

## Modeling life at the cell-matrix interface

The MERLN Institute for Technology-inspired Regenerative Medicine at Maastricht University in the Netherlands invites applications for a PhD position.

The PhD student will perform cutting-edge research in computational modeling methods applied to regenerative medicine and more specifically, to cell-matrix interactions.

### Requirements and key expertise

- Master in data science, computer science, statistics, mathematics, bioinformatics, biomedical informatics, artificial intelligence, or equivalent
- Expertise in computational modeling
- Good programming skills (for example Matlab, Python, R)
- Basic knowledge of image processing and analysis
- Affinity with regenerative medicine
- Excellent oral and written English communication

### Project description:

- Computational modeling of integrin signaling, cell-ECM interaction to inform the design of synthetic matrices
- Parameter optimization and sensitivity analysis
- Analysis and integration of various “materiomics” data for model calibration

### What we offer:

- Computational ecosystem at Maastricht University: Institute for Data Science (IDS), Department of Knowledge Engineering (DKE) and Maastricht Centre for Systems Biology (MacsBio)
- Excellent computational and experimental facilities to validate the *in silico* analyses and predictions *in vitro/in vivo*
- Interdisciplinary environment within MERLN and the “Materials-driven regeneration (MDR)-consortium”

### The application should contain:

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

Regenerative medicine (RM) holds the promise to cure many of what are now chronic patients, restoring health rather than protracting decline, bettering the lives of millions and at the same time preventing lifelong, expensive care processes: cure instead of care. The scientific community has made large steps in this direction over the past decade, however our understanding of the fundamentals of cell, tissue and organ regeneration and of how to stimulate and guide this with intelligent biomaterials in the human body is still in its infancy. In order to tackle these challenges, the “**Materials-driven regeneration (MDR)-consortium**” (see <http://www.mdrresearch.nl/> for more information) brings together an interdisciplinary team of excellent scientists at three leading institutes (ICMS at Eindhoven University of Technology, RMU at Utrecht University and MERLN at Maastricht University). The central goal of MDR’s research program is to investigate, design and use intelligent biomaterials that drive the functional regeneration of living tissues and organs under complex (patho)physiological conditions.

To date, the RM field has focused on studying cell-biomaterial interactions. Materials properties such as elasticity, topography, hydrophobicity, and porosity have all been shown to influence cell fate, and the introduction of high-throughput combinatorial approaches is expediting research and decoupling the properties to further inform the design of biomaterials. However, in order to improve the design of synthetic biomaterials, it is crucial to understand the physiological cell-ECM interactions and how these influence cell behavior. This research project aims to use in silico models to simulate cell-ECM interactions, improve our fundamental understanding thereof and use the obtained knowledge to design improved synthetic matrices.

The **MERLN Institute for Technology-inspired Regenerative Medicine** focuses on developing novel and challenging technologies to advance the field of tissue and organ repair and regeneration through, amongst others, the development of high-throughput material platforms to screen cell-biomaterial interactions. MERLN consists of an interdisciplinary team of researchers including fields as (stem cell) biology, materials engineering, chemistry, micro/nanofabrication, additive manufacturing, etc. The scientists at MERLN have an extensive network of collaborators within research institutions in and outside the Netherlands as well as with a number of biomedical companies, including their own spin-off companies, as entrepreneurship is highly fostered.

**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.

**Maastricht** is the southernmost city in the Netherlands, and is the capital of the province of Limburg. Situated on the Maas river, within walking distance of Belgium and cycling distance of Germany, it claims to be the oldest city in the Netherlands (a claim it shares with Nijmegen). A great place to spend some time, it contains some magnificent buildings and culture, taking the form of plenty of old houses and buildings, lovely cathedrals and a spectacularly cobblestoned town centre. The city is also well known for its fine cuisine, excellent shops and multicultural atmosphere.

The full-time position is offered for four years (1+3), with a yearly evaluation. The salary will be set in PhD salary scale of the Collective Labor Agreement of the Dutch Universities (€2.325,- gross per month in first year to €2.972,- last year). On top of this, there is an 8% holiday and an 8.3% year-end allowance. The terms of employment of Maastricht University are set out in the Collective Labor Agreement of Dutch Universities (CAO). Furthermore, local UM provisions also apply. For more information look at the website [www.maastrichtuniversity.nl](http://www.maastrichtuniversity.nl) > Support > UM employees

For more detailed information you can contact dr. A. Carlier: [a.carlier@maastrichtuniversity.nl](mailto:a.carlier@maastrichtuniversity.nl).