



Job Opening Doctoral Candidate 3 (DC3) InnoCAR-T

Title: Innovative transfection tools for efficient and versatile *ex vivo* CAR-T modification

Keywords: CAR-T, transfection, novel technologies, cells, photonics, microscopy, nanocarriers

Duration: 36 months

Host institute: UGent, Ghent, Belgium

Duration: 24 months

Secondment institutes: UMCG, Groningen, Netherlands

Duration: 8 months

Scinus Expansion, Bilthoven, Netherlands

Duration: 4 months

APPLICATION DEADLINE: 30/02/2023

Intended start date: April 2023

PhD-student position (3 years):

This exciting and innovative PhD student position offers a research project focused on the development of novel gene and protein delivery tools for CAR-T modification (with initial focus on delivery of the Cas9 RNP complexes). Hereto, the in-house developed methods of controlling membranes, for example previously applied to red blood cells (ACS Nano 2012, 6, 4169) or polymeric capsules (JACS 2008, 130, 11572), will be applied to transfect cells with Cas9 RNP complexes. In brief, exposure to laser light will be initiated by engineering and modifying the surface of cells with the goal of the permeability control of the lipid membrane for delivery. This approach can be tailored to “traffic” molecules, so as it was previously done for ions (Nano Lett. 2014, 14, 4273), of different molecular weight (particularly large ones) through the membrane of cells with minimal toxicity.

The PhD candidate will be working as a part of an international consortium on their search for an immunotherapeutic approach to cancer treatment and will start their 3-year research project at Ghent University / Belgium, in Ghent, Belgium. At UGent, novel transfection technologies will be developed and characterized. The candidate will continue at the UMCG / The Netherlands, with preclinical validation studies of transfection technology and will work at Scinus Cell Expansion / The Netherlands towards GMP implementation. With this project, the candidate will acquire experience in both industrial and academic research. This research project will end with a PhD thesis defense at Ghent University.

This project is a part of a collaborative training network of 10 closely related projects (<https://www.innocar-t.eu/>) in which PhD students will benefit from networking opportunities. This includes a multidisciplinary training program with network-wide training events that will be provided to the candidates. Herewith, the PhD project will provide the candidate a unique opportunity to obtain knowledge/expertise on important facets of both academia and industry.

Key Responsibilities:

- Preparation of novel nanoparticle formulations
- Optimization of transfection technology for GMP-implementation
- Preclinical CAR-T production



- Preclinical validation studies
- Management, presentation and publication of research data

Requirements:

- Candidate is in the first four years of his/her research career and does not have a doctoral degree
- Knowledge of data analysis, machine learning, deep learning, optimization techniques, mathematical data processing, basic software concepts
- Residence duration in Belgium does not exceed 12 months in total within the last 3 years
- MSc in biophysics or applied physics/photonics, biotechnology, biology, biochemistry, or related
- Experience with photonics and photonic components as well as microscopy would be an asset
- Experience with drug delivery carriers, for example, multimodal capsules would be an asset
- Good time management and communication skills. Ability to communicate fluently and effectively in English
- Excellent team player who enjoys working in a fast-evolving research environment

Contact:

To apply, please send the following documents:

- CV (Name_Surname_CV.pdf)
- Cover letter (Name_Surname_CL.pdf)
- 2 letters of recommendation (Name_Surname_LR.pdf)

to the email address Andre.Skirtach@UGent.be with "*PhD_InnoCAR-T*" in the email title.