CANCER RESEARCH UK MANCHESTER INSTITUTE

JOB DESCRIPTION

JOB DETAILS:

Job Title: Senior Computational Biologist

Grade: Bioinformatician 3 (MI3)

Department: Bioinformatics and Biostatistics (BBS) Team

Division: Cancer Research UK National Biomarker Centre (NBC)

ORGANISATIONAL ARRANGEMENTS:

Accountable to:

1. NBC BBS Deputy Team Lead(s)
2. NBC BBS Team Lead
3. NBC Director

BACKGROUND:

CRUK National Biomarker Centre (NBC) has an international reputation for liquid biomarkers, with the aim to develop, validate and implement biomarkers that facilitate cancer precision medicine through improved cancer detection, prognosis prediction, and prediction and monitoring of patient responses to therapy. Our research integrates clinical, molecular and computational science into a highly convergent programme, with bioinformatics and computational biology playing a critical role in delivering our biomarker agenda. Single cell and spatial molecular profiling studies increasingly inform biomarker development within NBC by yielding detailed insight into cancer biology and enabling characterisation of rare cell populations such as metastatic cells, circulating tumour cells, and infiltrating immune cell subsets.

JOB PURPOSE:

Working in the Bioinformatics and Biostatistics (BBS) Team within NBC, the successful candidate will be responsible for computational data analysis of bulk, single-cell, and spatial transcriptomics datasets, as well as single-cell multiomics datasets that integrate scRNA-Seq with ATAC-Seq, CITE-Seq, and TCR-Seq. The successful candidate may also be responsible for analysis of single-cell and spatial proteomic datasets such as CyTOF and PhenoCycler data. Additionally, the post-holder will be responsible for designing experiments and bioinformatics analyses to analyse datasets, including development or implementation of appropriate statistical or machine learning approaches. The post-holder will consult with computational and wet lab biologists to interpret these datasets, explore biological mechanisms, develop biomarkers.

The work will be carried out under the guidance of the BBS team lead and deputy team leads, and in consultation with the other members of NBC involved in single-cell cancer biology projects, with training provided where required. The post holder will be able to leverage the High-Performance Computing facilities located within the CRUK Manchester Institute and supported by the Scientific Computing team.

DUTIES AND RESPONSIBILITIES:

The post-holder will apply their own bioinformatics engineering expertise, leverage expertise from the BBS team and work collaboratively to:

Assess which bioinformatics and computational analysis solutions are best suited to the projects they are responsible for.

- Explore, develop and apply bioinformatics approaches for single-cell biology and biomarker development.
- Process and analyse data from a range of experimental studies (including bulk, single-cell, and spatial transcriptomes, epigenomes, genome, and proteomes), with a focus on single-cell transcriptomic studies in lung cancer and cancer immunology, and on cancer biomarker development.

In addition, you will:

- Collaborate and communicate effectively with cross-disciplinary teams within the NBC and with external collaborators.

- Work closely with the BBS Team Lead/Deputy Team Lead and collaborators to agree on processes, timelines and deliverables.
- Keep abreast of the latest developments in computational biology/bioinformatics, and proactively suggest and implement improvements to processing and analysis workflows.
- Develop working knowledge in the field of cancer biomarkers.
- Ensure comprehensive and up-to-date documentation of data analyses and report progress periodically to the BBS Team Lead/Deputy Team Lead.
- Manage multiple concurrent projects effectively, ensuring timely delivery of analysis outputs according to agreed timelines.
- Provide specialist advice, support and training to colleagues and collaborators on bioinformatics tools and analysis workflows, ensuring best practices are followed and knowledge is shared across teams.
- Contribute to the preparation of manuscripts for scientific publications.
- Present and discuss your work with BBS team members and colleagues across NBC to obtain feedback and facilitate knowledge sharing.
- Deliver formal presentations of your work at the Centre and CRUK Manchester Institute to communicate findings, progress, and results to a broader scientific audience.
- Attend and contribute to meetings, including seminars and the annual Centre Colloquium
- Respect the confidential nature of research associated with collaborations, adhering to legally binding research contract stipulations on confidentiality.
- Perform other functions consistent with the position, nature of the post and as determined by the BBS Team Lead/Deputy Team Lead.

