

Job title	Post-Doctoral Research Associate in Computer Simulations of Protein Phase Separation and Aggregation
Grade	7
Salary range	£37,174 – £45,413
Staff Group	Research
Department / Institution	Department of Chemistry

Role-specific information

Role Summary

We are seeking an ambitious and talented postdoctoral research associate to join our team to work on a computational project focussed on predicting TDP-43 mutant phase separation and aggregation in the context of elucidating the molecular driving forces behind motor neurone disease. This project is part of a Discovery Network funded by the My Name's5 Doddie Foundation ['Dissecting a TDP-43 knock-in allelic series to yield diverse MND drug targets'].

The successful candidate will join research groups led by Dr Aleks Reinhardt in the Department of Chemistry and Prof. Rosana Collepardo-Guevara in the Departments of Chemistry and Genetics, University of Cambridge. Both groups focus on developing computational and statistical-mechanical approaches to model the physical properties of matter and their underlying molecular mechanisms, including in biological systems. The overarching Discovery Network spans King's College London, the University of Dundee and the University of Cambridge.

TDP-43 dysfunction can arise from mutations affecting aggregation and phase separation. Proteins featuring low-complexity aromatic-rich kinked segments, like TDP-43, can form interprotein β -sheets, which drive fibrillisation in condensates, resulting in amyloid-like fibrils. Hydrogen-bond co-operativity between disordered protein regions increases binding affinity between certain motifs over time, encouraging fibrillisation and rigidifying the interacting proteins. In this project, we will investigate this behaviour computationally to gain molecular-level insights into the multiple possible mechanisms of aggregation.

As part of the overarching Discovery Network, we will collaborate closely with our experimental colleagues. This will allow us to link simulations directly to experimental data in order to uncover the molecular mechanisms explaining why and how pathological mutations disrupt material properties of the condensates they form, both at equilibrium and dynamically, and use that molecular-level information to design strategies to overcome the pathological outcomes of such MND mutations.

The role holder's principal responsibilities will include carrying out their research in computer simulations and statistical mechanics of clinically significant mutants of TDP-43. Related tasks will include collaborating in the preparation of reports and journal articles, presenting papers at conferences and workshops, which will include regular meetings of the Discovery Network team, and co-supervising postgraduate students.

Key Responsibilities

Research and scholarship:	%
<ul style="list-style-type: none"> • develop research objectives and proposals for own or joint research; • conduct individual and collaborative research projects; • write up research work for presentation and publication; • continually update knowledge and understanding in field or specialism; • translate knowledge of advances in the subject areas into research activity; • manage own research and administrative activities, with guidance if required. • assist in the preparation of proposals and applications to external bodies, e.g. for funding and contractual purposes; • communicate material of a specialist or highly technical nature. 	
Teaching and learning support:	%
<ul style="list-style-type: none"> • may assist in the supervision of student projects; • provide limited supervision/instruction to classes; • may assist in the development of student research skills; • may plan and deliver seminars relating to research area. 	
Liaison and networking:	%
<ul style="list-style-type: none"> • liaise with colleagues and students; • build internal and external contacts and participate in networks for the exchange of information and to form relationships for future collaboration. 	
Planning and organising:	%
<ul style="list-style-type: none"> • plan the use of research resources, laboratories and workshops as appropriate; • plan and manage own research activity in collaboration with others; • contribute to planning of joint research projects led by principal investigator. 	

Person Profile

This section details the knowledge, skills and experience we require for the role.

Education & qualifications	Holds (or be about to obtain) a PhD in Physics, Chemistry or a closely related field.
Specialist knowledge & skills	<p>Will continually update knowledge in the specialist area and engage in continuous professional development.</p> <p>Research experience with sufficient breadth/depth of specialist knowledge in the discipline</p> <p>Advanced knowledge of research methods and techniques to work within established research programmes</p>

Interpersonal & communication skills	Excellent writing and presentation skills Ability to work in a team and strong inter-personal skills. Self-management and good prioritisation skills Ability to organise time, plan ahead and to work effectively independently.
Relevant experience	A strong interest in biological systems. Experience in modelling and simulations of condensed-matter systems, ideally including biomolecular phase transitions. Experience in developing or applying coarse-grained models, polymer models, and/or in developing and applying molecular dynamics and/or Monte Carlo simulations to biomolecular systems or condensed-matter systems. Good communication skills, ideally including a track record of collaboration with experimental scientists.
Additional requirements	

