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Review of the Human Frontier Science Program's Initiatives 2000-2005



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Preface of the HFSP President

This NIFU STEP report on the Human Frontier Science Program (HFSP) is the third in a series of external reviews of the Program. These are part of an ongoing system for monitoring the relevance and performance of the HFSP scientific programmes. Such reviews are of the utmost importance to ensure that HFSP remains at the cutting edge of life science research and that it continues to provide the means to stimulate innovative international collaborations.

The current report concentrates on the program initiatives introduced since 2000 and examines the extent to which these fulfil their original aims. The study considers the drive to increase interdisciplinary research and collaboration as well as whether the introduction of repatriation schemes for postdoctoral fellows has realised its aims. It also examines the rigorousness and impartiality of the peer review process and the role of the annual awardees meeting in creating global networks of scientists in different fields.

The Board of Trustees notes with satisfaction that the recent initiatives appear to be achieving their intended effect. The level of new, interdisciplinary collaborations has increased markedly over the last 5 years according to the self-assessment of the grant awardees in the survey. This result is further supported by HFSP's own independent analysis as described in recent Annual Reports. The repatriation schemes, in particular the Career Development Awards, have been welcomed by the HFSP awardees. Indeed, there is evidence that these have provided a motivation for young scientists to return home and have helped them negotiate a position in their home countries. The introduction of the Awardees Annual Meeting has been positively received as an opportunity for the awardees to meet their peers from all over the world in a broad range of disciplines. Finally, analysis of other international funding sources indicates that the HFSP continues to occupy a unique and prestigious position in the global scientific landscape.

However, despite the overall positive evaluation of the Program, one issue of concern was identified: the consistently lower success rates of female applicants in the Long-Term Fellowship program compared to their male counterparts. Given that the Fellowship program is aimed at young researchers, the normal reasons for a difference in gender representation at the faculty position level should not be evident. The NIFU STEP report did not analyse why women do not compete as well as men in the Fellowship scheme. It is important, however, that we examine in an open-minded manner whether any unintended bias might be inherent in the peer review process. An analysis of existing data from recent review cycles is currently being undertaken to this end. Whatever the outcome of this analysis, the lower performance of female candidates in such an international competition is a serious matter of concern, for the HFSP as well as for national funding agencies and the global scientific community.

The Board of Trustees would like to thank NIFU STEP for the rigour and professionalism with which they have conducted this review. We are also grateful for the cooperation of all the awardees and members of the HFSP Council of Scientists and Review Committees who took the time to complete the survey and be interviewed by NIFU STEP.

Masao Ito
President, Chair of the Board of Trustees

Preface

This report was commissioned by the Human Frontier Science Program Organisation (HFSP) and presents a review the impact of recent policies changes in the Human Frontier Science Program (HFSP). The Terms of Reference for the review are found in Appendix 1.

The members of the evaluation team were Senior Researcher Liv Langfeldt, Senior Researcher Karl Erik Brofoss, Senior Researcher Egil Kallerud and Research Director Randi Søgne. The report is authored by Langfeldt, while Brofoss, Søgne and Kallerud commented on plans and drafts. Senior Researcher Nils Henrik Solum assisted with the web-based applicant survey.

We are indebted to the many HFSP applicants and awardees who contributed to the review through their questionnaire replies, to the interviewed chairs and members of HFSP Review Committees and Council of Scientists who took the time and effort to share their experiences and insights with us, and to the people at the HFSP providing all necessary information and documentation. Without the helpful cooperation of all these people this review would not have been possible.

Oslo, February 2006

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Executive summary

This report presents the results of a review of recent policy changes in the Human Frontier Science Program (HFSP). The review was initiated by the Intergovernmental Conference on the Human Frontier Science Program (June 2004). The Norwegian research institute NIFU STEP was in May 2005 commissioned by the Human Frontier Science Program Organisation (HFSPPO) to conduct the review.

The HFSP is an international funding program established in 1989 to support basic life sciences aimed at the elucidation of the ‘sophisticated and complex mechanisms of living organisms’. Major objectives of the program are to promote interdisciplinary and intercontinental collaboration and mobility. This review encompasses program initiatives and changes in program policies in the period 2000-2005. In this period a number of changes have been initiated to stimulate a higher degree of interdisciplinarity, to enable young scientists to start an independent academic career in their home country, to improve the abilities of young investigators to collaborate in international and interdisciplinary teams and to facilitate interaction and cooperation among the awardees. Moreover, there have been adjustments in the procedures for reviewing applications.

The overall question addressed in this report is to what degree the HFSP initiatives introduced have been successful in terms of fulfilling their aims. The Terms of Reference for the review address a broad range of questions ranging from the niche of the HFSP in relation to other international funding sources, the interdisciplinarity and collaboration in funded research, the effects of the repatriation initiatives, the rigorousness and impartiality of the procedures for reviewing and selecting applications, as well as impacts of the overall HFSP interaction and information initiatives. Conclusions to each of the items in the Terms of Reference are presented in Chapter 9.

The major data sources for the review are a survey to all HFSP applicants in the period 2000 to 2005, interviews with participants in the review processes, as well as HFSP application review documents. 82 percent of the awarded applicants completed the questionnaire, whereas only 20 percent of the non-awarded did.

Interdisciplinarity and collaboration in HFSP Grants

HFSP Grants are awarded to international and interdisciplinary teams for 3-year collaborative projects. In the applicant survey we measured the interdisciplinarity in the Grant projects in two different ways. First we asked the applicants for their own description of the interdisciplinarity in the projects. Moreover, we asked which disciplines the project encompassed. The data show a clear increase in interdisciplinarity – both in awarded and non-awarded applications, and by both measuring methods. The proportion of funded projects that contains more than one discipline increased from 30 percent in 2000 to almost 90 percent in 2005. For the non-awarded applications, we find an increase from 40 percent in 2000 to 67 percent in 2005.

Working in interdisciplinary and intercontinental teams may entail particular challenges to scientific research. To a large extent the HFSP teams consist of members that have not previously collaborated. From 2002, when the two former programs on ‘Brain Functions’ and ‘Molecular Approaches’ merged into one program on ‘Complex mechanisms of living organisms’, we see that the proportion of ‘all new’ collaborations increases. When asked

about problems encountered in the project, half of the teams report no problems. For those reporting problems, the intercontinentality of the projects is a much more substantial challenge to the teams than their interdisciplinarity. Some also report problems in keeping all team members interested in contributing to the project after the award is obtained, indicating that in some cases clearer integrative incentives are needed to optimise collaborative outcomes from the research projects.

Still, in the large majority of the cases the collaborations seem to work well – the projects seem collaborative in the way that the research of the different participants are integrated and add to the outcome. 82 percent say that the collaborations within the team were of clearly positive importance for the results of the project, and 55 percent say the project could not have been organised with participants from one country only.

HFSP Fellows: International and disciplinary mobility and repatriation

HFSP Fellows are 3-year postdoctoral awards for interdisciplinary training abroad. To facilitate repatriation, the final year of the Fellowship may be spent in a laboratory in the home country. The proportion of the Fellows that change field when starting their HFSP project seems to have increased moderately in the analysed period. In 2000 to 2002, 66 percent of the Fellows moved into a new *discipline* (according to predefined categories). In 2003 to 2005, 77 percent did so.

A large majority of the Fellows report that the HFSP Research & Travel Allowance improved their ability to carry through their project in the host country (75 percent answered 4 or 5 on a scale from 1 to 5). Concerning the HFSP Living Allowance the replies are somewhat less positive. 64 percent meant that it was sufficient (i.e. answered 4 or 5 on the scale from 1 to 5).

19 percent of the surveyed Fellows used the opportunity to return to their home country for the final Fellowship year. In most cases both research and career opportunities and personal/family reasons motivated the return. 94 percent of those that returned have obtained a research position in their home country after the Fellowship, and the HFSP repatriation initiatives seems to facilitate a research career in their home countries. 81 percent of the repatriates report that the possibility of returning home for the final year, very much helped them repatriate. Also the possibility of deferring the final year is deemed helpful. Of those reporting problems on returning home, inferior research facilities and lack of available research positions are the most frequently mentioned problems.

The HFSP Career Development Awards

When completing their Fellowship and returning to an academic position in their home country, HFSP Fellows are eligible to apply for a 3-year HFSP Career Development Award (new award scheme in 2003). Our analyses conclude that the HFSP Career Development Awards (CDA) have had substantial effects both in motivating Fellows to take up a research career in their home country and in facilitating such a career. More than half of the CDA-holders think that the prospect of receiving a CDA helped them or partly helped them in negotiating their position in the home country. All but one of them report that the CDA support helped them establish an independent research group.

For most CDA-holders, research and career opportunities and personal/family reasons are their major motivations for returning home, whereas obtaining the CDA is an ‘additional’ motivation. Still, for some the CDA is their major motivation for returning home. Given

equal economic support, 10 percent of the CDA-holders would have preferred to establish their group in their HFSP Fellowship country or in a third country. On the other hand, for a third of the Fellows the CDA is not an attractive opportunity, partly because a CDA requires them to return to their home country.

The HFSP niche and comparison of program profiles

Based on a web search on alternative international funding sources mentioned by the surveyed applicants, the HFSP seems unique. There seem to be very few, if any, funding alternatives with the same profile and objectives as the HFSP. The HFSP Fellowship scheme seems to be one of very few schemes that articulate a high priority to Fellows widening their interdisciplinary expertise, and the only truly international scheme with such a focus. We found no other grant scheme with the same international scope and focus on interdisciplinarity for the Life Sciences as the HFSP Grant scheme.

These web-searches confirmed the impression from the applicant survey. Most applicants do not seem to know about any alternative international funding sources for their application nor any domestic sources. The lowest proportions of applicants listing international alternatives for their projects are found in the Grant programs and in the CDA-program, the highest proportions in the Fellowship program. There are also regional differences. A substantially larger proportion of the Europeans, than the applicants from other parts of the world, has alternative funding for international projects.

We asked applicants to compare the HFSP with other funding sources along several dimensions: Prestige, interdisciplinarity, unique/original research, high-risk topics, requirements for preliminary research, support of young scientists, broadening of expertise, intercontinental networks, amount of funding and flexibility of funds. On all these issues, a large part of the HFSP applicants answer that the HFSP is better than other funding alternatives – both domestic and international. On some issues there is also an increase from 2000 to 2005 in good scores to the HFSP. Concerning opportunities offered for doing unique/original and high-risk research, the HFSP now score better than in 2000 when compared with applicants' domestic funding alternatives¹.

The HFSP selection procedures

There is, not surprisingly, a substantial difference between awarded and non-awarded applicants' confidence in the review process. Scoring the impartiality of the Review Committee on a scale from 1 to 5, the average score given by awarded applicants is 4.5, whereas the average score from the non-awarded is 2.9. However, the merger of the two programs in 2002 seems to have had little effect on the applicants' confidence in the Review Committees' ability to assess all fields in their proposal, or in their confidence of the thoroughness of the review. A possible effect of a wider program where all applications are reviewed in the same committee would be less confidence in the thoroughness of review and the Committee's ability to assess all different fields, but the merger does not seem to have affected applicants' confidence in the review.

An analysis of review documents and interviews with reviewers indicates that the HFSP review procedures are adequate and compare well with those of other funding organisations. Procedures are clearly defined and the review is thorough, and at the same

¹ The survey in 2000 only asked for comparison with domestic sources, and only some of the same issues were included in both surveys. Only awarded applicants were surveyed in 2000.

time there is openness allowing applications that for some reason come up with divergent scores in the first round to be reassessed and awarded in the final round. There is no evidence that the screening of the Letters of Intent filters out projects that could have been successful. Still, the degree of uncertainty in the assessments – as illustrated by Letters of Intent with high discrepancies in pre-meeting scores – indicate a need for measures to assure that original and high-risk research is not abandoned at the stage of the Letters of Intent.

Analyses of application data show substantial differences in Fellowship applicant's success rates depending on nationality, age and gender. The reasons for these differences remain to be examined.

Overall program initiatives and communication

The Awardees Annual Meeting was introduced in 2001 to facilitate interaction and cooperation among the awardees. The large majority of the participants report positive effects of these meetings in terms of providing interdisciplinary input and widening one's scholarly network. Moreover, the meetings seem to have a substantial role in creating a sense of community among HFSP awardees, especially for the Fellows and the CDA-holders.

Looking at the information sources that stimulate applicants' interest in applying for HFSP awards, information from colleagues and advisers and the HFSP web-site are by far the most important.

Program outcome

Judged from awardees survey replies, the awarded projects have had extensive effects in terms of improved insights and skills. More than half of the awardees reports that the project to a high degree broadened their field of expertise. High scores are also given on improved insight into their own field of research, and improved interdisciplinary skills. On questions about more specific effects, as improved ability to obtain an attractive research position, further funding or research collaborations beyond the term of the project, there are relatively many that answer 'too early to say', but also on these aspects a large part of the awardees give high scores. Especially the Young Investigators score high on research collaborations, both during and beyond the term of the project.

The Young Investigator Grants also seem the most important HFSP awards in terms of facilitating research that would otherwise not have been done. 38 percent of the Young Investigators report that without the grant, the research would not have been done at all, whereas 25 percent of other Grantees, 6 percent of Long-Term Fellows and 9 percent of Cross Disciplinary Fellows report the same. Moreover, only one percent of the Grantees think they would have done the same research with the same partners without the grant (both Young Investigator Grants and Program Grants included). Among the Fellows we find a larger proportion for whom the award has had little effect on facilitating research that would otherwise not have been done. 45 percent of them answer that they would have done the same research at the same host laboratory even if they had not obtained the HFSP Fellowship. Looking at the replies from those that did not obtain an award we find much the same pattern as for the awardees. The highest proportion that was able to carry out the project without an HFSP award is found among the Fellowship applicants (67 percent), the lowest proportion among the Young Investigators (18 percent).

Conclusions and recommendations

The overall impression that appears from the analysis of the HFSP activities 2000 to 2005 is very positive. The HFSP is successful in terms of promoting interdisciplinarity and new collaborations, and fills a unique niche in international research funding. The success seems to have two major premises: First and foremost, the HFSP is a high ranking international research funding organisation whose initiatives are highly appreciated by its awardees. Moreover, the program leadership is engaged in monitoring and adjusting the funding schemes. Below is a summary of the major recommendation for further improving the program (extracted from Chapter 9).

- Most awardees are clearly interested in joining an international HFSP alumni network, which indicates that such a network should be established. Other initiatives that would be welcomed by the awardees are electronic forums for interaction and networking on the HFSP web site.
- More transparency and feedback to applicants seem to be needed in both award schemes to increase non-awarded applicants' confidence in the HFSP review procedures.
- The relevant HFSP committees should discuss whether there are domestic structural differences in postdocs' abilities to qualify for a HFSP Fellowship and whether such differences may explain the large differences in success rates for different nationalities. They should also discuss to what degree career breaks are taken into consideration when assessing the candidates' productivity and as well as other possible explanations to the substantial differences in success rates depending on applicants' age and gender.
- To be able to better measure the extent to which Fellows move into a new field of research, the term 'field of research' needs to be elaborated and predefined in the application form.
- Measures to help teams that encounter collaboration problems and to give clearer incentives to collaborate, should be considered.
- In order to further meet the expressed needs of young investigators, more funds and measures to secure their independence seem appropriate.
- As requested in the Terms of Reference, the report also presents several measures that may be introduced to further emphasise originality.

1 Introduction

The HFSP

The Human Frontier Science Program (HFSP) is an international funding program supporting basic life sciences aimed at the elucidation of the ‘sophisticated and complex mechanisms of living organisms’. To promote interdisciplinary and intercontinental and international collaboration are major objectives of the program, and researchers from all fields of science are welcomed to do frontier research on the mechanisms of living organisms.

The program was proposed by the Japanese Prime Minister at the Venice Economic Summit in 1987. The program secretariat was established in Strasbourg in 1989 and the first projects were funded in 1990. The major funding schemes include 3-year (early career) fellowships to work in a laboratory in another country and 3-year project grants for teams of 2-4 investigators in different countries and continents. The HFSP 1990 total budget was 31 million USD, in 2005 increased to ca. 55 million USD. The sponsors of the program include Canada, France, Germany, Italy, Japan, Switzerland, UK, USA and the European Commission, and, from 2005, Australia and Korea.

Background and purpose of the review

The purpose of the current review is to *study the impact of recent HFSP policy changes*. In the period 2000-2005 a number of changes in the funding instruments have been initiated. To stimulate a higher degree of interdisciplinarity the two former programs ‘Brain Functions’ and ‘Molecular Approaches’ have been merged into one program on ‘Complex mechanisms of living organisms’ (from award year 2002). Calls for applications have also more clearly emphasised the participation of scientists from physics, chemistry, mathematics, computer science and engineering. In addition a separate call for *Cross-Disciplinary Fellowships* was introduced to enable candidates from outside the life sciences to obtain post-doctoral research training in HFSP relevant life sciences (from award year 2005). It is also required that the regular HFSP post-doctoral fellows change their scientific field to broaden their competence.

Incentives for HFSP fellows to return to their home country have also been introduced. The last year of the 3-year fellowships may now be used in the fellows’ home country (from 2000). In addition, a new funding instrument, a 3-year *Career Development Award*, has been introduced to HFSP Fellows who return to an academic position in their home country (from award year 2003).

To further improve the abilities of young researchers a separate call for *Young Investigator Grants* was introduced for researchers who are within the first five years of their first independent position (from award year 2001).

As a more overall and integrative initiative an Awardees Annual Meeting has been introduced to facilitate interaction and cooperation among the awardees (from 2001).

Moreover, a two-step submission procedure for grant applications was introduced to avoid applicants being discouraged by the low success rate and to reduce the work-load on review committees (from award year 2002). All applicants for research grants now have to

first submit a Letter of Intent, and only applicants who map on to the scientific criteria of the program are invited to submit full applications. Furthermore, to increase the attractiveness of the awards and enable more ambitious projects, the average amounts awarded per Research Grant have been increased (flat rate from award year 2002), and the Fellowships have been extended from two to three years (from award year 2000).

Review tasks

The overall question addressed in this review is to what degree the HFSP initiatives introduced since 2000 have been successful in terms of fulfilling their aims. The Terms of Reference for the review address a broad range of questions.² Below these questions are organised under four thematic headings. Conclusions for each item are found in Chapter 9, whereas the rest of the report is structured somewhat differently. There are separate chapters for the different award schemes (Chapters 2 – 4), followed by chapters dealing with more overall questions.

Interdisciplinarity, change of field and collaboration

- The impact of recent initiatives on the degree of interdisciplinarity of Research Grant teams
- The extent to which members of Research Grant teams collaborate and their challenges related to working in intercontinental, interdisciplinary teams.
- The extent to which HFSP Research Grants have seeded collaborations that continue beyond the term of the grant.
- The extent to which young scientists have made significant changes in their fields of research through the fellowships, and whether there are barriers against changing fields.

Repatriation and young investigators' needs

- The effects of HFSP repatriation incentives, and fellows' motivations and problems related to returning to their home country.
- The extent to which young investigators have special needs and whether these are met by the current Young Investigators' Program.

Overall policy and selection procedures

- The rigorousness and impartiality of the review procedures
- Measures that could be introduced to stimulate more originality in interdisciplinary grants.
- The HFSP niche and to what extent it is unique.

Overall program initiatives and information/communication

- The extent to which the Awardees Annual Meeting have succeeded in creating a sense of community among HFSP awardees.
- The extent to which the HFSP web site and annual report are appropriate for stimulating interest in the Program, and what other types of web-based information or services HFSP could provide that would be useful to awardees.

² In agreement with the HFSP those parts of the Terms of Reference that dealt with the content and quality of awarded projects are not tasks for this review, see Appendix 1.

The HFSP has been subjected to external review twice before, in 1995/1996 and 2000/2001, which points to 2001-2005 as an ordinary five-year period for the present evaluation. In addition to this period we also use the years 1995 and 2000 as reference points to study effects of the policy changes in the evaluated period.

Data sources

The review is based on a survey of HFSP applicants 2000-2005, publicly available information on alternative funding sources, interviews with participants in the review processes, review documents and data on applicants provided by the International Human Frontier Science Program Organisation (HFSP). Different approaches and data sources are used addressing the different questions. Applicant survey and archive data on awardees are used addressing the questions of interdisciplinarity, collaboration, mobility/repatriation and opportunities/problems of young researchers. Interviews and archive data on selection processes are used for the study of the review procedures. To elucidate the niche of the program, we also did web-searches to compare the HFSP profile with alternative programs/funding sources.

Documents

The collected archive data include applicant lists for all HFSP awards schemes for the years 2000 to 2005, review guidelines and review forms, reviewers' scores and comments, the scores and ranking obtained in the Review Committee meetings and the minutes from the HFSP Council of Scientists. In addition to the 2000 to 2005 data, some data from award year 1995 was also provided by the HFSP.

Interviews

Nine present and former chairs and members of the HFSP Review Committees were interviewed about the work in the Committees, the HFSP review criteria, changes in program priorities during their period on the Committee, strengths and weaknesses of the HFSP, and suggestions for improvements. In addition to the Review Committees members, two members of the HFSP Council of Scientists that had been observers in Review Committee meetings were interviewed. All interviews were phone interviews. The average time was 1.2 hours per interview. All interviewees are listed in Appendix 2.

Applicant survey

The survey was designed to encompass all applicants for major HFSP awards in the period under review. That is, all applications except the Short-Term-Fellowships³ in the period 2000-2005. For Grant applications, only Principal Applicants (and not the co-investigators) were addressed, so that there should only be one reply per application. The list of respondents was composed to exclude duplicates – each person was only supposed to answer according to his/her last HFSP award or (if not awarded in the period under review) according to his/her last application.

Each respondent received an e-mail invitation with a personal link to access the web-based survey (18.10.2005). There were three e-mail reminders to different sets of respondents: first one to all that had not accessed the questionnaire, some days later one to those that

³ Short-Term-Fellowships are awarded for visits (from two weeks up to three months) to labs in other countries, and were not included in the Terms of Reference for this review.

had accessed but not completed the form, and finally a special reminder to awardees that had not answered. The final deadline for replies was 02.11.2005.

Merging the application lists for different years and different types of applications we ended up with 6404 different persons that had applied at least once in the period (as Principal Applicant/PI). Of these the HFSP had e-mail addresses for 5651, and the survey were sent to these. 916 were confirmed *not* received by the applicant (the address generated a rejection/unknown recipient notice). This leaves us with a presumed obtainable sample of 4735 applicants and awardees that should have received the questionnaire. 1894 of these accessed the survey site and 1491 completed it, giving a general response rate at 31.5 percent (the complete sample of 1494 as proportion of the obtainable sample of 4735, Table 1.1).⁴

Table 1.1 Applicant survey response rates

Sample category	N	Response rate (%)	
		Complete sample	Incomplete sample
'Universe' : Different applicants 2000-2005	6404	23.3	31.0
Requested sample : Questionnaires to applicants with e-mail address reg. by HFSP	5651	26.4	33.5
Obtainable sample : Applicants presumably with correct e-mail address (no rejection notes)	4735	31.5	40.0
Obtained incomplete sample : Respondents accessing the survey	1894	78.7	
Obtained complete sample : Respondents completing the survey	1491		

There is a very large difference in the response rate of the awarded and the non-awarded applicants. 82 percent of the awarded and 20 percent of the non-awarded completed the questionnaire (Appendix 4, Table A.1). This means that the data give a much better basis for analysing the experiences and opinions of the awardees than the non-awarded applicants.⁵

There are also differences in response rates for the different HFSP award schemes. For the non-awarded applicants, response rates are somewhat higher within the Grant Program than within the Fellowship Program, whereas for the awarded applicants response rates are somewhat higher within the Fellowship Program than within the Grant Program (Table A.2 and A.3). The lowest response rate is found among non-awarded Fellowship applicants in the first years of the period analysed. Here there are not enough replies for separate analysis within years. There is also some variation in response rates by applicant's continent, but all continents have a response rate above 19 percent of all applications in both programs (complete sample calculated from the 'universe' and not the 'obtainable sample' as other response rates in this paragraph, Table A.6).

⁴ 53 percent of those that accessed but did not completed the whole questionnaire answered more than the two first questions, 7 percent went further than the question number 21 (i.e. response rates vary between questions).

⁵ There are larger confidence intervals for results in the group of non-awarded. Whereas the confidence interval on a reply distribution of 40/60 percent in the group of awarded respondents would be ± 1.9 pp, it would be ± 3.0 pp in the group of non-awarded respondents. Problems occur when analysing subgroups of respondents within these groups. With replies from a subgroup of 40 *awardees* a difference of 40 vs. 60 percent is significant, whereas in a subgroup of 40 *non-awardees* it is not (95 percent confidence level).

2 Interdisciplinarity and collaboration in HFSP Grants

HFSP Grants are awarded to international and interdisciplinary teams for 3-year collaborative projects. Below we present results of the applicant questionnaire addressing the interdisciplinarity and collaboration in the projects.

Interdisciplinarity within projects

In the period to be reviewed, there have been several initiatives to increase the degree of interdisciplinarity in the projects (cf. Chapter 1). In the applicant survey we tried to measure the interdisciplinarity in the project in two different ways. First we asked the applicants for their own description of the interdisciplinarity in the projects. The question was copied from a previous HFSP-survey to allow comparisons over time. The question, the three reply categories and the results are shown in the Tables 2.1 and 2.2. Moreover, we asked which disciplines the project encompassed. The answers to this question are shown in Table 2.3.

The data show a clear increase in interdisciplinarity – both in awarded and non-awarded applications for HFSP Grants, and by both methods of measuring it. Table 2.1 shows that, whereas 55 percent of the awardees from the 1990s replied that the project drew extensively on more than one discipline, this proportion has increased from 64 percent in 2000 to 93 percent in 2005. For non-awarded projects, the proportion that draw extensively on more than one discipline has increased from 45 percent in 2000 to 69 percent in 2005 (Table 2.2, non-awarded applicants were not addressed in the previous survey).

Table 2.1 Interdisciplinarity in awarded Grants 2000-2005, awardees' survey replies, percentages within years

Would you describe your HFSP project/application as interdisciplinary?	*1990-97	2000	2001	2002	2003	2004	2005	2000-05
Yes, drawing extensively on more than one discipline	55	63.9	65.0	78.1	76.9	91.7	92.9	76.3
Yes, with limited inputs from at least one other discipline	33	25.0	22.5	21.9	19.2	8.3	7.1	18.3
No, almost entirely within the boundaries of a single discipline	11	11.1	12.5		3.8			5.4
N	(356)	36	40	32	26	24	28	186

*Source for 1990-1997 figures: HFSP Review Final Report 23 April 2001, Appendix C7. 356 Grantees (both PAs and CAs replied to this previous survey (# replies to this specific question is not specified in the 2001 report).

