

# NERC Mathematics and Informatics for Environmental 'Omic Data Synthesis Research Programme

## Announcement of Opportunity: Discipline-Hopping Scheme

*Date issued: 2<sup>nd</sup> October 2012; closing date: 16.00 on 27<sup>th</sup> November 2012*

### 1.0 Summary

Applications are invited for a Discipline-Hopping Scheme to deliver part of the NERC *Mathematics & Informatics for Environmental 'Omic Data Synthesis ('Omics) Research Programme*.

The aim of these awards is to allow environmental science researchers to gain experience within a mathematics and informatics arena by 'hopping' into a range of partner organisations with specialist expertise and/or to encourage those with a background in mathematics and informatics to spend a period of time embedded within a leading environmental science research team. Discipline-Hoppers will be encouraged to communicate their findings to other researchers through the proposed Environmental 'Omics Network (EON) including with potential end users of the research to get an insight into the transfer of research to real world applications to help achieve benefits for the environment and society. The scheme is intentionally flexible; designed to encourage knowledge transfer between research communities (including biological, biomedical and environmental disciplines from academia or industry backgrounds) and aimed at researchers at any point in their careers.

Applicants may request up to £50k total cost to NERC) for a single award. Proposals should be between 3 and 6 months in duration. All projects must be completed before the end of 2013.

The closing date for proposals submitted through Je-S is 16.00 on Thursday 27<sup>th</sup> November 2012.

### 2.0 Background

NERC has invested previously in 'Omics science, for example through the [Environmental Genomics](#)<sup>1</sup> and [Postgenomics and Proteomics](#)<sup>2</sup> programmes and more recently through the [NEOMICS consultation](#)<sup>3</sup> which outlined a strategy for NERC environmental 'Omics. 'Omics technologies aim to determine the full complement of DNA molecules in an organism (genomics) or community (metagenomics), and large complements of other molecules, including messenger RNA (transcriptomics), proteins (proteomics), peptides (peptidomics), lipids (lipidomics), sugars (glycomics), all other small molecules (metabolomics), and DNA modifications (epigenetics) in a single experiment. Combined with advances in data processing and analysis (bioinformatics), information from 'Omics investigations is yielding insights in a range of scientific fields of interest to NERC environmental science.

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<sup>1</sup> <http://www.nerc.ac.uk/research/programmes/genomics/>

<sup>2</sup> <http://www.nerc.ac.uk/research/programmes/proteomics/>

<sup>3</sup> <http://www.nerc.ac.uk/research/programmes/omics/omics-report.asp>

The rapidity of advances in ‘Omics technologies and analytical methods and the vast quantities of data generated also raise significant challenges that must be overcome by the environmental biology community. These include the need to ensure that research leaders are informed of what can be achieved with each technology and that their research personnel receive appropriate training. Further challenges stem from the facts that each technology is at a different stage of maturity, and that new “revolutionary” advances are continually impacting on the field, necessitating continued technology development and consolidation. The quantities of data being generated are often beyond the scale that can be handled by individual laboratories. Many of these challenges affect environmental science and other research communities (including biological, biomedical, and physical sciences). It is therefore important that new solutions for working together across different research communities are realised.

In order to enhance the use of ‘Omics to improve our understanding of the natural environment, NERC has launched the 5-year £4.5M [‘Omics Programme’](#)<sup>4</sup>. This research programme will be delivered through a number of key activities including, in addition to this Discipline-Hopping Scheme:

- 1) building of an Environmental ‘Omics Network (EON)<sup>5</sup>;
- 2) appointing advanced research positions; and
- 3) providing strategic input to an Environmental ‘Omics Synthesis (EOS) Centre<sup>6</sup> to help NERC to provide overall community coordination, prioritisation and integration of ‘Omics investments.

The ‘Omics programme Directorate, based at the NERC Centre for Ecology & Hydrology (CEH) and Cardiff University, is responsible for overseeing the management and coordination of these key activities, to ensure an integrated programme with maximum impact. An independent [Advisory and Implementation Group \(AIG\)](#) has been set up to provide strategic advice on the programme research direction to the Directorate.