STANDARDS OF PERFORMANCE:

- Work efficiently, cost-effectively and in a flexible manner.
- Meet objectives within pre-determined timescales.
- Maintain effective communication with staff at all levels.
- Manage and prioritise own workload to meet deadlines.
- Adhere strictly to protocols and Institute policies.

- Comply with Health & Safety requirements, including having an awareness of personal responsibilities to maintain a safe working environment.
- To contribute to an environment that is conducive to mental health and wellbeing.
- Contribute to the University's agenda for social responsibility, including sustainability.
- Maintain confidentiality of information in line with data protection requirements, and University and collaborative agreements with pharmaceutical partners.
- Familiarise themselves with the University's Equality and Diversity policies and actively support these wherever possible.
- Be a team player.
- Strive to accomplish high quality of work

PERSON SPECIFICATION

The person specification should set out the qualifications, experience, skills, knowledge, personal competencies and other requirements which the post holder requires to perform the job to a satisfactory level.

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	ESSENTIAL The qualities without which a post holder could not be appointed	**DESIRABLE** Extra qualities which can be used to choose between candidates who meet all the essential criteria	**METHOD OF ASSESSMENT**
QUALIFICATIONS	• Postgraduate degree in Bioinformatics/ Computational Biology or related discipline (or equivalent relevant experience) OR • undergraduate degree in Bioinformatics/ Computational Biology or related discipline, plus relevant single cell bioinformatics experience.		Application and Presentation of certificate
EXPERIENCE	• Demonstrable experience developing and applying NGS data analysis approaches and/or NGS bioinformatics pipelines. • Demonstrable	• Experience with single cell or spatial proteomics data • Experience with epigenomic or genomic data analysis • Demonstrable	Application, references, publications and interview

EXPERIENCE CONTINUED…	experience in analysing single cell or spatial transcriptomics data OR extensive experience with bulk transcriptomic data AND other molecular data types. • Demonstrable experience in writing reproducible bodies of code. • Demonstrable experience in defining and solving research questions in relation to the project. • Fundamental understanding of experimental design and basic statistics. • Some project management experience.	experience in applying appropriate machine learning or advanced statistical approaches to the analysis of high-throughput data sets. • Experience running and building bioinformatics pipelines. • Experience using R: RStudio, R Markdown, Bioconductor and tidyverse/ggplot2 • Experience using Python: pandas, numpy, jupyterlab, matplotlib, seaborn; and sklearn, tensorflow/pytorch for ML problems. • Experience analysing complex biological datasets arising, for example, from deep sequencing (DNA-Seq, RNA-Seq, DNA methylation sequencing, ChIP-Seq, ATAC-Seq).	Application, references, publications and interview

EXPERIENCE CONTINUED…		• Experience of cancer bioinformatics approaches.	Application, references, publications and interview
SKILLS	• Ability to write code in R and/or Python. • Comfortable working with the Linux command line and bash scripts. • Attention to detail with coding and code annotation • Accurate comprehensive record-keeping and attention to detail. • Effective organisational skills and ability to multi-task. • Ability to be flexible around supervisors with clinical commitments. • Demonstrable ability to design and plan experiments and interpret results. • Ability to work in a collaborative environment. • Ability to select and apply the correct statistical methodologies to complex data sets. • Ability to work	• Comfortable in the use of project control software (git, GitHub). • Some experience with workflow management systems (Nextflow or Snakemake), including running and modifying nextflow workflows from nf-core. • Some experience with container management systems (e.g. Docker, Singularity) • Some experience of cancer specific bioinformatic approaches for processing and analysing data • Ability to work effectively within a multidisciplinary team including clinicians to achieve timely and valued objectives. • Ability to inspire and motivate	Application, references, publications and interview

