

Project Ambition

BioImplant Innovative Training Network (ITN) is an ambitious European Industrial Doctorate programme that will provide world-class multidisciplinary training to 12 Early-Stage Researchers (ESRs) in the area of bioabsorbable medical implant development.



The research vision of the BioImplant ITN is to use an integrative approach that combines polymer-, metal- and ceramic-based bioabsorbable materials, to deliver functionally superior bioabsorbable materials with enhanced mechanical behaviour and controllable degradation profiles. The successful development of these materials has the potential to form the basis for the next-generation of medical implants.

Research Objectives

The scientific objective of the BioImplant ITN is to develop and implement improved bioabsorbable materials for vascular and orthopaedic implant applications. This next-generation of medical implants will be realised through technological innovation throughout the Supply Value Chain, including novel material development, advanced manufacturing technologies, robust characterisation and predictive capabilities and innovative application design. The specific research objectives of the BioImplant ITN are as follows:

1. Enhance the mechanical properties of polymer-based bioabsorbables through novel processing technologies.
2. Control degradation rates of magnesium-based bioabsorbable materials through innovative polymer and ceramic coating technologies.
3. Develop novel metal- and ceramic-based polymer composite bioabsorbables that exhibit superior mechanical properties to traditional polymers using advanced manufacturing technologies.
4. Predict degradation and long-term mechanical performance of implanted bioabsorbable devices using an integrated multiscale and multiphysics predictive modelling framework.
5. Design, prototype and functionally test a series of small- and large-scale bioabsorbable implants for vascular and orthopaedic applications.

Training Project

The specific training objectives (TOs) of the programme have been identified as follows. Each ESR will develop core technical skills throughout all elements of the Supply Value Chain (see Figure 1.3), i.e. (i) Materials development, (ii) Manufacturing processes, (iii), Characterisation and (iv) Application Design, which will be acquired locally within host academic and industrial environments and secondment opportunities, based on the scientific objectives outlined within each ESR project.

Provide advanced technical skills training to ESRs on advanced topics in all core elements of the Supply Value Chain through network-wide training events, delivered based on the complimentary expertise of consortium participants.

Deliver key transferable skills to ESRs in areas such as communication and dissemination through a series of network-wide training events to enable ESRs to excel in both academic and non-academic environments.

Provide network-wide training on interdisciplinary aspects of medical implant development, such as clinical engagement and commercialisation/entrepreneurship.

Promote international mobility of ESRs through inter-sectoral placement and secondment opportunities between participating countries of the consortium

Impact

Currently, the Medical Technology sector employs over 650,000 people across the EU and files more patent applications with the European Patent Office than any other technical field. It is expected that the continuing innovation and development within this emerging sector will lead to extensive job opportunities across the EU for all ESRs. The technical expertise, transferrable skills and international experience the BioImplant ITN will provide to the ESR community will make them highly attractive to potential employers across academic, industry, regulatory and clinical settings in the Medical Technology sector

Who Are We Partner Organisations

Contact

Website:
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Innovative Training Network
Developing Next-Generation
Bioresorbable Medical Devices

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