Lung-Targeted Cell-Based Therapies for Inflammatory Disease and Cancer

Tech ID: 34383 / UC Case 2024-179-0

TECHNOLOGY DESCRIPTION

Introducing a groundbreaking lung-targeted SynNotch T-cell platform, engineered to revolutionize the treatment of lung diseases and lung cancer. This cutting-edge technology leverages synthetic biology to program immune cells for precision activation exclusively within lung tissues. By targeting a lung-specific receptor, SynNotch T cells deliver therapeutic payloads, including CARs, cytokines, and anti-fibrotic genes, with unparalleled specificity to the lung environment, minimizing systemic toxicity and maximizing localized efficacy. Compatible with systemic administration, this modular, payload-agnostic platform supports diverse therapeutic applications and integrates seamlessly into existing cell therapy pipelines.

Competitive Advantages

- **Lung-Specific Activation:** SynNotch T cells ensure localized therapeutic effects and reduce off-target toxicity.
- **Modular Platform:** Adaptable to multiple lung disease indications, including non-small cell lung cancer (NSCLC), small cell lung cancer (SCLC), idiopathic pulmonary fibrosis (IPF), acute lung injury and autoimmune lung disorders.
- **Broad Payload Compatibility:** Supports diverse therapeutic approaches, including CAR T-cell therapies, cytokine, growth factor or anti-fibrotic delivery.
- **Safety Profile:** Preclinical studies confirm the absence of systemic inflammation or off-tissue toxicity while demonstrating sustained therapeutic activity within the lung.
- **Scalability:** Integrates seamlessly with existing CAR-T manufacturing workflows and systemic administration methods, optimizing production efficiency.
- **Unmet Need Addressed:** Positioned to address significant gaps in treatment of pulmonary fibrosis, acture lung injury, auto-immune lung disorders, lung cancer and isolated pulmonary metastases by minimizing systemic toxicity and resistance.

STAGE OF DEVELOPMENT

The lung-targeted SynNotch T-cell platform has undergone rigorous preclinical validation, including:

- **Tissue Specificity:** Demonstrated selective activation through co-culture studies.

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OTHER INFORMATION

KEYWORDS

SynNotch, Inflammatory Disease, Cancer, Non-Small Cell Lung Cancer, Small Cell Lung Cancer, Idiopathic Pulmonary Fibrosis, Autoimmune Lung Disorders

CATEGORIZED AS

- **Medical**
  - Disease: Cancer
  - Disease: Respiratory and Pulmonary System
  - Therapeutics

RELATED CASES

2024-179-0

- **In Vivo Selectivity:** Proven therapeutic activity confined to lung tissue in dual-tumor xenograft models, preventing off-target effects.
- **Safety and Persistence:** Confirmed localized immune activation without systemic cytokine release or toxicity in preclinical models.
- **Scalable Proof-of-Concept:** Preclinical models validate the platform's adaptability across oncology and inflammatory disease applications.

RELATED MATERIALS

PATENT STATUS

Patent Pending

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