



PRESENTACIÓN PROYECTO DE TESIS

Doctorado en Ciencias Físicas

Multi-scale mechanical properties of electrospun functional biomaterials

Martín Alonso Chavarría Vidal

COMISIÓN PROYECTO DE TESIS

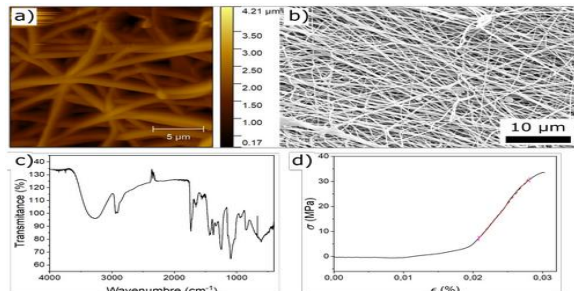
Dr. Cristian Acevedo, Evaluador .

Dr. Francisco Peña, Evaluador.

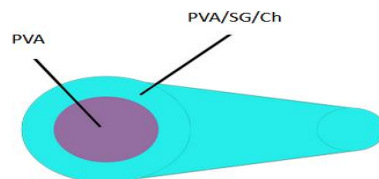
Dra. Odette Toloza, Evaluador.

Director Proyecto de Tesis

Dr. Tomás Corrales.



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Resumen: This thesis will focus on the mechanical properties of biomaterials fabricated by electrospinning. Electrospinning is a technique that consists of a polymer-loaded syringe subjected to an electric field large enough to break the surface tension of the solution. When electrostatic forces are strong enough, a polymer solution jet is ejected onto a collector, where electrospun nanofibers are finally deposited. We will fabricate electrospun membranes, made from different types of polymers. Our main goal is to produce coaxial nanofibers, i.e., composed of a core and shell formed by different polymers. With these coaxial nanofibers we aim to produce a biomaterial with electromechanical actuation properties, which in turn, could be used for biological applications, e.g., tissue engineering.

We will study the multi-scale mechanical properties of our biomaterials using Atomic Force Microscopy (AFM) and mechanical traction experiments. The AFM will allow us to study nanoscale mechanics in dry and liquid medium using force spectroscopy AFM. In force spectroscopy mode, the AFM cantilever interacts mechanically with a single point on the sample, and the force versus tip-sample distance is recorded. Furthermore, we will explore ways of making single cells interact with a biomaterial using Fluidic Force Microscopy (FluidFM). FluidFM consists of a technique that can micro-manipulate single cells and is based on a microfluidic AFM system..

Viernes 26 de abril de 2024 - 12:00 h.
Sala de conferencias Dr. Luciano Laroze (E300)
Departamento de Física - UTFSM