Abstract

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Neoantigen-specific T-cell activation for the treatment of solid tumours

Karine Breckpot
Vrije Universiteit Brussel, Brussels, Belgium

Abstract

The potential of personalized cancer immunotherapy using neoantigens (mutated proteins) has been highlighted by an increasing number of preclinical and clinical studies that show promising T-cell responses. It has been shown in various clinical trials that mRNA-engineered monocyte-derived dendritic cells (moDCs) are potent antigen-presenting cells that can activate antigen-specific T cells. Therefore, we optimized the manufacturing process of a cancer vaccine consisting of mRNA-modified, neoantigen-presenting moDCs, making it fully GMP compliant, allowing flexibility and possibility of automation. Monocytes were obtained by apheresis and differentiated ex vivo into moDCs. These were electroporated with two types of mRNA to generate the cancer vaccine designated TetraMixDC-NEO. The first type of mRNA encoded a single neoantigen (SNA), manufactured using an in-house developed proprietary synthetic DNA template, a flexible, time and cost-efficient strategy to encode and deliver SNA in an mRNA format.

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Biography

Karine Breckpot (°1976, https://orcid.org/0000-0003-4331-3480) obtained a MSc in Biomedical Sciences in 1998 and a PhD in Medical Sciences in 2004, all at the Vrije Universiteit Brussel (VUB, BE). Following a postdoctoral stay at the Division of Infection and Immunity at the University College London (UK), she became a group leader and Assistant Professor in 2010 at the Laboratory for Molecular and Cellular Therapy (LMCT), VUB. She became a Tenured Professor in 2014 and Full Professor in 2019 at which point she became director of the LMCT (https://lmct.research.vub.be).