Prospective Isolation Of Tumor-Reactive Cytotoxic CD4+ T Cells For Bladder Cancer Therapy

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INVENTORS

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OTHER INFORMATION

KEYWORDS

Immunotherapy, CD4+, Cytotoxic T cells, Bladder cancer

CATEGORIZED AS

- **Medical**
  - Disease: Cancer
  - Therapeutics

RELATED CASES

2018-159-0

INVENTION NOVELTY

UCSF researchers have discovered a method for the isolation and expansion ex vivo of an endogenous population of bladder tumor-reactive cytotoxic CD4+ T cells that can be used to specifically and potently treat bladder cancer.

VALUE PROPOSITION

Bladder cancer is one of the most common types of cancers in the US, with approximately 80,000 new cases diagnosed in 2018 alone. Current treatments include checkpoint immunotherapy, a broad method of inhibiting a mechanism by which cancer cells evade the immune system.

Utilizing a novel combination of cell-surface markers, this method of isolating and expanding endogenous tumor reactive CD4+ T cells provides a more specific immune response towards the treatment of bladder cancer.

ADVANTAGES OF TECHNOLOGY

- Identifies a **novel, bladder tumor infiltrating population of T cells**
- More **specific to bladder cancer** than other immunotherapy treatments
- **Can be expanded ex vivo** and has shown to **possess cytotoxic activity towards tumor cells**
- May have **fewer regulatory challenges** over engineered chimeric antigen receptor (CAR) approaches due to the endogenous nature of these cytotoxic CD4+ T cells
- These **identified markers and T cell receptor sequences could be used to transduce T cells** to specifically target bladder cancer
- Identified markers and T cell receptors are **potential targets for pharmacological manipulation** for enhancement of activity

TECHNOLOGY DESCRIPTION

Researchers at UCSF, using single-cell RNA sequencing and T cell receptor sequencing of patient-derived bladder tumor cells, have identified a series of gene expression markers and specific T cell receptors specific to infiltrating bladder tumor resident CD4+ T cells. Utilizing these cell surface markers, they isolated this novel CD4+ T cell population, expanded it ex-vivo, and confirmed its cytotoxic potential.

LOOKING FOR PARTNERS

To develop & commercialize the technology for cancer therapeutics.

STAGE OF DEVELOPMENT

Pre-clinical

DATA AVAILABILITY

Under CDA / NDA

PATENT STATUS

Country	Type	Number	Dated	Case

Patent Cooperation Treaty	Reference for National Filings	WO 2019/204338	10/24/2019	2018-159

Patent Pending

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- T Cell Signature Predictive of Clinical Outcome with Immunomodulatory Treatment
- NOVEL ANTIGEN TARGETS IN AUTOIMMUNE DISEASES (LUPUS AND TYPE I DIABETES) USEFUL FOR VACCINE DEVELOPMENT AND TREATMENT
- XYZeq – Spatially-Resolved Single Cell Sequencing

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