Stiftelsen för Strategisk Forskning

Bio-X – Announcement of Collaborative Framework Grants

The Swedish Foundation for Strategic Research has allocated SEK 55 million for adventurous, international-level research projects of up to three years' duration and a total size of SEK 4-6 million. The Foundation now invites proposals that address strategic topics at the interface of biology or biomedicine on one hand, and engineering or the physical sciences (physics, chemistry, mathematics, computer sciences) on the other, that are to be conducted in collaboration between a "Bio-partner" and an "X-partner". The strategic objective is to stimulate novel and groundbreaking research with a high potential for innovation, while simultaneously enhancing scientific and technological progress in the areas of *both* the X-partner and the Bio-partner.

Successful projects will deliver significant knowledge beyond state-of-the-art in the area(s) concerned and provide a basis for future activities of potentially high economic and societal value. The latter are envisaged to include e.g. complex instrumentation and support systems that address human or industrial needs, radically improved biomedical procedures and therapies, etc.

Preliminary timetable for prospective applicants

Extended to 12 October 2004	Submission of *Declarations of Interest* (see below)
26 October	Closing date for submission of *Full Proposals*
7 February 2005	Announcement of successful proposals, *possibly* followed by a second call *within* the same total economic frame (selective; see Selection Procedure below).

Introduction

Progress in the life sciences in combination with rapid development in microelectronics, nanoscience, information technology and other technologies that have taken place during the last few years, will enable the integration of knowledge needed to solve complex problems. This call is intended as a window of opportunity for highly qualified scientists in Sweden to join forces and mutually utilise one another's expertise to progress front-line knowledge at the conceptual level for the benefit of research, industry and society at large.

Objectives of the Programme

The strategic objective is to stimulate novel and groundbreaking research with a high potential for innovation. Other objectives are to

- Promote collaboration between biologists or biomedical scientists (including suitably trained clinicians) on one hand and engineers, physical scientists, etc, on the other
- stimulate radical research in interdisciplinary areas with high prospective user value and of high international recognition
- foster interaction, networking and mutual learning between research communities with different traditions and cultures
- demonstrate the capacity of top researchers in Sweden in relevant underlying areas to create added value by working together towards a common goal of high strategic importance.

Nature of the Projects

Based upon a truly interdisciplinary collaboration between one Bio-partner and one X-partner (individuals; see Eligibility below), the projects should represent research at the frontline in an international perspective. Through synergies this is to result in the development of new knowledge in *both* partners' areas. Given Sweden's industrial structure, the strategic potential and applications of the projects may, at least initially, relate to the life sciences and healthcare. However, the Foundation is convinced that the bold research aimed at in this programme in various ways will benefit important parts of the "X"-related user sectors as well, even though the "bio-dimension" then may not be obvious to a wider audience.

Particular emphasis will be given to elements of "high-risk, high-reward" knowledge development and the potential of the projects to create an impact at a systems, or "systemic", level (to use the latter term in a generalised biomimetic sense). The projects thus should not be limited to the development of individual components, stand-alone instruments or (software) programmes only but, to the extent possible, strive for integration at a higher level. Neither is such research addressed that mainly is to be seen as a continuation of long-standing activities or where Bio+X represents a combination of "obvious" necessity (e.g. industrial processing of biological raw materials), although such research may otherwise be high-quality.

To structure the selection and review process, the Foundation has chosen to collect proposals under four, partially overlapping, main headings that all in different ways illustrate important strategic needs and opportunities related to the Bio-X theme. This does not mean that applications displaying other strategic combinations will be excluded. However, the Selection Committee (see below) has a mandate to identify particularly interesting topics, should it find this appropriate; also it is not bound to any specific distribution of grants among the headings indicated. Broadly identified headings representing a multitude of research opportunities are:

A **Quantitative Biology** including systems biology, computational biology, bioinformatics and other mathematics-intensive aspects of biology. Drivers and applications probably mainly relate to the life science sectors

B **Applied Neuroscience /Neuroengineering** including technology-intensive aspects at the interface with cognitive science and learning. The area encompasses opportunities and applications on both sides of the Bio and X border

C **Tissue Engineering** including entirely new concepts for bio(compatible) materials for direct or indirect human purposes. This could relate to regenerative medicine but also to *in-vitro* applications such as drug design, toxicology testing, etc

D **Bioengineering**[1] interfacing other areas and/or addressing other needs than those implied above. For the purposes of this announcement bioinspired, biomimetic and bionic[2] technologies are included here as well.

Projects relevant to more than one of these broad headings are encouraged. Some enabling technologies, e.g. bioimaging, cut across several of them.

