Job title	Post-doctoral scientist – Integral Membrane Proteins Group
Division	Medical Sciences
Department	Nuffield Department of Medicine, Structural Genomics Consortium
Location	Old Road Campus Research Building, Old Road Campus, Roosevelt Drive, Headington, Oxford, OX3 7DQ
Grade and salary	Grade 7: £32,817 - £40,322 per annum
Hours	Full time
Contract type	Fixed-term until 30 June 2022
Reporting to	Liz Carpenter, Professor of Membrane Protein Structural Biology and PI for Integral Membrane Proteins Group in Oxford
Vacancy reference	*143943*
Additional information	Funded by Innovative Medicines Initiative and Wellcome

Research topic	Structure and function of human membrane enzymes and transporters involved in genetic diseases
Principal Investigator / supervisor	Liz Carpenter, Professor of Membrane Protein Structural Biology and PI for Integral Membrane Proteins Group 1
Project team	Integral Membrane Proteins Group, SGC, NDM
Project web site	http://www.thesgc.org/node/9498
Funding partner	The funds supporting this research project are provided by Innovative Medicines Initiative and Wellcome
Recent publications	**Selected recent publications:** Rödström, et al., "A unique lower X-gate in TASK channels traps inhibitors within the vestibule". (2019), BioRxiv DOI: https://doi.org/10.1101/706168. Bushell, et al., "The structural basis of lipid scrambling and inactivation in the endoplasmic reticulum scramblase TMEM16K". (2019), Nature Communications, 10:3956, 1-16,

	(https://doi.org/10.1038/s41467-019-11753-1). Schewe, et al., “Pharmacological Master Key Mechanism that Unlocks the Selectivity Filter Gate in K+ Channels”, (2019), Science, 363, 6429, 875-880. Dong, et al., “Structures of DPAGT1 explain glycosylation disease mechanisms and advance TB antibiotic design”, (2018), Cell, 175, 1045-1058. Grieben, et al., “Structure of the polycystic kidney disease TRP channel Polycystin-2/PC2.”, (2017), Nature Structural and Molecular Biology, 24, 114-122. Wilkes, M., et al., (2017), “Structures of the TRP channel Polycystin-2 in complex with lipids and cations”, Nature Structural and Molecular Biology, 24, 123-130. Dong, et al., “K2P channel gating mechanisms revealed by structures of TREK-2 and a complex with Prozac” (2015). Science, 347, 1256-1259. Quigley, A., et al., “The structural basis of ZMPSTE24 dependent laminopathies”, (2013), Science, 339 (6127), 1604-1607. Shintre, C. A., et al., “The first human ABC exporter structure reveals the initial steps in the transport cycle”, (2013), Proc Natl Acad Sci U S A, 110, 24, 9710-9715.

The role

Reporting to Professor Liz Carpenter, the principal investigator for one of the Integral Membrane Proteins groups at the Structural Genomics Consortium, in the Nuffield Department of Medicine, Oxford University. The post holder will be a member of Liz Carpenter’s IMP group at the SGC, where they study the structure and function of a range of human membrane proteins that are mutated in neuropsychiatric and metabolic diseases, cancer and rare diseases. This post will initial have a focus on the structure and function of a set of integral membrane enzymes, with a longer term view on studies of transporters found at the blood brain barrier.

At the SGC, we have created a high-throughput pipeline for expression, purification, crystallisation and structural studies of human membrane proteins, including ion channels, solute carriers, ABC transporters and integral membrane enzymes. We have cloned and screened for expression over 600 human membrane proteins. Each protein has been tested for purification quality in a range of detergents and buffer systems, followed by large scale purification, crystallisation and/or cryo-EM grid preparation. We use both crystallography and cryo-EM for structure determination. We use the Diamond Light Source Synchrotron for X-ray data collection and for cryo-EM work we have access to electron microscopes in the Oxford Particle Imaging Centre (OPIC), the COSMIC facility in the Dunn School in Oxford and eBIC, the national cryo-EM facility at Harwell. Using these facilities we have solved the structures of twelve human membrane proteins to date. In addition we have access to state-of-the-art facilities for biophysical and functional studies.

