**Job description and selection criteria**

<table>
<thead>
<tr>
<th>Job title</th>
<th>Post-doctoral Scientist – Integral Membrane Proteins Group 1</th>
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<tbody>
<tr>
<td>Division</td>
<td>Medical Sciences</td>
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<tr>
<td>Department</td>
<td>Nuffield Department of Medicine (NDM)</td>
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<tr>
<td>Location</td>
<td>Structural Genomics Consortium, Old Road Campus Research Building, Roosevelt Drive, Headington, Oxford</td>
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<tr>
<td>Grade and salary</td>
<td>Grade 7: £31,604 - £38,833 per annum</td>
</tr>
<tr>
<td>Hours</td>
<td>Full time</td>
</tr>
<tr>
<td>Contract type</td>
<td>Fixed-term until 31st August 2020</td>
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<tr>
<td>Reporting to</td>
<td>Liz Carpenter, Professor of Membrane Protein Structural Biology and Principal Investigator for Integral Membrane Proteins Group 1</td>
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<tr>
<td>Vacancy reference</td>
<td>132236</td>
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**Research topic**

Cryo-EM, crystallography and function studies of human membrane proteins involved in genetic disease. This project involves working closely with a Pharma company.

**Project team**

Integral Membrane Proteins Group 1, SGC, NDM

**Project web site**


**Funding partner**

The funds supporting this research project are provided through collaboration with a pharmaceutical company.

**Recent publications**

**Structure and function of PKD2**


Related work from the Carpenter group:


The role

Reporting to Professor Liz Carpenter, the principal investigator for one of the Integral Membrane Proteins groups at the Structural Genomics Consortium, NDM. You will be a member of the IMP-1 group at the SGC.

Liz Carpenter’s group studies the structure and function of a range of human membrane proteins associated with genetic disease. The group use X-ray crystallography, cryo-electron microscopy and any other available methods to determine structures, together with a range of biophysical and biochemical methods to study protein function. Only by understanding the biology of each protein mutated in disease will we be able to provide new medicines. One example of an area where we have been successful recently is autosomal dominant polycystic kidney disease (AD-PKD). This is one of the most common genetic diseases, occurring in 1:1000 in the general population. AD-PKD leads to formation of large cysts within the kidneys and other organs, resulting in failure of kidney function, often leading to a need for renal dialysis and kidney transplants. AD-PKD is caused by mutations in two integral membrane proteins, called polycystins, PKD1 (70%) and PKD2 (15%). PKD2 is a member of the TRP channel family and PKD1 forms a complex with PKD2. We solved the structure of human PKD2 in a closed state by cryo-electron microscopy to 4.2 Å (Grieben et al., NSMB, 2017) and our collaborators on PKD2 were successful in solving the structure in an open state.

You will be responsible for structure and function studies of ion channels and related proteins involved in genetic disease. You will produce the proteins in insect and mammalian cells, optimize the protein production methods and determine the structures of these proteins, using both cryo-EM (in collaboration with Professor Juha Huiskonen, OPIC, Oxford), and X-ray crystallography. You will also use biophysical and biochemical techniques to study protein function and identify novel small molecule binders that could regulate protein function. You will be responsible for design of experiments, mutagenesis, protein purification, functional assays, structure determination by cryo-EM and X-ray crystallography, analysis of data and preparation of manuscripts.

This project is a collaboration with a pharmaceutical company and you will be expected to work in close collaboration with scientists at the company, remaining in regular contact and sharing all information. The work done at the SGC will be publishable without restriction. You will be joining a team of 14 membrane protein scientists in the IMP-1 group at the SGC, who have extensive experience in structure and function studies of a range of integral membrane proteins. The group works extensively with colleagues at the SGC, including the Biotech group, the Research Informatics group and the Crystallography group.
Responsibilities

- Express and purify ion channels and related proteins for structural studies.
- Maintain cells and perform large scale grow-ups of insect cell and mammalian cell cultures for purification.
- Solve structures of these proteins in a range of conformations, with mutations and in the presence of activators and inhibitors, using cryo-electron microscopy, X-ray crystallography and any other appropriate methods.
- Develop and perform biophysical assays to identify activators and inhibitors.
- Keep up-to-date with the literature on the proteins and techniques you are using.
- Prepare manuscripts for publication in high quality journals.
- Work closely with the Pharma collaborators who are funding this work, sharing information with them and visiting their labs on a regular basis. Work with collaborators on this project in Oxford and elsewhere.
- Keep accurate, complete and up-to-date records of all experiments performed, using the SGC’s database and electronic notebook system.
- Interact effectively with the lab head and other members of the Integral Membrane Proteins Group and other groups in the SGC. Report your work to the IMP group and to the SGC on a regular basis.
- Carrying out any other relevant duties as may reasonably be associated with the post and which may be required from time to time.

