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| JOB TITLE | Postdoctoral Researcher in Structural Cell Biology of Host-Parasite Interactions in Malaria | |
| FACULTY & SCHOOL/DEPARTMENT | Biological Sciences, Institute of Structural and Molecular Biology | |
| REPORTS TO | Professor Helen Saibil | |
| SUPERVISES | Not applicable | |
| POST REFERENCE | 10637 | |
| GRADE | Academic & Research, Grade 7 | DATE Nov 2011 |

Birkbeck is a world-class 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 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 in the University of London in 1920.

PURPOSE OF THE JOB

To contribute to the development of research proposals and/or objectives, and to conduct and write up both individual and collective research projects for publication.

Project

Clinical malaria results from replication of protozoan parasites of the genus *Plasmodium* in circulating erythrocytes. Following erythrocyte invasion, the parasite resides within a membrane-bound parasitophorous vacuole (PV) where it divides asexually to form 16 or more daughter merozoites. Eventually, in a process collectively called egress, major surface proteins of the intracellular merozoites undergo dramatic proteolytic modification whilst the enclosing PV and residual host erythrocyte membranes rupture, releasing mature merozoites which invade fresh erythrocytes to perpetuate the cycle. Successive cycles of replication lead to increasing parasitaemia and pathology. Some effective antimalarial drugs are currently available but parasites typically rapidly acquire resistance in the face of drug pressure. There is a need to expand our understanding of the basic biology of the malaria parasite and to seek parasite-specific processes that can be exploited as new drug targets. One such process is egress. Egress has long been known to require protease activity, and recent work has shown a critical role for a single parasite protease called PfSUB1 in both major elements of egress: proteolytic maturation of merozoite surface proteins required for subsequent invasion of fresh host cells, and rupture of the PV and host membranes to allow merozoite release. Egress is a potential drug target, as some protease inhibitors – including compounds that selectively target PfSUB1 – block egress. However, our understanding of the molecular events during egress is poor. Nothing is known about precisely how PfSUB1-mediated modifications to merozoite surface proteins modulate parasite invasiveness, nor how

the two barriers surrounding the merozoites (PV and host red cell membranes) are lysed. This project seeks to address these fundamental questions, providing an improved understanding of egress that will aid the development of new antimalarial strategies.

Using state of the art facilities for cellular electron tomography at Birkbeck and NIBSC along with parasite culture facilities and pharmacological tools developed at NIMR, the postdoc will examine the structural and functional consequences of protease cleavage of the major malaria merozoite surface protein, MSP1, during malaria merozoite egress from the infected host red blood cell, as well as the rearrangements of the membranes surrounding the parasite that enable merozoite release.

RESEARCH ENVIRONMENT AND FACILITIES

The Institute of Structural and Molecular Biology (ISMB)

The ISMB (<http://www.ismb.lon.ac.uk>) is a centre of excellence, which jointly consists of the Department of Biological Sciences at Birkbeck, the Research Department of Structural & Molecular Biology at UCL, and the Chemical Biology section of the Department of Chemistry at UCL. The Institute provides a scientific environment conducive to world-class research in the field of biomolecular science. The ISMB (Director: Professor Gabriel Waksman) is organised along 5 research programmes: Structural Biology (Head: Professor Helen Saibil FRS), Chemical Biology (Head: Professor Helen Hailes), Biophysics and Proteomics (Head: Professor Steve Perkins), Bioinformatics (Head: Professor David Jones), and Biochemistry and Molecular Biology (Head: Dr Katherine Bowers). Major research facilities at the ISMB include laboratories for X-ray crystallography, cryo-electron microscopy, NMR spectroscopy, biophysical methods, cell biology, optical microscopy, bioinformatics and ion mobility mass spectrometry. The ISMB organises multidisciplinary activities that are aimed at increasing collaborative, interdisciplinary research within speciality areas and between these areas and the vast body of biomedical research taking place at UCL, NIMR, and Birkbeck. ISMB activities include symposia, retreats, seminar series, and students/postdocs presentations. The ISMB also runs Wellcome Trust, MRC and BBSRC funded PhD programmes.

