1** HFSP 20th Anniversary
- 3.2** Awardees Meeting
- 3.3** Frontiers Meeting
- 3.4** HFSP Nakasone Award
- 3.5** MIOIR Review
- 3.6** HFSP Communications
- 3.7** Honours and Prizes



Left to right: Martin Reddington, Rosalyn Huie (Communications) and Xavier Schneider (IT manager and webmaster)

3.1

HFSP 20TH ANNIVERSARY

20 YEARS
IN PURSUIT OF EXCELLENCE
1989 2009

"20 Years in the Pursuit of Excellence" was the motto of the 20th anniversary of the HFSP, celebrated on the occasion of the annual HFSP Awardees Meeting held in Tokyo from June 1-4 2009. In the afternoon before the main Awardees Meeting, members of the Japanese political and administrative establishment, of the HFSP governing bodies together with HFSP awardees from throughout the world and Japanese alumni, came together to look back over the first 20 years of the Program and to discuss future directions of the life sciences.

In his address, former Prime Minister Nakasone of Japan, the founding father of the Program, recalled that the aim of HFSP was to enable courageous, daring researchers "with a challenging spirit to be recruited from all over the world to work in teams collaborating on research aimed at elucidating the complex functions of life." He expressed great joy in the fact that, 20 years on, the high level of the science supported by the Program was well recognised and that so many former awardees had gone on to be awarded the Nobel Prize (currently 16 including three of the six 2009 Laureates in Physiology or Medicine and Chemistry). He hoped that continued

support from Japan and other countries would lead to the further development of the program. Mr. Nakasone's congratulations to HFSP were echoed by Toichi Sakata and Keiko Terui speaking on behalf of the Minister of Education, Culture, Sports, Science and Technology (MEXT) and the Minister of Economy, Trade and Industry, who looked forward to supporting further basic research through the HFSP in the hope that this will contribute to solving the problems facing mankind.

Prof. Masao Ito, former President of the HFSP, took the audience back to the early days of the Program, commenting that "this international program is something of a miracle". The HFSP emerged from a rare combination of circumstances: the end of the cold war, opening up the possibility of increased global cooperation, and the post-war recovery of Japan leading to a strong Yen, accompanied by a strong wish in Japan to contribute more to the international community. After discussions within Japan, Mr. Nakasone proposed the establishment of an international scientific program at the G7 Economic Summit in Venice in 1987 and the way was open for establishing the HFSP. Prof. Ito witnessed the progress of the HFSP as a member of the Council of Scientists during the first 8 years and subsequently as President. In Prof. Ito's own words "When HFSP was conceived, the prevailing big dream was to create a new field or discipline across traditional scientific fields integrating physics, chemistry, mathematics, engineering and biology. However, to quickly develop funding activities there was considerable pressure to take a more restrictive approach to concentrate on a few limited subfields of the life sciences. At Council meetings there was an intense confrontation between idealists and realists as recorded in Nature's commentaries and news in 1992. Science is changing rapidly in its organisation and the pressure for integration [of disciplines] is very high. The matter of where HFSP funding is to be invested should be a matter of ongoing discussion".

Indeed, after the first 10 years of the Program substantial changes were made to ensure that HFSP remained firmly at the frontier of biology. Prof. Torsten Wiesel described the challenges he faced when he took over as Secretary General in 2000. First, to encourage creative young scientists, a special collaborative grant for young investigators was introduced. The value of the grants was increased and the guidelines were changed eliminating the need for preliminary results so as

to stimulate scientists to do something risky and innovative rather than "bread and butter projects". The two programs on neuroscience and molecular biology were fused to enhance the breadth of science funded and a big effort was made to stimulate interdisciplinary collaborations of the kind envisaged by the Program's founders. The postdoctoral fellowship program was also reformed, with an extension from 2 to 3 years and the possibility to take the 3rd year back in the home country. Those who went home were also able to apply for a new Career Development Award. In the spirit of encouraging a new "renaissance" kind of scientist, a new fellowship program was introduced to encourage those trained in the physical sciences to work in biology. However, "it seemed strange that we have an international program and nobody gets to know each other", commented Prof. Wiesel, which led to the establishment of the annual awardees meeting. HFSP thus provides possibilities for researchers from their early years to senior scientists to meet in different countries. The Tokyo meeting was the 9th in the series.

FRONTIERS - WHERE NEXT?

Following the talks by Profs. Ito and Wiesel, the theme of frontier research was taken up by an international panel, moderated by science journalist Akira Ozeki from the respected Japanese daily newspaper, Asahi Shimbun, on the theme "Frontiers - where next?".



Yasuhiro Nakasone
Former Prime Minister of Japan

Opening the discussion, Dr. Kathie Olsen (National Science Foundation, USA) commented that interdisciplinary approaches are becoming an integral feature of research due to the complexity of the problems facing both science and society. Such issues are being tackled by HFSP, which is about innovation, collaboration and interdisciplinarity, "creating pathways and interfaces to develop new concepts and methods and a new integration of experimental and theoretical approaches. This is the frontier." This theme was reinforced by HFSP President Akito Arima, a distinguished nuclear physicist, who emphasized the importance of breaking down frontiers both in terms of "frontiers of science" and "human frontiers", i.e. science transcending national borders. The founders of the Program were foresighted in anticipating the need for international and multidisciplinary approaches in the 21st Century.

Where is biology going in the 21st century? Prof. Ernst-Ludwig Winnacker (Secretary General of the European Research Council and Secretary General Elect of the HFSP) commented "I see the future of biology in the form of a complexity pyramid standing on its head. At the tip is the gene, the smallest unit of life, the unit of information. Above this are layers and layers of molecular and cellular aggregates that become ever more complex." Twenty years ago, biological thinking was focussed on the nature of the gene and the perspective of being able to study entire genomes. This goal has been reached but there are still areas to be explored with the help of cheaper sequencing methods and the cooperation of fields such as computer science. For instance metagenomic approaches to the human gut flora or the oceans have opened a new era for microbiology with implications for population genetics, biogeochemistry and ecology. However, even though we continue to work on the "inventory of life and its molecules", we must at the same time obtain a quantitative insight into their behaviour, changing biology from a descriptive to a predictive mode. It is clear that the next 20 years will see a partnership between biology and mathematics, engineering, physics and related fields to this end.

Predictive power will also be needed to promote the field of synthetic biology, the first steps towards which have been taken. Prof. Glauco Tocchini-Valentini (CNR Institute of Cell Biology, Rome, Italy) also emphasized the need for innovative theoretical approaches: "Now we must face the study of the internal logic of the organism, of how it is constructed and the logic behind how it functions". Paraphrasing Sydney Brenner, we should be able to move between the molecular hardware and the software determining how it is organised without feeling they are different sciences. This is a program for the next 10-20 years of the life sciences.

Prof. K. VijayRaghavan (National Centre for Biological Science, Bangalore, India) returned to the question of the challenges of interdisciplinary research. "The mingling of disciplines has led to new avenues of science being opened up. There is a new generation of people who are able to span these disciplines, not only by collaboration but also by having all these capacities in one unit." He bemoaned that while scientists are improving their abilities to communicate across disciplines, funding agencies and governments are still frequently pouring money in a top-down way into specific kinds of problems. It is essential to address directly the value of intellectual interdisciplinary pursuits through the restructuring of funding programs.

In summarising, Akira Ozeki commented on the emphasis placed by all panelists on interdisciplinary research. In the past 10-20 years we have seen the technical collaboration between biology and chemistry or physics. In the next 10 years we can expect collaborations based more upon theory and mathematics. This is the challenge for the new generation of scientists. The President of HFSP, Akito Arima rounded off the session by addressing the audience with a grin: "There are many young promising researchers here. I hope all of you are very healthy!"

3.2

AWARDEES MEETING

NINTH HFSP AWARDEES MEETING TOKYO, 1-4 JUNE 2009

The annual Awardees Meetings have now become a highpoint in the HFSP calendar. The meetings have been welcomed enthusiastically by the awardees and have provided members of the HFSP Board, Council, Review Committees and staff with an excellent opportunity to appreciate the work being funded and to increase the visibility of the HFSP in the host country.

The ninth meeting, held in Tokyo from 1-4 June 2009 coincided with the 20th anniversary of the HFSP as described above. The meeting was generously hosted by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) and the Ministry of Economy, Trade and Industry (METI). All current awardees were invited to the meeting, as well as former awardees from the Tokyo area. The 2009 Young Investigators and Career Development Awardees were also invited to encourage young laboratory leaders to make new contacts in the HFSP community. The meeting featured 33 talks and 142 posters by HFSP awardees. Two excellent plenary lectures were given by Nobel Prize winner Peter Agre and neuroscientist Takao Hensch. The program also included four "Chalkboard sessions", more specialized thematic sessions, which enabled scientists in specific fields to meet each other early in the program, and a special workshop on "Deciphering signaling and gene networks". The theme of interdisciplinary, frontier research discussed during the 20th Anniversary celebration the day before was strongly in evidence in the awardees' presentations. Experimental and theoretical approaches



were reported in areas including enzymology, molecular motors, animal and plant development and evolution. Computational methods were being applied to problems as far ranging as the modeling of potential targets for protein inhibitors to the use of virtual reality techniques in understanding how we experience ownership of our own bodies.

In the workshop on signaling and gene networks, the panelists, bacteriologist Judy Armitage (Oxford), mathematician Leah Keshet (Vancouver) and experimental physicist Friedrich Simmel (Munich) discussed a list of open questions, which they referred to as "Things that keep us awake at night". Interestingly, despite the very different fields of research and academic backgrounds of the three panelists, they came up with the same issues. Among these were:

- How to identify the appropriate model?
- How to deal with differences of scale when moving from molecules to whole organisms?
- How to derive parameters such as binding constants, diffusion coefficients that reflect what is going on in living cells?
- How to ensure that experimental data are appropriate for modeling?
- How to ensure the *reliability* of published data for use in modeling?
- How to present the interrelationships between the components of complex networks in a way that is clearly defined, e.g. as in systems engineering?
- How to decide if noise and robustness are relevant in a given situation?

During the ensuing discussion, several participants emphasized the importance of chemistry as well as

physics in approaching biological networks at the systems level. It is difficult to go straight from the language of mathematics to that of biology without going through the step of understanding molecules and their interactions. The panelists agreed on the importance of chemistry but pointed out that it is sometimes difficult to interest chemists in biological problems. Nevertheless, a consideration of chemical structures and their interactions is essential in determining whether models are valid and it is important to go back and forth between different levels. Finally, there remain serious problems of communication between scientists from different disciplines and between institutional departments, which sometimes seem to be separated and defended by "moats and drawbridges". Interdisciplinary centres that facilitate interaction between scientists coming from very different fields are still the exception rather than the rule. Clearly, the approaches taken by HFSP to stimulate collaboration between scientists from different disciplines are highly relevant for the way ahead.

3.3

FRONTIERS MEETING

3-6 MARCH 2010
CHATEAU DE L'ILE, STRASBOURG

From the discussions presented in previous sections at the 20th Anniversary celebration and the Awardees Meeting it is clear that the life sciences face major challenges as they are transformed into a more quantitative mode. After 20 years of activity and the new appointments of President Akito Arima and Secretary General Ernst-Ludwig Winnacker, it seemed timely to convene a meeting of experts from different areas of biology to discuss the needs of life science research in the 21st century and the place of HFSP in the new scientific landscape.

The 2010 Frontiers Meeting was held at the Hotel Chateau de l'île, Strasbourg from 3-6 March. It brought together around 35 scientists, both senior figures and members of the younger generation of researchers, from a broad range of fields to discuss the frontiers of the life sciences. Twenty two talks were given by scientists from 10 different countries in the presence of members of the HFSP Board of Trustees, Council of Scientists, Secretariat and guests. The program was based on the idea of a pyramid of complexity as enunciated by Ernst-Ludwig Winnacker during the 20th Anniversary panel discussion, starting from molecules and gene circuits and rising in complexity to the brain and cognition. Speakers were not only from the core biological disciplines that have been the mainstay of HFSP's funding activities over the years but also from physics, chemistry, computer science and ecology, which have been playing an increasing role in recent years. Although not all areas were represented a number of overriding themes emerged that are also relevant for these fields. Some of the points emerging for the frontiers of biology from the presentations and the final general discussion were:

- interdisciplinarity is a necessary condition for progress in the life sciences but not a sufficient one. Only combined with excellence and risk-proclivity does it define a frontier;

- novel technologies, like the DNA-sequencing revolution, the improvement of imaging tools or the new developments in light-microscopy constantly redefine the field and accelerate progress in an unprecedented matter;

- the relationship of mathematics and biology, unlike the one between mathematics and physics, is only in its infancy, still making it a challenge to reach beyond tautology and the trivial;

- systemic, synthetic and quantitative approaches to biology thus require additional breakthroughs, in information theory, in high-throughput chemistry, in mathematics and in the computer sciences;

- the science of genetics is on a continuing track of success as seen in the new developments in the understanding of the biology of plants and of the biology of development in general;

- the new possibilities in understanding complexity are beginning to penetrate even fields not only like the cognitive neurosciences, but also ecology and biodiversity, which have not found intensive support by HFSP in the past;

- the borderlines between genetics, epigenetics and the environment are becoming more and more defined, permitting us to pose clearer questions as to their respective relationships;

- new opportunities are presented by the availability of large datasets that can be used as a basis for discovery and for building models of biological systems; however, as discussed during the workshop at the Tokyo Awardees meeting, there is a need for ensuring the reliability of the data if it is to yield appropriate models;

- «Big Science» has become a feature of modern biology thus posing challenges to an organization like HFSP as to how to participate, e.g. by supporting the critically innovative aspects;

- education in the interdisciplinary context of the life sciences has become ever more important.