Examples of interesting approaches relating to artifical systems aspects of headings B and D above may be found in the European Union's research programme IST-FET – Future and Emerging Technologies, http://www.cordis.lu/ist/fet/home.html.

[1] applying an engineering approach (systematic, quantitative, and integrative) and an engineering focus (the solution of problems) to biological problems

[2] designing, constructing etc artifical systems that imitate living systems

Selection Procedure

As projects will be of the size SEK 4-6 million, the SEK 55 million will enable support to some 10 to 14 projects. With regard to the high-risk/high-reward ambition of this programme, the Foundation is eager to ensure that proposals funded are qualified enough. The Selection Committee therefore has been mandated to arrange for a second announcement *within* the frame of the total amount allocated, should it find reason to do so. In the same vein, the Foundation recognises that it may take some time to identify the "ideal" partnership for prospective applicants with potential high-level ideas for a proposal and to jointly elaborate the intriguing project goals. Thus in case not enough high-quality proposals will be received at closing date, the Foundation will test a somewhat experimental procedure. Through submitting as detailed a description as possible in a "one-partner proposal", such individuals will be able to make themselves known. Thus the Committee may *potentially* reserve some space for a subsequent full two-partner proposal at a later point of time.

In this way, Bio-X Partners who have already found one another will be able to submit full proposals at closing date and then be considered for funding, at the same time as potential Bio- *or* X-Partners will get a chance to candidate for a *possible* second call for proposals. In the latter case, eligibility thus will be limited to those who have submitted a proposal by closing date, describing the project envisaged as fully as possible according to the instructions and clarifying their ambitions to identify a partner with details as to desired qualifications, etc. Should the present call indeed result in enough top-quality proposals, however, the Selection Committee will be free to proceed with a recommendation to use the full amount of financing available.

In view of the type of projects envisaged, and before making its final recommendation(s), the Committee may decide to arrange *hearings* with applicants on the basis of need.

Assessment Criteria

Potential for groundbreaking results /knowledge generation, including delivery prospects, in combination with

- ♣ Scientific/technical quality of the proposed research on both the "Bio"-side and the "X"-side with equal weight;
- ♣ Strategic relevance and potential for an impact on a systems/*systemic* level in view of the goals and topics addressed by the project;
- ♣ Logic of the collaboration in view of the topic(s) and the partnership chosen;
- ♣ Degree of genuine collaboration (vs. "inter-academic contract research");
- ♣ Applicants' potential to lead and implement the project, including management of scientific risk/benefit as well as presentation of a contingency plan;
- ♣ Applicants' international partners/network of relevance to the proposal.

Also, possible synergies (but not doubling of effort) with other related activities regardless of funding body, as well as active involvement of potential users will be considered as additional qualifications. At the time of final recommendation, the Selection Committee may take into account the financing available to the applicants for similar projects from other sources (outside or within the Foundation).

Eligibility

The projects envisaged represent frontline research at the post-doctoral level; both partners should have post-doc experience or corresponding[3]. The *Bio-Partner* has a PhD and qualified background in biology or biomedicine or has otherwise acquired a solid experience in working with biological problems, methods and approaches. The *X-Partner* has a PhD and qualified background in engineering or the physical sciences (physics, chemistry, mathematics, computer sciences).

Depending on the nature and goals of the project, one of the two Partners (Bio or X) will be Overall Project Leader and designated Main Applicant; the other partner will be Co-applicant (Bio or X). Both Partners work at Swedish universities, university colleges or recognised research institutes. Depending on the nature of the collaboration[4] and the facilities required, the Partners may represent the same or different universities, etc (but only as an exception, the same department).

Any further collaborators in the proposal – including researchers in industry or healthcare etc, and in Sweden or abroad – may represent any area of expertise relevant to the project. A mix of senior and more junior researchers is encouraged. (But see below regarding PhD students.)

Selection Committee

A group constituting the Swedish members of the Selection Committee has prepared this Announcement. The Committee will convene in mid-November to decide which projects that are qualified enough to be sent for international review and to discuss the potential need for a second announcement, including any adjustments called for. Based on the international reviews and its own deliberations, the Selection Committee in mid-January 2005 will make a recommendation to be put forward to the Foundation. The Board of the Foundation will make the final granting decision at its first meeting in 2005.

