

Multiomics and Artificial Intelligence for Early Diagnosis of Osteoarthritis

Position: PhD candidate

Location: Maastricht University, Maastricht, The Netherlands

Job Description:

The department of Cell Biology-Inspired Tissue Engineering (cBITE) at the MERLN Institute for Technology-inspired Regenerative Medicine at Maastricht University in the Netherlands invites applications for a PhD position. We seek a motivated and talented PhD candidate to join our dynamic research team as part of the KIC CircBioCare project, which is dedicated to advancing early diagnosis methods for osteoarthritis (OA). This exciting project aims to develop innovative proteomic strategies to detect biomarkers associated with the onset of OA, leveraging advanced technologies and artificial intelligence.

Project Background:

Osteoarthritis (OA) affects hundreds of millions of patients worldwide, with incidence rates expected to rise due to an aging population. Early diagnosis is critical in mitigating the progression of OA and improving patient outcomes. The KIC CircBioCare project, funded by NWO and ReumaNederland, aims to develop state-of-the-art methods to detect blood proteins and genetic material associated with the onset of OA in individuals monitored over time.

Project Aim:

Our research team, part of the KIC CircBioCare initiative, aims to pioneer early diagnostic tools for OA using proteomic and/or miRNA analysis. This project will also employ artificial intelligence, digital PCR, and Proximity Extension Assays to design predictive tests. Additionally, we will explore factors influencing public perception of healthcare screening to enhance early diagnosis uptake and reduce OA development risk.

Key Responsibilities:

Develop and optimize tissue and serum automated and high throughput proteomic workflows to study the molecular mechanisms underlying OA development.

Conduct state of the art proteomic analysis to identify key proteins associated with OA onset.

Integrate artificial intelligence and machine learning techniques to enhance predictive test accuracy.

Validate the identified biomarkers and predictive tests through rigorous multiomic platforms and clinical studies.

Collaborate closely with interdisciplinary teams, including bioinformaticians, molecular biologists, companies and healthcare professionals.

Communicate research findings through high-quality publications and presentations at (inter)national conferences.

Qualifications:

A Master's degree in biochemistry, analytical chemistry, or a related field.

Strong background in proteomics, including experience with mass spectrometry and related data analysis.

Experience with serum/plasma protein analysis.

Prior experience with TIMS-ToF or other Bruker mass spectrometers will be considered an advantage.

Proficiency in molecular biology techniques and data analysis tools.

Experience with programming, artificial intelligence and machine learning applications in biomedical research is highly desirable.

Excellent analytical and problem-solving skills.

Demonstrated ability to work independently as well as in a team.

Effective communication skills and ability to work collaboratively in a multidisciplinary team.

Good oral and written English communication.

Prior experience in osteoarthritis research is not required but will be considered an advantage.

Benefits:

Opportunity to work on a cutting-edge project with significant potential for clinical impact.

Access to state-of-the-art analytical and proteomics facilities and a collaborative research environment.

Competitive salary and benefits package.

Opportunities for professional development and training.

Application Process:

Interested candidates are invited to submit their application, including a CV, a cover letter outlining their research experience and motivation for this position, and contact details for two references.

Contact Information:

For further information about the position, please contact Dr. Berta Cillero Pastor at b.cilleropastor@maastrichtuniversity.nl

Join us in our mission to develop transformative diagnostic tools for osteoarthritis and make a meaningful impact on the lives of patients worldwide. We look forward to receiving your application!

What we offer:

- Mass spectrometry ecosystem at Maastricht University: The Maastricht Multimodal Molecular Imaging Institute
- Excellent wet lab and computational facilities
- Interdisciplinary environment within MERLN

Organisation

Maastricht University (UM) is the most international university in the Netherlands and, with more than 16,000 students and 4,000 employees, is still growing. The university stands out for its innovative education model, international character and multidisciplinary approach to research and education. Thanks to its high-quality research and study programs as well as a strong focus on social engagement, UM has quickly built up a solid reputation. Today it is considered one of the best young universities in the world.

Department (MERLN)

The candidate will mainly perform this research in the laboratory of Dr. Cillero Pastor at the **MERLN Institute** at **Maastricht University**. At **MERLN**, we are a collaborative, international, and interdisciplinary group with diverse expertise, including biomaterials science, chemistry, tissue engineering, and (stem) cell biology. We share newly renovated laboratory facilities with modern equipment. We have a long history as leaders in the field of tissue engineering and are particularly well-known for our orientation towards translational research.

Application timeline

Candidates can expect to hear from us within two weeks of the deadline for applications. Short video interviews will be scheduled for short-listed candidates. Those proceeding to the second interview round will be invited to attend an in-person interview.

The application should contain:

- Cover letter with motivation and preferred starting date
- Statement of research interests and accomplishments, max 2 pages
- CV
- Contact information of two references

For more detailed information you can contact dr. Cillero Pastor: b.cilleropastor@maastrichtuniversity.nl.

Contract information

The terms of employment of Maastricht University are set out in the Collective Labour Agreement of Dutch Universities (CAO). Furthermore, local UM provisions also apply. For more information look at the website www.maastrichtuniversity.nl > Support > UM employees.