

## **Call for Proposals**

### **“Innovation in Biocatalysis: A toolbox for sustainable bio-based production”**

#### **Description of program**

“Innovation in Biocatalysis: A toolbox for sustainable bio-based production” is a program supported by project contributions from the Swiss Higher Education Council. The project is led by the Competence Center for Biocatalysis (CCBIO) located at the University of Applied Sciences in Wädenswil (ZHAW). The goal of the program is to create a network for dynamic and innovative biocatalysis in Switzerland by facilitating the development of transdisciplinary expertise between the fields of chemistry, biotechnology, micro-/ molecular biology and engineering as well as by complementing the currently existing curriculum at tertiary level with classes and practical courses in biocatalysis.

From the perspective of applied research, new transdisciplinary concepts will be developed which should serve integration of biocatalytic and chemical processes for the sustainable production of added-value chemicals. In addition to developing methods and applications, educational content for the tertiary level will be adapted to incorporate the bio-based technology shift; economic and social implications will also be examined and communicated within the community and to a larger audience.

The program includes three types of calls

#### **Research Projects (Summer 2017)**

The “Research Project” calls will support projects concerned with biocatalysis, i.e. the chemical transformation catalyzed by one or multiple enzymes in any form, and platforms enabling the discovery, application and optimization of biocatalysts.

- Process design of biocatalytic reactions or enzyme production processes.
- Improvement of enzyme scope, robustness and production cost.
- Novel biocatalytic transformations (e.g. implementation of underexploited enzyme families, cascade reactions, improved cofactor recycling, enzyme repurposing).
- Generic chassis strain development.
- Acceleration of biocatalytic route development (e.g. via bioretrosynthesis, HTS screening methods, smart enzyme library design).
- New applications in biocatalysis (e.g. biopolymers with new properties, functionalization of surfaces, cell free protein expression, diagnostics).

## **Curricular Elements (Summer 2017)**

The call will support development of Curricular Elements aiming at a long-term integration of biocatalysis in the life sciences education to facilitate the use of enzyme systems for modern production processes. Curricular Elements should target BSc/MSc and continuing education levels.

### **Curricular Elements could be (but are not limited to)**

- New practical and theoretical courses, also employing innovative teaching formats
- Integration of new biocatalytic elements into existing courses
- Integration of nationally distributed competences into joint curricular elements

### **Content could include**

- Expanding retrosynthesis by including biocatalytic elements
- Exploring the regulatory and IP space as well as fundamental elements of economic feasibility of biocatalysis
- Integrative approaches ranging from gene to final product
- Adapting industrial case studies to teachable formats
- Novel approaches to maintain and advance core competences in biocatalysis (e.g. directed enzyme evolution, chemical and process engineering as well as downstream processing)
- Integration of biocatalytic principles in education curricula in particular on tertiary level.
- Development of practical/ modular biocatalysis courses by one school or multiple schools.

## **Sustainability (Summer 2019)**

Projects in this section will focus on

- The sustainable implementation of biocatalysis in industry and collaboration between academia and industry beyond 2020.
- **Evaluation of outcome** from Research Projects and Curricular Elements.
- **Roadmap** “Science-based Bioeconomy in Switzerland”.
- **Concept** on how to use the “Innovationsraum Biokatalyse” beyond 2020.

The scope of the sustainability projects will be adapted by the working group “Sustainability” in Spring 2019.

## 1. Governance Structure

### 1.1 Scientific Board

The five-member Scientific Board (Annex 1) will have the following rights and obligations:

- Monitor the “Innovationsraum Biokatalyse”.
- Appoint the members of the Working Groups.
- On the basis of the recommendations of the Working Groups, decide on the funding of projects according to available budget.
- On the basis of the recommendations of the Working Groups, decide on the continuation/ termination of projects.

### 1.2 Working Groups (WG)

The evaluation and monitoring of the project areas “Biocatalysis Projects”, “Curricular Elements” and “Sustainability” are undertaken by three working groups since the three types of projects require different evaluation competences. Each panel will include experts of biocatalysis.