Table 2.2 *Interdisciplinarity in non-awarded Grants applications 2000-2005, applicants' survey replies, percentages within years*

Would you describe your HFSP project/application as interdisciplinary?	2000	2001	2002	2003	2004	2005	Total
Yes, drawing extensively on more than one discipline	44.8	52.9	54.7	64.3	58.1	69.3	61.3
Yes, with limited inputs from at least one other discipline	44.8	41.2	37.7	25.7	34.6	24.1	31.1
No, almost entirely within the boundaries of a single discipline	10.3	5.9	7.5	10.0	7.4	6.6	7.6
N	29	34	53	70	136	166	488

Table 2.3 shows the percentages of the projects that include the various disciplines. 97 percent of the 'Principal Applicants' for awarded applications and 95 percent of the 'Principal Applicants' for non-awarded applications answer that the project contained one or more discipline within the fundamental life sciences. 36 of the awarded reply that the project contained physics, 29 percent that it contained chemistry, and 23 percent that it contained computer science. Similar figures for physics and chemistry in the non-awarded projects are somewhat lower (21 and 20 percent).

Table 2.3 *HFSP Grants 2000-2005: Percentages of awarded and non-awarded projects that include various disciplines. Applicants' survey replies*

Disciplines in your HFSP projects (Multiple response question)	Not awarded (Percent)	Awarded (Percent)	Total applications	
			Cases	Percent
Fundamental Life Sciences*	94.5	97.3	624	95.3
Biochemistry	44.8	54.9	312	47.6
Cell biology	42.7	53.8	300	45.8
Developmental biology	17.8	25.0	130	19.8
Genetics	26.1	35.9	189	28.9
Immunology	9.6	3.3	51	7.8
Neuroscience	31.6	32.6	209	31.9
Microbiology	10.8	12.5	74	11.3
Molecular biology	45.4	57.1	319	48.7
Plant biology	7.2	7.1	47	7.2
Structural biology	22.7	34.2	170	26.0
Other fundamental Life Sciences	14.2	10.3	86	13.1
Other Life Sciences*	21.9	10.3	122	18.6
Chemistry	20.0	29.3	148	22.6
Physics	20.8	35.9	164	25.0
Mathematics	12.3	14.7	85	13.0
Engineering and Technology				
Computer Science	21.9	22.8	145	22.1
Other Engineering and Technology	12.5	12.0	81	12.4
Other disciplines	8.5	5.4	50	7.6
N	471	184	655	655

**Fundamental Life Sciences* were defined as "fields directed at understanding basic biological mechanisms", whereas *Other Life Sciences* were defined as "fields not primarily directed at understanding basic biological mechanisms, e.g. clinical Sciences, Environmental Sciences, Agricultural Sciences".

In table 2.4 we have calculated the proportion of the applications that contained more than one discipline – counting all fundamental life sciences as one discipline. Also when

measuring the interdisciplinarity in the projects in this way, we find a large increase in interdisciplinarity in awarded projects and a somewhat more moderate increase in the interdisciplinarity in non-awarded projects. The proportion of funded projects that contains more than one (overall) discipline increased from 30 percent in 2000 to almost 90 percent in 2005. For the non-awarded applications, we find an increase from 40 percent in 2000 to 67 percent in 2005.

Table 2.4 also shows an increase in the average number of (overall) disciplines included. The average number of disciplines in projects awarded in 2000 was 1.5, whereas in 2005 the average was 2.8 disciplines per project.

There might be sources of error in these measurements. Respondents probably have better memories of the disciplines involved in their recent projects than in their older projects (questions were answered in October 2005 regardless of award year). Moreover, clearer requirements for interdisciplinarity may urge applicants to more explicitly define the interdisciplinary aspects of their application, and thereby more explicitly understand their projects as interdisciplinary. Even if such factors may contribute to higher figures, there still remains a substantial growth in interdisciplinarity in the analysed period.

Table 2.4 Interdisciplinarity in awarded and non-awarded HFSP Grants 2000-2005, measured by number of disciplines included, percentages and means

	2000	2001	2002	2003	2004	2005	2000-2005
Percent > 1 discipline							
Awarded projects	30.3	43.9	65.6	84.6	83.3	89.3	63.0
Non-awarded projects	40.0	53.1	58.2	64.2	56.6	66.9	60.3
Average # disciplines							
In awarded projects	1.5	1.7	2.3	2.7	3.3	2.8	2.3
In non-awarded projects	1.7	1.9	2.0	2.2	2.0	2.3	2.1
N (Cases)							
Awarded projects	33	41	32	26	24	28	184
Non-awarded projects*	25	32	55	67	129	163	471

Disciplines are defined as in Table 2.3 above, counting all Fundamental Life Sciences as one discipline.

*For the first part of the period we only have answers from a small part of the non-awarded applicants.

Collaboration and intercontinentality

The increase in the interdisciplinarity in the awarded projects has not been followed by an increase in the number of team members, or the number of continents, involved in the projects (Table 2.5). The average number of participating continents in awarded projects varies between 2.1 and 2.5 in the analysed period – the highest average is found in 2000, the lowest in 2002. The average number of team members varies between 3.2 and 4.2, and the highest and lowest averages are found in the same years as for the highest and lowest average numbers of continents.

According to these figures the lowest number of disciplines per project and the highest numbers of members and continents are found in the beginning of the period (2000), whereas in the end of the period the projects contain more disciplines and fewer members from fewer continents. As shown above, in the same period the average number of disciplines per project has increased from 1.5 to 2.8 (Table 2.4).

There is no clear trend in the proportion of projects that fulfil the intercontinentality criterion. The lowest percentages of projects where all members come from the same continent are found in 2000 (4 percent) and 2005 (6 percent), and the highest percentages are found in the middle of the period (2002 and 2003, Table 2.5).

Table 2.5 Number of continents participating in HFSP Grants 2000-2005, awarded projects, percentages

Number of continents participating in the project	2000	2001	2002	2003	2004	2005	2000-2005	Cases 2000-2005
1	3.7	9.6	19.4	16.1	12.1	5.9	10.4	25
2	50.0	44.2	55.6	48.4	57.6	70.6	53.3	128
3	42.6	44.2	25.0	29.0	27.3	23.5	33.8	81
4	3.7	1.9		6.5	3.0		2.5	6
N	54	52	36	31	33	34	240	240
Average # continents	2.46	2.38	2.06	2.26	2.21	2.18	2.28	240
Average # team members	4.17	3.50	3.22	3.29	3.36	3.44	3.55	240

Source: Calculations are based on data provided by HFSP (lists of applicants and awardees 2000-2005 excluding duplicates).

Notes: Continents are counted on basis of the PI's location and the Co-investigators nationalities.

Categorisation of 'continents' is as for Table 5.3.

Working in interdisciplinary and intercontinental teams may entail particular challenges to scientific research. The applicant questionnaire addressed this topic in different ways. We asked about difficulties in finding collaborators in different countries (Table 2.6), and to follow up this topic we also asked whether they (i.e. the PIs), had collaborated with any of the team members before (Table 2.7). Moreover, we asked about collaboration problems and the outcome of the collaboration (Tables 2.8.-2.10).

Table 2.6 Planning your HFSP project, did you encounter difficulties in finding collaborators in different countries? Awardees' survey replies, percentages.

Answer	2000	2001	2002	2003	2004	2005	2000-2005	Total cases
No	87.9	82.9	90.6	80.8	91.7	89.3	87.0	160
To some extent	9.1	14.6	9.4	19.2	8.3	10.7	12.0	22
Yes	3.0	2.4					1.1	2
N	33	41	32	26	24	28		184

Throughout the period analysed, 87 percent of the Principal Investigators report that they had no difficulties in finding team members from different countries (varying between 80 and 90 percent). Only 1 percent answer yes to the question about such problem – and all of these were awarded prior to 20002. 12 percent report that they to some extent had problems in finding collaborators (Table 2.6). The answers indicate that the large majority of the awardees has an international network that enables them to identify and attract the wanted kind of team members.

Table 2.7 Had you collaborated with any of the members of your HFSP project team before? Awardees' survey replies, percentages.

Answer	2000	2001	2002	2003	2004	2005	2000-2005	Total cases
None of them	24.2	24.4	43.8	30.8	29.2	42.9	32.1	59
Some of them	69.7	65.9	46.9	57.7	50.0	50.0	57.6	106
All of them	6.1	9.8	9.4	11.5	20.8	7.1	10.3	19
N	33	41	32	26	24	28		184

From Table 2.7 we also see that to a high extent the teams consist of members that had not previously collaborated. 32 percent of the PIs report that they had not collaborated with any of the team members before, 58 percent that they had collaborated with some of them and 10 percent that they had collaborated with all of them.

From 2002, when the two former programs on ‘Brain Functions’ and ‘Molecular Approaches’ merged into one program on ‘Complex mechanisms of living organisms’, we see that the proportion of ‘all new’ collaboration increases. For awards in 2000 and 2001, 24 percent of the PIs had not collaborated with any of the team members before. For the years 2002 to 2005 between 29 and 44 percent of the PIs had not collaborated with any of the team members before.

Table 2.8 Did your HFSP project encounter any of the following problems of working in international, interdisciplinary teams? Awardees' survey replies.

Encountered problems relating to working in international and interdisciplinary teams	Program Grants	Young Investigators	Total
Problems due to geographical distance	32.6	42.9	34.7
Problems due to different languages	2.8		2.3
Problems due to different scholarly background	2.8	2.9	2.8
Problems due to different economies or administrative systems	10.6	20.0	12.5
Problems due to young investigators having very different degrees of independence	2.1	14.3	4.5
Other collaboration problems	14.9	11.4	14.2
No, non of the above	51.1	40.0	48.9
N	141	35	176

Note: Multiple response question.

When asked about problems encountered in the project, half of the PIs report no problems (49 percent, Table 2.8). Of those reporting problems, geographical distance is the difficulty most emphasised. 35 percent of the PIs report that their HFSP team encountered problems due to geographical distance. Only 3 percent report problems due to different scholarly background of team members, indicating that the intercontinentality of the projects is a much more substantial challenge to the teams than their interdisciplinarity.

We also see that a larger proportion of the Young Investigators reports problems. 14 percent of them report problems due to young investigators having very different degrees of independence, whereas only 2 percent of the Program Grant holders report such problems. The young investigators also report more problems due to geographical distance and “different economies or administrative systems”.

In total, 13 percent of the awardees report problems due to “different economies or administrative systems”. We do not have data on the specific economic and administrative

problems encountered, except for some free text answers relating to this question.⁶ On the other hand, some PIs commented on more general collaboration problems that may be denoted economical or administrative. Answering the question: “Are there any features of the HFSP that could be improved to better deal with the challenges of working in intercontinental, interdisciplinary teams?”, some described problems in keeping the other team members interested in contributing to the project after the award was obtained. Suggestions to handle this included clearer incentives for continued collaboration, e.g. more leeway to PIs in administering the funding, and commitment to meet (at least once per year was suggested). Also measures to screen out applications with little evidence of integrative collaboration was suggested, including requiring descriptions of the specific commitments and tasks for each team members in the applications.

Comments from some of the applicants for Young Investigator Grants point to quite another aspect of facilitating collaboration and interdisciplinarity.⁷ Several were concerned about specific problems for Young Investigators in obtaining funds, emphasising that young scientists have more restricted scholarly networks and less impressive track records than senior scientists. A very good track record is normally required to obtain funds for high-risk, original and interdisciplinary projects, it was stated. When applying to HFSP Grants they also have specific problems in identifying collaborators in other continents and disciplines to be able to form a team filling the HFSP requirements.

Table 2.9 How important are/were the collaborations within the project team for the results in your part of the project? Awardees’ survey replies, percentages.

Answer	2000	2001	2002	2003	2004	2005	2000-2005	Total cases
- of clearly positive importance	78.8	82.9	78.1	65.4	95.8	92.9	82.1	151
- of partly positive importance	21.2	14.6	18.8	34.6	4.2	3.6	16.3	30
- of no importance								
- of partly negative importance*		2.4					.5	1
- of clearly negative importance**			3.1					1
- cannot say						3.6		1
N	33	41	32	26	24	28	184	184

*"E.g. because of a waste of time" was added to this reply alternative.

**"I would have achieved more without the collaboration" was added to this reply alternative.

Another way to analyse collaboration is to look at its importance for the results of the projects. Table 2. 9 shows PI’s assessments of positive and negative effects of the collaborations in the team. 95 percent of them report that the collaborations were of positive importance for the results in their own part of the project – hereof the large majority report ‘clearly positive’ (82 percent ‘clearly positive importance’ and 16 percent ‘partly positive importance’). Very few – only two respondents – report negative effects of the collaborations.

⁶ One commented that international exchange of experimental animals is becoming harder. Another reported that money was lost due to poor currency exchange. Moreover, two awardees were concerned about data transfer and suggested that the HFSP could provide a secure portal for transferring data requiring large disk space.

⁷ These were mainly answers to another free-text question: “If you think there are features of HFSP that inhibit original and interdisciplinary projects, or support to young scientists, please elaborate”.

These answers indicate that for the large majority of the projects, collaboration is needed to obtain at least parts of the results. In other words, the projects are collaborative in the way that the research of the different participants are integrated and add to the outcome. As different team members are supposed to contribute with competence from different disciplines, this indicates that the projects not only are multidisciplinary (containing more than one disciplines), but that they also to some degree integrate the different disciplines, and thereby fulfil what would normally be a minimum requirement for being denoted as interdisciplinary.

Table 2.9 also shows an increase in the clearly positive importance of the collaborations for projects awarded the two last years of the period. As these projects are not yet completed, this result might be due to optimism. It might be that the PIs expect the collaboration within the team to be more important for the results than it turns out to be. We also see that the 2003-awardees, who would be in the final phase of their projects when answering the survey, are the ones with the lowest proportion answering ‘clearly positive’ (65 percent). A plausible explanation for this result would be that some of 2003-awardees were in a state of readjusting their expectations to the project – realising that not all of their expectations for the results of their collaborators would be fulfilled.

Table 2.10 Could a project with a similar scientific content have been organised with participants from one country only? Awardees’ survey replies, percentages.

Answer	2000	2001	2002	2003	2004	2005	2000-2005	Total cases
No	54.5	53.7	59.4	46.2	70.8	50.0	55.4	102
To some extent	27.3	26.8	25.0	30.8	25.0	28.6	27.2	50
Yes	18.2	19.5	15.6	23.1	4.2	21.4	17.4	32
N	33	41	32	26	24	28	184	184

The majority of the awardees think that the international contributions are vital to their projects. 55 percent report that a project with a similar scientific content could not have been organised with participants from one country only (Table 2.10). 17 percent think their project could have been accomplished without international, whereas 27 percent answered ‘to some extent’.

General attitudes and barriers against interdisciplinarity

In addition to questions about the interdisciplinarity and collaboration in the awarded projects, the survey contained some questions to all grant applicants about more general attitudes and opinions about barriers against interdisciplinary research. Table 2.11 shows the replies.

Table 2.11 What is your view on the following statements related to barriers against doing interdisciplinary research? Applicants survey replies, percentages.

Statement	Disagree	Partly agree	Agree	Don't know	N
There are no substantial barriers against interdisciplinary research	33.9	29.5	33.9	2.8	679
The academic reward system provides little incentive for interdisciplinarity	24.7	34.6	38.0	2.7	671
Interdisciplinarity is inhibited because research positions often do not allow scientists to freely pursue their research interests	33.9	34.2	28.5	3.4	678
It is more difficult to find a suitable journal for publication of interdisciplinary research	43.7	28.6	22.7	5.0	678
If younger scientists were less dependent on senior scientists there would be more interdisciplinary research	36.3	28.3	23.8	11.7	669
Most funding opportunities are for research within a single discipline	19.4	34.5	44.7	1.3	684
In most cases approaches within a single discipline provide more solid and valuable results than interdisciplinary approaches	63.0	22.8	11.1	3.1	675

Note: These questions were posed to Grant applicants.

Starting on top of Table 2.11 we see that the respondents divide in two equal shares on the statement “There are no substantial barriers against interdisciplinary research”. 34 percent agree, 34 disagree, and 30 percent partly agree. For several of the claims about barriers we see that there are more respondents that disagree than agree. Neither the statement that interdisciplinarity is inhibited because research positions do not allow scientists to freely pursue their research interests, nor that it is difficult to find a suitable journal for publishing interdisciplinary research, nor that dependency on senior scientists inhibits interdisciplinarity, is supported by a majority of the respondents.

The clearest barrier against doing interdisciplinary research that appears from the table is lack of funding opportunities. 45 percent of the applicants agree with the statement that “Most funding opportunities are for research within a single discipline”, 34 percent partly agree, and 19 percent disagree with the statement. There is also a majority (of 38 percent) that supports the statement that “The academic reward system provides little incentive for interdisciplinarity”.

There are no large differences in the replies from the applicants for the Young Investigator Grants and the Program Grants. The one exception is the response to the statement “If younger scientists were less dependent on senior scientists there would be more interdisciplinary research”. A larger proportion of the Young Investigator applicants agrees to this statement. Whereas only 20 percent of the Program Grants applicants fully agrees with this statement, 30 percent of the Young Investigator applicants do so (no table).

In conclusion, the applicants for HFSP Grants seem to have mixed views and experiences concerning barriers to interdisciplinarity. Lack of funding and the academic reward system are the major barriers according to the data. Some applicants also seem to have some doubts about the value of interdisciplinarity. 11 percent agree that “In most cases approaches within a single discipline provide more solid and valuable results than interdisciplinary approaches”. Still, the large majority (63 percent) disagree with this statement.

3 HFSP Fellows: International and disciplinary mobility and repatriation

HFSP Long-Term and Cross Disciplinary Fellowships are 3-year postdoctoral awards. International and disciplinary mobility is required. The purpose is to obtain training in a new field of research. Long-Term-Fellowships are for change of research direction within the life sciences, whereas Cross-Disciplinary Fellowships are applicants from outside the life sciences that want to do research within the life sciences. Fellows are expected to do research in a foreign laboratory, but may spend the third year of the Fellowship in a laboratory in their home country. Candidates that have obtained their doctoral degree within the three last years are eligible.

Below we present results of the applicant questionnaire addressing the applicants' change of research field, mobility and repatriation.

Change of research area

The non-awarded applicants were asked whether the HFSP Fellowship, if awarded, would have caused them to move into a new area of research. Awardees were asked whether the HFSP Fellowship caused them to move into a new area of research. The answers for both groups are shown in Table 3.2, showing that 85 percent of the applications in the period represent some sort of change, whereas 15 percent report no change of research area.

Table 3.1 Change of research area: Fellowships applicants' survey replies, percentages within years 2000-2005

Did/would the HFSP Fellowship have caused you to move into a new area of research?	2000	2001	2002	2003	2004	2005	Total
No	17.1	14.3	21.2	18.7	13.9	9.7	14.7
Yes, I did/would have moved into another area of research within my discipline	34.2	26.8	42.4	29.3	36.7	36.9	35.1
Yes, I did/would have moved into a line of research that require input from disciplines that I have not previously been involved with	42.1	46.4	30.6	43.9	36.7	45.6	41.3
Yes, I did/would have moved into a completely new discipline	6.6	12.5	5.9	8.1	12.7	7.8	9.0
N	76	56	85	123	158	217	715

In a previous survey, awarded Fellows were posed the same question, but with different reply categories. Table 3.2 gives the results for awarded fellows only, including data from both surveys.

Table 3.2 Change of research area: Fellows/awardees' survey replies, percentages within years 2000-2005

Did the HFSP Fellowship cause you to move into a new area of research?	*1990-1998	2000	2001	2002	2003	2004	2005	Total
No	29	17.6	10.0	18.6	17.3	13.8	4.3	13.3
Yes, I moved into another area of research within my discipline		33.8	28.0	45.7	33.3	37.5	41.3	37.2
Yes, I moved into a line of research that require input from disciplines that I had not previously been involved with		41.2	48.0	30.0	40.0	33.8	43.5	39.1
Yes, I moved into a completely new discipline		7.4	14.0	5.7	9.3	15.0	10.9	10.3
N		68	50	70	75	80	92	435

*Source for 1990-1998 figures: HFSP Review Final Report 23 April 2001, Appendix D5. Reply options were yes or no, 29 percent replied no, 71 percent yes. 245 Fellows replied to the 2000 survey (# replies to this were not specified).

Table 3.2 show a substantial reduction of Fellows with no change in their research area. 29 percent of Fellows awarded in 1990 to 1998 answered that the Fellowship did not cause them to move into a new research area. For Fellows awarded in 2000 to 2005, only 13 percent answer that they did not move into a new area. There is some variation between the different years in the last period. The lowest percentages of ‘no change’ are found in 2001 and 2005 (with 10 and 4 percent of the awardees respectively). The highest proportion of ‘no change’ is 19 percent in 2002. It is consequently hard to conclude concerning a trend towards more or less disciplinary mobility.

For 2000 to 2005 there are three different reply categories for respondents reporting change in research area. 37 percent report that they moved into another area of research within their discipline, 39 percent report that they moved into a line of research that required input from disciplines that they had not previously been involved with, and 10 percent report that they moved into a completely new discipline (in the previous survey yes or no were the only reply alternatives).

Preparing the survey we put some efforts in formulating these reply categories so that they would allow us to measure different degrees of change. However, defining the borders of research area and the degree of change between fields are complex questions, and the results are not easily interpretable. This is illustrated by the replies from the 11 Cross-Disciplinary Fellows that replied to the survey. These Fellowships are awarded to postdocs from outside the life sciences to do research within the life sciences. A ‘normal’ interpretation of that would be that they “move into a completely new discipline”. Still, only 2 of the 11 Cross-Disciplinary Fellows answered that they did so. 8 of them answered that they moved into a line of research that required input from disciplines that they had not previously been involved with, and one answered that he/she moved into another area of research within his/her discipline (non of them answered no change). A possible explanation for the large proportion choosing the second alternative is that several of the Cross-Disciplinary Fellows already had done some research related to life sciences, and therefore thought that the alternative “completely new discipline” was inappropriate.

In addition to the direct question about change of field, we also asked applicants to indicate both the main area of their application and their main area before applying (a similar strategy was used for questions about interdisciplinarity in the Grant applications, see

previous chapter). The reply categories (i.e. the defined disciplines) and the results are shown in Appendix 4, Tables A.7 and A.8. The table below shows the percentages that ticked the same discipline for the application and for their prior research (for awarded and non-awarded applicants separately).

Table 3.3 Applications without disciplinary change (as defined by categories in the two tables above), Fellowships applications 2000-2005, survey replies, percentages within year and HFSP status

	2000	2001	2002	2003	2004	2005	Total
Percent awardees without change	30.0	30.0	38.6	20.0	21.3	25.8	27.2
N (awardees)	70	50	70	75	80	93	438
Percent non-awarded applicants without change	50.0	57.1	28.6	38.0	22.0	32.1	31.0
N (non-awarded applicants)	*6	*7	*14	50	82	131	290

*For these years it is not possible to draw any conclusion about field change in non-awarded applications, as nearly no non-awarded applicants have replied to the survey.

From the figures in Table 3.3, there seems to be a higher proportion of the Fellows that have moved into a new discipline in the last part of the period than in the first part of the period. For the years 2000 to 2002 the proportion of awardees without change varies between 30 and 39 percent, whereas for the years 2003 to 2005 it varies between 20 and 26 percent.

When analysed from the answers according to the predefined disciplines, the amount of *no change* is higher and variation between years different than for their own definition of change (compared to the direct question about change above, Table 3.2). However, if we combine the two relevant reply categories in Table 3.2, no change and change within one's discipline, Table 3.3 shows *lower* proportions of awardees that do not move into a new discipline, than that which is found in Table 3.2. This indicates that what is understood by terms like disciplines and area of research may vary considerably. We take the figures in Table 3.3., based on the applicants' indications of the discipline in their application and before applying – according to predefined areas – to be the most reliable measure of the degree to which the Fellows move into another discipline. We consequently conclude that the majority of the Fellows move into a new discipline and that there has been a moderate increase in the proportion of Fellows that do so⁸ (when disciplines are defined as in Appendix 4, Table A.7).

We also asked for the applicants' views on various statements about barriers against changing research fields. The applicants replied as shown in Table 3.4.

⁸ Comparing years 2000-2002 with 2003-2005 the change is statistically significant.

Table 3.4 Fellowship applicants' views on statements related to barriers against changing research field, survey replies, percentages

Statement	Disagree	Partly agree	Agree	Don't know	N
There are no substantial barriers against changing research fields	34.6	38.8	22.6	3.9	791
It is hard to change field because academic positions often do not allow scientists to freely pursue their research interests	19.1	43.6	30.6	6.7	791
You are not invited to a leading lab to do research outside your field of competence	26.0	37.6	28.0	8.4	787
It is difficult to obtain a grant or fellowship to do research in a new field	11.5	31.6	50.8	6.2	792

51 percent agree that it is difficult to obtain a grant or fellowship to do research in a new field. This is a bit higher than for a related question posed to the Grant applicants. In general, compared to the replies from the Grant applicants about barriers against interdisciplinarity (Table 2.11), the replies from the Fellowship applicants express stronger agreement with statements that there are barriers against changing research fields. Only 19 percent disagree that “It is hard to change field because academic positions often do not allow scientists to freely pursue their research interests”, whereas 34 percent of the Grant applicants disagreed with a similar statement about interdisciplinarity. According to the replies – both from Fellowship and Grant applicants – funding is the most frequently expressed barrier. This indicates that the HFSP Fellowships and Grants are directed towards resolving what seems a major obstacle against changing field and for doing interdisciplinary research.

Repatriation: motivations and effects

To enable Fellows to repatriate and prepare a research career in their home country, after having acquired training in a new field abroad, the last year of the Fellowship (or parts of the last year) may be spent in their home country. Table 3.5 shows that 19 percent of the respondents made use of this opportunity.

Table 3.5 Repatriation: third year Fellowship location of, Fellows survey replies, percentages

Did you return to your home country for the third year of your HFSP Fellowship?	Male	Female	Total
Yes, I spent/am spending my 3 rd HFSP fellowship year (or parts of it) in my home country	18.1	20.3	18.8
No, I spent/am spending my 3 rd HFSP fellowship year in my host country	69.6	62.0	67.2
No, I had/have a two-year HFSP Fellowship	1.2	2.5	1.6
No, I chose to terminate my fellowship before the third year	11.1	15.2	12.4
N	171	79	250

Note: 189 answering that they have not yet started their 3rd Fellowship year are not included in the analysis.

A slightly larger proportion of female Fellows spent their final year in their home country, or terminated their Fellowship before the 3rd year. In all, 62 percent of the female and 70 percent of male Fellows spent the final year in the host country.

Respondents that had completed their Fellowships were also asked to indicate in which countries they had held a research position after completing their HFSP Fellowship. Table 3.6 shows the proportion that reports to have held a research position in their country, combined with the information on the location of their last Fellowship year.

Table 3.6 Repatriation: Research position in home country after the HFSP fellowship, by 3rd year Fellowship location, Fellows survey replies, percentages

	Research position in home country after HFSP Fellowship		N
	No	Yes	
3rd HFSP fellowship in home country	5.6	94.4	36
3rd HFSP fellowship year in host country	68.1	31.9	119
Terminate fellowship before the third year	23.3	76.7	30
Total	48.7	51.3	185

Note: Fellows that had not yet completed their Fellowship are not included.

