



The 2025 Review of HFSP

October 2024

Background

The International Human Frontier Science Program Organization (HFSP) is a story of extraordinary vision and a rare example of successful science diplomacy.

The beginnings lay in Japan in the 1980's and evolved from two governmental plans designed to stimulate collaboration with foreign research institutions and companies. HFSP was an experiment in more flexible program management allowing bottom-up initiatives that would be decided by an independent scientific structure and governed by an international board of trustees.

In 1986, a feasibility study for such an international endeavor was carried out by leading Japanese scientists under the auspices of the Japanese Prime Minister's Council for Science of Technology. This discussion was expanded in 1987 to include scientists from the G7 nations and the European Union, resulting in the "London Wise Men's Conference" in April 1987, which endorsed the suggestion. Prime Minister Nakasone of Japan proposed to implement HFSP as the operational entity for the organization, at the Venice Economic Summit of the G7 countries and the European Commission in June 1987. The Economic Summit partners and the Chairman of the European Community welcomed the initiative. The newly created organization was charged with the mission "To promote and fund basic research focused on the elucidation of the sophisticated and complex mechanisms of living organisms for the benefit of all humankind, through international cooperation."

Since the beginnings, HFSP has kept its unique position in the research landscape: it supports innovative, frontier research in the life sciences, encourages high-risk, high-reward research, and promotes international collaboration in the spirit of science without borders. The original supporting Members were the countries of the G7 together with the European Commission. Switzerland joined in 1990. Australia, the Republic of Korea, India, New Zealand, Singapore, and Israel have joined since 2004, and Norway and South Africa joined in 2023.

Programs

HFSP supports fundamental research in the life sciences with special emphasis on novel and interdisciplinary research, international and, in particular, intercontinental collaboration, and support for young investigators. Its funding complements national programs to enable collaborations in a scientific landscape that changes fast. Novel approaches coming from different disciplines hold great promise to address the most important problems in understanding complex life. The challenge for all scientists is to look beyond their original expertise and broaden their horizons by working with collaborators they have never interacted with before and by moving into new fields of research. HFSP is at the forefront of such interdisciplinary, collaborative research. Through its funding schemes, it supports frontier, potentially transformative 'out-of-the-box' proposals and encourages discovery research projects that may contain risk. Successful projects challenge existing paradigms by using novel approaches and techniques; they address important problems and barriers to progress in the field.

The life sciences have emerged as a leading scientific area in which there is a convergence of approaches from physics, mathematics, chemistry, computer science and engineering in solving biological questions. Therefore, HFSP supports research into the complex mechanisms of living organisms, ranging from the biomolecular level to the whole organism by involving scientists from outside the life sciences as part of research collaborations and as postdoctoral fellows. To this end, the Program and Early Career Grants are specifically geared to fostering interactions between scientists from different disciplines and this is a major factor in the review of applications in these programs. HFSP supports Cross-Disciplinary Fellowships to equip young scientists from outside biology with the skills needed to tackle problems in the life sciences.

Since its establishment in 1989, HFSP has demonstrated the value of creating a framework for competitive, collaborative, international research of the highest caliber and for providing young scientists with the opportunity to emerge as talented researchers capable of shaping the science of the future.

HFSP implements its programs through the following mechanisms of research support:

- **Long-Term Postdoctoral Fellowships** – for young life scientists within three years of obtaining their PhD who wish to broaden their scientific experience in a foreign laboratory.
- **Cross-Disciplinary Postdoctoral Fellowships** – specifically for scientists with a PhD in non-biological disciplines to bring new perspectives to research in the life sciences.
- **Research Grants - Early Career** – grants for interdisciplinary teams of young researchers who are within the first five years of their first independent positions and located in different countries.
- **Research Grants - Program** – for interdisciplinary teams of researchers in different countries at any stage of their careers.
- **Accelerator Grants**, a new program activity launched in 2024, they support the integration of scientists from selected member countries into ongoing HFSP Research Grants.

Since 1990, more than 1200 research grants involving more than 4600 scientists working in more than 50 different countries, and more than 3500 fellowships have been awarded. HFSP support has been granted to scientists working at more than 1000 research institutions and universities worldwide. Young scientists from more than 70 nationalities have received HFSP fellowship support so far. Detailed information on the HFSP programs is available in the funding section of the HFSP website; further information can be provided upon request.

Scope of the Review Project

HFSP is an agile organization, voluntary in nature, yet secured by the commitment of its member countries, and driven by a mission to support high-risk, high-reward life science research. A range of challenges, both macro and micro in nature, make it imperative that HFSP implements a strategic plan that provides for the organization's evolution, meets the needs of the Members, and serves the changing nature of frontier life science.

