

QUB - Mechanical and Aerospace Engineering PhD Project Description

Title: Optimising mechanical properties and degradation profile of orthopaedic bone repair devices harmonised with tissue regeneration.	
Theme: Bioengineering	
<p>Project description:</p> <p>Bioresorbable materials are rapidly gaining traction in bone repair/regeneration devices as they reduce the need for revision surgeries and avoid biocompatibility issues associated with conventional permanent implants. Polymer, ceramic and metal-based bioresorbable alternatives have been developed for medical device applications, however, major issues relating to their poor mechanical properties and non-optimised degradation behaviour have limited their application in the medical technology sector. Within the QUB Bioengineering Research Group we aim to develop improved bioresorbable materials and implement them in orthopaedic applications. The development of these technologies requires a multi-disciplinary understanding of complex areas such as biomaterial science, engineering, biology and medicine. This PhD represents an opportunity to become a highly trained early stage researcher who will develop skills to contribute to the field of medical implants and to exploit the potential of bioresorbable implants for societal and economic benefit.</p> <p>Aims and Objectives: Develop the next generate of bioresorbable technology for orthopaedic applications via design, fabrication and testing of hybrid combinations which utilise the combined benefits of polymer, ceramic and metal bioresorbable materials.</p>	
Key skills required for the post: Broad engineering skills/knowledge that can be advanced into the field of bioengineering. Enthusiasm to work as part of a multidisciplinary team with focus on healthcare technologies to improve quality of life for patients suffering trauma and brittle bone disease (osteoporosis).	
Key transferable skills that will be developed during the PhD:	
Lead supervisor:	Professor Fraser Buchanan
Other supervisor(s):	Second/third supervisors will be members of MATCH and provide multidisciplinary expertise/facilities (www.qub.ac.uk/ MATCH/)
Funding mechanism:	Yet to be secured
Application closing date:	Dependent on appointment of suitable candidate
Guaranteed stipend:	This can include a basic stipend and any guaranteed top-up (if available). N.B. Stipend for 20-21 is not yet confirmed. Base stipend for 19/20 is £15,009.
Conditional top-up available:	Not yet confirmed
PhD students in the School may have the opportunity to apply to be demonstrators on undergraduate modules. Compensation for this can amount to in excess of £2,400 per year.	

Queens University Belfast is a diverse and international institution which is strongly committed to equality and diversity, and to selection on merit. Currently women are under-represented in research positions in the School and accordingly applications from women are particularly welcome.