

## **CALL FOR PROPOSALS**

### **NETWORKS IN INDUSTRIAL BIOTECHNOLOGY AND BIOENERGY (NIBB)**

#### **SUMMARY**

The Biotechnology and Biological Sciences Research Council (BBSRC) and its partners (EPSRC, TSB, BioKTN, CIKTN, HeathKTN etc) are committed to supporting the application of outstanding research to the challenges of industrial biotechnology and bioenergy (IBBE) including bioprocessing and biorenewables, for the benefit of the UK and more widely. BBSRC is planning to support a significant programme of new investment that will encompass funding for both networking activities (including proof of concept studies) and investment in major integrated research projects.

The first phase of this strategy for implementation in 2013 will involve a competition for open Networks, aimed at both emerging and established areas of importance to IBBE. This will be followed in 2014 by the launch of a BBSRC/TSB IB Catalyst that will provide funds to support major integrated research projects involving collaborations between the academic and business communities. The IB Catalyst is modelled on the MRC/TSB Biomedical Catalyst (see: <http://www.innovateuk.org/content/competition/biomedical-catalyst.ashx>) and will encourage major challenge-led research projects derived from networking activities: the initial call will allocate funds up to a value of £25M.

The purpose of the Networks is to foster collaboration between academic researchers and business at all levels, in order to find new approaches to tackle research challenges and help deliver key benefits in IBBE through a range of approaches including the application of genomic, systems and synthetic biology as well as the underpinning sciences such as biochemistry, enzymology, metabolism and microbiology. The Networks should work across the boundaries of biology, chemistry and engineering; the participation of other disciplines including mathematics, computational modelling, environmental science, economics and social science is strongly encouraged. Only members of the Networks will be eligible to apply for funding from the IB Catalyst.

# NETWORKS IN INDUSTRIAL BIOTECHNOLOGY AND BIOENERGY

## INTRODUCTION

The Biotechnology and Biological Sciences Research Council (BBSRC) in association with EPSRC<sup>1</sup>, TSB<sup>2</sup> and the BioKTN<sup>3</sup>, CIKTN<sup>4</sup> and HeathKTN<sup>5</sup> wish to support a number of cross-disciplinary, community-building Networks as part of its two-component strategy in supporting IBBE. The expansion of IBBE approaches and expertise will underpin the development of a sustainable UK Bioeconomy with the potential to maintain future energy security, create innovative bio-based products, and increase the efficiency of a wide range of manufacturing processes, generating sustainable economic growth and creating jobs. A brief description of IBBE, as it relates to this call, is provided in **Annex 1**.

Once established, the Networks will foster collaborative activities between academic researchers and business at all levels to identify and develop new approaches to tackle major research challenges and help deliver key benefits in IBBE through the application of a range of approaches, including genomic, systems and synthetic biology as well as the underpinning sciences such as biochemistry, enzymology, metabolism and microbiology. The Networks will be cross-disciplinary, working across the boundaries of biology, chemistry and engineering. Participation from other disciplines including mathematics, computational modelling, environmental science, economics and social science is strongly encouraged.

The purpose of this call for proposals is:

- *To support* a number of Networks in industrial biotechnology and bioenergy and through them, facilitate the development of internationally competitive cross-disciplinary communities capable of undertaking innovative research and attracting further investment from UK and international sources.
- *To provide* the resources to support proof of concept funding for a range of research projects identified by the Networks, ultimately leading to more competitive, collaborative, cross-disciplinary and integrative research proposals to BBSRC and elsewhere.
- *To encourage* the interaction between the academic research base and technology-deploying, associated value-chain and end-user businesses, promoting the translation of research particularly involving genomic, systems and synthetic biology.
- *To enable* the supported Networks to provide the leadership to develop, in collaboration with business, challenges to be addressed by the IB Catalyst fund.