The HFSP Strategic Plan¹, "Frontier Life Science in a Time of Change" will guide our work from 2024 to 2032, a span of nine years, which accords with a period of three fiscal triennia. The plan is founded on four principles addressing aspects of vitality, diversity, connectivity, and enable foresight. The principles frame the three strategic goals **to expand grant making to support frontier science (Goal 1)**, strengthening the relationships to the scientific community and our members through **reinforced engagement (Goal 2)**, and becoming a **globally more inclusive organization (Goal 3)**.

During the first of the three triennia, the Board of Trustees seeks independent evaluation and analysis of the main mechanisms that support postdoctoral researchers and international research grant teams. Both exist since the very beginnings and have been updated occasionally to adjust fellowship salaries, parental leave policy etc. The current review should provide a deep and thorough analysis of several aspects that surround

¹ The HFSP Strategic Plan 2024-2032 is available at <https://www.hfsp.org/about/strategy/strategic-plan-2024-2032>

the programs for HFSP support. Since the beginning of the HFSP operations in 1990 the program has been reviewed extensively and most recently in 2022 by an independent agency with a focus on operational aspects that govern the procedures and criteria for selecting HFSP awards of the current support programs (previous HFSP reviews are available at <https://www.hfsp.org/about/strategy/reviews>).

Operating in its fourth decade of supporting international research collaborations in the life sciences, the focus of the 6th HFSP review is to apply a logic framework for assessing

- (i) its uniqueness and the quality of the research it supports,
- (ii) (ii) the added value it provides to the Members and the world,
- (iii) (iii) the value that basic research supported by HFSP contributes to the innovation economy, and,
- (iv) (iv) to provide a perspective for change and improvement with regard to the overall strategic planning of the organization.

The outcome of this review should be presented to the Board for their **2026 Annual General Meeting**. It will serve as a key component of the decision-making process to implement the second (2027-2029) and third (2030-2032) triennium of the new Strategic Plan 2024-2032.

The Payback Framework – a conceptual model for the review of HFSP

Contemporary life science research takes place in the form collaborative efforts and consortia spanning across the globe. Support schemes must now be equipped to review and fund research in rapidly moving fields where collaborations may last only a few weeks or months to achieve just one aspect of a broad set of interrelated questions needing many skills, techniques, and concepts. Therefore, this review of HFSP will be based on a conceptual framework to measure the impact of HFSP supported research and the added value to the HFSP Members. The outcome may suggest measures to establish (new) benchmarks for gauging the success of future research. When evaluating basic research, a conceptual framework is needed because in the context of HFSP - supporting basic research - the term ‘impact of research’ may be a more meaningful concept than return on investment².

To advance and support the rich bioscience research ecosystem that seeds developments in health and human well-being, both now and into the future, HFSP needs to engage with a global audience that has diverse interests, varying needs, and different priorities. Therefore, a multi-pronged activity plan is proposed, that implements the three strategic objectives. HFSP engages with representatives at the science-policy interface to solidify the commitment and increase ownership with HFSP members and new strategic partners. Outreach activities promote dialogue and discussion to enable direct interactions and networking between scientists, representatives of HFSP members and third parties from international science. Based on a results-oriented communications approach we disseminate relevant information to a very broad audience distributed across the entire scientific landscape and all countries.

HFSP’s ambition is to achieve greater visibility with stakeholders and partners well beyond the limits of the core life science research. Therefore, for the 6th review HFSP requires the application of a logic framework that provides a basis for measuring the impact of the research supported by the programs and for assessing its innovation potential. HFSP functions as an “always-on, closed loop system” where the grant process drives research impact and research impact drives donor contributions. The current review should be based on a logic model, one of which could be the Payback Framework³ or variants thereof. The five categories of the Payback Framework, originally developed to assess impact of health/clinical research could be adopted for the purpose of basic research supported by HFSP in the following way:

² Bowden et al. *Health Research Policy and Systems* (2018) 16:39; <https://doi.org/10.1186/s12961-018-0311-3>

³ Donovan and Hanney, *Research Evaluation*, 20(3), September 2011, pages 181–183;
DOI: 10.3152/095820211X13118583635756

1. Knowledge production (output)
2. Engagement and capacity building
3. Development of novel applications (outcome)
4. Benefits for the research field in question (outcome, progress)
5. Wider societal or economic benefits

The logic framework should be applied in the context of the three goals outlined in the HFSP Strategic Plan 2024-2032 and analyze the program along five main thematic threads as outlined below.

