

Ref: LSX-03775

**THE UNIVERSITY OF MANCHESTER**  
**PARTICULARS OF APPOINTMENT**  
**FACULTY OF LIFE SCIENCES**  
**RESEARCH ASSOCIATE**

- 1 The University invites applications for the above post which is available from January 2014 and tenable for 10 months.
- 2 Salary will be £29,541 to £36,298 per annum according to relevant experience (pay award pending)
- 3 Informal inquiries may be made to Dr Clair Baldock  
Email: [clair.baldock@manchester.ac.uk](mailto:clair.baldock@manchester.ac.uk)  
Tel : 0161 275 5439
- 4 Applications should be made on line. If you are unable to apply on line please request an application form by emailing [hrservices@manchester.ac.uk](mailto:hrservices@manchester.ac.uk) quoting the reference number or by calling 0161 275 4499 (HR Services).
- 5 The University of Manchester values a diverse workforce and welcomes applications from all sections of the community.

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**Project Title:** Structure and regulation of the chordin-BMP inhibitory complex

**Project Description:**

The bone morphogenetic proteins (BMPs) are powerful growth factor signalling molecules in the extracellular matrix. BMPs play important roles at multiple stages of skeletal development, from early patterning to regulation of chondrocyte proliferation and maturation in the growth plate. Extracellular regulation of BMPs is essential for correct development and is of therapeutic interest in relation to a broad range of pathologies including cancer, vascular disease and arthritis. Large extracellular proteins form inhibitory complexes with these growth factors, thereby preventing receptor activation but the molecular details of these complexes are unknown. One such regulator, chordin, acts by binding to BMPs thereby preventing their association with BMP receptors on the cell surface. This BBSRC funded project is to understand the structure of the chordin-BMP inhibitory complex leading to an understanding of how BMP regulation via chordin inhibition is controlled in tissue assembly and developmental patterning.

**Background Information:**

The position will be in the lab of Dr Clair Baldock, a group leader in the Wellcome Trust Centre for Cell-Matrix Research <http://www.wellcome-matrix.org> The Cell-Matrix centre is an interdisciplinary research centre embedded within the Faculty of Life Sciences at the University of Manchester. This Wellcome Trust funded Centre of Excellence was established in 1995 and consists of 20 research teams. The research covers two main areas: 'Matrix assembly and tissue regeneration', and 'Matrix signalling, cell fate, and cancer' with the long-term aim of defining the contribution of cell-matrix interactions to human diseases, and developing approaches for preventing and treating these diseases.

The project will be carried out in a modern laboratory within the Faculty of Life. This Faculty is one of the largest and most successful research and teaching organisations of its kind in Europe (see <http://www.ls.manchester.ac.uk/about/> for more details). The Faculty provides an ideal environment for highly interactive research of top international standing and has a truly international dimension, recruiting research staff and students from around the world. The Faculty of Life Sciences is extremely well equipped, and offers high quality research facilities including electron microscopy, biomolecular analysis, protein expression and bioimaging. These facilities provide excellent support for the described research project.

The Faculty operates a formal Career Development Programme for postdoctoral research associates. This includes workshops and training programmes together with regular discussion groups. All postdoctoral staff also have a formal annual meeting with a senior member of staff to discuss their career progress and aims. Overall, the Faculty will offer the successful candidate a very real advantage as a place where they can strengthen and enhance their research experience.

Manchester is a vibrant and dynamic city, and surrounded by some of the most beautiful countryside in the UK. The city is built on grand Victorian structures, complemented by the stylish visionary architecture of the new Millennium. Fast trains connect Manchester with London, and Manchester International Airport is 20 minutes from the city centre.

**Overall Purpose of the Job:**

The purpose of this post is to perform research on a BBSRC funded project to define the structure of the chordin-bone morphogenetic protein inhibitory complex leading to an understanding of how extracellular BMP regulation is controlled in tissue assembly and developmental patterning. A multidisciplinary approach of structural, biochemical and biophysical techniques including electron microscopy, small angle X-ray scattering, BIAcore and analytical ultracentrifugation will be used.

**Selected Publications:**

- Berry R, Jowitt TA, Ferrand J, Roessle M, Grossmann JG, Canty-Laird EG, Kammerer RA, Kadler KE, Baldock C. Role of dimerization and substrate exclusion in the regulation of bone morphogenetic protein-1 and mammalian tolloid. Proc Natl Acad Sci U S A. 2009 106:8561-6.

A full list of Baldock lab publications are available at:

<http://www.ls.manchester.ac.uk/people/profile/Default.aspx?alias=baldockc&view=publications>

**Key Responsibilities and Duties:**

You will be responsible for performing research to address project objectives, the subsequent compilation of data, and presentation of results.

You will be expected to:

- Design and perform experiments
- Maintain accurate and organised records of your methods and results
- Analyse and interpret data
- Assist with synchrotron data collection trips when required
- Keep up-to-date with the scientific literature in the field
- Contribute to the academic development of the project
- Engage in and maintain internal and external research collaborations
- Produce high quality work suitable for publication in peer-reviewed journals
- Present research findings at relevant internal and external meetings
- Assist with general supervision and laboratory training of undergraduate and postgraduate students
- Assist with ordering reagents and general laboratory upkeep
- Assist with health and safety compliance (preparation of risk assessments and COSHH forms, etc.)

## **Person Specification**

### **Essential Knowledge, Skills and Experience:**

The applicant must:

- Hold (or expect to obtain shortly) a PhD in structural biology, biophysics or other relevant biological sciences subject
- Be a highly self-motivated individual with a genuine enthusiasm for scientific research
- Be able to work independently as well as part of a small team
- Be able to design and perform experiments with meticulous laboratory technique
- Have laboratory experience with molecular biology protocols such as molecular cloning, plasmid DNA purification, DNA sequencing, PCR
- Have experience with biochemical techniques such as PAGE, Western blotting, chromatography, and other methods for protein purification and analysis
- Have good computer skills
- Have experience in structural biology or biophysical methods
- Have excellent time management, organisational skills and record keeping
- Be willing to work flexible hours including weekends
- Have evidence of publication of prior work as poster presentations or journal publications
- Have excellent verbal and written communication skills in English
- Demonstrate an interest in learning new techniques

### **Desirable Knowledge, Skills and Experience:**

It would be desirable for the candidate to have:

- Have experience in electron microscopy and single particle image analysis techniques
- Have experience with small angle X-ray scattering and data processing
- Prior experience with synchrotron data collection
- Prior experience in the field of extracellular matrix
- Have experience with mammalian cell culture techniques including transfection
- Have experience in analytical ultracentrifugation and data analysis
- Have experience with surface plasma resonance interaction analyses (e.g. BIAcore)
- Publications in peer-reviewed journals

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The above particulars are intended as a general guide to the duties of the post and the conditions of service. They do not constitute a contract of employment between the University and the person appointed. The successful applicant will, however, receive a full set of conditions of service on appointment.

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