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<sup>1</sup> Engineering and Physical Sciences Research Council (EPSRC) - <http://www.epsrc.ac.uk>

<sup>2</sup> Technology Strategy Board (TSB) - <http://www.innovateuk.org>

<sup>3</sup> Bioscience Knowledge Transfer Network (BioKTN) - <https://connect.innovateuk.org/web/biosciencesktn>

<sup>4</sup> Chemistry Innovation Knowledge Transfer Network (CIKTN) - <https://connect.innovateuk.org/web/chemistryinnovationktn>

<sup>5</sup> HeathTech and Medicines Knowledge Transfer Network (HealthKTN) <https://connect.innovateuk.org/web/healthktn>

BBSRC has allocated up to £15M for this networking initiative and aims to fund approximately 10 Networks of varying scales focusing on a broad range of fundamental and strategic questions and challenges facing the IBBE area. Networks will operate for 3 to 5 years and, whilst highly desirable, are not expected to become self-sustaining beyond this.

**Interested parties are invited to register to attend one of two town-meetings**, to be held in York (15<sup>th</sup> February 2013) and London (21<sup>st</sup> February 2013) by emailing the registration form (see Additional Documents) to [nibb@bbsrc.ac.uk](mailto:nibb@bbsrc.ac.uk) at least 5 working days before the chosen meeting.

The purpose of the town-meetings will be to:

- Introduce the IBBE strategy and explain its aims, scope and future funding options.
- Bring different research communities and disciplines together and to start building potential Networks.
- Discuss the use of \_connect.

Attendance will be on a first-come-first-served basis, so early registration is recommended.

An outline application stage is to be undertaken via the TSB \_connect website (<https://connect.innovateuk.org/web/bbsrc-nibb>; see “Application Process” and “Related Links”) with a closing date of **16:00 on 16<sup>th</sup> April 2013**.

### ***Timeline***

<b>Deadline for registration to attend town-meeting</b>	8 <sup>th</sup> /14 <sup>th</sup> February 2013
<b>Town meetings</b>	15 <sup>th</sup> /21 <sup>st</sup> February 2013
<b>Closing date for expression of interest</b>	16 April 2013
<b>Assessment of expression of interest</b>	Early May 2013
<b>Meeting with PIs (in London)</b>	Mid May 2013
<b>Launch of call for full proposals</b>	Mid May 2013
<b>Closing date for full proposals</b>	Mid July 2013
<b>Assessment of full proposals</b>	Late September 2013
<b>Research grants awarded and projects start</b>	December 2013

### **Contact**

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## BACKGROUND

A key development in establishing the UK as a world leader in IBBE will be the emergence of an internationally competitive cross-disciplinary scientific community in this area, with strong links to related businesses and international research communities. BBSRC aims to support the emergence of these communities through building capacity and capability in the UK. The ultimate aim is to contribute to meeting societal needs such as maintaining affordable, sustainable and healthier lifestyles through the increased use of biorenewables, bioenergy and the efficient manufacture of biopharmaceuticals.

## OBJECTIVES FOR THE CALL FOR NETWORKS IN INDUSTRIAL BIOTECHNOLOGY AND BIOENERGY

The objectives are

- *To support* a number of Networks in industrial biotechnology and bioenergy and through them, facilitate the development of internationally competitive cross-disciplinary communities capable of undertaking innovative research and attracting further investment from UK and international sources.
- *To provide* the resources to support proof of concept funding for a range of research projects identified by the Networks, ultimately leading to more competitive, collaborative, cross-disciplinary and integrative research proposals to BBSRC and elsewhere.
- *To encourage* the interaction between the academic research base and technology-deploying, associated value-chain and end-user businesses, promoting the translation of research particularly involving genomic, systems and synthetic biology.
- *To enable* the supported Networks to provide the leadership to develop, in collaboration with business, challenges to be addressed by the IB Catalyst fund.

## NETWORK DEVELOPMENT PROCESS

BBSRC and its associated partners<sup>6</sup> expect the communities to organise themselves into groupings that will address major challenges in IBBE, including those needs identified in Government and other related strategy and policy documents. To enable the widest possible participation the initial development of the Networks will be done in an open forum on the TSB \_connect website (<https://connect.innovateuk.org/web/bbsrc-nibb>) which will lead to the submission of an outline application. This will also allow Network proposals to be developed that are complementary and not duplications of similar areas.