How unique is HFSP?

A key selection criterion to all HFSP awards is the frontier character of the research. HFSP research grants in particular are scrutinized intensively for their originality and potential to advance our knowledge. As a consequence, seed funding by HFSP often attracts follow-up support from other funders who rarely accept high-risk high gain proposals but consider success in HFSP as a distinction for scientific quality and as a unique opportunity for pioneering novel research that is worth long-term support. Also, HFSP research grants go well beyond the traditional bilateral cooperation agreements. The review should attempt to answer how unique HFSP still is after close to 35 years of operation using the following questions as guidance:

- Is HFSP support still in a unique position throughout the member countries or internationally in general that justifies the member's investments?
- Is the mission of HFSP as formulated in the new strategy and the current operational modus reflecting the needs and requirements of the members?
- If truly unique, is HFSP support the only means for teams of applicants to collaborate across disciplinary and country boundaries? Would young scientists be able to carry out their research without HFSP support? Is there a measurable effect of HFSP discontinuing the Career Development Award for the fellows in terms of career development and scientific productivity?
- Is there evidence that HFSP supported research is seeding novel research that attracts significant follow-up funding?
- Does HFSP stimulate awardees to continue international collaborative high-risk research after their HFSP Research Grant has come to an end?

Excellence of HFSP research.

Every year applications for HFSP awards are submitted from dozens of countries which allows cross-country comparisons. The emphasis on international collaborative approaches to frontier topics turns HFSP support programs into a global benchmarking exercise. Particularly the programs for young researchers attract applications from 40-50 different nationalities per year. The competition is therefore truly global and being awarded HFSP funding provides reassurance that as an HFSP awardee one belongs to the very best around the world. The review should assess the excellence of the research supported by HFSP and if the work is truly at the frontiers.

The following aspects should be emphasized:

- Is HFSP supporting truly frontier-extending research, that is internationally collaborative, and of a type not normally fundable through national schemes?
- For the Long-term (LTF) and Cross-Disciplinary Fellows (CDF), does their postdoctoral experience lead to further frontier life sciences research?
- Is there a special value in the (CDF) program for both the young scientist but also the field of research, also in comparison to the LTF?

- What is the scientific impact of HFSP funded research as evident through peer reviewed scientific publications? Do HFSP funded scientists publish more articles with a higher impact?
- Is there a different degree of interdisciplinarity in research funded by HFSP in comparison to other funding organizations? Is this visible in publications by HFSP awardees?

Valorization of basic research

HFSP puts a high value on basic science at the frontiers of knowledge as a driver of future economic and social benefit, and on international scientific cooperation, which is not only an absolute necessity in pushing forward the scientific frontier but also a way of promoting mutual understanding between countries. The life sciences are one of the most complex fields of research and have become a true “frontier” in basic science which HFSP addresses by emphasizing interdisciplinary approaches in all its funding programs. In comparison to other funding organizations, the HFSP is significantly different because the programs allow scientists to propose bold, untested, high risk-high gain ideas without preliminary data or publications. It is this foundational principle of trust towards the scientists that distinguishes HFSP support. Supporting fundamental research is a rare currency in the current funding ecosystem and HFSP is interested if there is payback that can be assessed and that harbors potential and impact for the global innovation ecosystem.

- Are there parameters that would allow to measure the innovation potential of HFSP supported research?
- Are there indications that the field(s) of research engaged in by HFSP researchers changes or broadens over time?
- Biology has taken a central position in the 21st century research and innovation landscape. Is HFSP’s contribution recognizable and significant?
- Fundamental research in the life sciences is a driver of innovation. How much does HFSP supported research contribute to this innovation pipeline?

Value added of HFSP for its Members

The HFSP niche of international cooperation complements the research priorities of its members. The program supports excellence in frontier research by enabling the best scientists to carry out high risk-high gain projects. Through its support HFSP provides a forum for scientists to enter into international collaborations in areas and at times not covered by existing international agreements. The review should evaluate if HFSP’s position is still unique and if not, what should be changed.

- Does HFSP succeed in seeding truly international collaborations, and if so, how is that valued by HFSP Member countries?
- How do rates of international collaboration compare to other organizations? Have lasting collaborations emerged from HFSP funded research?
- Is there a difference in the collaboration patterns between teams of young investigators vs teams of senior investigators
- Does HFSP supported research collaborations have a specific impact as indicated by collaborative papers compared to non-collaborative publications?
- What is the best way to articulate the overall value-added of the HFSP to its Members (beyond academic and financial benefits)?

