UNIVERSITY OF LEICESTER

Job Summary

Job Title: NIHR Research Associate in Omics of Heart Failure and Type 2 Diabetes
Grade: 7
Salary: £39,906 to £46,049 per annum, pro rata if part-time
Department: Cardiovascular Sciences
Hours/Contract: Full-time, or job share considered, fixed term contract until 31 March 2028
Job Family: Teaching and Research
Reference: 11744

Role Purpose

This post is part of a package of support provided by the University of Leicester in relation to the NIHR-BRC Core and Cardiovascular Themes. You will join a dynamic and rapidly expanding research group which has secured over £8 million in research grants in the last 24 months.

You will be based at the University of Leicester van Geest Omics facility at the Hodgkin Building in an outstanding environment. Research infrastructure includes a NIHR Biomedical Research Centre (BRC), a BHF funded Clinical Research Centre, a BHF Accelerator centre award and 4-year PhD programme, the van Geest MultiOmics facility, a NIHR Clinical Research Facility including a dedicated 3T MRI research scanner (BHF funded Siemens Vida with multinuclear capability) and clinical physiology labs/consulting rooms.

You will work closely with Professors Leong Ng, Don Jones and Gerry McCann and other staff working on a programme of research around the early detection, diagnosis and prevention of heart failure in people with type 2 diabetes. The primary project is to develop omic signatures and pathway enrichment analyses for the presence of subclinical cardiovascular dysfunction detected by cardiac MRI in a multi-ethnic cohort of asymptomatic adults with a diagnosis of type 2 diabetes (PREDICT study). In addition, we will be conducting a pilot trial of low-calorie diet in HFpEF with MRI and plasma sampling.

You will lead on the acquisition of mass spectrometry data for proteomic and metabolomic analysis of plasma samples from the above studies with downstream bioinformatics analysis of this high dimensional data, and perform pathway enrichment analyses to delineate the most impacted disease processes in early heart failure in type 2 diabetes. Following on, you will lead on the design of targeted assays for candidate's biomarkers for these conditions, and use these to verify and validate biomarkers and biotargets. This work is one of the flagship projects of the NIHR Leicester BRC and you will work closely with colleagues in the Leicester Diabetes Centre and the Leicester Precision Medicine Institute.

It is anticipated that you will be a researcher with, or capable of obtaining, independent funding as a principal investigator and will be encouraged to apply for personal fellowships. Knowledge of proteomic and metabolomics sample preparation and mass spectrometric acquisition of data for complex downstream bioinformatic pathway analysis is mandatory. Knowledge of Cardiovascular Imaging is also mandatory.

Resources Managed

Data collected for study.

Post holder will be trained to use of several high value pieces of equipment.

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Main Duties and Responsibilities

Research

You will establish your role between Professor McCann's Imaging group and the van Geest MultiOmics group and NIHR Biomedical Research Centre (BRC) related studies with particular emphasis on the analysis of omics datasets from the patient cohorts described above, and lead on the bioinformatics analysis of omics data, with the eventual aim of defining the most important pathways involved in early heart dysfunction in type 2 diabetes. Other projects to contribute to will include HFpEF, Aortic Stenosis and analysis of the BRICCS CT cohort. Duties will include:

- Leading the development of an omic data analytical workflow for plasma samples from early heart failure in type 2 diabetes.
- Obtain omic signatures of early heart failure in type 2 diabetes.
- Discovery and validation of biomarkers in BRC studies.
- Perform pathway enrichment analysis using current bioinformatics methods, to determine the biological pathways and molecular processes related to the most highly differentially expressed analytes.
- Perform a comprehensive systematic literature review on biomarkers of early heart failure in diabetes and management strategies including pharmacological and lifestyle interventions and compare in-house analyses with the literature.
- Draft papers for high quality peer-review publication, taking responsibility for research papers.
- Present research at scientific meetings and workshops to improve the reputation of the group and post holder.
- You will work with Prof McCann, Jones and Ng and the omics group to develop novel research questions, seek collaborators and obtain independent funding to execute such work.
- Develop your own research within the group to develop a proposal for a fellowship within 2 years,

Teaching

- Occasional lectures and small group teaching for students/ junior doctors/post-graduate staff.