Terms and Conditions

Location	Department of Chemistry, Central Cambridge
Working pattern	Full-time
Hours of work	The hours of work are full-time, There are no conditions relating to hours and times of work but it is expected that such hours and days are worked as are reasonably necessary for the proper performance of the duties. Times of work should be agreed with head of institution. We welcome applications from individuals who wish to be considered for part-time working or other flexible working arrangements.
Length of appointment	2 years due to limited funding.
Probation period	6 months
Annual leave	Full time employees are entitled to annual paid leave of 41 days inclusive of public holidays. For contracts issued for new part-time employees from 1 October 2019, annual leave will be pro rata based on days worked. The entitlement is pro rata in the holiday year of commencement of employment, in the year your employment terminates.
Pension eligibility	Universities Superannuation Scheme (USS). Pension scheme details, including information about the legal requirement for the University to automatically enrol its eligible jobholders into a qualifying workplace pension scheme from 1 March 2013, is available at:

	http://www.pensions.admin.cam.ac.uk/ .
Retirement age	The University does not operate a retirement age for research staff.

Screening Check Requirements

We have a legal responsibility to ensure that you have the right to work in the UK before you can start working for us. If you do not have the right to work in the UK already, any offer of employment we make to you will be conditional upon you gaining it. If you need further information, you may find the Right to Work page within the 'Applying for a job' section of the University's Job Opportunities pages helpful (please see <http://www.jobs.cam.ac.uk/right/have/>).

Application Process

To submit an application for this vacancy, please click on the link in the 'Apply online' section of the advert published on the University's Job Opportunities pages. This will route you to the University's Web Recruitment System, where you will need to register an account (if you have not already) and log in before completing the online application form.

Please ensure that you upload your Curriculum Vitae (CV) and a covering letter in the Upload section of the online application. If you upload any additional documents which have not been requested, we will not be able to consider these as part of your application.

Yusuf Hamied Department of Chemistry

Chemistry in Cambridge supports fundamental science of the highest quality in a first-class environment. We are a world-class teaching and research centre recognised for our exceptional record in discovery, innovation and excellence. Our work has relevance to a broad range of real world challenges and industrial applications such as drug discovery, oil recovery, ageing, energy research, fuel cells and batteries, synthetic medicine, computer memory and sensors.

Our department, part of the School of Physical Sciences, hosts around 200 postdoctoral research staff, over 250 postgraduate students, and around 60 academic staff, including newly independent researchers.

Research

This department is home to a large number of internationally-recognised research groups. Our enthusiastic research culture embraces new challenging areas, including strong collaborations with other academic disciplines and institutions, while maintaining a powerful presence in the traditional core areas of chemistry. We broadly define our work according to five [core research areas](#):

- [Biological Research Interest Group](#)
- [Materials Chemistry Research Interest Group](#)
- [Physical Chemistry Research Interest Group](#)
- [Synthetic Chemistry Research Interest Group](#)
- [Theory Research Interest Group](#)

The Chemistry Department has internal and external collaborations with other Cambridge University departments, universities and industry.

Collaborative research areas

Three strategic collaborative research area:

- **Chemistry of Health:** advancing the understanding of health and disease in a number of areas that are of global importance: these include ageing, cancer and infection.
- **Sustainable Energy, Environment and Climate:** increasing understanding of the impact of chemical processes on the environment and to develop sustainable energy systems.
- **Innovative Molecular and Materials Design:** transforming the development and assembly of important functional chemicals to produce new high-value products that will lead to novel applications in health care, agriculture, energy and consumer products.

The Department holds an Athena SWAN silver award (2022). The Athena Swan Charter is a framework now used in a number of countries to encourage and recognise commitment to advancing gender equality within higher education and research. Its goals promote a wider and more inclusive culture in the STEM (science, technology, engineering, mathematics) subjects.

In addition, the Department has received a Green Impact silver award for promoting meaningful environmental and sustainability change.

The Department believes in developing and supporting their staff. A voluntary Mentoring Scheme is available to all members of Research staff, to provide support and development throughout their career within the Department.

The University

The University of Cambridge is one of the world's oldest and most successful universities. We are a renowned centre for research, education, and scholarship that makes a significant contribution to society. The University is consistently ranked amongst the top universities in the world. Our affiliates have won more Nobel Prizes than any other University.

Our sustained pursuit of academic excellence is built on a long history of world-leading teaching and research within a distinctive collegiate system. For eight centuries our ideas and innovations have shaped the world. Our principal goal is to remain one of the world's leading universities in an increasingly competitive global higher education sector. Today the University of Cambridge is at the centre of a cluster of over 4,300 businesses employing 58,000 people.