The Department of Biological Sciences at Birkbeck College

This department was created in 2009 from the merger of the School of Crystallography and the School of Biological and Chemical Sciences (<http://www.bbk.ac.uk/biology/>). It is a multidisciplinary department composed of 38 academic staff (including 6 joint with UCL), 17 HEFCE support staff and around 40 research fellows and research assistants. It houses the ISMB Biophysics Centre, the ISMB Cryo-EM facility, and the ISMB X-ray Crystallography facility.

The Birkbeck electron microscopy laboratory, based in the Crystallography part of the Department of Biological Sciences, is equipped for state of the art cryo-electron microscopy, electron tomography, high pressure freezing, cryo sectioning, freeze-substitution and correlative fluorescence/electron microscopy, along with all the necessary hardware and software for image processing and 3-dimensional reconstruction (<http://people.cryst.bbk.ac.uk/~ubcg16z/empage.html>).

The Division of Parasitology at the MRC National Institute for Medical Research (NIMR)

The MRC National Institute for Medical Research is the largest of the UK Medical Research Council's research institutes. Based in Mill Hill, research at NIMR is dedicated to basic medical research in the four major areas of Genetics and Development,

Neurosciences, Infections and Immunity, and Structural Biology. The Blackman laboratory (www.nimr.mrc.ac.uk/research/mike-blackman/) is in the Division of Parasitology which focuses on malaria, a disease that kills a million victims each year and is a major burden on the developing world. The laboratory is comprehensively equipped for manipulation and biochemical analysis of pathogens and is fully equipped for molecular biological, biochemical and biophysical studies. The Division of Parasitology is well equipped for optical and confocal microscopy, FACS analysis, BiaCore and Isothermal Titration Calorimetry, mass spectrometry, NMR spectroscopy and x-ray crystallography. NIMR has extensive animal facilities and is one of the leading centres for mouse transgenesis in the UK.

National Institute for Biological Standards and Control (NIBSC)

NIBSC is the global leader in the field of biological standardisation, responsible for developing and producing over 90% of the International Standards in use around the world to assure the quality of biological medicines. The Institute is responsible for testing of biological medicines within the framework of the European Union. NIBSC scientists have an international reputation for excellence in research and are widely consulted on issues of biological medicine safety and efficacy. The Institute has a particularly close relationship with the World Health Organisation (WHO) and is the leading WHO International Laboratory for Standards. NIBSC has an advanced facility covering a range of techniques from conventional fluorescence and confocal microscopy, live cell imaging, transmission and scanning electron microscopy, tomography, cryo-scanning and cryo-transmission electron microscopy, together with supporting technologies for cryo and conventional specimen preparation and image processing, with suitable containment facilities for the planned work.

Main Duties of the Jobholder

Research and Scholarship

- To develop research objectives and proposals for own or joint research, with the assistance of a mentor if required.
- To conduct individual and collaborative research projects and write up research for publication
- To update knowledge and understanding in field or specialism.
- To translate knowledge of advances in the subject area into research activity.
- To ensure that research content and the 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.

Communication

- To deal with routine communication using a range of media.
- To communicate complex information, and material of a specialist or highly technical nature orally, in writing, and electronically.
- To prepare proposals and applications 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 on joint projects, as required
- To collaborate with academic colleagues on areas of shared research interest.
- To attend and contribute to relevant meetings.

Liaison and Networking

- To liaise with colleagues and students.
- To build internal contacts, and participate in internal networks for the exchange of information and to form relationships for future collaboration.
- To join external networks to share information and identify potential sources of funds.

Dimensions

Problem Solving and Impact

- To use new research techniques and methods.
- To use own initiative and creativity to identify areas for research, 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 workshops as appropriate.

