Job Opening Doctoral Candidate 9 (DC9) InnoCAR-T

Title: Development of nanoparticle/CAR-T fusions for tumour-localized release of immunostimulatory drugs

Keywords: CAR-T, transfection, microscopy, drug delivery, capsules, nanocapsules, AFM, polymers, spectrophotometry

Duration:	36 months	
Host institute:	UGent, Ghent, Belgium	Duration: 30 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:

The primary goal of this project is to develop novel nanocarriers for controlling delivery and perform release of immunostimulatory drugs in the tumor micro-environment. For achieving this goal, various nanoparticles will be first synthesized and characterized, based on which nanocapsules will be developed. Subsequently, their essential physicochemical parameters will be optimized and the strength of their interaction with cells will be measured and fine-tuned. These carriers will be used to load CAR-T *ex vivo* with tumor-selective immunomodulatory nanoparticles and nanocapsules. Ability to develop microscopy-based methods and functional blocks for capsule characterization, work with microfluidics, and apply various methods to investigate cells and their interaction with capsules would be considered as important parts of this research work.

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, one of the leading academic centers in Belgium. At UGent, novel nanoparticle and nanocapsule technology will be developed and characterized for CAR-T *ex vivo* loading and tumor-specific release of bioactive drugs. The candidate will continue at the UMCG / The Netherlands, with preclinical validation of NP-modified CAR-T cells and at Scinus Cell Expansion / The Netherlands for the implementation of NP strategies into the ATMP manufacturing process. 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 the 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
- Ex vivo characterization of CAR-T loading and NP release properties
- 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, basic software concepts
- Residence duration in Belgium does not exceed 12 months in total within the last 3 years
- MSc in biotechnology, biophysics, (bio)-physical chemistry, (bio)-materials, biology, biochemistry, biotechnology, or related
- Experience with polymers, capsule and nanocapsule preparation, characterization, and microfluidics would be an asset
- Knowledge and experience with electron microscopy, atomic force microscopy (AFM), spectrophotometric techniques 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)

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