



Post Specification

Post Title:	Research Assistant (Neurophysiological Biomarkers)
Post Status:	Specific Purpose Contract – Full-time
Research Group / Department / School:	Academic Unit of Neurology, School of Medicine, Trinity College Dublin, the University of Dublin
Location:	Trinity Biomedical Sciences Institute, Trinity College Dublin, the University of Dublin College Green, Dublin D02 R590, Ireland
Reports to:	Dr Bahman Nasserolelami/Dr Lara McManus/Prof. Orla Hardiman
Salary:	Appointment will be made on the Research Assistant Salary Scale, starting at Irish Universities Association (IUA) Level 1 Point 5 (€30,692 per annum) in line with Government Pay Policy.
Hours of Work:	39 hours per week (Full Time)
Closing Date:	12 Noon (GMT), Monday 14 th November 2022

Please note that Garda vetting will be sought in respect of individuals who come under consideration for a post.

Post Summary

Applications are invited for a motivated and self-driven individual for the position of research assistant with the Irish ALS Research Group. This role will support the Neurophysiology and Neural signal Analysis Research Strand (NeuroMotor) hosted in the Trinity Biomedical Sciences Institute (TBSI)'s Academic Unit of Neurology. The ideal candidate will have an undergraduate or master's degree in Engineering (including but not limited to Neural, Biomedical, or Electrical Engineering), Computer Science, Bio-Statistics, Bio/Neuro-informatics, Mathematics, Physics, Data Sciences, or other computational/quantitative sciences such as Computational Neuroscience. Suitable candidates will have a strong interest in neural engineering and neuroscience. Excellent analytical, programming (preferably in MATLAB), and communication skills are essential. Experience in recording or analysing electrophysiological signals (i.e. electroencephalography (EEG) and electromyography (EMG)), data analysis, statistics, and machine learning are also highly desirable. The post is available for 1 year initially, with the possibility of extension up to 4 years, based upon continuation of funding and job performance.

Subject Description: Amyotrophic Lateral Sclerosis (ALS) or Motor Neurone Disease (MND) is a neurodegenerative condition that leads to progressive decline in muscle function. There is an average life expectancy of just 3-5 years following ALS diagnosis. ALS is both clinically and biologically heterogeneous, however patient stratification is currently based on clinical parameters and there are no objective biomarkers to discriminate between different ALS subtypes. This project aims to develop novel methods for separating patient groups. Information extracted from neuroelectric signals recorded in brain and muscle will be used to identify different types of motor network disruption to distinguish disease subtypes (using techniques such as Discriminant Analysis, unsupervised clustering). Electroencephalogram (EEG) and electromyogram (EMG) have been used to study neurodegeneration but their true potential to capture disease heterogeneity has not been harnessed. The chosen candidate will be assisting in the recording of EEG and surface EMG (including high density EMG) and the analysis of these signals to identify the features that are most useful as ALS biomarkers. This analysis will involve applying dimensionality reduction techniques to the multivariate neurophysiological and clinical data sets, and pattern classification to identify patient subgroups with similar patterns of brain network disruption.

Representative publication:

Dukic S, McMackin R, Costello E, Metzger M, Buxo T, Fasano A, Chipika R, Pinto-Grau M, Schuster C, Hammond M, et al. 2022. Resting-state EEG reveals four subphenotypes of amyotrophic lateral sclerosis. *Brain*. 145(2):621–631. Doi:[10.1093/brain/awab322](https://doi.org/10.1093/brain/awab322).

Research Group: Neurophysiology and Neural Signal Analysis is a research strand (led by Dr Bahman Nasserleslami) within the ALS Research Group (led by Professor Orla Hardiman). The research group focuses on developing biomarkers of motor and cognitive decline in MND and cognate neurological conditions using neurophysiological experiments, advanced neural signal analysis, clinical phenotyping, and multi-modal methods. Dr McManus leads the HD-sEMG studies in the team. The Academic Unit of Neurology is a multidisciplinary research team of neural engineers, clinicians, neuroscientists, neuropsychologists, geneticists, and other contributors. The unit has links and collaborations with Beaumont and St. James's Hospitals in Dublin, and other Irish and international research groups.

