

Experimental Officer in Bioinformatics - 47322

**School Of Biosciences
College Of Life and Environmental Sciences
University Of Birmingham, UK**

Salary from £28,132 to £38,907 a year

We seek to recruit a full-time postdoctoral-level Experimental Officer in computational biology to join the team of scientists running the **NERC Biomolecular Analysis Facility for Environmental Metabolomics**. This national facility offers a comprehensive metabolomics research service to environmental scientists from across the UK, including experimental design, metabolite extraction, measurement of metabolites using NMR spectroscopy and/or high resolution LC-MS, metabolite identification, and extensive data handling and computational analysis. The research addresses major 21st century challenges within the marine, freshwater and terrestrial environments, including studies in environmental toxicology, biodiversity and global climate change.

The **Experimental Officer in Bioinformatics** will focus on the development and application of workflows for spectral processing of mass spectrometry metabolomics data. In addition they will lead the statistical and network analyses of the metabolomics data generated using both mass spectrometry and NMR spectroscopy. This will include programming in Matlab, R and/or Python, and developing Galaxy workflows and related tools for data management and multi-omics data integration. The position also includes the training of visiting scientists and undertaking some independent research in computational metabolomics, all while working closely with other Experimental Officers in mass spectrometry and NMR spectroscopy metabolomics.

You should hold a PhD in bioinformatics, computational biology or metabolomics, with significant hands-on experience in the analysis of metabolomics or related data.

The post is available in the first instance until 31st March 2016, with potential for extension.

Informal enquiries can be addressed to Professor Mark Viant on tel: +44 (0)121 414 2219 or email: M.Viant@bham.ac.uk or visit <http://www.birmingham.ac.uk/facilities/metabolomics/index.aspx> for further details on the NERC Biomolecular Analysis Facility at the University of Birmingham.

The University offers a variety of courses for personal development of its employees.

Closing date: 4 July 2014

Post reference: 47322

To apply please visit: www.hr.bham.ac.uk/jobs

Job description

Post title and post number	Experimental Officer in Bioinformatics
Organisation advertising Description	School of Biosciences
Post number	47322
Full-time/Part-time	Full Time
Number of hours / weeks to be worked	100%
Duration of post	Until 31st March 2016, with potential for extension
Post is open to:	Internal/External candidates
Grade	7
Salary	Starting salary is normally in the range £28,132 to £36,661. With potential progression once in post to £38,907 a year.
Additional information	Informal enquiries can be directed to Professor Mark Viant m.viant@bham.ac.uk
Terms and conditions	Research Staff
Closing date	4 July 2014

Job summary

To develop and apply expert analysis of metabolomics datasets as part of the national NERC environmental metabolomics research facility. This includes designing and conducting computational analyses (including data processing, statistical and network analyses, and multi-omics data integration), liaising with and training environmental scientists, and undertaking independent research.

Main duties

- To develop and conduct computational and statistical analyses of metabolomics datasets within the NERC Biomolecular Analysis Facility – Metabolomics Node, School of Biosciences; including of mass spectrometry and NMR metabolomics datasets including multivariate (e.g., PCA, PLS-DA, PLS-R) and univariate techniques.
- To develop and conduct similar methods, including in multi-omics data integration, as part of a nanotoxicology research project that includes both metabolomics and transcriptomics datasets.

- To undertake independent research in computational metabolomics, to develop the workflows for managing and analysing multi-omics datasets, for example using Galaxy software.
- To develop and maintain the computer hardware and software associated with the metabolomics laboratory.
- To train and assist postdoctoral researchers and PhD students in bioinformatics analyses of metabolomics datasets.
- To disseminate research findings through contribution to peer-reviewed publications.
- To present research findings at conferences in the form of talks/posters.

Person specification

- PhD or equivalent experience in Bioinformatics, Chemometrics or Computational Biology (all with metabolomics or related specialism) or Metabolomics.
- Experience in the application of these techniques to the analysis of metabolomics datasets (e.g. mass spectrometry based and/or NMR spectroscopy based).
- Experience in statistical analyses, including multivariate and univariate methods.
- Experience in computer programming, specifically Matlab.
- Experience in workflows, e.g. Galaxy.
- Experience in managing multiple projects simultaneously.
- Good communication and interpersonal skills.
- A high level of accuracy and attention to detail.
- Ability to work on own initiative, manage time effectively, progress tasks concurrently and work to deadlines.
- Detailed knowledge of laboratory safety.

Scope of the Role

- Work starting from area of specialism but to expand into other areas as appropriate

Planning and Organising

- Contribute to the planning and organising of the research projects within the NERC facility.
- Co-ordinate own work with others, in particular with the two other Experimental Officers in the facility, to avoid conflict or duplication of effort.