### 3.0 Scope

The Discipline-Hopping Scheme will enable researchers to develop complementary skills, build long term-collaborative partnerships and provide a forum for the development of novel lines of inquiry and interpretative frameworks. The high level goal of this scheme is to promote development of ‘Omic informatics as a professional niche within environmental research via discipline-hopping to/from mathematical and computational sciences and through wider community engagement and knowledge transfer from other research communities, including biomedical, biological and environmental sciences. As such the scheme will facilitate the exchange of personnel and ideas between mathematics/informatics and environmental science disciplines. Researchers at any point in their career (from PhD to professorial) may propose to ‘hop’ disciplines for 3-6 months with the purpose of developing new transferable skills in the context of delivering specific scientific goals.

Funding may be awarded for:

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<sup>4</sup> <http://www.nerc.ac.uk/research/programmes/omics/>

<sup>5</sup> This network will engage with the wider NERC environmental community, together with key stakeholders and end users of NERC research

<sup>6</sup> The concept of a NERC Environmental ‘Omics Synthesis centre was set out in the NEOMICS report

- Salary support for the individual (e.g. research assistant) to 'hop'.
- Salary support to enable applicants to be released from teaching, administrative or other duties in order to undertake the 'hop'.
- PhD Stipend for a student undertaking the 'hop'.
- Reasonable costs to the partner institution to support the discipline-hopping activity' e.g. bench fees.
- Funding for reasonable consumables and travel costs that are necessary for the proposed 'hop'.
- Focused workshops to enhance networking between those in informatics and mathematics and those in environmental science.

The researcher will be expected to move to a different department or location for the duration of the award. Applications for international placements will also be considered.

## **4.0 Scheme requirements**

### **4.1 Scientific objectives and requirements**

Proposals can address any aspect of environmental science which include the development of 'Omics approaches. The awards however are not intended to directly address new research questions through new data generation and are expected to be primarily desk-based studies. All proposals must directly address the following strategic scientific objectives of the scheme:

- to stimulate innovative approaches to environmental 'Omics data analysis of benefit to the broader research community;
- to promote knowledge exchange and further long-term collaborative frameworks between research communities;
- to enhance UK leadership in environmental informatics; and
- to generate innovations with benefit to the wider research community.

Proposed projects also need to address scientific challenges that fall within the NERC remit. Indicative NERC 'Omics challenges are listed in the 2010 NEOMICS consultation report <http://www.nerc.ac.uk/research/themes/biodiversity/events/documents/neomics-report.pdf>

Applicants are welcome to identify scientific challenges beyond those listed in the NEOMICS report, however full justification should be provided.

### **4.2 Non-scientific objectives and requirements**

Applicants should demonstrate how they will meet the following requirements of participation in the scheme:

- Award-holders will be required to communicate and disseminate their findings through other activities associated with the NERC 'Omics Programme (e.g. meetings, seminars etc.). This will include participation in the new EON that will be established as part of the NERC 'Omics Programme.
- Award-holders will be required to report to the AIG for the NERC 'Omics Programme.

## **5.0 Application procedure**

### **5.1 Funding**

Applicants may request up to £50k **as the total NERC contribution**. The NERC funded contribution will be at 80% of the Full Economic Cost (fEC), with standard exceptions paid at 100% (fEC), in accordance with the standard rules governing RCUK research grants.

Resources requested will principally include personnel costs, travel and subsistence and modest technical and/or consumables costs. Equipment costs will not be supported.

The award will generally be held by the researcher's home institution and can include estates and indirect costs, if applicable (see table overleaf). Applicants are encouraged to enquire with their employing institution for the appropriate on-costs (overheads and estates costs) that relate to staff who are involved in an off-site 'hop' and taking into account that the awards are expected to emphasise desk-based research.

The support available will depend upon the level of the researcher participating in the scheme. Please see below for more information.

#### **Principal Investigator as Discipline Hopper**

NERC will pay up to 80% of the PI salary or up to 80% of teaching replacement salary costs for the period covered by the discipline-hopping activity.

#### **Postdoctoral Staff as Discipline Hopper**

NERC will pay 80% of the postdoctoral staff's salary for the period covered by the discipline-hopping activity. Applicants in employment will need to arrange approval from their current employers for the period of the 'hop', where appropriate, e. g. a no-cost extension to their current project.

