UNIVERSITY OF LEICESTER

Job Summary

Job Title: Research Associate (Virtual Patient)
Grade: 7
Salary: £40,704 to £44,352 per annum, pro-rata if part-time
Department: School of Engineering
Hours/Contract: Full time or job share considered, fixed term until 11 October 2030
Job Family: Teaching and Research
Reference: 14216

Role Purpose

The postholder will lead development of a multiscale virtual asthma patient within the UKRI Future Leaders Fellowship programme, the Lung Pharmacome. The role will connect mechanistic modelling, multimodal biological and clinical data, and experimental evidence from patient-derived lung organoids to improve understanding of asthma heterogeneity and treatment response. The postholder will also help translate the resulting research platform towards practical use and commercialisation. This is an explicitly interdisciplinary and outward-facing position requiring scientific independence, research and laboratory leadership, active participation in dissemination, and close collaboration across computational, experimental, clinical, engineering and enterprise communities.

Main Duties and Responsibilities

Research

- Lead the development, calibration and validation of a multiscale virtual asthma patient linking relevant molecular, cellular, tissue, organ and patient-level processes.
- Integrate heterogeneous evidence, including experimental, organoid, imaging, omics and clinical datasets, into transparent and testable computational models.
- Develop reproducible modelling and data-analysis workflows in Python, C, and/or R, with appropriate testing, documentation, version control and use of Linux/HPC environments where required.
- Formulate and test mechanistic hypotheses, quantify uncertainty and sensitivity, and define validation criteria with experimental scientists, clinicians, and quantitative researchers.
- Develop interpretable patient-stratification and in silico intervention workflows that can support prediction of disease trajectories and treatment response.
- Contribute to integration between the virtual-patient and lung-organoid strands of the Lung Pharmacome, ensuring model assumptions and outputs can be challenged experimentally.
- To develop and carry out a plan to extend an area of personal research or contribute as a team member to the development of a broader programme, this may include contributing to the writing of research bids/grants.
- With the support of colleagues, identify opportunities to apply for fellowships and/or further project grants

Interdisciplinary Research and Laboratory Leadership

- Provide day-to-day intellectual leadership for the virtual-patient workstream and help coordinate interfaces between computation, respiratory biology, organoid science, engineering, clinical research and commercial translation.
- Lead or co-lead research and lab meetings, "methods sprints", data reviews, and milestone discussions; translate across disciplinary vocabularies and convert decisions into clear actions.
- Mentor students and less-experienced researchers in reproducible analysis, critical interpretation, scientific writing, and responsible use of computational methods.
- Support development of protocols, data-management plans, ethics/governance documentation, and standard operating procedures, where relevant to the workstream.
- Contribute flexibly to adjacent experimental and translational tasks where this strengthens model development, validation, or team delivery.
- Pro-actively build networks and collaborations.
- Providing mentoring and coaching to Early Career Researchers and research students.

Commercialisation, Translation, and Impact

- Work with Principal Investigator, University commercialisation team, clinicians, patients, and industrial partners to define priority use cases and a credible route from research prototype to adoption.
- Contribute to market and competitor landscaping, stakeholder discovery, value-proposition development, product requirements, risk analysis, and evidence planning for the virtual-patient platform.
- Help identify protectable intellectual property and maintain clear records of model provenance, contribution and foreground IP, in line with university processes.
- Develop demonstrators, technical documentation, and accessible materials for potential users, partners, funders, and investors, while clearly communicating limitations and validation status.
- Support translational funding applications, partnership development, and evaluation of delivery models such as licensing, collaborative R&D, or a spin-out pathway.

Dissemination and Research Outputs

- Lead and contribute to high-quality publications, conference abstracts, posters, oral presentations, software or model releases, and fellowship deliverables.
- Participate prominently in scientific, clinical, industry and public-facing dissemination activities, adapting complex multiscale concepts for specialist and non-specialist audiences.
- Contribute to open and reproducible research through appropriate sharing of code, workflows, metadata and documentation, subject to IP, ethics and information-governance constraints.

Internal and External Relationships

- Report to and work closely with the Principal Investigator and collaborate with the PDRA leading the lung-organoid platform.

- Work with respiratory scientists, clinicians, engineers, data scientists, research software specialists, students and professional-services colleagues.
- Build effective relationships with patients and public contributors, industrial collaborators, pharmaceutical partners, University enterprise/IP teams, funders and relevant external networks

Planning and Organising

You will be required to effectively manage your time to plan your research activity and to deliver on the priorities of the project:

- Prioritise tasks within agreed work schedules
- Plan for specific aspects of research incorporating issues such as deadlines, project milestones and overall research aims
- Adapt daily and weekly plans to accommodate new developments and be flexible to the changing priorities of the research project
- Plan and prioritise a coherent programme of research against agreed milestones, dependencies, risks and deliverables
- Maintain rigorous records of methods, analytical decisions, code or protocols, data provenance and version history to support reproducibility and knowledge transfer
- Coordinate access to specialist facilities, datasets, samples, and collaborators, and identify delivery risks early and proposing proportionate mitigations.
- Balance independent research, team leadership, dissemination, commercialization, and shared project responsibilities, communicating promptly when priorities require adjustment