In all, 51 percent of the Fellows have held a research position in their home country after completing the fellowship (Table 3.6). A much higher proportion of those that spent the 3rd year in their home country have held such a position. 94 percent of Fellows that spend the 3rd year in their home country have held a research position in their home country after the fellowship, whereas only 32 percent of Fellows that spend the 3rd Fellowship year in host country have held a research position in their home country after the fellowship. Those using the final year’s repatriation option are probably the Fellows most motivated for returning home, and a large part of them would probably have been able to find a research position in their home country after the fellowship, even if they were not allowed to go home for the final year.⁹ The figures still indicate that the possibility of spending the final year in the home country facilitates a research career in their home country. This is substantiated by the figures in the next table.

We asked the Fellows that had returned to their home country for the final Fellowship year about the role of the HFSP Fellowship in the repatriation. The large majority of the ‘repatriates’ (81 percent) answered that their HFSP Fellowship very much helped them to repatriate. Only one of them answered that it did not at all help the repatriation (Table 3.7).

Table 3.7 Help from HFSP in repatriation. Survey replies from Fellows spending their final fellowship year in their home country, percentages

To what degree did the HFSP Fellowship help you repatriate?	Percent
Not at all	2.1
Somewhat	17.0
Very much	80.9
N	47

⁹ 58 percent of those spending the last year in host country have held a research position in host country after the Fellowship. 17 percent of those that spend their last year in their home country have held a research position in the host country after the Fellowship.

We also asked the returned Fellows about their motivations for repatriation. The result is shown in Table 3.8.

Table 3.8 Motivations for repatriation. Survey replies from Fellows spending their final fellowship year in their home country, percentages

What were your motivations for returning to your home country for the final year of your Fellowship?	Unimportant	Partly important	Important	N
Research and career opportunities	8.7	41.3	50.0	46
Personal/family reasons	4.4	37.8	57.8	45
Other	53.8	23.1	23.1	26

58 percent state that personal/family reasons were important for taking the final year at home. 50 percent state that research and career opportunities were important. The large majority of the remaining said “partly important” (Table 3.8). This indicates that in most cases, both career opportunities and personal reasons motivate the return, and that repatriation is not a difficult choice between family motivations and career opportunities.

When asked about problems relating to final year’s repatriation the Fellows answered as shown in Table 3.9.

Table 3.9 Repatriation: Problems encountered on returning home for the final year of the Fellowship. Survey replies from Fellows spending their final fellowship year in their home country, percentages

Did you encounter problems on returning home for the final year of your Fellowship?	No	Partly	Yes	N
No established research group in the field in my home country	69.6	17.4	13.0	46
Inferior research facilities	58.7	17.4	23.9	46
No opportunity to continue the same line of research I performed in my HFSP host laboratory	73.9	15.2	10.9	46
No available research position after the Fellowship	48.9	26.7	24.4	45

There was also a category for “Other problems”. Only 3 respondents answered “yes” to the question about other problems (5 answered partly).

For the large majority the return to the home country seems to have been satisfactory (Table 3.9). In most cases, there was an established research group in the home country (70 percent), and there were opportunities to continue the same line of research (74). Of those reporting problems, inferior research facilities and lack of available positions were the most frequent problems. 24 percent of the Fellows report inferior research facilities, and 17 percent report partly inferior research facilities. 24 percent report that there was no available research position after the Fellowship, and an additional 27 percent report that no available research position partly was a problem. It should also be noted that 6 of the Fellows that returned home for the last year report that there was no established research group in the home country, and 5 of them could not continue the same line of research as in the host laboratory.

When planning to return home for the final year of the fellowship, the Fellows are allowed to defer the final year (with up to two years) and thereby spend some more time in the host laboratory and better plan their return to the home country. 40 percent of the repatriates being surveyed had used the opportunity to defer the last year of the Fellowship (see

Appendix 4, Table A.9). Of these, most report that this opportunity helped them plan the return to the home country. 68 percent think the deferral helped them very much plan the return, and 26 percent think the deferral was somewhat helpful. One respondent answered that it did not at all help to plan the return (Table 3.10).

Table 3.10 Help from deferral, Fellows' survey replies

To what degree did the possibility of deferring the third year of your HFSP Fellowship help you plan your return to the home country?	Percent
Not at all	5.3
Somewhat	26.3
Very much	68.4
N	19

HFSP Funding

The funding for the HFSP Fellowships consists of a 'Research & Travel Allowance' and a 'Living Allowance'. The 'Research & Travel Allowance' is supposed to cover the expenses for materials and supplies which are needed specifically for the performance of the Fellow's research and which cannot be provided by the host institute. The allowances vary by host country. For 2006 the Living Allowance for Fellows in the USA is 38.000 USD per year, and the Research & Travel Allowance is 6.500 USD per year.

In the survey the Fellows were asked about the sufficiency of the Living Allowance and to what degree the Research & Travel Allowance (Table 3.11).

Table 3.11 HFSP Fellowship funding: Fellows' survey replies, percentages

	Not at all				To a high degree	Cannot say	N
	1	2	3	4	5		
To what degree did the Research & Travel Allowance of your HFSP Fellowship improve your ability to carry through your project in the host country?	1.4	3.4	13.0	27.1	47.4	7.7	439
To what degree was the Living Allowance of your HFSP Fellowship sufficient in your host country?	2.3	9.6	21.2	33.6	30.4	3.0	438

The majority of the Fellows report that the HFSP Research & Travel Allowance improved their ability to carry through their project in the host country. On a scale from 1 to 5 (5 signifying to a high degree) 75 percent ticked 4 or 5. Very few (1 percent) answered that it did not at all help them to carry through the project. Concerning the HFSP Living Allowance the replies are somewhat less positive. 64 percent meant that it was sufficient (ticked 4 or 5) and 2 percent that it was not at all sufficient.

Terminated Fellowships

Some Fellows terminate their HFSP Fellowship before the end of the award period. 31 Fellows in this category answered the survey (see Table 3.5 above). These were asked about their reasons for termination, and answered as shown in Table 3.12.

Table 3.12 *Reasons for terminating Fellowships*

Why did you terminate your HFSP Fellowship before the end of the award period?	Percent
I obtained a more attractive fellowship	3.2
I obtained a permanent/tenure track research position	64.5
I decided to change to another line of research	3.2
I decided to leave research	3.2
Other reason	25.8
N	31

"Other reason": five obtained a more attractive position, two terminated because of family reasons, one because of dissatisfaction with host laboratory.

The majority report that they obtained a more attractive position (25 of the 31). In most cases this was a permanent or a tenure track research position (20 of the 31). In one case the HFSP Fellowship was left for a more attractive Fellowship, one Fellow terminated because of dissatisfaction with the host laboratory, in one case the Fellow decided to change to another line of research, and in one case the Fellow decided to leave research. Moreover two Fellows terminated for family reasons.

There is no significant gender difference in reasons for termination. 83 percent of the 12 female Fellows terminating say they obtained a more attractive position or Fellowship, 84 percent of the 19 male Fellows say they obtained a more attractive position or Fellowship (including 'other reasons' that were specified in the comments).

4 The HFSP Career Development Awards

When completing their Fellowship and returning to an academic position in their home country, HFSP Long-Term and Cross-Disciplinary Fellows are eligible to apply for a 3-year Career Development Award. Below we present results from the applicant questionnaire concerning the attractiveness of this award and the experiences and opinions of the CDA-holders.

The HFSP CDA's attractiveness

Judging from the proportion of HFSP Fellows' that consider applying for a HFSP Career Development Award, this award is clearly attractive. 71 percent of the Fellows answer that they plan to apply or have already applied (Table 4.1, not including Fellows that already were awarded a CDA).

Table 4.1 Considering applying for a CDA. Fellows' survey replies, percentages.

Have you considered applying for the HFSP Career Development Award (CDA)?	Percent
No	29.2
Yes, I plan to apply for the CDA	64.5
Yes, I have applied for the CDA, but it was not awarded	6.2
Yes, I have applied and obtained a CDA*	0.2
N	439

* Only respondents previously answering that they last HFSP award was a Long-Term or Cross-Disciplinary Fellowship was posed the question about considering the CDA. When correctly filling out the questionnaire, this reply category should be empty.

Those not planning to apply for a CDA, were asked why. Replies are shown in Table 4.2.

Table 4.2 Reasons for not considering applying for a CDA. Fellows' survey replies, percentages.

Why have you not considered applying for the HFSP Career Development Award (CDA)?	Male	Female	Total
In my situation the CDA is not an attractive opportunity	12.2	6.5	10.2
I don't know much about the CDA	14.6	17.4	15.6
It is too early to plan my career after the Fellowship	31.7	32.6	32.0
Other reasons	41.5	43.5	42.2
N	82	46	128

32 percent of those not planning to apply for a CDA think it is too early to plan their career after completing their Fellowship. 16 percent say they do not know much about the CDA. Only 10 percent answer that the CDA is not an attractive opportunity for them. However, of those specifying 'other reasons' for not considering applying, the majority (32)¹⁰ state that they are not eligible for the CDA because they do not want to return to their home country. This implies that the CDA is not an attractive opportunity because a CDA requires them to return to their home country. Adding these to the 10 percent that answered that the

¹⁰ 32 of in all 53 Fellows that specified 'other reasons' for not considering applying for a CDA. Only 3 of these 32 specify private/family reasons for not applying.

CDA is not an attractive opportunity for them, 35 percent of the 128 Fellows that do not consider applying for a CDA think that the CDA is not an attractive opportunity.

Of the others that specify ‘other reasons’, 11 Fellows state other reasons (than not returning home) why they are not eligible for the CDA (e.g. that they have terminated their HFSP Fellowship). Other replies include that the Fellows don’t think they would be able to obtain an independent position in their home country (3 males) or that they, due to the progress of their scientific work, would not qualify for a CDA or are not yet ready for an independent position (4 females, of which 2 mention child care as the reason). Other comments include suggestions to open the CDA for all Fellows, regardless of where they want to establish a research group.

Returning home: motivations

The Career Development Awardees’ major motivations for returning to their home country are research and career opportunities and personal/family reasons (Table 4.3).

Table 4.3 CDA-holders’ motivations for returning to their home country, survey replies percentages

What were your motivations for returning to your home country (for your CDA-project)?	Unimportant	Partly important	Important	N
Research and career opportunities	2.6	20.5	76.9	39
Obtaining the HFSP Career Development Award	25.6	35.9	38.5	39
Personal/family reasons	7.7	17.9	74.4	39

77 percent say research and career opportunities were important, and 74 percent say personal/family reasons were important. For a majority of the CDA-holders, the HFSP award was not their major motivation for returning home. 26 percent say that obtaining the HFSP Career Development Award was unimportant for returning home, 39 percent that it was important, and 36 percent that it was partly important (Table 4.3).¹¹

We conclude that research and career opportunities and personal/family reasons are the major motivations for returning home, whereas obtaining the CDA in some cases is an additional motivation.

Table 4.4 CDA-holders’ country preferences, survey replies percentages

Given equal economic support, in which country would you have preferred to establish your own research group?	Percent
In my HFSP Fellowship host country	7.7
In my home country	89.7
In another country	2.6
N	39

For the large majority (90 percent) of those who have obtained a CDA, their home country is their preferred country for establishing their own research group. Still, 4 of the 39 CDA-holders (10 percent) would have preferred to establish their group in their HFSP Fellowship country or in another country (Table 4.4).

¹¹ 80 percent of them also say that they would have done research in their home country even if they had not obtained the CDA (Chapter 8, Table 8.5).

Table 4.5 CDA-holders' prospect of continued appointment at the Fellowship host institution, survey replies percentages

Did you already have an appointment at your host institution at the time of your application for a Career Development Award?	Percent
I had no prospect of continued appointment at the host institution	0.0
I had positive signals of job openings at the host institution	35.9
I had been offered an appointment at the host institution	64.1
N	39

Despite this preference for returning home, all CDA-holders answering the questionnaire had prospects of continued appointment at the host institution, and 64 percent of them had been offered an appointment at the host institution (Table 4.5).

Summing up so far, for 90 percent of the CDA-holders the home country is their preferred country for establishing their own research group. Both research and career opportunities and personal/family reasons are major motivations for returning home, whereas obtaining the CDA is more an 'additional' motivation. In the next section, we further analyse the role of the HFSP award in facilitating an academic career in their home country.

Finding that the CDA-holders had a strong motivation for returning home, we went on to analyse whether the CDA-holders' motivations for international job mobility, differed from that of other HFSP applicants. Table 4.6 shows the CDA-holders' answers to more general questions about their motivations compared to the answers from the respondents from the Fellowship program and the Grant program.

Table 4.6 Motivations for international job mobility, differences between programs survey replies, percentages

What were/would be your motivations for international job mobility?		Grant applicants	Fellowship applicants	CDAs	All programs
To increase my professional opportunities in my home country	Unimportant	30.1	12.9	10.0	20.6
	Partly important	35.2	30.8	25.0	32.6
	Important	34.7	56.3	65.0	46.8
Dissatisfaction with my home laboratory	Unimportant	50.9	55.2	62.5	53.5
	Partly important	29.4	29.4	20.0	29.2
	Important	19.6	15.4	17.5	17.4
Location close to my spouse/family	Unimportant	49.0	42.6	55	45.9
	Partly important	24.2	26.3	12.5	25.0
	Important	26.8	31.0	32.5	29.2
To receive a higher salary	Unimportant	51.9	42.5	47.5	46.9
	Partly important	36.7	40.4	42.5	38.8
	Important	11.4	17.1	10.0	14.3
To obtain a more independent research position	Unimportant	21.7	7.3	5.0	13.7
	Partly important	23.1	25.1	25.0	24.2
	Important	55.3	67.6	70.0	62.1
To work in the laboratory doing the most interesting research in the relevant field	Unimportant	2.8	0.9		1.7
	Partly important	14.4	9.8	5.0	11.7
	Important	82.9	89.3	95.0	86.5
To work with leading researchers in a prestigious laboratory	Unimportant	7.1	2.8		4.7
	Partly important	29.6	23.6	20.0	26.2
	Important	63.3	73.6	80.0	69.1
To work in a laboratory with excellent research facilities and generous research budgets	Unimportant	4.7	2.1		3.2
	Partly important	22.4	21.6	30.0	22.2
	Important	73.0	76.3	70.0	74.6
N		641-648	741-746	40	1422-1434

From Table 4.6 we see that to increase one's professional opportunities in the home country is more important for the CDA-holders' motivation for international job mobility, than it is for HFSP applicants in general (65 percent of the CDA-holders and 47 percent of all applicants rank this as important). Moreover we see that dissatisfaction with the home laboratory is ranked unimportant by a higher proportion of the CDA-holders, than by HFSP applicants in general (63 versus 54 percent). We also see that location close to spouse or family is not significantly more important for the CDA-holders than for other groups.

Looking at the more *overall patterns* in the figures, Table 4.6 shows much the same patterns of motivations for the CDA-holders as for the other applicants. "To work in the laboratory doing the most interesting research in the relevant field" get the most 'votes' as 'important' from all groups. "To work with leading researchers in a prestigious laboratory" and "To work in a laboratory with excellent research facilities and generous research budgets" come up as the two next most important.¹² To obtain a higher salary and dissatisfaction with one's home laboratory come up as the two least important motivations

¹² Here the CDAs differ slightly from the other respondents by ranking "To work with leading researchers in a prestigious laboratory" highest of the two.

in all groups. In sum, apart from small variations in the order of importance, the motivation patterns for international job mobility look much the same for the different groups.

Returning home: difficulties and help

Asked about problems encountered on returning home for the CDA-project, answers vary. The difficulties met by the largest proportion of the CDA-holders, are inferior research facilities in the home country (41 percent ‘yes’ or ‘partly’), difficulties in negotiating a position and infrastructure (46 percent ‘yes’ or ‘partly’) and difficulties attracting competent personnel to the group (49 percent ‘yes’ or ‘partly’). The percentages that encounter problems in obtaining an independent research position, a position after the CDA, or in continuing the same line of research after the CDA, are substantially lower (Table 4.7).

Table 4.7 CDA-holders’ problems returning home, survey replies percentages

Did you encounter problems on returning home for your CDA-project?	No	Partly	Yes	N
Difficulties in negotiating my position and infrastructure support in my home country	53.8	25.6	20.5	39
Difficulties obtaining an independent research position in my home country	69.2	15.4	15.4	39
Difficulties attracting competent personnel to my group in my home country	51.3	30.8	17.9	39
Inferior research facilities in my home country	59.0	17.9	23.1	39
No opportunity to continue the same line of research after the CDA in my home country	82.1	15.4	2.6	39
No available research position after the CDA in my home country	82.1	12.8	5.1	39
Other problems	88.9	3.7	7.4	27

Some respondents provided free text comments to the questions about problems encountered on returning home. Concerning difficulties in negotiating terms in the home country, one CDA-holder commented:

I have found that everything is negotiable even after a deal is done. Constant negotiation is frustrating.

Another CDA-holder explained the difficulties in getting an early career position in his home country, and emphasised that the CDA had been instrumental in supporting his early career by making a position available that would otherwise not have been offered him.

According to the answers to another question, 21 percent of the CDA-holders think that the prospect of receiving a CDA helped them in negotiating their position in the home country (Table 4.8). 26 percent think the prospect of receiving a CDA were partly helpful, and 31 think it had no importance.

Table 4.8 CDA-holders' help in negotiating position, survey replies percentages

Did the prospect of receiving a CDA help you in negotiating your first position after the HFSP Fellowship?	Percent
No	30.8
Partly	25.6
Yes	20.5
Cannot say	23.1
N	39

The economic support from the HFSP to the CDA-holders is intended to help them establish their independent research groups. The CDA-holders' views on the sufficiency of this support are shown in Table 4.9.

Table 4.9 To what degree was the CDA support sufficient to help you establish your independent research group? CDA-holders' survey replies, percentages

Not at all	2	3	4	To a high degree	Cannot say	N
1				5		
2.6	0	5.1	35.9	51.3	5.1	39

Assessing the sufficiency of the CDA support 87 percent give a high score, i.e. 4 or 5 on a scale from 1 to 5. One CDA-holder answers that the support was not at all sufficient to establish a research group. We conclude that most CDA-holders seem satisfied with the economic support from the HFSP, and that the support helped them to establish their independent research group.

As shown in the next table, most CDA-holders also receive support from their host institution. 90 percent are provided with laboratory space, 77 percent have access to special infrastructure or equipment, 69 percent are provided with research funds, 75 percent receive salary from the institution and 54 percent also obtain salary support for their PhD students or postdocs (Table 4.10).

Table 4.10 CDA-holders' support from host institution, survey replies percentages

What kind of support beyond the CDA do/did you receive from your host institution or other sources?	No	Yes	N
My own salary	25.6	74.4	39
Salary support for PhD students/Postdocs	46.2	53.8	39
Laboratory space	10.3	89.7	39
Access to special infrastructure/equipment	23.1	76.9	39
Research funds	30.8	69.2	39

5 The HFSP niche and comparison of program profiles

In this chapter we compare the HFSP with other relevant funding sources for international and interdisciplinary research within the life sciences. The overall question to be answered is: To what degree is the HFSP niche unique?

The first section of the chapter present survey results on applicants alternative funding sources. In the following sections we present the result of web-searches examining the profile of the relevant funding schemes of those organisations most frequently mentioned by the applicants as their alternative international funding. Finally, we present the applicants assessments of the HFSP compared to their alternative domestic and international funding sources.

HFSP applicants' alternative funding sources

Table 5.1 shows the proportion of the HFSP applicants that could list at least one alternative funding source for the project they applied for. The answers are shown separately for international and domestic funding sources (as defined by the respondents) and for the applications to the different programs.

Table 5.1 "If you are aware of other funding sources relevant for the kind of project for which you applied to the HFSP, please indicate these below" survey replies, percentages within programs

Applied for:	Lists alternative international funding	Lists alternative domestic funding	N
Program Grant	28.0	41.4	572
Young Investigator Grant	26.3	44.5	137
Long-Term Fellowship	52.1	43.5	752
Cross-Disciplinary Fellowship	52.6	36.8	*19
Career Development Award	22.0	53.7	41
All programs	39.9	43.0	1521

*There are very few Cross-Disciplinary Fellowship applicants in the sample – insufficient for any conclusions.

Most applicants do not seem to know about any alternative international funding sources for their application (60 percent) nor any domestic sources (57 percent, Table 5.1). The lowest proportions of applicants listing international alternatives are found in the Grant programs and in the CDA-program. The highest proportions of applicants listing international alternatives are found in the Fellowship program. Concerning domestic funding, more CDA-holders and Grant applicants are able to list alternatives. For the Fellowships, on the other hand, a larger proportion lists international, than domestic, alternatives.

It should be emphasised that the question to the applicants was formulated to make the respondents list (in free text) any funding source they though relevant for the project for which they had applied, and the primary purpose was to map alternative funding sources (for the web-searches presented in the next section), and not to measure the degree to

which HFSP projects have alternative funding sources.¹³ In contrast, a question more able to measure the degree to which projects with a HFSP-profile could be funded by other sources, was asked to *grantees* in the 2000 survey: “Are you aware of any other sources of funding which could have supported a similar project (same collaborators and research area, and with similar criteria for intercontinentality and multidisciplinary) as that offered by the HFSP?” 11 percent answered “Yes” and 89 percent “No”. In the 2005 survey 27 percent of the *grantees* answered the question referred in Table 5.1 by listing at least one alternative under “Other international funding”. As question formulation is different, and in particular because the 2005 question did not specify “same criteria for intercontinentality and multidisciplinary”, the answers are not comparable.

The following tables show, by continents, the proportion of applicants for HFSP Grant (Table 5.2) and Fellowships (Table 5.3) that are able to list alternative funding. European applicants are those most aware of other international funding for their projects, both for the Grant applications and for the Fellowship applications. Applicants from Asia, on the other hand, seem to have far less international funding options.

Table 5.2 Grants: “If you are aware of other funding sources relevant for the kind of project for which you applied to the HFSP, please indicate these below” Grant applicants’ survey replies by nationality/continent

Applicants’/PI’s nationality	Lists alternative international funding	Lists alternative domestic funding	N
North America	16.3	45.0	160
Europe	34.2	42.2	474
Asia	11.1	38.1	63

Note: Countries are categorised according to the World Bank’s classification of regions and parts of the world, except for Malta which is included in Europe (and not in Middle East & North Africa as categorised by the World Bank).

*In cases of multiple citizenships, only the first listed is included in the calculations

Table 5.3 Fellowships: “If you are aware of other funding sources relevant for the kind of project for which you applied to the HFSP, please indicate these below” Fellowship applicants survey replies by nationality/continent, percentages

Applicants’ nationality	Lists alternative international funding	Lists alternative domestic funding	N
North America	40.6	63.8	69
South & Central America	37.8	24.3	37
Europe	66.8	44.5	440
Asia	18.0	36.0	150
Oceania	36.4	40.9	22
Africa & Middle East	58.5	41.5	53

Note: Countries are categorised according to the World Bank’s classification of regions and parts of the world, except for Malta which is included in Europe (and not in Middle East & North Africa as categorised by the World Bank).

*In cases of multiple citizenships, only the first citizenship listed is included in the calculations

¹³ In lack of a ‘no’ category several respondents used the open space in the form to comment on the lack of alternative funding, or simply wrote ‘no’ (in total 110 applicants did so in the open space for listing international alternatives, Appendix 4, Table A.10).

In table 5.4 we have listed all the international funding sources that were listed by at least 5 respondents. Various EMBO funding alternatives was the most frequently listed alternatives. 315 out of 870 international alternatives listed relate to EMBO (36 percent), and 269 to the European Union (31 percent). Other alternatives for international funding are listed far less frequently – from 1 to 31 times.

Table 5.4 “If you are aware of other funding sources relevant for the kind of project for which you applied to the HFSP, please indicate these below” survey replies by organisation listed

Organisations listed as alternative international funding sources	Percent	# Times listed
EMBO/European Molecular Biology Organization	36.2	315
EU (the EU FP including Marie Curie Fellowships)	30.9	269
NIH/National Institutes of Health (US)	3.6	31
FEBS/Federation of European Biochemical Societies	2.3	20
LSRF/Life sciences Research Foundation (US)	2.1	18
Wellcome Trust (UK and Republic of Ireland)	2.1	18
Alexander von Humboldt Foundation (DE)	1.5	13
ESF/European Science Foundation	1.1	10
Helen Hay Whitney Foundation (US)	1.1	10
Damon Runyon (US)	0.9	8
NSF/National Science Foundation (US)	0.9	8
NATO	0.9	8
McDonnell Foundation/Pew Charitable Trusts/Pew Latin America (US)	0.9	8
Fulbright Foundation (US)	0.8	7
DFG/Emmi-Noether/DFG-NIH grants (DE)	0.8	7
JSPS Japan Society for the Promotion of Science (JP)	0.7	6
JST/AIST/ERATO/ICOP (JP)	0.6	5
Others (listed by less than 5 respondents)	12.5	109
Total	100.0	870

Note: The figures include the 3 first alternatives listed by 607 respondents that listed such alternatives. (211 respondents listed 2 alternatives, 53 listed 3 or more).

As shown in Table 5.4, the majority of the organisations mentioned under *international funding* sources are domestic organisations. The exceptions are four European organisations (EMBO, EU, FEBS, ESF) and the transatlantic NATO. The domestic organisations that appear on the list include major organisations in some of the larger HFSP member countries, such as *National Institutes of Health* (US), the *Wellcome Trust* (UK and Republic of Ireland), the *Alexander von Humboldt Foundation* (DE) and the *Japan Society for the Promotion of Science* (JP), indicating that these organisations provide funding for international projects.

Summing up so far, in most cases the projects applied for have no international alternative, and especially the HFSP Grants seems be in a niche with very few alternatives for international funding. In the next section, we look closer at the funding programs of the six organisations most frequently mentioned as alternatives for international funding: EMBO, EU, NIH, FEBS, LSRF and the Wellcome Trust. To what degree do relevant programs of these organisations focus on interdisciplinarity, international cooperation and high-risk research, and offer terms comparable to the HFSP’s Fellowships and Grants?

Analysing this, we started by splitting the most frequently mentioned alternatives by type of funding scheme. Those who listed *EMBO*, *FEBS* or *LRSF* as alternative international funding sources had applied for HFSP Fellowships (95-100 percent of them). The large majority of those who named *NIH* as an alternative international funding source had applied for HFSP Grants (about 80 percent). Those who named *EU* or the *Wellcome Trust* as alternative international funding sources comprise both applicants for Grants and for Fellowships – EU about 60 percent Grant applicants and 40 percent Fellowship applicants; the Wellcome Trust about 50 percent each.¹⁴

Alternative Fellowships

The HFSP Fellowships are expected to be used for widening ones expertise by moving into a new research field. Looking into the relevant Fellowship programs of the most frequently mentioned organisations, we find two programs that explicitly encourage postdocs to change field and widen their expertise. The aims of *The Marie Curie Intra-European Fellowships* include enabling Fellows to complete or diversify their expertise, and ‘interdisciplinary transfer’ and ‘advanced training in multi-disciplinary fields’ are mentioned as examples in the documents.¹⁵ The *Wellcome Trust Advanced Training Fellowships* aim at postdoctoral research in a new discipline or in a new aspect of the applicants’ field, and the scheme in particular encourages applications for research training in newly emerging disciplines.

