



OXFORD-GSK
INSTITUTE *of* MOLECULAR *and*
COMPUTATIONAL MEDICINE



Job title	Postdoctoral Research Scientist – Biochemistry/biophysics of protein-RNA condensates
Division	Medical Sciences
Department	Nuffield Department of Medicine
Location	Centre for Human Genetics, Building for Genomic Medicine, Old Road Campus, Roosevelt Drive, Headington, Oxford, OX3 7BN
Grade and salary	Grade 7: Salary in range £38,674 - £46,913 per annum (pro rata). This is inclusive of a pensionable Oxford University Weighting of £1,500 per year (pro rata).
Hours	Full time
Contract type	Fixed-term contract for 36 months Funding is provided by GSK
Reporting to	Dr. Martina Hallegger, IMCM Fellow and Georgina Kerr, IMCM Programme Manager
Vacancy reference	176287

Additional information	This role meets the eligibility requirements for a Skilled Worker Certificate of Sponsorship under UK Visas and Immigration legislation.
About us	<ul style="list-style-type: none"> University of Oxford - www.ox.ac.uk/about/organisation Nuffield Department of Medicine (NDM) - https://www.ndm.ox.ac.uk Unit - https://www.chg.ox.ac.uk/
What we offer	https://hr.admin.ox.ac.uk/staff-benefits <ul style="list-style-type: none"> An excellent contributory pension scheme 38 days annual leave A pensionable Oxford University Weighting allowance of £1,500 per annum (pro rata) A comprehensive range of childcare services Family leave schemes Cycle loan scheme Discounted bus travel and Season Ticket travel loans Membership to a variety of social and sports clubs A welcoming and diverse community

Research topic	The condensation-dependent protein and RNA interactome of TDP-43
Principal Investigator / supervisor	Dr. Martina Hallegger, IMCM Fellow
Project team	Institute of Molecular and Computational Medicine (IMCM)



Athena
SWAN
Silver Award



Project web site	https://www.chg.ox.ac.uk/ https://www.imcm.ox.ac.uk/about/team/martina-hallegger-1
Funding partner	The funds supporting this research project are provided by the IMCM.
Recent publications	https://www.sciencedirect.com/science/article/pii/S0092867421008771 https://www.biorxiv.org/content/10.1101/2021.08.27.457890v1 https://www.biorxiv.org/content/10.1101/2023.08.22.544179v1 https://www.sciencedirect.com/science/article/pii/S2211124717305223

The role

This post provides an exciting opportunity to join the newly established multidisciplinary Oxford-GSK Institute for Molecular & Computational Medicine (IMCM) operating within Nuffield Department of Medicine (NDM) in collaboration with Nuffield Department of Clinical Neuroscience (NDCN), Nuffield Department of Population Health (NDPH) and Department of Physiology, Anatomy and Genetics (DPAG). The Institute will bring together the very best scientific, clinical, technological and computational expertise from Oxford University and GSK to form unique industry/academic partnership. The aim of the institute is to improve tools in, and knowledge from, genetics, genomics, molecular and single cell biology, spatial imaging, machine learning and novel methods of data handling to study the pattern of diseases in new ways. The Institute will develop disease agnostic platforms to change the clinical practise of pathology, helping to identify and validate early potential drug targets, and biomarkers to predict disease progression.

The Institute is built around IMCM Fellows and Oxford-GSK project teams, focusing on neurodegeneration and the central nervous system. A highly motivated Postdoctoral Research Scientist looking to develop an independent research career with the ability to autonomously drive an interdisciplinary project is being recruited to join the Hallegger group (Oxford-GSK IMCM Fellow; Visiting Research Fellow at the Francis Crick Institute).

The Hallegger Lab is an inclusive environment with a focus on positive and proactive mentorship, teamwork, and scientific creativity. The Hallegger lab addresses the question of what proteomics and transcriptomics changes are linked to the earliest stages in neurodegeneration. In this role, you will undertake multidisciplinary approaches to discover and validate proteomic changes associated with changes in the condensation behaviour of TDP-43, an RNA-binding protein central to Motor Neuron Disease (MND) and ALS (Amyotrophic lateral sclerosis).

Recent work from Dr. Hallegger's team has demonstrated, by taking an interdisciplinary approach, how RNA- and condensation-dependent assemblies affect transcriptome-wide RNA networks. This work in the increasingly important field of membrane-less organelles/condensates describes how the TDP-43 condensation properties specify its RNA-binding and regulatory repertoire.

Proper RNA processing requires several RNA binding proteins (RBPs) to assemble and function co-ordinately. Recent studies revealed that some RBPs form highly dynamic condensates. These condensates are driven by weak multivalent interactions, which have distinct biophysical properties and regulatory mechanisms from the high-affinity 'lock and key'-type interactions. We recently showed that the RBP TDP-43, a key player in the neurodegenerative disease spectrum of FTD-ALS (Frontotemporal dementia, Amyotrophic lateral sclerosis), can assemble into condensates when bound to RNA and that this influences its RNA selectivity. The composition of these condensates is still not understood on a molecular level or how they are regulated and become dysregulated, and, critically, how they impact RNA metabolism in diseases.

The Hallegger lab is looking for a skilled and motivated Postdoctoral Research Scientist with a strong background in protein biochemistry, biophysics and proteomics. The project will combine novel methods for studying membraneless organelles with proteomics strategies for characterising molecular interactions, the biophysical properties that drive these assemblies and how they are changed in disease. By studying the composition of these condensates using mass spectrometry-based methods and linking these results to transcriptomic methods we aim to characterise TDP-43 condensation-dependent RNA granule assembly. You will regularly communicate and work collaboratively with the other Oxford-GSK IMCM post-doctoral fellows and researchers in the institute, keeping in mind the Oxford-GSK IMCM's approach and mission.

