DC9: Synthesis and design optimisation of biobased furan (co)polymers for advanced scaffolding

Host institution: University of Groningen, Groningen, Netherlands

Supervisor: Dr. Dina Maniar

Co-supervisors: Prof. Katja Loos (University of Groningen), Prof. Mathias Destarac (CNRS-SOFTMAT)

Project description: Chronic wound infections remain a major clinical challenge, requiring advanced materials that combine structural functionality with antimicrobial and regenerative properties. However, the development of sustainable and biocompatible materials for such applications is still limited by the availability of suitable polymers with tunable properties.
This PhD project focuses on the design and synthesis of biobased furan-derived (co)polymers as sustainable alternatives for advanced scaffolding applications. The work will explore the development of a library of furan-based polymers with tailored mechanical properties, degradability, and processability, suitable for biomedical use. Particular attention will be given to optimising polymer structure and composition to meet the requirements of additive manufacturing techniques.

A key objective is to establish structure-property relationships that enable the controlled design of polymers for scaffold fabrication, ensuring compatibility with advanced manufacturing methods and target tissue properties. The project will also investigate the performance of these materials in scaffold production, with emphasis on their suitability for tissue engineering applications.

The doctoral candidate will be trained in polymer synthesis, materials characterisation, and additive manufacturing technologies. The outcomes will contribute to the development of sustainable, high-performance biomaterials for advanced wound care solutions within the broader HEAL-4WARD programme.

Host laboratory:

The successful candidate will be employed by the University of Groningen (The Netherlands) and enrolled in the PhD programme of the Faculty of Science and Engineering. The position is embedded within the Zernike Institute for Advanced Materials, an interdisciplinary research institute that brings together expertise in physics, chemistry, and materials science.

The PhD candidate will join the Maniar Group (https://www.rug.nl/research/zernike/macromolecular-chemistry-and-new-polymeric-materials/maniar-group/), part of the Macromolecular Chemistry and New Polymeric Materials research cluster. The group offers a collaborative and international research environment, comprising members from diverse nationalities and academic backgrounds. It focuses on the design, synthesis, and characterization of advanced polymeric materials, with a strong emphasis on sustainability and innovation in polymer chemistry.

Secondments: This project is carried out in collaboration with the following groups, and visits to their laboratories are expected during the project. A willingness to travel and spend time abroad is therefore essential:

- Dr. Vincenzo Taresco, University of Nottingham, Nottingham, United Kingdom
- Prof. Mathias Destarac, CNRS-SOFTMAT, Université Toulouse III – Paul Sabatier, Toulouse, France

Eligibility conditions:

- Master's degree in Polymer Chemistry, Materials Science, Chemistry, Chemical Engineering or related fields.
- Applicants must be doctoral candidates, i.e not already in possession of a doctoral degree.
- Mobility rule: researchers must not have resided or carried out their main activity in the country of the recruiting beneficiary for more than 12 months in the 36 months immediately before their recruitment date.

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Required skills:

- Experience in polymer synthesis and characterisation (e.g. polycondensation, copolymerisation, NMR, SEC, thermal analysis), ideally demonstrated through Master's thesis work or research internships.
- Familiarity with structure-property relationships in polymeric materials and their processing would be beneficial.
- Prior exposure to biomaterials or additive manufacturing (e.g. 3D printing of polymers) is an advantage.
- Proficiency in the English language is required, as well as good communication skills, both oral and written. Successful candidates will need to provide an English test (e.g. IELTS, TOEFL, Cambridge English). You may be exempt if you are a national of a majority native-English speaking country, or have qualifications / degree that has been taught and assessed in English. The supervisor may also confirm that a candidate has the required level of English.

Remuneration:
The Doctoral Candidate will receive a gross monthly salary starting from EUR 3,059 in accordance with the MSCA Doctoral Networks programme, including a living allowance and a mobility allowance. The salary will increase annually during the appointment (up to EUR 3,881 in year 4). This amount corresponds to the contractual gross salary and is indicated before deduction of employee taxes and social security contributions. An additional family allowance (if applicable) is foreseen. The net salary will depend on local taxation, social security and employment regulations.

Enquiries:
For general information about the HEAL-4WARD Doctoral Network visit the project website (www.heal-4ward.eu) or send an email to heal4ward@gmail.com. For additional information on this project please contact Dr. Dina Maniar (d.maniar@rug.nl).

How to apply
To learn more about the application process, visit the HEAL-4WARD recruitment web page (www.heal-4ward.eu/open-positions).

Required documents:

- Statement of interest (limit of 2,500 characters) explaining why you wish to be considered for the fellowship and which qualities and experience you will bring to the role.
- Curriculum vitae et studiorum.
- A certificate of University examinations taken (with marks).
- A final degree certificate translated in English. If, at the time of application, candidates should not be yet in possession of a degree certificate, they can submit it at the time of the examination.

A limited number of applicants will be invited for an interview and will be required to provide contact information of up to two contact person for reference letters.

Application deadline: The closing date for applications is **30 June 2026.**