SKILLS CONTINUED…	independently with minimal supervision. • To set goals, respond to challenges and take the initiative. • Excellent communication skills, written and verbal, including the ability to explain complex statistical/computational issues to a non-statistical/computational audience.	colleagues, including students and technicians.	Application, references, publications and interview
KNOWLEDGE	• An insight into current machine learning approaches for robust analysis of complex datasets. • An understanding of bioinformatics approaches for processing of sequencing data. • Knowledge in the field of bioinformatics and computational biology as applied to cancer studies. • Some understanding of basic cell biology and cellular processes.	• Understanding of relevant statistical models. • Some knowledge in single cell transcriptomics data acquisition protocols. • Some knowledge of DNA epigenetics data. • Some understanding of image processing. • Some understanding of immunology • A general knowledge of cancer.	Application, references, publications and interview
OTHER	• Willingness to travel • Self-motivated • Meticulous		Interview, Referees comments

OTHER CONTINUED…	• Interactive • Organised • Ability to work to strict deadlines • Ability to work well within a multidisciplinary team framework as well as on an individual project • Technically focused • Willingness to learn and implement new experimental techniques • To show commitment to equality and fairness and integrity in dealing with others • To be willing to work across organisational boundaries • To seek new knowledge and share ideas • To be open and responsive to change and innovation		Interview, Referees comments

THE CITY OF MANCHESTER AND THE REGION

Manchester is one of the great European cities and the Cancer Research UK Manchester Institute is located a short distance from the city centre and is serviced by regular public transport to the city centre. The city's architecture represents one of the high points of Victorian achievement. The modern city is a major centre of banking, commerce and manufacturing. It has a highly cosmopolitan atmosphere and its cultural life is internationally renowned.

There are three outstanding professional theatre companies, the halls of the Hallé and BBC Philharmonic orchestras, the Cornerhouse as well as other cinemas, and Europe's fastest-growing Chinatown. On the way into the city, there is perhaps the best stretch of road in the entire country for Indian and Pakistani food, known as the curry mile in Rusholme.

Amongst developments enriching the area's cultural life have been: the opening of the Lowry Centre and Media City at Salford Quays; the opening of the Bridgewater Concert Hall; the refurbishment of the City Art Gallery; the opening of Urbis in the centre of Manchester and of the Imperial War Museum North, designed by Daniel Libeskind, in Trafford.

Trafford, specifically Old Trafford, is known internationally for sport: it is a venue for Test cricket and the home of Manchester United FC. The Commonwealth Games were held in Manchester in 2002 and were highly acclaimed. The Commonwealth Stadium became the home of Manchester City FC in 2003.

Housing is varied, plentiful and the price ranges can start moderately priced and are as varied as the requirements.

Schooling ranges from world-famous private schools to excellent sixth-form colleges and comprehensives.

Manchester is well served by a major international airport, with direct scheduled flights to many destinations in Europe as well as North America and Asia.

Manchester Piccadilly railway station has been refurbished and is served by inter-city and other train services – with a direct link to Manchester Airport. The expanding network of Metrolink tram services offers an alternative mode of public transport from certain parts of the conurbation and is currently being expanded to include connections near to the Institute. Some of the most beautiful countryside in Europe is

just short of an hour's drive from the Institute in the Peak District National Park, while the Lake District and Snowdonia are also within easy reach.

Manchester offers extensive provision for research. Library facilities include the John Rylands University Library (the major library in the North West and the third largest in the country) and the Manchester Central Reference Library. Facilities for quantitative analysis are provided by Manchester Computing and the Computer Support Unit.

ADDITIONAL RECRUITMENT AND SELECTION PARTICULARS

Shortlisted Candidates:

1. We will reimburse reasonable travel expenses. You need to retain all your receipts as you will need to submit these with your expense claim form. This form will be given to you when you attend your interview.

2. If candidates require accommodation the Institute can arrange this for you. Please notify the Human Resources Department as soon as possible so that this can be arranged on 0161 306 6098 / 0161 306 6091 or email: jobs@cruk.manchester.ac.uk. Please note that reimbursement for accommodation may **not** apply.

3. If candidates have any additional support needs to enable them to attend an interview they will be able to request/discuss this with the HR department when arranging the interview.

4. Shortlisted candidates may be expected to complete a presentation as part of the selection process. Information regarding the duration and title of the presentation will be provided in the invitation to interview correspondence. We supply both laptop and projector for presentations.