#### **PhD Student as Discipline Hopper**

Students may perform the 'hop' as an integral part of the training element of their PhD or, if their registering organisation approves, may look to extend the period of the PhD to cover the period of the award. In this latter case NERC will pay the stipend equivalent to the period covered by the discipline-hopping activity for PhD students and any additional PhD fees that are incurred. It would be possible to request the costs of an academic in the partner organisation as a Co-Investigator for the time spent hosting the researcher, i.e. reasonable bench fees can be requested.

#### **Industry as a Discipline-Hopping Partner**

If the hopper is from industry and wanting to 'hop' into academia, NERC will fund the research organisation (RO). The RO will "employ" the hopper (or pass the salary to the Industrial body) for the period. A PI at the RO must submit the application on behalf of the hopper. If an academic researcher wishes to 'hop' into industry NERC will fund the RO at which the hopper is generally employed or studying their PhD.

#### **Other Investigators as Discipline Hopper**

It is also possible to request the costs of an academic in the partner department or organisation for the time spent hosting the researcher. They can be the PI if the hop is within the home RO or a Co-I if the hop is at a different UK RO. Where the hop is to a non-UK RO, reasonable bench fees can be requested.

All costs must be outlined and justified fully in the Justification of Resources.

It is the responsibility of the organisations involved to put any necessary collaborative agreements in place before the award begins. The terms of any collaboration agreements must not conflict with the Research Council's terms and conditions.

The table below is a summary of the funding available depending on the scenario of the proposed hop:

Scenario	Discipline hopper	Location of "Hop"	Indirect costs	Estates costs	PI/CoI
1	Academic/PI	Different Dept/same RO	Pay to home RO	Pay to home RO	PI would be "hopper", co-I optional
2	Academic/PI	Different RO/UK	Pay to home RO	Can claim, but transfer to partner RO	PI would be "hopper", co-I at partner RO optional
3	Academic/PI	Different RO/non-UK	Pay to home RO	None payable	PI would be "hopper", non-UK staff funded under subcontract/bench fees
4	Research assistant (non-PI)	Different Dept/same RO	Pay to home RO	Pay to home RO	Will need PI from home or partner dept. RA will be researcher co-I
5	Research assistant (non-PI)	Different RO/UK	Pay to home RO	Can claim, but transfer to partner RO	Will need PI from home RO, optional co-I from partner RO, RA will be researcher co-I
6	Research assistant (non-PI)	Different RO/non-UK	Pay to home RO	None payable	Will need PI from home RO, RA will be researcher co-I, non-UK staff funded under subcontract/bench fees
7	PhD student	Different Dept/same RO	None payable for PhD	None payable for PhD	Will need PI from home or partner dept, PhD student can be named on proposal.
8	PhD student	Different RO/UK	None payable for PhD	None payable for PhD	Will need PI from home RO, PhD student can be named

					on proposal. Optional co-I from partner RO
9	PhD student	Different RO/non-UK	None payable for PhD	None payable for PhD	Will need PI from home RO, PhD student can be named on proposal. non-UK staff funded under subcontract/bench fees
10	Industrial employee	RO	Pay to host RO	Pay to host RO	Will need PI from home RO, industrial hopper can be named on proposal including their salary costs (in-part or in-full).
11	Individual from RO	Industry	Pay to home RO	None payable	Will need PI from RO, industry can receive bench fee.

The standard NERC grant terms and conditions will apply to the award. There will also be additional conditions specific to the delivery of this scheme (please see section 4).

## 5.2 Eligibility

This scheme is open to individuals and organisations eligible for NERC research grant funding, i.e. applicants based in UK Higher Education Institutions (HEIs), NERC Research & Collaborative Centres, and Independent Research Organisations (IROs) approved by NERC. Please refer to the [NERC Research Grants Handbook](#) for details.

Although awards can only be made to UK based researchers the partner organisation can be located overseas.

As PhD students are not eligible to be a grant-holder (PI/ co-I), a PhD student's supervisor may apply on their behalf allowing the student to 'hop' disciplines with the purpose of developing new transferable skills.

## 5.3 Assessment process

Applications will be assessed by an assessment panel drawn from the AIG for the 'Omics Programme.

