

Pulmonology

Therapeutic Inhibition of the WT1-MYCN-PLK1 Axis for Treatment of Idiopathic Pulmonary Fibrosis (IPF)

Brief Description of Technology

Repurposing Volasertib, a potent PLK1 inhibitor, as a treatment of Idiopathic Pulmonary Fibrosis

TECHNOLOGY ID

2021-0702

BUSINESS OPPORTUNITY

Exclusive License or Sponsored Research

TECHNOLOGY TYPE

Small Molecule

PATENT INFORMATION

US Non-Provisional Filing

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Technology Overview

A key pathologic process in pulmonary fibrosis is fibroblast activation, including fibroproliferation, fibroblast-to-myofibroblast transformation (FMT), and impaired apoptotic clearance of myofibroblasts. These processes collectively result in excessive extracellular matrix (ECM) production and the formation of scar tissue. Aberrant activation of Wilms' Tumor 1 (WT1), a novel zinc-finger transcription factor, appears to drive fibroblast activation and ECM deposition in idiopathic pulmonary fibrosis (IPF), a fatal fibrotic lung disease. In vivo studies suggest that WT1-MYCN axis functions as a positive regulator of polo-like kinase 1 (PLK1) in IPF fibroblasts. A potent PLK1 inhibitor, Volasertib, decreases WT1, MYCN, and PLK1 levels in IPF fibroblasts, attenuates fibroblast activation, and reduces ongoing fibrosis. Repurposing Volasertib is a promising therapeutic for a variety of pulmonary fibrosis conditions including IPF.

Applications

- Idiopathic Pulmonary Fibrosis (IPF)
- Pulmonary Fibrosis

Advantages

- Volasertib is a Phase I/II compound
- Repurposing Volasertib can potentially inhibit the expansion of fibrotic machinery in IPF

Market Overview

Idiopathic pulmonary fibrosis has an estimated prevalence of 13 to 20 per 100,000 people worldwide. About 100,000 people are affected in the United States, and 30,000 to 40,000 new cases are diagnosed each year. In the U.S. Medicare population, patients with IPF incurred substantial health care resource utilization. The annual IPF-attributable medical cost to the U.S. health care system, excluding medication costs, is estimated at close to \$2 billion.

Investigator Overview

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