Applications are invited from suitably qualified candidates for a full-time fixed term Research Associate position on the Computational Biomechanics of a Polymer-based Aortic Valve Replacement at the Biomechanics Research Centre (BioMec), College of Engineering and Informatics, University of Galway. This position is funded through an Enterprise Ireland Disruptive Technology Innovation Fund (DTIF) collaborative project, PolyValve, whose aim is to develop a next-generation polymer-based transcatheter aortic valve. The position is available immediately to the 13th November 2024.

Transcatheter aortic valve replacement (TAVR) is a procedure to replace the damaged heart valve of a patient with valvular heart disease. It is an alternative approach to invasive open-heart surgery, especially for patients who are high risk for surgery. Current TAV devices use animal-derived pericardium tissue as the leaflet material, either from bovine or porcine origin. However, these leaflets are costly to produce as the manufacturing process requires chemical processing and hand suturing to TAV frames, with further oncoming market barriers of availability and supply. This overarching aim of this project is to develop a sutureless polymeric transcatheter aortic valve (‘PolyValve’) that will ensure the availability of cost-effective and high-quality polymer based TAV for aortic valve replacement.

This research will be conducted using the equipment, technical expertise, office and research space within the Biomechanics Research Centre in the School of Engineering at University of Galway. The Alice Perry Engineering building houses state-of-the-art Biomedical Engineering facilities including cell culture laboratories, biomechanical testing laboratories, micro-CT scanning, microscopy, research space and computer suites.

**Job Description:**
The successful candidate will be involved in the computational design, development and verification of the TAV stent frame, polymer leaflet geometries and the integrated TAV and delivery system. The successful candidate will be experienced in the development of computational models of polymer and/or metallic medical devices. The successful candidate will be responsible for in-vitro testing of synthetic valve system through both hydrodynamic flow testing and accelerated wear (durability) testing. Prospective candidates should be highly-motivated to participate in research and development related medical devices. The candidate will work closely with industrial and academic collaborators within the PolyValve consortium.

**Duties:**
The successful candidates will:
- Develop Finite Element Models of a polymer-based TAV device to allow for understanding and measurement of iterative changes on industry developed cardiovascular medical devices.
- Conduct design verification activities, including in-vitro hydrodynamic testing and durability testing of the polymer-based TAV device according to ISO-5840
- Be responsible for preparation of project reports on project deliverables.
- Actively participate in national/international conferences and meetings.
- Publish data in high impact factor journals and/or protect new intellectual property.
Qualifications/Skills required:

**Essential Requirements:**
- Applicants must have a primary degree and masters in mechanical or biomedical engineering, or a related discipline.
- 4+year’s research/industry experience in computational modelling of polymer-based medical devices.
- Applications must have a strong background in the Abaqus Finite Element software, or similar and must have experience in engineering programming languages (e.g. Fortran, C, Matlab, Python).
- Applicants must have a strong background in non-linear constitutive models and theory, such as elasto-plasticity, super-elasticity and/or visco-elastic behaviour.
- Applicants should have experience in experimental testing of materials and/or medical devices according to ISO standards.
- Applicants must have experience in computer aided design (CAD) packages (e.g. Autodesk Inventor/Solidworks).
- Applicants must have evidence of peer-reviewed journal publications in the area of medical devices.
- Applicants should have experience in experimental testing of materials and/or medical devices according to ISO standards.
- Applicants must have experience in computer aided design (CAD) packages (e.g. Autodesk Inventor/Solidworks).
- Applicants must have evidence of peer-reviewed journal publications in the area of medical devices.
- Applicants should have excellent communication and organizational skills and should be highly motivated and passionate about development of advanced computational engineering solutions.

**Desirable Requirements:**
- PhD in engineering.
- Experience in experimental testing of cardiovascular implants according to ISO-5840.
- Experience of working on industry-related projects, or in collaboration with industry.

**Salary:** €39,522 to €46,907 per annum pro rata for shorter and/or part-time contracts (public sector pay policy rules pertaining to new entrants will apply).

**Start date:** Position is available immediately

**Continuing Professional Development/Training:**
Researchers at University of Galway are encouraged to avail of a range of training and development opportunities designed to support their personal career development plans.

Further information on research and working at University of Galway is available on [Research at University of Galway](http://research.universityofgalway.ie)

For information on moving to Ireland please see [www.euraxess.ie](http://www.euraxess.ie)

Informal enquiries concerning the post may be made to Dr. Ted Vaughan at ted.vaughan@universityofgalway.ie

**To Apply:**
Applications to include a covering letter, CV, and the contact details of three referees should be sent, via e-mail (PDF attachments only) to Dr. Ted Vaughan at ted.vaughan@universityofgalway.ie

Please put reference number **University of Galway-281-22** in subject line of e-mail application.

**Closing date for receipt of applications is 5.00 pm, 8th November 2022**

All positions are recruited in line with Open, Transparent, Merit (OTM) and Competency based recruitment.

National University of Ireland, Galway is an equal opportunities employer.