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Research Assistant/Associate

Department/Division/Faculty:	Mechanical Engineering, Applied Mechanics, Engineering
Campus/Location:	South Kensington
Job Family/Level:	Research Job Family, Research Assistant or Associate* (Research salary scale)
Responsible to:	Daniele Dini (Co-supervision also provided by Tian Yuan)
Key working Relationships (Internal):	Ferdinando Rodriguez y Baena, Yunlong Zhao, Mengxing Tang, Marco Brancaccio, and other researchers and colleagues on this project
Key Working Relationships (External):	The Griffin Institute (preclinical/large-animal research partner); project collaborators and clinical/industrial advisors, including members of the External Expert Advisory Board, as appropriate, ARIA (funding body)
Contract type:	Full time, Fixed term for up to 12 months in the first instance

Purpose of the Post

Funded by the UK Advanced Research + Invention Agency (ARIA) through its Massively Scalable Neurotechnology Programme, this Research Associate position will contribute to an ambitious, interdisciplinary project developing a radically new class of endovascular, electronics-free acoustic neural interfaces for minimally invasive, transcranial neural monitoring.

At Research Associate level: To carry out research in experimental testbed engineering (microfluidic and phantom fabrication), computational biomechanics and fluid-structure interaction modelling, and vascular biomechanics, undertake project management and/or supervise multi-disciplinary teams. The Research Associate will be expected to submit publications to refereed journals and to contribute to research funding proposals.

Key Responsibilities

Main Duties:

IMPERIAL

- Apply computational modelling, microfabrication and experimental testbed techniques for the collection and analysis of vascular, haemodynamic and acoustic data, informed by vascular imaging datasets.
- Design, fabricate and validate microfluidic vascular platforms and tissue-mimetic phantoms, and integrate these into functional experimental testbeds.
- Apply and extend established computational biomechanics and fluid-structure interaction (FSI) models to support device design, performance evaluation and vascular safety assessment.
- Utilise imaging-derived cerebral vascular geometries to develop physiological vessel models, phantom designs and experimental flow conditions.
- Conduct in vitro validation studies to assess device retention, vascular compatibility, mechanical safety and transcranial acoustic performance, and contribute to the development of endovascular delivery methodologies.
- Maintain accurate and complete records of all findings
- Assist with the writing of reports to research sponsors
- Present findings to colleagues and at conference.
- Provide advice to other staff and students.
- Assist with the publication of findings.
- Attend relevant workshops and conferences as necessary.
- Develop contacts within the College and the wider community.
- Promote the reputation of the Group, the Department and the College.

In addition, at Research Associate level:

- Take initiatives in the planning of research.
- Direct the work of small research teams.
- Write reports for submission to research sponsors.
- Submit publications to refereed journals.
- Provide guidance to staff and students.
- Provide guidance to PhD Students.
- Contribute to bids for research grants.
- Conduct and plan own scientific work with appropriate supervision.
- Maintain highly organised and accurate record of experimental Work.
- Actively participate in the research programme of the Group.
- Publish in high-quality journals and to present data at national and international meetings.
- Participate in Group research meetings and internal seminars.
- Collaborate with other allied scientists within Imperial College and elsewhere (including project partners at the Hamlyn Centre and the Griffin Institute) in London and abroad, as appropriate.
- Contribute to the smooth running of the Group's laboratories and, facilities with other scientists, clinicians, technicians and students within the laboratories.
- Assist in the supervision of undergraduate and postgraduate research students and research assistants as required.

Other Duties:

- To undertake any necessary training and/or development
- To undertake appropriate administration tasks
- To attend relevant meetings

IMPERIAL

Where Imperial or funder conditions necessitate, you will be required to complete timesheets for your work on projects in a timely manner.

