

CAR T Cells against Prostate Cancer

A novel treatment paradigm to solid cancer

Technology

Prostate cancer is one of the most frequent malignancies in men and shows high expression of Prostate-Specific Membrane Antigen (PSMA), making PSMA an established biomarker and an attractive therapeutic target for precision immunotherapies. The invention provides a proprietary PSMA-targeting chimeric antigen receptor (CAR) T-cell platform with two novel CAR constructs recognizing distinct PSMA epitopes and showing strong antitumor activity *in vitro* and *in vivo*.

The patented CAR designs use a human PSMA-specific binding domain and costimulatory elements optimized for robust T-cell activation and persistence, and the two epitope specificities provide options to address antigen heterogeneity and tailor safety and efficacy profiles.

In xenograft mouse models, focal intratumoral administration of one PSMA CAR T-cell product eradicated established tumors after a single application, highlighting its potent local cytotoxic effect. This focal approach is particularly attractive for localized disease, as it achieves high intratumoral CAR T-cell levels while limiting systemic exposure and reducing “off-tumor” toxicities in normal PSMA-low tissues. Local delivery can also help to overcome solid tumor microenvironment barriers.

Systemic application is enabled through combination regimens. In preclinical studies, intravenous PSMA CAR T-cells combined with non-ablative low-dose docetaxel significantly inhibited tumor growth, whereas either monotherapy was ineffective, demonstrating the benefit of microenvironment modulation without myeloablative conditioning.

For patients and health care providers, this PSMA-CAR platform offers the prospect of more effective local control of early prostate cancer and new systemic options for advanced disease, with potentially lower toxicity than high-dose chemotherapy or non-targeted treatments. Focal application may reduce complications and hospital stays, while outpatient-compatible systemic regimens can relieve capacity pressures on oncology centers. Against the backdrop of a rapidly growing global market for prostate cancer therapeutics and PSMA-targeted precision therapies, such differentiated PSMA-CAR products target a particularly attractive, high-value segment.

In addition to licensing, the inventors are open to translational co-development and offer extensive expertise and infrastructure, including GMP-level production and advanced *in vitro* and *in vivo* models, to support projects from lead optimization through to IND-enabling studies.



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Freiburg University and the Freiburg
University Medical Center

universität freiburg

Contact

Dr. Markus Schwab
Campus Technologies Freiburg GmbH
Stefan-Meier-Str. 8 | D-79104 Freiburg
Email: markus.schwab@campus-technologies.de
Tel: +49 (0)761 203-4987
Fax: +49 (0)761 203-5021

Innovation

- PSMA-specific CARs targeting two distinct PSMA epitopes for flexible antigen recognition and product differentiation.
- Optimized costimulatory design enabling high antigen-specific activation, cytotoxicity, and persistence of CAR T cells.
- Demonstrated curative potential in mouse xenograft models after single focal intratumoral application.
- Significant tumor growth inhibition upon systemic CAR T-cell application in combination with non-ablative low-dose docetaxel chemotherapy.
- Humanized PSMA-CAR variants available to reduce immunogenicity and support clinical translation.

Application

- Treatment of PSMA-expressing prostate cancer across localized, high-risk, and advanced disease stages.
- Focal intratumoral injection of PSMA CAR T cells for local control of primary or oligometastatic lesions with reduced systemic toxicity.
- Systemic administration of PSMA CAR T cells in combination with low-dose chemotherapy to enhance efficacy in advanced or metastatic prostate cancer.
- Platform for next-generation PSMA-CAR products (e.g., dual or logic-gated constructs) and for combination strategies with other tumor-microenvironment-modulating agents.

Responsible Scientists

Prof. Dr. Toni Cathomen

Prof. Dr. Philipp Wolf

Inst. for Transfusion Medicine
and Gene Therapy, Urology

Patent Status

EP3814382 pending
US20210371491 pending
CN112313251 active
JP7485371 active
EP4081553 pending
US12428492 active
CN114867750 active
JP7625281 active

Earliest Priority Date

27.06.2018

Further Reading

PMID: 40940743
PMID: 34239139
PMID: 32728611

UFR Reference Number

2018050201/ZEE,
2019121202/ZEE

Status: Feb-26



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universität freiburg

Contact

Dr. Markus Schwab
Campus Technologies Freiburg GmbH
Stefan-Meier-Str. 8 | D-79104 Freiburg
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