We are seeking an enthusiastic and dedicated membrane protein structural biologist to take responsibility for a range of structural and functional biology projects involving both cryo-EM

and crystallography. This will include several membrane enzymes, some of which are already giving crystals, as well as a set of membrane proteins that reside at the blood brain barrier. Many of these projects will involve cryo-EM, for which we can provide training. The post holder will express proteins in insect and mammalian cells, optimize protein production methods, purify proteins, prepare crystals and cryo-EM grids. They will then collect data and solve structures. They will also be responsible for biophysical and functional studies for the late stage proteins. They will be responsible for design of experiments, mutagenesis, protein purification, functional assays and structure determination by cryo-EM and X-ray crystallography, analysis of data and preparation of manuscripts. Many of our projects involve close collaborations with scientists in the SGC, elsewhere in academia and also in Pharma companies, so excellent communication skills and an enthusiasm for working with others is essential.

Responsibilities

You will take overall responsibility for running and managing a set of projects involving integral membrane enzymes and solute carriers, with an emphasis on structure and function studies, as agreed with your line manager in the SGC. You will:

1. Express and purify membrane proteins for structural studies.
2. Maintain cells and perform large-scale grow-ups of insect cell and mammalian cell cultures for purification.
3. Develop and perform biophysical and functional assays to identify substrates, activators and inhibitors.
4. Crystallise proteins and prepare grids for structural work.
5. Solve structures of these proteins, using X-ray crystallography, cryo-electron microscopy, and any other appropriate methods. Structures may include complexes with small molecule inhibitors, activators, substrates or protein/nanobody or antibody binders.
6. Keep up-to-date with the literature on the proteins and techniques you are using.
7. Prepare manuscripts for publication in high quality journals.
8. Keep accurate, complete and up-to-date records of all experiments performed, using the SGC's database and electronic notebook system.
9. Work closely with the SGC colleagues, sharing information with them and keeping all colleagues updated on your work.
10. Interact effectively with the lab head, other members of the Carpenter group and other groups in the SGC. Provide reports on your work to the Carpenter group at the SGC and to colleagues in academia and industry on a regular basis.
11. Carrying out any other relevant duties as may reasonably be associated with the post and which may be required from time to time.

This job includes the following hazard-specific or safety-critical duties, which will require successful pre-employment health screening through our Occupational Health Department before the successful candidate will be allowed to start work:

- Regular manual handling – lifting centrifuge rotors and working extensively with large volume grow-ups which involved moving large numbers of 1L flasks.

Pre-employment screening

All offers of employment are made subject to standard pre-employment screening, as applicable to the post.

If you are offered the post, you will be asked to provide proof of your right-to-work, your identity, and we will contact the referees you have nominated. You will also be asked to complete a health declaration (so that you can tell us about any health conditions or disabilities so that we can discuss appropriate adjustments with you), and a declaration of any unspent criminal convictions.

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/.

Hazard-specific / Safety-critical duties

This job includes hazards or safety-critical activities. If you are offered the post, you will be asked to complete a health questionnaire which will be assessed by our Occupational Health Service (OHS), and the offer of employment will be subject a successful outcome of this assessment.

The hazards or safety-critical duties involved are as follows:

- Working at heights
- Night working (11pm-6am)
- Regular manual handling
- Work with any substance which has any of the following pictograms on their MSDS: 
- Travel outside of Europe or North America on University Business

Selection criteria

Essential selection criteria

- PhD 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 membrane protein expression and purification, including optimization of protein stability and production.
- Proven experience in either grid preparation for cryo-EM or crystallisation for X-ray crystallography, preferably with integral membrane proteins.
- Experience in analysing complex data and using this information to plan the next step of your experiments.
- A proven record in preparation of high quality research publications, including a demonstrable ability to write first-author publications for leading journals.
- Excellent oral, presentation and written communication skills.
- 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 using and optimizing expression in insect cells, yeast and/or mammalian expression systems for membrane proteins.
- Experience in performing biophysical and/or biochemical assays on membrane proteins.
- Structure determination for integral membrane proteins, and/or large complexes by either crystallography or cryo-EM.
- Experience working in a high-throughput environment, with tight timelines.
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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, while providing all our staff with a welcoming and inclusive workplace that enables everyone to develop and do their best work. Recognising that diversity is our strength, 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 2016/17 exceeded £564m and we rank first in the UK for university spin-outs, with more than 130 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)…fostering your career in science

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.