The Selection Committee presently includes

Docent Gunnar Edwall, Ericsson AB (Chairman)
Professor Søren Brunak, Technical University of Denmark
Dr Jan Brundell, DiaSorin AB
Professor Sverre Grimnes, Oslo University & University Hospital
Dr Gösta Jonsson, AstraZeneca AB
Professor Risto Kostiainen, University of Helsinki
Professor Irma Thesleff, University of Helsinki
Professor Urban Ungerstedt, Karolinska Institutet

Further expertise may be recruited; any new members will be announced on the homepage of the Foundation.

Coverage of the Grants

The framework grants may be used for salaries, materials and other running costs, travel costs to enable international visits in both directions. Equipment may be included only to a minor proportion. Because of the specific nature of this particular programme, however (high risk, interdisciplinary, collaborative, need for flexibility / "plan B" if the initial approach should not

[3] If a formal post-doc period is not a tradition in the area of one partner (as is sometimes the case in certain areas of applied engineering), this person should have a suitable equivalent.
[4] For example, as several Swedish industrial research institutes on the X-side (electronics, computer science, etc) strive to grow into the life science sector, this programme offers an opportunity to join with Bio-Partners from leading universities.

work), the Foundation recommends that careful consideration is given to financing of PhD students; probably only a comparatively small part of the budget should be used for this purpose. As to overhead costs for university applicants, see Agreement between SUHF and the Foundation at http://www.stratresearch.se/images/FFL%20agreement%20overhead.jpg; institute applicants should take part of information in the *Budget* section of the Application Form.

More about the Programme

It is expected that the projects funded in this call will be completed during 2008.

A small fraction of the total funding will be kept within the Foundation so as to finance coordinating activities and to stimulate collaboration among the grantees. A workshop will be held annually – possibly already at the start of the programme – to bring together the funded groups and subsequently to assess progress. During the third year this may be combined with an external evaluation.

A Programme Committee will be appointed to monitor the projects and initiate cross-cutting activities, taking into account other relevant Foundation efforts.

Submission

1) "Declarations of Interest" (DoI) are invited by 12.00 hrs on Tuesday 12 October (extended from 28 September)**.** Although not absolutely mandatory, a DoI is *strongly recommended* as it will benefit *all* prospective applicants – in particular where the "second" Bio/X-Partner is not already identified and in general because the overall review procedure will be facilitated.

Such a declaration should be submitted electronically to Bio-X@stratresearch.se (max 1 page). The subject line of the message as well as the attachment should read "DoI Bio-X + Family name". In the attachment give tentative *Project title*; *Bio-Partner* and/or *X-Partner* (with a profile of an as yet missing partner that the first partner is pursuing); *Relevant heading(s)* from A – D above; and an *Abstract* of the project with goals and some details that address the assessment criteria as stated above. The Swedish members of the Committee will meet in October to analyse the Declarations of Interest.

2) Full Proposals should be submitted by 1600 hrs on Tuesday 26 October 2004 at the latest. Use the provided Bio-X Application Form that also includes a template with headings and instructions for all Appendices. The full proposal is to be submitted in **one original set and 20 complete paper copies,** the latter printed on plain punched (A4) paper and stapled, without using any special covers or binders etc. The Main Applicant is responsible for checking that all material submitted is ready to use by the Foundation directly upon arrival.

Further, by the same date (26 October), the complete proposal (Application Form with all Appendices) is to be **electronically submitted** to Bio-X@stratresearch.se as one single file in PDF format (Portable Document Format only; no other formats will be accepted). The subject line as well as the heading of the attachment should read "Bio-X + Family names of Main Applicant and Co-Applicant". Please note that the electronic submission will *immediately* be used to produce a CD, with all proposals, to be sent to the Selection Committee. Thus the file submitted must not necessitate any editing on the part of the Foundation.

Faxed submissions will *not* be accepted; neither will any complementary material be accepted after 26 October.

Address for mailed applications
Stiftelsen för Strategisk Forskning
Box 70483
107 26 STOCKHOLM, Sweden

Address for delivery firms and personal visits
Note different Postal Code for delivery firms, otherwise deliveries may not arrive in time
Stiftelsen för Strategisk Forskning
(World Trade Center)
Kungsbron 1, plan G7
111 21 STOCKHOLM
Telephone operator +46-8-505 816 00

Applicants should note that the Foundation is subject to the "Principle of public access to official documents" (*Offentlighetsprincipen*). Thus material that should not be made public, e.g. information that could prevent patenting, should not be submitted.

Contact

Address any questions to Lena-Kajsa Sidén, Programme Manager, LKS@stratresearch.se, specifying "Bio-X" and your own name in the subject line. (But do *not* use this email address for submission of Declarations of Interest or the actual applications, where instead the special submission address given above should be used!)