#### 1.2.1 WG “Biocatalysis Projects”

- **Structure:** The WG “Biocatalysis Projects” will be composed of a group of 5-10 members from Swiss Universities of Applied Sciences, Universities and ETHs as well as industry representatives. Further representatives can be called in depending on the expertise needed to evaluate the proposals submitted in that particular call.
- **Rights and obligations:** WG “Biocatalysis Projects” will work out the project calls, evaluate submitted proposals, rank projects according to their value, and prepare recommendations to the Scientific Board. They will monitor project progress and make recommendations about continuation of the projects.

#### 1.2.2 WG “Curricular Elements”

- **Structure:** The WG “Curricular Elements” will be composed of a group of 5-10 members from Swiss Universities of Applied Sciences, Universities and ETHs as well as industry representatives. Further representatives can be called in depending on the expertise needed to evaluate the proposals submitted in that particular call.
- **Rights and obligations:** WG “Curricular Elements” will work out the project calls, evaluate submitted proposals, rank projects according to their value, and prepare recommendations to the Scientific Board. They will monitor project progress and make recommendations about continuation of the projects.

#### 1.2.3 WG “Sustainability”

- **Structure:** The WG “Sustainability” will be composed of a group of approximately 5 members from Swiss Universities of Applied Sciences, Universities and ETHs as well as industry representatives. Further representatives can be called in depending on the expertise needed to evaluate the proposals submitted in that particular call.

- **Rights and obligations:** WG “Sustainability” will work out the project calls, evaluate submitted proposals, rank projects according to their value, and prepare recommendations to the Scientific Board. They will monitor project progress and make recommendations about continuation of the projects.

### 1.3. Executive office

- **Structure:** The two-member executive office is located at the leading house ZHAW (Annex 1).
- **Rights and obligations:** The executive office will call in the Scientific Board and Working Groups and coordinate and organize the respective meetings, carry out the administration for the project calls, coordinate the reporting and will represent the “Innovationsraum Biokatalyse” to the public and a broader scientific community.

## 2. General

### 2.1 Goal and basic principles

- Under the funding opportunity “Innovationsraum Biokatalyse” grants are awarded to qualified researchers who intend to conduct a research and innovation project with the clear goal of developing new technologies valuable to the central activities along the biocatalytic value chain.
- There will be a single call for “Biocatalysis Projects” and “Curricular Elements” within the “Innovationsraum Biokatalyse” in summer 2017 and a call for “Sustainability Projects” in summer 2019.

### 2.2 Duration of grants

- “Innovationsraum Biokatalyse” grants are awarded for a maximum of 30 month (“Biocatalysis Projects” and “Curricular Elements”) and 12 month for “Sustainability Projects”. Exceptionally, extensions for a maximum of 3 month may be granted without additional funding if sufficient reasons are given.
- It is possible to apply for a shorter funding period.

## 3. Formal requirements

### 3.1 Personal requirements

- Applications may be submitted by faculty members or teaching and research staff employed at a research institution (“host institute”) such as a Swiss University, a Federal Institute of Technology or a University of Applied Science (please consult Annex 2 for a complete list of eligible host institutes).

- Applicants must be in a position to carry out research projects under their own responsibility and to lead scientific and non-scientific project staff.
- Applicants are employed at a research institution that is eligible for research funding at least for the duration of the project or they have written assurance of such employment.
- Members of the Scientific Board are excluded from participating in the “Innovationsraum Biokatalyse” calls. Executive Office and Working Group members may participate in the “Innovationsraum Biokatalyse” calls. The usual rules regarding conflicts of interest and recusal apply. Executive Office and Working Group members will sign a “conflict of interest” form.

### **3.2 Requirements for the planned research**

Projects must focus on technological innovation in the field of biocatalysis.

### **3.3 Applicants and implementation partners**

Projects are submitted by a single applicant or a consortium.

In the case of more than one applicant

- a. each applicant must meet the eligibility requirements for the submission of applications;
- b. each applicant must be a member of an independent research group;
- c. each applicant takes personal responsibility for the project;
- d. applicants must designate one person (principal investigator) to coordinate and represent all applicants vis-à-vis the Executive Office, whose representation shall be legally binding.

Applicants may choose to involve implementation partners (e.g. industrial collaboration) in their project to provide specific expertise or infrastructure. However, these partners are not eligible to receive financial support within this call.