For the other Fellowships we find no such stated requirements for change of field. The *EMBO Long Term Fellowships*, for instance, might be used to complete work already initiated.¹⁶ This of course does not preclude that interdisciplinarity and change of field is promoted in the review process (we have been told that also EMBO gives some priority to those who change field). When it comes to requirements for taking up a new line of research, however, the HFSP Fellowship scheme seems to be one of very few schemes that include this as a formal eligibility criterion and thereby announces a high priority to Fellows widening their field of expertise.¹⁷

The HFSP Fellowships also seem to have a broader scope in relation to international exchange than several of the other schemes. The HFSP have intercontinental membership and allows researchers from any country to be a postdoctoral Fellow in any of the 31 member countries, and also researcher from any of the member countries to go to any country in the world. The alternative schemes studied vary both according to requirements and opportunities for international exchange.

Like the HFSP Fellowships, several other schemes require Fellows to go abroad to obtain a fellowship. Of those studied, the European schemes require a change of country (Marie Curie Fellowships, EMBO Long Term Fellowships and FEBS Long Term Fellowships),

¹⁴ These calculations include the first alternatives listed by each respondent.

¹⁵ “Structuring the European Research Area, Human Resources and Mobility, Marie Curie Actions, Work Program, Edition September 2004” page 23.

¹⁶ http://www.embo.org/fellowships/long_term.html#selection

¹⁷ Sources: The organisations’ web-sites January 2006. Searches including EMBO Long Term Fellowships, Marie Curie Fellowships (Inter-European, Outgoing and Incoming), FEBS Long Term Fellowships, LRSF 3-year Fellowships, Wellcome Trust Advanced Training Fellowships, NIH Postdoctoral Fellowships.

whereas the schemes of domestic organisations do not (LRSF 3-year Fellowships, Wellcome Trust Advanced Training Fellowships, NIH Postdoctoral Fellowships).

The *NIH Postdoctoral Fellowships* are open to US nationals, and if applying for support for research training abroad the applicant must show that this offers unique opportunities and clear scientific advantages¹⁸. For those opting for exchange to or from the US, a *LRSF 3-year Fellowship* is a more favourable alternative. US citizens are eligible to LRSF support to go anywhere in the world and foreign applicants are eligible for going to US laboratories. The *Wellcome Trust Advanced Training Fellowships*, on the other hand, are restricted to Europe and only include ‘incoming mobility’ – it is open for researchers from the European Economic Area that do research in the UK or the Republic of Ireland.

Of the three European schemes the *Marie Curie Fellowships* are the most flexible with regard to international mobility. There are *Intra-European Fellowships* for exchange between member countries, *Outgoing Fellowships* for going to other countries and *Incoming Fellowships* for coming to member countries. Marie Curie Fellowships thereby allow all kinds of international exchange that include member states in at least one end of the exchange (only the Intra-European Fellowships have the terms related to interdisciplinary and change of field described above). Contrary to the Marie Curie Fellowships, the *EMBO* and *FEBS Long Term Fellowships* are restricted to exchange between member states (EMBO have 24 European member states, whereas FEBS require applicants to be a member of one of their domestic member organisations which include 36 European countries).

To sum up, there seems to be few alternatives to the HFSP Fellowship that have the same focus on interdisciplinary training and international exchange. The HFSP Fellowship scheme seems to be one of very few schemes that announces a high priority to Fellows widening their interdisciplinary expertise. Moreover, none of the other schemes studied are open for international exchange if neither the US, nor Europe is included in at least one end of the exchange. Both the two other schemes found that focus on interdisciplinary training, are intra-European (Marie Curie Intra-European Fellowships and Wellcome Trust Advanced Training Fellowships). The HFSP Fellowship scheme consequently seems to be the only truly international scheme with such a focus. It should be noted that only funding agencies named by at least 15 respondents as their alternatives for international funding have been studied and these only include European and US organisations.

Alternative Grants

The HFSP Grants support international research teams, and gives high priority to intercontinental teams. The team members should come from different countries and different disciplines. High risk research is stimulated by giving priority to “novel, daring ideas and innovative approaches” and not requiring preliminary results. We have found relevant grant programs in three of the frequently mentioned alternative organisations: the *EU Framework Program*,¹⁹ the *NIH Research Project Grant Program* and the *Wellcome Trust Project Grant*. The web-searches support the impression from the study of the survey replies: applicants have very few funding alternatives that have the same profiles and objectives as the HFSP Grants.

¹⁸ <http://grants.nih.gov/grants/guide/pa-files/PA-03-067.html>

¹⁹ In particular Networks of Excellence (NoE), Specific Targeted Research Projects (STEP) and Integrated Projects (IP) under the Thematic Area of “Life sciences, genomics and biotechnology for health”.

The most relevant Thematic Area of the *EU 6th FP* is “Life sciences, genomics and biotechnology for health”. Compared to the HFSP, the objectives of this program are more applied and health-oriented, but have the same kind of focus on interdisciplinarity.²⁰ A substantial part of the activity in the program is Networks of Excellence (NoE) which aim at strengthening “scientific and technological excellence on a particular research topic through the durable integration of the research capacities of the participants”. This focus on excellence and integration of participants with different capacities resembles the HFSP objectives. NoE requires a minimum of three partners from three different member countries. Scientists from other countries may also participate. Funding is given for 5 years (with a possible extension to 7 years). Two large Networks of Excellence are funded under the heading of basic biological processes.²¹

Another alternative funding agency frequently mentioned by the grant applicants, was NIH. The NIH Research Project Grant Program (R01) is a flexible program, including support to team, travel, etc. within a broad scope of research topics for 1-5 years. The program is also open for applications from foreign institutions, in which case additional criteria are added to the review process – special opportunities that are not readily available in the US, specific relevance to NIH missions and objectives, and advancing health sciences in the US. In sum, this NIH program may open for HFSP-profiled projects, but such projects are not a specific objective of the program.

In our context, the recently initiated NIH Director's Pioneer Award Program (NDPA, from 2004), is more interesting. The program is launched as a “high-risk research initiative”. The program supports individual scientists of “exceptional creativity who propose pioneering approaches to major challenges in biomedical research”. Biomedical research is defined as encompassing scientific investigations in the biological, behavioural, clinical, social, physical, chemical, computational, engineering, and mathematical sciences. This is however not a scheme aiming at funding international teams. It is a scheme for US scientists in their early to middle career stages (US citizens employed in foreign institutions are also eligible; funding is \$500.000 in direct costs each year for five years). The initiative still indicates a trend to focus more on high-risk research and interdisciplinarity.

Compared to this, the last alternative studied is more open to international collaboration, but less focused on basic and high-risk research. The Wellcome Trust Project Grants focus at high-quality projects, in the basic and clinical sciences, which are relevant to human and animal health. Funds are given for up to 3 years and might be used to support international collaboration (as far as this includes the UK or the Republic of Ireland).

²⁰ “The objective is to help Europe exploit, in this post-genomic era, the unprecedented opportunities for generating new knowledge and translating it into applications that enhance human health. To this end both fundamental and applied research will be supported, with an emphasis on integrated, multidisciplinary, and coordinated efforts that address the present fragmentation of European research and increase the competitiveness of the European biotechnology industry.”
<http://www.cordis.lu/lifescihealth/home.html>

²¹ More precisely the heading: “Multi-disciplinary functional genomics approaches to basic biological processes”. http://europa.eu.int/comm/research/health/genomics/projects/noe_en.htm

Applicants' assessments

In this section we present applicants' scoring of the HFSP compared to other international funding and their domestic funding sources. Applicants were asked to compare HFSP with other funding sources along several dimensions: Prestige, interdisciplinarity, unique/original research, high-risk topics, requirements for preliminary research, support of young scientists, widening one's expertise, intercontinental networks, amount of funding and flexibility of funds.

Some of the questions were copied from a previous HFSP survey to allow comparisons over time. This previous survey only compares with *domestic* funding sources. Table 5.5 shows results from both surveys for the four repeated questions. Replies are restricted to awarded grant applicants, as only this group was posed the question in the previous survey.

Table 5.5 HFSP compared with Grantees' domestic funding sources. Survey replies from Grantees' 1990-97 and PI's 2000-2005, percentages

*Comparing HFSP with your domestic funding sources, is HFSP poorer, about the same or better concerning:	Survey year	Poorer	About the same	Better	Don't know**	N***
Opportunities offered for doing interdisciplinary research?	2005	1.6	23.9	74.5		184
	2000	2	26	73		
Flexibility of use of funds?	2005	3.8	16.8	79.3		184
	2000	4	24	72		
Opportunities offered for doing unique/original research?	2005	2.7	21.7	75.0	.5	184
	2000	2	35	60		
Opportunities offered for addressing high-risk topics?	2005	3.8	22.3	68.5		184
	2000	5	36	59		

*The question was posed slightly differently in 2000: "How do the opportunities provided from your research by HFSP compare to those provided by your national granting agencies".

**'Don't know' was not an option in the survey in 2000

*** 356 Grantees replied to the 2000 survey – both PIs and CIs were addressed. Numbers of replies to the specific questions are not specified in the 2001 report.

As seen in Table 5.5, the 2005 survey shows some increase in good scores to the HFSP along all dimensions examined. Especially opportunities offered for doing unique/original and high-risk research scored higher in 2005 than in 2000. These were the issues that in 2000 obtained the lowest scores. Concerning opportunities offered for doing interdisciplinary research, the increase was marginal (and not statistically significant, 1.5 percentage points more to 'better' in 2005). The highest score in the new survey is for flexibility of use of funds, which now is rated better than domestic alternatives by 79 percent of the grantees.

Table 5.6 shows the 2005 data for comparisons with domestic sources including all groups of applicants, and all questions asked.

Table 5.6 HFSP compared with applicants' domestic funding sources. Applicants' survey replies, percentages

Comparing HFSP with your domestic funding sources, is HFSP poorer, about the same or better concerning:	Poorer	About the same	Better	Don't know	N
Opportunities of building new intercontinental scholarly networks?	2.4	9.7	72.3	15.5	1457
Impact on the prestige and career of the awarded investigators?	4.2	16.4	64.5	15.0	1460
Opportunities offered for doing interdisciplinary research?	4.4	25.2	56.9	13.5	1463
Flexibility of use of funds?	4.5	21.3	52.4	21.8	1459
Opportunities offered for broadening your field of expertise?	5.7	29.0	50.5	14.7	1462
Support of young scientists?	7.5	31.9	42.1	18.5	1457
Opportunities offered for doing unique/original research?	9.3	29.3	48.5	12.9	1463
Support to new projects without requiring preliminary research?	9.8	31.3	36.4	22.5	1462
Opportunities offered for addressing high-risk topics?	10.1	26.4	41.4	22.1	1461
Amount of funding?	13.3	27.8	50.3	8.6	1462

See Appendix 4, Tables A.11 and A.12 for results by program and continents.

According to Table 5.6, the HFSP compares very well with the domestic alternatives, also when all applicants to all different HFSP schemes are included, and more dimensions are examined. Scores are especially high on prestige, building new international networks and opportunities for interdisciplinarity. 65 percent of the applicants think an HFSP award gives more prestige than their domestic alternative, 72 percent that it gives better opportunities for building international networks and 57 percent that it gives better opportunities for interdisciplinary research. For all items the proportion that has a better domestic alternative is very low. 'Amount of funding' is the item with the highest proportion of applicants that think their domestic alternative is better (13 percent), but still half of the applicants think HFSP is better, even when including those that does not know.

When splitting the data on Fellowship and Grant applicants and on continents some variation appears (Tables A.11 and A.12 in Appendix 4). For Grant applicants, opportunities of building new intercontinental networks are by far the item with the highest proportion answering that the HFSP is better (79 percent) and scores best regardless of the continent of the Principal Applicant. For other issues the views are more divergent. Whereas 'only' 20 percent of the Asian Principal Applicants answer that the HFSP is better than their domestic alternatives in offering opportunities for high-risk research, 44 percent of the Europeans think the HFSP is better. Moreover, 66 percent of the Europeans think an HFSP award has more impact on their prestige and career, but 'only' 35 percent of the Americans think so.

Concerning the Fellowship applications, the patterns are somewhat different. Whereas Applicants from North America score opportunities of building new intercontinental networks highest (71 percent think the HFSP is better), applicants from Asia and Europe gives highest score to the prestige of the program (69 and 73 percent think the HFSP is better), and applicants from South and Central America and Oceania score the amount of funding highest (65 percent think the HFSP is better). Including all Fellowship applicants in the calculations, the prestige of the program scores highest (69 percent think the HFSP is better) and support to new projects without requiring preliminary research score lowest (37 answering that the HFSP is better, Table A.12 in Appendix 4).

Below we examine how the HFSP score compared to other international funding sources. Table 5.7 shows the replies from the Grant applicants and Table 5.8 the replies from the Fellowship applicants and the CDA-holders (combined results are shown in Appendix 4, Table A.13).

Table 5.7 Grants: HFSP compared with alternative international funding sources. Grant applicants' survey replies, percentages

Comparing HFSP with alternative international funding sources, is HFSP poorer, about the same or better concerning:	Poorer	About the same	Better	Don't know	N
Opportunities offered for doing interdisciplinary research?	2.7	32.2	32.2	33.0	640
Impact on the prestige and career of the awarded investigators?	2.8	24.7	35.2	37.3	636
Flexibility of use of funds?	2.2	17.1	36.5	44.2	638
Opportunities of building intercontinental new scholarly networks?	2.7	26.1	37.1	34.1	633
Opportunities offered for broadening your field of expertise?	4.9	29.3	28.5	37.2	634
Amount of funding?	9.5	32.2	23.3	34.9	639
Opportunities offered for doing unique/original research?	4.7	27.5	35.2	32.6	639
Opportunities offered for addressing high-risk topics?	5.7	23.0	34.3	37.0	635
Support to new projects without requiring preliminary research?	5.8	25.0	30.1	39.1	637
Support of young scientists?	5.6	24.6	26.9	42.9	639

Also compared to international funding alternatives, very few think that the HFSP is poorer. The proportion of the respondents than answer that the HFSP is better than the alternatives is somewhat lower than for the comparison with domestic alternatives. This lower proportion is partly a result of a larger proportion answering 'don't know' when asked to compare with international funding than for domestic funding. This is not surprising. As shown above, many of them don't know of any alternative international funding sources.

On all items there is a substantial part of the Grant applicants that score the HFSP higher than alternative international funding sources (Table 5.7). As for the comparison with domestic funding sources, opportunity of building new intercontinental networks is the item with the highest proportion of Grant applicants thinking that the HFSP is better (37 percent). Likewise, amount of funding is the item with the highest proportion thinking that the HFSP is poorer (10 percent).

Also according to the replies from the Fellowship applicants and CDA-holders, HFSP compares very well with the international alternatives (Table 5.8). Very few think that the HFSP is poorer than other international funding sources, and for all items a substantial part think the HFSP is better. The best results are obtained for interdisciplinarity and prestige. 47 percent think the HFSP offers better opportunities for doing interdisciplinary research than other international programs do, and 43 percent think an HFSP award gives more impact on the prestige and career of the awardees than other international programs do.

Table 5.8 Fellowship and CDA: HFSP compared with alternative international funding sources. Fellowship and CDA applicants' survey replies, percentages

Comparing HFSP with alternative international funding sources, is HFSP poorer, about the same or better concerning:	Poorer	About the same	Better	Don't know	N
Opportunities offered for doing interdisciplinary research?	2.5	23.9	46.7	26.9	756
Impact on the prestige and career of the awarded investigators?	2.1	28.5	43.1	26.3	757
Flexibility of use of funds?	2.9	26.4	37.5	33.2	757
Opportunities of building intercontinental new scholarly networks?	1.8	28.9	35.7	33.6	757
Opportunities offered for broadening your field of expertise?	2.3	35.1	36.0	26.7	753
Amount of funding?	5.3	31.3	40.5	22.9	756
Opportunities offered for doing unique/original research?	2.9	38.8	29.6	28.8	758
Opportunities offered for addressing high-risk topics?	2.8	30.8	27.0	39.4	756
Support to new projects without requiring preliminary research?	4.0	33.2	26.6	36.3	757
Support of young scientists?	3.0	40.1	29.4	27.5	756

6 The HFSP selection procedures

This chapter presents analyses of the HFSP selection procedures based on different sets of data. The first section presents success rates for different groups of applicants. The second section present results from the applicant survey relating to the applicants' and awardees' confidence in the review process, and the final section presents an analysis of review documents and interviews with members of HFSP Review Committees and the HFSP Council of Scientists.

Profile of applications and awardees – geography, gender and age

Both for the Grant and the Fellowship scheme more than half of the applicants are European. Counting only the Principal Applicants to the HFSP Grant scheme in the period 2000 to 2005 (and not the rest of the intercontinental teams), 58 percent are located in Europe, 36 percent in North America and 6 percent in Asia. 57 percent of the Fellowship applicants are Europeans, 22 percent are from Asia, 10 percent North America, 4 percent from South or Central America, 6 percent from the Middle East or Africa and 3 percent from Oceania. There are no large variations in these figures in the period analysed (Tables A.14 and A.15).

Tables 6.1 and 6.2 percent show success rates for Grant and Fellowship applicants by geographical location and nationality.

Table 6.1 Grant applications 2000-2005, success rates by PI's nationality and location, percentages

Continent	By PI's location		By PI's nationality	
	Percent awarded	N	Percent awarded	N
North America	7.7	973	8.0	733
Europe	9.2	1596	8.8	1753
Asia	9.8	174	10.2	266
Other	100.0	1	12.9	31
Total	8.7	2744	8.7	2743

Source: Data provided by HFSP, survey 'universe' including persons that applied in the period 2000-2005 (duplicates excluded).

There are no large geographical differences in the success rates neither by PI's location, nor by nationality (Table 6.1). Applications with Asian PIs have a somewhat higher success rates than teams with European or American PIs. Seen from the point of view of the rather low proportion of applications with Asian team leaders, this might be seen as a good result.

Table 6.2 Fellowship applications 2000-2005, success rates by PI's nationality, percentages

Nationality/continent	Percent awarded	N
North America	21.6	342
South & Central America	12.6	127
Europe	17.1	2047
Asia	14.4	799
Oceania	11.9	101
Africa & the Middle East	21.8	202
Total applications	16.9	3618

Source: Data provided by HFSP, survey 'universe' of persons that applied in the period 2000-2005 (duplicates excluded). For success rates by country, see Table 6.14.

Looking at success rates for the Fellowship applicants, on the other hand, we find a larger amount of applicants from Asia, but these applicants are on average somewhat less successful than North American and European applicants. 22 percent of the North American applicants, 17 percent of the European and 14 percent of the Asian applicants succeeded. For applicants from other continents, the success rates vary from 22 (Africa & the Middle East) to 12 percent (Oceania).

Table 6.3 shows differences in success rate for male and female applicants. For the Program Grants there are no substantial differences in success rates for male and female applicants. For the schemes for the younger applicants, however, we find some differences. The largest gap is found in the Fellowship program. This gap is analysed more extensively below with a more complete data set.

Table 6.3 Success rates for applications, by gender and program. Applications 2000-2005, percentages.

Applications for	Gender of applicant/PI	Percent awarded	N
Program Grant	Male	8.8	1856
	Female	8.1	381
Young Investigator Grant	Male	10.0	370
	Female	7.4	108
*Long-Term/Cross-Disciplinary Fellowship	Male	20.9	1983
	Female	15.2	1214

Source: Data provided by HFSP. Based on survey 'universe' of persons that applied in the period 2000-2005 (duplicates excluded). Gender information is missing for 450 applicants. CDA-holders not included.

*For the Fellowship program more complete data are available in Table 6.13.

Turning to success rates by applicants' age, Table 6.4 shows which age groups are most successful in the different programs.

Table 6.4 Success rates for applications, by age and program. Applications 2000-2005, percentages.

Applications for	*Age of applicant/PI	Percent awarded	N
Program Grant	Below 30 (24-29)	0	1
	30-34	8.6	81
	35-39	10.5	401
	40-49	9.3	1112
	50-59	7.2	528
	Above 60 (60-82)	3.7	135
	All ages	8.6	2258
Young Investigator Grant	Below 30 (24-29)	0	1
	30-34	16.0	100
	35-39	8.5	283
	40-49	5.2	97
	50-59	0	1
	Above 60 (60-82)	-	-
	All ages	9.3	482
Long-Term/Cross-Disciplinary Fellowship	Below 30 (24-29)	17.8	1203
	30-34	17.9	2021
	35-39	9.9	342
	40-49	4.2	48
	50-59	-	-
	Above 60 (60-82)	0	1
	All ages	16.9	3615

* Age when applying.

Source: Data provided by HFSP. Based on survey 'universe' including persons that applied at least once in the period 2000-2005. CDA-holders not included

Success rates decrease with age in all programs. Possibly the HFSP emphases on being risk-taking and not requiring preliminary data, imply higher chances for younger applicants? Still, for the Grant programs, only the age of the PI is included in the figures, and PI's age may say little about the age profile of the teams. What is important to note in Table 6.4 is the different age profiles in success rates for the Program Grants and the Young Investigator Grants. The applicants here have different age profiles and there are also substantially higher success rates for the youngest applicants in the Young Investigator Program than in the Grant Program. In the Young Investigator Program 16 percent of Principal Applicants between 30 to 34 years are awarded, whereas for Program Grants the success rate for this age group is 9 percent. The introduction of the Young Investigator Program in 2001 consequently seems to have substantially improved younger scientists' chances for obtaining an HFSP award.

For the Fellowship program there are equal success rates for applicants below 35 years (18 percent succeed), but substantially lower success rates for applicants 35 years old or older (only 4 percent for those who have passed 40).

The lower success rates for female and older Fellowship applicants, and differences between applicants from different continents, should be looked at more closely.²² It might be that such differences are due to differences in career breaks, different employment conditions in different countries and variations between countries in what is the normal age for obtaining a PhD. When analysing review data from the Fellowship program below, we address these questions of fairness in the review process.

²² We also did a combined analysis of age and gender of the Fellowship applicants and found that females have substantially lower success rates than males in all age groups. See Table A.27, Appendix 4.

Applicants' confidence in the review process

In the survey the applicants were posed two sets of questions relating to the HFSP selection process. They were asked about their views on the review of their application and about whether they think the HFSP has appropriate policies and review processes. In both cases, respondents were asked to score the appropriateness of the procedures and policies on a scale from 1 to 5. The tables below show results from the two sets of questions, both by percentages in each reply category and by average scores.

Table 6.5 Applicants' confidence in the HFSP review process, survey replies, percentages

To what degree do you think the HFSP review committee that assessed your application:	Not at all	1	2	3	4	To a high degree	Cannot say	N
	1	2	3	4	5			
- Was able to assess all the fields of research involved in the proposal?	3.7	6.1	9.8	15.0	18.4	47.0	1668	
- Provided an impartial and unbiased assessment of your proposal?	3.7	6.9	9.2	15.0	16.9	48.2	1664	
- Provided a thorough assessment of your proposal?	7.0	8.6	10.8	13.3	14.5	45.8	1665	

From Table 6.5 we see that a large part of the applicants have no opinion about the appropriateness of the review of their application. Close to half of them cannot say whether the Review Committee was able to assess all the fields in the proposal, or provided an impartial, unbiased and thorough assessment of it. This is not surprising as in most cases the applicants have got very sparse feedback from the review process. It should be emphasised that the questions were intended to measure the applicants' confidence in the review process, rather than their knowledge about it.²³ In the next table we have excluded all those without an opinion, separated the awarded and the non-awarded and calculated averages for each year. Are there changes in the confidence in the HFSP review processes?

²³ With hindsight the questions ought to have been reformulated: "To what degree are you confident that the HFSP Review Committee that reviewed your application..."

Table 6.6 *Applicants' confidence in the HFSP review process, survey replies by year and HFSP status, average of applicants replies (1=Not at all; 5= To a high degree)*

To what degree do you think the HFSP review committee that assessed your application:	HFSP status	2000	2001	2002	2003	2004	2005	Total	N
Was able to assess all the fields of research involved in the proposal?	Not awarded	3.3	2.9	3.1	3.1	2.8	2.8	2.9	429
	Awarded	4.3	4.6	4.6	4.5	4.4	4.5	4.5	421
	Total	4.0	4.1	4.0	3.8	3.4	3.5	3.7	850
Provided an impartial and unbiased assessment of your proposal?	Not awarded	3.1	2.7	3.0	3.2	2.7	2.9	2.9	438
	Awarded	4.3	4.6	4.6	4.4	4.4	4.5	4.5	392
	Total	4.0	4.0	4.0	3.8	3.3	3.4	3.6	830
Provided a thorough assessment of your proposal?	Not awarded	2.7	2.3	2.5	2.8	2.2	2.5	2.5	476
	Awarded	4.2	4.4	4.5	4.4	4.4	4.4	4.4	392
	Total	3.8	3.8	3.6	3.5	2.9	3.1	3.3	868

Note: 'Cannot say'-replies are not included in the calculations. The lines including both awarded and non-awarded applicants show higher scores for the first part of the period because of a low response rate for non-awarded applicants these years.

Not surprisingly the awarded are much more satisfied with the review than the non-awarded (Table 6.6). The merger of the two programs in 2002 seems to have had little effect on the applicants' confidence in the Review Committees' ability to assess all fields in their proposal, nor in the confidence in the thoroughness of the review. One might fear that the merger of the programs entailed less confidence in the thoroughness in review or the ability to assess all different fields. But these figures show no substantial changes during the period under review. Nor are there any substantial changes in the confidence in the impartiality of the review.

One should note that all data are opinions/answers in 2005, meaning that for e.g. the applicants in year 2000 we measure their opinions five years after the review process, whereas for the 2005 applicants we have their opinions about a far more recent event. Looking at Table 6.6 we see that the non-awarded for the most recent years seem somewhat less satisfied with the review process than the non-awarded in the beginning of the period. This may indicate a time effect – the closer in time the rejection the less satisfied one is with the review. Splitting the data on Grant and Fellowship applicants, we see such time differences in the replies from non-awarded Grant applicants, but there is little difference in the replies from the Fellowship applicants. Generally there is a larger difference in the replies between the awarded and non-awarded Grant applicants, than between the awarded and non-awarded Fellowship applicants. Grant applicants average scores on the thoroughness of the assessment, for instance, differ from 4.5 (awardees) to 2.4 (non-awarded), whereas for the Fellowship applicants it differs from 4.3 (awardees) to 2.7 (non-awarded).²⁴

²⁴ For the three questions in Table 6.6 Grant awardees score in average from 4.5 to 4.7, Grant non-awardees from 2.4 to 2.7, Fellowship awardees score from 4.3 to 4.4, Fellowship non-awardees score from 2.7 to 3.1 (all years together, no Table).

In some way it seems that the Grant applicants, being more senior scientists, are more opinionated than the Fellowship applicants. They are both more satisfied with the review when they are awarded and less satisfied when they are not awarded. We see no obvious explanation to these differences related to changes in the HFSP review processes.

