Applications are invited for the following 2xPhD studentships for the following project:

**Mechanically Activated Extracellular Vesicles as a Multi-targeted Therapy to Enhance Bone Regeneration**

The position will be based within the Hoey Lab at the Trinity Centre for Biomedical Engineering, Trinity College Dublin within the Advanced Materials and Bioengineering Research Centre (AMBER) centre.

**Summary of project:** Every 3 seconds a person suffers an osteoporosis-related bone fracture, resulting in significant morbidity, mortality, and health-care costs. Osteoporosis arises when there is an imbalance between resorption and formation resulting in net bone loss. Current therapeutics are limited in efficacy and by side-effects. A potent regulator of bone formation and repair is physical loading. Bone cells sense mechanical stimuli and subsequently coordinate net bone gain by secreting multitargeted paracrine factors. Recent findings by our group indicates that these factors are delivered via extracellular vesicles (EV), which are membrane bound cargoes that facilitate cell-cell communication. Therefore, this research aims to develop a novel EV based multitargeted therapy that mimics the beneficial effects of physical exercise, by inhibiting osteoclastogenesis and bone resorption, while also enhancing angiogenesis, osteogenesis and bone formation. The identification of EVs and associated components as central to loading-induced bone anabolism will lead to the direct manipulation of multiple cell types via mechanically-activated EV based therapeutics. These therapeutics would therefore be used as a novel multitargeted strategy to treat osteoporosis. Furthermore, these EVs will be incorporated into scaffolds, generating innovative mechanobiomimetic materials for bone regeneration.

The ideal applicants will have a 1st Class Honours Bachelor’s degree in Biomedical/Mechanical Engineering or the Biomedical Sciences (or related disciplines). Experience in bone mechanobiology, extracellular vesicles, omics analyses, biomaterials, and tissue engineering would be advantageous but not essential. Specific skills that would enhance a candidate’s application would include experience in some of the following areas: Cell culture and associated techniques; small animal bone models, histological and imaging techniques; electrospinning; advanced microscopy; RT-PCR.

The researcher will work closely with other members of a multidisciplinary project team including PIs, postdoctoral and postgraduate researchers within this TCBE & AMBER research cluster. Excellent written and oral communication skills are essential.

**How to apply:**
CVs with the names and addresses of three referees should be e-mailed to: Prof. David Hoey; E-mail: dahoey@tcd.ie

Positions will remain opened until filled but preferred start date is September 1 2020. Only short-listed applications will be acknowledged.

This position is funded by Science Foundation Ireland’s Frontiers for the Future Programme.

The AMBER research centre, as a community of researchers, welcomes its responsibility to provide equal opportunities for all. We are actively seeking diversity in our research teams and particularly encourage applications from underrepresented groups.