The assessment criteria used will be as follows:

- Scientific excellence (primary criterion);
- Fit to Scheme – Scientific Objectives and Requirements (primary criterion)  
For full details of requirements please refer to section 4.1;

- Fit to Scheme – Non-scientific Objectives and Requirements (primary criterion)  
For full details of requirements please refer to section 4.2; and
- Pathways to Impact (secondary criterion).

Feedback to applicants will be available on request

#### **5.4 Assessment Timetable**

Call published: 2<sup>nd</sup> October 2012

Closing date for proposals: 16.00 on 27<sup>th</sup> November 2012

Assessment panel: 24<sup>th</sup> January 2013

Funding decision communicated to applicants: March 2013

Awards start: April – September 2013

#### **6.0 Format and content of response**

##### **6.1 Format**

The Principal Investigator must submit form Je-SRP1 (NERC), detailing the financial request, together with the Case for Support and other attachments. All attachments submitted through the Je-S system must be completed in single-spaced typescript of minimum font size 11 point, Arial font; with margins of at least 2cm. References can be presented in a smaller font size provided it is sufficiently clear to ensure good quality reproductions. Any proposal in which the Case for Support does not comply with these specifications will be rejected. Applicants should avoid the use of colour.

Application forms (available through Je-S) must be accompanied by a Case for Support, which must include:

- Previous research track record (up to 2 sides of A4) include:
  - a description of the PIs academic research (if a PhD student/ postdoc is undertaking the ‘hop’ a description of their academic research and that of any proposed Col at the partner organisation should also be included);
  - an outline of the suitability of the proposed partner organisation;
  - the proposed synergy between PI and partner and the potential of the award to lead to long term collaborative innovative research.
- Description of the proposed Discipline-Hopping programme (up to 2 sides of A4) that addresses the scientific and non-scientific requirements and objectives, including comments on:
  - what scientific goals will be achieved;
  - what novel/innovative approaches to environmental ‘Omics data analysis will be employed;
  - what enduring collaborations are envisaged;
  - why a Discipline-Hopping award is timely at this point in the researcher’s career;
  - why the researcher has chosen to engage with the research area; and

- what added value this particular award will bring to the researcher’s own research and the broader research community.

The proposal should also include:

- Diagrammatic Workplan (up to 1 side of A4)
- Justification of Resources (up to 1 side of A4)
- Pathways to Impact (up to 1 side of A4)
  - Specific reference should be made of how the pathways to impact plan delivers the networking activities defined under the Scientific and Non-Scientific Objectives and Requirements (see sections 4.1 & 4.2).

## **6.2 Accompanying Documentation**

The following documentation must also be submitted with the proposal:

- A CV of up to 2 sides of A4 for the PI and, if a PhD student or postdoc is undertaking the ‘hop’, CVs for the PhD student/ postdoc and any proposed CoI at the partner organisation.
- A letter from the partner organisation into which the researcher is hopping confirming they agree to host the researcher. This should be submitted in the Je-S system as an attachment under ‘Letter of Support’.
- A letter from the Head of the applicant’s department confirming that they agree to the discipline hop and that, where applicable, appropriate arrangements are in place for the management of current NERC research grants held by the applicant during his/her Discipline-Hopping award. This letter should be submitted in the Je-S system as an attachment under ‘Head of Department Statement’.

## **6.3 Proposal Submission**

Applications must be submitted using the Research Councils’ Joint electronic Submission (Je-S) System (<https://je-s.rcuk.ac.uk/>). When adding a new proposal, you should select Council ‘NERC’, document type ‘Standard Proposal’ and ‘Directed’ scheme and the ‘Omics Discipline-Hopping Scheme’ Call.

To ensure that your application reaches us in time, please give your administrative department at least two weeks’ notice of your application and check they have sufficient time to complete their parts of the proposal before the NERC deadline date.

## **7.0 Contact information**

For general queries and further information about application or assessment procedures, please contact:

[Tracey Timms-Wilson](#)

Tel: 01491 692271

For queries about Je-S registration or technical submission of proposals, please contact the Je-S Helpdesk by email at [JeSHelp@rcuk.ac.uk](mailto:JeSHelp@rcuk.ac.uk) or by telephone on 01793 444164.