Selection criteria

Essential selection criteria

- PhD or equivalent in a relevant area of protein science and biochemistry, either awarded, submitted for final examination or close to submission.
- Proven experience in academic and/or industrial laboratories in structure/function studies with integral membrane proteins.
- Strong molecular biology skills, including site-directed mutagenesis and preparation of plasmids and baculovirus.
- Proven experience in protein expression and purification, including optimization of protein stability and production. Including either grid preparation for cryo-EM or crystallisation, preferably with integral membrane proteins.
- Experience in solving structures of proteins using either X-ray crystallography or cryo-EM techniques.
- Experience in analysing complex data and using this information to plan the next step of your experiments.
- Excellent oral, presentation and written communication skills.
- Proven record in preparation of high quality research publications, including a demonstrable ability to write first-author publications for leading journals.
- Highly self-motivated, well-organized and flexible with strong planning and problem solving skills.
- Ability to work independently and as part of a team, and to collaborate with colleagues and external collaborators from industry on a range of projects.
Desirable selection criteria

- Experience in optimizing cryo-EM grids would be a considerable advantage.
- Experience in preparing crystals using lipidic cubic phase (LCP) and other membrane protein specific techniques and performing biophysical and/or biochemical assays, preferably on membrane proteins.
- Experience in using insect cells, yeast or mammalian expression systems and making stable cell lines.
- Experience working in a high-throughput environment, with tight timelines.

About the University of Oxford

Welcome to the University of Oxford. We aim to lead the world in research and education for the benefit of society both in the UK and globally. Oxford’s researchers engage with academic, commercial and cultural partners across the world to stimulate high-quality research and enable innovation through a broad range of social, policy and economic impacts.

We believe our strengths lie both in empowering individuals and teams to address fundamental questions of global significance, and in providing all of our staff with a welcoming and inclusive workplace that supports everyone to develop and do their best work. Recognising that diversity is a great strength, and vital for innovation and creativity, we aspire to build a truly diverse community which values and respects every individual’s unique contribution.

While we have long traditions of scholarship, we are also forward-looking, creative and cutting-edge. Oxford is one of Europe’s most entrepreneurial universities. Income from external research contracts in 2014/15 exceeded £522.9m and ranked first in the UK for university spin-outs, with more than 130 spin-off companies created to date. We are also recognised as leaders in support for social enterprise.

Join us and you will find a unique, democratic and international community, a great range of staff benefits and access to a vibrant array of cultural activities in the beautiful city of Oxford.

For more information please visit www.ox.ac.uk/about/organisation

Medical Sciences

The Medical Sciences Division is an internationally recognized centre of excellence for biomedical and clinical research and teaching.

We are the largest academic division in the University of Oxford World-leading programmes, housed in state-of-the-art facilities, cover the full range of scientific endeavour from the molecule to the population. With our NHS partners we also foster the highest possible standards in patient care.

For more information please visit: www.medsci.ox.ac.uk
Nuffield Department of Clinical Medicine (NDM)

The Nuffield Department of Clinical Medicine (NDM) is one of the largest departments of the University of Oxford and is part of the Medical Sciences Division, with responsibility for a significant part of the teaching of clinical students within the Medical School. The Department also has a substantial research programme which requires high quality administrative management.

NDM has significant financial turnover and complexity, resulting from its diverse research portfolio, its geographical spread and its close links with NHS funding and strategic teams involved in the development and delivery of increasingly integrated clinical research platforms.

For more information please visit: www.ndm.ox.ac.uk/home

The University of Oxford is a member of the Athena SWAN Charter and holds an institutional Bronze Athena SWAN award. The Nuffield Department of Medicine holds a Silver Athena SWAN award to recognise advancement of gender equality: representation, progression and success for all.

For more information please visit: www.ndm.ox.ac.uk/athena-swan

Structural Genomics Consortium (SGC)

The Structural Genomics Consortium (SGC), a not-for-profit, public-private partnership funds pre-competitive research that contributes to new hypotheses in understanding and treating human disease, and the subsequent identification of new targets for drug discovery. The SGC supports pioneering research at the University of Oxford (UK), University of Toronto (Canada), University of Campinas (Brazil), and University of North Carolina (USA). The reagents and knowledge related to human proteins that the SGC supports are made openly accessible to researchers around the world to accelerate the discovery of new medicines in order to bring potentially life-saving drugs to market faster and at a lower cost.

SGC Oxford, a part of the Nuffield Department of Clinical Medicine, receives funding from public, charitable and private sector organisations such as the European Commission, UK Research Councils, Wellcome Trust, and pharmaceutical companies. Research in SGC Oxford is focused on the production and characterisation of the 3-dimensional structures of soluble and of integral membrane proteins, the discovery of selective chemical probes that can modulate protein function, and the development of target enabling packages that transform genetic hits into starting points for drug discovery. SGC Oxford shares its research outputs through collaborations with researchers worldwide.

For more information please visit: http://www.thesgc.org/scientists/groups/oxford/
How to apply

Before submitting an application, you may find it helpful to read the ‘Tips on applying for a job at the University of Oxford’ document, at www.ox.ac.uk/about/jobs/supportandtechnical/.

If you would like to apply, click on the Apply Now button on the ‘Job Details’ page and follow the on-screen instructions to register as a new user or log-in if you have applied previously. Please provide details of two referees and indicate whether we can contact them now.

