



Thesis Project Form

Title (tentative): Monitoring Electrospun Small Diameter Vascular Prosthesis with Iron Oxide Nanoparticles

Thesis advisor(s): Pastorino Laura, Pierfrancesco Ferrari

E-mail: Laura.Pastorino@unige.it

Address: Via Opera Pia 13

Phone: (+39) 010 33 56547

Description

Motivation and application domain

This thesis project focuses on fabricating a small diameter (5 mm) vascular prosthesis using electrospinning technology. The scaffold is engineered from a blend of polycaprolactone (PCL) and poly(glycerol sebacate) (PGS), integrated with iron oxide nanoparticles for MRI traceability and quercetin to improve bioactivity and antioxidant effects. This aims to enhance graft

General objectives and main activities

The main objective of this proposal is the fabrication and characterization of a vascular prosthesis produced via electrospinning, engineered with iron oxide nanoparticles for MRI monitoring and quercetin for its anti-inflammatory properties. The experimental work will focus on the electrospinning of a blend of two biomedical-grade polymers combined with iron oxide nanoparticles, the synthesis of the nanoparticles themselves, and a comprehensive set of characterization techniques. These will include scanning and transmission electron microscopy, FT-IR spectroscopy, X-ray diffraction, vibrating sample magnetometry (VSM), dynamic mechanical analysis, and in vitro testing.

Training Objectives (technical/analytical tools, experimental methodologies)

To gain practical experience in biofabrication and characterization of biongnieered scaffolds.

Place(s) where the thesis work will be carried out: DIBRIS and DICCA

Additional information

Maximum number of students: 1