Standard Duties and Responsibilities of the Post

A candidate is being sought to fulfil the role of Research Assistant. The successful candidate will work within a multidisciplinary neural signal analysis team with close links to epidemiology, clinical medicine, genetics, and imaging groups. More specifically, the successful applicant will:

- Provide support in collecting EEG and EMG data from patients and controls (our recording lab is located at St. James's Hospital, Dublin. Travelling between TBSI and St. James's Hospital is expected)
- Use existing MATLAB codes and further develop, add, and integrate new codes for dimensionality reduction and pattern classification on the EEG/EMG datasets
- Visualise and present the results as scientific reports, manuscripts and/or posters/presentations
- Work and collaborate closely with the Principal Investigators (including Academic Staff and Senior Postdoctoral Fellows), other team members (PhD students and Research Assistants) in the Neurophysiology and Neural Signal Analysis group, as well as project

supervisors, collaborators, research managers and other groups in the ALS research group

- Assist in design and testing of newly implemented protocol, including literature review, hardware and software testing
- Keep accurate, up-to-date, and detailed records of the neurophysiological and clinical research datasets provided by other researchers in the team
- Appropriately manage the large datasets and sample banks used for the project
- Participate in driving scientific and intellectual developments within the group
- Report regularly to the project supervisors

Funding Information

This position is funded by the Health Research Board (HRB) Ireland.

Person Specification

The ideal candidate will have demonstrated competency in performing quantitative analyses (e.g. statistics, machine learning, data analytics) and programming, and preferably will have research experience in areas such as neurophysiology, neurology, medical informatics/statistics (to a BSc. or MSc. level). They will also have an interest in building their research profile and a career in scientific/medical data analytics and quantitative/computational neurosciences (e.g. continuation towards a PhD).

Qualifications

Applicants should hold a minimum upper-second class (2:1) honours degree (or equivalent) in any of the following areas: Engineering (e.g. Neural, Biomedical, or Electrical Engineering), Computer Science, Statistics, Mathematics, Physics, Data Sciences, or other computational/quantitative sciences such as Computational Neuroscience. A Master's degree in relevant fields is an advantage.

Knowledge & Experience (Essential & Desirable)

Essential:

- Excellent programming skills (preferably MATLAB)
- Experience working with datasets and conducting data analytics, advanced statistics, or machine learning methods
- Ability to present and communicate the findings and to work in a team with other researchers

Desirable:

- Experience in electrophysiological and/or neurological data collection or analysis
- Experience in conducting literature reviews and/or reviews of evidence
- Understanding of basic concepts in neurological research, neurodegenerative diseases, motor neuroscience or neurophysiology, GDPR and research ethics training

Skills & Competencies

- Flexibility and willingness to adapt working hours when required
- Self-motivated, with strong organisational, interpersonal and (oral/written) communication skills
- Willingness to engage with the scientific literature in the research area
- Proficiency in Microsoft Office Word and Excel
- Highly self-motivated with the ability to work under own initiative or as part of a team
- Ability to prioritise work and meet deadlines
- Able to establish appropriate documentation and record keeping

Application Procedure

Applicants should submit the requested information and documents by email. **Please see the last page for full details.**

Informal queries can also be directed to Dr Bahman Nasserolelami at nasserob@tcd.ie

Please quote phrases relevant to this position in the subject line of all email correspondences.

Further Information for Applicants

URL Link to Area	www.tcd.ie
URL Link to Human Resources	https://www.tcd.ie/hr/
URL Link to Research Group	https://www.tcd.ie/medicine/neurology/

GARDA CLEARANCE:

Police vetting will be sought in respect of individuals who come under consideration for a post.

PLEASE NOTE: Applicants will be required to complete and return a Garda vetting form should they come under consideration for appointment. In some cases they may be requested to complete the form on the day of interview. This form will be forwarded to An Garda Síochána (Irish Police) for security checks on all Irish addresses at which they have resided. An Garda Síochána will make enquiries with the Police Service of Northern Ireland with respect to addresses in Northern Ireland. If an applicant is not successful in obtaining the post for whatever reason, this information will be destroyed. If an applicant, therefore, subsequently comes under consideration for another position, they will be required to supply this information again.