You will also be asked to upload a CV and a supporting statement. The supporting statement should explain how you meet the selection criteria for the post using examples of your skills and experience. This may include experience gained in employment, education, or during career breaks (such as time out to care for dependants).

Your application will be judged solely on the basis of how you demonstrate that you meet the selection criteria stated in the job description.

Please upload all documents as PDF files with your name and the document type in the filename.

All applications must be received by midday on the closing date stated in the online advertisement.

Information for priority candidates

A priority candidate is a University employee who is seeking redeployment because they have been advised that they are at risk of redundancy, or on grounds of ill-health/disability. Priority candidates are issued with a redeployment letter by their employing departments.

If you are a priority candidate, please ensure that you attach your redeployment letter to your application (or email it to the contact address on the advert if the application form used for the vacancy does not allow attachments)

Should you experience any difficulties using the online application system, please email recruitment.support@admin.ox.ac.uk. Further help and support is available from www.ox.ac.uk/about_the_university/jobs/support/. To return to the online application at any stage, please go to: www.recruit.ox.ac.uk.

Please note that you will be notified of the progress of your application by automatic emails from our e-recruitment system. Please check your spam/junk mail regularly to ensure that you receive all emails.
Important information for candidates

Pre-employment screening
Please note that the appointment of the successful candidate will be subject to standard pre-employment screening, as applicable to the post. This will include right-to-work, proof of identity and references. We advise all applicants to read the candidate notes on the University’s pre-employment screening procedures, found at: www.ox.ac.uk/about/jobs/preemploymentscreening/.

The University’s policy on retirement
The University operates an Employer Justified Retirement Age (EJRA) for all academic posts and some academic-related posts. From 1 October 2017, the University has adopted an EJRA of 30 September before the 69th birthday for all academic and academic-related staff in posts at grade 8 and above. The justification for this is explained at: www.admin.ox.ac.uk/personnel/end/retirement/revisedejra/revaim/.

For existing employees, any employment beyond the retirement age is subject to approval through the procedures: www.admin.ox.ac.uk/personnel/end/retirement/revisedejra/revproc/

Form 1 October 2017, there is no normal or fixed age at which staff in posts at grades 1–7 have to retire. Staff at these grades may elect to retire in accordance with the rules of the applicable pension scheme, as may be amended from time to time.

Equality of Opportunity
Entry into employment with the University and progression within employment will be determined only by personal merit and the application of criteria which are related to the duties of each particular post and the relevant salary structure. In all cases, ability to perform the job will be the primary consideration. No applicant or member of staff shall be discriminated against because of age, disability, gender reassignment, marriage or civil partnership, pregnancy or maternity, race, religion or belief, sex, or sexual orientation.
Benefits of working at the University

Training and Development
A range of training and development opportunities are available at the University. Further details can be found at https://www.ox.ac.uk/staff/working_at_oxford/training_development/index.html.

For research staff only: Support for Research Staff
There is a particularly wide range of support for career development for research staff. Please visit https://www.ox.ac.uk/research/support-researchers to find out more.

Pensions
The University offers generous occupational pension schemes for eligible staff members. Further details can be found at https://www.admin.ox.ac.uk/finance/epp/pensions/pensionspolicy/.

Information for international staff (or those relocating from another part of the UK)
A wealth of information is available on the University's International Staff website for staff who are relocating to Oxford from abroad, at https://www.admin.ox.ac.uk/personnel/staffinfo/international/.

The University of Oxford Newcomers’ Club
The Newcomers’ Club is aimed at helping partners of newly-arrived visiting scholars, graduate students and academic members of the University to settle in and to meet people in Oxford.

Transport schemes
The University offers a range of travel schemes and public transport travel discounts to staff. Full details are available at https://www.admin.ox.ac.uk/estates/ourservices/travel/.

University Club and University Sports Facilities
The University Club provides social, sporting and hospitality facilities. It incorporates a Club bar, a cafe and sporting facilities, including a gym. See https://www.club.ox.ac.uk for all further details.

University staff can use the University Sports Centre at discounted rates, and have the chance to join sports clubs. Please visit https://www.sport.ox.ac.uk/oxford-university-sports-facilities.

Childcare and Childcare Vouchers
The University offers quality childcare provision services at affordable prices to its employees. For full details about the services offered, please visit https://www.admin.ox.ac.uk/childcare/. NB: Due to the high demand for the University’s nursery places there is a long waiting list.

The University also offers nursery fee payment schemes to eligible staff as an opportunity to save tax and national insurance on childcare costs. Please visit https://www.admin.ox.ac.uk/childcare.

Disabled staff
The University is committed to supporting members of staff with a disability or long-term health condition and has a dedicated Staff Disability Advisor. Please visit https://www.admin.ox.ac.uk/eop/disab/staff for further details.

BUPA - Eduhealth
Bupa Eduhealth Essentials private medical insurance offers special rates for University of Oxford staff and their families https://www.eduhealth.co.uk/mini-site/.

All other benefits
For other benefits, such as free entry to colleges, the Botanic Gardens and staff discounts offered by third party companies, please see https://www.admin.ox.ac.uk/personnel/staffinfo/benefits/.