5. All dates and times stated in correspondence from the Institute refer to UK GMT (Greenwich Mean Time).

6. Candidates need to bring along their passport to interview, (a copy of which will be taken for our records) and where applicable, your visa, when you visit the Institute. If candidates have difficulty in producing their passport, please contact the Human Resources Department prior to the interview on 0161 306 6098 / 0161 306 6091 who will be able to advise you.

7. **Zoom interview with or without presentation:**
   Instances may arise where we propose to hold a Zoom interview as a first stage selection process. If this is the preferred method of interview, you will be provided with a link and password to attend the interview at a specified time on a specified date. This link will redirect you to your Zoom interview.

Please note:

You do not have to have a Zoom account to attend a Zoom interview. You will be prompted to download the software, once you have clicked on the link that you have been provided. You do however, need to have a working microphone and camera connected to your electronic device in order for this interview to go ahead.

8. **Telephone conference with presentation:**

   As above, instances may arise when it may not be possible for candidates to travel to the Institute to attend the interview on the given date. In this circumstance, and if a zoom interview is not possible, then a telephone conference interview may be arranged as the first stage of the selection process. The criteria will be consistent with all other candidates. 24 hour prior to the interview we will require:

   - A contact telephone number emailed to ***jobs@cruk.manchester.ac.uk*** along with a scanned copy of passport for ID purposes
   - Where applicable, a copy of your presentation emailed to: ***jobs@cruk.manchester.ac.uk.***

Please note :

You should have a postgraduate degree in Bioinformatics/Computational Biology or related discipline (or equivalent relevant experience), along with some experience with single cell bioinformatics or a strong desire to learn and gain experience. Alternatively, you should have an undergraduate degree in Bioinformatics/Computational Biology or related discipline as well as significant relevant single cell bioinformatics/computational biology research experience.

CANCER RESEARCH UK | National Biomarker Centre

STANDARD CRUK MANCHESTER INSTITUTE TERMS AND CONDITIONS

The following is a basic summary of the standard terms and conditions applicable to the post you have applied for:

- The post of Senior Computational Biologist is on a Cancer Research UK pay scale. It's on an MI3 grade with a salary range of £34,000 – £38,000 per annum (dependent upon experience).

- Your employment will be with The University of Manchester appointed under the Cancer Research UK Manchester Institute terms and conditions.

- Salary is paid monthly on the penultimate last working day of the month.

- There are 32 days holiday per year plus Bank Holidays for England.

- Duration of contract is: 3 years fixed term.

- Working hours are 35 hours per week.

- There is a probationary period attached to this post of 6 months. It's standard for many organisations now and consists of two 3-monthly reviews with your line manager.

- You are eligible to join the USS (https://www.uss.co.uk/) pension scheme.

- You may be eligible to claim relocation expenses in accordance with the criteria listed in the Institute's Relocation Policy.

- Any offer made by the Cancer Research UK Manchester Institute would require the successful candidate to undergo a medical clearance. This is arranged with Occupational Health department at The University of Manchester prior to starting employment and consists of a basic medical. This is to address and gain clearance for any potential hazards identified for the role on offer.

- Offer is subject to receipt of satisfactory references and proof of your highest qualification.

- Offer is subject to documented evidence of your right to work in the UK under the Home Office UK Border Agency Regulations.

- Overseas candidates should determine, when applying for the position, the likelihood of obtaining a Certificate of Sponsorship (CoS) for the post by assessing their own circumstances against the criteria specified on the gov.uk website

- Successful overseas candidates may be eligible to claim reimbursement of expenses to cover their visa and National Health Surcharge costs, if required. Overseas candidates will be required to meet the eligibility criteria as specified in the skilled worker points-based system.

  Please note reimbursement does not extend to include family members, although a loan scheme is available.

- The successful candidate is required to complete a Rehabilitation of Offenders/Criminal Records declaration form at the offer stage of the process. *Please note a criminal record will not necessarily be a bar to obtaining a position.*

- The Institute is promoting a green travel plan and there are staff benefits promoting this including a cycle to work scheme and the use of public transport. There are strong links to bus routes and trains to all CRUK Manchester Institute locations. More information about this can be found on our 'Our Benefits Package' page or by contacting the HR Department.