### **3.4 Formal requirements for the application**

Proposals for the calls “Research Projects” and “Curricular Elements” must be submitted electronically to the executive office ([ccbio.icbt@zhaw.ch](mailto:ccbio.icbt@zhaw.ch)) by July 31<sup>st</sup>, 2017, 17:00 Swiss local time. Proposals for the call “Sustainability” must be submitted electronically to the executive office ([ccbio.icbt@zhaw.ch](mailto:ccbio.icbt@zhaw.ch)) by July 31<sup>st</sup>, 2019, 17:00 Swiss local time.

Proposals must be written in English and contain the following information and documents:

### Call “Research Projects”

- **one page summary** of the research project including clear description of objectives pertinent to the call
- **project description** (5 pages) covering
  - Current state of research and innovation in the fields
  - Innovative potential of the proposed project beyond the state of art including potential applications in industrial biocatalysis and economic and/or societal impact
  - Detailed project plan with goals, methodology, approach and outcomes
- **Timeline, milestones and deliverables** indicating complementary and expected synergies between collaborators (maximum 1 page)
- **CV of the applicant(s)** (maximum 1 page per applicant)
- **Letter of support from an authorised signatory of the host institute** confirming 50:50 co-financing of the project by their host institute.

### Call “Curricular Elements”

- **one page summary** of the development idea for the Curricular Elements including clear description of objectives pertinent to the call
- **project description** (max. 5 pages) covering
  - Description of the current curriculum/ situation and its limitations
  - Description of the proposed project and expected impact for relevant stakeholders
  - Detailed project plan with goals, approach and outcomes
- **Timeline, milestones and deliverables** indicating complementary and expected synergies between collaborators (maximum 1 page)
- **CV of the applicant(s)** (maximum 1 page per applicant)
- **Letter of support from an authorized signatory of host institute** confirming 50:50 co-financing of the project by their hosting research institute.

### Call “Sustainability”

Proposal requirements will be announced in Spring 2019.

### **3.5 Other forms of funding**

- At the time of submission or during an ongoing project, applicants may also receive grants from other funding organizations.
- All other funding should be declared in the project proposal.

## **4. Proposal evaluation procedure**

### **4.1 Non-consideration**

Proposals that do not meet the formal requirements laid under point 3 will not be considered for evaluation.

### **4.2 Evaluation criteria**

The following criteria are applied during the evaluation proposals:

1. Scientific content and innovative potential
  - a. The project's scientific objectives must be within the scope of the call, of high quality and realistic, providing a clear added value with respect to the current state of the art. The proposed methods must be suitable, sound and relevant to the objectives. The evidence should be related to the intended innovation and further industrial application rather than to continued basic research.
  - b. The project must present a credible vision of the potential technological impact and benefits of the innovation as well as its possible implementation should be pointed out.
  - c. The project must be feasible and goal-oriented according to its work plan and defined milestones, and must include a realistic budget.
  - d. The project must contain a convincing roadmap outlining the envisaged steps towards implementation.
2. Qualification of applicants:
  - a. The applicants demonstrate an appropriate level of scientific and innovation-based expertise as well as entrepreneurial and management competence.
  - b. In projects with more than one applicant, their expertise must be complementary and their collaboration must deliver a clear added value. Moreover, the applicants must be able to show that they are capable of organizing the consortium and establishing appropriate project-internal communication and decision processes.

### **4.3 Evaluation procedure**

- The Working Groups members evaluate all proposals that meet the formal requirements according to the criteria outlined in 4.2. During evaluation the opinions of external experts may be obtained in addition.

- Based on the assessment of the written documents, the Working Groups rank the projects according to their quality and submit funding or rejection recommendations to the Scientific Board for all evaluated proposals.

#### **4.4 Decision**

- Based on the recommendations of the Working groups, the Scientific Board will rank the proposal for funding.
- Decisions made by the Scientific Board are communicated to the principle investigators by the Executive Office.
- The ruling states, in particular, the reasons for the decision, the amount of funds allocated to the project and the conditions or requirements to be fulfilled before the project starts or once it is underway.