Table 6.7 shows applicants' replies to the questions about the appropriateness of the HFSP program policies and review processes to support promising and important research, interdisciplinary research, high-risk research, well-founded and solid research, and to assess the potentials of young scientists.

Table 6.7 Applicants' views on the HFSP policies, survey replies, percentages

In your opinion, to what degree does the HFSP have the appropriate program policies and review processes to	Not at all				To a high degree	Cannot say	N
	1	2	3	4	5		
Support the most promising and important research on complex mechanisms of living organisms?	2.2	8.0	15.0	28.0	30.1	16.6	1606
Facilitate interdisciplinary research?	2.0	5.3	13.1	24.9	42.1	12.6	1612
Support high-risk research?	7.1	16.9	18.2	17.7	17.8	22.4	1606
Support well-founded and solid research?	2.4	7.4	15.8	32.6	22.8	19.0	1605
Assess the potentials of young scientists?	3.5	11.0	13.8	23.8	25.5	22.2	1606

Table 6.7 includes the opinions of all respondents, regardless of award scheme and success in the program. See Table 6.8 for how the awardees in the different award schemes assess the program policies and review processes.

Scoring on a scale from 1 to 5, the policy aspects of the program are assessed positively by the applicants. The policies and review processes score especially high on appropriateness for facilitating interdisciplinary research. 42 percent of the applicants answered 'to a high degree' on this aspect. Supporting high-risk research is the aspect given the lowest score. Here 18 percent answered 'to a high degree' and 7 percent 'not at all', whereas the rest is close to equally distributed on the three middle scores.

Many of the non-awarded applicants who were critical to the program policies or review procedures used the free text space in the questionnaire to elaborate their views. Whereas some regretted the eligibility criteria of the program, others criticised the review procedures. Some thought that requirements to include different disciplines and continents, or to change research field, were artificial criteria and partly contra-productive in terms of promoting original and high-risk research. Some thought the scientific scope of the program was unclear, or too narrow or too broad. Of those criticising the review procedures, a large number were frustrated about insufficient feedback on their application. It was commented that better feedback on rejected applications would help applicants to better understand the scope and aims of the program – including what is meant by interdisciplinary and high-risk research, as well as to improve their project. Several also stated there was too much reviewer emphasis on high-profile track academic records and affiliation with prestigious laboratories, and far too little willingness to support risk-taking projects. Concerning the ability to assess the potential of young scientists, one applicant for the Young Investigator Grant put it like this:

The concept that no preliminary data is needed, as stated on the grant application [form], was for me, found not to be true. I had a proposal that made it through the

first round for in-depth review. It was rejected primarily because we did not show our idea would work; i.e. no preliminary data. Of course, the current funding model has served the HFSP very well. High profile results emerge from the current funding scheme. I simply do not agree that HFSP is fostering young investigators to participate in high-risk, high-reward science. Right now, the current funding strategy supports established researchers to continue their high reward science.

It should be added that this quote is far from representative. It is the only comment explicitly stating that the HFSP requires preliminary data²⁵. The quote still illustrates an opinion that was expressed by several non-awarded applicants – they think the HFSP emphasises high-profile track academic records and not high-risk projects. The ability to assess the potential of young applicants obtained an equal amount of negative and positive scores from non-awarded applicants.²⁶ In contrast to such divided views expressed by the non-awarded, the awarded applicants scored this item very positively. 81 percent of them scored 4 or 5 on this question, whereas only 2 percent scored 1 or 2 (percentages when including ‘cannot say’ replies in the calculations, no table). The answer below, from an awardee in the Grant program, expresses quite a different view than the quote above, and may illustrate the gap between awarded and non-awarded applicants’ opinions:

I do think that HFSP encourages original work and also places emphasis on interdisciplinary research. The instructions to applicants are very clear in this regard; moreover, no preliminary data are required to obtain a program grant, which is unusual and means that high-risk and novel work is encouraged.

Table 6.8 shows the average scores from the awarded applicants for all the policy questions, and for each award scheme. All policy aspects score relatively high, from 4 to 4.6 when all awardees replies are calculated together. Compared to the previous table that included both awarded and non-awarded applicants, the differences in the scores to the different policy aspects are reduced. The scores for high-risk research and well-founded and solid research are still somewhat lower than the scores for the other policy aspects. These two policy aspects – solid and high risk – may be perceived as partly conflicting, or at least difficult to combine and promote simultaneously. To the extent that the respondents perceive such a conflict, they may tend to not assign high scores on both, which may explain the lower scores on these two aspects. Still, on average HFSP score high on both solid and high risk research (Table 6.8).

²⁵ Whereas two more say so more indirectly.

²⁶ 24 percent scored 4 or 5, and 24 percent scored 1 or 2. Percentages when including ‘cannot say’ replies in the calculations, no table.

Table 6.8 Awardees' views on the HFSP policies, average of awardees' replies (1=Not at all; 5= To a high degree), by kind of award obtained

In your opinion, to what degree does the HFSP have the appropriate program policies and review processes to:	Grantees		Fellows		CDA	Total	N
	Program	Young Investigator	Long-Term	Cross-Disciplinary			
Support the most promising and important research on complex mechanisms of living organisms?	4.4	4.5	4.5	4.4	4.7	4.5	636
Facilitate interdisciplinary research?	4.7	4.8	4.5	4.5	4.7	4.6	653
Support high-risk research?	4.2	4.4	3.9	3.6	4.2	4.0	579
Support well-founded and solid research?	4.2	4.1	4.2	3.9	3.9	4.1	607
Assess the potentials of young scientists?	4.2	4.7	4.4	4.1	4.7	4.4	607

Notes: Average scores on a scale from 1 (not at all) to 5 (to a high degree). 'Cannot say'-replies are not included in the Table.

We also analysed the first and the last question for the separate years and found no substantial differences in scores (awardees, non-awardees and Fellowship and Grant applicants analysed separately).

Looking at the scores from the different groups of awardees, we see that the CDA-holders and the Young Investigators score especially high on some of the policy aspects. Both these groups seem very pleased with the HFSP ability to assess the potential of young scientists and to facilitate interdisciplinary research.

The lowest score is given by the Cross-Disciplinary Fellows on support of high risk research (3.6). As there are very few Cross-Disciplinary Fellows in the survey, this result should not be given much weight. Still, it might be that the Cross-Disciplinary Fellows, coming from different research areas than most of the other awardees, have a different understanding of what high-risk research signifies.

The Review Process

The Terms of Reference ask for an assessment of the rigorousness and impartiality of the review procedures, listing four items as examples of what should be analysed:

- The guidance provided to committees
- The extent to which procedures are clearly defined and articulated
- The steps taken to avoid conflicts of interest
- The extent to which any features of the review process inhibit success of original, interdisciplinary applications

According to the interviewed Review Committee members and the provided review documents, the guidance provided to reviewers and regulations for avoiding conflicts of interest seem adequate and procedures are clearly defined and articulated. Interviewees emphasised that the HFSP review procedures compare well with the procedures of the other funding organisations they have served on. Several of them were especially pleased with the final stage of the meetings when the final ranking list was discussed. They emphasised that this promoted a more thorough discussion about the applications around the cut-off line than they had seen in other organisations. It was also emphasised that as a small organisation with dedicated staff, HFSP procedures score high on efficiency.

Moreover, some thought that the HFSP was more risk-taking than other funding organisations. It was said that the HFSP “moves science ahead”. It was still emphasised that the applicants needed a strong track record to be awarded a high-risk project.

Asked about changes in priorities and emphases in the review of the applications during the period they had served on the committee, Grant Review Committee members stated that the review emphasis on interdisciplinarity had increased. Defining and assessing the degree of interdisciplinarity in the projects seems to have been a central topic in review meetings throughout the period. It was stated that ‘interdisciplinarity’ now was more clearly defined than in the first years of the period. Committee members also thought that the degree of interdisciplinarity in the applications had increased, some also emphasised that the program had attracted a higher number of really good interdisciplinary applications during later years. This implied less tension between reviewing scientific quality and interdisciplinarity.

Fellowship Review Committee members had similar views about assessing ‘change of field’ in the Fellowship applications. Emphasis on ‘change of field’ was said to be much more explicit now than in the first part of the period. The definition of such change and how much it should be emphasised in the scoring was still a major topic in review meetings. The complexity of the issue was illustrated by one Committee member who thought the requirement for change of field should be relaxed so that someone applying for a Fellowship within a young and emerging interdisciplinary field, could be awarded a Fellowship even if he/she was already in that field. Apart for this, informants agreed that applicants’ academic track record was the single most important review criterion.

Another issue that concerned some of the informants was the fairness of the review concerning applicants’ career breaks and their different domestic employment and career conditions. There seem to be no rules on whether or how to take career breaks into account when assessing applicants past record. This was presented as an issue that should be looked into. Moreover some were concerned that applicants from different countries could have different possibilities for good scores on central review criteria – because of different domestic academic structures and traditions relating to young scientists’ careers, e.g. longer gap in years between obtaining a PhD and having opportunities for independent research, or less prestigious laboratories with fewer papers in international high ranking journals or other easy measurable indicators of independent and high quality research. It was also stated that the large HFSP Review Committees with representation from a broad range of countries could have an important role in preventing applicants from different countries being advantaged or disadvantaged by the way track record was assessed. There were still doubts concerning whether such issues were adequately dealt with.

Other suggestions for improvement of the review process included interviewing applicants before the final review. However, most seemed to think this was not necessary and would take too many resources away from the research budget. Improved feedback to applicants from the review process, was another issue that several suggested could be improved.

The inputs from the informants partly decided our focus in the analysis of the review documents. When studying the Fellowship review we looked especially at gender and country differences. To study the rigidity, thoroughness and flexibility of the review processes we look at discrepancies between scores and success rates in both award schemes – the focus being on features that may inhibit the success of original, interdisciplinary and high-risk applications.

Review of the Letters of Intent

From 2002 (award year) the Grant review procedure contains a separate pre-review stage deciding which teams should be invited to submit full applications, i.e. a large number of 'Letters of Intent' (LoI) are reviewed in the first phase, allowing the review to concentrate on a smaller number of full applications in the second phase. A separate *Selection Committee* is set up to screen the Letters of Intent (containing 8 members). Each Letter of Intent is given scores by two reviewers in advance of the meeting of the Selection Committee. The reviewers are selected among the members of the *Review Committees* that review the full applications. Scores are given separately for 'Scientific Significance', 'Interdisciplinarity', 'Novelty/innovation', 'Need for collaboration', 'Ambitiousness' and 'Team quality' (on a scale from 1-4 where 4 is best). The reviews also provide an overall rating on a scale from A-D:

- A. "Clearly fulfils criteria for consideration in terms of scientific quality and true interdisciplinarity"
- B. "Definitely worth consideration"
- C. "Not the highest priority but worth consideration if numbers permit"
- D. "Not sufficiently high priority for further consideration"

In addition, each Letter of Intent is sent to one member of the Selection Committee, who classifies the Letter of Intent into one of three categories before meeting:

- A. "deserves to be invited to submit a full application"
- B. "needs further discussion"
- C. "does not merit a full application"

We have looked into available documents from the Letters of Intent reviews for 2002 and 2005 to see if there is any indication that the pre-selection hamper innovative, high risk and interdisciplinary projects to be selected for further review.

For 2002, 13 percent of the 554 Letters of Intent were invited to submit a full application. 277 of the Letters of Intent were subject to consideration/discussion in the Selection Committee. Of those that had obtained *very divergent scores* from the two reviewers (64 Letters of Intent given A and C or A and D), 22 percent were invited to submit full applications. 5 of them also ended up as awardees after submitting full applications. Of those given *two Bs*, only 9 percent were invited and 2 of these 56 applicants ended up as awardees after submitting full applications.

For 2005, 12 percent of the 719 Letters of Intent were invited to submit a full application. 224 of the Letters of Intent were subject to consideration/discussion in the Selection Committee. Of those that had obtained *very divergent scores* from the two reviewers (71 Letters of Intent given A and C or A and D), 31 percent were invited to submit full applications. 8 of them also ended up as awardees after submitting full applications. Of those given *two Bs*, 21 percent were invited, and 3 of these 37 applicants ended up as awardees after submitting full applications.

These crude numbers indicate that Letters of Intent with a major discrepancy in scores had both a higher "invitation-rate" and a higher final success rate than applications with two next best scores (both in 2002 and 2005). Discrepancy in scores may indicate that the Letter of Intent is hard to assess, e.g. because of high risk research or an original approach, or that the reviewers for other reasons have very different opinions about the potential of the project (e.g. reviewers with different competencies). The analysis indicates that such

discrepancy in itself is not a reason for low success rate – you have a better chance with at least one A than with two Bs.

Looking closer at the selected and not selected Letters of Intent with a major discrepancy in overall scores, the subscores give little guiding in explaining the different outcomes (only Letters of Intent for 2002 studied). There are cases where the reviewers score ‘2’ and ‘3’ on “Novelty/Innovation” that are invited and also end up as awardees. On the other hand there are cases where these scores are better, but the Letter of Intent is turned down. The comments given to those with a major score discrepancy that were invited and also ended up being awarded, indicate that different views on, and interpretations of, what is a mainstream and conventional project and what is a difficult and risky project is a major reason for differences in scoring to these 5 projects. For each of them, the reviewer giving ‘A’ commented that it was a difficult and risky project, *or* the reviewer giving C/D commented that it seemed to be a conventional or mainstream project. In other words, both projects that one reviewer thinks exciting and risky and scores high (and the other reviewer scores low), and projects which one reviewer thinks are not original enough at the Letters of Intent stage (but the other reviewer scores high) have a chance of obtaining a HFSP Grant.

Moreover, the classification by a Selection Committee member prior to the meeting indicates that this person’s skills in interpreting and ‘levelling’ the discrepancy in review scores are important.²⁷ 69 percent of those that were classified ‘A’ by the Selection Committee member were invited to submit a full application, and 15 percent of them ended up as awardees. 17 percent of those that were classified ‘B’ by the Selection Committee member were invited to submit a full application, and 8 percent of them ended up as awardees. 4 percent of those that were classified ‘C’ by the Selection Committee member were invited to submit a full application (one Letter of Intent that also ended up as an awarded team).²⁸

A major question in pre-selection processes is how to find a balance between taking care not to screen out promising projects and screening out as many non-promising projects as possible. There is an uncertainty in all peer review, and no way to be sure that no potential winners are screened out by mistake. How ‘selective’ does the HFSP LoI-review need to be? There is no ‘best solution’ to how to find an adequate balance between being ‘selective’ and including all projects that might turn out to be interesting for the program. Guidelines to the reviewers say that about 40 percent of the Letters of Intent will be discussed in the Selection Committee and reviewers are asked to restrict the highest score to the 10 percent best applications. Some interviewed reviewers found this 10 percent limit problematic. When the quality of applications in general is high and several are outstanding, it is hard to only give 10 percent ‘A’.

An alternative to today’s procedure could be to invite all Letters of Intent that obtain at least one ‘A’ to submit a full application (or two Bs). An even more ‘including’ method would be to invite three reviews instead of two, and invite all Letters of Intent that obtain

²⁷ In addition, the Director of the Grant program examines those scored BC, BD and CC for any positive hint that indicates that the Letter of Intent should be discussed in the Selection Committee. The reviewers’ different scoring profiles are also taken into consideration when examining these Letters of Intent.

²⁸ These calculations include the 64 Letters of Intent for 2002 with a major discrepancy in mail review scores.

at least one A, or no lower score than B, to submit a full application. Both methods would imply less work for the Selection Committee (it could be abolished) and more work for the Review Committee, as it would have to review more applications, and more mail reviewers would be involved with full applications. It would also mean more work for the applicants as more teams would spend time on preparing unsuccessful applications. Still, if the HFSP decides on a more including policy – putting more emphasis on the uncertainty in peer review and to be surer not to screen out potential winners – a change in the Letter of Intent procedures should be considered.

Review of full Grant applications

The full applications are first sent to 2 or 3 mail reviewers, and also scored by 2 or 3 Review Committee members before the meeting in the Grant Review Committee. The mail reviewers score each application on originality, suitability of methods, interdisciplinarity, necessity of collaboration and team quality (scale 1-10), as well as providing free text comments. The review committee members give one overall score on “Project and Team” (scale 1-10), and also provide free text comments.²⁹

In the review meeting each application (and its reviews) is presented by the committee members in charge, and discussed before all members give their scores. The final ranking list – and who are awarded and who are not – is the result of the average of the scores from the whole committee. That is, all panel members (currently 23) – regardless of speciality and which applications he/she are assigned – explicitly takes part in the decision-making for all applications (except in cases of conflicts of interest). In addition to the score (on the scale from 1 to 10), each member is also asked to fill in his/her opinion on whether the project should be funded (voting ‘Yes’ or ‘No’). These votes provide a framework for the final discussion about applications ending up around the cut-off line. Members that intend to score clearly different from what is the general conclusion of the discussion are asked to declare their opinion (to make sure that there are no deviating views that are not discussed, and to avoid that scores are misinterpreted/’misvotes’).

To study the result for disputed projects in 2005, we have analysed success rates for applications that received divergent scores from the two (or three) committee members that were assigned the applications (Table 6.9), and success rates according to number of panel members voting for the application (Table 6.10).³⁰

Looking at the scores given prior to the meeting, we find that applications with divergent scores have a lower success rate than applications with more similar scores (Table 6.9). Still, some of the applications with clearly divergent scores were successful. The awarded application with the highest variance in pre-meeting scores was scored 4 by one Committee member and 9 by the other (final score in the meeting was 7.15).³¹

²⁹ The central criteria are leading edge project and necessary, novel and interdisciplinary collaboration. For some years, including 2005, they were also asked to give a separate score on interdisciplinarity (scale 1-4). Separate scores on interdisciplinarity were also given in the meeting by all committee members.

³⁰ Another approach would be to calculate the variance for the scores given in the meeting, but such data are not available.

³¹ In 2005 the cut-off score was 6.95 for Program Grants and 6.75 for Young Investigator Grants. Average (final) score for awarded applications was 7.7, while non-awarded applications in average obtained a score of 5.3.

Table 6.9 Result of Grant review 2005 by variance in scores to 'Project and Team' given by Review Committee members prior to meeting, percentages

Variance in pre-meeting 'Project and Team' scores	% Not awarded	% Awarded	N
< 0.5	44.4	55.6	45
0.5-1.5	68.2	31.8	22
> 1.5	89.5	10.5	19
Total	60.5	39.5	86

We also calculated the variance in the scoring for the two groups and found more divergent scoring for those applications that failed, than for the successful ones. For awarded teams the range in variance was 0 - 6.3, average was 0.6. For non-awarded teams the range in variance was 0 - 8.7, average was 1.3 (calculation includes scores given by the 2-3 committee members prior to the meeting).

There were also applications that were scored high prior to the meeting, but ended up unsuccessful. For instance, one application that was scored 10 and 8.5 prior to the meeting ended up with 6.79 as the final average score and was not awarded. In all 8 applications with a pre-meeting average score of 8 or better, were not awarded. On the other hand, only one application with a pre-meeting average below 7 was awarded. In all 93 percent of the applications ended up with a lower score than the pre-meeting average.³² In general, peer review meetings are important for reaching a conclusion that incorporates and balances the different views, both the different reviews and the assessments from other panel members. The figures above indicate that a major function of the HFSP Grant review meeting is to find *weaknesses* in the applications. In other words, to make sure that all awarded projects really are as leading edge and original as claimed, and that the methods are adequate, that the teams are competent, interdisciplinary and intercontinental, seems to be more important than to make sure that no applications fulfilling these criteria are overlooked by mistake. The figures may of course also indicate that outstanding projects are easily identified and very seldom overlooked in the pre-meeting review.

Whereas Table 6.9 shows that applications with divergent *pre-meeting* scores have lower success rates, Table 6.10 shows awards according to number of Review Committee members voting for the application. The latter shows that all applications supported by at least 7 of the 21 Committee members were awarded.³³

Table 6.10 Result of Grant review 2005 by number of "yes votes" in Review Committee meeting, percentages

Number of 'yes'-votes in Review Committee meeting	% Not awarded	% Awarded	N
0	100.0	0	16
1-3	96.4	3.6	28
4-6	90.0	10.0	10
7-21	0	100.0	32
Total	60.5	39.5	86

Note: For borderline cases, only the votes from the final discussion on applications around the cut-off line are included in the table.

Ranking appearing from the average scores in review committees is a kind of majority decisions where the degree of majority needed for success varies both with how the two

³² 80 applications obtained a lower score, 5 a higher score, and one the same score as prior to the meeting.

³³ Even one team supported only by three of the panel members was awarded. However, in this case only the votes of the final borderline discussion are included in the table. In the initial discussion of the application, the application obtained 14 'yes'-votes. This application first ended up on the waiting list (i.e. under the expected cut-off line at the time of the meeting).

“fractions” are scoring the applications and with available funds. According to our analysis of the Grant review in 2005 there is a substantial degree of flexibility in the majority needed to obtain an award. From the point of view of the policy priorities of the HFSP this flexibility seems appropriate: Mechanisms that enable projects to get funded without a majority of the reviewers, implies good conditions for more plurality in review outcome, and thereby fewer barriers to controversial or high risk projects.

An analysis of the separate scores given on interdisciplinarity in 2005 indicates that a high score on interdisciplinarity is emphasised, but not necessary for an award. The average scores given by the committee members (in the meeting) on interdisciplinarity were 3.0 for awarded applications and 2.4 for non-awarded (scale from 1 to 4 where 4 is best). Even if good interdisciplinarity gives a better chance, also some applications with more moderate scores on interdisciplinarity are awarded. The minimum average scores an awarded application obtained was 2, the maximum was 3.9. For the non-awarded applications the minimum obtained was 1.2, the maximum was 3.6.

Review of Fellowship applications

Each Fellowship application is reviewed and classified by 2 members of the *Fellowship Review Committee* in advance of its annual review meeting. The guidelines specify the following criteria:

- accomplishments and potential of the candidate
- significance of change in research direction, with particular emphasis being placed on outstanding candidates who are changing disciplines. We expect successful candidates to move into a new research direction for their postdoctoral experience
- scientific originality and excellence of the project
- quality of the host and training potential of the environment
- the value of the true international exchange also needs to be considered as part of the evaluation, as the HFSP welcomes broad geographic distribution

Only one overall score on the scale from A to D is given, no comments, but the reviewer may ‘flag’ the application for special discussion as a high risk/high impact project.³⁴ In cases of major discrepancies between the two reviews (i.e. combined score AC or AD), a third member is asked to review the application. In the review meeting the procedure is much the same as for the Grant application. Each short-listed application is presented by the committee members in charge, and after the discussion, all Committee members (currently 26) give their scores on a scale from 1 to 10. The final ranking list appears from the averages of these scores, and members that intend to score clearly different from what is the general conclusion of the discussion are asked to declare their opinion before the voting.

With this procedure, the two panel members who are assigned an application, might be decisive for its outcome – normally at least one A or two Bs is required to be on the initial short-list for the meeting.³⁵ To study degree of rigidity in the process, we have analysed success rates in 2000, 2002, 2003 and 2005 for applications that received very divergent scores from the two committee members that were assigned the applications. Before 2003

³⁴ ‘A’ represent the top 10 percent of the reviewed applications, ‘D’ the bottom 60 percent, and ‘B’ and ‘C’ 15 percentiles each. Before 2003 a scale from 1 to 10 were used and the applicant, the project and the host institution were scored separately.

³⁵ In addition, applications that are ‘flagged’ as high risk, or applications that any of the committee members bring up for discussion during the meeting, will be considered.

a scale from 1-10 was used for the pre-meeting scores, and the reviewers were also asked to rank the applications (to help calibrate scores). Apart from that, the procedure was similar. Two Committee members scored each application in advance of the meeting and all members scored at the meeting.³⁶

The results for ‘disputed’ projects are shown in Tables 6.11 (years 2000 and 2002) and Tables 6.12 (years 2003 and 2005). For both 2000 and 2002 we see that the applications with divergent scores in general have a lower success rate than applications with more similar scores. In 2000 an application with initial scores that differed more than 3 points on the grading scale, had 18 percent chance of success, whereas an application that differed less than 1 point, had 31 percent chance of success. Similar figures for 2002 were 13 and 24 percent chance of success. Still, for both years applications with a discrepancy above 3 have a somewhat higher success rate than those with a discrepancy between 2 and 3. This may indicate that in some cases applications with a major discrepancy in scoring are found especially interesting, and that the review procedure is sensitive and open enough to identify and awarding such applications.

Table 6.11 Result of Fellowship review 2000 and 2002 by difference between scores given by Review Committee members prior to meeting, percentages

Difference in pre-meeting scores	2000			2002		
	% Not awarded	% Awarded	N	% Not awarded	% Awarded	N
< 1	69.1	30.9	343	76.1	23.9	289
1-1.9	79.1	20.9	177	84.5	15.5	174
2-3	90.0	10.0	110	91.5	8.5	59
>3	81.8	18.2	22	87.5	12.5	8
Total	75.8	24.2	652	80.8	19.2	530

Notes: Scores given on a scale from 1-10 by two Review Committee members prior to meeting. A difference of ‘1’ equals one point on this scale.

23 applicants offered an award, but that declined, are included as awarded.

37 applications scored only by one member are excluded from the calculations.

There are, however, clear indications of limits to such sensitivity and openness. In 2000 and 2002 all those that ended up as awarded had a minimum pre-meeting score at 7.8 from at least one of the reviewers. Looking at the pre-meeting “ranking” of the applications we find only one case in which an application that was not at any of the pre-meeting reviewers’ top 20 was awarded. On the other hand, we found 6 cases in which an applicant that was ranked number one by one of the pre-meeting reviewers, ended up without being offered a Fellowship (in total for the two studied years 2000 and 2002).

³⁶ Moreover, requirements for change in research direction were not explicit in the 2000 to 2002 guidelines.

Table 6.12 Result of Fellowship review 2003 and 2005 by combined scores given by Review Committee members prior to meeting, percentages

Scores (two reviewers combined)	2003			2005		
	% Not awarded	% Awarded	N	% Not awarded	% Awarded	N
AA or AB	26.9	73.1	104	4.8	95.2	84
AC or AD	76.3	23.7	59	64.7	35.3	34
BB	82.4	17.6	51	54.3	47.7	35
BC - DD	100.0		425	100.0	0	521
Total	84.5	15.5	639	84.0	16.0	674

16 applicants offered an award, but that declined, are included as awarded

The figures for 2003 and 2005 show the same kind of tendency (Table 6.12). Applications with a major discrepancy in scores have lower success rates. Still, in 2003 applications obtaining B from both pre-meeting reviewers, had a lower success rate than those that obtained at least one A.

