Announcement

by the Federal Ministry of Education and Research of guidelines for funding research projects as part of the initiative "GABI-FUTURE: Plants as a Basis for Life – from Genome Analysis to Product Innovations" in the framework programme "Biotechnology – Taking and Shaping Opportunities".

of 31 May 2006

1. Purpose of funding, legal basis

1.1. Purpose of funding

Together with its European partners, Germany has to find an answer to the global challenges of the 21st century: rapid growth of the world population, safeguarding the world food supply, satisfying increasing demand for energy and raw materials in view of ever decreasing fossil resources, limiting environmental and climate change, maintaining scientific and economic competitiveness.

Modern plant genome research can make a major contribution to overcoming these pressing global problems by speeding up the gain in knowledge and making imaginative use of scientific findings for innovative products, technologies, production systems and services along existing and also new value-added chains. Central significance in this endeavour is attached to plants as renewable biological resources in the required restructuring of industry, which is currently largely based on fossil hydrocarbons, into an economy structured according to the demands of growth and sustainability on a bioscientific basis (knowledge-based bio-economy). The successful creation of a knowledge-based bio-economy is, for its part, a necessary condition for opening up new innovation and value-added potential and thus for the creation of jobs with a guaranteed future. Only in this way can Europe achieve its goal of becoming the world's most competitive and dynamic knowledge-based economic area (Lisbon Strategy). Germany will play the role of a driving force in this process.

Through the GABI research and funding initiative undertaken jointly by the Federal Ministry of Education and Research (BMBF) and industry, internationally competitive plant genome research has become established in Germany and at the same time the research results have been implemented in practical plant breeding with the aid of innovative technology transfer mechanisms. So-called "bridging projects" have been implemented as a new and successful instrument for research funding, by means of which researchers from academia and industry make joint use of findings obtained from model plant organisms in order to be able to deal with issues concerning applications in agronomically important crops of considerable significance for plant breeding, agriculture and processing industry, such as potatoes, maize, oilseed rape, sugar beets.

European cooperation with plant genome research programmes in France and Spain has proved to be of particular significance for maintaining the international competitiveness of the researchers from academia and industry involved in GABI. These bi- and trilateral research cooperations have become the driving force for the European integration of plant genome research.

With a view to the development of a sustainable knowledge-based bio-economy in Germany,

the GABI-FUTURE funding initiative is intended to raise plant genome research onto a new plane with respect to structure and content. The aim is not only to create the necessary conditions for the breeding of new innovative varieties through research and development but also to thoroughly exploit the enormous potential of plants as suppliers of raw materials and biofactories of the future, replacing conventional production methods by paving the way for energy-efficient and environmentally compatible biological processes, thus making a contribution towards covering Germany's energy demand and ultimately encouraging the creation of new high-tech sectors and ensuring the scientific and economic competitiveness of Germany by opening up new markets.

The research projects under the umbrella of GABI-FUTURE are to be found in the field of basic research and at the pre-competitive stage where they are organized in funding modules according to topic and will address defined links in the respective innovation and value-added chain. Important elements in GABI-FUTURE will concern support for post-docs and the provision of research resources.

The GABI-FUTURE call for proposals is aimed at all relevant actors from science and industry along the plant-based innovation and value-added chains, ranging from molecular plant research through plant breeding and plant protection up to the processing industry, the food industry, chemical industry and the energy sector. This also includes those research institutions and commercial enterprises that are not yet part of the existing network of expertise.

1.2. Legal basis

Projects may be funded by grants in accordance with these guidelines, the BMBF's standard guidelines for grants on an expenditure or cost basis, and the administrative regulations concerning Section 44 of the Federal Budget Code (BHO). Applicants are not automatically entitled to receive a grant. A decision will be made by the funding agency after duly assessing the circumstances within the framework of available budget funds.