On the last day of the meeting, participants discussed the implications for an organization such as HFSP in this new quantitative era of biological science. HFSP has been molding its programs over the last years to support the kind of interdisciplinary approaches necessary for progress in biology in



the coming decades. There was general agreement that HFSP must continue to support excellence and to take risks in funding frontier science in areas that tend to be neglected by agencies subject to more traditional constraints.

SPEAKERS

Wilfred van Gunsteren,
ETH Hönggerberg, Zurich, Switzerland
Computer simulation in the life sciences: where do we go?

Thomas Henzinger,
Institute of Science and Technology, Austria
Computer science versus Computational science

Jordi Garcia-Ojalvo,
Universitat Politècnica de Catalunya, Barcelona, Spain
From gene circuit dynamics to the molecular mechanisms of cellular function

Roger Brent,
Molecular Biosciences Institute, Berkeley and Fred Hutchinson Cancer Research Center, Seattle, USA
New types of biological function via single cell physiology

Sven Panke,
Bioverfahrenstechnik, Basel, Switzerland
Synthetic biology: engineering complex systems?

Kai Simons,
Max-Planck Institute of Molecular Biology and Genetics, Dresden, Germany
Protein-lipid interactions and cell membrane organisation

Akihiro Kusumi,
Institute for Integrated Cell-Material Sciences (iCeMS), Kyoto University, Japan
Single-molecule tracking approaches to membrane domains

Patrick Cramer,
Gene Centre, Ludwig-Maximilians-University, Munich, Germany
Structural biology of multicomponent complexes: state of the art and new frontiers

Andreas Ladurner,
EMBL, Heidelberg, Germany
Charting the future epigenetic landscape - from small molecules in action to gene-environment interactions

Jonathon Howard,
University of Cologne, Germany
Darwin and Mendel: two paradigms for biology

Suzanne Cory,
Walter and Eliza Hall Institute, Parkville, Australia
Targeted cancer therapy: improving outcomes by inducing apoptosis more effectively

Stefan Hell,
Max-Planck Institute for Biophysical Chemistry, Göttingen, Germany
Far-Field optical nanoscopy

John Gurdon,
University of Cambridge, UK
Reversal of the differentiated state: concentration and time

3-6 MARCH 2010
CHATEAU DE L'ILE, STRASBOURG

SPEAKERS

Jen Sheen,
Massachusetts General Hospital, Boston, USA
Connecting plant cell signaling networks

Gary Ruvkun,
Massachusetts General Hospital, Boston, USA
Based on the last 50 years of molecular biology discovery, HFSP should bet on the continued centrality of gene inactivation and phenotyping (i.e., genetics).

Ian Baldwin,
Max-Planck Institute for Chemical Ecology, Jena, Germany
Ecology's future mission: salvaging books from the burning library

Anja Geitmann,
University of Montreal, Canada
Mechanics of cellular morphogenesis – towards a holistic view of development?

Detlef Weigel,
Max-Planck Institute for Developmental Biology, Tübingen, Germany
Complex interactions in natural environments

Carla Shatz,
Stanford University, USA
How can Nature be unraveled from Nurture in Neuroscience?

Henry Markram,
Ecole Polytechnique Fédérale de Lausanne, Switzerland
The Blue Brain Project: understanding through building

Henrik Ehrsson,
Karolinska Institute, Stockholm, Sweden
Cognitive neuroscience of body self-perception

Atsushi Iriki,
RIKEN Brain Science Institute, Wako-shi, Japan
Neuroscience of human intellectual evolution

DISCUSSANTS AND RAPORTEURS

Akito Arima,
President of HFSP, President of Japan Science Foundation, Tokyo, Japan

Jesper Haeggström,
Karolinska Institute, Stockholm, Sweden

Young-Joon Kim,
Yonsei Genome Institute, Seoul, Republic of Korea

Paul Lasko,
McGill University, Montreal, Canada

Rae Silver,
Columbia University, New York, USA

Glauco Tocchini-Valentini,
Institute of Cell Biology, CNR, Monterotondo, Italy

K. VijayRaghavan,
National Centre for Biological Sciences, Bangalore, India

Torsten Wiesel,
Former Secretary General of HFSP and President Emeritus of the Rockefeller University, New York, USA



Karl Deisseroth, Stanford University, the first recipient of the HFSP Nakasone Award in 2010 for his pioneering work on optogenetics in neurobiology.

3.4

**HFSP
NAKASONE
AWARD**

THE HFSP NAKASONE AWARD FOR KARL DEISSEROTH OF STANFORD UNIVERSITY

At the 20th Anniversary meeting in May 2009, the idea arose to recognize the vision of former Prime Minister Nakasone of Japan in the creation of the Human Frontier Science Program by establishing a special award for contributions to frontier science in his name. The HFSP Nakasone Award has been established to honour scientists who have made key breakthroughs in fields at the forefront of the life sciences.

The first HFSP Nakasone Award was conferred in March 2010 upon Karl Deisseroth of Stanford University for his pioneering work on the development and application of optogenetic techniques for the study of the relationship between neural circuits and behaviour. Karl Deisseroth holds joint appointments as Associate Professor of Bioengineering and Associate Professor of Psychiatry and Behavioral Sciences at Stanford University. His work has been recognised by many prestigious awards, including from the Society for Neuroscience for his

Links on Karl Deisseroth and optogenetics:
<http://www.youtube.com/watch?v=C8bPbHuOZXg>
<http://www.asklive.org/research/ecs/deisseroth.html>
<http://www.optogenetics.org>

development of optogenetics, and from the Howard Hughes Medical Institute. He will give the first HFSP Nakasone Lecture at the annual meeting of HFSP awardees to be held in Kerala, India in November 2010.

A major challenge in neuroscience is to understand the cellular mechanisms underlying neural circuits responsible for behaviours. Approaches from pharmacology and electrophysiology have made major contributions to our understanding of the chemical and electrical basis of neural activity, but have not allowed the manipulation of specific classes of nerve cells in defined anatomical areas. Karl Deisseroth's contribution has been to engineer neurons of defined specificity in a way that makes them sensitive to light, and to use light as a stimulus to activate or inhibit their activity.

His approach builds on studies of microbial opsins (genes that encode light-activated ion channels and pumps called bacteriorhodopsins, halorhodopsins, and channelrhodopsins), ranging from work by Walter Stoeckenius and Dieter Oesterhelt in 1971 to work by Peter Hegemann and Georg Nagel in 2002, on the microbial biology and biophysics of these proteins. In a paper published in 2005, Karl Deisseroth, the principal investigator of a team at Stanford that included graduate students Ed Boyden and Feng Zhang, took the gene for one of these microbial opsins and inserted it into a virus that was then used to insert the genes into nerve cells in cell culture. The cells could be stimulated with blue light at millisecond time resolution, thus allowing for the first time optical activation of nerve cells at physiological time scales. Using the power of genetics to create different modified viral vectors, Karl Deisseroth has been able to apply this approach in living animals to make defined sets of neurons sensitive to light, even in deep brain structures of mammals. He has also developed sophisticated optical fibre technologies to allow both the optical stimulation and recording of neuronal activity together with behavioural observation. Finally, he has led the molecular engineering of microbial opsins for new classes of function, and the application of these new tools to study neural circuit function in health and disease. This combination of genetics with optics has been dubbed "Optogenetics". Karl Deisseroth has made this technology freely available and it is now being used by hundreds of laboratories throughout the world.

3.5

MIOIR REVIEW

The HFSP programs have been reviewed several times. The last review, in 2006/2007, approached the changes to the programs since introduction of various initiatives from 2000. However, the new programs such as the Young Investigator Grants (YI), Career Development Awards (CDA) and Cross-Disciplinary Fellowships (CDF) could only be partially reviewed since they had been introduced too recently. The participants of the Intergovernmental Conference held in Ottawa in 2007 therefore requested a further review of these initiatives, including an evaluation of publication output. A new review was carried out in 2009/2010 by the policy research institute, the Manchester Institute of Innovation Research (MIOIR), part of the University of Manchester. The conclusions of this review are paraphrased below. The full review is on the HFSP web site at http://www.hfsp.org/pubs/pubs_reports_top.php.

SUMMARY AND RECOMMENDATIONS OF MIOIR REVIEW

The HFSP provides a unique set of programs, with a sui generis combination of excellence, high risk, inter- and cross-disciplinarity and a global outreach. The programs are designed to complement each other, to support individuals, teams and – indirectly – organisations. At the same time the HFSP is well aware of the structural effects of the programs in terms of mobility and build up of excellence in national research systems. It thus also strives for a balanced mobility pattern of the awardees

without in any way compromising excellence. All in all, the scientific excellence as measured through bibliometric analysis and the impacts on careers and organisations as analysed in the surveys are impressive, and the prestige of the program appears unique.

In sum, the HFSP programs contribute to research and capacity building in life sciences in a crucial way. In their unique combination they constitute an opportunity structure for research in life science, whereby risk-taking, mobility, collaboration is enabled that follows the need of that field and the desires of individuals. It thus complements national and other supranational schemes that, one way or the other, are more limited than the offering of the HFSP.

The program and the organisation are extremely well regarded in the funded community, which was at the centre of this evaluation. By and large, all programs do what they intend to do. In addition, although the management of the program was not in the focus of the evaluation, all indications we have about the management point towards excellence and a very high level of user-friendliness. The feedback in open text fields and in interviews about the HFSP is overwhelmingly positive.

The programmatic innovations, such as the CDF and (earlier) the CDA and YI, are challenging, but work. The broadening of programs has accentuated the profile of the HFSP even further, rather than softened it. In all schemes the overriding principles of the HFSP are present, and the effects on excellence, international collaboration and high risk research apparent. The CDF allows even more radical change and linkage of fields and disciplines and appears to achieve this even beyond the funded period. The CDA scheme has been widely accepted and become a cornerstone and catalyst in "HFSP careers". It appears that in some cases it is a challenge to find appropriate organisational hosts and institutional framework conditions for all potential CDA awardees to go to their home country as defined in the scheme and build up careers in their niches. The Young Investigator Grant is a success, especially as regards the opportunity for an accelerated build up of international visibility and collaboration on highest levels.

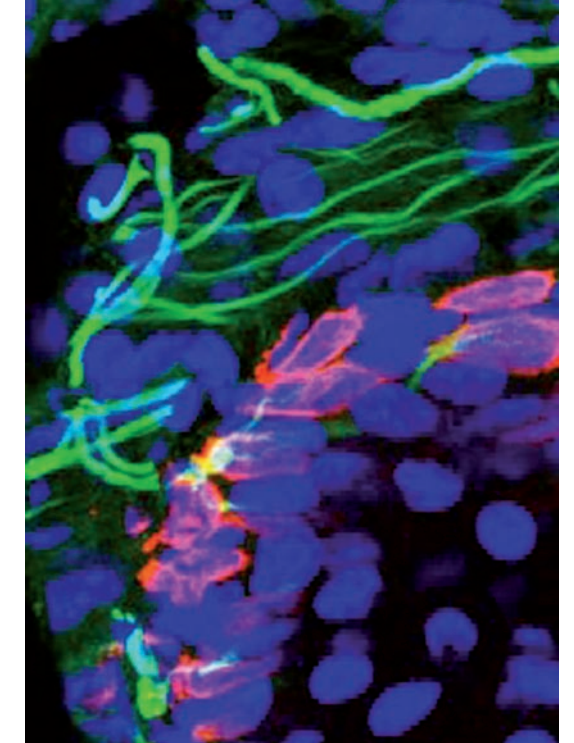
3.6

HFSP COMMUNICATIONS

Our communication efforts are being substantially intensified as a service to the scientific community and others who are interested in the Program. In particular, the web continues to be an increasingly important tool for disseminating information about the Program.

The HFSP web site is visited on average 25,000 times per month, with a peak of 32,000 visits soon after the announcement of the 2009 and 2010 awards, indicating the importance of the site as an information source. According to the internet search engine AltaVista, over 2000 web pages in web sites around the world link to pages on the HFSP web site. These are mostly sites dedicated to summarizing funding opportunities (e.g. GrantsNet, BioMedNet), academic institutions (especially pages summarizing funding opportunities), other funding agencies and awardees' own web sites.

We are becoming increasingly aware of the publication output of our awardees, many of whom inform us of forthcoming or recent publications. Recent changes in bibliographic databases such as the Web of Science now allow searches on the funding agencies cited in publications and we are now alerted to recent papers in a timely manner. Summaries of selected publications by HFSP awardees are now posted more frequently under the "Hot off the Press" rubric of the HFSP home page. These summaries are being viewed approximately 2500 times per month.



Cells involved in transmitting mechanical stimuli in the skin (Cedric Blanpain, CDA holder).

An occasional electronic newsletter is sent out to approximately 6500 subscribers to inform them about HFSP activities and point to new information on the web site. This leads to a dramatic increase in visitors to the site and is being sent more frequently. Over the next year, the HFSP web site will be enhanced with a more substantial news section and with more ways for the community to be alerted to changes on the site (email alerts, RSS feeds).

HFSP has also been experimenting with new social networking media. The HFSP page on Facebook, started in November 2009, has over 300 subscribers. Over 50% of these are aged between 25 and 34, with another 25% between 35 and 44. The number of subscribers is still relatively small but they are visiting the Facebook page almost twice per week on average. HFSP also posts information on Twitter, which is less popular than Facebook with only 50 subscribers. However, the numbers of followers of both the Facebook and Twitter feeds is growing continuously and this could prove to be a valuable channel for reaching a younger generation interested in the Program.

Web-based scientific press sites such as AlphaGalileo in Europe and Eurekalert in the USA are effective means of disseminating information about the Program. We are making more use of these in order to increase mention of HFSP in the media. Since the beginning of 2010 we have also made direct contact with the press officers at many of the awardees' institutions and are encouraging the institutions to write their own press releases and to publicise the awards on their own web sites. This initiative is still young but has already led to more publicity of the 2010 HFSP awards in the electronic scientific news media and will be intensified in the future.