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

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| Salary: | £30,870 rising to £35,788 per annum on Grade 7 of the salary scales, plus £2,934 London Allowance per annum. <i>The initial salary award will be dependent on the skills and experience of the successful applicant.</i> |
| Ref No: | 10637 |
| Probation: | The appointment may be subject to a probationary period of six months. |
| Duration of post: | Up to three years. |
| Hours: | Full-time, 35 hours per week |
| Annual leave entitlement: | 25 days per year, plus an additional six days when the College is closed during the spring and winter breaks. This is in addition to the eight bank holidays. |
| Superannuation: | The normal retirement age for all staff is 65. The post is superannuable under the USS scheme (Universities Superannuation Scheme). This is a final salary scheme, and is often substantially more beneficial to the employee than a "money-purchase" scheme. |
| Closing date: | 2 December 2011 |
| Interview date: | December 2011 or early January 2012 |
| Start date: | tbc |

To apply for this post please visit www.bbk.ac.uk/jobs (**Search using Ref No. 10637**)

If you have difficulty applying for a post, please contact Human Resources: tel: 020 7380 3164 or fax: 020 7380 3172 or email: humanresources@bbk.ac.uk

Informal enquiries can be made to:

Professor Helen Saibil, Crystallography, Birkbeck, Malet Street, London WC1E 7HX.
tel: 020 7631 6820, e-mail: h.saibil@mail.cryst.bbk.ac.uk. Web page: <http://people.cryst.bbk.ac.uk/~ubcg16z/index.html>

PERSON SPECIFICATION

Job Title: Postdoctoral Researcher

Post No: 10637

School /Dept: Science/Biological Sciences

| Attributes | Essential | Desirable | Method of Assessment |
|------------------------------------|--|---|---|
| Knowledge | <ul style="list-style-type: none"> • Possess sufficient breadth or depth of specialist knowledge of research approaches to work within a structural, molecular and cell biology research programme • A background in structural biology, cell biology, biochemistry or bioimaging | <ul style="list-style-type: none"> • Knowledge of structural biology, protein biochemistry and specialist biochemical and biophysical methods. • Knowledge in cell biology | <i>Application Presentation Interview</i> |
| Technical/Work-based Skills | <ul style="list-style-type: none"> • Skills in structural, biochemical, molecular and/or cell biology methods • Effective oral and written communication skills, to write up complex research findings and to convey specialist/technical material. • Computer proficiency in standard office and presentation functions | <ul style="list-style-type: none"> • Research skills in electron tomography, image processing and 3-dimensional reconstruction, and in cell biology or microbiology | <i>Application Presentation Interview</i> |
| General Skills/Attributes | <ul style="list-style-type: none"> • Initiative, commitment 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 meetings and workshops | <ul style="list-style-type: none"> • Understanding of diffraction and imaging methods, and 3-dimensional structure determination • Understanding of the processes of intracellular parasite infection. • Specialist knowledge of key mammalian cellular processes. | <i>Application Presentation Interview</i> |
| Experience | <ul style="list-style-type: none"> • Experience using or developing research methods and techniques, particularly in structural or cellular biology • Previous experience of contributing to research | <ul style="list-style-type: none"> • Experience in structural cell biology, microbiology; experience in handling infectious organisms, particularly Malaria. | <i>Application Presentation Interview</i> |
| Qualifications | <ul style="list-style-type: none"> • PhD (or equivalent) in a relevant subject area, such as structural or cell biology, biochemistry or microbiology. | | <i>Application</i> |

General Information for Prospective Job Applicants

The College

Birkbeck is a unique institution within the UK higher education system. We are the UK's leading provider of part-time face-to-face courses for mature students and the largest single provider of such courses in London.

Birkbeck has an international reputation for the quality of its research and teaching. But, more than that, Birkbeck has a unique social mission – to provide universal access to the benefits of learning and particularly to provide opportunities in higher education to students who may be in full-time employment, or who may not have had the opportunity to study at an earlier stage in their lives. This has always been the central mission of Birkbeck, ever since it was established over 180 years ago, and it is one that we are proud to stand by.

Today, Birkbeck offers students, from diverse educational, cultural and social backgrounds, an extensive range of undergraduate and postgraduate programmes across the disciplines, as well as an unrivalled choice of both vocational and non-vocational courses through our Faculty of Continuing Education. This is what makes Birkbeck a special place to study.

Birkbeck is also a special place in which to work. Feedback from both staff and students clearly shows that the expertise, hard work and commitment of colleagues across the College, from academics to catering staff, school administrators to researchers, is the foundation upon which Birkbeck has forged its reputation as a centre of teaching and research excellence.