There is a major difference between 2003 and 2005 in the proportion of the applications that obtained at least one A or two Bs. In 2003, 50 percent of the applications fall in this category, whereas in 2005 only 29 percent. This is presumably a result of stricter instructions to reviewers to limit the use of the best scores. As explained above ‘A’ is supposed to represent the top 10 percent of the applications, ‘D’ the bottom 60 percent. As far as this means that a lower proportion of the applications is presented and discussed in the review meeting, this might indicate a reduced sensitivity and openness in the review process. Applications that are not assigned to at least one reviewer that find this to be among the top 10 percent he is assigned, or to two reviewers that both find it to be among the top 25 percent they are assigned, have small chances of any further consideration – unless one of them ‘flag’ the applications as ‘high risk’ or another Committee member for some reason brings the application up for discussion during the meeting.³⁷

These differences are also visible between the pre-meeting and final scores for 2003 and 2005. In 2003 a larger proportion of the applications obtained final top scores than in 2005 (6.3 percent in 2003 and 2.2 percent in 2005 obtained a final score above 9, Appendix 4, Table A.17). An analysis of the difference between pre-meeting and final scores in 2000 and 2002 indicates that the pre-meeting reviews to a high degree decide an application’s destiny. No application with a higher difference than two (on the scale from 1 to 10) between initial and final score was awarded (Appendix 4, Table A.16).

To investigate the impartiality of the review process we have also calculated success rates by gender and nationality. Table 6.13 shows that male applicants have a clearly higher success rate than female applicants. In total for the period 2001 to 2005, 18 percent of male applicants and 13 percent of female applicants were awarded. All years males have a minimum of 3 percentage points higher success rate than females, and for 2005 males’ success rate is twice as high as for females. There is also a gender gap in the composition of the review committees, with about 20 percent female members (Appendix 4, Table A.18).

³⁷ It should be added that the Review Committee members are also asked to reconsider initially low scored applications after seeing the quality of all applications. We have not studied to what degree such reconsiderations alter the outcome.

Table 6.13 Success rates for male and female applicants, Fellowship applicants 2001-2005, percentages.

Year	Female applicants		Male applicants	
	Success rate	N	Success rate	N
2001	11.0	245	14.8	420
2002	13.7	212	20.8	355
2003	14.2	239	17.3	422
2004	13.3	270	17.6	444
2005	10.5	276	21.8	445
Total	12.5	1242	18.4	2086

Sources: Applicant lists from the HFSP 2001-2005.

Notes: 40 applicants offered an award, but that declined, are included as awarded. Award year 2000 is not included as we lack gender information for a substantial number of the non-awarded this year (as for 1995, for which we also collected data).

The gender difference in success rates may reflect that male applicants in general are more qualified than female applicants, or it may reflect that female applicants for some reason are disadvantaged in the review process. If we choose to believe that talent for scientific research is equally distributed between the sexes, the latter is the most probable explanation. We would advise the Review Committee and the HFSP Council of Scientist to look closer into the problem and especially examine to what degree career breaks are taken into consideration when assessing the candidates productivity.

There are also substantial differences in success rates depending on the applicant's nationality that should be looked into. In Table 6.14 we have included all applications and awards in the 13-year-period for which we have data to outweigh year-to-year fluctuations in the countries' success rates. We have also calculated success rates for the period 2000 to 2005, and found similar differences in success rates (see Table A.19 in Appendix 4).

Table 6.14 shows success rates for all countries with at least 10 applications in the period 1993 to 2005. If we limit our analysis to HFSP member countries with more than 50 applications in the period, the largest difference is found between Austria and Switzerland with 34 percent success and Sweden with 11 percent success, whereas Japan is around the average with 20 percent success in the period. Such differences might be a result of different domestic education systems or differences in academic traditions that are not taken into account when reviewing the applications. The number of an applicant's first author publications in international journals is a central criterion in the review of the applications for HFSP Fellowships. Differences in the independence given to young scientists and in the relations between the young scientists and their supervisors may foster substantially different domestic conditions for publishing first author articles early in one's career, and consequently for postdocs' ability to qualify for a HFSP Fellowship. According to some interviewees such potential differences are not sufficiently taken into consideration in the discussions of the Fellowship Review Committee. Both the Review Committee and the HFSP Council of Scientists have representation from a broad range of countries and should have the knowledge required to assess whether the differences shown in Table 6.14 and Table A.19 might be a result of structural domestic differences in postdocs' ability to qualify for a HFSP Fellowship, or whether the differences reflect different domestic opportunities for young scientists – including differences in encouraging the best talent to go abroad for postdoctoral training – or reflect which countries have the strongest groups and laboratories in HFSP relevant research areas.

Table 6.14 Success rate by applicant's nationality, HFSP Fellowships 1993-2005.

Nationality/Country	Applications 1993-2005	Awards 1993-2005	Success rate
Austria	56	19	33.9
Switzerland	151	51	33.8
Israel	323	97	30.0
Ukraine	11	3	27.3
Canada	448	122	27.2
Germany	720	192	26.7
Netherlands	256	67	26.2
Greece	101	26	25.7
Republic of Korea	63	16	25.4
Croatia	13	3	23.1
Taiwan China	22	5	22.7
Finland	55	12	21.8
United States of America	373	80	21.4
Morocco	24	5	20.8
Russian Federation	55	11	20.0
Japan	1295	258	19.9
Denmark	31	6	19.4
Italy	392	68	17.3
France	1371	231	16.8
United Kingdom	618	103	16.7
Portugal	36	6	16.7
Turkey	12	2	16.7
Romania	12	2	16.7
Australia	190	31	16.3
Ireland	62	10	16.1
New Zealand	25	4	16.0
Belgium	109	17	15.6
Argentina	82	12	14.6
Mexico	49	7	14.3
Poland	42	6	14.3
Spain	703	100	14.2
Hungary	57	8	14.0
Brazil	31	4	12.9
China	154	18	11.7
Sweden	116	13	11.2
Czech Republic	20	2	10.0
India	209	18	8.6
Singapore	16	1	6.3
Bulgaria	15	0	0.0
Nigeria	12	0	0.0
Chile	11	0	0.0
Other nationalities*	198	27	13.6
Total	8539	1663	19.5

Source: Aggregated data file provided by the HFSP Fellowship Program.

*Countries with less than 10 applications in the period 1993-20005.

7 Overall program initiatives and communication

In this chapter we present the results of the applicant survey relating to the Awardees Annual Meetings and the HFSP information sources.

Awardees Annual Meetings

The Awardees Annual Meeting was introduced in 2001 to facilitate interaction and cooperation among the awardees. All Fellows, all CDA-holders, as well as final year Grantees are invited to the meeting. Other awardees are invited when space permits. As shown in Table 7.1, close to 90 percent of all Young Investigators and 85 percent of the CDA-holders in the survey have participated in one or more Awardees Annual Meeting. Moreover, 44 percent of the Fellows and 33 percent of Program Grant holders have participated.

Table 7.1 Have you participated in any HFSP Awardees Annual Meeting? Awardees' survey replies, percentages.

Program	No	Yes	N
Program Grant	66.9	33.1	145
Young Investigator Grant	10.8	89.2	37
Long-Term Fellowship	55.9	44.1	426
Cross-Disciplinary Fellowship	100.0	0.0	11
Career Development Award	15.0	85.0	40
Total	54.0	46.0	659

Asked about effects of participating in the meeting – on a scale from 1 to 5 – the participants replied as shown in Table 7.2.

Table 7.2 Effects of HFSP Awardees Annual Meetings. Awardees survey replies, percentages

To what degree did the meeting(s):	Not at all				To a high degree	Too early to say	N
	1	2	3	4	5		
Improve your scientific insight into your field of research	12.3	29.1	33.4	16.2	8.9		302
Give you valuable interdisciplinary input	4.3	10.9	21.5	33.4	29.8		302
Broaden your scholarly network	2.7	10.6	26.9	32.9	26.9		301
Broaden your intercontinental scholarly network	4.7	14.3	23.9	28.2	27.9	1.0	301
Lead to new research collaboration (joint research, applications, publications, etc)	39.5	24.3	14.3	7.0	6.6	8.3	301
Other	30.4	4.3	2.9	2.9	7.2	52.2	69

The large majority of the respondents report positive effects of the meetings in terms of giving them interdisciplinary input and widening their scholarly network, including their intercontinental networks. Very few answer 'not at all' on these questions. Inputs in terms of better insight in their own field of research are far less frequently reported. This is in

line with the aim of the Awardees Annual Meetings: They are intended as interdisciplinary and intercontinental arenas, and not as arenas for specific fields. When it comes to new research collaboration in terms of joint research, publications or similar, far fewer effects are reported than for the other items. 40 percent answer that the meeting ‘not at all’ led to such collaborations, 52 percent answer that the meeting to a limited or high degree did so (scores 2 to 5), whereas 8 percent say it is too early to say (Table 7.2).

10 respondents used the free text option to elaborate other outcomes of the meetings. The outcomes specified in these answers include getting overview of, and inspiration from, high quality research in a wide variety of research fields, the opportunity to present ones results, to get to know the program, its staff and committee members as well as getting a better understanding of the HFSP ‘spirit’. One respondent stated that he/she would like to collaborate with another participant at the meeting, but could not as he/she did not yet hold an independent position. Another respondent had a broader concept of collaboration and reported that the meeting had entailed continued contact and exchanging of ideas and reagents with someone working on a similar topic – a kind of collaboration that was not specified in the question text.

Below are shown the average scores from the participants from the different award schemes.

Table 7.3 Effects of HFSP Awardees Annual Meetings. Awardees survey replies, average scores by program

To what degree did the meeting(s):	LTF	CDA	YIG	PG	All programs	N
Improve your scientific insight into your field of research	2.8	3.0	2.7	2.8	2.8	302
Give you valuable interdisciplinary input	3.8	3.8	3.7	3.4	3.7	302
Broaden your scholarly network	3.9	4.0	3.4	3.1	3.7	301
Broaden your intercontinental scholarly network	3.7	3.9	3.3	3.3	3.6	298
Lead to new research collaboration (joint research, applications, publications, etc)	2.0	2.7	2.1	2.1	2.1	276

Note: Average scores on a scale from 1 (not at all) to 5 (to a high degree). Respondents answering ‘Too early to say’-replies are not included in the table.

The CDA-holders seem to have had benefited somewhat better from the Awardees Annual Meeting than the other participants, and in particular the Program Grant-holders. The difference is especially visible for outcomes in terms of new research collaborations. This might be because the CDA-holders are in a phase of establishing an independent group and are looking for new collaborators.

Taken together, we find that most participants in the Awardees Annual Meetings have got valuable interdisciplinary input and increased their networks, and some have also benefited in terms of finding new research collaborators for applications, research and publications.

HFSP information sources

To examine the importance of various information sources, we asked the applicants to indicate which information sources had stimulated their interest in applying for funds from the HFSP. The result is shown in Table 7.4.

Table 7.4 Did any of the following sources of information stimulate your interest in applying for funds from the HFSP? Applicants' survey replies, percentages.

Source	PG/YIG	LTF/CDF	CDA	All programs
Colleagues/advisors	60.8	79.7	77.5	70.9
HFSP grant holders/Fellows	31.4	42.1	50.0	37.4
Direct information from other persons affiliated with HFSP (e.g. present or past reviewers, members of review committees, Council of Scientists)	15.0	8.6	22.5	12.0
The HFSP web site	49.5	51.0	52.5	50.3
The HFSP call for applications mediated through domestic organisations	20.2	9.3	25.0	14.8
The call for applications in scientific journals	18.6	6.4	10.0	12.2
Presentations by HFSP staff	1.9	2.0	12.5	2.2
None of the above	2.6	2.5		2.5
N	687	753	40	1480

Note: This was a multiple-choice question. Respondents were asked to tick all relevant alternatives.

Regardless of program, information from colleagues/advisors and the HFSP web site were the most important sources stimulating interest in the program. Concerning other sources, for those who are already familiar with HFSP – the CDA-holders – the personal HFSP sources are more important than for other applicants ('personal HFSP sources' include HFSP awardees, appointees and staff). For others than the CDA-holders, presentations by HFSP staff seem to have a marginal role in stimulating interest in the program.

In addition to the question about sources stimulating interest in applying, awardees were also asked about HFSP information sources in general. The HFSP web site comes up as the far most used source of information. 40 percent have to a high degree used information from the HFSP web site, whereas far lower numbers have used the e-mail letters of the annual reports (Table 7.5).

Table 7.5 Use of HFSP information sources, awardees' survey replies, percentages

To what degree have you used information provided by the following HFSP information sources?	Not at all				To a high degree	Cannot say	N
	1	2	3	4			
HFSP web site	4.5	11.6	20.1	22.4	40.4	0.9	661
HFSP e-mail newsletters	22.7	21.3	24.4	14.9	10.4	6.4	644
HFSP Annual Reports	31.3	25.2	21.8	8.9	4.4	8.5	639

Awardees were furthermore asked whether they would be interested in joining an international alumni network for HFSP awardees (Table 7.6).

Table 7.6 Would you be interested in joining an international alumni network of HFSP awardees? Awardees' survey replies, percentages

Award	Not interested	Partly interested	Clearly interested	N
Program Grant	13.4	45.1	41.5	142
Young Investigator Grant	2.7	43.2	54.1	37
Long-Term Fellowship	3.3	32.1	64.6	427
Cross-Disciplinary Fellowship		45.5	54.5	11
Career Development Award	5.0	22.5	72.5	40
Total	5.5	35.2	59.4	657

59 percent report that they are clearly interested in joining such a HFSP alumni network, 35 percent partly interested, and only 6 percent are not interested. There are clear differences between the respondents from the different award schemes. 73 percent of the CDA-holders are interested in joining, whereas 'only' 42 percent of the most senior awardees, the Program Grant-holders express clear interest.

The questionnaire also contained a question about *other communication initiatives* the awardees would like from the HFSP. A substantial number (87) of the awardees used this opportunity to give free text comments on how the HFSP could improve. About 30 of these would like the HFSP web site to facilitate exchange of information between (both past and current) awardees, or would like the HFSP to provide information and facilitate interaction that could be handled by such a web site. Wanted information and options included overview of expertise and contact information on (past and current) awardees, job opportunities, finding new collaborators, dissemination of scientific information, e-mail groups/discussion forums on promising future research directions, on particular research topics, and also forums for groups lobbying the terms of postdocs.³⁸

A substantial number were also concerned about meetings, conferences or workshops that the HFSP could arrange. Several wanted the meetings to be open also to past awardees. More time for interaction in Awardees Annual Meeting to favour a sense of HFSP community and new collaborations was also suggested. Some regretted they could not attend the (one) Awardees Annual Meeting they had been invited to and wanted more frequent meetings. Several suggested regional/local meetings in addition to the international ones, as a low cost opportunity to meet like minded scientists. Others suggested smaller, more focused/topical meetings. Some also suggested that the meetings should be highlighted in scientific magazines, or publishing proceedings from the meetings.

Other suggestions for better promoting the HFSP included using past HFSP awardees that won prestigious prizes to signal that HFSP is an outstanding international research program, to publish statistics on the positions of former HFSP Fellows, and that the HFSP should be present at important scientific meetings to present its activities.

Some also commented on the e-mail newsletter. Some stated they did not receive any HFSP newsletter. Some would like to have a printed version of it. Some suggested the newsletter should contain information on individual awardees to facilitate new collaboration (i.e. similar to what was suggested by others for the web site).

³⁸ Direct comments on today's web site included more frequent updating and links to other funding organisations.

Other suggestions included country based alumni networks, the possibility of providing courses in lab management and management skills, more details on funded projects and reasons for funding, complete referees' comments to applicants, and the possibility of communicating with the Review Committee.

8 Program outcome

This chapter analyses effects of HFSP funding and project outcome as reported by awardees, and effects of rejections as reported by non-awardees.

Results of the projects

In the survey the awardees were asked to indicate – on a scale from 1 to 5 – how the HFSP award had contributed to their scientific work. The replies are shown in Table 8.1 (overall distribution of replies) and in Table 8.2 (average scores by program).

Table 8.1 Results of HFSP projects. Awardees survey replies, percentages

Has the HFSP grant/fellowship/CDA contributed to your scientific work in any of the following ways?	Not at all				To a high degree 5	Too early to say	N
	1	2	3	4			
Improved my scientific insight into my field of research	1.4	1.5	8.3	26.4	50.8	11.5	659
Broadened my field of expertise	1.1	2.0	6.1	26.3	55.5	9.1	658
Improved my interdisciplinary skills	2.1	4.6	14.5	26.2	40.9	11.7	657
Resulted in research collaboration during the project (joint research, applications, publications, etc)	5.2	5.2	11.0	21.5	36.7	20.5	657
Resulted in research collaborations that continue beyond the term of my HFSP project	7.0	4.1	9.3	14.9	27.2	37.5	658
Broadened my scholarly network	1.8	4.0	14.6	30.0	34.3	15.2	656
Broadened my intercontinental scholarly network	3.2	4.9	14.7	25.5	34.9	16.8	654
Improved my ability to obtain further funding	2.3	4.4	10.0	20.4	25.2	37.7	658
Improved my ability to obtain a research position/a more attractive research position	7.2	5.6	8.9	17.3	23.7	37.4	655

According to the survey, the awarded projects have had extensive effects in terms of improved insights and skills. 56 percent score 5 on effects in terms of broadening their field of expertise, 51 percent score 5 on improved insight into their own field of research, 41 percent score 5 on improved interdisciplinary skills – and a large part of the remaining awardees score 4 on these items.

On questions about more specific effects, as improved ability to obtain an attractive research position, further funding or research collaborations beyond the term of the project, there are relatively many that answer ‘too early to say’.

The average scores in Table 8.2 show some variation by program (excluding ‘too early to say’-replies). The Young Investigators score highest on the collaboration questions, both collaborations during and after the project. The Fellows score highest on broadening their field of expertise.

Table 8.2 Results of HFSP projects. Awardees survey replies, average scores by program

Has the HFSP grant/fellowship/CDA contributed to your scientific work in any of the following ways?	LTF	CDF*	CDA	YIG	PG	All programs	N
Improved my scientific insight into my field of research	4.4	4.6	4.3	4.2	4.4	4.4	583
Broadened my field of expertise	4.5	4.8	4.2	4.4	4.3	4.5	598
Improved my interdisciplinary skills	4.2	4.7	3.8	4.1	4.0	4.1	580
Resulted in research collaboration during the project (joint research, applications, publications, etc)	3.8	4.4	4.0	4.6	4.4	4.0	522
Resulted in research collaborations that continue beyond the term of my HFSP project	3.6	3.5	4.1	4.5	4.2	3.8	411
Broadened my scholarly network	4.1	4.2	4.1	3.9	4.1	4.1	556
Broadened my intercontinental scholarly network	4.0	4.0	3.8	3.9	4.0	4.0	544
Improved my ability to obtain further funding	4.1	4.3	4.3	3.8	3.8	4.0	410
Improved my ability to obtain a research position/a more attractive research position	4.2	4.0	4.0	3.5	2.7	3.7	410

"Too early to say" not included in the calculations. The number of cases (last column) consequently varies.

*Very low number of answers, maximum bases of calculation 9 (improved interdisciplinary skills), minimum 2 (collaboration beyond the project).

Effects of obtaining and not obtaining an HFSP award

In the survey, non-awardees were asked what happened to the rejected project, and awardees were asked what they would have done if they had not obtained the award. Results are shown below.

Table 8.3 Possibility of carrying out the project without the HFSP award. Awardees' survey replies, percentages

Would you have carried out the same research if you had not obtained the HFSP grant/fellowship?	LTF	CDF	PG	YIG
I would have done the same research	47.9	45.5	7.5	5.4
I would have done related/partly similar research	37.1	27.3	64.4	51.4
The research would not have been done at all	5.6	9.1	25.3	37.8
Don't know	9.3	18.2	2.7	5.4
N	428	11	146	37

From Table 8.3 it seems that the Young Investigator Grants are the most important HFSP awards in terms of facilitating research that would otherwise not have been done. 38 percent of the Young Investigators report that without the grant, the research would not have been done at all. Whereas 25 percent of other Grantees, 5.6 percent of Long-Term Fellows and 9.1 percent of Cross Disciplinary Fellows report the same.

Comparison with previous survey results

The survey in 2000 asked the same question as in Table 8.3, but the reply alternatives were combined with questions about partners and host. To compare, we therefore have to combine answers to the question shown in Table 8.3 with the counterfactual questions about collaboration and location (Tables A.20 and A.21, Appendix 4). In the 2005 survey, only one percent of the Grantees answer that they would have done the same research with

the same partners, and 7 percent answer that they would have done related/similar research with the same partners. In 2000, 6 percent answered that they would have done “similar research with same partners”.³⁹ In both cases the proportion of Grantees that would have done just the same without the grant seems marginal.

Looking at the Fellows we find a larger proportion for which the award has had little effect on facilitating research that would otherwise not had been done. In the 2005 survey, 45 percent of the Fellows answer that they would have done the same research at the same host laboratory and 27 percent that they would have done related/similar research in the same host laboratory. In 2000, 73 percent answered that they would have done the same research in the same host laboratory (“related research” in the same laboratory was no option).

Different formulations of reply alternatives make it difficult to analyse change. We still think the data indicate that there have been no large changes in the degree to which the Fellowships or Grants affect the research and collaboration patterns/locations of the awardees. Tables A.20 and A.21 in Appendix 4 show the 2005 replies concerning partners and host laboratory without the HSFP award.

Looking at the replies from those that did not obtain an award we find much the same pattern as for the awardees. The highest proportion that was able to carry out the project without an HFSP award is found among the Fellowship applicants (67 percent), the lowest proportion among the Young Investigators (18 percent, Table 8.4).

Table 8.4 Possibility of carrying out the project without an HFSP award. Survey replies from non-awarded applicants, percentages

What happened to the project you did not obtain HFSP-funding for?	LTF	CDF	PG	YIG
I obtained another grant/fellowship and went on with the project as planned	67.1	25.0	18.3	18.0
I modified the project/obtained funding for a partly similar project	12.4	37.5	29.2	23.6
I was not able to go ahead with the project	20.1	37.5	51.2	58.4
I don't remember	0.3		1.3	
N	298	*8	383	89

*New program in 2005. Reply from 8 of 51 non-awarded.

Turning to the replies related to the CDA, we see that 54 percent of the non-awarded report that they did research in their home country, whereas 80 percent of the awarded say they would have done research in their home country even without the CDA (Table 8.5). These figures can be use to interpret the repatriation effect of the CDA scheme in different ways. On the one hand, it might seem as if the scheme has awarded a large proportion of those applicants that would have returned home anyway. On the other hand, some CDA-holders might also have overestimated their opportunities for repatriating without the CDA.

³⁹ The alternatives and reply percentages for *Grantees* were: Yes, similar research with same partners (6%); Yes, similar research but with some change in partnership (36%); No, significantly different research but with the same partners (6%); No, the research could not have been done at all (47%); Don't know (6%). The alternatives and reply percentages for *Fellows* were: Yes, same research and same host laboratory (73%); Yes, same research but in different laboratory (3%); No, significantly different research in the same host laboratory (6%); No, significantly different research in a different laboratory (6%); No, I would probably not have been doing research at all (2%); Don't know (10%).

Table 8.5 Possibility of carrying out the project without the HFSP funding. Survey replies from awarded and non-awarded CDA-holders, percentages.

Awarded: "What would you have done if you had not obtained the Career Development Award (CDA)?"		Not awarded: "What was the implication of the rejection of your application for a Career Development Award?"	
Continued research in my HFSP host country	12.8	I continued research in my HFSP host country	23.1
Done research in my home country	79.5	I did research in my home country	53.8
Done research in another country	5.1	I did research in another country	0.0
Other	0.0	Other*	23.1
Don't know	2.6		
N	39	N	26

*The 6 persons selecting this answer, provided comments as follows: one did research in the home country with a poor budget; one did research in the host country; one obtained other funding to start up his/her own laboratory (but does not say where); one was unable to start a new line of research (but does not say where he/she continued the old line); two gives no information about the implications of the rejection.

To measure effects of the awards we also examined the HFSP career profiles. The available data provide limited input for this analysis. We only have information about respondents' present academic position, and due to the low response rate of the non-awarded Fellows from the first part of the period, we do not have data for comparing the career of awarded and non-awarded Fellows.

Table 8.6 Fellows' careers: Current position of former and present HFSP Fellows. Fellows' survey replies, percentages within years

What is your current position?	2000	2001	2002	2003	2004	2005	Total
Senior faculty (e.g. head of department/institute, associate/ full professor, research director)	3.1	2.1					0.7
Junior faculty (e.g. assistant professor, lecturer)	38.5	22.9	25.0	10.8	2.5	2.1	15.2
Independent young investigator	20.0	22.9	14.7	4.1		2.1	9.1
Postdoc	32.3	50.0	58.8	85.1	97.5	95.7	73.7
Other	6.2	2.1	1.5				1.4
N	65	48	68	74	80	94	429

Tables A.23 to A.25 in Appendix 4 show similar data for the other HFSP schemes.

As we see from Table 8.6, 32 percent of the Fellows awarded in 2000 are still postdocs. 20 percent are independent young investigators, 39 percent hold a junior faculty position (e.g. assistant professor), and 3 percent have obtained a senior faculty position.

Identity with HFSP

The final survey question to be presented, deals with HFSP's ability to create a sense of community among its awardees. We asked the awardees to score on a scale from 1 to 5 the degree to which they felt that they were part of a particular HFSP community during their award. Average scores for the various schemes, separately for awardees that have and have not participated in Awardees Annual Meeting, are presented in Table 8.7.⁴⁰

⁴⁰ For overall figures including the 'cannot say'- replies, see Appendix 4, Table A.26.

Table 8.7 “Did you feel that you were part of a particular HFSP community during your award?” Awardees survey replies, average scores on a scale from 1 (not at all) to 5 (to a high degree) by scheme and participation in Awardees Annual Meeting

Participation in Awardees Annual Meeting	LTF	CDF*	CDA	YIG	PG	All programs
Yes	3.8	-	4.5	3.2	3.3	3.7
No	3.1	3.2	2.4	3.0	3.1	3.1
Total	3.4	3.2	4.2	3.2	3.2	3.4
N	357	6	37	31	116	547

*‘Cannot say’-replies are not included in the table.

Seeing all different groups of awardees together, the average score on HFSP identity is 3.4. As 1 on the scale denotes ‘not at all’ and 5 denotes ‘to a high degree’, 3.4 should be interpreted as some identity with the HFSP, but not a close identity. Awardees that have not participated in any HFSP Awardees Annual Meeting score 3.1 at average, whereas those who have participated score 3.7, indicating that these meetings have a substantial role in creating an HFSP community. This effect seems substantially more important for the Fellows and the CDA-holders, than for the Grant-holders. For the latter group the difference between those who have participated in the meeting and those who have not, is marginal.

Moreover, the CDA-holders seem to have a closer identity with the HFSP than the other awardees. This can be explained by the fact that the CDA-holders are multiple awardees and have been associated with HFSP for a longer period than the other awardees. A substantial part of them have probably participated in several Awardees Annual Meetings. Very few (5) of them have not participated at all.

Table 8.8 Identity with the HFSP. Awardees survey replies, average scores by award year

Did you feel that you were part of a particular HFSP community during your award?	2000	2001	2002	2003	2004	2005
Average score on a scale from 1 to 5	3.1	3.4	3.4	3.6	3.5	3.6
N	100	86	98	104	97	62

“Cannot say” not included in the calculations.

