

PHD POSITION IN THE CONTEXT OF AN FWO RESEARCH PROJECT

“ELECTROSPUN SCAFFOLDS MEET NON-THERMAL PLASMA: A COMPREHENSIVE APPROACH FOR SKIN REGENERATION AND INFECTION CONTROL IN CHRONIC WOUND”

PROMOTORS:

- Prof. dr. ir. Nathalie De Geyter – Research Unit Plasma Technology (RUPT), Faculty of Engineering and Architecture, Ghent University, Belgium
- Dr. Maryam Nilkar – Research Unit Plasma Technology (RUPT), Faculty of Engineering and Architecture, Ghent University, Belgium

We are seeking a highly motivated PhD candidate to join an interdisciplinary project that combines plasma technology with advanced biomaterials to address the clinical challenges of chronic wounds. This research focusses on the development of tissue engineering scaffolds enhanced with plasma-polymerized coatings and biomolecules for improved skin regeneration, along with the generation of plasma-treated liquids for enhanced antimicrobial action.

CONTEXT:

Chronic wounds remain a major healthcare concern worldwide, due to prolonged healing times, infection risks, and high treatment costs. Traditional therapies often fail to meet clinical expectations. This project introduces a novel strategy by integrating electrospun scaffolds with cold atmospheric pressure plasma technologies. The scaffolds will be functionalized with plasma-polymerized coatings and biomolecules to promote skin regeneration. In parallel, plasma-treated liquids (PTLs) enriched with reactive oxygen and nitrogen species (RONS) will be developed for targeted antimicrobial efficacy. The project is structured into 4 work packages:

- WP1: Fabrication of biocompatible electrospun scaffolds optimized for cellular interaction
- WP2: Surface functionalization using aerosol-assisted plasma polymerization, incorporating bioactive molecules
- WP3: Development of PTLs containing selective RONS with antimicrobial properties
- WP4: Evaluation of the combined therapeutic potential in wound models, with emphasis on tissue healing and biofilm prevention

This integrated approach aims to deliver a synergistic wound healing platform with long-lasting antimicrobial effects.

JOB DESCRIPTION:

The PhD student will be responsible for:

- (1) Developing electrospun tissue engineering scaffolds
- (2) Coating nanofibrous scaffolds via plasma polymerization
- (3) Conducting surface characterization of scaffold materials
- (4) Preparing and characterizing plasma-treated liquids for antimicrobial applications
- (5) Investigating in vitro performance of scaffolds and PTLs using wound healing models

You will collaborate closely with experts in plasma science, microbiology, and tissue engineering.

CANDIDATE PROFILE:

We welcome candidates who:

- Hold (or are final-year students in) a Master's degree in biomedical engineering, biomedical sciences, chemistry, (applied) physics, engineering or materials engineering
- Have excellent academic results
- Have interest in plasma medicine, tissue engineering, polymer chemistry, surface modification, plasma physics and/or plasma chemistry
- Demonstrate a clear interest in experimental, interdisciplinary research
- Are fluent in English, supported by a validated certificate
- Are eager to develop expertise in plasma physics or chemistry, biomaterials, and regenerative medicine

BENEFITS:

- Work on a cutting-edge, interdisciplinary research project
- Be part of an international team with access to high-class laboratories and facilities
- Receive a competitive PhD scholarship
- Benefit from training programs, skills development workshops, and active participation in (inter)national conferences

ABOUT THE RESEARCH UNIT PLASMA TECHNOLOGY:

You will work at The Research Unit Plasma Technology (RUPT), Department of Applied Physics, Faculty of Engineering and Architecture at Ghent University. RUPT has a strong international reputation in cold atmospheric pressure plasmas and leads innovative research across applications in biomedicine, materials science, and environmental technology.

APPLICATION:

For further information, contact Prof. dr. ir. Nathalie De Geyter at nathalie.degeyter@ugent.be.

To apply, submit your cover letter, transcript of records, and detailed CV by July 20th, 2025 to Dr. Karen Leus at karen.leus@ugent.be using "FWO project application" as the subject line.