The way forward

Scientific research in the 21st century has become a complex and globally networked enterprise which evolves at unprecedented speed and exposes emerging properties unimaginable just 10 years ago. Because the fundamental research is the key engine to drive early innovation breakthroughs, HFSP should remain in a leading position in the foreseeable future. The organization has grown in membership and reputation and therefore the review should also assess the higher level, organizational aspects.

- Are the resources available conducive to continue as a lead program for research support. Does HFSP dispose over the financial foundations and operational resources for the implementation of the new strategic plan?
- Do member countries see a need for additional, novel program activities (incl. engagement) or changes to existing programs
- Does the membership of HFSP present the critical mass of the leading science countries or should there be an even broader membership based with more countries as part of the organization? What would be the best suited future governance strategy in light of the ambitious new strategic plan 2024-2032?

Evaluation process and tools

This review has a very broad scope which may require several ways for assessing the different objectives. Therefore, HFSP will establish an international high-level recommendation panel (Blue-Ribbon Panel) of leading scientists to oversee the conduct of the Review independently from the Board of Trustees and Secretariat. The Panel will be resourced from within the Secretariat and will receive reports from external evaluation agencies⁴ that will report to the panel.

HFSP is open to different methodological approaches but considers the approaches listed below as an integral part of the overall review:

- Bibliometric analysis
HFSP supported researchers publish close to 1000 scientific articles per year. A thorough analysis of both publication metrics and impact of the articles should be considered. The objectives stated earlier provide a starting point for further analysis.
- Impact and innovation potential of HFSP research
HFSP research is intrinsically interdisciplinary, and the review could consider a cross-cutting approach in measuring performance outcome. Knowing more about the valorization of basic research supported by HFSP would be a valuable asset for the Members of the organization. The complexity and required analytical depth of this part of the review may require limiting the scope to a cohort of case studies that are chosen from a range of award years.
- Cohort study
HFSP never explored the possibility of evaluating the career success of the more than 3000 postdoctoral fellows (LTF and CDF) that were supported since 1990. A thorough, albeit selective, study could shed light on the effectiveness and impact of the fellowship program to support the next generation of scientific leaders in frontier research. This part of the assessment would be closely connected with the bibliometric analysis but would also look at Altmetrics to describe the success of individual researchers.

Competitive bids may include assessment strategies that address all of the objects but can also be limited to focusing on individual items. Evaluating agencies should therefore contact HFSP first before submitting a bidding proposal.

⁴ As of 16 October 2024, three renowned evaluating agencies have expressed interest in submitting a proposal, and a fourth firm is also considering submitting a bid.

Timeline and Additional Requirements

October 2024:	Publication of the request for proposals and invitation of high-level panel and invitations send to members of the high-level panel.
January 2025:	Deadline for proposal submission
Mid-February 2025:	Initial meeting of high-level recommendation panel
February 2025:	Kick off meeting with selected evaluation agency and start of analytical work
Early September 2025:	Interim report by evaluation agency
End September 2025:	Validation/calibration meeting (HFSP Secretariat, Evaluation agency, and members of the HFSP Board Steering Committee)
End of October 2025:	First full draft of final report by evaluation agency
Mid-November 2025:	Draft final report sent to High Level Panel
Mid-December 2025:	Meeting of the high-level recommendation panel to discuss the agency report and prepare recommendation for the AGM in July 2026
Early February 2026:	Delivery of final report by evaluating agency

The responsibilities of the external agency will include the preparation and design of the study, as well as the actual conduct of the evaluation and preparation of the report. Information about awards and publications needed for the review will be provided by HFSP.

Proposals of the agency which assists with the Review must address the questions in the Terms of Reference described in this document. Modifications to the Terms of Reference and questions may be suggested, with justification. The proposal should contain the following sections:

Understanding of Problem: Proposals should indicate the bidder's understanding of the tasks outlined in the Terms of Reference and critically discuss the suitability of the items in the Terms of Reference for providing reliable answers.

Methodology: A description of the approach and a critical assessment of the methodology to be used in the review should be given, together with a critical discussion of their strengths and weaknesses.

Schedule and Budget: A proposed timeline with milestones for the review must be provided, together with itemized costs for each stage outlining budgets for personnel, travel, consumables and other items. The amount of time each member of the review team will spend must be stated. Bidders are encouraged to present and cost-out alternative options for methodological components.

Project Team: A brief curriculum vitae of each team member should be included, indicating relevant experience for the present project.

Contact at the HFSP Secretariat

Any questions and all tenders should be sent by email to:

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