

Postdoctoral position: Extracellular vesicle-based CRISPR gene therapy for rare cardiomyopathy

University Medical Center Utrecht – Experimental Cardiology Laboratory

About the position

We are seeking a highly motivated postdoctoral researcher with a strong background in cell and molecular biology to join our team at the University Medical Center Utrecht. This position is part of the innovative EVOLVE consortium, collaborating with NanoFCM and JAMA Tx.

Research focus

The primary focus of this project is to develop an innovative gene therapy approach using extracellular vesicles (EVs) for treating R14del phospholamban (PLN) cardiomyopathy. Your research will focus on developing and optimizing novel endogenous loading strategies to incorporate CRISPR prime editor ribonucleoprotein complexes (RNPs) into EVs. You will have access to state-of-the-art facilities for comprehensive EV characterization. The therapeutic potential of this approach will be evaluated through extensive testing in clinically relevant cardiac disease models. This project is part of a larger consortium effort combining expertise in EV biology, gene editing, and cardiac disease to develop next-generation therapeutic strategies for genetic heart diseases.

About the laboratory

The Experimental Cardiology Laboratory at UMC Utrecht is dedicated to developing innovative therapeutic strategies for cardiac diseases. Our research focuses on extracellular vesicle-based delivery systems using cutting-edge molecular biology, genetics, and advanced disease models. We are part of the University Medical Center Utrecht's Circulatory Health Program and play a crucial role in developing novel therapeutic approaches for inherited cardiac diseases. Our multidisciplinary environment combines expertise in cardiac biology, gene therapy, and nanotechnology to advance the field of precision medicine in cardiology.

Key Responsibilities

- Optimize endogenous loading strategy for encapsulating CRISPR prime editors in EVs
- Improve cardiac delivery through specific EV membrane modifications
- Conduct *in vitro* testing to assess delivery efficiency and functionality
- Analyze stability and purity of EVs loaded with CRISPR prime editors
- Assess PLN-R14del mutation correction and evaluate functional improvements in relevant cell and preclinical models
- Validate efficacy and safety of EV-mediated CRISPR prime editing *in vitro* and *in vivo*

Required Qualifications

- Ph.D. in cell biology, molecular biology, biochemistry, regenerative medicine, or related field
- Expertise in molecular cloning, cell culture, assay development, and CRISPR-Cas9 gene editing
- You are motivated, pro-active, independent, and able to work in an interdisciplinary team in the field of cardiac gene therapy
- You are (near) fluent in English and proficient in presenting your work, both orally (scientific presentations) and written.
- Strong analytical skills and experience with preclinical work
- Excellent communication skills
- Proven track record of scientific productivity in peer-reviewed journals
- Article 9 certification is considered a pre

What We Offer

- Innovative, multidisciplinary research environment.
- Collaboration within the EVOLVE consortium.
- Access expertise in extracellular vesicle characterization, application of EVs for cardiac drug delivery, phospholamban cardiomyopathy and more.
- State-of-the-art facilities.
- Opportunity to travel and present work on (inter)national congresses.
- Possibilities to develop yourself personally and professionally.
- A salary between € 3493 and € 5504 gross per month (scale 10), depending on experience, based on full-time employment (36 hours).
- A one-year employment contract, with the possibility of extension for an additional two years based on positive performance.
- Year-end bonus of 8.3% and holiday allowance of 8%.
- Pension insurance with ABP. We take care of approximately 70% of the monthly contribution.
- 100% public transport reimbursement. Are you coming on foot, by bike or by car? You will then receive a reimbursement of € 0.18 per km (by car up to a max. of 40 km one way).
- The option to select additional employment benefits in exchange for gross salary, such as purchasing a bicycle and memberships.

Application Process

Interested candidates are invited to submit the following documents before the 6th of January 2025:

- A curriculum vitae (CV)
- A brief summary outlining their research experience
- Contact details for three professional references

Please send applications to: Prof. dr. Joost Sluijter (jsluijter@umcutrecht.nl) and Dr. Zhiyong Lei (z.lei-3@umcutrecht.nl)

Location

University Medical Center Utrecht
Utrecht, The Netherlands

We look forward to welcoming a new team member who is passionate about advancing extracellular vesicles as delivery vehicles for gene therapy in treating inherited cardiomyopathies.