

Candidate Information

Position:	Research Fellow
School/Department:	Patrick G Johnston Centre for Cancer Research
Reference:	23/110952
Closing Date:	Monday 12 June 2023
Salary:	£36,333 - £39,592 per annum
Anticipated Interview Date:	Monday 3 July 2023
Duration:	Fixed term for 36 months or until 30 June 2026, whichever is sooner

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 substantial ongoing research programme building on datasets from lab and clinical studies developed as part of the ongoing FastMan PCUK-November 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.

This successful candidate will build and apply novel genomic analysis and integration strategies to support research aimed at discovering and validating novel treatment approaches to improve treatment outcomes for men with locally advanced prostate cancer treated with radiotherapy. This will include applying a range of methodologies for integrative analysis of a range of cutting-edge genomics datasets including machine learning and deep learning approaches 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). They will also support AI/ML efforts to integrate these data modalities with longitudinal clinical, pathological and imaging data including unique digital pathology and radiomics datasets.

Working directly within the McDade group they will also provide support for managing genomics 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 and execute workflow/analyses/software 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. Support application of novel approaches to integrative data analysis including use of machine learning and other AI approaches.
3. 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.
4. Develop and apply new genomics workflows and downstream analysis methodologies (e.g. spatial transcriptomics).
5. Modify in house data analysis pipelines and R/Shiny applications to enable rapid/robust functional analysis and integration of prostate genomics datasets.
6. 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.
7. Maintain, apply and further develop automated gold-standard genomic analysis workflows in a high-performance computing environment.

8. Management, processing and maintenance of large-scale datasets from in house projects and retrieved from public repositories.
9. Direct, train and support staff and students to ensure work is carried out to the required standard and timescale.
10. Ensure up to date knowledge of scientific data and technological developments in the field of cancer genomics in order to develop and implement state of the art analysis pipelines for a range of NGS experiments.
11. Initiate and maintain collaborative links with various project partners.
12. To write up results in a timely manner and take a leadership role in writing research manuscripts.
13. To regularly present regular progress reports on research to members of the research group and to external audiences to disseminate and publicise research findings.
14. To formulate, write and submit grants for fellowship awards, project and travel support.
15. To attend and present new experimental data at national and international meetings.
16. Assist grant holder in the preparation of funding proposals, applications and progress reports to external bodies.
17. Support the development and delivery of courses to ensure users are kept up to date with new technologies and analysis techniques.
18. 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.
19. 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
20. 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 Genetics, Bioinformatics or a closely related area such as computer Science, mathematics (with relevant research experience).
2. At least three years relevant research experience to include:
 - Significant experience designing, developing, managing, and analysing NGS methodologies, technologies, and data
 - 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
 - Experience of programming (PERL, python, R and Shell scripting) and data processing
 - Experience utilising Open Source genomics software and packages e.g. Bioconductor and python packages
 - A publication record commensurate with stage of career.
3. Must demonstrate good team working and communication skills.
4. Sufficient breadth and depth of specialist knowledge in the discipline and of research methods and techniques to work within established research programmes.
5. Ability to communicate complex information clearly.
6. Ability to build contacts and participate in internal and external networks.
7. Evidence of having presented work at national and international conferences (poster and/or oral).
8. Demonstrable intellectual ability.
9. Ability to assess and organise resources.
10. Demonstrates attention to detail and works to exceptional levels of accuracy whilst under pressure.
11. Be capable of using own initiative.
12. Ability to work in a team and as an individual.
13. Ability to plan own work schedule responding to new pressures and adjusting priorities.
14. Must be willing to work irregular hours when necessary for the progress of the research project.
15. 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. 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 developing 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.