Last, but by no means least, we continue to maintain close links with the HFSP community. The annual Awardees Meetings have proved to be a successful mechanism for fostering interaction between current awardees and with members of the HFSP Board of Trustees, Council of Scientists, Review Committees and Secretariat. Many awardees have regretted not being able to attend these meetings after their awards ended. This was a clear response of awardees during the MIOIR review of the HFSP described in 3.5. Steps are now being taken to enhance the HFSP community by establishing a network of alumni groups and by developing a new alumni section with social networking facilities on the HFSP web site (expected late 2010).

HFSP web site: <http://www.hfsp.org>
Facebook: <http://www.facebook.com/pages/Human-Frontier-Science-Program-HFSP/166939256131>
Twitter feed: <http://twitter.com/hfsp>

HFSP PARTICIPATION IN SCIENTIFIC AND SCIENCE POLICY MEETINGS:

2009

International Opportunities Expo2009, NIH, 2 April, Bethesda, MD, USA

International Peer Review Workshop, The Potomac Institute for Policy Studies, 20-22 May, Arlington, VA, USA

"Forschen in Europa", University of Leipzig, 28 May, Leipzig, Germany

59th Meeting of Nobel Laureates, 28 June-3 July, Lindau, Germany

"Horizons", PhD Career Symposium, University of Göttingen, 9 September, Göttingen, Germany

"Netzwerke, Cluster, Allianzen: Wo bleiben die Forscher? Über die Vielfalt der Forschung und der Forschungsförderung", Konstanzer Wissenschaftsforum, 17-18 September, Stuttgart, Germany

Science and Technology in Society (STS) Forum, 4-6 October, Kyoto, Japan

"Evo-Devo meets Marine Ecology – New Frontiers in Ocean Science through Integrative Biology", 9-11 October, Sant'Angelo d'Ischia, Naples, Italy

Society for Neuroscience Annual Meeting, 16-21 October, Chicago, USA

"From Science to Politics; Connecting Knowledge and Experience", 23-26 October, Schloss Ringberg, Germany

Canada Foundation for Innovation, 5-7 November, Halifax, Canada

"Synthetic Biotechnology", Germany Academy of Science and Engineering, 9-10 November, Frankfurt, Germany

10th anniversary meeting of Fonds National de la Recherche, Luxembourg, 9 December, Luxembourg

2010

Indian Young Investigators meeting, 8-13 February, Calcutta, India

"Lust auf wissenschaftliche Karriere in Deutschland! Wege, Förderungen und Netzwerke im Überblick", 2nd Annual KissWin Meeting, 25 February, Berlin, Germany

3.7

HONOURS AND AWARDS

Award 2009	Name	Nationality	Current affiliation	HFSP award & year
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AMERICAN ACADEMY OF ARTS AND SCIENCES

Members				
Biochemistry and molecular biology	Sankar ADHYA	USA	National Cancer Institute, Bethesda, USA	Program Grant 2002
	Alan HINNEBUSCH	USA	National Institutes of Health, Bethesda, USA	Program Grant 2009
Cellular and Developmental Biology, Microbiology and Immunology	Marianne BRONNER-FRASER	USA	California Institute of Technology, Pasadena, USA	Research Grant 2000
	James HABER	USA	Brandeis University, Waltham, USA	Research Grant 2000
	Gary RUVKUN	USA	Harvard Medical School, Boston, USA	Research Grant 1991
Foreign Honorary Member Cellular and Developmental Biology, Microbiology and Immunology	Lelio ORCI	Italy	University of Geneva, Switzerland	Research Grant 1990, 1994
	Nancy KANWISHER	USA	MIT, Cambridge, USA	Research Grant 1997, Program Grant 2001
Neurosciences, Cognitive Sciences and Behavioral Biology	Gary WESTBROOK	USA	Vollum Institute, Oregon Health and Science University, Portland, USA	Research Grant 1998
	Sean CARROLL	USA	University of Wisconsin-Madison, USA	Research Grant 1998
Medical Sciences, Clinical Medicine and Public Health	Andrew FEINBERG	USA	Johns Hopkins School of Medicine, Baltimore, USA	Program Grant 2007

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

Fellows				
Biological Sciences	Sarah ASSMANN	USA	Pennsylvania State University, University Park, USA	Program Grant 2009
	Ronald DAVIS	USA	Baylor College of Medicine, Houston, USA	Research Grant 1992
	Barry DICKSON	Australia	Research Institute of Molecular Pathology, Vienna, Austria	Program Grant 2001, 2007
	Alfred GOLDBERG	USA	Harvard Medical School, Boston, USA	Research Grant 1995
	Peter JONES	USA	University of South California, Los Angeles, USA	Research Grant 1994
	Steve KAY	USA	University of California, San Diego, USA	Research Grant 1993
	Marc KIRSCHNER	USA	Harvard Medical School, Boston, USA	Program Grant 2004
	Mark PEIFER	USA	University of North Carolina, Chapel Hill, USA	Program Grant 1998
	James TEPPER	USA	Rutgers University, Newark, USA	Short-Term Fellowship 2002
	Willem VERMAAS	Netherlands	Arizona State University, Tempe, USA	Research Grant 1997

Award 2009	Name	Nationality	Current affiliation	HFSP award & year
Chemistry	Philip BEVILACQUA	USA	Pennsylvania State University, University Park, USA	Program Grant 2009
	Richard CERIONE	USA	Cornell University College of Veterinary Medicine, Ithaca, USA	Research Grant 1996
	Martin EGLI	Switzerland	Vanderbilt School of Medicine, Nashville, USA	Short-Term Fellowship 2005
	Michael GELB	USA	University of Washington, Seattle, USA	Short-Term Fellowship 1999
	James McCLOSKEY	USA	University of Utah, Salt Lake City, USA	Research Grant 1993
Medical Sciences	Christopher WALSH	USA	Children's Hospital, Boston, USA	Research Grant 1995
Neuroscience	David AMARAL	USA	University of California, Davis, USA	Research Grant 1992, 1996
	Heinrich BETZ	Germany	Max-Planck Institute for Brain Research, Frankfurt, Germany	Research Grant 1996
	William CATTERALL	USA	University of Washington, Seattle, USA	Research Grant 1993
	Craig JAHR	USA	Oregon Health and Science University, Portland, USA	Research Grant 2000

BAYER SCIENCE AND EDUCATION FOUNDATION

Otto Bayer Prize	Detlef WEIGEL	USA/Germany	Max Planck Institute for Developmental Biology, Tuebingen, Germany	Research Grant 1997, Program Grant 2001, 2007
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EUROPEAN MOLECULAR BIOLOGY ORGANISATION

Young Investigators	Cédric BLANPAIN	Belgium	Université Libre de Bruxelles (ULB), Belgium	Long-Term Fellowship 2003, Career Development Award 2006	
	Alan CARLETON	France	Ecole Polytechnique Fédérale de Lausanne, Switzerland	Long-Term Fellowship 2003	
	Casper HOOGENRAAD	Netherlands	Erasmus Medical Center, Rotterdam, The Netherlands	Long-Term Fellowship 2003, Career Development Award 2006	
	Luca JOVINE	Italy	Karolinska Institute, Huddinge, Sweden	Long-Term Fellowship 2001	
	Sophie MARTIN	Switzerland	University of Lausanne, Switzerland	Long-Term Fellowship 2003, Career Development Award 2008	
	Botond ROSKA	Hungary	Friedrich Miescher Institute, Basel, Switzerland	Short-Term Fellowship 2000, Young Investigator Grant 2003	
	Gerhard SCHRATT	Germany	University of Heidelberg, Germany	Long-Term Fellowship 2002, Career Development Award 2006	
	Tobias WALTHER	Germany	Max Planck Institute for Biochemistry, Martinsried, Germany	Long-Term Fellowship 2003, Career Development Award 2007	
	Members	Frédéric ALLAIN	France	ETH Zurich, Switzerland	Long-Term Fellowship 1997
		Gil AST	Israel	Sackler Medical School, Tel Aviv University, Israel	Long-Term Fellowship 1994
		Simon BOULTON	UK	Cancer Research UK, Clare Hall Laboratories, South Mimms, UK	Long-Term Fellowship 1998
		Julia COOPER	USA, UK	Cancer Research UK, London, UK	Research Grant 1999
		Liam DOLAN	Ireland	John Innes Centre, Norwich, UK	Program Grant 2005
		Marcos GONZALEZ-GAITAN	Spain	University of Geneva, Switzerland	Program Grant 2004
Ian HAGAN		UK	Paterson Institute for Cancer Research, Manchester, UK	Long-Term Fellowship 1990	
Brigitte KIEFFER		France	IGBMC, Illkirch, France	Research Grant 2000	
Thomas LECUIT		France	CNRS-Université de la Méditerranée, Marseille, France	Long-Term Fellowship 1999, Program Grant 2008	
Ben LUISI		USA	University of Cambridge, UK	Research Grant 1996	

Award 2009	Name	Nationality	Current affiliation	HFSP award & year	
Members	Vivek MALHOTRA	USA	Centre for Genomic Regulation (CRG), Barcelona, Spain	Program Grant 2001	
	Victor MUÑOZ	Spain	University of Maryland, College Park, USA	Long-Term Fellowship 1996	
	Andrea MUSACCHIO	Italy	European Institute of Oncology	Long-Term Fellowship 1995, Program Grant 2003, 2009	
	Roger PATIENT	UK	The John Radcliffe Hospital, Oxford, UK	Research Grant 1999	
	William SCHAFER	USA	MRC Laboratory of Molecular Biology, Cambridge, UK	Program Grant 2001, Short-Term Fellowship 2004	
	Anne SPANG	Germany	University of Basel, Switzerland	Program Grant 2009	
	Nektarios TAVERNARAKIS	Greece	Foundation for Research and Technology - Hellas (FORTH), Heraklion, Greece	Long-Term Fellowship 1996	
	Marat YUSUPOV	France, Russia	IGBMC, University of Strasbourg, France	Program Grant 2006	
	Associate member	Masatoshi TAKEICHI	Japan	RIKEN Center for Developmental Biology, Kobe, Japan	Research Grant 1992, 1995

EUROPEAN RESEARCH COUNCIL

Starting Grant

Life Sciences	Rafael Edgardo CARAZO	Costa Rica	ETH Zurich, Switzerland	Long-Term Fellowship 2002, Young Investigator Grant 2009
	Alan CARLETON	France	Ecole Polytechnique Fédérale de Lausanne, Switzerland	Long-Term Fellowship 2003
	Rosa COSSART	France	Université de la Méditerranée, Marseille, France	Long-Term Fellowship 2002
	Hilal LASHUEL	USA	Swiss Federal Institute of Technology Lausanne, Switzerland	Young Investigator Grant 2009
	Madelon Maria MAURICE	Netherlands	University Medical Center Utrecht, The Netherlands	Long-Term Fellowship 1998
	Antonin MORILLON	France	CGM, CNRS, Gif-sur-Yvette, France	Long-Term Fellowship 2002, Career Development Award 2005
	Alexander STARK	Germany	The Research Institute of Molecular Pathology (IMP), Vienna, Austria	Long-Term Fellowship 2006
	David SUMPTER	UK	Uppsala University, Sweden	Program Grant 2007
	Kevin VERSTREPEN	Belgium	Flanders Institute for Biotechnology (VIB), Heverlee, Belgium	Young Investigator Grant 2007
	Physical Sciences and Engineering	Michael MEIJLER	Netherlands	Ben-Gurion University of the Negev, Beer Sheva, Israel
Edit TSHUVA		Israel	Hebrew University of Jerusalem, Israel	Young Investigator Grant 2006

Advanced Grant

Life Sciences	Genevieve ALMOUZNI-PETTINOTTI	France	Institut Curie, Paris, France	Research Grant 1997
	Uri ALON	Israel	Weizmann Institute of Science, Rehovot, Israel	Research Grant 2000, Young Investigator Grant, 2004
	Silvia ARBER	Switzerland	Biozentrum, University of Basel, Switzerland	Long-Term Fellowship 1996
	Nenad BAN	Croatia	ETH Zurich, Switzerland	Young Investigator Grant 2002
	Yves BARRAL	France	ETH Zurich, Switzerland	Long-Term Fellowship 1996
	Monsef BENKIRANE	Morocco	Institute of Human Genetics, Montpellier, France	Young Investigator Grant 2003

Award 2009	Name	Nationality	Current affiliation	HFSP award & year
Advanced Grant	René BERNARDS	Netherlands	Netherlands Cancer Institute, Amsterdam	Research Grant 1999
	Paul Martin BRAKEFIELD	UK	Leiden University, The Netherlands	Research Grant 1998
	Yihai CAO	China/Sweden	Karolinska Institute, Stockholm, Sweden	Long-Term Fellowship 1994, Research Grant 2000
	Marie-France CARLIER	France	CNRS, Gif-Sur-Yvette, France	Research Grant 1998, Program Grant 2003
	Stanislas DEHAENE	France	INSERM-CEA, Orsay, France	Program Grant 2007
	John DIFFLEY	USA/UK	Cancer Research UK London Research Institute, South Mimms, UK	Program Grant 2001
	Jean-Antoine GIRAULT	France	Université Pierre et Marie Curie, Paris, France	Research Grant 2000
	Ueli GROSSNIKLAUS	Switzerland	University of Zürich, Switzerland	Long-Term Fellowship 1994
	Michael HAUSSER	Canada	University College London, UK	Long-Term Fellowship 1995, Research Grant 2000
	Edith HEARD	UK	Institut Curie, Paris, France	Long-Term Fellowship 1990, Program Grant 2003
	Klaus Peter HOFMANN	Germany	Humboldt University, Berlin, Germany	Research Grant 1992
	Antonio LANZAVECCHIA	Italy	Institute for Research in Biomedicine, Bellinzona, Switzerland	Program Grant 2007
	Peter MOMBAERTS	Belgium	Max Planck Institute of Biophysics, Frankfurt, Germany	Short-Term Fellowship 1990, 1992, Program Grant 2002
	Hannah MONYER	Germany	University of Heidelberg, Germany	Research Grant 1995
	Christof NIEHRS	Germany	Deutsches Krebsforschungszentrum, Heidelberg, Germany	Research Grant 1999
	Poul NISSEN	Denmark	University of Aarhus, Denmark	Program Grant 2002
	Olivier POURQUIE	France	University of Strasbourg, Illkirch, France	Research Grant 1999
	Giacomo RIZZOLATTI	Italy	University of Parma, Italy	Research Grant 1990, 1993
	Christan ROSENMUND	Germany	University of Berlin, Germany	Program Grant 2007
	Claudio Daniel STERN	UK	University College London, UK	Research Grant 1992, 1996
Markus STOFFEL	Germany	ETH Zürich, Switzerland	Program Grant 2001	
Frank UHLMANN	Germany	Cancer Research UK London Research Institute, UK	Young Investigator Grant 2005	
Jean-Claude WEILL	France	Faculté de Médecine Necker, Paris, France	Research Grant 1997	
Stephen WEST	UK	Cancer Research UK, South Mimms	Research Grant 1997	

