

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

Announcement of Opportunity: NERC Independent Research Fellowships in the priority area of Bioinformatics

1.0 Summary

Proposals are invited for **NERC Independent Research Fellowships (IRFs)** in the priority area of Bioinformatics to deliver part of the NERC *Mathematics & Informatics for Environmental 'Omic Data Synthesis ('Omics)* Research Programme.

The aim of these fellowships is to develop scientific leadership among the most promising early-career scientists, by giving all Fellows five years' support, which will allow them sufficient time to develop their research programmes, and to establish international recognition.

Through this call NERC aims to support a minimum of six Fellows working in the area of environmental bioinformatics. This is the final year for this specialised opportunity with closing date of **1st October 2014**.

2.0 Introduction

The primary goal of the NERC IRFs in the priority area of Bioinformatics is to build a sustained UK presence in environmental 'omics and bioinformatics through creation of a new generation of science leaders that are able to harness the power of these approaches to address fundamental scientific questions aligned with NERC strategic priorities. There is also considerable potential in 'omics technologies and bioinformatics to tackle scientific problems where the environment is one part of a complex matrix of factors that affect human health, food security, agricultural productivity, ecosystem health, and other aspects of sustainability. The scale of data associated with 'omics technologies, and the application of bioinformatics to integrate across complex problems from an environmental perspective, also have potential to result in the generation of novel algorithmic and computational applications. Whilst not excluding a primary focus on NERC-led strategic priorities there is therefore an expectation that the Fellowships will address multi-disciplinary challenges that extend beyond the NERC remit and have wider application.

For further information on the NERC strategy see:-

<http://www.nerc.ac.uk/latest/publications/strategycorporate/strategy/the-business-of-the-environment.pdf>

3.0 Mathematics & Informatics for Environmental Omic Data Synthesis (Omics) Programme

The 'Omics programme aims to develop the fundamental knowledge needed to integrate large volumes of genomic, transcriptomic, proteomic, and metabolomic data into wider environmental analyses to address new research questions. This announcement of opportunity is for a number of IRFs in the area of bioinformatics under the auspices of the 'Omics programme. Applicants will need to meet the criteria and high quality standards expected for a NERC Independent Research Fellow whilst also delivering the strategic objectives of the 'Omics programme. A central aim of the programme is to promote strategic alignment with interdisciplinary partners.

For further information on the 'Omics Thematic Action Plan please see:

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

4.0 Interdisciplinary Partnerships and Development of Environmental Omics network (EON)

NERC recognises that some of the most cutting-edge current and future areas of research in environmental 'omics could involve scientific problems where the environment is part of a more complex matrix. Thus, we have formed the Environmental Omics network (EON) <http://environmentalomics.org/project-partnership/> securing and seeking partnerships to underpin

the interdisciplinary context of the programme. Fellowships that seek to strategically align with other Research Councils, Government Agencies or Departments, charities and industry are therefore strongly encouraged. The 'Omics Programme Management Team is actively looking to support such novel research directions by establishing partnerships at appropriate scientific and technological interfaces. Current Partnerships opportunities can be found at: <http://environmentalomics.org/partnerships>

5.0 Proposal Submission and Eligibility

Proposals 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 'Fellowship Proposal', scheme 'Research Fellowship' and the 'OMICS Fellowships OCT14' call.

Apart from selecting a different call, the proposal and all application guidance for this call is exactly the same as that used for the standard NERC IRF call.

Applicants are only eligible to submit one proposal to either the standard NERC IRF call or to this call for NERC IRFs in the priority area of Bioinformatics.

The proposals submitted to this call will be assessed alongside those submitted to the standard NERC IRF call and if a proposal is considered to fall outside the remit of this call, it will be assessed as a standard NERC IRF proposal.

For full information on eligibility and the application and assessment process, please see: <http://www.nerc.ac.uk/funding/available/fellowships/irf/>

Applicants can begin submission of their proposals on the Je-S System from **1 June 2014**; prior to this date, the call will not appear on the Je-S System.