Qualifications, Knowledge and Experience

Essential

- A PhD (or thesis submitted by the time of appointment) in computational biology, systems biology, bioengineering, biomedical data science, quantitative biomedicine, bioinformatics or a closely related discipline. *****
- Experience in agent-based modelling or rule-based computational modelling in human development or disease contexts. *****
- Demonstrable experience analysing complex biological or clinical data using Python and/or R, including statistical modelling, data visualisation and reproducible pipeline development. *****
- Experience integrating more than one data modality, scale or evidence type, and the ability to explain how assumptions, uncertainty and validation affect interpretation. *****
- Experience with relevant quantitative methods such as mechanistic modelling, machine learning, network/pathway analysis, image-derived features, omics analysis or patient stratification.
- Evidence of interdisciplinary research across computational and experimental, clinical or translational settings. *****

- Evidence of research or laboratory leadership, such as coordinating projects, developing SOPs/protocols, training colleagues, supervising students, leading meetings or managing shared research resources.
- A strong dissemination records appropriate to career stage, including contributions to papers and presentations to scientific or wider audiences.
- Excellent written and verbal communication, project organisation and collaborative problem-solving skills. *****
- Willingness to contribute actively to commercialisation and learn relevant approaches to stakeholder discovery, IP, product development and translational funding.

Desirable

- Experience in asthma, respiratory disease, immunology, airway remodelling, precision medicine or patient-derived experimental models.
- Experience with Linux, Bash, HPC/SLURM, Git, workflow tools, interactive visualisation or deployment of research software.
- Experience of multimodal omics, whole-exome or RNA-seq analysis, digital pathology/spatial imaging, or pathway enrichment methods.
- Experience drafting ethics applications, data-management plans, SOPs, grant applications or technical reports.
- Experience of entrepreneurship, innovation programmes, industry collaboration, software/product development or other research commercialisation activity.
- Experience engaging patients, public contributors, healthcare professionals, pharmaceutical partners or investors.

Skills, Abilities and Competencies

Essential

- Ability to move confidently between biological questions, quantitative methods and translational priorities. *
- Ability to work independently while making decisions visible and inviting constructive challenge from the wider team. *
- Strong analytical judgement, including recognition of model limitations, confounding, uncertainty and data-quality constraints. *
- Ability to lead inclusive discussions and support colleagues from different disciplinary backgrounds. *
- Willingness and ability to work with internal and external stakeholders. *
- Evidence of continued development of subject expertise. *
- Excellent communication skills – written and verbal evidenced by the ability to communicate complex information. *
- Evidence of working effectively as part of a team and the ability to work independently. *

- Working towards independence and ability to be involved in collaborative research.
- Evidence and commitment to Continuous Professional Development (CPD) for yourself and encourage commitment to learn and develop in others.
- Collegiate member of a research team.
- Clear, persuasive communication with technical and non-technical audiences. *

Desirable

- Budget management skills

Criteria to be used in shortlisting candidates for interview

Reason for Fixed Term Contract

The reason for the fixed term contract is stated in section 1.9 in the summary of contractual terms in your contract of employment.

Criminal Declaration

If you become an employee, you must inform your manager immediately, in writing, if you are the subject of any current or future police investigations/legal proceedings, which could result in a criminal office, conviction, caution, bind-over or charges, or warnings.

Supporting University Activities

As a University of Leicester citizen, you are encouraged to support key university activities such as clearing, graduation ceremonies, student registration and recruitment open days. We encourage all staff as citizens to work flexibly across the University if required. If supporting these activities is likely to affect your workload, please speak to your line manager in the first instance

University Values

Inclusive - We are diverse in our makeup and united in ambition. Our diversity is our strength and makes our community stronger.

Inspiring - We are passionate about inspiring individuals to succeed and realise their ambitions. We challenge our community to think differently, to get involved, and to constantly embrace new ideas.

Impactful - As Citizens of Change we will generate new ideas which deliver impact and empower our community

Freedom of Speech

The University is committed to upholding freedom of speech and academic freedom within the law throughout our recruitment processes. We ensure that all candidates are considered based on merit and suitability for the role, without regard to their lawful viewpoints or the expression of challenging or controversial ideas. Our recruitment policies and practices are designed to protect applicants from discrimination or adverse treatment on the basis of their opinions, and to foster an environment where open debate and diverse perspectives are valued as essential to our academic mission.

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Job Summary

Equity and Diversity
We believe that equity, diversity and inclusion is integral to a successful modern workplace. By developing and implementing policies and systems that challenge stereotypes across all aspects of our work, we have a culture that recognises and values the diverse contributions of our staff which benefit everyone. Our strong values of inclusivity and equity support our efforts to attract a diverse range of high-quality staff and students and identify our University as a progressive and innovative workplace that mainstreams equity, diversity and inclusion.