GENETICS SOCIETY OF AMERICA

Novitski Prize	Rodney ROTHSTEIN	USA	Columbia University Medical Center, New York, USA	Program Grant 2001
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GERMAN RESEARCH COUNCIL

Leibniz Prize	Petra SCHWILLE	Germany	Biophysics, Dresden University of Technology, Germany	Program Grant 2002, 2005
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GAIRDNER FOUNDATION

Gairdner Award	Richard LOSICK	USA	Harvard University, Cambridge, USA	Research Grant 1991, 1995
	Peter WALTER	Germany, USA	University of California, San Francisco, USA	Research Grant 1992

HOWARD HUGHES MEDICAL INSTITUTE

Early Career Scientists	Aviv REGEV	Israel	Massachusetts Institute of Technology and Howard Hughes Medical Institute, Cambridge, USA Johns Hopkins University School of Medicine,	Program Grant 2005
	Sinisa URBAN	Canada	Baltimore, USA Harvard Medical School, Boston, USA	Long-Term Fellowship 2003 Program Grant 2007
	Rachel WILSON	USA		

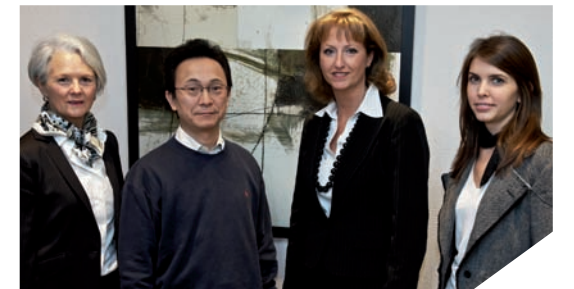
Award 2009	Name	Nationality	Current affiliation	HFSP award & year
INSTITUTE OF MEDICINE				
Members	Thomas CURRAN	USA	University of Philadelphia, USA	Research Grant 1998
	Alfred GOLDBERG	USA	Harvard Medical School, Boston, USA	Research Grant 1995
	Alexandra JOYNER	Canada	Memorial Sloan-Kettering Cancer Center, New York, USA	Research Grant 1996
	Michel NUSSENZWEIG	Brazil, USA	Rockefeller University, New York, USA	Research Grant 1996
	Gary RUVKUN	USA	Harvard Medical School, Boston, USA	Research Grant 1991
Foreign Associate	Richard FRACKOWIAK	UK	Centre Hospitalier Universitaire Vaudois, Lausanne, Switzerland	Research Grant 1993, 1998
ISRAEL CANCER ASSOCIATION				
Excellence Award	Orly REINER	Israel	Weizmann Institute, Rehovot, Israel	Long-Term Fellowship 1990, Research Grant 1999
JAPAN ACADEMY				
Japan Academy Prize	Katsuhiko MIKOSHIBA	Japan	RIKEN, Wako City, Japan	Research Grant 1993, 1998
NATIONAL ACADEMY OF SCIENCES				
Members	Lorena BEESE	USA	Duke University Medical Center, Durham, USA	Research Grant 1998
	Doug HANAHAN	USA	University of California San Francisco, USA	Research Grant 1994
	Mu-Ming POO	USA	University of California, Berkeley, USA	Program Grant 2001
	Paul STERNBERG	USA	California Institute of Technology, Pasadena, USA	Research Grant 1992, Program Grant 2005
	Michael STRYKER	USA	University of California, San Francisco, USA	Research Grant 1990, 1993
	Detlef WEIGEL	Germany, USA	Max-Planck Institute for Developmental Biology, Tuebingen, Germany	Research Grant 1997, 2001, 2007
Foreign Associates	Ari HELENIUS	Finland	Swiss Federal Institute of Technology (ETH), Zurich, Switzerland	Research Grant 1993
	Glauco TOCCHINI-VALENTINI	Italy	Institute of Cell Biology, CNR, Monterotondo, Italy	Research Grant 1991
NATIONAL INSTITUTES OF HEALTH				
NIH Directors' Pioneer Award	Sarah TISHKOFF	USA	University of Pennsylvania School of Medicine, Philadelphia, USA	Program Grant 2006
NATIONAL SCIENCE FOUNDATION				
Faculty Early Development Award	Antonis ROKAS	Greece	Vanderbilt University, Nashville, USA	Long-Term Fellowship 2002

Award 2009	Name	Nationality	Current affiliation	HFSP award & year
NOBEL PRIZE				
Physiology or Medicine	Jack SZOSTAK	USA	Harvard Medical School, Boston, USA	Program Grant 2001
Chemistry	Ada YONATH	Israel	Weizmann Institute of Science, Rehovot, Israel	Program Grant 2003
	Venkatraman RAMAKRISHNAN	USA	MRC Laboratory of Molecular Biology, Cambridge, UK	Program Grant 2000, 2009
PEW CHARITABLE TRUST				
Pew Scholars in the Biomedical Sciences	Frank ALBER	Germany	University of South California, USA	Young Investigator Grant 2009
	Joshua SHAEVITZ	USA	Lewis-Sigler Institute for Integrative Genomics, Princeton University, USA	Young Investigator Grant 2008
ROYAL SOCIETY				
Fellows	David GLOVER	UK	University of Cambridge, UK	Research Grant 1990
	Christopher Carl GOODNOW	Australia, USA, UK	Australian National University, Canberra, Australia	Research Grant 1997
	Brian HEMMINGGS	UK	Friedrich Miescher Institute for Biomedical Research, Basel, Switzerland	Research Grant 1996
	Christine Elisabeth HOLT	UK	University of Cambridge, UK	Program Grant 2009
	Neil Christopher HUNTER	UK	University of Sheffield, UK	Research Grant 1995
	Wolfram SCHULTZ	Germany	University of Cambridge, UK	Program Grant 2004
	Jesper Qualmann SVEJSTRUP	Denmark	Clare Hall Laboratories, London Research Institute, Cancer Research UK	Research Grant 1997
Foreign members	Roger KORNBORG	USA	Stanford University, School of Medicine, USA	Research Grant 1990, 1993, 1997, 2000
SOCIETY FOR DEVELOPMENTAL BIOLOGY				
Otto Mangold Prize	Joachim WITTBRODT	Germany	Heidelberg University, Germany	Program Grant 2001
SOCIETY FOR NEUROSCIENCE				
Ralph W. Gerard Prize	Lily JAN	USA	University of California, San Francisco (UCSF), USA	Research Grant 1997
Peter and Patricia Gruber Prize	Jeffrey HALL	USA	University of Maine, Orono, USA	Research Grant 1991, 2000
YAD HANADIV FOUNDATION				
Michael Bruno Memorial Award	Uri ALON	Israel	Weizmann Institute, Rehovot, Israel	Research Grant 2000, Young Investigator Grant 2004

chapter 4

Budget and Finance

- 4.1 Guidelines for HFSP0 funding
- 4.2 Key financial figures for FY 2009
- 4.3 FY 2009 financial summary
- 4.4 Budget for program activities FY 2010



Left to right: Sarah Cazau-Naett, Shigeru Sakurai, Isabelle Coquard and Jennifer Sayol

4.1

GUIDELINES FOR HFSP0 FUNDING

The Human Frontier Science Program (HFSP) is supported by contributions from its Management Supporting Parties (MSPs): Australia, Canada, France, Germany, India, Italy, Japan, Republic of Korea, New Zealand, Norway, Switzerland, the United Kingdom, the United States of America and the European Union.

MSPs hold regular Intergovernmental Conferences (IGCs) at which the intended level of contribution for the next budgetary period is established as a guideline for the HFSP0 Board of Trustees. The last such Conference was held in Ottawa in June 2007, establishing a three-year indicative budgetary guideline for the period FY 2008 to FY2010.

The next one for the period FY2011 to FY2013 will be held in Canberra, Australia in May 2010.

The Ottawa guideline is based on an annual increase of contributions by all MSPs, except Japan which is exempt from the increase until the "equal match" between the contribution of Japan and the other IGC members is achieved. Like the previous budgetary guideline, the Ottawa IGC guideline was established in USD and converted into currencies of contribution using IGC reference rates (Table 4-1). This table was reviewed by the Finance Committee and approved by the Board in March 2008.

4.2

KEY FINANCIAL FIGURES FOR FY 2009

For the Human Frontier Science Program Organization (HFSP0), FY 2009 extends from 1 April 2009 until 31 March 2010.

Figures are reported in million USD unless stated otherwise. Different exchange rates are used in this report for different purposes (Table 4-1):

- IGC Ottawa reference rates: these are used to monitor the implementation of the IGC budgetary guideline in USD over extended periods, without the risk of distortion by variations in the exchange rate. Reference rates may differ from actual rates.
- FY 2009 budget rate: the exchange rate used for the budget.
- FY 2009 actual rates: these are used for HFSP0's legal accounts and their consolidation in EUR or in USD. They are updated daily on the basis of data published by the European Central Bank.

Table 4-1:
Exchange rates used in FY 2009 report

Exchange rates FY 2009	CAD	CHF	EUR	GBP	JPY
1 USD =					
Ottawa IGC	1.30	1.24	0.80	0.55	108
Budget FY 2009	1.16	1.13	0.73	0.62	99
Actual FY 2009 (average)	1.10	1.07	0.71	0.63	94.00

4.2.1 Contributions

The adoption of a three-year budgetary guideline and its conversion into currencies of contribution have improved the precision of budgetary planning, with the result that HFSP0 can maximise the number of awards made each year.

Contributions received from MSPs during FY 2009 are shown in the agreed currencies in Table 4-2. Most MSPs met the intended level of contribution indicated in Table B of the Ottawa IGC guideline. Japan maintained its high level of contribution, as did Switzerland. As of 31 March 2010, the Indian and the Italian contributions remained unpaid. However, since Board members for India and Italy have officially confirmed the amounts, these can be reported, in accordance with the policy established by the HFSP0 Finance Committee. The French contribution fell below the intended level of contribution; severe budgetary constraints meant that the Ministry of Foreign Affairs had to decrease its contribution from 932 000 EUR to 500 000 EUR in FY 2009. As a result, France has settled only 74% of the Ottawa financial guideline for FY 2009. Contributions from the UK and Canada were also marginally below the guideline, due to discrepancies in the exchange rate between the agreed currency and the USD. All other MSPs matched or increased their FY 2009 contribution, providing a total of USD 60.095 million

Table 4-2:
Contributions received in FY 2009 in currencies
(thousands) at IGC reference rates

MSP	Organization	Contribution Currency (LC)	Contribution received for FY 2009 in LC	Ottawa Guideline (Table B) or MoU for 2009 in LC	Contribution as % of guideline (Table B)	Contribution received for FY 2009 in USD (Ottawa rate)	Ottawa Guideline (Table B) or MoU for 2009 in USD	Contribution as % of guideline (Table B)
Australia	NHMRC	USD	566	566	100%	566	566	100%
Canada			1 436	1 482	97%	1 104	1 139	97%
	CIHR	CAD	1 112	1 482		855		
	NSERC		324			249		
European Union		EUR	3 982	3 981	100%	4 977	4 976	100%
	DG RESEARCH	EUR	2 389			2 985		
	DG INFSO	EUR	1 593			1 991		
France		EUR	1 692	2 292	74%	2 115	2 865	74%
	MAE	EUR	500			625		
	MER	EUR	775			969		
	CUS*	EUR	265			331		
	Région Alsace*	EUR	153			191		
Germany	BMBF	EUR	3 543	3 543	100%	4 428	4 428	100%
India **	DOB	USD	844	844	100%	844	844	100%
Italy ***	CNR	EUR	755	755 to 1 442	100%	944	944 to 1 803	100%
Japan		USD	31 248	31 248	100%	31 248	31 248	100%
	METI	USD	11 582			11 582		
	MEXT	USD	19 666			19 666		
Korea	MOST	USD	658	658	100%	658	658	100%
New Zealand	MRC	USD	108	108	100%	108	108	100%
Norway****	RCN	USD	520	520	100%	520	520	100%
Switzerland	SER	CHF	870	850	102%	635	620	102%
UK		GBP	1 164	1 185	98%	2 117	2 155	98%
	BBSRC	GBP	235			427		
	MRC	GBP	929			1 689		
USA	NSF + NIH	USD	9 832	9 743 to 13 234	101%	9 832	9 743 to 13 234	101%
						60 095	60 814	

LC = Local currency

* City of Strasbourg and Région Alsace as host of HFSP Secretariat

** Indian contribution not received at end of FY 2009

*** Italy contribution not received at end of FY 2009

**** Joined HFSP from FY 2008

When consolidated at FY 2009 budget rates, the total amount of MSPs' contributions reached USD 61.32 million (Table 4-3), compared with USD 61.87 million in FY 2008.

