



Job Opening Doctoral Candidate 4 (DC4) InnoCAR-T

Title: *Ex vivo* CAR-T modulation with tailored nanoparticle formulations

Keywords: CAR-T, gene-editing, knock-out, cell biology, GMP-ready, biomaterials, microscopy, drug delivery, particles, nanoparticles

Duration: 36 months

Host institute: UGent, Ghent, Belgium

Duration: 24 months

Secondment institutes: UMCG, Groningen, Netherlands

Duration: 8 months

INTEGRA Barcelona, Spain

Duration: 4 months

APPLICATION DEADLINE: 30/02/2023

Intended start date: April 2023

PhD-student position:

In this project, a nanoparticle-based drug delivery system will be developed for delivering proteins such as antibodies and Cas nucleases to CAR-T cells. We will develop nanoparticles, which on one hand, will allow for incorporation of antibodies into the inner porous network, while on the other hand, will be capable of degrading depending on pH values. Inorganic nanoparticles will be assessed, but organic nanocarriers will be also explored. Your role in this project will be to develop particles, perform their careful characterization including that with advanced optical and electron microscopy. Investigate particle interaction with cells and being able to follow and control release of encapsulated cargo. Ability to develop microscopy-based methods and functional blocks for characterization of particles and cells, work with biomedical applications as well as apply this knowledge to investigate cells and their interaction with particles would be essential.

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, Ghent, Belgium. At UGent, novel particles will be developed and characterized. The candidate will continue in Barcelona / Spain at the biotech company Integra. Integra is a leading company in gene editing technology and the candidate will evaluate integration of Cas nucleases into NP delivery. The candidate will further continue at the UMCG / The Netherlands, with preclinical validation studies of NP-mediated delivery. 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 an unique opportunity to obtain knowledge/expertise on important facets of both academia and industry.

Key Responsibilities:

- Preparation of novel nanoparticle formulations



- Tunable release of bioactive drugs
- Cell culturing including primary patient-derived cell culturing
- Preclinical CAR-T production
- Preclinical validation studies, including microscopy
- 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, basic software concepts
- Residence duration in Belgium does not exceed 12 months in total within the last 3 years
- MSc in biotechnology, biology, biochemistry, biotechnology, materials, biophysics, (bio)physical chemistry or related
- Experience with nanoparticle preparation and characterization including dynamic light scattering, microscopic and spectroscopic techniques would be an asset
- Knowledge and experience with optical microscopy and atomic force microscopy 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.