

Candidate Information

Position:	Research Fellow
School/Department:	Patrick G Johnston Centre for Cancer Research
Reference:	24/112081
Closing Date:	Monday 12 August 2024
Salary:	£39,922 - £47,631 per annum
Anticipated Interview Date:	Wednesday 4 September 2024
Duration:	31 months

JOB PURPOSE:

Applications are invited from an exceptional Postdoctoral Bioinformatician/Data Scientist with expertise in genomics to join a pioneering, multi-disciplinary interdisciplinary Emerging Hub of Excellence - the HEA North South Research Programme funded eHealth Hub for Cancer, a collaborative programme between Queen's University Belfast (QUB) and the University of Limerick (UL). The successful candidate will be embedded in a unique multi-disciplinary initiative linked to the creation of Secure Data Research Environments (SDREs) for Cancer Research, bridging work between the QUB Patrick G Johnston Centre for Cancer Research (PGJCCR), Centre for Public Health (CPH), NIBiobank, the Health and Social Care trust NI (HSCNI) and UL. This 4-year position is part of a cross-border initiative "E-Health Hub for Cancer" funded by the Higher Education Authority (HEA) (QUB lead Prof. Mark Lawler) under the joint supervision of Dr Simon McDade (PGJCCR), Dr Michael Quinn (CPH/HSCNI), and Prof. Jackie James (PGJCCR/NI Biobank).

The successful candidate will collaborate with cloud and software engineering experts to develop and validate proof-of-concept SDREs for colorectal and prostate cancer research. These SDREs will enable the seamless integration of clinical and research data across the island with pre-clinical datasets and insights, supporting the eHealth Hub for Cancer's research teams in both cancer areas to discover and validate novel genomic biomarkers and therapeutic approaches. A particular focus will be on understanding treatment efficacy for CRC patients treated with 5FU-based chemotherapy and men with locally advanced prostate cancer undergoing radiotherapy.

Specifically, the PDRA will have the opportunity to lead integrative analysis of unique suite of pre-clinical multi-modal functional genomics datasets (CRISPR, RNA-seq, CHIP-seq, Mass-Spec, single cell and spatial RNA-seq) related to models of treatment persistence and resistance and their integration with patient-related Omics data for the identification of novel targetable vulnerabilities.

MAJOR DUTIES:

1. Collate and integrate clinical and research datasets for Proof of Concept (PoC) Secure Data Research Environments (SDREs) focusing on colorectal cancer (CRC) and prostate cancer (PCa).
2. Support the creation and development of SDREs, ensuring they meet project specifications and standards.
3. Curation and integration of pre-clinical "omics" datasets in models of treatment resistance and persistence in CRC and PCa.
4. Facilitate the integration of key pre-clinical and biomarker studies with CRC and prostate cancer use case data to enhance research outcomes.
5. Employ novel integrative data analysis approaches, including machine learning and other AI methodologies, to extract actionable insights from complex datasets.
6. Develop a personal research agenda within the project's scope, contributing to the team's efforts and advancing your expertise.
7. Contribute to projects that develop and apply novel genomics workflows, such as spatial transcriptomics, and integrate these with other 'omics' tools for comprehensive data analysis.
8. Manage, process, and maintain large-scale datasets from both in-house projects and public repositories, ensuring data integrity and accessibility.

9. Provide direction, training, and support to staff and students, ensuring high-quality research outputs and adherence to project timelines.
10. Stay abreast of scientific and technological advancements in cancer genomics to develop and implement cutting-edge analysis pipelines for various NGS experiments.
11. Establish and maintain collaborative relationships with project partners to facilitate knowledge exchange and project progress.
12. Lead the writing of research manuscripts, ensuring timely dissemination of research findings and taking a leadership role in publication efforts.
13. Present research progress and findings regularly to both internal and external audiences, promoting the project's impact and fostering collaboration.
14. Proactively seek funding opportunities, writing and submitting grant proposals for fellowships, project support, and travel, contributing to the project's sustainability and growth.
15. Represent the project at national and international meetings, showcasing research achievements and networking with the broader scientific community.
16. Assist the grant holder with the preparation of funding proposals and progress reports, ensuring compliance with external funding body requirements.
17. Participate in the development and delivery of educational courses related to the project's research themes, keeping users informed of new technologies and analysis techniques.
18. Supervise students within your area of expertise, under academic supervision, to develop your supervisory skills.
19. Perform routine administrative tasks associated with the research project(s), such as organizing meetings and managing project documentation and finances, to ensure the project's objectives are met within the allocated budget.
20. Engage in continuous learning by reading academic literature to remain informed about developments in your specialism and related fields. Undertake any other reasonable duties that fall within the scope of the post and your competencies, as required by the project's evolving needs.