Student Supervision

- You will take a supervisory role for at least 1 or more doctoral students working within the van Geest omics facility.
- You will be expected to devise projects for and supervise intercalating medical students and potentially MSc students undertaking research projects within the College.

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Professional Development

- Duties and opportunities to engage in work that support your own professional development.

Impact and Knowledge Exchange

- Network and contribute to the maintaining and furthering of the wider research programme and research area
- To contribute to industry collaborations
- To consult effectively on own specialism directly with people external to the University
- To engage positively and pro-actively in research impact

Leadership and Citizenship

- Guidance to other team members both research staff and students
- Pro-actively build networks and collaborations.
- Providing mentoring and coaching to Early Career Researchers and research students.

Internal and External Relationships

The post requires frequent and close collaboration with the following:

Internal:

- Multi-disciplinary team at University of Leicester van Geest omics facility, comprising 2 professors, 3 senior technicians, 3 post-doctoral fellows, 7 PhD students.
- Multi-disciplinary team at Glenfield Hospital and there will be two new appointments related to this study with a Clinical Associate Professor and Doctoral Research Fellow. In addition, the Academic Clinical Cardiovascular Imaging Group currently comprises one NIHR Clinician Scientist/ Honorary Consultant, two NIHR ACLs and five Clinical Research Fellows whose research primarily involves CMR. There are a number of additional early translational studies as well as a number of phase III clinical trials.)
- Primary responsibility will be to the Cardiovascular Theme of the BRC, but will extend to all themes within the BRC as appropriate.

External:

- Collaborators in Leeds, Manchester, Bethesda and Pennsylvania, USA. Industrial collaborators include Waters Corporation, Non-linear Dynamics, SISCAPA Assay Technologies, Shimadzu and Sphingotec GmbH.

Planning and Organising

- Plan and perform research on a day-to-day basis.
- Completion of probation and annual reports.
- Collect, process and analyse data for the study.
- Planning research publications and presentations incorporating own data and that of others.

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Qualifications, Knowledge and Experience

Essential

- Completed a PhD programme (Or near completion - Thesis to be submitted within 3 months of start of post) in a related discipline (e.g. Bioinformatics, Proteomics, Metabolomics) *
- Strong record in Proteomic LC-MS platforms, particularly the Waters Synapt G2S platforms and the TQ-XS triple quadrupole instrument.
- Sound statistical and bioinformatics knowledge, with ability to program in R (in particular RUVSeq, NOISeq, WGCNA, edgeR and limma), and preprocessing and handling of high dimensional data and pathway analytical methods*
- Experience of Waters proteomic software e.g. PLGS and Progenesis QI for Proteomics.*
- Experience with other proteomic software such as Skyline and Scaffold.
- Have strong background in cardiovascular proteomics with an intention to progress to be an independent researcher in this field
- Knowledge of type 2 diabetes, heart failure, diabetic cardiomyopathy
- Knowledge of Cardiac MRI, echocardiography, cardiac pulmonary exercise testing. Understanding what the variables are and how to use them in data analysis and predicting disease*
- Experience with automation platforms e.g. Andrew Plus or Bravo
- Experience of various plasma proteomic protocols (e.g. crude digest, Extracellular vesicle preparations, lipoprotein preparations.)
- Previous research experience with evidence of outputs*
- Academic potential as evidenced by undergraduate/postgraduate performance*

Desirable

- Proven ability to write high-quality manuscripts
- Successful supervision of undergraduate and postgraduate students
- Experience of writing scientific papers as first author
- Obtained independent funding as PI

Skills, Abilities and Competencies

Essential

- Excellent, fluent oral communication skills and evidence of good written communication skills in English* sufficient to undertake research, teaching and administrative activities and communication with patients as required
- Proven ability to project manage
- Ability to work with minimal supervision
- Ability to plan, prioritise and work on own initiative
- Willingness and aptitude to present work at international and national meetings
- The ability to constructively interact with other members of the research group
- The ability to complete work on time and to work to deadlines
- Self-motivation
- Good organisational skills

- Excellent team working skills
- Enthusiasm and desire to become an independent researcher*

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 offence, conviction, caution, bind-over or charges, or warnings.

Supporting University Activities

As a University of Leicester citizen, you are expected to support key university activities such as clearing, graduation ceremonies, student registration and recruitment open days. We expect all staff as citizens to work flexibly across the University if required.

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

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 benefits 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.