



JOB TITLE	Post-doctoral Research Assistant in Structural Biology	
FACULTY & SCHOOL/DEPARTMENT	School of Science, Crystallography and ISMB	
REPORTS TO	Professor Helen Saibil, FRS	
SUPERVISES	Students, as required	
POST REFERENCE	10309	
GRADE	Academic & Research, Grade 7	DATE October 2009

Birkbeck

Birkbeck is a world-class research institution, a vibrant centre of academic engagement and excellence and the UK's leading provider of part-time, evening education for mature students. There are nearly 19,000 students studying for short courses, certificates, diplomas, first degrees, postgraduate taught and postgraduate research degrees. Birkbeck provides Londoners with the unique opportunity to fit study around their busy lives. Founded in 1823 as the London Mechanics' Institute Birkbeck was incorporated into the University of London in 1920.

PURPOSE OF THE JOB

To carry out research in structural biology involving cryo electron microscopy and image processing, to study the action of molecular chaperones and structure and cellular distribution of amyloid-like aggregates formed in protein misfolding diseases. The successful applicant is expected to collect and analyze data, participate in experimental design and method development, to interact with external and internal collaborators and to participate in writing up the work for publication.

Project and research group

The research assistant will work on a 5-year Wellcome Trust Programme Grant on chaperone-substrate interactions and cellular aggregates in protein quality control, in the research group of Professor Helen Saibil. The project involves the use of cryo-electron microscopy and image processing to study chaperone complexes and protein aggregates by single particle analysis and by cryo sectioning and electron tomography. For a brief summary of the subject area, please see *Chaperone machines in action*, Saibil, HR (2008) *Current Opinion in Struct. Biol.* 18, 35-42. Examples of recent work can be found in *Chaperonin complex with a newly folded protein encapsulated in the folding chamber*, Clare, DK, Bakkes, PJ, van Heerikhuizen, H, van der Vies, SM & H. R. Saibil, HR. (2009) *Nature* 457, 107-110, and *Motor mechanism for protein threading through Hsp104*, Wendler, P, Shorter, J, Snead, D, Plisson, C, Clare, DK, Lindquist, S, Saibil, HR, (2009) *Mol. Cell* 34, 81-92.

The Birkbeck Electron Microscopy Laboratory, led by Professor Saibil and Professor Elena Orlova, has first class facilities, with four cryo microscopes, including 300 kV Polara and 200 kV FEG systems, and is fully equipped for both single particle analysis and cellular tomography, including high pressure freezing and vitreous sectioning.

The research group of Professor Saibil includes research students and postdoctoral fellows studying molecular chaperones, amyloid fibrils, and membrane proteins. For this post, we seek

someone with research experience in structural molecular biology, preferably in electron cryo-microscopy and image processing, and/or experience in the area of chaperones and protein folding/misfolding.

Main Duties of the Jobholder

Research and Scholarship

- To prepare samples and collect electron cryo-microscopy data in co-operation with other group members and outside collaborators.
- To carry out computer image processing of electron microscope images with the aim of aligning and classifying images for averaging and three-dimensional reconstruction by single particle analysis and tomography.
- To modify and develop existing procedures as required.
- To study the structures of macromolecular assemblies formed in cellular and biochemical models of prion and other protein misfolding diseases, and to understand the mechanisms of action of molecular chaperones in preventing protein aggregation.
- For sample preparation as well as interpretation of results, extensive scientific interactions with both internal and external collaborators will be essential.
- To devise and apply image processing scripts for structural analysis of macromolecular assemblies.
- To acquire knowledge and understanding in the extensive literature on molecular chaperones and protein homeostasis, and on the experimental and computational methods related to determination and interpretation of cryo-electron microscopy maps.
- To translate knowledge of advances in the subject area into research activity.
- To identify sources of funding and contribute to the process of searching for/generating funds.
- To write or contribute to publications or disseminate research findings using other appropriate media.
- To ensure that research content and methods used are in accordance with equal opportunities.

Teaching & Learning

- To contribute to the assessment of student knowledge and supervision of their projects.
- To assist in the development of student research skills
- To contribute to the teaching programmes in the department.