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<sup>6</sup> Associated partners: EPSRC, TSB, BioKTN, CiKTN and HealthKTN

Applicants are encouraged to engage with a range of stakeholders who could contribute to and benefit from the proposed Network.

## **WHAT SHOULD A NETWORK DELIVER?**

Networks should include a range of activities and mechanisms to deliver the objectives of this call for proposals. **Detailed plans for the governance structure, including the development, assessment and monitoring of proof of concept funding will be an essential component of the outline (and full) proposal.**

Examples of activities and mechanisms that applicants may wish to consider are listed in **Annex 2**.

## **NETWORK MEMBERSHIP**

Each Network should have members from the relevant academic and business communities covering the disciplines of biology, chemistry and engineering. Networks should comprise a diversity of expertise and experience and may include international researchers, Government Departments and other stakeholders, as appropriate. Networks should include participation at all levels including, where appropriate, postdoctoral and postgraduate researchers as well as more senior members. Applicants should also consider the wider impacts of work undertaken by the Network and include representatives from the environmental, economic and social science communities.

Although applicants are expected to identify an initial core membership in the outline and full proposal as a community-building exercise, any successful Network is intended to be “open” in that participation by other interested members will be encouraged throughout the life of the Network in order to develop the community as it matures. How new members can join the Network should be considered within the outline proposal.

## **EXPECTED OUTPUTS OF THE NETWORKS**

The main outputs are expected to include:

- **Improved community interactions** (academic and business) through communication and co-ordination across a number of major research areas relevant to IBBE.
- **Wider cross-disciplinary integrative participation** (bioscience, chemistry and engineering are the minimum disciplines to be covered) to address major research areas but also including environmental, economic and social sciences.
- **Establishment of the UK as an internationally recognised partner of choice** in each research area by formation of a nucleus of like-minded people, deploying genomic, systems biology and synthetic biology approaches.

- **Deployment of community expertise** to construct high quality grant proposals for a range of opportunities both nationally and internationally, using genomics, synthetic and systems biology approaches.
- **Preliminary experiments to explore ideas and generate initial data to construct competitive grant proposals** through proof of concept funding, encouraging participation from different disciplines as well as business, leading to grant proposals to the IB Catalyst and elsewhere.
- **Provide important links between business and academic researchers**, extending knowledge exchange with business, promoting translation of research in the IBBE area and leading to proposals to relevant support schemes.
- **Provide input into UK (and EU) policy**, by providing evidence and expertise as appropriate.
- **Support personal development of Network members** through participation of individuals at all levels and providing all members with exposure to other disciplines and research communities.

Each Network will be expected to disseminate the outcomes of its activities widely and appropriately (eg through meetings, web pages, newsletters or published reports). Each Network's Principal Investigator (PI) will also be expected to play a leading role with BBSRC in promoting opportunities in IBBE, including presentations and dissemination of information at meetings such as grant holders' workshops.

## **FUNDING**

Up to £15M is available for this call and it is expected to support a number of Networks of varying sizes focusing on a broad range of fundamental and strategic questions and challenges facing the IBBE area. Funding awarded to each Network will depend on the size of the community, proposed activities and degree of business engagement.

Larger Networks would be expected to demonstrate clear strategic relevance to IBBE and address most or all of the following requirements:

- A portfolio of existing grant support relevant to the Network research area (including BBSRC and other sponsors).
- Demonstrable evidence of business interest in the Network research area.
- A track record of successful working with business and translation of relevant research with business.
- A critical mass of researchers (academic and business based) involved in the Network research area.
- Well established international links.

Feedback and guidance on the level of funding requested will be provided after the outline proposal assessment; however the Office is happy to discuss your proposal in advance of the submission deadline (see contact details).

## **APPLICANT ELIGIBILITY**

The Network PI (and host Institution) must satisfy BBSRC's standard eligibility conditions (as described in Section 3 of the BBSRC Grants Guide) and will be responsible for the development and directorship of the Network. One co-investigator (also satisfying BBSRC's standard eligibility criteria) may be named in the proposal if the Network is to be directed jointly. The key 10 researchers and members of the associated communities (including business) who will participate from the beginning of the Network should be named on the Outline Proforma. Any industry collaborators supporting the Network with a cash or in-kind contribution (such as a clear role on an advisory board) should be included in this. A more extensive list will be required for the full proposal and further details will be available after the Outline stage.