2. Object of funding

This first announcement within the framework of GABI-FUTURE is intended to lay the scientific foundation for a comprehensive optimization of plants as an economic factor, not just as a food and feedstuffs but also as suppliers of raw materials and energy for the future. To this end, project proposals should be submitted that deal with scientific issues in the following areas, giving consideration in particular to those crops that are of major economic significance for Germany and Europe.

2.1. Topics

- **Crops and suitable wild plants that produce customized innovative substances for further industrial processing**
  The majority of the synthesis components required by the chemical industry, and also to some extent whole products – frequently in the form of high-quality fine and special chemicals – are based on fossil resources that will be exhausted in the foreseeable future. In order to compensate for the finiteness of these fossil sources, renewable alternatives based on plants will be developed – paying special attention to a holistic use of these raw materials. Interest may be focused here, for example, on novel, modified or customized plant metabolites or (secondary) plant metabolites whose

concentrations are optimized as initial substances for improving the material, and also for more efficient production, synthesis and fermentation processes for plant substances – for instance via a selective translocation of chemical syntheses in plants. The development of production systems based on cell cultures is not the object of this funding.

- **Crops and suitable wild plants optimized for energy production under extensive conditions**
  The fossil reserves for our energy supply – above all in the form of crude oil – are dwindling continuously. At the same time, global energy demand continues to rise, combined with global atmospheric warming and accompanied by increasingly extreme climatic conditions and their negative impacts. Renewable, plant-based energy sources (including bioethanol, biodiesel, biogas and biomass-to-liquid (BTL) fuels) with an equalized CO_2 balance are consequently attracting growing interest. The selective optimization of crops or parts of plants and also suitable varieties that have not yet been domesticated are of particular interest for use as sources of energy under extensive conditions. Funding is earmarked for those projects that aim to increase basic knowledge as a preliminary stage before the concrete application of plants for energy purposes.
- **Crops containing medicinal substances or improved food quality and safety**
  As a consequence of the demographic changes in our society, there will be a continual increase in the demand for foodstuffs tailored to a wide range of special needs on behalf of the consumer. Apart from quality and safety, attention will be primarily focused on the prevention of nutrition-related diseases. The identification and modification of desirable (e.g. antioxidants, vitamins) and undesirable plant constituents (e.g. toxins, allergens) will, amongst other aspects, contribute to improving food and feedstuffs as well as satisfying future consumer requirements.
- **Crops capable of withstanding biotic and abiotic stress and thus contributing to innovative plant protection concepts**
  A plant-based, efficient and at the same time sustainable production of food, feedstuffs, energy carriers and other industrial and pharmaceutical raw materials is always based on functional adaptation to adverse environmental conditions, e.g. to pathogens or biotic and abiotic stress factors. In the course of evolution, plants have developed a unique spectrum of adaptive strategies. An important objective is to utilize this diversity, for example by comparative research approaches for the whole genome in order to make crops more stable in the long term or to achieve increased crop yields on the basis of an optimized environmental adaptation while at the same time conserving the environment and natural resources.
- **Crops that take up and utilize nutrients or water more efficiently**
  Adaptation to changing climatic conditions requires agricultural crops that use the existing nutrients and water more effectively and at the same time prove to be more resistant to more frequently occurring drought, floods and extreme temperatures. Such crops will also minimize the necessity for fertilization and thus significantly reduce the economic costs as well as the ecological burden. On the basis of the existing diversity, and also exploiting the existing biological variability, plants with significantly reduced requirements for water and nutrients will be developed which will be able to produce a greater amount of useful biomass in shorter vegetation periods.
- **Crops that have been optimized with respect to their metabolism, the development of crop organs and their plant architecture**
  The primary crop organs (e.g. seeds, tubers, beets) are of special interest with respect to the sustainable use of the whole plant for material or energy purposes. Knowledge

of the development and physiology of plant crop organs must be decisively improved in order to achieve the increased yields required in future (higher harvest index), as well as yield stability and quality on the area of land currently under cultivation which it will be difficult to extend. Apart from the elucidation of fundamental phylogenetic processes leading to the formation of crop organs, attention is focused above all on development and physiology, the accumulation of valuable constituents, as well as the genetic basis of the formation and maturation of crop organs, e.g. also on the basis of the research approach of systems biology.