Table 4-3:
MSPs' contributions in million at FY 2009 budget rate

MSP	Currency	Contribution received in FY 2009 in local currency	Contribution received in FY 2009 in USD at budget rate	2008 Contribution in USD at budget rate
Australia	USD	0.566	0.566	0.534
Canada	CAD	1.436	1.238	1.239
EU	EUR	3.982	5.454	5.573
France	EUR	1.692	2.318	3.034
Germany	EUR	3.543	4.853	4.913
India*	USD	0.844	0.844	0.812
Italy*	USD	0.755	1.034	0.909
Japan	USD	31.248	31.248	31.247
Korea	USD	0.658	0.658	0.624
New Zealand	USD	0.108	0.108	0.103
Norway	USD	0.520	0.520	0.500
Switzerland	CHF	0.870	0.770	0.785
UK	GBP	1.164	1.877	2.238
USA	USD	9.832	9.832	9.364
TOTAL			61.320	61.875

* unpaid as of 31/03/2010

Fig. 4-1:
MSPs' contributions for FY 2009

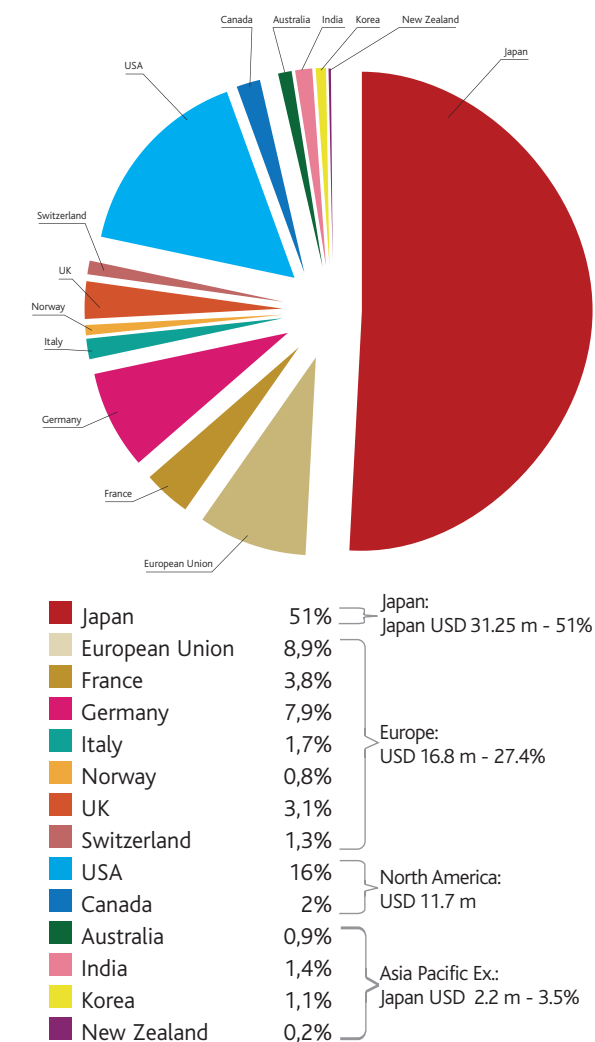
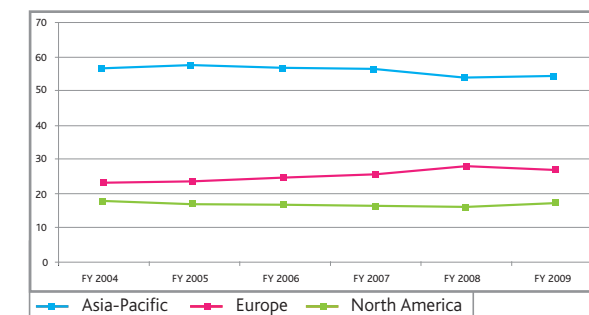


Fig. 4-2:
Regional distribution of MSPs' contributions to HFSP in percentage of total



The Asia Pacific region, including Japan, remains the main source of funding, contributing 54.5% of the total, as compared with 53.9% in FY 2008. It is followed by Europe, which contributed 27.4% as compared with 29% in FY 2008 and North America, which contributed 18.1% as compared with 17.1% in FY 2008

4.2.2 Payment of awards

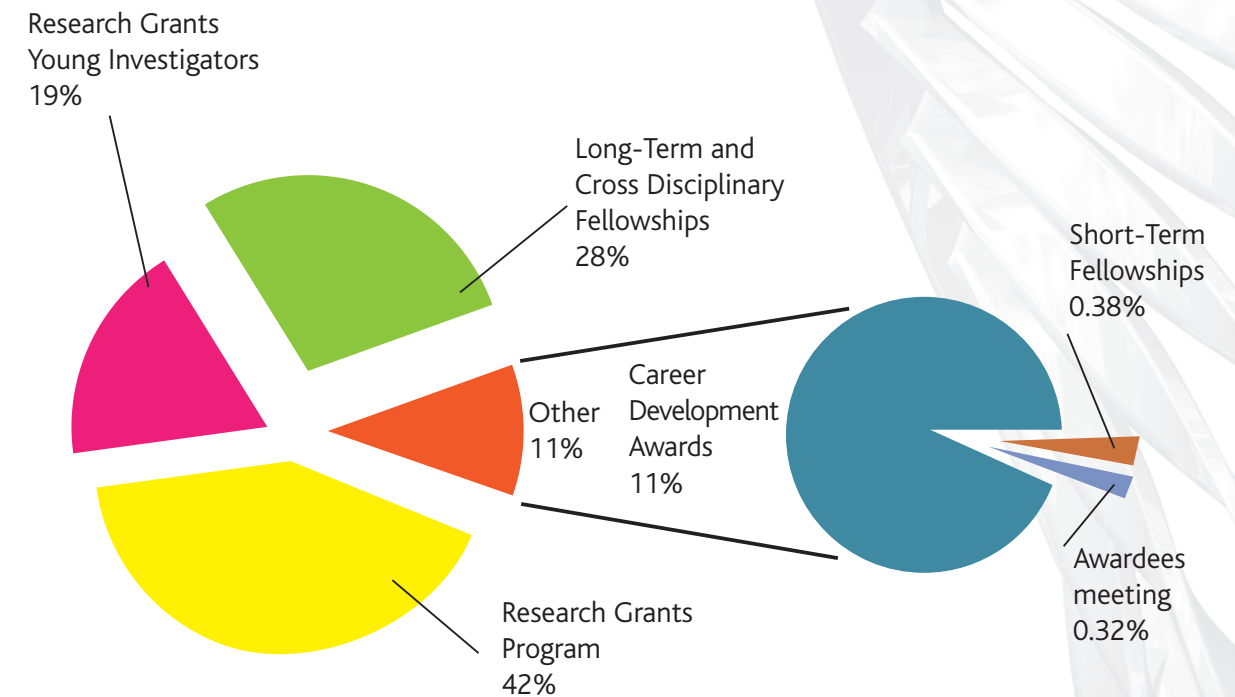
HFSPo paid USD 59 million to its awardees during FY 2009. This figure is 1.36 million below budget and 1.12 million above the amount paid in FY 2008 (Table 4-4 and 4-5).

Annual payments to Research Grants and Career Development Awardees were on budget. Payments to Long-Term and Cross-Disciplinary Fellows were 1 million below budget for two reasons observed every year:

- Some payments planned for FY 2009 were postponed for reasons such as parental leave or deferral of the third year in the event of repatriation. These payments were transferred to the following fiscal years.
- Some fellows terminated earlier than scheduled, for instance to take up a permanent position. The annual attrition rate is close to 5% and is taken into account when calculating the number of fellowships fundable each year. This amounted to about 1 million in FY 2009.

The HFSP Awardees Meeting was held in association with 20th anniversary celebrations in Tokyo, Japan.

Fig. 4-3:
Payments made in FY 2009 by type of award/activity (budget rate)



4.2.3 Geographical distribution

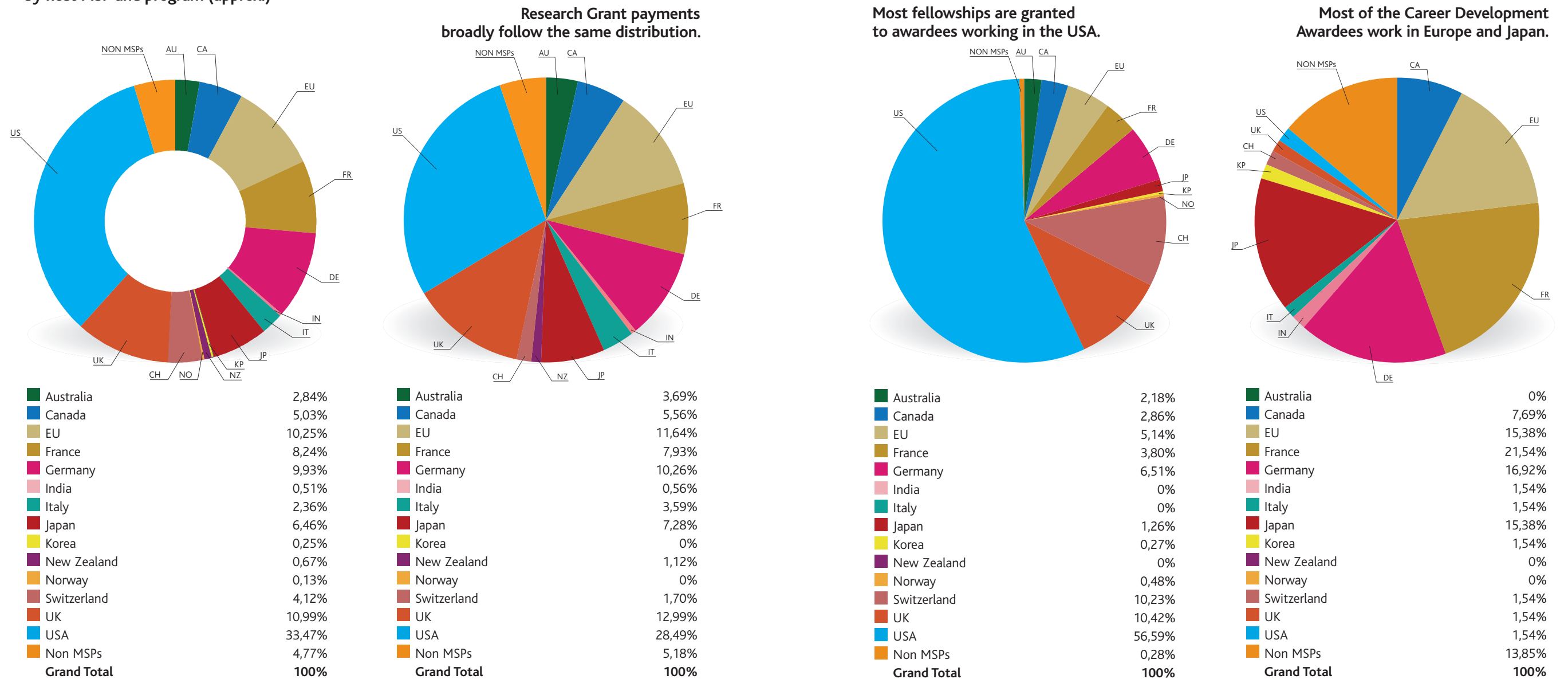
46% of the total amount of awards paid in FY 2009 went to awardees in Europe

38.5% to awardees in North America (34 % in the USA)

10.7% to awardees in the Asia-Pacific region (6.5 % in Japan)

4.8% to non MSPs.

Fig. 4-4: Geographical distribution of awards paid by HFSP to laboratories and fellows in FY 2009 by host MSP and program (approx.)



4.3

FY2009 FINANCIAL SUMMARY

4.3.1 Accounting summary

The accounting summary (Table 4-4) provides an overview of the nature of funds and of financial movement. Together, these result in the net financial position.

Contributions paid in currencies other than the USD are consolidated at the exchange rate of the date of payment. This explains the difference with the amount indicated in Table 4-3 where budget rates are used.

Table 4-4:
HFSP0 accounting summary FY 2009 (budget and actual rates)

Income/ commitments received	Budget 2009		Annual Report FY 2009		Expenditures/ new commitments	Budget 2009		Annual Report FY 2009	
	IN kLC	IN kLC	IN kUSD	IN kUSD		IN kUSD	IN kUSD		
Contributions			61,227	60,556	Administrative expenses	4,986	5,067		
Australia	USD	0,566	0,566	0,566	Provisions	0,137	0,000		
Canada	CAD	1,482	1,487	1,311	Program activities	60,382	59,015		
European Commission	EUR	3,981	3,982	5,453	Program Grants	24,400	24,584		
France	EUR	1,900	1,692	2,603	Young Investigators	11,083	10,878		
Germany	EUR	3,543	3,543	4,853	Long-Term Fellowships	17,600	16,625		
India	USD	0,844	0,844	0,844	Career Development Awards	6,800	6,500		
Italy	USD	0,755	0,755	1,034	Short-Term Fellowships	0,200	0,225		
Japan	USD	31,248	31,248	31,248	Awardees meeting and outreach activities	0,300	0,203		
Korea	USD	0,658	0,658	0,658	Committed funds beyond FY	61,405	63,888		
New Zealand	USD	0,108	0,108	0,108	Program Grants	24,150	24,208		
Norway	USD	0,520	0,520	0,520	Young Investigators	10,599	10,531		
Switzerland	CHF	0,850	0,870	0,752	Long-Term Fellowships	20,156	21,075		
UK	GBP	1,185	1,164	1,911	Career Development Awards	6,500	8,078		
USA	USD	9,364	9,832	9,364	Refundable loan to HFSP-P	0,411	0,411		
Interest and capital gains (estimate)			1,000	2,675					
MISC Reimbursements			0,000	0,508					
Committed funds from previous FY			60,823	59,896					
Program Grants			21,850	21,856					
Young Investigators			12,383	12,233					
Long-Term Fellowships			19,290	19,302					
Career Development Awards			7,300	6,505					
Carry over from previous FY			8,538	8,850					
TOTAL INCOME			131,588	132,484	TOTAL EXPENSES (incl. 60 kUSD in kind)	127,322	128,381		
Balance (negative)					Annual Balance	4,266	4,103		
GRAND TOTAL			131,588	132,484	GRAND TOTAL	131,588	132,484		

Financial income

Income from financial operations amounted to USD 2.68 million, compared to USD 2.5 million last year. This income was generated from the active management of funds reserved to meet HFSP0's obligations to its awardees for the whole period of their award. Investments are made in short and medium term structured products¹ and tailored to the payment schedule of awards. All investments are made in compliance with HFSP0's prudential rules and are reported to the Finance Committee.