### **5. Costs**

#### **5.1 Eligible costs**

- Project grants may be used to cover the following costs:
  - a. The salaries of scientific and technical staff designated for the research project within the salary scales prescribed (CTI funding scales apply).
  - b. Research costs that are directly related to the research work, namely material of enduring value, expendable items, field expenses, travel costs or third-party charges;
  - c. Costs and fees of scientific open access e-publications produced within the scope of the funded research;
  - d. Additional costs may be covered if required for the success of the project.
- 50% of the money for the project is to be supplied by the host institute in case of eligible applicants (co-financing).
- At least half of the institutes' co-financing is to be supplied as "Real Money" (to be used for staff and/or equipment), the reminder can be "Virtual Money" (e.g. use of infrastructure).
- The efficient use of a realistic budget is an essential criterion in the evaluation of the project.
- The costs must be applied for and quantified in the proposal; costs for personal and research costs are to be listed separately.
- The pay-out of the grant will be carried out in yearly instalments. The first instalment will take place after the positive evaluation of the proposal by the Working Group and the Scientific Board, subsequent instalments will be allocated after the approval of the annual financial and progress reports by the SBFI.

#### **5.2 Salary scales**

- Institutions may apply their CTI salary scales to the envisaged project staff, such as scientific staff or technicians.

- The requested percentages of employment for project staff must correspond to the actual planned time requirement for the project.

## **6. Grants and grant management**

### **6.1 Legal consequences of the award**

- Grantees must:
  - a. use the grant in accordance with the conditions set out in the ruling;
  - b. comply with the provisions stipulated in this call and all other rules that apply to the grant;
  - c. carry out the project work with due care, while respecting the rules of good scientific practice and upholding the relevant principles of the discipline in question, in particular its ethical guide-lines.
- In case of a single applicant, the grantee becomes the principal investigator. In a consortium with more than one applicant, one grantee becomes the principle investigator of the project and assumes its coordination, including scientific, administrative and financial aspects (see 3.3d)

### **6.2 Grants start and administration**

- The earliest possible starting date of grants is November 1<sup>st</sup>, 2017.
- The grants are transferred in yearly installments and are connected to the approval of the yearly reports.
- The principle investigators must request the transfer of funds and start their project within three months of the date on which the ruling was issued.
- The CCBIO Office approves the release of funds if the conditions for release as defined in the ruling are met.
- The principle investigators must provide the CCBIO Office with a written summary of the planned project that is understandable to non-experts (lay summary). They must also provide thematic keywords for the CCBIO and related websites.
- The lay summary and keywords must be submitted on receipt of the funding decision, but no later than on submission of the release of funds request.
- Once the grant has been released, the lay summary and keywords will be made available to the public.
- Once the funded project has been completed, principle investigators will be required to update the lay summary by including the results of the project. Such updates are a mandatory requirement for the approval of the project activity report (see 7.1; 7.2).

### **6.3 Changes to research plan**

- Substantial changes to the work, tasks and milestones described in the project proposal and/or set by the Scientific Board as conditions for financing may only be made if requested in writing and approved by the CCBIO Office and the Scientific Board.

## 6.4 Project withdrawal or termination

- Applicants who withdraw their project or are forced to terminate it prematurely must inform the CCBIO Office in written form stating reasons.
- Any unused funds must be reimbursed.

## 6.5 Sanctions

The Scientific Board is responsible for deciding on potential sanctions and demanding reimbursements in the event of suspected breaches of the terms of this call or of terms applicable to research integrity or good research practice <sup>1</sup>

## 7. Reporting and project conclusion

### 7.1 Reporting duties

- Grantees must report their activities and achievements. In particular, they must submit:
  - a. a yearly progress report.
  - b. a yearly finance report which accounts for the co-financing of the host institution.
  - c. a final project activity report upon conclusion of the project (see 7.3).
  - d. a final financial report which accounts for the co-financing of the host institution.
- In consortia, the principal investigator coordinates the reporting duties of all grantees and submits the reports to the CCBIO Office.
- If the requirements are met (see 7.3), the CCBIO Office will approve the reports and send the principal investigator a confirmation. If the report is not approved, the CCBIO Office will return the reports to the principal investigator for revision.
- Grantees are required to provide information that will help to evaluate the impact of the program “Innovationsraum Biokatalyse” based on a template that will be provided by the CCBIO Office.

