



SWEDISH FOUNDATION *for*  
STRATEGIC RESEARCH

26 October 2020

## Announcement

# SSF Call for Proposals

## Framework Grants within Bioengineering and Plant Breeding; Food, Feed, and Forest Products

The Swedish Foundation for Strategic Research announces SEK 120 million in a national Call for four problem-, challenge-, and application-driven research projects that meet the highest international scientific standards. The Call aims to stimulate collaborative multidisciplinary research with a clear breeding approach within the areas of Food, Feed, and Forest Products, of strategic relevance to present or future Swedish-based industry and to society. The projects should be of benefit for Sweden's competitiveness in terms of self-sufficiency, reduced environmental impact, and mitigating or providing resiliency to climate change.

Selected projects will be supported by grants of MSEK 4-7 per year for a period of 5 years (incl. overheads) to be used for salaries (senior researchers, postdocs, PhD students, etc.), expensive equipment and other research infrastructure, research tools, and running costs per the needs of the project. Funding for the last two years will be depending on a successful midterm evaluation.

### Background

Research within agriculture, macro- and microalgae cultivation, and forestry is vital for the future long-term sustainable production of food and feed. The estimation that there will be 9 billion humans on earth by 2050 requires strong efforts in strategies how to produce enough food for the entire planet. This in turn requires that virtually every nation needs to adopt cutting-edge technologies, adjusted to regional conditions like for scarce water supplies, to secure food production. From a national point of view, being at the forefront in the food and feed research areas increases self-sufficiency and hence preparedness in the event of crisis. Furthermore, an increased self-sufficiency will most likely lead to shorter transports of food and feed, and thus to a reduction in carbon dioxide emissions.

It is of further strategic value to mitigate the loss of arable land in predominately the northern parts of Sweden. Agricultural and horticultural crops suited for the north thus need to be further developed to maintain, and even reclaim, land to both maximize production in the agricultural sector as well as to bring to market high quality products from niche crops. The northern part of the country is in this context highly suitable for animal husbandry since conditions for feed production are favorable as are conditions for production of vegetables and berries.

Competitive Swedish research utilizing modern breeding techniques within the areas of food and feed will not only benefit Swedish self-sufficiency, but also Swedish competitiveness in terms of product refinement, export opportunity, entrepreneurship and

reduced environmental impact. It may also lead to improved population health and well-being in society.

The framework of this Call was elaborated from discussions in the National Committee for Food Research.

## **Scope**

The aim of the Call is to promote research that combines modern breeding techniques within the areas of food, feed, and forest products with the overarching goal to increase Swedish self-sufficiency or to reduce climate change impact. Regarding research on forest products, projects should use modern breeding techniques to address new challenges and opportunities for the refinement of forest products.

In terms of technology readiness levels (TRL), projects should reside between TRL 1 (basic principles observed) and TRL 6 (technology validation in relevant environment).

The proposed research should be multidisciplinary and of the highest international standard. It should be characterized by joint efforts in breeding, molecular biology, physiology, pathology, interactions with the microbiome, etc. This in turn includes the use of a vast number of techniques such as functional genomics, bioinformatics, metabolomics, protein engineering, structural biology and studies of mechanisms and metabolic pathways as well as selection strategies, statistics and field trials.

The present Call has a broad approach and leave room for researchers to design innovative and challenging projects, but prerequisites for funding are that the proposed project has a strong focus on collaboration and that a clear breeding approach forms the basis of the project.

One example of research areas is plant breeding projects where different omics (functional genomics, transcriptomics, metabolomics, etc.) are intertwined with other research areas, such as plant physiology, plant pathology, plant-microbiome interactions, and soil chemistry/microbiology.

Another research area encompassed by the Call is the cultivation of macro- and microalgae to investigate their use for example as a protein source.

Projects could also concern niche crops, alternative use of existing crops or forest products to be refined for use in the food and feed industry. By combining breeding approaches with geographic requirements and innovative strategies for production of food and feed, a more even and geographically balanced use of the natural resources can be obtained.

Yet other examples of projects that fit into the Call could involve residuals of primary products in combination with a microbiology approach in order to study and develop refinement processes for production of substances for different applications, e.g. the food and feed industry. This exemplifies a type of project that to a large extent relies on modified microorganisms, capable to metabolize a basic product to a desired one.

Projects in the forest area could include using breeding techniques for replacing fossil-based products with forest-based renewable products in industries such as transportation and building construction.

An important aspect of the research areas covered by this Call is the possibility to use gene editing and/or genetic modification techniques, which may be very strategic in the long term even though they are of limited practical use presently due to political limitations. These technologies could be advantageously included in proposed projects.

Finally, the Call provides leverage for Swedish research groups to participate in the EU Horizon Europe research and innovation programs, like Pillar 2 on Global Challenges and European Industrial Competitiveness, in particular the Clusters on Food, Bioeconomy, Natural Resources, Agriculture, and Environment.

Depending on the scientific quality and the strategic relevance of the submitted applications, the Foundation may choose to fund at least one project in each of the three key categories, or projects overlapping the categories.