Our capital investment projects include academic and commercial growth at both the West Cambridge Innovation District, and the Biomedical Campus in the south of the city. Eddington, in North West Cambridge, is a mixed-use development including key worker housing for staff, a community centre and a new primary school, managed by the University. Through these projects, the University is deeply embedded in, and committed to serving, our local community. These are all conspicuous signs of a University that is not only adapting to new needs, but also anticipating the future.

Our mission is to contribute to society through the pursuit of education, learning, and research at the highest international levels of excellence. Our core values are:

- freedom of thought and expression; and
- freedom from discrimination.

About us

The University is one of the world's leading academic centres. It comprises 150 faculties and departments, together with a central administration and other institutions. Our institutions, museums and collections are a world-class resource for researchers, students and members of the public representing one of the country's highest concentrations of internationally important collections.

The University has an annual income of £2 billion. Research income, won competitively from the UK Research Councils, the European Union (EU), major charities and industry, exceeds £500 million per annum and continues to grow.

The Colleges and the University remain committed to admitting the best students regardless of their background and to investing considerable resources both in widening access and financial support. The 31 Colleges are self-governing, separate legal entities which appoint their own staff. Many academic staff are invited to join a College as a Teaching Fellow, which provides a further social and intellectual dimension. The Colleges admit undergraduate students, provide student accommodation and pastoral support and deliver small group teaching for undergraduates.

The University awards degrees and its faculties and departments provide lectures and seminars for students and determine the syllabi for teaching.

Our instinct for seeking out excellence and setting up enduring and mutually beneficial collaborations has led us to establish strategic partnerships across the globe. Whether it is the successful Cambridge-Africa Programme involving universities in Ghana, Uganda and elsewhere on the African continent; or the close association with the government of India to pursue new research in crop science; or the creation, with Germany's Max Planck Institutes, of a Cambridge-based centre for the study of ethics, human economy and social change – international partnerships are now an inextricable part of the University's make-up.

“Cambridge graduates and researchers have made – and continue to make – a colossal contribution to human knowledge and the understanding of the world around us. Their work touches on the lives and livelihoods of everyone from patients diagnosed with life-threatening diseases, to residents of areas critically affected by climate change, to children growing up in conflict zones. It has a lasting impact on our society, our economy and our culture: the world is truly a better place thanks to their efforts.”

Stephen Toope, Vice Chancellor 2019

Working at the University

Working at Cambridge you will join a diverse, talented and innovative community, with more than 23,000 students and over 16,000 staff from all walks of life and corners of the world.

The University continually explores strategies to attract and retain the best people. It is committed to supporting its staff to achieve their best. We are a fair, diverse and inclusive society and we believe our staff are our greatest asset. There is strong commitment to developing institutional leadership and supporting and encouraging staff development at all levels.

We offer a variety of roles including academic, research, professional, managerial and support roles. We also offer extensive benefits and excellent learning opportunities within a stimulating working environment.

The University's estate is undergoing the most significant transformation in its history. Cambridge has been able to create a science and technology campus to the west of the city centre, and is expanding further to the north west of Cambridge including investing in affordable homes for University key workers and community facilities. Even with our continued development, the University remains within walking or cycling distance across the campus. The University is a major partner on the Cambridge Biomedical Campus and we continue to redevelop our historic city centre sites demonstrating our determination to ensure that we can offer the best facilities and

opportunities for our staff and students.

Equality & diversity

The University has built its excellence on the diversity of its staff and student community. We aim to be a leader in fostering equality and inclusion, and in promoting respect and a sense of belonging for all. We encourage applications from all sections of society. All appointments are made on the basis of merit. We have an Equal Opportunities Policy, along with a range of diversity groups, including the Women's Staff Network, Race Equality Network and LGBT+ Staff Network. More details are available here: <http://www.equality.admin.cam.ac.uk/>

The University has a bronze Race Equality Charter award, with a framework for improving the representation, progression and success of minority ethnic staff and students within higher education. Furthermore, the University's silver Athena swan award recognises and celebrates good practice in recruiting, retaining and promoting gender equality.

Living in Cambridge

Cambridge is rich in cultural diversity. From beautiful University and College buildings, museums and art galleries, quaint gardens and punts on the River Cam, to a vibrant restaurant and café scene, our employees are surrounded by the wonderful features of this unique city.

You can find a wide-range of high street shops and 3 shopping centres, with independent alternatives at the historic market and nestled within the passageways in the city centre. You will find a cinema, bowling alley, a nightclub and various live performances at the Cambridge Leisure Park, with further entertainment options at the Corn Exchange, Arts Theatre and the ADC Theatre. Further information can be found on the Visit Cambridge website.

