Candidate Information

Position: Research Fellow
School/Department: Patrick G Johnston Centre for Cancer Research
Reference: 25/112773
Closing Date: Monday 1 September 2025
Salary: £41,519 per annum
Duration: 24 months

JOB PURPOSE:

Applications are invited for a two-year Postdoctoral Research Fellow in Bioinformatics /Data Science (Genomics) to join the Higher Education Authority North South Research Programme (HEA - NSRP) eHealth Hub for cancer, a cross-border collaboration between The Queen's University Belfast (QUB) and the University of Limerick (UL).

Embedded within the Patrick G. Johnston Centre for Cancer Research and working closely with the NI Biobank, Momentum 1.0, Centre for Public Health and Health & Social Care NI. The post-holder will support development of secure, interoperable Secure Data Research Environments (SDREs) that link retrospective clinical cohorts with routinely collected clinical, genomic, imaging and digital-pathology data for colorectal, head-and-neck and prostate cancer.

Partnering with cloud and software-engineering teams, the PDRF will implement OMOP/OHDSI-compliant pipelines to automate data ingestion, cohort creation, and all-island federation. Leveraging these SDREs, they will support integrative multi-omics analyses to discover and validate novel multi-modal biomarkers of prognosis and treatment resistance/persistence and pinpoint targetable vulnerabilities.

The role, jointly supervised by Prof Jackie James, Prof Mark Lawler, Prof Michael Quinn and reporting to Prof Simon McDade offers a unique opportunity to shape next-generation cancer data infrastructure while advancing precision-oncology research across Ireland.

MAJOR DUTIES:

1. Collate and harmonise clinical and research data to build proof-of-concept Secure Data Research Environments (SDREs) for colorectal and prostate cancer.
2. Co-develop and harden SDRE architecture with cloud/software engineers, ensuring security, FAIR compliance and project specifications are met.
3. Curate and integrate pre-clinical multi-omics datasets modelling treatment resistance and persistence in CRC, HNSCC and PCa.
4. Fuse these pre-clinical and biomarker datasets with clinical SDRE data to drive translational discoveries.
5. Apply cutting-edge AI/ML methods to extract actionable insights from complex, multi-modal data.
6. Define and pursue a personal research programme that advances the Hub's goals and your scientific profile.
7. Design and implement novel genomics workflows (e.g. spatial transcriptomics) and integrate them with other 'omics pipelines.
8. Manage, process and quality-control large-scale in-house and public datasets, maintaining robust metadata and access logs.
9. Train and mentor students and staff to ensure high-quality, reproducible analysis and timely project delivery.
10. Track emerging technologies in cancer genomics and continuously upgrade in-house pipelines for NGS and related assays.
11. Cultivate collaborations with all project partners, facilitating knowledge exchange and joint milestones.
12. Lead manuscript preparation and coordinate timely submission of high-impact publications.
13. Present progress regularly at internal meetings and external conferences to maximise project visibility and collaboration.
14. Identify funding calls and draft fellowship/project/travel proposals that extend Hub capacity.
15. Represent the Hub at national and international forums, showcasing outputs and forging new partnerships.
16. Support PIs with drafting progress reports and supplementary grant materials to satisfy funder requirements.

17. Co-develop and deliver training courses/workshops on Hub-relevant technologies and analytical best practice. Co-supervise postgraduate researchers, gaining formal supervisory experience.
18. Handle project administration (e.g. meetings, documentation, budget tracking) to keep workstreams on schedule and within budget.
19. Maintain subject knowledge through continual literature review and professional-development activities.
20. Perform any other reasonable duties within the scope of the role as project needs evolve.