¹ Monetary mutual funds (SICAV or Société d'Investissement à Capital Variable) and EMTN (Euro Medium Term Notes) with capital guaranty at maturity.

Running costs of the HFSP (Administrative expenses)

The Organisation and its 15 employees are responsible for the management and the implementation of the Program and the fulfilment of its mission. Since HFSP0 is located in France, its running costs occur mostly in EUR. Due to the high impact of the EUR/USD exchange rate, expenses for FY2009 amounted to USD 5.07 million, slightly in excess of the USD 4.99 million budgeted. Salaries represent two thirds (63%) of the total, followed by "honoraria and services" (18%) and costs associated with "meetings and travel" (16%).

4.3.2

Cash flow statement and financial position (assets and liabilities)

The net cash expenditure of HFSPPO consolidated in USD at actual exchange rates amounted to USD 64.49 million compared with USD 63.74 million in total cash income. The annual cash balance is close to zero.

Statement of financial position (assets and liabilities)

HFSPPO's financial position is the balance between its assets and its liabilities (Table 4-6). A positive position ensures that HFSPPO's current resources are sufficient to fulfil the requirement to guarantee the payment of current awardees for the whole period of their award. Assets: HFSPPO's assets include receivables (overdue contributions from India and Italy in FY 2009) and cash invested at various levels of liquidity (current accounts, short term monetary funds and medium term investments). HFSPPO has no long-term liabilities other than awards payable to its current awardees beyond FY 2009 (USD 63.89 million).

Table 4-5:
FY 2009 cashflow statement (in USD at actual exchange rates)

Inflow	FY 2009			Outflow	FY 2009		
	FY 2009	FY 2008	FY 2007		FY 2009	FY 2008	FY 2007
Contributions received from MSPs*	60.56	60.10	61.10	Administrative expenses (excl. provisions)	5.07	4.80	5.11
Interest and capital gains	2.68	2.50	3.00	Program activities	59.02	57.90	58.40
Misc. reimbursements from awardees	0.51	0.30	0.15	Refundable loan to HFSPPO	0.41	0.40	0.00
Total cash inflow	63.74	62.90	64.25	Total cash outflow	64.49	63.10	63.51
Cash balance (negative)	0.75	0.20		Cash balance (positive)			0.74
TOTAL	64.49	63.10	64.25	TOTAL	64.49	63.10	64.25

* including payment of overdue contributions.

Table 4-6:
Statement of financial position (actual rates)

Assets	FY 2009			Liabilities	FY 2009		
	FY 2009	FY 2008	FY 2007		FY 2009	FY 2008	FY 2007
Current accounts	4.79	4.34	1.36	Program Grants	24.21	21.90	26.62
Mutual funds (UCITS)	20.80	19.48	22.46	Young Investigators	10.53	12.40	10.15
Structured products (EMTN)	38.92	41.92	42.00	Long-Term Fellowships	21.08	19.40	19.50
Contributions to be received	1.88	0.81	0.09	Career Development Awards	8.08	7.30	7.70
Fixed assets (Secretariat building)	3.00	3.20	3.50	Total Commitments	63.89	61.00	63.97
TOTAL	69.39	69.75	69.41	Balance (positive)	5.50	8.75	5.44
				TOTAL	69.39	69.75	69.41

At the end of FY 2009, HFSPPO's assets exceeded its liabilities by USD 5.50 million .



4.4

BUDGET FOR PROGRAM ACTIVITIES FY 2010

4.4.1 Contributions

The budgetary guideline adopted at the HFSP IGC in Ottawa in June 2007 for the period FY 2008-FY 2010, and converted into currencies of contribution, served as the basis for budgetary planning in FY 2009 (Table 4-7). Norway joined the Program in 2008 and contributed according to the terms of the Memorandum of Understanding (MoU) established at the time of accession.

Table 4-7:
Implementation of the Ottawa IGC budgetary guideline (2008-2010) in USD and currency of contribution

MSP		FY2008	FY2009	FY2010
Australia	Ottawa guideline (kUSD)	534	566	598
	Requested (kUSD)	534	566	598
Canada	Ottawa guideline (kUSD)	1 090	1 139	1 190
	Requested (kCAD)	1 418	1 482	1 549
EU	Ottawa guideline (kUSD)	4 770	4 976	5 191
	Requested (kEUR)	3 901	3 981	4 153
France	Ottawa guideline (kUSD)	2 768	2 865	2 966
	Requested (kEUR)	2 214	2 292	2 373
Germany	Ottawa guideline (kUSD)	4 299	4 428	4 561
	Requested (kEUR)	3 439	3 543	3 649
India	Ottawa guideline (kUSD)	812	844	879
	Requested (kUSD)	812	844	879
Italy (1)	Ottawa guideline (kUSD)	909 to 1 339	944 to 1 803	981 to 2 267
	Requested (kEUR)	727 to 1 071	755 to 1 442	785 to 1 814
Japan	Ottawa guideline (kUSD)	31 248	31 248	31 248
	Requested (kUSD)	31 248	31 248	31 248
Korea	Ottawa guideline (kUSD)	624	658	694
	Requested (kCHF)	624	658	694
New Zealand	Ottawa guideline (kUSD)	103	108	113
	Requested (kUSD)	103	108	113
Switzerland	Ottawa guideline (kUSD)	603	620	638
	Requested (kCHF)	850	850	850
UK	Ottawa guideline (kUSD)	2 053	2 155	2 263
	Requested (kGBP)	1 129	1 185	1 244
USA (1)	Ottawa guideline (kUSD)	9 364 to 11 117	9 743 to 13 234	10 137 to 15 352
	Requested (kUSD)	9 364 to 11 117	9 743 to 13 234	10 137 to 15 352

(1) lower limit corresponds to Table B and upper limit to Table A of the Ottawa budgetary guideline.

Most MSPs confirmed their contribution for FY 2010 (Table 4- 8). One exception is France, whose Ministry of Foreign Affairs will decrease its contribution significantly. However, efforts are currently being made to identify additional funders to make up the French contribution. After two decades of generous contributions to the Program and due to severe budgetary restrictions, the Japanese Ministry of Economy, Trade and Industry (METI) has confirmed a 15% decrease in FY2010, contributing USD 9.857 million instead of the USD 11.582 paid during the last years.

Table 4-8:
MSPs' contributions budgeted for FY 2010 in the currency of contribution and USD at budget rate

INCOME		FY 2010	progression from FY 2009	IGC-MoU Table B	BUDGET 2010
		In kLC	In kLC	In kLC	In kUSD
CONTRIBUTIONS		n.a.			60 140
Australia	USD	598	32	598	598
Canada	CAD	1 549	67	1 549	1 549
EU	EUR	4 153	172	4 153	5 537
France (2)	EUR	1 692	-208	2 373	2 256
Germany	EUR	3 649	106	3 649	4 865
India	USD	879	35	879	879
Italy (2)	EUR	785	30	785	1 047
Japan	USD	29 523	-1 725	31 248	29 523
Korea	USD	694	36	694	694
New Zealand	USD	113	5	113	113
Norway	USD	541	21	541	541
Switzerland	CHF	850	0	850	746
UK	GBP	1 210	25	1 244	1 862
USA (2)	USD	9 930	566	10 137	9 930

Exchange rate : 1 USD = 1 CAD = 1,14 CHF = 0,75 EUR = 0,65 GBP.

(2) Amount to be confirmed

4.4.2 Program activities

The Program activity plan, adopted by the Board in March 2010, followed the recommendation of the Council, with the exception of 2 fellowships, which were not funded due to budgetary limitations. Awarded:

- 25 new Program Grants,
- 9 Young Investigator Grants,
- 86 Long-Term Fellowships,
- 16 Career Development Awards.

Payments to awardees in FY 2010 will reach USD 58.95 million as compared to USD 60.3 million in FY 2009 (Table 4-9).

- 10th HFSP Awardees meeting in India and an Alumni network meeting in Montreal: USD 350 thousand.

**Table 4-9:
Funding of Program activities for FY 2010 in
number of awards and value**

PROGRAM ACTIVITIES	NUMBER	USD
Program Grants	58,0%	23 750
PG 2008/3	18	6 250
PG 2009/2	26	9 000
PG 2010/1	25	8 500
Young Investigators		10 250
YI 2008/3	14	4 400,0
YI 2009/2	9	3 100,0
YI 2010/1	9	2 750,0
Fellowships	31,6%	18 498
LT 2006/3	7	349,9
LT 2007/3	42	1 378,5
LT 2008/3	98	5 244,2
LT 2009/2	119	6 185,7
LT 2010/1	88	5 340,0
Career Development Awards	10,4%	6 100
CDA 2008/3	20	2 000,0
CDA 2009/2	25	2 500,0
CDA 2010/1	16	1 600,0
Outreach activities		350
Awardees meetings		300,0
Alumni network		50,0
TOTAL PROGRAM ACTIVITIES	100%	58 948

**Table 4-10:
Budget exchange rates for FY 2010**

Exchange rates FY 2010	1 USD =	CAD	CHF	EUR	GBP	JPY
Ottawa IGC		1,30	1,24	0,80	0,55	108
Budget FY 2010		1,00	1,14	0,75	0,65	100,00
Budget FY 2009		1,16	1,13	0,73	0,62	99

**Table 4-11:
Overview of HFSP budget for FY 2010 including all commitments for futurs years.**

Income + assets	Budget FY 2010	FY 2009	Expenditure + liabilities	Budget FY 2010	FY 2009
Contributions	60,14	60,56			
Financial income	1,00	2,68	Operation costs (incl tax and provisions)	4,74	5,07
Misc reimbursment		0,51	Program activities	58,95	59,02
Committed funds from previous year	63,40	59,90	Committed funds beyond FY	60,59	63,89
Carry over from previous year		8,85			0,41
Total*	124,54	132,48	Total*	124,28	128,38
			Annual balance	0,26	4,10
TOTAL	124,54	132,48	TOTAL	124,54	132,48

* incl USD 60,000 in kind from Japan

Notes on FY 2009 accounts

Accounts for FY 2009, consolidated in EUR, have been prepared by the HFSP accountant, SEGEC. Deloitte audited and certified these accounts. HFSP's legal accounts are reported on an accrual basis. They follow the French GAAP applicable to not-for-profit organisations. Legal accounts are consolidated and stated in EUR. The currency of consolidation used for HFSP's internal reporting, including this annual report, is the USD.

appendix

- A.1** History of the Program
- A.2** Summary of decisions of the Board of Trustees in FY 2009
- A.3** Research Grants awarded in 2009
- A.4** Long-Term and Cross-Disciplinary Fellowships awarded in 2009
- A.5** Short-Term Fellowships awarded in 2009
- A.6** Career Development Awards made in 2009



HISTORY OF THE PROGRAM

BEGINNINGS

1986. A feasibility study was carried out by leading Japanese scientists under the auspices of the Japanese Prime Minister's Council for Science of Technology, to explore possible means to encourage international collaboration in basic research.

1987. Discussion was expanded to include scientists from the G7 summit nations and the European Union, resulting in the "London Wise Men's Conference" in April 1987, which endorsed the suggestion.

Prime Minister Nakasone of Japan proposed the Human Frontier Science Program at the Venice Economic Summit in June. The Economic Summit partners and the Chairman of the European Community welcomed the initiative and activities aimed at implementing it as soon as possible were started.

1988. Further international talks were held from November 1987 to March 1988 in the form of an International HFSP Feasibility Study Committee, which culminated in April 1988 in the "Bonn Wise Men's conference" - this established an outline of the program activities and defined the general scientific areas and types of activity to be supported.

Prime Minister Takeshita of Japan reported the conclusions of the international feasibility study at the Toronto Economic Summit in June. The assembled Heads of State welcomed the proposal for implementation in the near future.

1989. An International Scientists Committee, which had started work in 1987, gave further shape to the Program, defining its organization and the details of its program activities, research areas and selection procedures.

Intergovernmental conferences were held in June and July 1989 in Tokyo and Berlin, respectively, which led to endorsement of the plan by the participating governments. It was agreed to implement the HFSP for an initial experimental phase of 3 years.

The Secretariat of the Program, the International Human Frontier Science Program Organization, was founded in October 1989 in Strasbourg, France. The first President of the Program was Ambassador Miyazaki (Japan), the first Chairman of the Council of Scientists was Dr. Edward Rall (US) and the first Secretary General was Sir James Gowans, former Secretary of the Medical Research Council, UK.

1990. The peer review process was established and the first awards were made in March.

FURTHER DEVELOPMENT OF THE PROGRAM

Intergovernmental Conferences bring together representatives of the Management Supporting Parties, i.e. those countries that support the Program directly, plus the European Union, representing the remaining EU countries, to discuss overall policy and strategy. Since 2004, they also establish an indicative financial framework for the following three years.

1st Intergovernmental Conference, Tokyo, January 1992: this conference recognised the achievements made in the initial phase of the Program and the desirability of continuing the HFSP. It was decided to carry out a general review of the program from both scientific and organisational standpoints.

2nd Intergovernmental Conference, Washington, DC, May 1997: it was decided to continue the HFSP for another five years. The MSPs reaffirmed the goals of the Tokyo Joint Communiqué aimed at increased and equitable funding for the Program. A further review of the Program was requested for March 2001.