Person Specification

Requirements	Essential (E)/ Desirable (D)
Candidates/post holders will be expected to demonstrate the following:	
Education	
Hold a PhD (or be close to completion of a PhD) in Mechanical Engineering, Biomedical/Bioengineering, or a closely related discipline, or equivalent research, industrial or commercial experience <i>*Candidates who have not yet been officially awarded their PhD will be appointed as Research Assistant.</i>	(E)
Experience	
Practical experience within a research environment and/or a publication record in relevant, refereed journals	(E)
Experience working effectively within multidisciplinary research teams and collaborating with academic, clinical, industrial, or other scientific partners	(E)
Hands-on experience in the design, fabrication, characterisation, and experimental integration of microfluidic devices and tissue-mimetic phantoms	(E)
Experience using additive manufacturing techniques, particularly SLA or DLP 3D printing, for the production of microfluidic devices, phantoms, or related components	(E)
Experience in computational biomechanics, fluid-structure interaction (FSI), or multiphysics modelling of vascular or soft-tissue systems, including model validation and adaptation to new geometries	(D)
Experience working with pre-clinical imaging datasets and/or image-based 3D anatomical or vascular reconstruction from MRI, CT, angiographic, or similar imaging modalities	(D)
Experience developing, characterising, or applying soft tissue-mimetic materials, including hydrogels or elastomers with tailored mechanical and/or acoustic properties	(D)
Experience in medical device, endovascular device, biosensor, or related healthcare technology development, with awareness of biocompatibility, safety, and regulatory considerations	(D)
Experience contributing to in-vivo or ex-vivo experimental studies, ideally involving vascular, neurological, or large-animal models	(D)
Knowledge	
Knowledge of vascular/soft-tissue biomechanics, haemodynamics, and fluid-structure interaction principles	(E)

IMPERIAL

Knowledge of research methods and statistical procedures relevant to experimental and computational validation	(E)
Knowledge of quantitative, precision experimental techniques, including measurement uncertainty, calibration and repeatability, to ensure rigorous and reproducible testbed data.	(E)
Knowledge of neurovascular physiology and/or neurovascular coupling mechanisms	(D)
Knowledge of ultrasound physics, acoustic wave propagation, or transcranial ultrasound principles	(D)
Knowledge of endovascular/interventional delivery principles (e.g. microcatheter-based vascular access and deployment)	(D)

Skills & Abilities

Ability to conduct a detailed review of recent literature	(E)
Ability to develop and apply new concepts	(E)
Creative approach to problem-solving	(E)
Excellent verbal communication skills and the ability to deal with a wide range of people	(E)
Excellent written communication skills and the ability to write clearly and succinctly for publication	(E)
Ability to organise own work	(E)
Ability to prioritise own work in response to deadlines	(E)
Strong numerical modelling skills (e.g. using COMSOL, ANSYS, Abaqus, or equivalent)	(D)
Practical engineering/workshop skills relevant to building, operating, and troubleshooting bespoke experimental rigs (fluidic, mechanical, and sensor/data-acquisition integration)	(E) (Associate)
Ability to direct the work of a small research team and motivate others to produce a high standard of work	(E) (Associate)
Willingness to work as part of a team and to be open-minded and cooperative	(E)
Flexible attitude towards work	(E)
Discipline and regard for confidentiality and security at all times	(E)
Willingness to undertake any necessary training for the role	(E)
Willingness to travel both within the United Kingdom and abroad to conduct research (including to the Griffin Institute for large-animal studies) and to attend conferences	(E)
Willingness to work out of normal working hours (including weekends) if the requirements of the project demand	(E)
Programming/scripting skills (e.g. Python, MATLAB) to automate image processing, simulation workflows, or data analysis	(D)

Further Information

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.

[Our values](#) are at the root of everything we do and everyone in our community is expected to demonstrate Imperial:

- Respect
- Collaboration
- Excellence
- Integrity
- Innovation

Employees are also required to comply with all Imperial policies and regulations.

We are committed to equality of opportunity, to eliminating discrimination and to creating an inclusive working environment for all. We encourage candidates to apply irrespective of age, disability, marriage or civil partnership status, pregnancy or maternity, race, religion and belief, gender reassignment, sex, or sexual orientation. You can read more about our commitment [on our webpages](#).

Imperial 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/>

Imperial 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 which are ultimately aimed towards finding new treatments and making scientific and medical advances, and where there are no satisfactory or reasonably practical alternatives to their use. Imperial is committed to ensuring that, in cases where this research is deemed essential, all animals in our care are treated with full respect, and that all staff involved with this work show due consideration at every level. [Find out more about animal research at Imperial](#).

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