



West Wing, Level 6, John Radcliffe Hospital, Oxford, OX3 9DU Web: www.ndcn.ox.ac.uk | Tel: +44(0)1865 234702 | Email: recruitment@ndcn.ox.ac.uk

Job title	Postdoctoral Scientist in Lewy Body Dementia Research
Division	Medical Sciences Division
Department	Nuffield Department of Clinical Neurosciences (NDCN)
Location	John Radcliffe Hospital, Headington, Oxford, OX3 9DU
Grade and salary	Grade 7: £38,674 – £46,913 per annum
Hours	Full time
Contract type	Fixed-term until 30/04/25
Reporting to	Prof Laura Parkkinen, Director of Oxford Brain Bank and Professor of Translational Neuropathology
Vacancy reference	176228

Research topic	Dissecting the aetiology of Lewy body dementias using modern neuropathology tools
Principal Investigator / supervisor	Prof Laura Parkkinen
Project team	Parkinson's Neuropathology Group
Project web site	www.ox.ac.uk/ https://www.ndcn.ox.ac.uk/research/parkinson2019s- neuropathology-group
Funding partner	The funds supporting this research project are provided by the National Institute of Health (NIH)
Recent publications	 Altay MF, Liu AKL, Holton JL, Parkkinen L, Lashuel HA. Prominent astrocytic alpha-synuclein pathology with unique post- translational modification signatures unveiled across Lewy body disorders. Acta Neuropathol Commun. 2022 ;10(1):163. Poggiolini I, Gupta V, Lawton M, Lee S, El-Turabi A,
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B, Ben-Shlomo Y, Hu MT, Parkkinen L. Diagnostic value of
cerebrospinal fluid alpha-synuclein seed quantification in synucleinopathies. Brain. 2022;145(2):584-595.
3) Borghammer P, Horsager J, Andersen K, Van Den Berge N, Raunio A, Murayama S, Parkkinen L, Myllykangas L. Neuropathological evidence of body-first vs. brain-first Lewy body disease. Neurobiol Dis. 2021;161:105557.

The role

This post provides an exciting opportunity to join a multidisciplinary research team studying Lewy body (LB) dementia (LBD) led by Professor Laura Parkkinen in the Nuffield Department of Clinical Neurosciences of the University of Oxford. The project is funded by National Heath Institute (NIH) and is carried out in collaboration together with Prof Steve Finkbeiner (Gladstone Institute). The group is combining expertise in clinical neuropathology, molecular biology, protein chemistry and genetics to investigate mechanisms and drug targets and to develop biologically-relevant biomarkers for PDD and DLB.

LBD, including Parkinson's disease with dementia (PDD) and Dementia with Lewy bodies (DLB), is the second most common progressive dementia, after Alzheimer's disease (AD) and it affects millions of individuals around the world. LBD is fatal, and its incidence is increasing as the population age. Despite its impact, basic questions remain unanswered. Specifically, it is not clear if PDD and DLB are distinct diseases with different underlying mechanisms or if they are clinical syndromes on a single mechanistic spectrum. Furthermore, there are virtually no tools that enable clinicians to make an accurate diagnosis of LBD, which can only be confirmed at autopsy. The lack of validated biomarkers for LBD contributes to delayed diagnosis and misdiagnosis, and thus potentially exposes individuals affected by DLB to inappropriate medication use and results in the failure to treat DLB-specific manifestations. Thus, determining if the DLB and PDD are molecularly distinct is necessary for the identification of disease-specific therapeutic targets and biomarkers that will lead to effective treatments.

Our hypothesis is that by employing 2nd generation neuropathology tools i.e. digital pathology with artificial intelligence (AI) and genetics, we can distinguish between the underlying disease mechanisms of DLB and PDD. You will use novel supervised AI-driven algorithms established in the Parkkinen lab to quantify PD- and AD-related pathologies including protein aggregation and inflammatory markers in digital images of brain tissue in a high-throughput manner (~1,000 PDD/DLB patients from UK brain banks). Images will be presented to deep learning networks to determine if the learnt information from the labels can accurately classify images according to diagnosis. Gradient-weighted class activation mapping will be used to reveal the labelled features that network discovers as the basis for accurate diagnoses. These cases will also undergo genotyping on Illumina's Global Screening Array (GSA). We believe that genetic factors, in addition to modulating risk for disease, age at onset and disease progression, can also modulate the neuropathological endophenotypes. The high-throughput quantitative



methods described above enable us to perform the first GWAS assessing the role of genetics in relation to quantitative PD neuropathology that may pinpoint to mechanistic targets.

