

<b>Job Title:</b>	Research Associate
<b>Department/Division/Faculty:</b>	Cardiac Function Section / National Heart and Lung Institute / Faculty of Medicine
<b>Campus location:</b>	Hammersmith Campus (Paddington)
<b>Salary Range:</b>	£40,215 - £47,579 per annum  Candidates who have not yet been officially awarded their PhD will be appointed as a Research Assistant within the salary range £35,477 - £38,566 per annum.
<b>Job Family/Level:</b>	Academic & Research, Research Associate
<b>Responsible to:</b>	Professor Costanza Emanuelli
<b>Key Working Relationships (internal):</b>	Members of the research group, Prof Prakash Punjabi, Hammersmith campus Cardiac Function Section administration, other academic staff, service departments, Internal research facilities
<b>Key Working Relationships (external):</b>	Professor Enrico Petretto (Duke Singapore); members of the COST action in CardioRNAs; academic collaborators at the UNESP-Brazil
<b>Contract type:</b>	Full-time, Fixed-Term until 31 May 2022

### **Purpose of the Post**

This research project at the National Heart and Lung Institute, led by Professor Emanuelli, funded by the British Heart Foundation, focuses on the study of cardiovascular disease.

The project will make use of clinical samples from cardiac surgeries, cell and mouse models of ischaemia and Diabetes Mellitus, as well as previously acquired and computationally analysed, small and long RNA datasets from clinical samples. This project will further mechanistically investigate:

- 1) the impact of human ischaemic heart disease and Diabetes Mellitus on microRNAs and their expressional (such as RNA methylation and editing) and functional regulators (such as circular RNAs) on vascular microRNAs;
- 2) The contribution of exosomes and extracellular microRNAs to cell-to-cell communication in the setting of ischaemic heart disease complicated by Diabetes Mellitus;
- 3) The value of circulating exosomes and extracellular microRNAs as clinical biomarkers of ischaemic disease in diabetic subjects.

### **Key Responsibilities**

We are looking for a motivated researcher who has first-hand or will fast develop experience with:

- The different techniques for single cell (sc) and single cell nucleus (scn) RNA-seq
- Flow cytometry of the heart cellulose
- Preparation of culture endothelial cells, pericytes and stromal cells from human and animal heart samples
- Preparation and characterisation of bioactive exosomes from the conditioned media of cultured cells and from human biological fluids (pericardial fluid, plasma)
- Data mining from GEO and similar platforms and consultation of publicly available resources for microRNA and epigenetic studies (such as <http://www.roadmapepigenomics.org/>)
- Bioinformatic analyses (under supervision from the bioinformatic staff of the Emanuelli team)
- A wide range of molecular biology techniques, including but not limited to CHIP, RIP, cloning and preparation of plasmids
- Immunocytochemistry and IHC followed by in vitro imaging (a wide range of microscopes) of cells and tissue section

- Cell biology functional assays
- Grant and/or Fellowship funding proposal writing, as co-PI or PI (to extend the contract and advance from this initial role)
- Supervision of (MRes, MSc and BSc students to increase the research potential and team size and to gain important teaching skills, which can be accredited with an AFHEA <https://www.advance-he.ac.uk/fellowship/associate-fellowship>)

The Post-holder will conduct and help design experiments on / using a wide range of techniques and might need some of them to respond to the challenge of the project. The role will be supported by a wide range of internal and external collaborators. However, the postholder will need to challenge themselves in the first instance, and in particular, be able to develop innovative solutions and optimisation in development of the project. Solid experience of molecular biology adapted to cardiovascular cell biology is required. The Post-holder will be familiar with wet-lab based approaches and techniques, especially cardiovascular cell biology, and have a track record of independent bio-research, evidenced by a PhD in a related field and publications. The Post-holder will be able to converse with computational scientists and learn from them how to develop project-oriented analyses. The Post-holder will also draft technical reports, manuscripts for scientific journals, patent applications, and present work internally and externally to consultants and collaborators.

