Candidate Information

Position:	Research Fellow
School/Department:	School of Medicine, Dentistry and Biomedical Sciences
Reference:	25/113011
Closing Date:	Monday 5 January 2026
Salary:	£41,519 per annum
Anticipated Interview Date:	Wednesday 14 January 2026
Duration:	2 Years

JOB PURPOSE:

We are inviting applications for a Postdoctoral Research Fellow position, funded by a Medical Research Council (MRC) Grant. This role offers an exciting opportunity to contribute to a cutting-edge project investigating the interplay between epigenetics and metabolism in embryonic stem cells (ESCs).

Metabolic pathways supply essential metabolites for chemical modifications of chromatin, ultimately affecting gene expression. However, there is a fundamental gap in our knowledge about the molecular mechanisms through which cell metabolism affects chromatin modifications in pluripotent stem cells and how these processes are coordinated during early development. We recently discovered that pluripotent stem cells have an unusual metabolism and, unlike adult cells, use specific nutrients (betaine) to drive their metabolism (one carbon metabolism). Interestingly, mutations of the one carbon (1C) metabolism are associated with inborn errors of metabolism such as homocystinuria patients. These mutations may also influence neural differentiation in the early embryo.

Under the supervision of Dr. Yaser Atlasi, the successful candidate will employ CRISPR/Cas9 gene editing to delete different members of the 1C metabolism in human ESCs, and assess the impact on neural differentiation. Furthermore, the candidate will utilize state-of-the-art epigenomics approaches to map the genomic distribution of specific histone marks in response to metabolic changes in ESCs.

This project is conducted in collaboration with University of Sheffield and EMBL Italy, providing an exceptional opportunity to study these molecular mechanisms within the context of early development. The PDRA will have the opportunity to visit University of Sheffield to gain further training in neural differentiation assays in hESCs. The collaboration offers the successful candidate access to world-class expertise, resources, and mentorship, fostering a vibrant and supportive research environment.

MAJOR DUTIES:

1. Use CRISPR/Cas9 to introduce specific mutations or generate KO models for target genes.
2. Culture and maintain human ESCs models.
3. Apply neural differentiation assays in different KO hESC models.
4. Map the genomic distribution of specific histone marks in response to activation of Betaine-metabolism.
5. Share findings and coordinate research efforts within a multidisciplinary team.
6. Prepare high-quality research manuscripts for publication in peer-reviewed journals.
7. Attend and present findings at national and international conferences.
8. Engage in seminars and workshops to disseminate research outcomes.
9. Assist in training and supervising undergraduate or graduate students within the research group.
10. Ensure compliance with laboratory safety protocols and ethical guidelines.
11. Document experimental methods, results, and analyses comprehensively and accurately.
12. Assist grant holder in the preparation of funding proposals and applications to external bodies.

13. 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.
14. Carry out occasional undergraduate supervision, demonstrating or lecturing duties within the post holder's area of expertise and under the direct guidance of a member of academic staff.
15. Read academic papers, journals and textbooks to keep abreast of developments in own specialism and related disciplines.

ESSENTIAL CRITERIA:

1. Hold or be about to obtain* a PhD in Molecular biology, Biochemistry, genomics, or a related discipline (*PhD to be completed within 3 months of the closing date for the post).
2. Significant, relevant research experience to include:
   - o Experience in maintaining stem cell culture models, with preference for human ECSs.
   - o Experience in genome editing tools, such as CRISPR/Cas9.
   - o Experience in high-throughput (epi)genomics assays or related technologies.
   - o Familiarity with tools for analysing genomic data.
   - o Knowledge in chromatin biology and related technologies.
3. Ability to contribute to broader management and administrative processes.
4. Demonstrated capacity capability to troubleshoot experimental workflows and address technical challenges effectively.
5. Skilled in presenting scientific findings clearly, both in written reports and oral presentations.
6. Proven ability to develop and optimise experimental protocols for high-throughput or innovative laboratory techniques.
7. Strong foundation in cellular and molecular biology techniques, including the use and maintenance of cell culture systems.
8. Sufficient breadth and depth of specialist knowledge in the discipline and of research methods and techniques to work within established research programmes.
9. Ability to work collaboratively in multidisciplinary teams, contributing to shared research objectives and outcomes.
10. Ability to communicate complex information clearly.
11. Ability to build contacts and participate in internal and external networks.
12. Team worker, highly motivated, supportive of junior colleagues within the group.
13. Motivated, and driven, who takes initiative in addressing challenges, proposing solutions, and driving projects forward.
14. Ability to work collaboratively in multidisciplinary teams, contributing to shared research objectives and outcomes.
15. Persistence in the face of setbacks, with the ability to learn from failures and refine approaches.
16. Receptive to feedback, new ideas, and alternative perspectives, fostering continuous learning and improvement.
17. Willingness to work irregular hours when necessary for the progress of the research project.

DESIRABLE CRITERIA:

1. 1st Class undergraduate degree in genetics, biochemistry, molecular biology, or related discipline.
2. Direct experience with human ESCs.
3. Knowledge of stem cell biology.
4. Advanced data visualisation and statistical modelling using tools like R, Python, or MATLAB.
5. Familiarity with tools and programming languages (e.g., R, Python, or others) for advanced data analysis and modelling.
6. Evidence of mentoring students, colleagues, or team members in experimental design or data interpretation.
7. Experience working in international or cross-institutional partnerships, particularly with shared resources or diverse expertise.
8. Experience of undergraduate and postgraduate research supervision / mentorship.
9. Contribute to the School's outreach programme by links with industry, community groups etc.