As a protein biochemist with biophysical experience, you will be part of a multi-disciplinary, science driven team delivering proteomics, transcriptomics and imaging-based results to better understand the molecular mechanisms in neurodegenerative disease. You will work closely with the bioinformatics and proteomics teams on the data analysis. You will work to tight and moving deadlines, adopting a flexible approach, communicating progress clearly, and prioritising effectively across the team. This position represents an exciting opportunity to work in a dynamic research environment, driving the delivery of proteomics and biophysics projects in close collaboration with the joint Oxford-GSK research project teams.

Responsibilities

You will:

- Perform protein purification and phase separation experiments.
- Generate proteomic data of co-condensates formed by TDP-43.
- Undertake cellular and biochemical assays on these co-condensates using molecular biology, proteomics techniques and microscopy.
- Utilise RNAseq and iCLIP RNA-sequencing approaches to look at gene expression and regulation changes to identify proteins/pathways linked to the condensation behaviour of identified RNA binding proteins.
- Manage your own academic research and administrative activities, including small scale project management, co-ordinate multiple aspects of work to meet deadlines.
- Adapt existing and develop new scientific techniques and experimental protocols.
- Assist in the supervision and mentorship of other lab members or graduate students.
- Test hypotheses and analyse scientific data from a variety of sources, reviewing and refining working hypotheses as appropriate.
- Be responsible for the data analysis and interpretation of datasets (with support from local specialist proteomics, bioinformatics and imaging teams).
- Contribute ideas for new research projects, develop ideas and preliminary data for generating research income, and present detailed research proposals to senior researchers.
- Undertake other duties in the department from time to time as determined commensurate with the grade and responsibilities of this post, and any other reasonable request.
- Participate in and support the public engagement and widening access activities of the Department and the University. This is anticipated to be not more than 2 days per year.
- Undertake mandatory training as required by the University, Division and Department. The specific list of training courses may change from time-to-time, in response to both legal and internal University requirements.



Selection criteria

Essential

- Hold a PhD/DPhil (or close to completion) in a relevant area of protein biochemistry or biophysical science.
- Have a strong track record in the key areas of research such as protein/proteins or protein/RNA interactions, membrane-less organelles, or similar.
- Experience in general molecular biology techniques (immunoprecipitation, immunoblotting, and microscopy).
- Experience in protein purification including chromatography techniques.
- Excellent experimental skills and the ability to independently drive a project, including decision-making, problem-solving, planning, and organising.
- Strong communication skills both in writing and oral presentations.
- Capacity to work as part of a team and supervise more junior colleagues.
- Ability to lead in the preparation of manuscripts for publication, and the skills to present outcomes of projects to researchers from a broad range of disciplines.
- Experience in microscopy.
- Experience in proteomics and basic bioinformatic analysis.
- Working knowledge of relevant analysis and statistical programs (eg. Fiji, CellProfiler, Adobe Photoshop/Illustrator, GraphPad Prism, RStudio).
- Highly motivated, with the capacity to think creatively and work across teams, and with a successful publication record and/or research income generation.

Desirable

- Experience in the field of neurodegeneration.
- Experience in protein interaction/mass spectrometry sample preparation & analysis.
- Experience in RNA biochemistry.
- Experience in single-molecule microscopy and FRAP.
- Experience in tissue culture, cell fractionation and immunoprecipitation.



Pre-employment screening

Standard checks

If you are offered the post, the offer will be subject to standard pre-employment checks. You will be asked to provide: proof of your right-to-work in the UK; proof of your identity; and (if we haven't done so already) 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 for which you may need us to make appropriate adjustments.

Please read the candidate notes on the University's pre-employment screening procedures at: <https://www.jobs.ox.ac.uk/pre-employment-checks>

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, and the offer of employment will be subject a successful outcome of this assessment.

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

- Lone Working
- Regular manual handling
- Working with blood, human products and human tissues
- Work with any substance which has any of the following pictograms on their MSDS:



How to apply

Applications are made through our e-recruitment system and you will find all the information you need about how to apply on our Jobs website <https://www.jobs.ox.ac.uk/how-to-apply>.

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.

As part of your application you will be asked to provide details of two referees and indicate whether we can contact them now. You will 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. Please note using a long file name may prevent you from uploading your documents.

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

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

If you currently work for the University please note that:

- As part of the referencing process, we will contact your current department to confirm basic employment details including reason for leaving.
- Although employees may hold multiple part-time posts, they may not hold more than the equivalent of a full time post. If you are offered this post, and accepting it would take you over the equivalent of full-time hours, you will be expected to resign from, or reduce hours in, your other posts(s) before starting work in the new post.

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).

If you need help

Application FAQs, including technical troubleshooting advice is available at: <https://staff.web.ox.ac.uk/recruitment-support-faqs>. Non-technical questions about this job should be addressed to the recruiting department directly recruitment@ndm.ox.ac.uk

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 online recruitment portal 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: <https://compliance.admin.ox.ac.uk/job-applicant-privacy-policy>. The University's Policy on Data Protection is available at: <https://compliance.admin.ox.ac.uk/data-protection-policy>.

The University's policy on retirement

The University operates an Employer Justified Retirement Age (EJRA) for very senior research posts at **grade RSIV/D35 and clinical equivalents E62 and E82**, which with effect from 1 October 2023 will be 30 September before the 70th birthday. The justification for this is explained at: <https://hr.admin.ox.ac.uk/the-ejra>.

For **existing** employees on these grades, any employment beyond the retirement age is subject to approval through the procedures: <https://hr.admin.ox.ac.uk/the-ejra>.

There is no normal or fixed age at which staff in posts at other grades 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.