While applicants must complete information in relation to all addresses at which they have resided, the vetting is only done on addresses on the island of Ireland.

If an applicant has resided / studied in countries outside of Ireland for a period of 6 months or more, it is mandatory for them to furnish a Police Criminal Records Check/ Police Certificate from those countries stating that they have no convictions recorded against them while residing there. Applicants will need to provide a separate Police Criminal Records Check/ Police Certificate for each country in which they have resided. The Police Criminal Records Check/ Police Certificate must be dated after the date the applicant left the relevant country. Applicants should provide documentation in the English and/or Irish language. Translations must be provided by a registered translation company/institute in the Republic of Ireland; all costs will be borne by the applicant. Only original version documents will be accepted.

Applicants should be aware that any information obtained in the Garda Vetting process can be made available to the employing area.

It is the responsibility of the applicant to seek security clearances in a timely fashion as they can take some time. No applicant will be appointed without this information being provided and being in order.

The following websites may be of assistance in this regard:

www.disclosurescotland.co.uk

www.psni.police.uk

This website provides information on obtaining a national police clearance certificate for Australia

www.afp.gov.au

This website provides information on obtaining police clearance in New Zealand.

www.courts.govt.nz

For other countries not listed above applicants may find it helpful to contact the relevant embassies who could provide information on seeking Police Clearance. Original Police Clearance documentation should be forwarded to Human Resources where it will be copied and the original returned to the applicant by post. **Any cost incurred in this process will be borne by the Applicant.**

Trinity College Dublin, the University of Dublin

Trinity is Ireland's leading university and is ranked 108th in the world (QS World University Rankings 2020). Founded in 1592, the University is steeped in history with a reputation for excellence in education, research and innovation.

Located on an iconic campus in the heart of Dublin's city centre, Trinity has 18,000 undergraduate and postgraduate students across our three faculties – Arts, Humanities, and Social Sciences; Engineering, Mathematics and Science; and Health Sciences.

Trinity is ranked as the 17th most international university in the world (Times Higher Education Rankings 2020) and has students and staff from over 120 countries.

The pursuit of excellence through research and scholarship is at the heart of a Trinity education, and our researchers have an outstanding publication record and strong record of grant success. Trinity has developed 19 broad-based multidisciplinary research themes that cut across disciplines and facilitate world-leading research and collaboration within the University and with colleagues around the world. Trinity is also home to 5 leading flagship research institutes:

- Trinity Biomedical Sciences Institute (TBSI)
- Trinity College Institute of Neuroscience (TCIN)
- Trinity Translational Medical Institute (TTMI)
- Trinity Long Room Hub Arts and Humanities Research Institute (TLRH)
- Centre for Research on Adaptive Nanostructures and Nanodevices (CRANN)

Trinity is the top-ranked European university for producing entrepreneurs for the past five successive years and Europe's only representative in the world's top-50 universities (Pitchbook Universities Report).

Trinity is home to the famous Old Library and to the historic Book of Kells as well as other internationally significant holdings in manuscripts, maps and early printed material. The Trinity Library is a legal deposit library, granting the University the right to claim a copy of

every book published in Ireland and the UK. At present, the Library's holdings span approximately 6.5 million printed items, 400,000 e-books and 150,000 e-journals.

With over 120,000 alumni, Trinity's tradition of independent intellectual inquiry has produced some of the world's finest, most original minds including the writers Oscar Wilde and Samuel Beckett (Nobel laureates), the mathematician William Rowan Hamilton and the physicist Ernest Walton (Nobel laureate), the political thinker Edmund Burke, and the former President of Ireland Mary Robinson. This tradition finds expression today in a campus culture of scholarship, innovation, creativity, entrepreneurship and dedication to societal reform.

Rankings

Trinity is the top ranked university in Ireland and ranked 108th in the world (QS World University Rankings 2020). Trinity ranks in the top 50 in the world on 6 subjects and in the top 100 in 20 subjects (QS World University Rankings by Subject 2019). Full details are available at: www.tcd.ie/research/about/rankings.

