

<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
<b>Job Family/Level:</b>	Research Associate
<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>Responsible to:</b>	Professor Costanza Emanuelli
<b>Key Working Relationships (internal):</b>	Members of the research group, Prof Enrico Petretto, Prof Prakash Punjabi, Cardiac Function Section administration, other academic staff, service departments, Internal research facilities
<b>Key Working Relationships (external):</b>	Prof Bussolati (University of Turin, Italy); Profs Gianni Angelini and Caputo (University of Bristol); Gavin Murphy (University of Leicester); members of the COST action in CardioRNAs, Prof Enrico Petretto
<b>Contract type:</b>	Full-time and fixed-term from 1 June 2020 to 30 November 2021

### **Purpose of the Post**

Every year, around 40,000 cardiac surgery operations are performed in the UK. Acute kidney injury (AKI) is an abrupt loss of kidney function and can affect up to 40% of cardiac surgery patients. In the most severe cases, AKI can lead to patient death soon after surgery and before discharge from post-operative intense care unit. Moreover, patients that have experienced AKI have a high risk of Chronic Kidney Disease (CKD) and might require support from a dialysis machine for the rest of their lives, or until receiving a kidney transplant.

Despite the potentially devastating effects of AKI in cardiac surgical patients, our understanding of the underlying processes is poor. Biomarkers that are able to predict its occurrence in time to adjust treatments are lacking. Moreover, specific and functional therapies for limiting the severity of AKI and its progression to CKD are still unavailable.

The researcher will make use of clinical samples (plasma and urine) from cardiac surgeries, and microRNA datasets and cell and mouse models to mechanistically investigate microRNAs (and their relationship with circular RNAs) as predictive biomarkers and therapeutic targets in AKI.

This research project at the National Heart and Lung Institute is funded by the Rosetrees Trust and led by Professor Emanuelli.

The project represents the extension of a Rosetree Trust-funded seed corn award and has a high potential for clinical translation.

### **Key Responsibilities**

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

- Grant proposal writing as co-PI (to extend the contract and to progress the research translational pathway)

- Supervision of Master 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 different techniques for microRNAs and circular RNA analyses in exosomes, cells, tissues and biofluids
- Preparation and characterisation of bioactive exosomes from the conditioned media of cultured cells and from human biological fluids (plasma, urine)
- Preparation and characterisation of microRNA-carrying lipoproteins from the conditioned media of cultured cells and from human biological fluids (plasma, urine)
- Cell culture and cell biology (kidney cells, including endothelial cells and pericytes)
- Datamining from GEO and similar platforms and consultation of publicly available resources for microRNA, GWAS, and epigenetic studies
- Bioinformatic analyses
- A wide range of molecular biology techniques, including but not limited to CHIP, RIP, cloning and preparation of plasmids
- Work on clinical samples (including writing and updating of H&S and ethic documents and MTAs for importing samples externally from imperial and IP document when appropriate)

The researcher will conduct and help design experiments on/using computation and laboratory approaches. The role will be supported by a wide range of internal and external collaborators. However, the researcher will need to challenge themselves in the first instance and to be able to develop innovative solutions and optimisation of the protocols and design.

A solid experience of molecular biology adapted to cardiovascular and/or renovascular cell biology are required.

The post will be familiar with wet-lab based approaches and techniques, especially for the study of microRNAs, and have a track record of independent bio-research, evidenced by a PhD in a related field and publications.

The researcher will be able to converse with several collaborators and learn from them how to develop project-oriented analyses.

The researcher 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 AKI ethology and prediction with focus on microRNAs and circular RNAs
- To develop and validate new models of extracellular circular RNAs and microRNAs-led cell-to-cell communications in the ischaemic and diabetic heart,
- To investigate miRNAs as AKI biomarker in the setting of cardiac surgery
- To culture kidney cells and to perform functional and expressional experiment with them.
- To optimise the preparation of exosomes and lipoproteins 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 by the projects
- To perform small and long RNA-sequencing
- To validate the miRNA arrays and RNA-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**

- 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

### **Person Specification**

<b>Requirements</b>	<b>Essential (E)/ Desirable (D)</b>
Candidates/post holders will be expected to demonstrate the following	
<b>Education</b>	
At Research Assistant level: a Master's degree in a Bioinformatic or Biomedical subject or equivalent industrial or commercial experience	<b>E</b>
At Research Associate level: PhD degree in a Bioinformatic or Biomedical subject or equivalent industrial or commercial experience	<b>E</b>

<b>Experience</b>	
Direct experience of cardiovascular and/or renovascular cell biology	<b>E</b>
Experience with molecular biology	<b>E</b>
Animal work	<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>E</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 and/or renovascular functions	<b>E</b>
microRNA and circular RNA analyses (different techniques)	<b>E</b>
Exosome production and analyses	<b>D</b>
Lipoproteins production and analyses	<b>D</b>
Library preparation for RNA-sequencing (small RNA, long RNA)	<b>D</b>
Bioinformatics	<b>E</b>
RNA-sequencing data analyses	<b>D</b>
Statistical analyses	<b>E</b>
Experience in programming	<b>D</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 (for short periods) 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.*