#### Experimental laboratory work

- To study design (with the PI) and troubleshoot (independently) the different stages of the projects and related methodologies
- To develop and validate new molecular models of interference of Diabetes on the cardiovascular homeostasis and repair process, with a focus on cardiac microangiopathy and fibrosis
- To develop and validate new models of exosomal microRNAs-led cell-to-cell communications in the ischaemic and diabetic heart,
- To investigate miRNAs as cardiovascular biomarker in the setting of human Diabetes
- To optimise the production of primary cultures of cardiovascular cells from human and animal heart samples
- To optimise the preparation of exosomes from the cultured cells and from patients' biofluids
- To prepare "molecular tools" as required by the projects
- To perform molecular and cell biology analyses as required
- To perform flow cytometry analyses after digestion of heart samples
- To perform scRNA-seq analyses after digestion of heart samples
- To validate the scRNA-seq data with PCR analyses
- To perform additional analysis using a range of techniques, such as immunohistochemistry, confocal microscopy, etc.
- To identify and develop suitable techniques for the collection and analysis of data
- To conduct data analysis, ensure the accuracy, validity, completeness and reliability of data, and maintain highly organised, up-to-date and faithful records of all experimental work, including ethics reporting requirements.
- To conduct and plan own scientific work with taking responsibility for day-to-day planning, scheduling, carrying out research in accordance with the project goals

#### Contribution to Teaching and Training

- To contribute to the training of junior members of the team (primarily PhD, MRes and MSc) as required.
- To contribute to writing new research projects for MRes, MSc and BSc students and to act as a main or co-supervisor in such projects.

#### Scientific Writing

- Grant and/or Fellowship funding proposal writing, as co-PI or PI (to extend the contract and advance from this initial role)

- To draft technical reports, manuscripts for scientific journals, patent applications, and present work internally and externally to consultants and collaborators
- To publish in high quality journals
- To submit abstract and travel grant applications to present data at national and international meetings and to visit external labs to improve the scientific expertise.
- To contribute to applications for new/follow-on research grant proposals.

*Contribution to the Team, Collaborations and Administration*

- To participate in all Group/Unit research meetings and internal seminars.
- To comply with the College, Division, and Unit safety practices and to attend courses on safety when appropriate.
- To collaborate with other allied scientists within Imperial College and elsewhere in London and abroad, as appropriate.
- To contribute to the smooth running of the Group's/Unit's laboratories and, facilities with other scientists, clinicians, technicians and students within the laboratories.
- To maintain highly organised and accurate record of experimental work.
- To present findings to internal meetings
- To provide guidance to staff and students.
- To undertake appropriate administration tasks
- To attend relevant workshops and conferences as necessary
- To undertake any necessary training and/or development
- Any other duties as may be deemed reasonable by Head of group as well as Head of Division/Department/Section