Communication

- Presenting talks or posters at national and international research meetings.
- To deal with routine communication using a range of media.
- To regularly communicate complex information and conceptual ideas to those with limited knowledge and understanding as well as to peers using high level skills and a range of media.
- To prepare proposals and reports to external bodies, for example, for funding and contractual purposes.

Working Relationships and Contacts

People Management and Teamwork

- To manage own research and administrative activities, with guidance if required.
- To work with colleagues and external collaborators, as required
- To collaborate with academic colleagues on areas of shared research interest.
- To attend and contribute to relevant meetings.

- To ensure that the work is conducted in accordance with equal opportunities.
- To mentor colleagues with less experience and advise on personal development.
- To help colleagues resolve their concerns about progress in research, and deal with any standard problems.

Liaison and Networking

- To liaise with colleagues and students.
- To build internal contacts, and participate in internal networks for the exchange of information.
- To collaborate actively both within and outside of the College, to complete research projects and advance thinking in the subject area.

Dimensions

Problem Solving and Impact

- To use initiative and creativity to develop new research methods, and extend the research portfolio.
- To use creativity to analyse and interpret research data and draw conclusions on the outcomes.
- To contribute to collaborative decision making with colleagues in areas of research.
- To understand equal opportunity issues as they may impact on areas of research content and methods.

Resource Management

- Plan and manage own research activity in collaboration with others.
- To use research resources, laboratories, and computer equipment as appropriate.
- Manage the use of research resources and ensure that effective use is made of them.

Working Environment

- To balance, with help, the competing pressures of research and administrative demands and deadlines.
- To carry out tasks that require the learning of certain skills.
- To engage in continuous professional development.
- To be aware of the risks in the work environment and their potential impact on their own work and that of others

General Responsibilities

These are standard to all Birkbeck Job Descriptions:

- To adhere to the College's Equal Opportunities policy in all activities, and to actively promote equality of opportunity wherever possible
- To be responsible for your own health and safety and that of your colleagues, in accordance with the Health and Safety at Work Act (1974) and relevant EC directives.
- To work in accordance with the Data Protection Act and to ensure that all new systems are reported to your Data Protection Controller.
- To undertake such other duties as may be reasonably expected.
- To provide a healthy and comfortable working environment, smoking is prohibited throughout the College, except in specially designated areas.

FURTHER PARTICULARS & INFORMATION ON THE POST

In partnership with the recognised trade unions, these terms are under review as part of the development of a new pay and grading structure. Staff will be notified of changes once they are agreed.

JOB TITLE:	Postdoctoral Research Assistant
POST REFERENCE:	ACR
SALARY:	Grade 7: £30,594 to £35,469 per annum plus £2,907 per annum London Allowance. The initial salary award will be dependent on the skills and experience of the successful applicant.
PROBATION:	There is a probation period of six months.
DURATION OF POST:	This is a fixed term appointment for up to 5 years.
HOURS:	Full-time, 35 hours per week.
ANNUAL LEAVE ENTITLEMENT:	Annual leave entitlement is standardised at 25 days per annum (pro-rata where appropriate), plus public holidays and College closure days for all staff.
SUPERANNUATION:	The normal retirement age for all staff is 65. The post is superannuable under the USS (Universities Superannuation Scheme). This is a final salary scheme, and is often substantially more beneficial to the employee than a "money-purchase" scheme.
START DATE:	As soon as possible
CLOSING DATE:	22 Nov 2009
INTERVIEW DATE:	TBA

To apply for this post please visit www.bbk.ac.uk/jobs (**Search using Ref No. 10309**)

If you have difficulty applying for a post, please contact Human Resources: tel: 020 7079 0735 or fax: 020 7631 6521 or email: humanresources@bbk.ac.uk

Informal enquiries can be made to: Professor Helen Saibil, Crystallography, Birkbeck, Malet Street, London WC1E 7HX. (e-mail: h.saibil@mail.cryst.bbk.ac.uk)

School web page: <http://www.cryst.bbk.ac.uk>

Research group: <http://people.cryst.bbk.ac.uk/~ubcg16z>

EM and Image Processing group: <http://www.cryst.bbk.ac.uk/~ubcg16z/empage.html>

CRYSTALLOGRAPHY (DEPARTMENT OF BIOLOGICAL SCIENCES)

Crystallography derives its name from the technique that has contributed more than any other to the elucidation of molecular structure. It forms a major part of the Department of Biological Sciences, a multidisciplinary, undergraduate and postgraduate department composed of 28 academic staff and about 40 research fellows and research assistants. It has laboratories equipped for protein crystallography, cryo-electron microscopy, biophysics, molecular biology and bacteriology, with excellent computing facilities and infrastructure supported by two full time computer management staff.