From Table 8.8 we see that those who were awarded in the last part of the period have a somewhat stronger HFSP-identity. One reason for this might be that these awardees also answer for their *current* identity.

In conclusion, the HFSP’s have some abilities to create a sense of community among its awardees, and the strength of the HFSP-identity has been stable or increasing during the analysed period.

9 Conclusions and recommendations

The overall picture that emerges from the analysis of the HFSP activities 2000 to 2005 is very positive. The success seems to have two major premises: First and foremost, the HFSP is a high ranking international research funding organisation whose initiatives are highly appreciated by its awardees. Moreover, the program leadership is engaged in monitoring and adjusting the funding schemes.

This chapter presents the conclusions and recommendations of the review. The presentation follows the questions in the Terms of Reference and is organised thematically as in Chapter 1.

Interdisciplinarity, change of field and collaboration

- *The impact of recent initiatives on the degree of interdisciplinarity of Research Grant teams*

There is a substantial growth in the interdisciplinarity in the teams in the analysed period, as reported by the awardees. The proportion of the funded projects that contained more than one discipline (counting all life sciences as one discipline) increased from 30 percent in award year 2000 to almost 90 percent in award year 2005. Moreover, the members of the Review Committee report that the assessments of the applications have increasingly emphasised the interdisciplinarity in the project teams.

Part of the increase might depend on measurement errors or be part of a general increase in interdisciplinary research. Still, we take a substantial part of the increase to be a result of the HFSP initiatives to stimulate a higher degree of interdisciplinarity – the merger of the two programs in 2002 and more clear emphasis on interdisciplinarity in the call for proposals and in the guidelines to reviewers.

- *The extent to which members of Research Grant teams collaborate and their challenges related to working in intercontinental, interdisciplinary teams*

The majority of the awardees think that the international contributions are vital to their project – 55 percent say the project could not have been organised with participants from one country only, and 82 percent say that the collaborations within the team were of clearly positive importance for the results of the project. These answers indicate that the projects are collaborative in the way that the research of the different participants are integrated and add to the outcome. As different team members are supposed to contribute with competence from different disciplines, this indicates that the projects not only contain more than one disciplines, but that they also to some degree integrate the different disciplines, and thereby fulfil what would normally be a minimum requirement for being denoted as interdisciplinary.

Half of the Principal Investigators report no problems from working in intercontinental, interdisciplinary teams. Few report problems due to different scholarly background or languages. Of those reporting problems, geographical distance was the major problem. In sum, the intercontinentality of the projects seems a much more substantial challenge to the teams than the interdisciplinarity. Moreover, some described problems in keeping the other team members interested in contributing to the project after the award was obtained.

- *The extent to which HFSP Research Grants have seeded collaborations that continue beyond the term of the grant*

A large part of the projects have resulted in continued collaboration. On a scale from 1 to 5 the average score to results in terms of continued collaboration given by the Program Grant-holders is 4.2. The average score given by the Young Investigators is 4.5.

- *The extent to which young scientists have made significant changes in their fields of research through the fellowships, and whether there are barriers against changing fields.*

About 73 percent of the Fellows moved into a new *discipline* when starting their HFSP project (according to predefined disciplinary categories). The degree of significance in the changes is hard to measure. A large part reports to have moved into another area of research within their disciplines, or to a line of research that require input from disciplines they had not previous been involved with (according to their own definitions of disciplines). 13 percent report that they have not moved into a new area of research. The proportion of the Fellows that change field seems to have increased moderately in the analysed period.

Recommendations

The HFSP has been successful in terms of promoting interdisciplinarity and new collaborations. To be able to better measure the extent to which Fellows moves into a new field of research, the term ‘field of research’ needs to be elaborated and predefined in the application form.

Measures to help teams that encounter collaboration problems and to give clearer incentives to collaborate, should be considered – including more leeway to Principal Investigators (PI) in administering the funds, and commitment for the teams to meet during the project. Some PIs that have been supported by the HFSP in reallocating the funds report that this was very helpful. If the possibility of withdrawing funds is more clearly expressed, non-contributing team members could be prevented.

Repatriation and young investigators’ needs

- *The effects of HFSP repatriation incentives, and Fellows’ motivations and problems related to returning to their home country*

19 percent of the surveyed Fellows used the opportunity to return to their home country for the final Fellowship year. In most cases both research and career opportunities and personal/family reasons motivated the return. 94 percent of those that returned have obtained a research position in their home country after the Fellowship, and the HFSP repatriation initiatives seems to facilitate a research career in their home countries. 81 percent of the repatriates report that the possibility of returning home for the final year, very much helped them repatriate. Also the possibility of deferring the final year is deemed helpful. Of those reporting problems on returning home, inferior research facilities and lack of available research positions are the most frequently mentioned problems.

The HFSP Career Development Award (CDA) have good effects both on motivating Fellows to take up a research career in their home country and to facilitate such a career. More than half of the CDA-holders think that the prospect of receiving a CDA helped them or partly helped them in negotiating their position in the home country. Nearly all of them say that the CDA support helped them in establishing an independent research group.

For most CDA-holders, research and career opportunities and personal/family reasons are their major motivations for returning home, whereas obtaining the CDA is an ‘additional’ motivation. Still, for some the CDA is their major motivation for returning home. Given equal economic support, 10 percent CDA-holders would have preferred to establish their group in their HFSP Fellowship country or in a third country. On the other hand, for a third of the Fellows the CDA is not an attractive opportunity, partly because a CDA requires them to return to their home country.

- *The extent to which young investigators have special needs and whether these are met by the current Young Investigators’ Program*

Several of the Young Investigator applicants point to specific problems for Young Investigators in obtaining funds. Young scientists have more restricted scholarly networks and less impressive track records than senior scientists, and without a very good track record one normally does not obtain funds for high-risk, original and interdisciplinary projects, it was stated. Relating to the HFSP they have specific problems in identifying collaborators in other continents and disciplines to form a team filling the HFSP requirements. Some of the Young Investigator applicants also point to dependency on senior scientists as a barrier, and Principal Investigators also point to young investigators having very different degrees of independence as a problem in some of the awarded Young Investigator teams. In sum, the major problems for young investigators in relation to high-risk, original or interdisciplinary research, seem to be funds and independence.

The introduction of the Young Investigator Program in 2001 seems to have substantially improved younger scientists’ chances for obtaining an HFSP award. This conclusion is based on the fact that the age profile of the Young Investigator Program is substantially lower than for the HFSP Grant Program and the success rates for the youngest applicants higher. In the Young Investigator Program 16 percent of Principal Applicants between 30 to 34 years are awarded, whereas for Program Grants the success rate for this age group is 9 percent. Moreover, the Principal Investigators report that their HFSP Young Investigators Grant to a large extent has improved their ability to obtain further funding (in average 4.3 on a scale from 1 to 5), broadened their field of expertise (4.8 on a scale from 1 to 5), and their scholarly network (4.2 on a scale from 1 to 5). The Young Investigator Grant is also the HFSP scheme that seems most important in terms of facilitating research that would otherwise not have been done.

Recommendations

The measures to repatriate young scientist have been successful and are highly appreciated by the awardees. No initiatives to more strongly encourage repatriation are suggested by the respondents. On the contrary, some suggest more support to young scientists regardless of the country in which they want to establish a career.

In order to further meet the expressed needs of young investigators, more funds and measures to secure their independence seem appropriate.

Overall policy and selection procedures

- *The HFSP niche and to what extent it is unique*

From a web search on the six alternative international funding sources mentioned by at least 15 applicants, HFSP seem to have a distinct niche. The applicants seem to have very few, if any, funding alternatives with the same profile and objectives as the HFSP. The HFSP Fellowship scheme seems to be one of very few schemes that articulate a high

priority to Fellows widening their interdisciplinary expertise, and the only truly international scheme with such a focus. We found no other grant scheme with the same international scope and focus on interdisciplinarity for the Life Sciences as the HFSP Grant scheme.

Moreover, compared to other funding alternatives, on all issues examined a large part of the HFSP applicants answer that the HFSP is better. There is also an increase in positive answers (good scores to the HFSP) from 2000 to 2005, especially concerning opportunities offered for doing unique/original and high-risk research compared with applicants' domestic funding alternatives. The HFSP also compares very well with applicants' alternative international funding sources.

- *The rigorousness and impartiality of the review procedures*

The HFSP review procedures seem adequate and compares well with those of other funding organisations. Procedures are clearly defined and the review is thorough, and at the same time there is openness allowing applications that for some reason come up with divergent scores in the first round to be reassessed and awarded in the final round.

There is no evidence that the screening of the Letters of Intent filters out projects that could have been successful. Still, the degree of uncertainty in the assessments – as appearing from high discrepancies in pre-meeting scores for some Letters of Intent – indicate a need for measures to assure that original and high-risk research is not abandoned at the stage of the Letters of Intent.

Moreover, there are substantial differences in Fellowship applicants' success rates depending on nationality, age and gender that should be further examined in order to find the reasons for these differences.

Recommendations

The *HFSP Fellowship Review Committee* and the *HFSP Council of Scientist* should discuss whether there are domestic structural differences in postdocs' abilities to qualify for a HFSP Fellowship and whether such differences may explain the large differences in success rates for different nationalities. They should also discuss to what degree career breaks are taken into consideration when assessing the candidates' productivity as well as other possible explanations to the substantial differences in success rates for male and female applicants, and for different age groups. If structural explanations are found, a next step should be to discuss whether the guidelines need to be changed in order to better support talented young scientists regardless of gender and nationality.

The Terms of Reference specifically ask for recommendations on measures that could be introduced to stimulate more originality in interdisciplinary *Grants*. Based on the analysis of the review procedures (interviews and documents) and the comments from applicants, the following initiatives should be considered if the HFSP decides to further emphasise originality in the projects:

- Discussions in the *HFSP Council of Scientists* and the *Grant Review Committee* to get a broader understanding of the concepts of originality and high risk research and what kind of original projects that the reviewers might overlook. Criticisms from non-awardees (free text comments in the survey) indicate that several think HFSP is risk-averse and to a low degree support innovative and original research because a high-profile track academic record is required to obtain an award.

- Emphasise more the risk-taking attitude of the program, both in instructions to the reviewers, and to the applicants, and clarify what is meant by risk-taking.
- Introduce originality as a separate topic in the final Review Committee discussion of the cut-off line: Are there clearly original and exciting projects under the cut-off line?
- A more 'including' Letter of Intent review should also be considered, according to the suggestions in Chapter 6.
- More dialogue and feedback to applicants and awardees on the originality of their projects – both to underline the priority given to this aspect and to help them to improve their projects.

In general, more transparency and feedback to applicants seem to be needed in both award schemes to increase non-awarded applicants' confidence in the HFSP review procedures.

Overall program initiatives and information/communication

- *The extent to which the Awardees Annual Meeting have succeeded in creating a sense of community among HFSP awardees*

The survey indicates that the Awardees Annual Meetings have a substantial role in creating a sense of community among HFSP awardees, especially for the Fellows and the CDA-holders. Moreover, the large majority of the participants report positive effects of the meetings in terms of giving them interdisciplinary input and widening their scholarly network.

- *The extent to which the HFSP web site and annual report are appropriate for stimulating interest in the Program, and what other types of web-based information or services HFSP could provide that would be useful to awardees*

Information from colleagues and the HFSP web-site are the most important information sources stimulating applicants' interest in applying for HFSP awards. For most awardees the HFSP Annual Report seem to be of little use.

Recommendations

Most awardees are clearly interested in joining an international HFSP alumni network, which indicates that such a network should be established – open both to past and present awardees. Such a network should be valuable in facilitating new international and interdisciplinary collaboration, and would probably also contribute to a stronger HFSP-identity among past and present awardees. Another initiative that would be welcomed by the awardees are additions to the HFSP web site including overview and contact information to past and present awardees, notice board for job opportunities and new collaboration, as well as discussion forums.

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Appendix 1 Terms of Reference

Extracted from "Human Frontier Science Program. Terms of Reference for Program Review. Call for Tenders" HFSP, May 2005. The items concerning scientific content and qualities were not the tasks for the present review.

4. Terms of Reference

Information about the current HFSP programs and changes made since 2000 is provided in the accompanying document "Activities of the Human Frontier Science Program Organization" Issues that should be addressed in this study are listed below. The proposal should indicate if any of the issues listed below could be better approached by an expert panel of leading scientists.

Research Grants

- The impact of recent initiatives (since 2000) on the degree of interdisciplinarity of Research Grant teams
- The extent to which there has been a significant change in the scientific content of grants funded
- The extent to which there has been a significant change in the originality and challenging nature of projects funded.
- Are there measures that could be introduced to stimulate more originality in interdisciplinary grants?
- What is the HFSP niche and to what extent is it unique?
- The extent to which members of Research Grant teams collaborate. Are there specific challenges of working in intercontinental, interdisciplinary teams?
- The extent to which HFSP Research Grants have seeded collaborations that continue beyond the term of the grant.
- The quality of publications that result from HFSP Research Grants
- The rigorosity and impartiality of the review procedures for Research Grants, e.g.
 - The guidance provided to committees
 - The extent to which procedures are clearly defined and articulated
 - The steps taken to avoid conflicts of interest
 - The extent to which any features of the review process inhibit success of original, interdisciplinary applications
- The extent to which young investigators have special needs and whether these are met by the current Young Investigators' Program.

Fellowships/Career Development Award

- The scientific quality of the fellows.
- The extent to which young scientists have made significant changes in their fields of research through the fellowships, and the significance of recent initiatives (i.e. requiring fellows to change field). Are there barriers against changing fields?
- The extent to which the introduction of the third year of the Long-Term Fellowship with the option of deferment for two years in the host laboratory before taking the third year in the home country, and the introduction of the Career Development Award have improved countries' ability to repatriate young scientists? What were

candidates' motivations for returning to their home country? What problems were faced on returning home?

Awardees Annual Meeting

- The extent to which the Awardees Annual Meeting succeeded in creating a sense of community among HFSP awardees.

Other Issues

- The extent to which the HFSP web site and annual report are appropriate for stimulating interest in the Program, providing clear information for those interested and relevant accounts of the outcome of HFSP awards? What other types of web-based information or services could HFSP provide that would be useful to awardees?

Appendix 2 Informant list

Telephone interviews

Chairs and members of the HFSP Review Committees and the Council of Scientists

William S. Bialek	09.11.2005
Frances Brodsky	16.11.2005
Shin'ichi Ishiwata	15.11.2005
Elisa Izaurralde	15.11.2005
Jean-François Joanny	01.02.2006
Daniel Kiehart	02.11.2005
Paul F. Lasko	15.11.2005
Robin Lovell-Badge	08.11.2005
Jean-Philippe Pin	18.11.2005
Gunter Schneider	03.11.2005
Joachim Seelig	24.01.2006

Meetings

Up-start meeting with HFSPo, Strasbourg, 09.09.2005

Guntram Bauer
Jill Husser
Armelle Koukoui
Marie-Claude Perdigues
Martin Reddington
Geoff Richards
Takayuki Shirao
Patrick Vincent
Torsten Wiesel

HFSP Board of Trustees, Strasbourg, 04.-05.12.2005

Presentation and discussion of interim report from the project.

Appendix 3 Technical notes on survey data

Mismatch of respondent replies and the HFSP register data

In the survey questionnaire each respondent was first asked whether or not he/she had obtained an HFSP award (grant or fellowship) in the period 2000-2005. Those who answered that they had were then directed to this text: ⁴¹

(Q2) Please indicate the type of HFSP award you have received. If you have received more than one award, please answer according to your last award as Principal Applicant/PI/Fellow/CDA holder. In the remaining of this questionnaire, this is the award/project your answers should relate to.

Four options were given:

*Program Grant/Research Grant
Young Investigator Grant
Long-Term Fellowship or Cross-Disciplinary Fellowship
Career Development Award*

Those who answered that they had not obtained an HFSP award were directed to this text:

Please indicate the type of HFSP award you have applied for. If you have applied more than once, please answer according to your last application as Principal Applicant. In the remaining of this questionnaire, this is the application/project your answers should relate to.

Three options were given:

*Program Grant/Research Grant
Young Investigator Grant
Long-Term Fellowship or Cross-Disciplinary Fellowship*

Each respondent was then directed to the questions relevant to their answers to these two first questions.

When analysing the survey data we found some mismatch between respondent replies to the two first questions and the HFSP register data. Relating to the first question (awardee or not) there were 43 cases of mismatch between respondents' replies and HFSP register data. 7 awardees answered that they had not been awarded in the relevant period and 36 non-awardees answered that they had been awarded in the period. Looking closer into the data we found an explanation to all but one of the mismatches. 6 of the 7 that answered they had not obtained an award were awarded in 2000 and probably had incomplete memory about when they had received the award. The 7th were awarded in 2005 but had not yet started the project and might therefore still define him/herself as a non-awardee. Of the 36 that answered that they had obtained an award, 11 had obtained an award before 2000 (but were on the respondent list for a later, non-awarded application), 19 had been awarded as co-investigators (but not as PI on the application they were supposed to relate their answers to), 4 had obtained a Short-Term-Fellowship and 1 was the host of a Long-Term-Fellow. In all these 35 cases the respondent answered the questionnaire relating to applications and awards other than the application they were supposed to, and in all cases

⁴¹ In addition, the instructions in the e-mail giving the link to the survey contained the following text: "The survey is directed to HFSP applicants and awardees 2000-2005. If you are a grant applicant/awardee, please note that the survey is sent to Principal Applicants/Pis only, so that there will only be one reply per application/project."

these were applications and awards that were not supposed to be included in the survey. In the 36th case we found no reason why the respondent should regard him/herself as an HFSP awardee.

Relating to the second question (kind of application/award) there were 35 cases of mismatch that had implications for which categories of questions they were routed to⁴² (in addition to the mismatches cases of Question 1 – the first cases of mismatches were excluded in the analysis of mismatches in the second question). The largest group was Long-Term-Fellows applicants (17) that defined their applications as applications for Young Investigator Grants. We expect incomplete memory about the application categories to be the reasons for these mismatches. In the cases of multiple applications from the same person, incomplete memory about which was the last application may also be an explanation.

How cases of mismatch are handled in the analysis

The analysis of mismatch indicates that in these cases the respondents relate their answers to applications that are not supposed to be included in the review, or they are not directed to the questions appropriate for their kind of application. In the analysis these replies are therefore *excluded*, except in the analysis of replies not directly relating to specific applications. Implication: up to 5 percent (i.e. the total of 78 mismatches) of the 1491 respondents are not included when answers are analysed according to different application or award categories.

⁴² In addition there were 45 mismatches that had no routing implications. These were respondents that defined Program Grants as Young Investigator Grants or vice versa.

Appendix 4 Tables

Applicant survey response rates

Table A. 1 Applicant survey response rates by awardee status

Awardee status*	Completed		Accessed but not completed		No response		Total
	Count	Row %	Count	Row %	Count	Row %	Count
Lol rejected by SC	398	22.4	168	9.5	1207	68.1	1773
Not awarded	424	19.9	196	9.2	1506	70.8	2126
Awarded	664	82.0	37	4.6	109	13.5	810
Award declined by applicant	5	19.2	2	7.7	19	73.1	26
N	1491	31.5	403	8.5	2841	60.0	4735

*This is status as defined by HFSP register data and give a slightly different result than award status as defined by the respondents. In 43 cases there is a mismatch between respondents' replies and the HFSP register data. See Technical Notes in Appendix 3 for information about how these cases are handled in the analysis.

Table A. 2 Applicant survey response rates, non-awarded applicants by program, percentages

Not awarded	Program Grant/Young Investigator Grant	Long-Term/Cross-Disciplinary Fellowship	Total
Completed	22.5	19.1	21.1
Accessed but not completed	9.0	9.8	9.3
No response	68.5	71.1	69.6
N	2254	1645	3899

Table A. 3 Applicant survey response rates, awarded applicants by program, percentages

Awarded	Program Grant/Young Investigator Grant	Long-Term/Cross-Disciplinary Fellowship	CDA	Total
Completed	77.4	80.0	95.2	80.0
Accessed but not completed	5.4	4.5	2.4	4.7
No response	17.2	15.5	2.4	15.3
N	239	555	42	836

Note: Response rates for awarded applicants is somewhat lower as awards declined by the applicant here is part of the awarded category.

Table A. 4 Applicant survey response rates by award year

Reference year	Completed		Accessed but not completed		No response		N
	Count	Row %	Count	Row %	Count	Row %	
2000	145	35.1	24	5.8	244	59.1	413
2001	135	30.1	29	6.5	285	63.5	449
2002	176	29.1	50	8.3	378	62.6	604
2003	240	28.1	68	8.0	545	63.9	853
2004	346	29.6	97	8.3	725	62.1	1168
2005	449	36.0	135	10.8	664	53.2	1248
Total	1491	31.5	403	8.5	2841	60.0	4735

Table A. 5 Applicant survey response rates by application type

Application for:**	Completed		Accessed but not completed		No response		N
	Count	Row %	Count	Row %	Count	Row %	
Program Grant	561	27.2	173	8.4	1332	64.5	2066
Young Investigator Grant	131	30.7	43	10.1	253	59.3	427
Long-Term Fellowship	740	34.6	181	8.5	1220	57.0	2141
Cross-Disciplinary Fellowship	19	32.2	5	8.5	35	59.3	59
CDA*	40	95.2	1	2.4	1	2.4	42
Total	1491	31.5	403	8.5	2841	60.0	4735

*CDA only includes awardees as all non-awarded CDA applicants have been awarded as LTF (and replied as such).

**The analysis is based on application category as defined by HFSP register data. In 35 cases respondents' replied to the question about what kind of application they had submitted/what kind of award they had received in a way that routed them to different categories of questions than they were supposed to answer according to how their application/award was registered by the HFSP. See Technical Notes in Appendix 3 for information about how these cases are handled in the analysis.

Table A. 6 Applicant survey response rates by applicant's/PI's nationality and program, percentages

	North America	South & Central America	Europe	Asia	Oceania	Africa & The Middle East	Total
Grants							
Completed	21.3	27.3	26.4	27.0	33.3	54.5	25.2
Accessed but not completed	4.9	9.1	8.7	11.1	0	9.1	7.9
No address/incorrect address	8.7	0	9.4	9.3	0	9.1	9.2
No response	65.1	63.6	55.4	52.7	66.7	27.3	57.7
N	733	11	1753	226	9	11	2743
Fellowship and CDA							
Completed	20.8	29.7	22.0	19.4	21.8	27.1	21.8
Accessed but not completed	4.9	3.9	4.3	8.2	0	4.8	5.1
No address/incorrect address	31.8	29.7	41.4	39.0	45.6	25.1	38.7
No response	42.5	36.7	32.3	33.5	32.7	43.0	34.3
N	346	128	2072	806	101	207	3660

Applicant survey results

Table A. 7 Fellowship applicants' main research area before and in the application, survey replies

Area	Main area before		Main area of application	
	Percent	Cases	Percent	Cases
Fundamental Life Sciences				
Biochemistry	12.0	87	7.3	52
Cell biology	14.1	102	16.0	115
Developmental biology	11.3	82	12.7	91
Genetics	5.1	37	5.6	40
Immunology	3.9	28	3.3	24
Neuroscience	15.1	109	23.3	167
Microbiology	2.2	16	2.2	16
Molecular biology	10.7	77	9.9	71
Plant biology	5.0	36	2.5	18
Structural biology	4.7	34	5.6	40
Other Fundamental Life Sciences	5.3	38	7.1	51
Other Life Sciences	1.5	11	1.4	10
Chemistry	4.4	32	1.1	8
Physics	3.3	24	.7	5
Engineering and Technology	.9	6	.2	2
Other disciplines	.6	4	1.0	7
Total/N	100.0	723	100.0	717

Table A. 8 Main research area of Fellowship applications, survey replies, percentages

Main area of your Fellowship application	Not awarded	Awarded	Total
	Percent	Percent	Cases
Fundamental Life Sciences			
Biochemistry	8.1	6.7	52
Cell biology	15.5	16.4	115
Developmental biology	12.0	13.2	91
Genetics	5.6	5.5	40
Immunology	1.8	4.4	24
Neuroscience	23.2	23.3	167
Microbiology	3.2	1.6	16
Molecular biology	11.6	8.8	71
Plant biology	1.4	3.2	18
Structural biology	5.6	5.5	40
Other Fundamental Life Sciences	6.3	7.6	51
Other Life Sciences	2.5	.7	10
Chemistry	1.4	.9	8
Physics	.4	.9	5
Engineering and Technology	.4	.2	2
Other disciplines	1.1	.9	7
N	284	433	717

Table A. 9 Deferring the last year of the Fellowship. Fellows' survey replies, percentages.

For Fellows taking the last year of the Fellowship in their home country, HFSP offer the possibility of deferring the last year (up to 2 years) to plan the return to the home country. Did you defer the 3rd year of your Fellowship?		Percent
Yes		40.4
No		59.6
N		47

No substantial difference between male and female Fellows (42% of males deferred last year, 38% of females).

Table A. 10 "If you are aware of other funding sources relevant for the kind of project for which you applied to the HFSP, please indicate these below" survey replies, percentages

Alternative international funding	Not awarded	Awarded	Total	
			Percent	cases
Explicitly states no alternative	7.2	7.8	7.5	110
Lists one alternative	23.4	28.9	25.9	381
Lists more than one alternative	12.8	16.6	14.6	214
No answer/no specific alternative listed	56.5	46.6	52.0	765
N	803	667		1470

Table A. 11 *HFSP compared with applicants' domestic funding sources. Grant applicants' survey replies by continent (applicants'/PI's nationality), Percentages answering better*

Comparing HFSP with your domestic funding sources, is HFSP poorer, about the same or better concerning:	North America	Europe	Asia	Other	All
Opportunities of building new intercontinental scholarly networks?	81.0	78.9	71.4	90.0	78.9
Impact on the prestige and career of the awarded investigators?	34.5	66.2	60.7	40.0	58.1
Opportunities offered for doing interdisciplinary research?	53.0	55.5	60.7	72.7	55.7
Flexibility of use of funds?	37.8	54.0	58.9	54.5	50.8
Opportunities offered for broadening your field of expertise?	41.6	46.8	50.0	36.4	45.7
Support of young scientists?	26.4	33.9	39.3	20.0	32.4
Opportunities offered for doing unique/original research?	33.1	48.2	42.9	45.5	44.3
Support to new projects without requiring preliminary research?	32.9	33.3	23.2	70.0	32.9
Opportunities offered for addressing high-risk topics?	35.8	43.5	19.6	54.5	39.9
Amount of funding?	22.8	51.5	32.1	18.2	42.7
N (varies between the items above)	147-149	436-438	56	10-11	649-654

"Other" comprises: South & Central America, Oceania, Africa & Middle East.

