

Seminar Monday 17th of March, 14:00-15:00

Location: seminar room 0.1, Faculty of Pharmaceutical Sciences, UGent

Information: br.degeest@ugent.be

Prof. Leyuan Ma – University of Pennsylvania (UPenn), USA

<https://www.malabimmuneng.com/>

Boosting Chimeric Antigen Receptor T cell therapy via a synthetic vaccine

Abstract. Adoptive T cell therapy using Chimeric Antigen Receptor T cells (CAR T) has made significant advances in the treatment of hematologic malignancies and solid tumors. However, a key challenge remains that a sufficient pool of functional CAR T cells are needed to achieve long-term therapeutic efficacy. Here, I'll present the development of a synthetic booster vaccine to enhance the long-term CAR T efficacy by vaccine-boosting donor cells through their chimeric receptor directly *in vivo*. I'll discuss an unexpected phenomenon that vaccine-mediated crosstalk between dendritic cells and CAR T cells elicited potent endogenous anti-tumor T cell responses that are critical for treating solid tumors with antigen heterogeneity. Finally, I'll show a directed evolution-based synthetic ligand (mimotope) discovery platform that can be leveraged to develop a mimotope vaccine for any CAR of interest (US FDA-approved CD19 CAR will be used as an example).

Short Bio. Dr. Ma obtained his PhD degree in biomedical sciences from Dr. Michael Green's lab at the University of Massachusetts Medical School in 2016. Following graduation, Dr. Ma continued his postdoctoral fellowship in Immunotherapy and Immune Engineering at Massachusetts Institute of Technology and Howard Hughes Medical Institute under the guidance of Dr. Darrell Irvine. During his fellowship, Dr. Ma developed a synthetic booster vaccine to enhance the Chimeric Antigen Receptor T cell therapy for solid tumors, and he was supported by American Cancer Society postdoctoral fellowship from 2019-2021. In 2022, Dr. Ma was appointed as an assistant professor in the department of Pathology and Laboratory Medicine at the University of Pennsylvania. Dr. Ma is also a member of the Raymond G. Perelman Center for Cellular and Molecular Therapeutics (CCMT) at the Children's Hospital of Philadelphia. Dr. Ma was awarded the NIAID new innovators award (DP2), W.W. Smith Charitable Trust award, Melanoma Research Alliance young investigator award, Ivy foundation Translational Adult Glioma Award, and Sontag Distinguished Scientist Award.