Decision Making

- Decide in consultation with the NERC facility Director and Manager, as appropriate, on the most appropriate way of undertaking the specified research activities.
- Decide in consultation with the NERC facility Director and Manager, as appropriate, how to analyse and interpret the data from the specified research activities.

- Decide in consultation with the NERC facility Director and Manager, as appropriate, what knowledge to draw on and how to apply it to develop new intellectual understanding of the projects.
- Decide in collaboration with the NBAF team of scientists as well as the customers which aspects of the research findings to include in a presentation or a publication and how to convey the findings.

Internal/External Relationships

- Liaise with NERC facility Director and Manager on research-related matters.
- Liaise and work closely with the other members of the NERC facility to ensure cohesive approach to the topic.
- Liaise with external customers of the NERC facility.
- Give presentations and/or contribute to presentations at national and/or international conferences, if appropriate.
- Maintain contact with (including membership of) appropriate professional bodies.
- Liaise with the relevant internal and external research community via seminars and personal contact.

Metabolomics Research at the University of Birmingham



The Metabolomics Initiative at the University of Birmingham began in earnest in 2003 and now encompasses several Schools including Biosciences, Medicine, Mathematics and Computer Science. Our metabolomics research spans the development of analytical and bioinformatic methods as well as their application to wide ranging and numerous projects in the Life Sciences. These include studies in mammals, fish, invertebrates, microbes and plants, with a particular emphasis in both **environmental metabolomics** and clinical metabolomics. The bioanalytical facilities and

expertise in both NMR spectroscopy and mass spectrometry at Birmingham are world class, and include the Henry Wellcome Building for Biomolecular NMR Spectroscopy with seven spectrometers ranging from 500 to 900 MHz, and the Advanced Mass Spectrometry facility with Thermo Fisher Scientific Fourier transform ion cyclotron resonance, Orbitrap Velos, triple quadrupole and a newly installed QExactive mass spectrometer (further details below). The bioinformatic facilities and expertise at Birmingham include the new Centre for Computational Biology and several high performance computing clusters (details below). Our current and highly active research program involves ca. 50 principal investigators, postdoctoral researchers and PhD students.

Further details on the **national NERC Biomolecular Analysis Facility (NBAF) for environmental metabolomics** research can be found at:

<http://www.birmingham.ac.uk/facilities/metabolomics/index.aspx>

Further details on the **University's Metabolomics Research** can be found at:

<http://www.birmingham.ac.uk/research/activity/metabolomics/index.aspx>

The School of Biosciences

The School of Biosciences at the University of Birmingham is the largest biology school in the region, delivering internationally excellent teaching and research across the broad span of modern biology. There is currently an academic staff of approximately 50, conducting research and delivering teaching from the level of individual biological molecules to the study of whole ecosystems. We have a lively research community, with over 70 postdoctoral research fellows and research assistants, and 120 doctoral research students.



Our ground-breaking research ranges from research into cancer and infectious diseases, such as tuberculosis, to studying the movement and behaviour of orangutans. We also offer major high-technology facilities for research in genomics, metabolomics, proteomics, structural biology and optical imaging (see below). The **national NERC Biomolecular Analysis Facility (NBAF) for environmental metabolomics** is based in the School of Biosciences.

Research in the School centres around four interlinked themes:

- **BioSystems and Environmental Change**
- Microbiology and Infection
- Molecular Cell Biology and Signalling
- Plant Genetics and Cell Biology

Current research grant income is around £7 million per year, and comes from a variety of sources including research councils, the European Union and charities. The School has an excellent research profile with 90% assessed as international quality supporting an exciting range of teaching programmes.

The NBAF Facility Director

Prof. Mark R. Viant holds a Chair in Metabolomics, is Director of the NERC Biomolecular Analysis Facility for Metabolomics, and the President of the international Metabolomics Society. As a postdoctoral fellow at the University of California, Davis, he pioneered the application of metabolomics to environmental health issues in aquatic organisms. In 2003 he relocated to Birmingham as a NERC Advanced Fellow with the remit to further develop metabolomics in environmental toxicology. With funding from the NERC, BBSRC, MRC, Wellcome Trust, Wolfson Foundation, EU, Environment Agency and several US agencies, he has developed new metabolomics methods in both 2-D NMR and mass spectrometry, and confirmed the high reproducibility of NMR environmental metabolomics in an international intercomparison study. He has applied these techniques to probe toxicant-induced metabolic changes in a range of organisms. He has demonstrated the need for “phenotypic anchoring” in metabolomics and most notably discovered biomarkers of toxic stress that are predictive of whole organism physiological perturbation. This work has received “Honourable Mention” from the Society of Toxicology as one of the top 5 papers published in *Toxicological Sciences* in 2010. He serves on the editorial boards of *Scientific Data* and *Metabolomics*. Viant has published ca. 120 peer reviewed publications.