Table A. 12 *HFSP compared with applicants' domestic funding sources. Fellowship applicants' survey replies by continent (applicants' nationality), Percentages answering better*

Comparing HFSP with your domestic funding sources, is HFSP poorer, about the same or better concerning:	North America	South & Central America	Europe	Asia	Oceania	Africa & Middle East	All
Opportunities of building new intercontinental scholarly networks?	71.0	55.9	66.7	64.6	60.0	53.1	65.1
Impact on the prestige and career of the awarded investigators?	62.3	64.7	73.1	68.8	50.0	55.1	69.0
Opportunities offered for doing interdisciplinary research?	53.6	50.0	59.8	52.1	55.0	46.9	56.2
Flexibility of use of funds?	41.2	54.5	54.6	50.7	50.0	46.9	51.8
Opportunities offered for broadening your field of expertise?	56.5	50.0	53.9	49.3	55.0	62.5	53.7
Support of young scientists?	49.3	44.1	49.5	45.5	50.5	40.8	47.9
Opportunities offered for doing unique/original research?	52.2	50.0	48.9	50.7	55.0	51.0	49.9
Support to new projects without requiring preliminary research?	39.4	32.4	38.3	31.9	30.0	36.7	36.5
Opportunities offered for addressing high-risk topics?	42.0	44.1	41.2	36.1	35.0	38.8	40.1
Amount of funding?	59.4	64.7	63.4	43.8	65.0	49.0	58.3
N	69	34	409	144	20	49	725

Table A. 13 HFSP compared with alternative international funding sources. Applicants' survey replies, percentages

Comparing HFSP with alternative international funding sources, is HFSP poorer, about the same or better concerning:	Poorer	About the same	Better	Don't know	N
Opportunities offered for doing interdisciplinary research?	2.6	27.6	40.3	29.6	1438
Impact on the prestige and career of the awarded investigators?	2.4	26.6	39.8	31.2	1435
Flexibility of use of funds?	2.5	22.3	37.4	37.8	1437
Opportunities of building intercontinental new scholarly networks?	2.2	27.7	36.6	33.5	1431
Opportunities offered for broadening your field of expertise?	3.4	32.5	32.8	31.2	1429
Amount of funding?	7.2	31.9	32.6	28.2	1437
Opportunities offered for doing unique/original research?	3.6	33.6	32.5	30.3	1439
Opportunities offered for addressing high-risk topics?	4.1	27.1	30.8	38.0	1433
Support to new projects without requiring preliminary research?	4.7	29.1	28.8	37.4	1436
Support of young scientists?	4.2	33.1	28.5	34.3	1437

Applicant profiles, review data and success rates

Table A. 14 Grant applications 2000-2005 by PI continent/location, percentages

PI's location	2000	2001	2002	2003	2004	2005	Total %	# Appl
North America	38.0	35.5	45.2	31.8	29.6	36.4	35.5	973
Europe	55.5	56.5	51.2	59.2	64.7	57.2	58.2	1596
Asia	6.5	8.1	3.6	8.9	5.5	6.4	6.3	174
Other					.1		.0	1
N	245	310	445	449	669	626	100.0	2744

Source: Data provided by HFSP. Lists of respondents to applicant survey including persons that applied at least once in the period 2000-2005.

Table A. 15 Fellowship applications 2000-2005 by applicant's nationality, percentages

Part of the world	2000	2001	2002	2003	2004	2005	Total %	# Appl
North America	9.1	8.3	8.9	9.0	11.2	10.1	9.5	342
South & Central America	2.4	2.6	3.0	3.5	5.9	3.4	3.5	127
Europe	62.2	57.8	57.4	54.2	54.1	54.5	56.6	2047
Asia	17.8	23.9	23.8	23.2	21.2	22.7	22.1	799
Oceania	2.7	2.6	3.2	3.3	2.5	2.5	2.8	101
Africa & the Middle East	5.8	4.8	3.8	6.8	5.1	6.8	5.6	202
N	585	581	530	603	645	675	100.0	3618

Source: Data provided by HFSP. Lists of respondents to applicant survey including persons that applied at least once in the period 2000-2005.

Table A. 16 Result of Fellowship review 2000 and 2002 by difference between average scores given by Review Committee members prior to meeting and final score, percentages.

Difference in Scores*	2000			2002		
	% Not awarded	% Awarded	N	% Not awarded	% Awarded	N
< 1	40.2	59.8	254	30.8	69.2	146
1-2	68.4	31.6	19	71.4	28.6	7
>2	100.0	0	379	100.0	0	414
Total	75.8	24.2	652	81.8	18.2	567

*Scores given on a scale from 1-10. A difference of '1' equals one point on this scale.
23 applicants offered an award, but that declined, are included as awarded.

Table A. 17 Fellowship review 2003 and 2005: difference between average scores given by Review Committee members prior to meeting and final score, percentages.

Pre-meeting scores	Final score					N
	0-5.99	6-6.99	7-7.99	8-8.99	9-9.99	
2003						
AA AB	1.0	3.8	12.5	45.2	37.5	104
AC AD	55.9	1.7	16.9	23.7	1.7	59
BB		13.7	60.8	25.5		51
BC DD	100.0					425
Total 2003	71.8	1.9	8.5	11.6	6.3	639
2005						
AA AB	2.4	1.2	28.6	50.0	17.9	84
AC AD	52.9	8.8	26.5	11.8	0.0	34
BB	8.6	22.9	54.3	14.3	0.0	35
BC DD	100.0	0.0	0.0	0.0	0.0	521
Total 2005	80.7	1.8	7.7	7.6	2.2	674

Table A. 18 Review Committee Members and gender distribution 1995, 2000-2005

Year	Total members of Review Committees	Percent female members	Percent male members
1995	70	10	90
2000	73	18	82
2001	72	19	81
2002**	47	13	87
2003	48	21	79
2004	48	19	81
2005	48	21	79
<i>All members 1995; 2000-2005*</i>	231	16	84

*Counting each person once. The table sum, on the other hand, amounts to 406 memberships.

**The drop in members relates to the reorganisation of the program and the review process (from separate Committees on Monelcular and Brain Sciences to Committees common to all fields (one for Fellowships and one for Grants).

Table A. 19 Success rates by applicant's nationality, HFSP Fellowships 2000-2005.

Nationality/Country	Applications 2000-2005	Awards 2000-2005	Success rate
Austria	37	10	27.0
Switzerland	49	13	26.5
Republic of Korea	42	11	26.2
Israel	174	44	25.3
Germany	310	71	22.9
Slovakia	9	2	22.2
Greece	42	9	21.4
Belgium	48	10	20.8
Canada	203	41	20.2
Finland	25	5	20.0
Hungary	26	5	19.2
Argentina	42	8	19.0
Denmark	21	4	19.0
Netherlands	116	22	19.0
Portugal	27	5	18.5
United States of America	149	27	18.1
China	53	8	15.1
France	597	90	15.1
Italy	165	24	14.5
Taiwan China	7	1	14.3
Japan	635	81	12.8
United Kingdom	186	23	12.4
Spain	291	30	10.3
Australia	89	9	10.1
Ireland	22	2	9.1
India	91	8	8.8
Mexico	23	2	8.7
Poland	26	2	7.7
Russian Federation	26	2	7.7
Brazil	27	2	7.4
Czech Republic	15	1	6.7
Sweden	61	3	4.9
Chile	9	0	0.0
New Zealand	8	0	0.0
Bulgaria	7	0	0.0

Source: Aggregated data file provided by the HFSP Fellowship Program.

Note: Includes countries with more that 6 applications in the period 2000-2005.

Applicant survey data: effects

Table A. 20 Collaboration without the HFSP award. Grantees' survey replies.

Would you have done research with the same partners if you had not obtained the HFSP grant?	PG	YIG
Yes	10.3	8.1
Partly, I would have done research with some of the members	60.3	59.5
No	26.7	27.0
Don't know	2.7	5.4
N	146	37

Table A. 21 Research location without the HFSP award. Fellows' survey replies.

Would you have done research at the same host laboratory if you had not obtained the HFSP grant?	Percent
Yes	76.5
No	8.4
Don't know	15.0
N	439

Table A. 22 Employment with and without an HFSP award. Applicants' survey replies.

In which sector are you currently employed?	Not awarded	Awarded	Total
Research at a university or non profit research laboratory/institute	98.6	98.0	98.3
Research in a for profit company (e.g. biotech, pharma indus	0.9	0.5	0.7
Communication (e.g. science writing, publishing)	0.0	0.2	0.1
Administration/NGO (e.g. funding agency, research policy/adm	0.1	0.3	0.2
Unemployed	0.1	0.3	0.2
Other	0.3	0.8	0.5
N	781	663	1444

Table A. 23 Program Grants: Awardees' current position by award year, PIs survey replies, percentages

What is your current position?	2000	2001	2002	2003	2004	2005	Total
Senior faculty (e.g. head of department/institute, associate/full professor, research director)	93.9	93.5	95.5	61.1	84.2	90.5	88.2
Junior faculty (e.g. assistant professor, lecturer)	6.1	6.5	4.5	33.3	15.8	4.8	10.4
Independent young investigator				5.6		4.8	1.4
N	33	31	22	18	19	21	144

Table A. 24 Young Investigator Grants: Awardees' current position by award year, PIs survey replies, percentages

What is your current position?	2001	2002	2003	2004	2005	Total
Senior faculty (e.g. head of department/institute, associate/full professor, research director)	55.6	50.0	25.0	50.0	16.7	40.5
Junior faculty (e.g. assistant professor, lecturer)	33.3	40.0	75.0	50.0	50.0	48.6
Independent young investigator					33.3	5.4
Other	11.1	10.0				5.4
N	9	10	8	4	6	37

Table A. 25 CDA: Awardees' current position by award year, CDA-holders' survey replies, percentages

What is your current position?	2003	2004	2005	All years
Senior faculty (e.g. head of department/institute, associate/full professor, research director)	25.0	7.1	5.6	10.0
Junior faculty (e.g. assistant professor, lecturer)	37.5	71.4	66.7	62.5
Independent young investigator	37.5	21.4	27.8	27.5
N	8	14	18	40

Table A. 26 Identity with the HFSP. Awardees survey replies, percentages

	Not at all				To a high degree	Cannot say	N
	1	2	3	4	5		
Did you feel that you were part of a particular HFSP community during your award?	7.4	13.3	19.7	22.7	19.7	17.1	660

Table A. 27 Fellowship applications 2001-2005: Success rates by age and gender.

Age	Gender	Percent awarded	N
Below 30 (24-29)	Male	18.8	547
	Female	12.0	465
30-34	Male	18.2	1100
	Female	14.2	593
35-39	Male	12.3	195
	Female	4.5	88
40-49	Male	6.5	31
	Female	0.0	11

Appendix 5 Applicant questionnaire

The next pages contain *the text* of the web-questionnaire to HFSP applicants 2000-2005. Respondents were routed to different questions depending on their answers to foregoing questions. This routing is not visible in this paper version, which contains all questions to all kinds of applicants (Applicants for Fellowship, Grant and CDA, awarded and non-awarded).

QUEST6

If you think there are features of HFSP that inhibit original and interdisciplinary projects, or support to young scientists, please elaborate.

QUEST7

HFSP and alternative funding

If you are aware of other funding sources relevant for the kind of project for which you applied to the HFSP, please indicate these below:

- Other international funding
- Domestic funding programs

QUEST8

Comparing HFSP with your *domestic* funding sources, is HFSP poorer, about the same or better concerning:

	Poorer	About the same	Better	Don't know
Opportunities offered for doing unique/original research?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opportunities offered for addressing high-risk topics?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Support to new projects without requiring preliminary research?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opportunities offered for doing interdisciplinary research?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opportunities offered for broadening your field of expertise?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Amount of funding?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flexibility of use of funds?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Support of young scientists?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Impact on the prestige and career of the awarded investigators?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opportunities of building new intercontinental scholarly networks?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QUEST9

Comparing HFSP with alternative *international* funding sources, is HFSP poorer, about the same or better concerning:

	Poorer	About the same	Better	Don't know
Opportunities offered for doing unique/original research?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opportunities offered for addressing high-risk topics?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Support to new projects without requiring preliminary research?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opportunities offered for doing interdisciplinary research?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opportunities offered for broadening your field of expertise?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Amount of funding?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flexibility of use of funds?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- | | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| Support of young scientists? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Impact on the prestige and career of the awarded investigators? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Opportunities of building intercontinental new scholarly networks? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

QUEST10

Your HFSP project/application

Would you describe your HFSP project/application as interdisciplinary?

- Yes, drawing extensively on more than one discipline
- Yes, with limited inputs from at least one other discipline
- No, almost entirely within the boundaries of a single discipline

QUEST11

Which disciplines did your HFSP project encompass?

- Fundamental Life Sciences (i.e. fields directed at understanding basic biological mechanisms)
- Other Life Sciences (fields not primarily directed at understanding basic biological mechanisms, e.g. Clinical Sciences, Environmental Sciences, Agricultural Sciences)
- Chemistry
- Physics
- Mathematics
- Computer Science
- Engineering and Technology (other than Computer Science)
- Other disciplines

QUEST12

Please specify the fundamental life sciences your project encompassed:

- Biochemistry
- Cell biology
- Developmental biology
- Genetics
- Immunology
- Neuroscience
- Microbiology
- Molecular biology
- Plant biology
- Structural biology
- Other fundamental Life Sciences (specify on next page)

QUEST13

Please specify the other fundamental Life Sciences in the project

QUEST14

Did the HFSP Fellowship cause you to move into a new area of research?

- No
- Yes, I moved into another area of research within my discipline
- Yes, I moved into a line of research that required input from disciplines that I had not previously been involved with
- Yes, I moved into a completely new discipline

QUEST15

If awarded, would the HFSP Fellowship have caused you to move into a new area of research?

- No
- Yes, I would have moved into another area of research within my discipline
- Yes, I would have moved into a line of research that required input from disciplines that I had not previously been involved with
- Yes, I would have moved into a completely new discipline

QUES16B

Your main area before applying

- Fundamental Life Sciences - Biochemistry
- Fundamental Life Sciences - Cell biology
- Fundamental Life Sciences - Developmental biology
- Fundamental Life Sciences - Genetics
- Fundamental Life Sciences - Immunology
- Fundamental Life Sciences - Neuroscience
- Fundamental Life Sciences - Microbiology
- Fundamental Life Sciences - Molecular biology
- Fundamental Life Sciences - Plant biology
- Fundamental Life Sciences - Structural biology
- Fundamental Life Sciences - Other (specify next page)
- Other Life Sciences
- Chemistry
- Physics
- Mathematics
- Engineering and Technology - Computer Science
- Engineering and Technology - Other than Computer Science
- Other disciplines

QUES17

Main area of your Fellowship application

- Fundamental Life Sciences - Biochemistry
- Fundamental Life Sciences - Cell biology
- Fundamental Life Sciences - Developmental biology
- Fundamental Life Sciences - Genetics
- Fundamental Life Sciences - Immunology
- Fundamental Life Sciences - Neuroscience
- Fundamental Life Sciences - Microbiology
- Fundamental Life Sciences - Molecular biology

- Fundamental Life Sciences - Plant biology
- Fundamental Life Sciences - Structural biology
- Fundamental Life Sciences - Other (specify next page)
- Other Life Sciences
- Chemistry
- Physics
- Mathematics
- Engineering and Technology - Computer Science
- Engineering and Technology - Other than Computer Science
- Other disciplines

QUEST18

Please specify your main area before applying

QUEST19

Please specify the main area of your HFSP Fellowship project

QUEST20

Barriers to changing fields

The HFSP is concerned to help postdoctoral researchers to master a wide repertoire of skills and expertise through the Fellowship programs by facilitating a change of research field. To provide HFSP with advice on how to improve their programs we would like your view on the following statements related to barriers against changing research field:

	Disagree	Partly agree	Agree	Don't know
There are no substantial barriers against changing research fields	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is hard to change field because academic positions often do not allow scientists to freely pursue their research interests	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You are not invited to a leading lab to do research outside your field of competence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is difficult to obtain a grant or fellowship to do research in a new field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QUEST21

Barriers to interdisciplinarity

What is your view on the following statements related to barriers against doing interdisciplinary research?

	Disagree	Partly agree	Agree	Don't know
There are no substantial barriers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|
| against interdisciplinary research | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The academic reward system provides little incentive for interdisciplinarity (conservative peer reviews, lower academic credits for interdisciplinary publication etc.) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Interdisciplinarity is inhibited because research positions often do not allow scientists to freely pursue their research interests | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| It is more difficult to find a suitable journal for publication of interdisciplinary research | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| If younger scientists were less dependent on senior scientists there would be more interdisciplinary research | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Most funding opportunities are for research within a single discipline | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| In most cases approaches within a single discipline provide more solid and valuable results than interdisciplinary approaches | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

QUEST22

Collaboration in your HFSP project

How important are/were the collaborations within the project team for the results in your part of the project?

- of clearly positive importance
- of partly positive importance
- of no importance
- of partly negative importance (e.g. because a waste of time)
- of clearly negative importance (I would have achieved more without the collaboration)
- cannot say

QUES23

Planning your HFSP project, did you encounter difficulties in finding collaborators in different countries?

- No
- To some extent
- Yes

QUEST24

Could a project with a similar scientific content have been organised with participants from one country only?

- No
- Partly
- Yes

QUEST25

Had you collaborated with any of the members of your HFSP project team before?

- None of them
- Some of them
- All of them

QUEST26

Did your HFSP project encounter any of the following problems of working in international,

interdisciplinary teams? (please tick all relevant alternatives)

- Problems due to geographical distance
- Problems due to different languages
- Problems due to different scholarly background
- Problems due to different economies or administrative systems
- Problems due to young investigators having very different degrees of independence
- Other collaboration problems
- No, non of the above

QUEST27

Are there any features of the HFSP that could be improved to better deal with the challenges of working in intercontinental, interdisciplinary teams?

QUEST28

Your HFSP Fellowship and mobility

In which country were you working at the time you applied for the HFSP Fellowship? (The drop-down list contains all HFSP member countries in alphabetic order, and below the rest of the countries of the world.)

- Select country

QUEST29

Were you already in your host institution when you were awarded the HFSP Fellowship?

- No
- Yes

QUEST30

Would you have done research at the same host laboratory if you had not obtained the HFSP fellowship?

- Yes
- No
- Don't know

QUEST31

If your HFSP Fellowship is completed, please indicate in which countries you have held research positions *after completing* your HFSP project.

- My HFSP host country
- My home country
- The country in which I worked prior to the HFSP project (if different from your home country)
- Another country
- My HFSP Fellowship is not completed

QUEST32

Throughout your research career, in how many different countries have you held a research position or fellowship?

QUEST33

What were/would be your motivations for international job mobility?

	Unimportant	Partly important	Important
To increase my professional opportunities in my home country	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dissatisfaction with my home laboratory	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Location close to my spouse/family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To receive a higher salary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To obtain a more independent research position	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To work in the laboratory doing the most interesting research in the relevant field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To work with leading researchers in a prestigious laboratory	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To work in a laboratory with excellent research facilities and generous research budgets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QUEST35

	Not at all 1	2	3	4	To a high degree 5	Cannot say
To what degree did the Research & Travel Allowance of your HFSP Fellowship improve your ability to carry through your project in the host country?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To what degree was the Living Allowance of your HFSP Fellowship sufficient in your host country?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QUEST36

Did you return to your home country for the third year of your HFSP Fellowship?

- I have not yet started my 3rd HFSP fellowship year
- Yes, I spent/am spending my 3rd HFSP fellowship year (or parts of it) in my home country
- No, I spent/am spending my 3rd HFSP fellowship year in my host country
- No, I had/have a two-year HFSP Fellowship
- No, I chose to terminate my fellowship before the third year

QUEST37

Why did you terminate your HFSP Fellowship before the end of the award period?

- I obtained a more attractive fellowship
- I obtained a permanent/tenure track research position
- I decided to change to another line of research
- I decided to leave research
- Other reason (please specify on next page)

QUEST38

Please specify the reasons for the termination of your HFSP Fellowship

QUEST39

What were your motivations for returning to your home country for the final year of your Fellowship?

	Unimportant	Partly important	Important
Research and career opportunities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personal/family reasons	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify on next page)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QUEST40

Please specify your other motivations for returning home for the final year

QUEST41

Did you encounter problems on returning home for the final year of your Fellowship?

	No	Partly	Yes
No established research group in the field in my home country	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inferior research facilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No opportunity to continue the same line of research I performed in my HFSP host laboratory	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No available research position after the Fellowship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other problems (please specify on next page)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QUEST42

Please specify your other problems on returning home

QUEST43

To what degree did the HFSP Fellowship help you repatriate?

- Not at all
- Somewhat
- Very much
- Cannot say

QUEST44

For Fellows taking the last year of the Fellowship in their home country, HFSP offer the possibility of deferring the last year (up to 2 years) to plan the return to the home country. Did you defer the 3rd year of your Fellowship?

- Yes
- No

QUEST45

To what degree did the possibility of deferring the third year of your HFSP Fellowship help you plan your return to the home country?

- Not at all
- Somewhat
- Very much
- Cannot say

QUEST46

Have you considered applying for the HFSP Career Development Award (CDA)?

- No
- Yes, I plan to apply for the CDA
- Yes, I have applied for the CDA, but it was not awarded
- Yes, I have applied and obtained a CDA

QUEST47

What was the implication of the rejection of your application for a Career Development Award?

- I continued research in my HFSP host country
- I did research in my home country
- I did research in another country
- Other (please specify on next page)

QUEST48

Please specify the implications of the rejection of your CDA applications.

QUEST49

Why have you not considered applying for the HFSP Career Development Award (CDA)?

- In my situation the CDA is not an attractive opportunity
- I don't know much about the CDA
- It is too early to plan my career after the Fellowship
- Other reasons (please specify on next page)

QUEST50

Please specify your reasons for not considering applying for a CDA.

QUEST51

Questions to holders of the Career Development Award

What would you have done if you had not obtained the Career Development Award (CDA)?

- Continued research in my HFSP host country
- Done research in my home country
- Done research in another country
- Other (please specify on next page)
- Don't know

QUEST52

Please specify what you would have done if you had not obtained the CDA.

QUEST53

Given equal economic support, in which country would you have preferred to establish your own research group?

- In my HFSP Fellowship host country
- In my home country
- In another country

QUEST54

What were your motivations for returning to your home country (for your CDA-project)?

	Unimportant	Partly important	Important
Research and career opportunities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Obtaining the HFSP Career Development Award	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personal/family reasons	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QUEST55

Did you already have an appointment at your host institution at the time of your application for a Career Development Award?

- I had no prospect of continued appointment at the host institution
- I had positive signals of job openings at the host institution
- I had been offered an appointment at the host institution

QUEST56

Did the prospect of receiving a CDA help you in negotiating your first position after the HFSP Fellowship?

- No

- Partly
- Yes
- Cannot say

QUEST57

Did you encounter problems on returning home for your CDA-project?

	No	Partly	Yes
Difficulties in negotiating my position and infrastructure support in my home country	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Difficulties obtaining an <i>independent</i> research position in my home country	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Difficulties attracting competent personnel to my group in my home country	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inferior research facilities in my home country	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No opportunity to continue the same line of research after the CDA in my home country	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No available research position after the CDA in my home country	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other problems (please specify on next page)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QUEST58

Please specify other problems encountered on returning home.

QUEST59

	Not at all 1	2	3	4	To a high degree 5	Cannot say
To what degree was the CDA support sufficient to help you establish your independent research group?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QUEST60

What kind of support beyond the CDA do/did you receive from your host institution or other sources? Please tick all relevant alternatives.

- My own salary
- Salary support for PhD students/Postdocs
- Laboratory space
- Access to special infrastructure/equipment
- Research funds

QUEST61

Consequences for your project

What happened to the project you did not obtain HFSP-funding for?

- I obtained another grant/fellowship and went on with the project as planned
- I modified the project/obtained funding for a partly similar project

- I was not able to go ahead with the project
- I don't remember

QUEST62

Would you have carried out the same research if you had not obtained the HFSP grant/fellowship?

- I would have done the same research
- I would have done related/partly similar research
- The research would not have been done at all
- Don't know

QUEST63

Would you have done research with the same partners if you had not obtained the HFSP grant?

- Yes
- Partly, I would have done research with some of the members of my HFSP project team
- No
- Don't know

QUEST64

Results of your HFSP project

Has the HFSP grant/fellowship/CDA contributed to your scientific work in any of the following ways?

	Not at all 1	2	3	4	To a high degree 5	Too early to say
Improved my scientific insight into my field of research	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Broadened my field of expertise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improved my interdisciplinary skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Resulted in research collaboration during the project (joint research, applications, publications, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Resulted in research collaborations that continue beyond the term of my HFSP project	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Broadened my scholarly network	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Broadened my intercontinental scholarly network	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improved my ability to obtain further funding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improved my ability to obtain a research position/a more attractive research position	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify on next page)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QUEST65

Please specify how the HFSP grant/fellowship has contributed to your scientific work.

QUEST66

	Not at all 1	2	3	4	To a high degree 5	Cannot say
Did you feel that you were part of a particular HFSP community during your award?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QUEST67

Opinions on the HFSP information and service

Did any of the following sources of information stimulate your interest in applying for funds from the HFSP?

Please tick all relevant alternatives.

- Colleagues/advisors
- HFSP grant holders/Fellows
- Direct information from other persons affiliated with HFSP (e.g. present or past reviewers, members of review committees, Council of Scientists)
- The HFSP web site
- The HFSP call for applications mediated through domestic organisations
- The call for applications in scientific journals (print or online)
- Presentations by HFSP staff
- None of the above

QUEST68

To what degree have you used information provided by the following HFSP information sources?

	Not at all 1	2	3	4	To a high degree 5	Cannot say
HFSP web site	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HFSP e-mail newsletters	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HFSP Annual Reports	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QUEST69

Would you be interested in joining an international alumni network of HFSP awardees?

- Not interested
- Partly interested
- Clearly interested

QUEST70

What other communication initiatives would you like to see from HFSP?

QUEST71

Awardees Annual Meeting

Have you participated in any HFSP Awardees Annual Meeting?

- No
- Yes

QUEST72

To what degree did the meeting(s):

	Not at all 1	2	3	4	To a high degree 5	Cannot say
Improve your scientific insight into your field of research	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Give you valuable interdisciplinary input	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Broaden your scholarly network	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Broaden your intercontinental scholarly network	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lead to new research collaboration (joint research, applications, publications, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify on next page)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QUEST73

Please specify other impacts of your HFSP Awardees Annual Meeting(s).

QUEST74

Background information

Your gender

- male
- female

QUEST75

Your year of birth (four digits required):

QUEST76

In which sector are you currently employed?

- Research at a university or non profit research laboratory/institute
- Research in a for profit company (e.g. biotech, pharma industry)
- Communication (e.g. science writing, publishing)
- Administration/NGO (e.g. funding agency, research policy/administration)
- Unemployed
- Other

QUES77

What is your current position?

- Senior faculty (e.g. head of department/institute, associate/full professor, research director)
- Junior faculty (e.g. assistant professor, lecturer)
- Independent young investigator
- Postdoc
- Other (please specify on next page)

QUEST78

Please specify your current position.

QUEST79

Final open question/comments

If you have additional information/experience/opinions relevant for the review of the HFSP, please use the space below. E.g. changes you would like to see in the program.