Responsibilities

- Develop, establish, and pursue appropriate analytical protocols and techniques to support research, particularly in relation to AI-driven algorithms to recognize different hallmark pathologies
- Assist in AI algorithm development by annotating different pathological hallmarks as ground truths
- Validate AI-driven algorithms in a smaller cohort with subsequent high-throughput application in final large cohort (~1000 PD/DLB patients)
- Liaise with collaborators and other neuropathologist validating the developed AI tools
- Extract and quality control the DNA samples for the GWA analysis
- Develop research questions, testing hypotheses and analyzing scientific data from a variety of sources, reviewing and refining working hypotheses as appropriate
- Manage own academic research and administrative activities. This involves small-scale project management, to co-ordinate multiple aspects of work to meet given deadlines
- Prepare relevant publications and presentations
- Represent the research group at external meetings/seminars, either with other members of the group or alone
- 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
- 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 selection criteria

• Hold a relevant PhD/DPhil (or close to completion) in Neuroscience or related area



- Demonstrable experience in translational human (or animal) neuropathology and knowledge of the brain anatomy
- Experience in general molecular biology techniques (immunohistochemistry, microscopy, DNA/RNA extraction)
- Working knowledge of statistical programs relevant to basic research
- Ability to manage own research and administrative activities
- Demonstrate strong teamwork and interpersonal skills Excellent communication skills, including the ability to write for publication, present results, and represent the research group at meetings
- Previous experience of contributing to publications/presentations
- Ability to work independently and problem solve
- Ability to manage time and work to strict deadlines

Desirable selection criteria

- Knowledge on digital pathology and deep learning algorithms
- Experience of working productively in a multi-disciplinary team

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. If you have previously worked for the University we will also verify key information such as your dates of employment and reason for leaving your previous role with the department/unit where you worked. 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: <u>https://www.jobs.ox.ac.uk/pre-employment-checks</u>

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 cuttingedge. Oxford is one of Europe's most entrepreneurial universities and we rank first in the UK for university spin-outs, and in recent years we have spun out 15-20 new companies every year. 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 Division

The Medical Sciences Division is an internationally recognized centre of excellence for biomedical and clinical research and teaching, and 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 visit: www.medsci.ox.ac.uk

The Nuffield Department of Clinical Neurosciences

The Nuffield Department of Clinical Neurosciences (NDCN), led by Prof Kevin Talbot, has over 400 staff and 150 postgraduate students. NDCN has an established research and teaching portfolio with a national and international reputation for excellence.

NDCN is based in high quality research and clinical facilities in the West Wing of the John Radcliffe Hospital, alongside the Department's world-class Wellcome Centre for Integrative Neuroimaging (WIN) and the Weatherall Institute of Molecular Medicine (which houses 3 of our research groups), and provides the ideal facilities to translate research from bench to bedside. In keeping with the award of NIHR Comprehensive Biomedical Research Centre status, to a partnership between Oxford University and the Oxford Radcliffe Hospitals NHS Trust, we have developed a highly integrated and interdisciplinary environment in which research, teaching, clinical training and clinical care interact. This enables us to establish new approaches to the understanding, diagnosis and treatment of brain diseases. To this end the Department fosters collaborations worldwide and warmly welcomes visiting scientists, clinical fellows and students. The Department comprises six sections:

For more information visit: www.ndcn.ox.ac.uk

Medical Research Council Brain Network Dynamics Unit

The MRC BNDU is directed by Professor Peter Magill and is exceptionally multidisciplinary, integrating research programmes that span clinical, experimental and computational neuroscience. The Unit's collective goal is to understand and exploit the moment-to-moment interactions between nerve cells that are critical for brain functions, with a special focus on the brain circuits underlying movement and memory.

