

Engineer / Master degree internship

Titre/Title	Biological characterization of superhydrophobic electrospun biomaterials for tissue engineering
Encadrant(s) / Supervisor(s)	Timothée BAUDEQUIN
Laboratoire/Laboratory	Biomechanics and Bioengineering (BMBI)
Mots clés/Key words	Biomaterials, electrospinning, cell culture, hydrophobicity
Descriptif du sujet/ Project description	<p>We propose an internship (6 months, starting in February 2025) in the Biomechanics and Bioengineering laboratory (Université de Technologie de Compiègne, France) in the Cells – Biomaterials – Bioreactors team.</p> <p>Biomaterials based on electrospinning, a fabrication method of polymeric nanofibers, are commonly investigated for tissue engineering applications as they closely mimic the architecture of the extracellular matrix. They are also highly versatile: electrospinning can be applied to many different polymers and the fibers' properties can easily be tuned (diameter, alignment, nanoparticle addition...).</p> <p>Innovative electrospun biomaterials have recently been developed in the BMBI laboratory thanks to specific compositions and architectures leading to increased hydrophobicity and/or watertightness. Such properties can be really useful for some tissue engineering applications, to prevent leakage of biological fluids or to reduce cell adhesion on specific surfaces of implantable devices. First results are promising but these biomaterials require further characterization: quantification of hydrophobicity, evaluation of cytotoxicity and cell adhesion, homogeneous distribution of nanoparticles, etc. In this context, the intern will be in charge of some of the characterization steps while being involved in the preparation of the biomaterial samples.</p> <p>The internship will therefore include mostly sterile cell culture experiments (BSL-2) in contact with the biomaterials and various biological characterization methods (cell viability, metabolic activity, fluorescence immunostaining with image processing for quantification) as well as physico-chemical characterization (FTIR, electron microscopy, pressure assays...)</p> <p>Expected background: Cell biology, biomaterials, interest in pluridisciplinary approaches; good writing and synthesis skills, proficient in English. A first experience in cell culture would be an advantage but the intern will be trained for BSL-2 experiments (and for all the characterization methods involved) at the beginning of the internship.</p>
Possibilité de poursuite en thèse/ Possibility of continuing in PhD	No