

MASTER THESIS IN MATERIAL SCIENCES

developing electrospun scaffolds for tissue engineering

Tissue Engineering was defined in 1993 by Robert Langer as “an interdisciplinary field that applies principles and methods of engineering and life sciences towards the development of biological substitutes that restore, maintain and improve the function of damaged tissues and organs”. Crucial for tissue development is the generation of an appropriate (polymer) substrate. Interdisciplinary teams of engineers, material scientists and life scientists collectively work on the development of substrates with tunable and customer tailored chemical and mechanical characteristics, opening the completely new and highly future-looking field of biomaterials. A joint project of the Empa St. Gallen and the Department of Cardiovascular surgery at the University of Bern focus on the development and functionalisation of electrospun scaffolds for cardiac repair.

In the current master thesis, scaffolds of varying porosity and surface coatings will be developed and analysed.

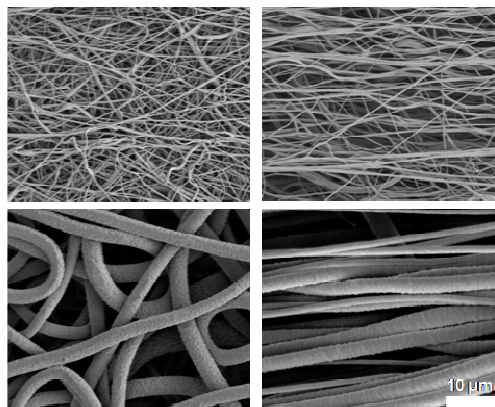
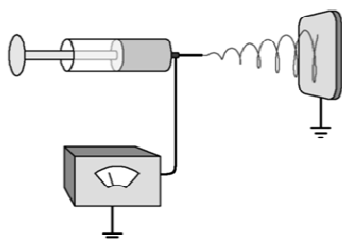
Aim: A) Develop and characterise a highly porous scaffold (>90% porosity)
B) Develop and characterise a plasma coated electrospun scaffold

Techniques: Electrospinning, plasma coating, porosity measurements, SEM, XPS and other analytical methods.

Demands: We are looking for one highly motivated student, open to work in an interdisciplinary field and curious to learn new techniques in polymer processing and materials analysis. The master thesis will last for 6 months and will be accomplished at the EMPA St. Gallen.

Start: As soon as possible or by arrangement.

Candidates are asked to send their application via email (reference Master Electrospinning) to Dr G. Fortunato (giuseppino.fortunato@empa.ch) and G. Guex (geraldine.guex@dkf.unibe.ch).



Electrospinning allows the production of fibres in the micrometer or nanometer range. SEM images represent substrates for cell culture, differing in fibre size and orientation.