## **Strategic relevance**

The proposed research shall aim to provide enabling technologies for future applications, products or services, and solutions to important application problems

The criterion of strategic relevance means that a proposal demonstrates how it contributes to Swedish international competitiveness by a clear vision of utilization/exploitation of the research results in Sweden in the 5-15 years term. This includes providing effective measures for translation and innovation, as could be eventually evaluated from the creation of enterprises and jobs. A central part of the relevance is graduate student education and the attractiveness of the corresponding PhD's in industry and society.

It is recommended that the PI's involve partners that can continuously support utilization/exploitation efforts of research results. One way to do this is to involve a university innovation office and/or holding company, already at the formulation stage of the application. Three percent of the grant will be reserved by SSF and can be claimed for such directed utilization activities.

## **Eligibility**

All projects should be based on a collaboration between, preferably, two to four PI's (senior applicants) with different kinds of relevant complementary scientific expertise at the international forefront. All PI's should take active part in the project and their activities should be at least partly financed by the project budget. PI's are encouraged to form research teams involving scientists from different faculties and institutes.

The application must be submitted by a main applicant, employed to at least 50% by a Swedish university, university college or research institute, who has the capacity to assume coordination responsibility for the project during the entire grant period. The co-applicants must be employed by a Swedish university, university college, university hospital, or by a public or private non-profit research institute. At least one of the applicants must be employed by a university or university college.

While project participation from industry, public authorities or other relevant organizations is an evaluation criterion, such participants cannot be funded by the SSF grant, but may participate on their own budget. Although SSF-grants may not be transferred to universities outside Sweden, they may be used for, e.g., visits by foreign-based scientists to applicants working in Sweden.

The proposed budget should be in the interval of MSEK 4 to 7 per year for five years. A maximum of 25% of the grant may be used for salary for the main applicant and/or the co-applicants, but only to cover up to a maximum of 25% of the salary of each applicant. Junior participants (PhD students, postdocs or other junior researchers) may be funded by 100% of the salary. A maximum of 10% of the grant may be used for covering cost of expensive equipment and other research infrastructure.

Please note:

- each applicant is allowed to be represented in no more than one application as a main applicant.
- each applicant is allowed to be represented in no more than one application as a co-applicant.

Applications not conforming to these conditions will not be considered. It is the responsibility of the main applicant to inform all the co-applicants and to check the application for compliance with the rules before submission.

## Application and submission

A complete application must contain, among other data specified in the Portal:

- A clear purpose statement and outline how the proposed constellation of research groups will be effective in view of its objectives
- Full description of the research plan with special attention to the collaborative nature of the proposed project
- Details of the relevant expertise and mode of collaboration between the participating groups
- Clear account of the strategic significance of the research in the medium to long term, including a plan for utilization/exploitation efforts that should commence in parallel with the research activities, already from day one in the project
- State-of-the-art description within the area(s) addressed, from which the outstanding research challenges for the project are identified
- Inventory of the resources available to the project
- A Letter of Intent from the Head of the main applicant's department.

The application must be written in English and submitted via the SSF Portal at:

<http://apply.strategiska.se>.

Note that to get a complete view of all data required for submission it is necessary to consult the Portal. Please log on to the Portal well in advance of the deadline. Please also submit the application in due time before the deadline. When the application is submitted, the system will reject it if some data field is missing. As long as this is done before the application deadline it is possible to submit and re-submit multiple times.

All applications must be submitted by **14:00 hours (2:00 pm CET) on March 16, 2021**. No additional material will be considered after this deadline.

## Evaluation

Applications will be assessed by an evaluation committee consisting of generalists and specialists from industry, academia, and research institutes. In a first selection, the applications will be judged primarily with regards to scope, relevance, and projected impact. Furthermore, applications that are judged unable to compete in the final step of the evaluation or that are considered too incomplete to be meaningfully assessed, will not pass this first step. The selected applications will be sent on international peer review. The results of this expert review will be taken into account by the evaluation committee in order to produce a recommendation on which SSF will base its decision.

The applications will be reviewed using the following criteria:

- Conformity to the scope of the Call and eligibility as outlined above
- Scientific quality; originality, strengths, weaknesses, degree of collaboration, and feasibility of the research plan
- Strategic relevance, with clear purpose and potential impact of the proposed research to Swedish industry and/or society, including explicitly formulated utilization/exploitation plans
- Qualifications of the applicants and composition of the research team with degree of synergy, previous achievements (science, innovation, and entrepreneurship), international experience and networks, and leadership/management of research teams.

SSF practices equal opportunity for female respectively male main applicants (project leaders).

### **Timetable**

- Last date for applications: March 16, 2021, 14:00 CET at the latest
- Decision by the SSF Board: October 2021
- Project start: January 1, 2022.

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*Please note that the Foundation is subject to the Principle of Public Access to Official Records (Offentlighetsprincipen). Thus, applicants should avoid submitting material that they do not wish to be made public, e.g., information that could prevent patenting.*