ESSENTIAL CRITERIA:

1. Hold or be about to obtain* a PhD in Bioinformatics, Data Science, Genomics (*must be obtained within 3 months of the closing date for the post).
2. Significant, relevant research experience with demonstrated expertise in the analysis of healthcare and 'omics' data, especially within the context of cancer research.
3. A proven track record of senior author publications appropriate to the career stage.
4. Proficiency in programming languages commonly used in bioinformatics and data-science, such as Python, R, Perl, and Shell scripting, is essential.
5. Experience in data processing and utilising open-source Omics software and packages, including Bioconductor and Python packages.
6. Experience with the analysis, integration and interpretation of large Omics datasets, including working with public genomic databases, is required.
7. Familiarity with downstream analysis and the integration of multi-omics data is also crucial.
8. Proficiency in Linux/UNIX compute environments is necessary, alongside experience with cloud computing platforms and applying AI/ML techniques to large-scale genomic datasets.
9. Experience in providing guidance and support to staff, collaborators, and students, contributing to their development and training, particularly in methodologies developed within functional genomics groups.
10. A collaborative attitude, capable of working effectively within an interdisciplinary team.
11. Sufficient breadth and depth of specialist knowledge in the discipline and of research methods and techniques to work within established research programmes.
12. Ability to communicate complex information clearly.
13. Ability to build contacts and participate in internal and external networks.
14. Evidence of having presented work at national and international conferences (poster and/or oral).
15. A track record of innovation in genomics research, with a commitment to advancing cancer treatment and patient care.
16. Demonstrable intellectual ability.
17. Ability to assess and organise resources.
18. Team worker, highly motivated, supportive of junior colleagues within the group.
19. Demonstrates attention to detail and works to exceptional levels of accuracy whilst under pressure.
20. Be capable of using own initiative.
21. Ability to plan own work schedule responding to new pressures and adjusting priorities.

22. Must demonstrate a true commitment to and interest in research.
23. Must be willing to work irregular hours when necessary for the progress of the research project.
24. Must be willing and able to travel to national and international meetings.

DESIRABLE CRITERIA:

1. 1st Class undergraduate degree in science, mathematics or computer science.
2. PhD in Bioinformatics, data-Science or a closely related area such as computer Science, or mathematics (with relevant research experience).
3. Experience with cloud computing, AI/ML techniques, and large-scale genomic datasets.
4. Experience with downstream analysis and integration and interpretation of multi-omics data.
5. Significant experience designing, developing, managing, and analysing NGS methodologies, technologies, and data.
6. Significant relevant experience with end-to-end analysis and interpretation of genomic datasets generation and analysis (For example Exomes, genomes, ChIP-seq, RNA-seq, ATAC-seq).
7. Cancer research experience.
8. Prostate cancer research experience.
9. Experience integrating genomic data from human and mouse models.
10. Single cell genomics experiences.
11. Spatial genomics experience.
12. CRISPR Screen experience.
13. Experience developing, managing and deploying HPC genomics pipelines.
14. Use of computer clustering, parallelisation and job scheduling (e.g., LSF, PBS, SGE, SLURM).
15. Experience developing cloud genomics workflows.
16. Machine learning, deep-learning, AI experience.
17. Coding experience in:
 - R/R-Studio/Shiny
 - Python
 - Shell Scripting
 - PERL.
18. Experience of compliance with data protection policies.
19. Experience of delivering lectures / tutorials.

ADDITIONAL INFORMATION:

Informal Enquiries to Sarah Maguire: s.maguire@qub.ac.uk