If you prefer the faster pace of life, London is a 45 minute train journey away. For those travelling from overseas, Stansted Airport is just 45 minutes away and Heathrow Airport under 2 hours away. The University is a short distance from a host of other attractions such as Ely Cathedral, Newmarket Races and various wildlife parks and stately homes. Cambridge is also within easy reach of the beautiful Broads and coastlines of Norfolk and Suffolk.

Relocation Support

The University recognises the importance of helping individuals to move and settle into a new area. We provide support and guidance to those relocating internationally or domestically to take up a post at the University of Cambridge, liaising with other University offices and selected partners to ensure comprehensive relocation support is available. This includes: accommodation, childcare, schools, banking, immigration and transport. If you would like further information, please visit <https://www.accommodation.cam.ac.uk/RelocationService/>. The Shared Equity Scheme and the Reimbursement of Relocation Expenses Scheme provide financial assistance to qualifying new members of staff with the costs of relocating to Cambridge.

Accommodation Service

The University Accommodation Service helps staff, students and visiting scholars who are affiliated to the University in their search for suitable accommodation in Cambridge. The dedicated accommodation team can provide access to a wide range of University-owned furnished and unfurnished properties, and has a database of private sector accommodation available for short and long-term lets. For further information and to register with this free service please

visit <https://www.accommodation.cam.ac.uk/>

What Cambridge can offer

We offer a comprehensive reward package to attract, motivate and retain high performing staff at all levels and in all areas of work.

The University offers a wide range of competitive benefits, from family leave entitlement, to shopping and travel discount schemes. Our generous annual leave package contributes to the positive wellbeing of our University employees. Sabbatical leave enables academics to focus on research and scholarship, whilst still maintaining their full salary. The University also has a [career break scheme](#) for academic and academic-related staff, with additional flexible working policies for all other staff.

Pay and benefits

The University salary structure includes automatic service-related pay progression in many of its grades and an annual cost of living increase. In addition to this, employees are rewarded for outstanding contribution through a number of regular pay progression schemes. The University offers attractive pensions schemes for employees, with an additional benefit of a salary exchange arrangement providing tax and national insurance savings.

CAMbens employee benefits

The University offers employees a wide range of competitive benefits, known as CAMbens. CAMbens offers something for everyone across a range of categories, including:

- Financial Benefits, including shopping discounts (both local and national) and a Payroll Giving scheme;
- Relocation and Accommodation Benefits, including relocation assistance and interest-free Rental Deposit Loans;
- Travel Benefits, including Cycle to Work, discounts on train season tickets and interest-free Travel to Work loans;
- Family Friendly and Lifestyle Benefits, including support with childcare and family friendly policies;
- Health and Wellbeing Benefits, including a University Staff Counselling Service, discounts at the University Sports Centre, and other local gyms, and healthcare schemes.

Family-friendly policies

The University recognises the importance of supporting its staff. We have a range of family-friendly policies to aid employees' work-life balance including a generous maternity, adoption and shared parental leave entitlement of 18 weeks full pay, and paid emergency leave for parents and carers.

Other family-friendly support includes:

Our highly regarded workplace nurseries, a childcare salary exchange scheme and a high quality holiday Playscheme may be available to help support University employees with caring responsibilities (subject to demand and qualifying criteria). Further childcare information can be found here: <https://www.childcare.admin.cam.ac.uk/>

The Newcomers and Visiting Scholars Group is an organisation within the University run by volunteers whose aim is to help newly arrived wives, husbands, partners and families of Visiting Scholars and members of the University to settle in Cambridge and give them an opportunity to meet local people. The Postdoc Academy supports the postdoctoral community within Cambridge. Further details are available here: <https://www.postdocacademy.cam.ac.uk/>

Your wellbeing

The University's Sport Centre, Counselling Services and Occupational Health are just some of the support services available to University employees to promote their physical and mental wellbeing. The University delivers The Festival of Wellbeing annually, which is a programme of stimulating talks and activities, which aim to promote wellbeing and good mental and physical health. The University also hosts the Cambridge Festival, which is a great opportunity to get your first taste of public engagement, through volunteering, supporting hands-on activities or proposing a talk.

Development opportunities

We support new employees to settle in through various activities as well as supporting their professional and career development on an ongoing basis. Our Personal and Professional Development (PPD) team provide development opportunities for all University employees, including face-to-face sessions, online learning modules and webinars. All employees also have unlimited access to LinkedIn Learning to support their development. Both new and existing employees can undertake funded Apprenticeships, which lead to a range of vocational and professional qualifications. We offer reduced staff fees for University of Cambridge graduate courses and the opportunity to attend lectures and seminars held by University departments and institutions. A range of University training providers also offer specialist learning and development in their own areas e.g. teaching and learning, digital literacy, finance, health and wellbeing, safety.