For more information visit: <u>www.mrcbndu.ox.ac.uk</u>

Nuffield Division of Anaesthesia



NDA is led by Associate Professor Andrew Farmery. The NDA is committed to the development and maintenance of internationally competitive research programmes in pain and consciousness; respiration and hypoxia; adult and neuro-intensive care; simulation and human factors training. For more information visit www.nda.ox.ac.uk

Division of Clinical Neurology

DCN is led by Professor David Bennett. DCN is committed to the development of research programs that improve understanding of the nervous system in health and disease. For more information visit www.dcn.ox.ac.uk

The Wellcome Centre for Integrative Neuroimaging (WIN)

WIN is a multi-disciplinary neuroimaging research facility led by Heidi Johansen-Berg. WIN aims to bridge the gap between laboratory neuroscience and human health, by performing multi-scale studies spanning from animal models through to human populations. It focuses on the use of Magnetic Resonance Imaging (MRI) for neuroscience research, along with related technologies such as Transcranial Magnetic Stimulation, transcranial Direct Current Stimulation, MEG and EEG. WIN has core locations at the John Radcliffe Hospital (FMRIB), Warneford Hospital (OHBA) and University Science area (BSB).

For more information visit <u>www.win.ox.ac.uk</u>

Nuffield Laboratory of Ophthalmology

NLO is led by Professor Russell Foster, who leads the Sleep & Circadian Neuroscience Institute. NLO pursues scientific and clinical research into a range of areas related to vision, the eye and circadian neuroscience.

For more information visit <u>www.nlo.ox.ac.uk</u>

Centre for the Prevention of Stroke & Dementia

CPSD is led by Professor Peter Rothwell. The centre carries out research that increases understanding of the causes of cerebrovascular disease. Its aims are to improve prevention of stroke and dementia by earlier diagnosis, more reliable prognostication, and more effective use of existing preventive treatments in routine clinical practice.

For more information visit <u>www.cpsd.ox.ac.uk</u>

Working at NDCN

NDCN actively promotes a healthy work life balance amongst employees through a number of family friendly policies. See <u>https://hr.admin.ox.ac.uk/staff-benefits</u> for further information.

The University of Oxford is a member of the <u>Athena SWAN Charter</u> and holds an institutional Bronze Athena SWAN award. The Department of Clinical Neurosciences holds a departmental Silver Athena award in recognition of its efforts to introduce organisational and cultural practices that promote advancement of gender equality: representation, progression and success for all.



How to apply

Applications are made through our online recruitment portal. Information about how to apply is available on our Jobs website <u>https://www.jobs.ox.ac.uk/how-to-apply</u>.

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

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)

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

All applications must be received by **midday** UK time 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).

If you need help

Application FAQs, including technical troubleshooting advice is available at: <u>https://staff.web.ox.ac.uk/recruitment-support-faqs.</u>

Non-technical questions about this job should be addressed to the recruiting department directly: <u>recruitment@ndcn.ox.ac.uk</u>.

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

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** of 30 September before the 70th birthday. The justification for this is explained at: <u>https://hr.admin.ox.ac.uk/the-ejra.</u>

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

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.



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 https://hr.admin.ox.ac.uk/staff-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 https://www.sport.ox.ac.uk/.

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 <u>https://welcome.ox.ac.uk/</u>

There is also a visa loan scheme to cover the costs of UK visa applications for staff and their dependants. See https://staffimmigration.admin.ox.ac.uk/visa-loan-scheme

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 the Work+Family Space, 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 https://hr.admin.ox.ac.uk/my-family-care

The University has excellent childcare services, including five University nurseries as well as Universitysupported places at many other private nurseries.

For full details, including how to apply and the costs, see https://childcare.admin.ox.ac.uk/

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 https://edu.admin.ox.ac.uk/disability-support

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 https://edu.admin.ox.ac.uk/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 <u>www.newcomers.ox.ac.uk</u>.

Oxford Research Staff Society (OxRSS)

A society run by and for Oxford University research staff. It offers researchers a range of social and professional networking opportunities. Membership is free, and all researchers employed by Oxford University are welcome to join. Subscribe at <u>researchstaff-subscribe@maillist.ox.ac.uk</u> to join the mailing list to find out about upcoming events and other information for researchers, or contact the committee on <u>committee@oxrss.ox.ac.uk</u>. For more information, see <u>www.ox.ac.uk/oxrss</u>, Twitter @ResStaffOxford, and Facebook <u>www.facebook.com/oxrss</u>.