3rd Intergovernmental Conference, Berlin, June 2002: the MSPS agreed to the continuation of HFSP for a further five years on the basis of its scientific value and the implementation of a number of initiatives introduced by the Secretary General. A working group was set up to consider the future finances, status and scope of the Program.

4th Intergovernmental Conference, Berne, June 2004: the delegates agreed upon a general indicative financial framework for 2005-2007 in order to reach a total budget of 60 million USD and a 50:50 distribution of contributions from Japan and the other countries. An annual increase was recommended to maintain the awarding capacity of the Program.

5th Intergovernmental Conference, Ottawa, June 2007: the representatives agreed on an indicative three year budgetary plan 2008-2010 and endorsed the Board recommendation of March 2007 that an annual minimum contribution be required of any new MSP.

MEMBERSHIP OF HFSP

HFSP was established at the initiative of the Japanese government, led by Prime Minister Nakasone. The founding MSPs were Canada, France, Germany, the European Union, Italy, Japan, the UK and the USA. Switzerland took up membership in 1991. At the 3rd Intergovernmental Conference, Berlin, 2002, MSPs agreed to take active steps to expand the membership of HFSP to enhance the intercontinental balance of the Program and promote international collaboration. The Guidelines for membership were subsequently revised and the Board accepted the following new members:

2004 Australia and the Republic of Korea

2006 New Zealand and India

2008 Norway

REVIEWS OF HFSP

A number of reviews have been carried out at the request of the MSPs.

1996 General Review: a questionnaire based review, with comments by an expert scientific panel.

2001 Second General Review: a questionnaire based review, with a bibliometric analysis.

2006 Review of the Human Frontier Science Program's Initiatives 2000-2005: a questionnaire based review to evaluate the success of the initiatives introduced under the leadership of Secretary General, Torsten Wiesel.

2007 Report of the Expert Review Panel on HFSP: an additional review by a panel of eminent scientists, who were invited to comment on the 2006 report and to identify issues for further evaluation.

2010 Review of the Human Frontier Science Program: a questionnaire based review to evaluate the success of the initiatives since 2000 and a bibliometric analysis of awardees' publications. A further study of commercialization resulting from HFSP funded research was carried out at the request of the Ministry of Trade, Economy and Industry, Japan.

LEADERSHIP AND MANAGEMENT

The MSPs nominate representatives to the Board of Trustees to take responsibility for the management of the Program in collaboration with the Council of Scientists. A President and two Vice-Presidents are elected by the members from among the Trustees for a three-year term. The Board of Trustees appoints a Secretary General for a term of three years to execute the Program in accordance with the decisions of the Board of Trustees and the Council of Scientists.

President of the Board of Trustees

Hiro-michi Miyazaki (Japan) *November 1989-March 1995*

Kozo Iizuka (Japan) *April 1995-March 2000*

Masao Ito (Japan) *April 2000 - March 2009*

Akito Arima (Japan) *April 2009 to present*

Chair of the Council of Scientists

Edward Rall (USA):

March 1990 (2nd meeting), March 1993 (8th meeting),

Klaus-Peter Hoffmann (Germany)

November 1993 (9th meeting), March 1995 (12th meeting)

Pierre Chambon (France)

March 1996 (13th meeting), March 1997 (14th meeting)

Albert Aguayo (Canada)

March 1998 (15th meeting), March 1999 (16th meeting)

Arturo Falaschi (Italy)

March 2000 (17th meeting), March 2001 (18th meeting)

Pierre Magistretti (Switzerland)

March 2002 (19th meeting), March 2003 (20th meeting)

Heinrich Betz (Germany)

March 2004 (21st meeting)

Joachim Seelig (Switzerland)

March 2005 (22nd meeting), March 2006 (23rd meeting)

Rudi Balling (Germany)

March 2007 (24th meeting)

Paul Lasko (Canada)

March 2008 (25th meeting), March 2009 (26th meeting), March

2010 (27th meeting)

Secretary General

James Gowans (UK) *November 1989-March 1993*

Michel Cuénod (Switzerland) *April 1993-March 2000*

Torsten Wiesel (USA) *April 2000 to June 2009*

Ernst-Ludwig Winnacker (Germany) *July 2009 to present*

A.2

SUMMARY OF DECISIONS OF THE BOARD OF TRUSTEES IN FY 2009

42ND BOARD MEETING (DECEMBER 2009)

The Board approved the introduction of the HFSP Nakasone Award from 2010.

The Board agreed to hold a meeting in March 2010 to explore the frontiers of biology.

The Board decided to elaborate a strategic plan for the period 2011-2016.

The Board accepted the Canadian offer to host the 11th Awardees meeting in 2011.

The Board approved the auditors' report for FY 2008.

43RD BOARD MEETING (MARCH 2010)

The Board approved the following awards for funding: 25 Program Grants, 9 Young Investigator Grants (with 1 on the reserve list), 74 Long-Term Fellowships (with 24 on the reserve list), 12 Cross Disciplinary Fellowships and 16 Career Development Awards.

The Board approved the introduction of a new remuneration scheme for all current fellows.

The Board approved the selection of Dr. Karl Deisseroth, Stanford University, USA as the recipient of the 2010 HFSP Nakasone Award.

The Board rejected a request from HFSP Publishing for the renewal of support to the HFSP Journal for a further three years.

The Board accepted the report of the Manchester Institute for Innovation and Research.

The Board approved the program activity plan and budget for FY 2010.

The Board approved the appointment of Mr. Hiroyasu Morita (Japan), Mr. Patrick Pierrat (France) and Ms. Meredith Stein (USA) as internal auditors for a term of one year.

The Board accepted the offer of the Republic of Korea to host the 12th Awardees meeting in 2012.

A.3

RESEARCH GRANTS AWARDED IN 2009²

Note that nationality is given in brackets if different from country of laboratory.

1. YOUNG INVESTIGATORS

Developing novel chemical approaches to control protein folding and self-assembly in health and disease

LASHUEL Hilal, (USA), Switzerland

BRIK Ashraf, Israel

Decoding physical and mechanistic roles of histone modifications with designer nucleosomes

VAN NOORT John, Netherlands

CHIN Jason William, UK

Quantitative study of polarized cell growth in vivo and in silico

CARAZO SALAS Rafael Edgardo, (Costa Rica), Switzerland

CSIKASZ-NAGY Attila, (Hungary), Italy

SATO Masamitsu, Japan

Temporal and spatial control of bacterial cell wall morphogenesis

CARBALLIDO LOPEZ Rut, (Spain), France

VEZENOV Dmitri, (Russia), USA

WEDLICH-SOELDNER Roland, Germany

Nucleoid proteins and DNA structure, global regulation of the bacterial transcription network

COSENTINO LAGOMARSINO Marco, Italy

CICUTA Pietro, (Italy), UK

DORFMAN Kevin, USA

SCLAVI Bianca, (Italy), France

High resolution folding/binding kinetics of single protein molecules within nanofluidic structures

EDEL Joshua, UK

JEMTH Per, Sweden

KIM Minjun, (Korea), USA

Probing the role of lipids in cell division

EGGERT Ulrike, (Germany), USA

ROUX Aurélien, France

SAKURAI Kaori, Japan

A hybrid approach to revealing intermediate structures of herpes simplex virus during infection

GRÜNEWALD Kay, Germany

ALBER Frank, (Germany), USA

CRISTEA Ileana, (Romania), USA

TOPF Maya, (Israel), UK

Integrating biochemical and physical mechanisms of actin and major sperm protein-driven propulsion

PLASTINO Julie, (USA), France

KOENDERINK Gijssje, Netherlands

KREPLAK Laurent, (France), Canada

² These awards were initiated during FY 2009. For a list of grant teams awarded in 2010, see the HFSP website (<http://www.hfsp.org/>).

2. PROGRAM GRANTS

Neuronal connectivity: unraveling the cell-surface recognition code

BAIER Herwig, (Germany), USA
TRAUNER Dirk, (Austria), Germany
WRIGHT Gavin, UK

RNA folding as a mediator of stress response in plants

BEVILACQUA Philip, USA
ASSMANN Sarah, USA
LILLEY David, UK
MAJOR François, Canada

Cheating the cold. How do Antarctic fishes use antifreeze to survive in ice-laden water?

BRIMBLE Margaret, New Zealand
DEVRIES Arthur, USA

Understanding supramolecular architectures in photosynthesis by space and time resolved spectroscopy

COGDELL Richard, UK
HASHIMOTO Hideki, Japan
MOORE Thomas, USA
POLLI Dario, Italy

Physiological forces in LN development and function: engineering an artificial lymph node

COLES Mark, UK
CUPEDO Tom, Netherlands
STROOCK Abraham, USA

Mechanotransduction in oligodendrocyte precursor cell differentiation

GUCK Jochen, (Germany), UK
FRANKLIN Robin, UK
VAN VLIET Krystyn, USA

First encounters of pathogens with the host: fundamentals of pathogen recognition and killing

HAAGSMAN Henk, Netherlands
BARRON Annelise, USA

Promotion of NMD by mechanistic differences between premature and normal translation termination

JACOBSON Allan, USA
EHRENBERG Måns, Sweden
VAN TILBEURGH Herman, (Netherlands), France

Cell-to-cell propagation of neurodegenerative disease-linked protein aggregates

KOPITO Ron, (Australia), USA
BRUNDIN Patrick, Sweden
HEUSER John, USA
MELKI Ronald, France

Mechanoregulation of nuclear architecture and genome function: a novel mechanism in stem cell fate

LEE David, UK
CREMER Thomas, Germany
DISCHER Dennis, USA
MAUCK Robert, USA

CNS development probed by random access non-linear optical electrophysiology

LOEW Leslie, USA
PAVONE Francesco, Italy
SATO Katsushige, Japan

Structural studies of yeast translation initiation

LORSCH Jon, USA
HINNEBUSCH Alan, USA
RAMAKRISHNAN Venki, (USA), UK

In search of conserved mRNA localization and anchoring mechanisms

MACARA Ian, USA
BROWN Chris, New Zealand
SPANG Anne, (Germany), Switzerland

A multidisciplinary approach to microtubule-kinetochore attachment

MUSACCHIO Andrea, Italy
HOWARD Jonathon, (USA), Germany
TAKEYASU Kunio, Japan
TANAKA Tomoyuki, (Japan), UK

Serotonin and decision-making: integrating inter-species experimental and computational approaches

NAKAMURA Kae, Japan
COOLS Roshan, Netherlands
DAW Nathaniel, USA

The molecular dynamics and imaging of Eph receptor-guided cell positioning in tissue assembly

PAWSON Anthony James, Canada
BASTIAENS Philippe, (Netherlands), Germany
LACKMANN Martin, Australia
NEEL Benjamin, (USA), Canada

Decoding and recoding sensation

PETERSEN Carl, (UK), Switzerland
BRODY Carlos, USA
CALLAWAY Edward, USA
DIAMOND Mathew, Italy

Inositides distribution and quantitation using multi-isotope imaging mass spectrometry

SAIARDI Adolfo, (Italy), UK
LECHENE Claude, USA

The multiple timescales of motor memory

SHADMEHR Reza, USA
KALASKA John, Canada
KITAZAWA Shigeru, Japan
MIALL Christopher, UK
ROSSETTI Yves, France

Quantitative analysis of the DNA loop-domain model for long range regulation of transcription

SHEARWIN Keith, Australia
DUNLAP David, USA
SWIGON David, (Czech Republic), USA

Multiscale mechanisms of epithelial patterning and morphogenesis: theory and experiments

SHVARTSMAN Stanislav, USA
AUDOLY Basile, France
DAHMANN Christian, Germany
PISMEN Leonid, Israel

Implications of tail structural features on molecular mechanisms and biological functions of myosins

SOWDHAMINI Ramanathan, India
FLYVBJERG Henrik, Denmark
SPUDICH James, USA

Actin turnover homeostasis and spatial heterogeneity of regulators in artificially polarized cells

WATANABE Naoki, Japan
VAVYLONIS Dimitrios, (Greece), USA

Listening through the looking glass: perception and neural encoding of mirror images in biosonar

WIEGREBE Lutz, Germany
SIEMERS Björn, Germany
ULANOVSKY Nachum, Israel

Sensitive molecular imaging of in situ axonal pathfinding mechanisms by low-level probe trapping

WOUTERS Fred, (Netherlands), Germany
BRUCHEZ Marcel, USA
HOLT Christine, UK

Two-photon monitoring and modulation of cerebrovasculature and neuronal excitability

MACVICAR Brian, Canada
CHARPAK Serge, France
ELLIS-DAVIES Graham, (UK), USA

A.4

LONG-TERM AND CROSS-DISCIPLINARY FELLOWSHIPS AWARDED IN 2009³

1. Long-Term Fellowships

Name	Nationality	Host institute	Host country
BAILLY Marc	FRANCE	University of Florida, Gainesville	USA
BARREIRO Luis	PORTUGAL	University of Chicago	USA
BATHELLIER Brice	FRANCE	Research Institute of Molecular Pathology, Vienna	AUSTRIA
BELL Stan Oliver	GERMANY	Stanford University	USA
BENHAMOUCHE Samira	ALGERIA	Harvard Medical School, Charlestown	USA
BERINGER Malte	GERMANY	The Wistar Institute, Philadelphia	USA
BERSHTEIN Shimon	ISRAEL	Harvard University, Cambridge	USA
BOISVERT Catherine	CANADA	Monash University, Melbourne	AUSTRALIA
BOUSSAU Bastien	FRANCE	University of California, Berkeley	USA
BREART Béatrice	FRANCE	New York University	USA
BROZ Petr	SWITZERLAND	Stanford University	USA
CANELA Andres	SPAIN	Cold Spring Harbor Laboratory	USA
COHEN Michael	USA	University of Amsterdam	NETHERLANDS
CREMADES Nunilo	SPAIN	University of Cambridge	UK
DE LA MATA Manuel	ARGENTINA	Friedrich Miescher Institute, Basel	SWITZERLAND
DIESTER Ilka	GERMANY	Stanford University	USA
DOUBROVINSKI Konstantin	SWEDEN	Princeton University	USA
ECKER Andrea	AUSTRIA	Columbia University, New York	USA
EFEYAN Alejo	ARGENTINA	Massachusetts Institute of Technology, Cambridge	USA
ELISCOVICH Carolina	ARGENTINA	Albert Einstein College of Medicine, New York	USA
ESPOSITO Maria Soledad	ARGENTINA	Biozentrum, University of Basel	SWITZERLAND
FU Yu	CANADA/CHINA	Harvard Medical School, Boston	USA

