Washington University in St. Louis
Office of Technology Management

MECHANICALLY OPTIMIZED SYNTHETIC DENDRITIC CELLS FOR THE EXPANSION OF ANTIGEN-SPECIFIC T CELLS

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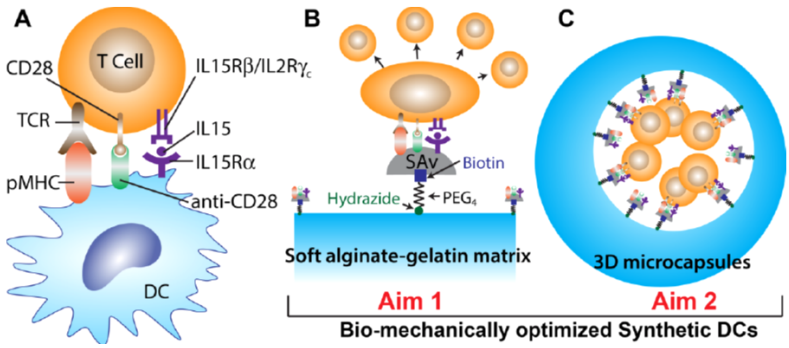
Value Proposition: *New method for expanding T cells against individualized tumor-specific mutational antigens.*

Technology Description

Researchers at Washington University in St. Louis have developed a device that enables high-throughput production of patient specific T cells. Current in vivo and ex vivo methods of expansion of T cells obtained from patients rely on non-specific exposure to T Cell receptor (TCR) stimuli and high dose of interleukin 2. The challenge is in the difficulty in expanding long-lived effector CD8+ T Cells that are specific to unique peptides presented by the tumors.

This invention uses a mechanically optimized alginate-gelatin (soft) matrix to mimic dendritic cells (Synthetic DCs) for the expansion of antigen-specific effector T cells and can be tailored for individual patients by expanding their unique neo-epitopes.



Above Figure: Optimized alginate-gelatin (soft) matrix that is formed into a 3D microcapsule for expansion and delivery of the T cells for tumor treatment.

Stage of Research

Proof of concept

Applications

- Cancer Immunotherapy

Key Advantages

- Enhanced clustering of DC mimicking molecules due to soft matrices, extended reach of linker, and multimeric pMHC for binding

- Modular, cost effective, higher therapeutic efficacy

Patents

Methods and Compositions for T cell activation (PCT Publication Number: WO 2019018727A1)

Related Web Links – Amit Pathak Profile; Pathak Lab