- **Structure and further development of the GABI infrastructure required in future**
  The development, continuation and provision of genomic resources, bioinformatics instruments and platform technologies for cross-project utilization within the GABI community will continue to be of central significance in future. Relations must be established between the GABI infrastructure and the concrete biological topics of the GABI-FUTURE projects. The further development of the existing GABI infrastructure must be based on the demonstration of sustainable use in the previous support phases. Future funding beyond the forthcoming support phase must be demonstrated. Material and immaterial GABI resources – which may function as a link between basic and product-oriented research – include primary databases and the associated data collections as well as bioinformatics services and access to visualization instruments, user-friendly access portals, populations, lines array and phenotyping platforms. In the development of bioinformatics tools, special attention should be paid to the aspect of the improved integration of data from genome research into practical breeding work. Project applications should give consideration to demand-oriented training opportunities for academia and industry.

2.2. Support modules and project structures

The topics mentioned in No. 2.1 will be processed as part of the support modules described in the following. In each of the modules both basic and application-oriented projects – depending on the module-specific project structures – can be planned and submitted.

i. **GABI-BASIS module**
   Long-term explorative research projects of strategic significance based on novel approaches and concepts, which will first be verified as an example in order to then further develop them in an application- or product-oriented manner. On the basis of highly innovative research approaches, priority will be given to cooperative projects although individual projects will also be funded. The projects submitted may also involve pilot studies for future research networks or so-called proof-of-concept projects which at a later point will lead to start-up companies (duration of such projects: up to 3 years).

ii. **GABI-BRIDGING PROJECTS module**
   So-called bridging project with prospects for implementation in the medium term will be funded in which findings from the field of basic research on reference systems will be transferred to agriculturally significant crops and further developed. Economically relevant research goals will be set in close cooperation with commercial enterprises. Only cooperative projects can be submitted as part of GABI-BRIDGING PROJECTS (duration of projects: up to 3 years).

iii. **GABI-PRODUCTS module**
   Attention will be focused on application-oriented projects at the pre-competitive stage which make a decisive contribution to addressing issues within one or more links of the relevant innovation and value-added chain. Preference will be given to cooperative

projects between commercial enterprises and academic research institutions (so-called public-private partnerships), which will ideally be coordinated by an industrial partner. Only cooperative projects can be submitted as part of the GABI-PRODUCTS module (duration of projects: up to 3 years).

iv. **GABI-RESOURCES module**
Funding will be allocated to projects that serve to establish and further develop the scientific infrastructure required within the framework of GABI-FUTURE (see No. 2.1) and that at the same time facilitate cross-project utilization (duration of projects: up to 3 years).

v. **GABI-START module**
Funding will be provided for individual projects implemented by independent post-doc groups that are intended to serve as the nucleus for new centres of excellence and which, in a subsequent step, intend to make further use of the findings obtained for a start-up or some other form of specific technology transfer. This module particularly also addresses German scientists currently abroad. With respect to topic, the post-doc groups can be associated with larger consortia. A prerequisite for the awarding of a grant is that the respective host university or research institution makes available to the post-doc group the facilities required for implementing the project (assignment of basic lab space and other infrastructure facilities) and assists the leader of the group in all matters involved. With the aim of an optimal transfer of technology and resources, it would be beneficial for such a group to be associated with a commercial company. A declaration to this effect from the host establishment should be appended to the project outline (duration of projects: up to 5 years).

In developing the project concept, the whole value-added chain on which it is based must be depicted up to and including the final product, even if not all the links in the innovation chain are represented by work packages in the project outline. Furthermore, potential industrial partners for the later development phases should already be included in the first project phase. It is therefore recommended that relevant commercial companies organized in the Economic Network for Plant Genome Research GABI (WPG) should first be contacted and preferentially integrated in the project application.

