

## PhD Studentship in Bioanalytical Chemistry

Posted on Thursday 29th March 2012

School of Biosciences  
University of Birmingham

We seek to attract a PhD candidate of outstanding ability as part of a highly active research program lying at the **interface of bioanalytical chemistry and environmental toxicology**. The overall aim of the studentship is to develop novel strategies for efficiently developing targeted, high-throughput and quantitative LC-MS assays for measuring molecular biomarkers of environmental pollution. These assays will then be used to revolutionise our ability to measure the real-world impacts of pollution on living organisms. The project, which starts in September 2012, is funded jointly by the NERC and Thermofisher Scientific, and will be supervised by Prof. Mark Viant (University of Birmingham) and Mr Alex Adam (Thermofisher).

**Background:** Worldwide contamination of freshwater ecosystems with thousands of industrial chemicals is one of the key environmental problems facing humanity. Assessing the impacts of these chemicals is of paramount importance. The Water Framework Directive, representing the central legislation on water quality in Europe, uses the health and abundance of plants and animals as a measure of ecological status. Although an improvement over chemical measurements, these bioindicators lack specificity and do not provide early warning of ecological damage. Mass spectrometry metabolomics measures hundreds of metabolites in a biological sample and is a powerful tool for discovering biomarkers that indicate if an organism is stressed. However this technique is impractical to deploy in routine environmental monitoring because of its expense and complexity. Therefore the focus of this PhD is to develop new analytical (LC-MS and LC-MS/MS) and computational workflows, to translate the biomarker fingerprints of environmental stress (discovered using metabolomics) into useful tools for measuring environmental health.

**Training:** the student will undertake extensive analytical research (separation chemistry, LC-MS, LC-MS/MS) and computational analysis of the spectral data. While the majority of training will be conducted in Viant's laboratory of more than a dozen PhD students and postdoctoral researchers, the student will receive extensive training from Thermofisher scientists and via university courses. This represents a tremendous opportunity to learn about the rapidly growing field of metabolomics from scientists who are at the top of the field, and will provide solid training in an analytical and quantitative science to facilitate future career development.

**World class bioanalytical research facilities** exist at Birmingham for this project as evidenced by the University hosting the NERC Biomolecular Analysis Facility (NBAF) for Metabolomics: <http://www.biosciences-labs.bham.ac.uk/NBAF-Birmingham> (<http://www.biosciences-labs.bham.ac.uk/NBAF-Birmingham>). This includes Thermofisher FT-ICR, Orbitrap and triple quadrupole mass spectrometers with considerable LC capabilities on all instruments. In addition the wet labs for sample preparation are modern and well equipped, as are the computational facilities for processing the large mass spectrometry datasets.

**Eligibility:** this NERC CASE studentship covers tuition fees and living expenses (£14,590), and is available to UK citizens as well as to non-UK EU nationals who have lived in the UK for the last 3 years. If English is not your first language, a recognised English language qualification is required before entry. Candidates must hold, or expect to hold, a very good honours degree (at least a 2.1 or equivalent) in a relevant subject, though a Masters degree is highly preferred. Applicants should have a strong background in analytical chemistry, data analysis, and an interest in environmental science; work experience in relevant areas is a definite advantage. For informal enquiries, contact Prof. Mark Viant ([m.viant@bham.ac.uk](mailto:m.viant@bham.ac.uk) (<mailto:m.viant@bham.ac.uk>)). For further details on the research in Viant's laboratory, including relevant research papers, visit: <http://www.biosciences-labs.bham.ac.uk/viant> (<http://www.biosciences-labs.bham.ac.uk/viant>).

**How to apply:** Online, via the **University of Birmingham's postgraduate application website** (<http://www.birmingham.ac.uk/students/courses/postgraduate/research/bio/biosciences.aspx>). Applicants should apply for the "PhD, School of Biosciences, Full-time research" programme, and under the "Proposed area of research" state "*NERC Bioanalytical Chemistry – Viant*".

**Closing date for applications:** 23rd April 2012.