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: http://www.ndm.ox.ac.uk/home

The Nuffield Department of Clinical Medicine has been presented with a Departmental Athena SWAN Silver award in recognition of the commitment made to promote gender equality through our organisational and cultural practices and our efforts to improve the working environment for both men and women. For more information please see our Departmental Athena SWAN pages: www.ndm.ox.ac.uk/working-for-ndm/aboutndmatheneswan/ .

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

http://www.ox.ac.uk/about_the_university/jobs/research/

http://www.ox.ac.uk/about_the_university/jobs/professionalandmanagement/

http://www.ox.ac.uk/about_the_university/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 must explain how you meet each of 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 department(s).

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 receive an automated email from our e-recruitment system to confirm receipt of your application. **Please check your spam/junk mail** if you do not receive this email.

Important information for candidates

Data Privacy

Please note that any personal data submitted to the University as part of the job application process will be processed in accordance with the GDPR and related UK data protection legislation. For further information, please see the University's Privacy Notice for Job Applicants at: www.admin.ox.ac.uk/councilsec/compliance/gdpr/privacynotices/job/. The University's Policy on Data Protection is available at: www.admin.ox.ac.uk/councilsec/compliance/gdpr/universitypolicyondataprotection/.

The University's policy on retirement

The University operates an Employer Justified Retirement Age (EJRA) for all academic posts and some academic-related posts. 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/acrelretire8+/.

For **existing** employees, any employment beyond the retirement age is subject to approval through the procedures: www.admin.ox.ac.uk/personnel/end/retirement/acrelretire8+/.

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

Employee benefits

University employees enjoy 38 days' paid holiday, generous pension schemes, travel discounts, and a variety of professional development opportunities. Our range of other employee benefits and discounts also includes free entry to the Botanic Gardens and University colleges, and discounts at University museums. See www.admin.ox.ac.uk/personnel/staffinfo/benefits.

University Club and sports facilities

Membership of the University Club is free for all University staff. The University Club offers social, sporting, and hospitality facilities. Staff can also use the University Sports Centre on Iffley Road at discounted rates, including a fitness centre, powerlifting room, and swimming pool. See www.club.ox.ac.uk and www.sport.ox.ac.uk/oxford-university-sports-facilities.

Information for staff new to Oxford

If you are relocating to Oxfordshire from overseas or elsewhere in the UK, the University's Welcome Service website includes practical information about settling in the area, including advice on relocation, accommodation, and local schools. See www.welcome.ox.ac.uk.
There is also a visa loan scheme to cover the costs of UK visa applications for staff and their dependents. See www.admin.ox.ac.uk/personnel/permits/reimburse&loanscheme/.

Family-friendly benefits

With one of the most generous family leave schemes in the Higher Education sector, and a range of flexible working options, Oxford aims to be a family-friendly employer. We also subscribe to My Family Care, a service that provides practical advice and support for employees who have caring responsibilities. The service offers a free telephone advice line, and the ability to book emergency back-up care for children, adult dependents and elderly relatives. See www.admin.ox.ac.uk/personnel/staffinfo/benefits/family/mfc/.

Childcare

The University has excellent childcare services, including five University nurseries as well as University-supported places at many other private nurseries.
For full details, including how to apply and the costs, see www.admin.ox.ac.uk/childcare/.

Disabled staff

We are committed to supporting members of staff with disabilities or long-term health conditions. For further details, including information about how to make contact, in confidence, with the University's Staff Disability Advisor, see www.admin.ox.ac.uk/eop/disab/staff.

Staff networks

The University has a number of staff networks including the Oxford Research Staff Society, BME staff network, LGBT+ staff network and a disabled staff network. You can find more information at www.admin.ox.ac.uk/eop/inpractice/networks/.

The University of Oxford Newcomers' Club

The University of Oxford Newcomers' Club is an organisation run by volunteers that aims to assist the partners of new staff settle into Oxford, and provides them with an opportunity to meet people and make connections in the local area. See www.newcomers.ox.ac.uk.