The Experimental Officer in Bioanalytical Chemistry to be appointed here will work alongside not only other NBAF team members, but Viant’s large and active research group comprising of more than a dozen PhD students and postdoctoral researchers.

Relevant facilities at the University of Birmingham

Metabolomics facilities

The **Advanced Mass Spectrometry Facility** in the School of Biosciences houses a hybrid 7T Fourier transform ion cyclotron resonance (FT-ICR) mass spectrometer (Thermo LTQ FT Ultra) equipped with a nano/capillary/HPLC (Dionex Ultimate 3000) and a Triversa chip-based nanoelectrospray system



(Advion Biosciences). In addition there is a Thermo Orbitrap Velos that is equipped with a dedicated nanoLC (Dionex Ultimate 3000) and a Triversa chip-based nanoelectrospray system, and a newly installed Q Exactive LC-MS. For targeted metabolite analyses, the University has recently purchased a triple quadrupole mass spectrometer (Thermo TSQ Vantage), which is also equipped with a Dionex LC (capable of UHPLC) and ion sources including a third Triversa system. All of these instruments are used solely for proteomics and metabolomics research. Several PhD students and postdoctoral researchers use these mass spectrometers, supported by a Scientific Officer for Proteomics and two Experimental Officers for Metabolomics/Lipidomics. Further details at:

<http://www.birmingham.ac.uk/facilities/advanced-mass-spectrometry/index.aspx>

The **Henry Wellcome Building for Biomolecular NMR Spectroscopy (HWB•NMR)** houses extensive instrumentation for high throughput metabolomics and protein structure determination. This state-of-the-art facility currently has seven NMR spectrometers (two 500 MHz, three 600 MHz, 800 MHz and 900 MHz) that are equipped with cryoprobes, autosamplers, and a high resolution magic angle spinning probe. The facility also houses a Bruker maXis high resolution mass spectrometer with a Dionex LC. The facility is supported by three staff, under the leadership of Professors Michael Overduin and Ulrich Günther. Further details at:

www.nmr.bham.ac.uk

These instruments form the core of the NERC Biomolecular Analysis Facility (NBAF) for Metabolomics, further details of which can be found at:

<http://www.birmingham.ac.uk/facilities/metabolomics/index.aspx>

Bioinformatics facilities

The newly forming **Centre for Computational Biology (CCB)** builds on the success of the former Centre for Systems Biology. The CCB is an interdisciplinary Research Centre that provides dedicated space for bioinformatics activities including a local high performance computing cluster. Researchers use this high performance cluster in the analysis of large amounts of data generated from biological experiments on gene expression and metabolomics, as well as the BlueBEAR supercomputer with includes dedicated servers for jobs run by the NBAF metabolomics facility staff. Further research collaborations across Schools (e.g. Computer Science, Engineering, Mathematics, Medicine and others) are also facilitated by the Centre

The University of Birmingham

The University of Birmingham has a distinguished academic reputation. It is a member of the Russell Group and belongs to the international network Universitas 21. The University was founded in 1900 at the initiative of local citizens and is now one of the largest in the UK offering degrees across a wide range of disciplines from Education to Medicine and from Engineering to Law. It is a major international centre of academic excellence and was ranked 10th in the UK by QS World University Rankings in 2013. Eight former members of the University have been Nobel prize winners.

The University has a turnover of over £400 million per annum and is currently undergoing an extensive capital programme. This positive financial position is almost unique in the UK Higher Education sector and provides a firm foundation for further

investment. One of the University's greatest assets is its Edgbaston campus. It offers its community of over 27,000 students and 6,000 staff an attractive environment in which to study and work. It is situated only two miles from the centre of a major European city and yet is set amongst green and leafy parkland which is largely pedestrianised, and provides a beautiful and pleasant backdrop for imposing Victorian redbrick buildings as well as some striking modern architecture.

The University of Birmingham is an Equal Opportunities employer. It aims to ensure that no job applicant or employee will receive less favourable treatment on the grounds of race, colour, nationality, ethnic or national origins, sex or marital status: this policy will include disabled persons who have the necessary attributes for the post. The University will operate selection and promotion criteria and procedures that are designed to ensure that individuals are selected, promoted and treated on the basis of their relevant aptitudes, skills and abilities.