Name	Nationality	Host institute	Host country
GARI Kerstin	GERMANY	Cancer Research UK London Research Institute	UK
GAT-VIKS Irit	ISRAEL	Massachusetts Institute of Technology, Cambridge	USA
GEROLD Gisa	GERMANY	Rockefeller University, New York	USA
GIODINI Alessandra	ITALY	Institut Pasteur, Paris	FRANCE
GOMEZ Céline	FRANCE	Wellcome Trust Centre, Cambridge	UK
GRODZINSKI Uri	ISRAEL/UK	University of Cambridge	UK
GUJRAL Taranjit	CANADA	Harvard University, Cambridge	USA
GUNDLFINGER Anja	GERMANY	University of Zurich	SWITZERLAND
HAMARATOGLU Fisun	TURKEY	Biozentrum, University of Basel	SWITZERLAND
HARRINGTON Eoghan	IRELAND	Stanford University	USA
HAYASHI Makoto	JAPAN	The Salk Institute for Biological Studies, La Jolla	USA
HEINZE Stanley	GERMANY	University of Massachusetts, Worcester	USA
HILLER Michael	GERMANY	Stanford University	USA
HORE Timothy	NEW ZEALAND	The Babraham Institute, Cambridge	UK
HUSSON Steven	BELGIUM	Goethe-University, Frankfurt am Main	GERMANY
INGMUNDSON Alyssa	USA	Max Planck Institute for Infection Biology, Berlin	GERMANY
INOUE Daigo	JAPAN	University of Heidelberg	GERMANY
JANSSEN Bert	NETHERLANDS	University of Oxford	UK
KAISERLI Eirini	GREECE	The Salk Institute, La Jolla	USA
KARPOWICZ Phillip	CANADA/POLAND	Harvard Medical School, Boston	USA
KIM Hyojung	KOREA	Dartmouth College, Hanover	USA
KISE Yoshiaki	JAPAN	Katholieke Universiteit, Leuven	BELGIUM
KOLODKIN-GAL Ilana	ISRAEL	Harvard University, Cambridge	USA
KÖNIG Julian	GERMANY	MRC Laboratory of Molecular Biology, Cambridge	UK
KONOPOVA Barbora	CZECH REPUBLIC	University of Cambridge	UK
KUIPERS Hedwich	NETHERLANDS	Stanford University	USA
KUMAR Madhu	USA	Cancer Research UK London Research Institute	UK
LAGOUGE Marie	FRANCE	Max-Planck Institute for Biology and Aging, Cologne	GERMANY
LAM Sheung Kwan	HONG KONG CHINA	University of California, Berkeley	USA
LAMBER Ekaterina	RUSSIA	Institute of Cancer Research, London	UK
LAPLANTE Caroline	CANADA	Yale University, New Haven	USA
LAURENT Gaëlle	FRANCE	Harvard Medical School, Boston	USA
LEVY Dan	ISRAEL	Stanford University	USA
LUNDIN Carl Victor	SWEDEN	Stanford University	USA
LUSTIG Yaniv	ISRAEL	Dana Farber Cancer Institute, Boston	USA
MAKHIJANI Kalpana	INDIA	University of California, San Francisco	USA
MANAVELLA Pablo	ARGENTINA/ITALY	Max Planck Institute for Developmental Biology, Tübingen	GERMANY
MEINECKE Michael	GERMANY	MRC Laboratory of Molecular Biology, Cambridge	UK
MEZER Aviv	ISRAEL	Stanford University	USA
MINGUENEAU Michaël	FRANCE	Harvard Medical School, Boston	USA
MONTEL-HAGEN Amélie	FRANCE	University of California, Los Angeles	USA
MUKHERJEE Saikat	INDIA	University of Geneva	SWITZERLAND

³ These fellowships were initiated during FY 2009. For a list of fellows awarded in 2010, see the HFSP website (<http://www.hfsp.org/>).

Name	Nationality	Host institute	Host country
NAKAMURA Kouichi	JAPAN	University of Oxford	UK
NIR Yuval	ISRAEL	University of Wisconsin-Madison	USA
NOESKE Jonas	GERMANY	University of California, Berkeley	USA
ONO Masahiro	JAPAN	University College London	UK
PARIS Mathilde	FRANCE	University of California, Berkeley	USA
PARMEGGIANI Fabio	ITALY	University of Washington, Seattle	USA
PARONETTO Maria Paola	ITALY	Centre for Genomic Regulation, Barcelona	SPAIN
PLAZAS Paola	ARGENTINA	University of California, San Diego	USA
POHL Christian	GERMANY	Memorial Sloan-Kettering Cancer Center, New York	USA
RAMDYA Pavan	USA	University of Lausanne	SWITZERLAND
REICHMANN Dana	ISRAEL	University of Michigan, Ann Arbor	USA
RINKEVICH Yuval	ISRAEL	Stanford University	USA
ROSENBUM Gabriel	ISRAEL	University of Pennsylvania, Philadelphia	USA
SADEH Ronen	ISRAEL	The Rockefeller University, New York	USA
SAUER Stephan	AUSTRIA	National Cancer Institute, Frederick	USA
SCHWAB Rebecca	GERMANY	IBMP, Strasbourg	FRANCE
SHCHEPROVA Zhanna	RUSSIA	IRB, Barcelona	SPAIN
SIEGL-CACHEDENIER Irene	AUSTRIA	University of Geneva	SWITZERLAND
SINHA Kalyan	INDIA	University of California, San Francisco	USA
SIRAJUDDIN Minhajuddin	INDIA	University of California, San Francisco	USA
SKOPELITIS Damianos	GREECE	Cold Spring Harbor Laboratory	USA
STARK Eran	ISRAEL/UK	Rutgers, State University of New Jersey, Newark	USA
STIGLOHER Christian	GERMANY	Ecole Normale Supérieure, Paris	FRANCE
SUMARA Grzegorz	POLAND	Columbia University, New York	USA
TADROS Wael	CANADA	University of California, Los Angeles	USA
TANG Yun-Chi	TAIWAN CHINA	Massachusetts Institute of Technology, Cambridge	USA
TIDOW Henning	GERMANY	University of Aarhus	DENMARK
TRAJKOVIC Katarina	SERBIA	University of Geneva	SWITZERLAND
TSETSENIS Theodoros	GREECE	Stanford University	USA
TSURIEL Shlomo	ISRAEL	Harvard University, Cambridge	USA
UEMURA Masato	JAPAN	Norwegian University of Science and Technology, Trondheim	NORWAY
USSAR Siegfried	AUSTRIA	Joslin Diabetes Center, Boston	USA
VAN DEN BOGAART Geert	NETHERLANDS	Max Planck Institute for Biophysical Chemistry, Göttingen	GERMANY
VANHOLLEBEKE Benoît	BELGIUM	University of California, San Francisco	USA
VARELA Ignacio	SPAIN	Wellcome Trust Sanger Institute, Hinxton	UK
VINCE James	AUSTRALIA	University of Lausanne	SWITZERLAND
WAGNER Samuel	GERMANY	Yale University, New Haven	USA
WANG Xindan	CHINA	Harvard Medical School, Boston	USA
WEIXLBAUMER Albert	AUSTRIA	The Rockefeller University, New York	USA
WIRTZ-PEITZ Frederik	GERMANY	Sloan-Kettering Institute, New York	USA
WU Hao	CHINA	Johns Hopkins University, Baltimore	USA
YAPICI Nilay	TURKEY	The Rockefeller University, New York	USA
YOONG Li Foong	MALAYSIA	RIKEN Brain Science Institute, Saitama	JAPAN
ZHONG Silin	CHINA	Cornell University, New York	USA
ZIV Guy	ISRAEL	Stanford University	USA

2. Cross-Disciplinary Fellowships

Name	Nationality	Host institute	Host country
AMADOR Ana	ARGENTINA	University of Chicago	USA
BONGER Kimberly	NETHERLANDS/CANADA	Stanford University	USA
FERRETTI Antonio	ITALY	The Scripps Research Institute, La Jolla	USA
GAL Maayan	ISRAEL	Harvard Medical School, Boston	USA
MEISSL Walter	AUSTRIA	RIKEN, Tokyo	JAPAN
MINNES Refael	ISRAEL	University of Pennsylvania, Philadelphia	USA
RAMMENSEE Sebastian	GERMANY	University of California, Berkeley	USA
TABEI Ali	IRAN	University of Chicago	USA
XULVI-BRUNET Ramon	SPAIN	Harvard University, Cambridge	USA
ZHAO Weian	CHINA	Harvard Medical School, Cambridge	USA

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SHORT-TERM FELLOWSHIPS AWARDED IN 2009

Name	Nationality	Host institute	Host country
ADROVER Miguel	SPAIN	National Institute for Medical Research, London	UK
BAJOREK Monika	ISRAEL/POLAND	Monash University, Clayton	AUSTRALIA
BORRONI Elena	ITALY	Institut Pasteur, Paris	FRANCE
CHINI Andrea	ITALY	University of California, Riverside	USA
ERCEG Slaven	CROATIA/SERBIA	University La Sapienza, Rome	ITALY
FRENKEL Lia	ARGENTINA/GERMANY	Cold Spring Harbor Laboratory	USA
GEBHARD Leopoldo	ARGENTINA	University of California, Berkeley	USA
GUSAREVA Elena	RUSSIA	Erasmus Medical Center, Rotterdam	NETHERLANDS
HERNANDEZ Ana María	CUBA	The Feinstein Institute for Medical Research, Manhasset	USA
HOLPER Lisa	GERMANY	University of Buenos Aires	ARGENTINA
JORQUERA Milko	CHILE	University of California, Riverside	USA
KAPELLOS George	GREECE	Rice University, Houston	USA
LYSSIOTIS Costas	USA	EPFL, Lausanne	SWITZERLAND
MARCAIDA Maria Josefina	SPAIN	Graduate School of Engineering, Kyoto	JAPAN
MERCER Tim	AUSTRALIA	Beth Israel Deaconess Medical Center, Boston	USA
MILLER Gabriel	USA	Seoul National University	KOREA
RAMM Steven	UK	University of Innsbruck	AUSTRIA
RAVIKUMAR Brinda	INDIA	University of Texas Southwestern Medical Center, Dallas	USA
RIANO-PACHON Diego Mauricio	COLOMBIA	The Ohio State University, Columbus	USA
TRUSOVA Valeriya	UKRAINE	Health Science Center, Fort Worth	USA
VAN ELK Michiel	NETHERLANDS	University of California, Santa Barbara	USA
VARGA Viktor	HUNGARY	Rutgers University, Newark	USA
VESIA Michael	CANADA	INSERM, Bron	FRANCE
WURTELE Hugo	CANADA	School of Medicine, Baltimore	USA

A.6

CAREER DEVELOPMENT AWARDS MADE IN 2009⁴

Name	Nationality	Institute of CDA	Country of CDA
ARCHAMBAULT Vincent	Canada	University of Montreal	Canada
BESSE Florence	France	University of Nice - Sophia Antipolis	France
DAUMKE Oliver	Germany	Max-Delbruck Centrum, Berlin	Germany
DE RENZIS Stefano	Italy	EMBL, Heidelberg	Germany
D'ORSO Iván	Argentina	Universidad Nacional de San Martin, Buenos Aires	Argentina
FOERSTER Friedrich	Germany	Max-Planck Institute of Biochemistry, Martinsried	Germany
GOLLISCH Tim	Germany	Max Planck Institute of Neurobiology, Martinsried	Germany
IGAKI Tatsushi	Japan	Kobe University	Japan
ISHII Masaru	Japan	Osaka University	Japan
ISHIKAWA Haruto	Japan	National Institute of Natural Science, Okazaki	Japan
KADENER Sebastian	Argentina/Israel	Hebrew University, Jerusalem	Israel
LIPPMAN Zachary	USA	Cold Spring Harbor Laboratory	USA
MARTIN-BELMONTE Fernando	Spain	Centro de Biología Molecular Severo Ochoa/CSIC, Madrid	Spain
NARAYANAN Rishikesh	India	Indian Institute of Science, Bangalore	India
NOLLMANN MARTINEZ Marcelo	Argentina/France/Spain	Université de Montpellier	France
REINKE Hans	Germany	Heinrich-Heine University, Dusseldorf	Germany
SCHEUSS Volker	Germany	Max Planck Institute of Neurobiology, Martinsried	Germany
SCHNORRER Frank	Germany	Max-Planck-Institute of Biochemistry, Martinsried	Germany
SIEMENS Jan	Germany	Max-Delbruck Center for Molecular Medicine, Berlin	Germany
SOUTOGLOU Evanthia	Greece	IGBMC, Strasbourg	France
TAKIZAWA Takumi	Japan	Nara Institute of Science and Technology, Ikoma	Japan
VAN ATTIKUM Haico	Netherlands	Leiden University Medical Center	Netherlands
VAN DER GUCHT Jasper	Netherlands	Wageningen University	Netherlands
ZELCER Noam	Israel/Netherlands	University of Amsterdam	Netherlands
ZHU Ping	China	JTU Institute of Biomedical Research, Shanghai	China

⁴ These awards were initiated during FY 2009. For a list of the CDAs
⁵ Awarded in 2010, see the HFSP website.

TEMPS FORT 

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