Project Title: 3D printing biodegradable coronary stents with continuous wire reinforced filament

Project Description:
Biodegradable stent implants are an innovative development for the treatment of various narrowing and obstructions without secondary removal surgery. One of the biggest challenges, however, is the weakness of biodegradable polymer materials. Compared to traditional metallic stents, polymeric stents have a much thicker stent strut to have sufficient mechanical strength. The thickness of the strut leads to an increased thrombosis rate, reduced flexibility, and increased difficulties in deployment.

Material Research Institute at Athlone Institute of Technology in Ireland has a core focus on polymer materials research, drug delivery technologies, thermoplastic composites, product design, additive manufacturing, construction and renewable materials and biomedical polymers in addition to providing contract and bespoke testing for industrial partners. The team led by Dr Yuanyuan Chen is funded by the Science Foundation Ireland and the Irish Research Council to investigate reinforced polymer composites for use in biodegradable stent implants.

This project is designed to construct or modify an FDM 3D printer to print stents with the reinforced materials and characterize the printed stents. Successful PhD candidate will receive structured training program, including biomaterial development and characterization, cytotoxicity, 3D printing technology, Data Analysis, Innovation and Research Commercialisation, academic writing etc. This funding covers a PhD stipend of €1000 per month, Postgraduate Fees of €5750 per year, and a materials/travel budget of €1500 per year, for 4 years (48 months).

Duration of Project: 48 months

Funding Agency: AIT Presidents Doctoral Scholarship

Type of Degree Offered: PhD

Minimum Qualifications/Experience Necessary/Any Other Requirements: [list relevant undergraduate programmes]

Candidates with primary degrees in Electronic Engineering, Mechanical Engineering, or Material Engineering.

Minimum classification of 2.1 honours or equivalent.

IELTS [International English Testing System] Applicants must have a minimum of 6.0 with no component score less than 6.0.
Research Supervisors: Dr Yuanyuan Chen

For further information please contact: yuanyuanchen@ait.ie

Download Application Form at
https://www.ait.ie/research-and-innovation/postgraduate-research-opportunities

Closing date for receipt of completed application forms is 30th July 2021

Please submit your completed application: pro@ait.ie
Please reference Project Title in all correspondence.