Crystallography has PhD and MRes students studying Structural Biology and Bioinformatics with Systems Biology. It receives studentships from the Wellcome Trust, BBSRC and MRC. In addition to an MSc (Bioinformatics with Systems Biology) course with full- and part-time students, the Department runs an MSc (Structural Biology) over the Internet that is taken by distance learning students in many parts of the world.

INSTITUTE OF STRUCTURAL AND MOLECULAR BIOLOGY

The ISMB is a joint UCL/Birkbeck multidisciplinary Institute that aims to foster interdisciplinary research on the molecular basis of diseases. The Institute was created in 2003 under the direction of Professor Gabriel Waksman FMedSci, and is organized in six programmes: 1) Chemical Biology, 2) Structural Biology, 3) Physical Biochemistry (Macromolecular Interactions), 4) Proteomics, 5) Bioinformatics (Structural Bioinformatics and Cheminformatics) and 6) Biochemistry and Molecular Biology). Some of these programmes are linked to a centre: the Bloomsbury Centre for Structural Biology (Director: Professor Helen Saibil, FRS, FMedSci), the Biophysics Centre for Macromolecular Interactions (Director: Dr Mark Williams), the Bloomsbury Centre for Bioinformatics (Director: Professor David Jones), and the Chemical Biology Centre (Director: Professor Steven Caddick). Thus the activities promoted by the Institute are focused on the use of this multidisciplinary framework to develop research programmes that will contribute to the understanding of human and animal pathologies. The ISMB is a world-leader in structural molecular biology, generating many high impact publications and substantial grant income.

PERSON SPECIFICATION

Job Title: Postdoctoral Research Assistant **Post Reference:** **Faculty/Dept/School:** Science, Biological Sciences, Crystallography

Attributes	Essential	Desirable	Method of Assessment
Knowledge	<ul style="list-style-type: none"> • Possess sufficient breadth or depth of specialist knowledge in the discipline and of research methods and techniques to work within an established structural biology research programme • A background in structural biology, biophysics, biochemistry or cell biology 	<ul style="list-style-type: none"> • Knowledge of methods in structural biology, in particular cryo-electron microscopy. • Knowledge of molecular chaperones, protein quality control and protein misfolding diseases 	<ul style="list-style-type: none"> • Application Form • Panel interview • Presentation
Technical/Work-based Skills	<ul style="list-style-type: none"> • Skills in structural biology, computational and/or biophysical methods. • Effective oral and written communication skills necessary for writing up complex research findings and to convey specialist/technical material. • 	<ul style="list-style-type: none"> • Skills in cryo electron microscopy and image processing. • Skills in protein biochemistry • Knowledge of programming 	<ul style="list-style-type: none"> • Application Form • Panel interview • Presentation
General Skills/Attributes	<ul style="list-style-type: none"> • Initiative and creativity to ensure research is effective • Effective presentation skills. • Organisation and administration skills • Commitment to working with diversity. • Good networking and interpersonal skills • Ability to work independently but also to co-operate and interact with other group members and outside collaborators • Willingness to travel for collaboration and meetings 	<ul style="list-style-type: none"> • Understanding of macromolecular structures and an ability to use information from X-ray crystallography, cryo-microscopy, and bioinformatics to interpret results. 	<ul style="list-style-type: none"> • Application Form • Panel Interview • Presentation
Experience	<ul style="list-style-type: none"> • Experience research methods in structural biology, biochemistry or cell biology 	<ul style="list-style-type: none"> • Experience in analysing cryo-electron microscopy data. 	<ul style="list-style-type: none"> • Application Form • Panel interview • Presentation
Qualifications	<ul style="list-style-type: none"> • PhD (or equivalent) in a relevant subject area, or be about to submit a thesis. 		<ul style="list-style-type: none"> • Application Form