There are over 7,000 undergraduate and postgraduate students enrolled at the College in a wide range of subjects in the Arts, Sciences, and Social Sciences. Through the College's Faculty of Continuing Education, a further 13,000 students are taught at centres throughout the London area. There are approximately 320 teaching staff in the Schools and associate Centres and over 600 staff engaged in areas of research, technical, computing, secretarial, library, and central administrative support services.

Equal Opportunities & Diversity

The University of London was established to provide education on the basis of merit alone and without regard to race, creed or political belief, and was the first University in the United Kingdom to admit women to its degrees. This tradition continues into the field of employment and the University will not tolerate unfair discrimination. Birkbeck is an equal opportunities employer.

The College and the trade unions represented in the College are committed to the development of positive policies to promote diversity and equality of opportunity in employment. Therefore, the equal opportunities and diversity policy of the College is that the only consideration in recruitment, training, appraisal and promotion of employees must be how the requirements of the post are met or likely to be met by the individual under consideration. These requirements being met, no regard should be taken (except where the law allows) of that person's race, creed, colour, nationality, ethnic origin, disability, religion, religious belief, language, political or other opinion affiliation, connections with a national minority, property, birth or other status, gender, gender reassignment, sexual orientation, marital status, family connections, or membership or non membership of a trade union. Except for the normal retirement age, the College does not discriminate on the basis of age, and applications from people over 50 years of age are welcome.

Location

The main Birkbeck building is in Malet Street, WC1, located in the Central University precinct in Bloomsbury, next to Senate House (the administrative centre of the federal University of London).

The College's administrative offices, library and other facilities, and certain academic schools are based in the main building. Other academic departments are in smaller premises, all within five minutes' walk from the Malet Street building. The Faculty of Continuing Education is located in houses in Russell Square, Tavistock Square and Torrington Square.

Birkbeck has good transport connections. The mainline stations of Kings Cross and Euston, underground stations Goodge Street, Euston Square, Warren Street, Tottenham Court Road, Euston and Russell Square are all within walking distance. A number of bus routes run parallel to Malet Street. There are cycle routes into Birkbeck and bicycle stands are located close to the main building.

As it is located so centrally, Birkbeck is close to many cultural institutions, such as the British Museum. Moreover, shopping districts such as Covent Garden, Soho, and Oxford Street can all be reached easily during your lunch break. There are a number of bookshops close by: one of the largest Waterstones bookshops in London is located at the end of Malet Street.

Facilities

There are snack bars in the Main Building, and the Gordon Square premises for tea, coffee, lunch, and evening meals. Staff are welcome to use the Students' Union bar and snack counter in the main buildings. The catering facilities of the other Colleges in the precinct, including the central London University Students' Union (ULU), which is next door to the College in Malet Street, are also open to staff.

'Energy Base' at ULU in Malet Street includes a 33-metre swimming pool, a large gym, and other facilities including a wide range of exercise classes. Staff may join as associate members. Staff may use the badminton court in Senate House, and arrangements may be made to play squash at certain halls of residence.

The College runs an evening nursery for the children of students and staff. Birkbeck is currently looking at introducing a childcare voucher scheme for staff.

Staff may borrow books from the Library and the majority are eligible to enrol on College courses. There are various staff common rooms and rest areas.

Birkbeck is a member of the Central University Institutions Health Service, which offers full medical facilities for staff and students. The College has a contributory pension scheme and staff may be eligible for a discount of up to 30% off subscriptions for the BUPAcare private medical insurance scheme. In an effort to provide a healthy and comfortable working environment, smoking is prohibited except in designated smoking areas.

Three trade unions are recognised for the local and national negotiation of pay and conditions of service, the Association of University Teachers (AUT), for academic,

research and administrative staff, UNISON for clerical and manual staff, and Amicus for technical and craft staff.

Interest-free loans are available for the purchase of annual season tickets and bicycles for use to travel to work.

For further information regarding benefits available to employees at Birkbeck, please visit the website at <http://www.bbk.ac.uk/jobs/working-at-birkbeck/facilities>