# Candidate Information

**Position:** Research Fellow
**School/Department:** School of Medicine, Dentistry and Biomedical Sciences
**Reference:** 23/111181
**Closing Date:** Monday 11 September 2023
**Salary:** £37,099 - £40,521 per annum
**Anticipated Interview Date:** Monday 25 September 2023
**Duration:** Fixed Term available from 1 Nov 2023 – 31 Oct 2026

**JOB PURPOSE:**

Applications are invited to join the multi-disciplinary Prostate Cancer genomics and radiation biology team led by Dr's Simon McDade, Melissa LaBonte-Wilson and Prof Suneil Jain.

This prestigious "BPCC genomics and bioinformatics fellow" post, has been funded as part of the philanthropically funded Belfast Prostate Cancer Centre (BPCC) in the Patrick G Johnston Centre for Cancer Research (PGJCCR) at Queen's University Belfast. Where they will not only contribute to the substantial ongoing research programme building on datasets from lab and clinical studies developed as part of the ongoing FastMan PCUK-Movember Prostate Cancer Centre of Excellence (CoE), a joint research programme with the CRUK Manchester Institute, the successful candidate will also be expected to develop their own avenues of research toward fellowship and funding applications.

The successful candidate will build and apply novel genomic lab and analysis methods and integration strategies to support research aimed at discovering and validating novel treatment approaches to improve treatment outcomes for men with locally advanced and metastatic prostate cancer treated with radiotherapy. This will include applying a range of methodologies for integrative analysis across a range of genomics datatypes including RNA-seq, low pass copy number, targeted DNA panels, single cell and spatial transcriptomics as well as epigenetic profiling (ChIP-seq and ATAC-seq) and CRISPR screens. They will also support artificial intelligence/machine learning efforts to integrate these data modalities with longitudinal clinical, pathological and imaging data including unique digital pathology and radiomics datasets as part of a broader interdisciplinary team.

Working directly within the McDade/Wilson group, they will also provide support for managing genomics data and data-processing and analysis pipelines to enable data interpretation to support research in broader research groups. They will also contribute to teaching and research supervision within the School and will contribute to manuscript and grant writing as appropriate.

**MAJOR DUTIES:**

1. To design, develop a range of genomic experimental and data analysis workflows related to the project under the supervision of Dr Simon McDade in order to obtain reliable data, then evaluate and interpret the results using methodologies and techniques appropriate to the area of the research.
2. Develop and plan an area of personal research and expertise, and/or undertake research under supervision within a specific research project or as a member of a research team.
3. Carry out and/or oversee service-based delivery of a range of genomics experiments (to include ChIP-seq, ATAC-seq, RNA-seq, CRISPR screens) on laboratory and patient-derived samples.
4. Develop and apply new genomics workflows and downstream analysis methodologies (e.g. single cell and spatial transcriptomics).
5. Modify in house data analysis pipelines to enable rapid/robust functional analysis and integration of prostate genomics datasets.
6. Maintain, apply and further develop automated gold-standard genomic analysis workflows in a high-performance computing environment.
7. Support application of novel integrative data analysis approaches.

8.  Support specific projects focussed on development and application of novel genomics workflows (e.g. spatial transcriptomics) and integration of results with a range of other OMICs tools.
9.  Management, processing and maintenance of large-scale datasets from in house projects and retrieved from public repositories.
10. Direct, train and support staff and students to ensure work is carried out to the required standard and timescale.
11. To write up results in a timely manner and take a leadership role in writing research manuscripts.
12. To regularly present regular progress reports on research to members of the research group and to external audiences to disseminate and publicise research findings.
13. To formulate, write and submit grants for fellowship awards, project and travel support.
14. To attend and present new experimental data at national and international meetings.
15. Assist grant holder in the preparation of funding proposals, applications and progress reports to external bodies.
16. Support the development and delivery of courses to ensure users are kept up to date with new technologies and analysis techniques.
17. May be required to carry out supervision of summer, undergraduate or master's students within the post holder's area of expertise and under the guidance of a member of academic staff, which will help develop their own supervisory skills.
18. Carry out routine administrative tasks associated with the research project/s to ensure that project/s are completed on time and within budget.  These might include organisation of project meetings and documentation, financial control, risk assessment of research activities.
19. Read academic papers, journals and textbooks to keep abreast of developments in own specialism and related disciplines. Any other reasonable duties within the general scope of the post and competence of post-holder.

**ESSENTIAL CRITERIA:**
1.  Hold or be about to obtain (submitted) a PhD in Biology, Genetics, Bioinformatics or a closely related area.
2.  Specific, relevant research experience to include:
    • Significant experience designing, conducting, managing, and analysing NGS methodologies, technologies, and data (to include lab experience of carrying out a range of NGS assays e.g ChIP-seq, ATAC-seq, RNA-seq)
    • 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)
    • Experience with downstream analysis and integration and interpretation of multi-omics data
    • Experience of working with Linux/UNIX Compute environments (e.g. HPC)
    • Experience of programming (PERL, python,R and Shell scripting) and data processing
3.  Specific, relevant research experience to include (continued):
    • Experience utilising Open Source genomics software and packages e.g. Bioconductor and python packages
    • A publication record commensurate with stage of career
4.  Must demonstrate good team working and communication skills.
5.  Sufficient breadth and depth of specialist knowledge in the discipline and of research methods and techniques to work within established research programmes.
6.  Ability to communicate complex information clearly.
7.  Ability to build contacts and participate in internal and external networks.
8.  Evidence of having presented work at national and international conferences (poster and/or oral).
9.  Demonstrable intellectual ability.
10. Ability to assess and organise resources.
11. Demonstrates attention to detail and works to exceptional levels of accuracy whilst under pressure.
12. Be capable of using own initiative.
13. Ability to work in a team and as an individual.
14. Ability to plan own work schedule responding to new pressures and adjusting priorities.
15. Must be willing to work irregular hours when necessary for the progress of the research project.
16. Must be willing and able to travel to national and international meetings.

**DESIRABLE CRITERIA:**
1.  1st Class undergraduate degree in science or a closely related area.
2.  Cancer research experience.
3.  Prostate cancer research experience.
4.  Experience integrating genomic data from human and mouse models.
5.  Single cell genomics experiences.

6.   Spatial genomics experience.
7.   Experience developing, managing and deploying HPC genomics pipelines.
8.   Use of computer clustering, parallelisation and job scheduling (e.g., LSF, PBS, SGE, SLURM).
9.   Experience utilising cloud genomics workflows.
10.   Machine learning, deep-learning, AI experience.
11.   Coding experience in:
   • R/R-Studio/Shiny
   • Python
   • Shell Scripting
   • PERL
12.   Experience of compliance with data protection policies.
13.   Experience working with public genomic data.
14.   Experience in analysis of large sequencing datasets.
15.   Experience of delivering lectures / tutorials.