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<sup>1</sup> [http://www.snf.ch/SiteCollectionDocuments/ueb\\_org\\_fehlverh\\_gesuchstellende\\_e.pdf](http://www.snf.ch/SiteCollectionDocuments/ueb_org_fehlverh_gesuchstellende_e.pdf)

## **7.2 Financial reports**

- Financial reports provide a detailed account of how the funding was used and must be submitted once a year (by December). This report must also include a detailed accounting of the co-financing of the host institute.
- A final financial report summarizing the use of the funding including accounting of the co-financing must be submitted no later than 3 months after the end of the funding period.
- Financial reports are compiled by the grant administration office of the principle investigator. They must be reviewed, signed and sent to the CCBIO Office by email in good time.

## **7.3 Project activity report**

Principal investigators must submit a final report consisting of a financial and a final project activity report via email to the CCBIO office no later than 3 months after the end of the funding period.

The following information must be included in the project activity report:

- a. summary;
- b. main scientific achievements and results;
- c. main achievements towards the planned innovation;
- d. future challenges for the implementation phase;
- e. possibilities for creating a start-up or for collaborating with an economic partner;
- f. next steps.

## **8. Research results**

### **8.1 Intellectual property**

- The rights to the research results obtained in the course of research work funded are owned by the grantees or their employers.
- Grantees are obliged to define such rights together with their employers in the form of an agreement before the start of the project.
- Projects that involve grantees from more than one institution who contributed to the research results, the institutions involved shall agree among themselves on ownership, rights and commercialization strategies.

### **8.2 Open access**

- It would be preferred if Grantees publish research results in digital form on free internet publication sites (open access publication).

## **CCBIO Office**

### **Dr. Rebecca Buller**

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## Annex 1: Members of the Scientific Board and the Executive Office (as of February 2017)

### **Scientific Board**

Prof. Dr. Gerhard Grundle (FHNW)

Dr. Steven Hanlon (Roche, President SIBC)

Prof. Dr. Donald Hilvert (ETH)

Dr. Jan Lucht (scienceindustries)

Dr. Roland Wohlgemuth (Merck)

### **Executive Office**

Dr. Rebecca Buller

Dr. Katrin Hecht

## Annex 2: List of research institutes eligible for funding

Die Forschungsanstalten des ETH-Bereichs und Institute, die an die nachfolgend aufgelisteten Institutionen angeschlossen sind, können sich an Projekten beteiligen und ebenfalls projektgebundene Beiträge erhalten, können aber nicht selber Projekte beantragen und nicht als Leading House figurieren.

### *Kantonale Universitäten:*

- Universität Basel
- Universität Bern
- Universität Freiburg
- Universität Genf
- Universität Lausanne
- Universität Luzern
- Universität Neuenburg
- Universität St. Gallen
- Università della Svizzera Italiana
- Universität Zürich

### *Beitragsrechtlich anerkannte Hochschulinstitutionen:*

- Graduate Institute of International and Development Studies, Genf (IHEID)
- Universitäre Fernstudien Schweiz (Fernuni Schweiz)

### *Eidgenössische Technische Hochschulen:*

- Eidgenössische Technische Hochschule Lausanne
- Eidgenössische Technische Hochschule Zürich

### *Andere eidgenössische Institution des Hochschulbereichs*

- Eidgenössisches Hochschulinstitut für Berufsbildung (EHB)

### *Öffentlich-rechtliche Fachhochschulen:*

- Berner Fachhochschule
- Fachhochschule Nordwestschweiz
- Fachhochschule Ostschweiz
- Fachhochschule Zentralschweiz
- Haute Ecole spécialisée de Suisse occidentale
- Scuola universitaria professionale della Svizzera italiana
- Zürcher Fachhochschule

### *Pädagogische Hochschulen:*

- Pädagogische Hochschule Bern
- Haute école pédagogique BEJUNE
- Pädagogische Hochschule Freiburg
- Pädagogische Hochschule Graubünden
- Pädagogische Hochschule Luzern
- Pädagogische Hochschule Schaffhausen
- Pädagogische Hochschule Schwyz
- Pädagogische Hochschule St. Gallen
- Pädagogische Hochschule Thurgau

- Haute école pédagogique du canton de Vaud
- Pädagogische Hochschule Wallis
- Pädagogische Hochschule Zug
- Interkantonale Hochschule für Heilpädagogik