<b>Person Specification</b>	
<b>Requirements</b> Candidates/Post-holders will be expected to demonstrate the following	<b>Essential (E)/ Desirable (D)</b>
<b>Education</b>	
At Research Assistant level: a good undergraduate degree or MSc (or their equivalents) in a Biomedical subject or equivalent industrial or commercial experience	<b>E</b>
At Research Associate Level: A PhD degree in a Biomedical subject or equivalent industrial or commercial experience	<b>E</b>
<b>Experience</b>	
Direct experience of cardiovascular biology	<b>E</b>
Experience of molecular biology adapted to cardiovascular cell biology	<b>E</b>
Experience with molecular biology, immunohistochemistry / histology and microscopy / imaging of cardiac biology and imaging and cell culture techniques	<b>E</b>
Animal work	<b>D</b>
Production of primary cultures of cardiovascular cells from human and animal heart samples	<b>D</b>
Experience of microRNAs	<b>E</b>
Practical expertise in data analysis and statistical procedures to support experimental planning and data interpretation	<b>E</b>
Work on human samples (including ethics and H&S)	<b>D</b>
Practical experience within a research environment and publications in relevant and refereed journals	<b>E</b>
Practical experience in presenting in English at conferences and workshop	<b>E</b>
Practical experience in scientific writing (papers and/or grants)	<b>E</b>
Previous experience in adhering to or implementing of good laboratory practice in a research laboratory environment	<b>D</b>
Experience in compiling, reviewing and editing study protocols and standard operating procedures	<b>E</b>
<b>Knowledge</b>	
Knowledge of general wet-lab techniques, instrumentation, and maintenance	<b>E</b>
In depth knowledge of molecular biology and cell culture techniques	<b>E</b>
Computer literate with experience in data presentation and statistical analyses	<b>E</b>
In depth knowledge of the literature on non coding RNAs as modulators of cardiovascular functions	<b>E</b>
microRNA analyses (different techniques)	<b>E</b>
Circular RNA and RNA modification (methylation and editing) protocols	<b>D</b>
Flow cytometric analyses	<b>E</b>
Exosome production and analyses	<b>D</b>
Bioinformatics	<b>D</b>
Library preparation for RNA-sequencing (small RNA, long RNA)	<b>E</b>
Single cell RNA-sequencing	<b>D</b>
Statistic analyses	<b>E</b>
<b>Skills &amp; Abilities</b>	
Ability to make effective use of scientific literature to direct research	<b>E</b>
Ability to develop and apply new concepts and the ability to apply relevant models, techniques and methods and develop new ones	<b>E</b>
Ability to prioritise work in response to deadlines	<b>E</b>
Creative approach to problem-solving	<b>E</b>

Excellent written communication skills and the ability to write clearly for publication and grants (in English)	<b>E</b>
Excellent verbal communication skills and the ability to positively communicate with colleagues, international staff, students, clinical staff, supportive staff and administrators	<b>E</b>
Demonstrable capability and commitment for independent research	<b>E</b>
Proven ability to design and analyse experiments	<b>E</b>
Willingness to learn new techniques required for research implementation	<b>E</b>
Willingness to work out of normal working hours (including weekends) if the requirements of the project demand	<b>E</b>
Willingness to work as part of a team and to be open-minded and cooperative	<b>E</b>
Willingness to travel both within the United Kingdom and abroad to conduct research and attend conferences	<b>E</b>

Please note that job descriptions cannot be exhaustive and the post-holder may be required to undertake other duties, which are broadly in line with the above key responsibilities.

Imperial College is committed to equality of opportunity and to eliminating discrimination. All employees are expected to follow the [7 Imperial Expectations](#) detailed below:

- 1) Champion a positive approach to change and opportunity
- 2) Encourage inclusive participation and eliminate discrimination
- 3) Communicate regularly and effectively within and across teams
- 4) Consider the thoughts and expectations of others
- 5) Deliver positive outcomes
- 6) Develop and grow skills and expertise
- 7) Work in a planned and managed way

Employees are also required to comply with all College policies and regulations paying special attention to:

- Confidentiality
- Conflict of Interest
- Data Protection
- Equal Opportunities
- Financial Regulations
- Health and Safety
- Information Technology
- Smoking
- Private Engagements and Register of Interests

They must also undertake specific training and assume responsibility for safety relevant to specific roles, as set out on the [College Website Health and Safety Structure and Responsibilities](#) page.

*The College is a proud signatory to the San-Francisco Declaration on Research Assessment (DORA), which means that in hiring and promotion decisions, we evaluate applicants on the quality of their work, not the journal impact factor where it is published. For more information, see <https://www.imperial.ac.uk/research-and-innovation/about-imperial-research/research-evaluation/>*

*The College believes that the use of animals in research is vital to improve human and animal health and welfare. Animals may only be used in research programmes where their use is shown to be necessary for developing new treatments and making medical advances. Imperial is committed to ensuring that, in cases where this research is deemed essential, all animals in the College's care are treated with full respect, and that all staff involved with this work show due consideration at every level.*  
<http://www.imperial.ac.uk/research-and-innovation/about-imperial-research/research-integrity/animal-research/>

*Committed to equality and valuing diversity, we are an Athena SWAN Silver Award winner, a Stonewall Diversity Champion, a Disability Confident Employer and work in partnership with GIRES to promote respect for trans people.*