The Selection Process in Trinity

The Selection Committee (Interview Panel) may include members of the Academic and Administrative community together with External Assessor(s) who are expert in the area. Applications will be acknowledged by email. If you do not receive confirmation of receipt within 1 day of submitting your application online, please contact the named Recruitment Partner on the job specification immediately and prior to the closing date/time.

Given the degree of co-ordination and planning to have a Selection Committee available on the specified date, the University regrets that it may not be in a position to offer alternate selection dates. Where candidates are unavailable, reserves may be drawn from a shortlist. Outcomes of interviews are notified in writing to candidates and are issued no later than 5 working days following the selection day.

In some instances the Selection Committee may avail of telephone or video conferencing. The University's selection methods may consist of any or all of the following: Interviews, Presentations, Psychometric Testing, References and Situational Exercises.

It is the policy of the University to conduct pre-employment medical screening/full pre-employment medicals. Information supplied by candidates in their application (Cover Letter and CV) will be used to shortlist for interview.

Applications from non-EEA citizens are welcomed. However, eligibility is determined by the Department of Business, Enterprise and Innovation and further information on the Highly Skills Eligible Occupations List is set out in Schedule 3 of the Regulations <https://dbei.gov.ie/en/What-We-Do/Workplace-and-Skills/Employment-Permits/Employment-Permit-Eligibility/Highly-Skilled-Eligible-Occupations-List/> and the Ineligible Categories of Employment are set out in Schedule 4 of the Regulations <https://dbei.gov.ie/en/What-We-Do/Workplace-and-Skills/Employment-Permits/Employment-Permit-Eligibility/Ineligible-Categories-of-Employment/> . Non-EEA candidates should note that the onus is on them to secure a visa to travel to Ireland prior to interview. Non-EEA candidates should also be aware that even if successful at interview, an appointment to the post is contingent on the securing of an employment permit.

Equal Opportunities Policy

Trinity is an equal opportunities employer and is committed to employment policies, procedures and practices which do not discriminate on grounds such as gender, civil status, family status, age, disability, race, religious belief, sexual orientation or membership of the travelling community. On that basis we encourage and welcome talented people from all backgrounds to join our staff community. Trinity's Diversity Statement can be viewed in full at <https://www.tcd.ie/diversity-inclusion/diversity-statement>.

Pension Entitlements

This is a pensionable position and the provisions of the Public Service Superannuation (Miscellaneous Provisions) Act 2004 will apply in relation to retirement age for pension purposes. Details of the relevant Pension Scheme will be provided to the successful applicant.

Applicants should note that they will be required to complete a Pre-Employment Declaration to confirm whether or not they have previously availed of an Irish Public Service Scheme of incentivised early retirement or enhanced redundancy payment. Applicants will also be required to declare any entitlements to a Public Service pension benefit (in payment or preserved) from any other Irish Public Service employment.

Applicants formerly employed by the Irish Public Service that may previously have availed of an Irish Public Service Scheme of Incentivised early retirement or enhanced redundancy payment should ensure that they are not precluded from re-engagement in the Irish Public Service under the terms of such Schemes. Such queries should be directed to an applicant's former Irish Public Service Employer in the first instance.

Application Procedure

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Applicants should submit:

- A cover letter, to include the purpose and motivation for pursuing this research area as a Research Assistant (1-2 pages)
- Copies of degree certificates (or equivalent) to show the degree has been or will be awarded
- A full Curriculum Vitae to include the names and contact details of 3 referees (including email addresses)
- Transcripts for all undergraduate and postgraduate courses to date
- Evidence of English language proficiency if required (Evaluated according to Postgraduate English Language Requirements , see www.tcd.ie/study/apply/admission-requirements/postgraduate/)

Application emails should be addressed to:

Ms. Adelais Farnell Sharp

Academic Unit of Neurology, Trinity College Dublin

Email Address: afarnell@tcd.ie

The applications are required to be submitted as one e-mail with all the requested documents attached in PDF format to the Email Address: afarnell@tcd.ie.

Please quote the following in the subject heading of the emailed application:

“Application for HRB Research Assistant Position (Motor Biomarkers)”

For informal enquiries please contact Dr Bahman Nasserolelami (nasserob@tcd.ie).



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