6.0 The Environmental Omics Synthesis Centre (EOS): Synergies

The 'Omics programme is being run under the auspices of the NERC Environmental Omics Synthesis (EOS) Centre. The goal of EOS is to provide a framework for the development of 'omics science strategy in NERC for the foreseeable future. All Fellows will play an active role in EOS and contribute to the following EOS goals:

- Bringing together ideas, disciplines, people and organisations to harness 'omics to advance Environmental Science.
- Ensuring that we build an active research community working in this area over the next five years and beyond.
- Establishing Bioinformatics as a discipline in its own right in environmental science.
- Mainstreaming the use of sophisticated informatics approaches and developing new ones.
- Promoting an interdisciplinary approach that facilitates integration of environmental biology into complex scientific problems.
- Promoting a synthesis approach that makes use of existing data resources as well as generating new data to address complex environmental problems.
- Building collaborations between environmental science and other areas of science (e.g. medical science, structural biology, computational science, etc.).
- Growing the environmental 'omics community in the UK and beyond.

Successful applicants will be required to interact with EOS and attend annual conferences.

7.0 Career Development

Applicants to this call must apply through an eligible host institution and have the support of the relevant Head of Department, or equivalent (e.g. Centre Director, Head of School, etc.), who can guarantee that you will be supported in developing your chosen area of research, and becoming a science leader. The host institution should support both your personal development and ensure that adequate space and resources will be provided for the duration of the award. Ideally, these

Fellowships will lead directly to permanent positions in the UK to create the next generation of research leaders in this area (PI level researchers).

8.0 Co-Funding

Co-funding and/or in-kind support from a collaborative party or host institution is strongly encouraged. Where the host institution is providing co-funding, details of the co-funding should be outlined in the Head of Department statement, submitted as part of the Fellowship proposal.

9.0 Scientific Challenge Areas:

Applicants will be expected to develop science-driven, environmentally relevant, multi-disciplinary and computationally-based independent research agendas in bioinformatics using 'omics technologies. All systems and approaches from cells to organisms to ecosystem scales are encouraged. Applicants will be well placed to advance the field of environmental 'omics using one or more of these interdisciplinary approaches: computational biology (bioinformatics), statistics, mathematics, theory, modelling, computer science and e-science. Research agendas can include hypothesis testing and generation using existing or novel data sets, informatics method development, or the use of databases and other resources/infrastructures that promote the development of theory.

In this final round of IRFs in the priority area of bioinformatics we are strongly encouraging prospective fellows whose projects align with strategic partners. Current potential project areas and partnerships agreed with the programme at the time of this Announcement of opportunity include:

- Sustainable intensification in agriculture (BBSRC)
- Development of novel informatic tools and resources to support Biosciences (BBSRC)
- Predictive and comparative (eco)toxicogenomics (AstraZeneca)
- Developing and validating an informatics/ systems biology framework to quantify significant mechanisms of AMR gene flow between environmentally significant and clinically important bacteria that result in adverse clinical outcomes (AstraZeneca)

Additional partnerships may be negotiated by the programme prior to the deadline date. Please consult the EOS fellowship webpage (<http://environmentalomics.org/fellowships/>) for up-to-date information.

Fellowship applicants are also welcome to identify and incorporate cofunding partners.

As an IRF, you will drive forward research in these, or related areas, of direct relevance to the NERC strategy and associated areas such as human health, global food security, agricultural productivity, ecosystem health, and other aspects of sustainability. Projects aligning with areas of cross council initiatives, such as Big Data, Living with Environmental Change (LWEC), Global Food Security, and the RCUK Energy programme and contributions to the Replacement, Refinement and Reduction (3Rs) agenda are also encouraged. (see also RCUK Cross-Council Research areas: <http://www.rcuk.ac.uk/research/xrcprogrammes/>).

Applicants should identify strategic alignments within their Case for Support.

10.0 Contact Information

Individuals considering applying for a NERC IRF in the priority area of Bioinformatics are strongly advised to discuss their proposal with the Omics Programme Manager prior to submission:

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 or by telephone on 01793 444164