Candidate Information

Position:	Research Fellow in Computational Biomechanics/Tissue Engineering
School/Department:	School Office (Mech & Aerospace)
Reference:	22/110242
Closing Date:	Monday 3 October 2022
Salary:	£35,333 per annum
Anticipated Interview Date:	Friday 14 October 2022
Duration:	12 Months Fixed Term

JOB PURPOSE:

In collaboration with Trinity College Dublin, the postholder will conduct research to support the CARTREGEN Project which will involve modelling and fabrication of microfibre reinforced composite constructs for repair and regeneration of articular cartilage. They will develop a validated computational framework to fabricate optimised composite constructs for articular cartilage tissue engineering.

The QUB team will develop the computational optimisation framework based on microscale homogenization of the composite structures and then leverage this framework to design regenerative construct biomechanical properties mimetic of the native tissue. The TCD team will provide experimental input to the modelling and then fabricate the optimised structures informed by the modelling, thereby validating the computational model. The developed optimised constructs will be assessed for their cartilage regeneration potential through in vitro studies.

MAJOR DUTIES:

1. Undertake research under supervision within the CARTREGEN project or as a member of a research team
2. Design and develop the computational optimisation framework based on microscale homogenization of the composite structures for cartilage tissue engineering
3. Carry out analyses, critical evaluations, and interpretations of experimental data and the literature using methodologies and other techniques appropriate to the area of research
4. Produce high quality research outputs consistent with project aims and commensurate with career stage. This will include collaborating and co-authoring with PI and the project team (as appropriate) on outputs.
5. In consultation with the project team, promote research milestones and outputs at national and international conferences and through social media (where applicable).
6. Assist grant holder in the preparation of funding proposals and applications to external bodies.
7. Carry out occasional educational supervision, demonstrating or lecturing duties within the post holder's area of expertise and under the direct guidance of a member of academic staff.
8. Undertake supplementary duties relevant to the success of the project including administrative duties and additional training and development activities as required.

ESSENTIAL CRITERIA:

1. Normally have or be about to obtain a PhD in computational biomechanics, biomaterials, tissue engineering, 3D (bio)printing or a related subject.
2. At least 3 years relevant research experience to include
   • Undertaking research in the area of nonlinear computational (bio)mechanics and/or multiscale modelling of soft/hard tissues.
   • A proven track record in numerical modelling, solid mechanics and using finite element software such as Abaqus, Comsol Multiphysics or Ansys.
   • Working effectively as part of a research team in the development and promotion of the research theme.
3. Strong publication record commensurate with stage of career.

4. Proven ability to:
   - Contribute to broader management and administrative processes.
   - Contribute to the School's outreach programme by links with industry, community groups etc.
5. Willingness to undertake additional training in research methods and other related skills as required.
6. Practical problem solving skills, independence of thought and initiative.
7. Ability to communicate complex information effectively in oral and written format.
8. Ability to build relationships to develop internal and external networks.
9. Ability to assess and organise resources.

DESIRABLE CRITERIA:

1. Experience in 3D (bio)printing, hydrogels, tissue engineering, cell culture, mechanical testing, histology techniques, etc.