3. Recipients of grants

Applications may be filed by universities, non-university research institutions and commercial companies with their headquarters in Germany.
Research institutions that receive their basic funding jointly from the German Federal Government and the federal states may only be granted project funds for their additional expenses under certain conditions.

4. Prerequisites for funding

In their own interest, applicants should also familiarize themselves with the EU RTD Framework Programme when planning a national project. They should check whether the envisaged project has specific European components so that funding from exclusively EU sources is possible. Moreover, it should be verified whether, in the context of the planned national project, an application for supplementary funding can be filed with the EU. The result of such examinations should be briefly described in the application for national funding.

The partners in a "collaborative project" should regulate their cooperation in a cooperation agreement. Before a funding decision can be taken, proof of basic agreement (cooperation agreement) on specific criteria set by the BMBF must be furnished. Details can be found on the BMBF information leaflet Vordruck 0110 - (http://www.kp.dlr.de/profi/easy/bmbf/pdf/0110.pdf).

5. Type and scope, amount of the grant

Funding may take the form of non-repayable grants awarded for projects.

The basis for calculating the grants for industrial companies is the eligible project-related costs which, as a rule, can be financed up to 50 %, depending on the closeness to application of the project. According to BMBF principles, industrial companies are expected to bear a reasonable share – in principle, at least 50 % of the eligible costs incurred.
The basis for calculating the grants for universities, research and science establishments and comparable institutions is the project-related expenses eligible for funding (for Helmholtz Centres and the Fraunhofer Society - FhG - the eligible project-related costs), up to 100 % of which can be individually funded.

The European Commission's Community Framework for State Aid for Research and Development must be observed when fixing the rates for funding. This Community Framework permits a differentiated bonus regulation for collaborative projects by applicants from the new federal states (the former East Germany) and for small and medium-sized enterprises (SMEs), which may lead to a higher funding rate.

6. Other terms and conditions for the awarding of grants

The BMBF's General Conditions for Grants on Cost Basis to Industrial Companies for R&D Projects (NKBF 98) will be an integral part of the notification of a grant.

The General Auxiliary Conditions for Grants for the Promotion of Projects (ANBest-P) and the Special Auxiliary Terms and Conditions for Grants from the BMBF for the Promotion of Projects on Expenditure Basis (BNBest-BMBF 98) will be an integral part of the notification of a grant.

Attention is also drawn to the "Information Leaflet for GABI-FUTURE Applicants", which can be obtained from PtJ.

7. Procedure

7.1 Commissioning a project management organization and request for documents

The following project management agency has been entrusted by the Federal Ministry of Education and Research with implementing this funding activity:

Projektträger Jülich (PtJ)
Geschäftsbereich Biologie
Forschungszentrum Jülich GmbH
Germany
Internet: http://www.fz-juelich.de/ptj

Your contact is

Dr. Rainer Büschges
Tel.: +49 2461/61-8782
Fax.: +49 2461/61-2730
E-mail: r.bueschges@fz-juelich.de

Special forms for compiling project outlines can be obtained from the contact at PtJ or from the website http://www.fz-juelich.de/ptj/gabi-future

Forms for applications for funding, guidelines, information leaflets, instructions and auxiliary terms and conditions are available on the Internet (http://www.kp.dlr.de/profi/easy/formular.html) or can be obtained directly from the Project Management Organization.

It is urgently recommended that the "easy" electronic application system (http://www.kp.dlr.de/profi/easy) should be used for formal funding applications.

7.2. Two-stage funding procedure

The funding procedure consists of two stages.

7.2.1. Submission and selection of project outlines

In the first step of the procedure, projects outlines must be submitted to PtJ by post and in parallel also in an electronic form by **13.10.2006** at the latest (date as per postmark). In the case of cooperative projects, the project outlines – approved by the other collaboration partners – must be submitted by the designated collaboration coordinator. The time limit for submitting applications is not a cut-off period. However, it may not be possible to consider project outlines received after the specified date.