ESSENTIAL CRITERIA:

1. Hold or be about to obtain* a PhD (awarded / submitted*) in Bioinformatics, Data-Science or a closely related area such as computer Science, or mathematics. *If PhD pending, it must be conferred less than 3 months after closing date.
2. Significant, relevant research experience.
3. Proven track-record analysing large-scale ‘omics and/or healthcare datasets, preferably in cancer genomics.
4. Experience of advanced coding in Python or R plus Shell scripting; familiarity with an additional language (e.g. Perl, Java, C++).
5. Experience of UNIX/Linux, Git and reproducible workflow frameworks (Nextflow, Snakemake, WDL/CWL).
6. Experience of use of open-source bioinformatics packages for data processing (e.g. Bioconductor, scikit-bio, PyPI genomics packages).
7. HPC and/or cloud computing experience (AWS, Azure, GCP) plus practical application of AI/ML or similar computational models/methods to clinical and/or genomic datasets.
8. Collaborative mindset: Demonstrably effective at working in multi-disciplinary teams spanning bioinformatics, clinical science, engineering and data governance.
9. Depth and breadth of expertise: Up-to-date command of cancer-genomics concepts, analytical methods and research techniques sufficient to contribute independently within established programmes.
10. Methodological fluency: Able to evaluate, select and adapt bioinformatics/AI approaches to suit diverse datasets and research questions.
11. Problem-solving orientation: Capacity to troubleshoot analytical, computational and data-integration challenges quickly and rigorously.
12. Communicates complex scientific information clearly to specialist and non-specialist audiences, both orally and in writing.
13. Builds and nurtures professional networks across disciplines, institutions and sectors.
14. Has presented research at national or international conferences (poster and/or oral) appropriate to career stage.
15. Demonstrated innovation in genomics research with a clear commitment to improving cancer care.
16. High intellectual ability and critical-thinking skills.
17. Proven team player, motivates and supports students and colleagues.
18. Self-starter who organises resources, meets deadlines and re-prioritises calmly under pressure.
19. Meticulous attention to detail; delivers accurate work even in complex, data-heavy settings.
20. Evident passion for research and continuous professional growth.
21. Must be willing to work irregular hours when necessary for the progress of the research project.
22. Must be willing and able to travel to national and international meetings.

DESIRABLE CRITERIA:

1. First-class (or equivalent) UG degree in a quantitative or life-science subject.
2. Formal training in statistics, AI/ML or health-informatics.
3. Governance & security experience working under GDPR and ISO 27001 (or similar) controls within Trusted/Secure Data Research Environments, including audit-logging and data-sharing agreements.
4. Standards-based data architecture — hands-on use of OMOP-CDM / OHDSI tools, FHIR resources, DICOMweb interfaces and other open standards for harmonising clinical, imaging and research data.
5. Cancer-site expertise: Prior work in colorectal, head-and-neck or prostate cancer, ideally integrating human and mouse model data.
6. Programming breadth : Proficiency in at least two of: Python, R/RStudio (Shiny), Shell scripting, Perl, with clean, well-documented code.
7. Multi-omics & AI/ML: Downstream integration of multi-omics data and application of machine-/deep-learning for biomarker discovery or outcome prediction.
8. NGS pipelines & infrastructure. Design/deployment of NGS workflows on HPC clusters and/or cloud platforms using containerised, reproducible frameworks.
9. Training & dissemination: Experience delivering lectures/tutorials or mentoring students and staff in computational genomics.

10. Leadership & facilitation: experience chairing cross-disciplinary meetings, running stand-ups or sprint retrospectives.
11. Project-management methods: Familiarity with Agile/Scrum or similar frameworks for organising multi-partner research programmes.
12. Stakeholder engagement: Proven ability to translate complex technical topics for clinicians, funders, patients or industry partners.
13. Knowledge-transfer & training: Experience designing or delivering workshops, short courses or online tutorials in computational genomics or data governance.
14. Grant-writing experience: Contribution to successful research-funding bids or fellowships.
15. Change management: Adaptability in rapidly evolving technical or regulatory environments (e.g. rollout of new ISO, GDPR updates).
16. Delivered invited talks, keynote lectures or chaired sessions at recognised meetings.
17. Contributed to outreach or public-engagement activities (e.g. patient groups, media, science festivals). Helped organise scientific symposia, workshops or conference tracks.
18. Emerging leadership potential and ability to inspire and coordinate small teams. Resilience & adaptability when facing rapidly changing technical or regulatory landscapes.
19. Active commitment to open science, public engagement or patient-advocacy initiatives.
20. Awareness of commercialisation or translational opportunities arising from research.

ADDITIONAL INFORMATION:

Informal Enquiries to Betsy Cherian: b.cherian@qub.ac.uk