## **ELIGIBLE COSTS**

### **Director salaries and research support costs**

The Director of the Network should be the named PI on the proposal and under full economic costing may request funds to cover their salary costs for the time spent developing and directing the Network. Requests may also be made for ONE co-investigator to assist the Network's Director in this. Costs can be requested for an appropriately skilled Network Manager (full or part-time) to be responsible for activities such as the day-to-day Network management, event coordination, and website development for the Network. It is recommended these costs are agreed with your Research Office before submitting the Outline Proforma.

The time spent on directing and managing the Network should be reasonable and is not expected to form the majority of costs of the proposal. The salary costs of Network members should **NOT** be included in the proposal.

### **Proof of concept studies**

Proof of concept funds for allocation by the Network may also be requested, the amount should be indicated and justified in the Outline Proforma. These funds can be used for projects ranging from feasibility studies or to provide preliminary data through to desk-based studies (eg the value of different substrates and products, the theoretical yields of different metabolic pathways) and visits to learn new techniques.

Proof of Concept projects should be used to address key issues in the area of the Network that are relevant to IBBE which should strengthen the quality, collaborative (including industry involvement) and cross-disciplinary nature of future innovative and novel grant proposals to BBSRC (and elsewhere). Outline proposals should

describe how these proof of concept projects will be assessed and selected for funding and how the projects' progress and outcomes will be monitored.

### **Network events**

Costs for supporting and facilitating meetings and events can be requested and associated costs should be justified in the Outline Proforma.

## **APPLICATION PROCESS**

The application process will be in two stages:

### **Outline proposal**

Network concepts should be initiated via the discussion function within the TSB \_connect website. A "BBSRC Networks in IBBE" Group (<https://connect.innovateuk.org/web/bbsrc-nibb>) has been created for this purpose and will be independently monitored by Dr Adrian Higson (NNFCC; <http://www.nnfcc.co.uk>). All interested parties are encouraged to join the Group, add to discussions, propose ideas and suggest connections. You can "subscribe" to discussion threads you are interested in to receive email updates of new comments. At an appropriate stage, it is possible for potential PIs to request the creation of a \_connect sub-group to allow embryonic networks to further develop. This early development of the proposed Network in the public domain has been implemented to enable the widest possible involvement from both academia and business and allow applicants to develop complementary rather than duplicative proposals. Further details on the \_connect platform will be presented at the town meetings.

The initial community-building activities between academics and potential technology deploying and associated value-chain supporting companies will conclude with each proposed Network completing and submitting an Outline Proforma (OP) form (available within the \_connect group and from the BBSRC website). The OP stage will allow a panel to assess the numbers of proposals, their scope, scale and ambition providing an opportunity to suggest refinements to the full proposals. Refinements may include recommendations for communities to work together rather than separately. It is likely that a meeting between BBSRC and the leaders of the proposed Networks will be organised in May 2013 where further guidance on completing the full proposal stage will be provided. **Participation in the \_connect group and submission of an OP form is essential if you wish to submit a full proposal.**

*Please note;* \_connect is a public networking website run by the TSB. You will need to register with \_connect to take part in the OP stage. This will require supplying your name and email address. Adding further information to your profile and increasing its visibility may allow more effective networking but should be done at

your discretion. Please ensure you read the Terms and Conditions of \_connect. Your profile visibility and notifications can be controlled via Account Settings. BBSRC is not responsible for \_connect or the data you provide to it.

The completed OP form must be uploaded to the appropriate folder in the \_connect group by **16:00 on the 16<sup>th</sup> April 2013**.

## **Full Proposals**

The full proposal stage will involve submitting an application to BBSRC via the JeS-system (<https://je-s.rcuk.ac.uk>). Further details on completing the full proposal will be provided after the OP stage, including a Case for Support template. The assessment of the full proposals may also involve the use of an interview between the Panel and the PI and any co-investigator.

