

## MAIT Cell Immunomodulation for Targeted Treatment of Inflammatory Diseases

### Business Opportunity

Exclusive license  
Non-exclusive license  
Sponsored research

### Technology Type

Cell Therapy  
Target

### State of Development

Preclinical in vivo

### Patent Information

US patent pending

### Investigator

**Martin Prlic, PhD**  
Vaccine and Infectious  
Disease Division

### Tech ID

17-068

### Contact

partnering@fredhutch.org

### Brief Description

MAIT cells undergo targeted therapeutic exploitation to alter CTLA-4 expression and dampen inflammatory responses

### Technology Overview

Mucosal-associated invariant T (MAIT) cells are non-conventional T cells that localize within inflamed tissue. Upon activation, MAIT cells act as effector cells with both cytotoxic and pro-inflammatory properties. The Prlic Lab determined MAIT cells have a unique transcriptional signature based on whether located within the blood or inflamed tissue. Conventional T cells activate through a TCR signal, however, MAIT cells require both TCR and inflammatory signals to elicit sustained effector function. They also established that an inflammatory signal could elicit CTLA-4 expression ex vivo, and that use of both TCR and inflammatory signals had a synergistic effect. Given MAIT cells detect bacteria-derived metabolites and not peptides, MAIT cells can be specifically targeted to alter CTLA-4 expression for immunomodulatory purposes.

### Applications

- Graft-vs-host disease
- Post-transplantation immune reconstitution
- Tumor treatment
- Mucosal inflammatory diseases (e.g., Crohn's disease)

### Advantages

- Controlled expression of CLTA-4 in MAIT cells
- Targeted immunomodulation within inflamed mucosal tissues
- MAIT cell activation will not affect conventional T cell activity

### Market Overview

In 2015, the World Health Organization estimated that 3 million US adults (1.3% of the population) were diagnosed with either Crohn's disease or ulcerative colitis. The global anti-inflammatory therapeutics market is predicted to reach USD 130.6 billion by 2026 with a predicted CAGR of 8.5% between 2018 and 2026. The combination of increasing prevalence of inflammatory diseases (e.g., Crohn's) and an impressive drug pipeline are boosting the market growth.