A form is available for compiling the project outline and can be downloaded from the PtJ website (see No. 7.1). Project outlines must be structured according to the criteria listed below. In view of the international character of the review process, it is recommended that the project outlines should be submitted to PtJ in English. Project outlines for individual projects should not exceed six A4 pages (not including appendices). Project outlines for collaborative projects may include up to two extra A4 pages per additional applicant (example: a collaboration with four partners may submit an application consisting of a maximum of twelve A4 pages).

The project outlines should be structured as follows (see form):

- goals (overall project goal, reference to the funding goals described in Section 2 [selected topic]; funding module selected; scientific and/or technical aims,
- state of the art,
- previous work by the applicant(s),
- work plan (project-related resource planning; milestone planning),
- need for services of GABI resource centres, if available,
- utilization plan (prospects for economic success; prospects for scientific and/or technical success; scientific and economic connectivity; if applicable, representation of the related value-added chain),

- division of labour/cooperation with third parties,
- need for funding.

The following are to be enclosed with the project outline as appendices:

- a title page with general information on the project (form, one A4 page),
- addresses for contacting the applicant(s) and, if applicable, the heads of the working groups in a cooperative project (form),
- a financial survey (forms, two A4 pages),
- a brief CV in tabular form of the responsible project leader of each co-applicant (one A4 page each),
- a project-related list of publications by each co-applicant (project leader) for the past five years – the five most important publications should be highlighted,
- in the case of project outlines for the GABI-START funding module, two independent letters of recommendation from present or previous employers must also be enclosed as well as a declaration by the host institution.

It is recommended that applicants should contact the responsible member of PTJ prior to submitting a project outline.
No legal claims can be derived from the submission of a project outline.

Project outlines which fulfil the formal criteria (determined by PtJ according to No. 7.2) will be submitted to the GABI-FUTURE Scientific Advisory Board (SAB), who will decide whether the project outlines correspond to the research object of the announcement (see No. 2.1). Project outlines which do not fulfil the formal criteria and/or the object of the announcement will not be further processed. The applicants concerned will be informed in writing by PtJ no later than 8 weeks after the final deadline.

For the remaining project outlines, SAB GABI-FUTURE – supported by PtJ – will appoint national and international experts for an external peer review, which will involve a scientific and technical assessment of the project application according to the following specific evaluation criteria:

- scientific excellence of the project (topicality, originality, multidisciplinarity),
- scientific and technical quality of the applicants (national and international competitiveness),
- feasibility of the project (appropriateness of the methods, envisaged duration, as well as the resources and funds applied for),
- in the case of collaborative projects: quality of the planned cooperation between the individual collaboration partners and assessment of the added value created by this cooperation, also with respect to the envisaged synergy effects,
- integration and incorporation in the existing GABI network, if applicable implementation of the bridge concept (model plant -> applied topics),
- innovative potential of the expected results, strategically and/or in industrial applications (utilization plan, position in the depicted value-added chain, patent rights concept),
- economic, social and environmental significance of the project.

On the basis of this assessment, SAB GABI-FUTURE will give PtJ a prioritized list of project outlines with a recommendation for further processing. The results of the selection process will be communicated in writing to those involved.

7.2.2. Submission of formal funding applications and decision-making process

In a second process step, those involved in the project outlines that have been positively evaluated by PtJ will be requested to make a formal application, on the basis of which, after further examination, PtJ will make a final decision.
Approval, payment and accounting of the funds as well as proof and examination of proper use and, if necessary, revocation of the award and reclaiming of the funds awarded are governed by the administrative regulations under Section 44 of the Federal Budget Code (BHO) and Sections 48 to 49a of the Administrative Procedure Act (VwVfG) unless the present funding guidelines permit an alternative procedure.

8. Entry into force

These funding guidelines shall enter into force on the date of their publication in the Federal Gazette.

Berlin, 31.05.06

On behalf of the

Federal Ministry of Education and Research

Prof. Dr. Frank Laplace