The closing date for the full proposals will be **in mid July 2013** and assessment will take place in **late September 2013**. Exact dates will be supplied after the OP stage.

## **MONITORING PROGRESS OF THE NETWORKS**

The resulting Networks will be expected to provide BBSRC with an invitation to all events and information on proof of concept projects (via the [nibb@bbsrc.ac.uk](mailto:nibb@bbsrc.ac.uk) mailbox). Funding for larger Networks will require a mid-term review to ensure progress is being made and the proof of concept resources are being used appropriately.

Representatives from the Networks will be expected to attend relevant grant holders' workshops when requested and be accountable to their communities; describing how the resources had been deployed, the progress made and the plans for subsequent years.

## **TIMELINE**

<b>Deadline for registration to attend town-meeting</b>	8 <sup>th</sup> /14 <sup>th</sup> February 2013
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## **Industrial Biotechnology**

Industrial Biotechnology is a set of cross-disciplinary technologies that use biological resources for producing and processing materials and chemicals (including biorenewables and biopharmaceuticals) for non-food applications. These resources can be derived from the tissues, cells, enzymes and genes of plants, algae, marine life, fungi and micro-organisms.

BBSRC aims to support the development of basic and strategic research to underpin innovative manufacturing routes to prepare biopharmaceuticals (ie bioprocessing), high-value chemicals (such as pharmaceutical intermediates, anti-microbial compounds, flavours and fragrances), industrial chemicals or platform chemicals from renewable feedstocks (including: algae, crop wastes, food and municipal waste, animal wastes and perennial biomass) rather than fossil hydrocarbon sources and utilising biological processes.

Industrial Biotechnology is also a way to reduce dependency on petrochemicals and helping the UK to become a low carbon economy, thereby contributing to the targets for reducing emission of green-house gases.

### **Bioenergy: generating new replacement fuels for a greener, sustainable future**

Bioenergy is a renewable form of energy generated from materials derived from biological sources. Bioenergy is increasingly being recognised as having an important role in helping the UK to maintain its energy security. Moreover, increasing the deployment of bioenergy within the UK will also play an important part in helping the UK to achieve its ambitious targets for reductions in green-house gas emissions, as set out in the Climate Change Act 2008.

BBSRC's interests are focussed on supporting research projects that aim to develop liquid transportation fuels, biogases and biologically generated electricity derived from a wide range of different biological feedstocks including: algae, crop wastes, food and municipal waste, animal wastes and perennial biomass. All BBSRC funded research should inform on the development of sustainable, advanced biofuels ("second-generation" and beyond).

BBSRC does not support bioenergy research where the feedstock is derived from material that could be used for the human food chain or animal feed or where the feedstock would be used for combustion or non-biological processing.

**Examples of how to deliver the objectives of this call:**

- Provide an appropriate governance structure to manage and deploy the resources including the proof of concept funding.
- Include a broad range of disciplines necessary to address the subjects or challenges identified.
- Offer a series of structured activities that build bridges between disciplines and find creative ways to enable knowledge sharing and collaboration between academic researchers and those in the technology-deploying, associated value chain supporting and end-user businesses.
- Provide a forum for discussion and development of cross-disciplinary research projects involving proof of concept studies.
- Provide a forum for the development of major integrated grant proposals based on the proof of concept studies, directed to the IB Catalyst and elsewhere.
- Provide regular updates on the development of the research area, nationally and internationally (eg through a newsletter).
- Support an annual meeting of the leading scientists from the UK, including some from overseas, open to the UK community providing an update on the latest research findings.
- Provide appropriate mechanisms to develop international linkages and collaborations where relevant.
- Collect the outputs from the emerging proof of concept studies and collaborations, including tracing those through to full grant proposals and provide case studies where appropriate.
- Host and actively maintain an up-to-date, visually appealing, informative, website promoting UK research in the chosen research area and national/international funding opportunities. (BBSRC will advise on the branding of the web site).
- Establish a mechanism to recruit new members as the Network develops.
- Support and encourage the participation and development of related PDRAs and students.
- Participate and/or organise outreach activities to engage non-specialised audiences in discussions related to the Network area.