



Preclinical Models of Idiopathic Pulmonary Fibrosis (IPF)

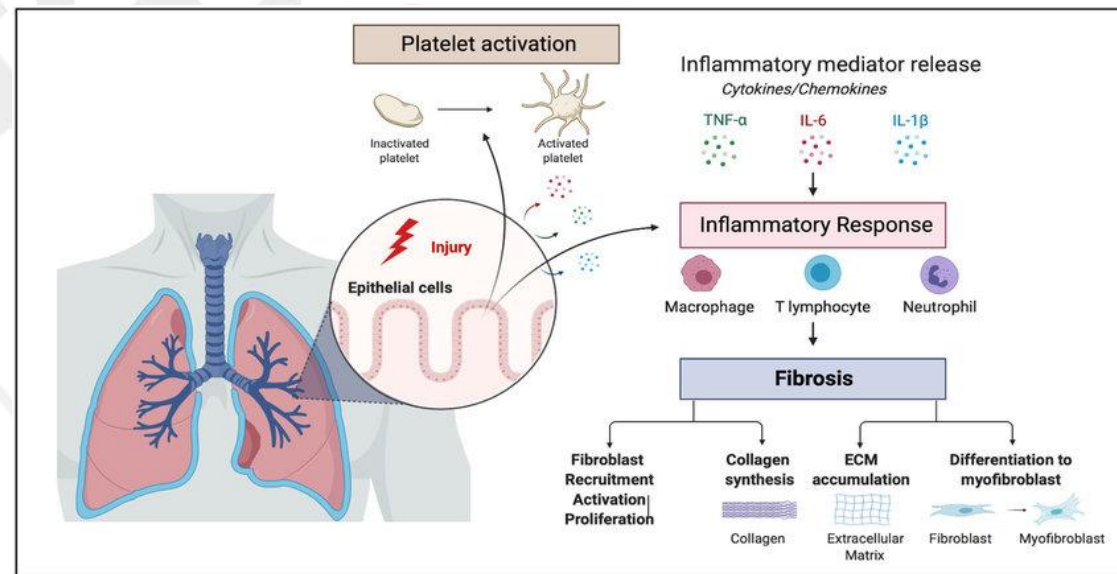
Idiopathic Pulmonary Fibrosis (IPF)

Symptoms and Causes

The symptoms of IPF tend to develop gradually and get slowly worse over time. Symptoms can include: shortness of breath, a persistent dry cough, tiredness, loss of appetite and weight loss. IPF is a type of interstitial lung disease. It is caused by lung tissue becoming thick and stiff and eventually forming scar tissue within the lungs. The scarring, or fibrosis, seems to result from a cycle of damage and healing that occurs in the lungs. Over time, the healing process stops working correctly and scar tissue forms. What causes these changes in the first place is unknown.

Models in place:

- **BLM Induced C57BL/6 IPF Model**
- **BLM Induced SD IPF Model**
- **SiO₂ Induced SD IPF Model**



BLM Induced IPF Model in Rodents

■ Mechanism

Bleomycin (BLM) is a drug used to treat different types of neoplasms. BLM's most severe adverse effect is lung toxicity, which induces remodeling of lung architecture and loss of pulmonary function, rapidly leading to death. BLM is one of the most widely used drugs for inducing lung fibrosis in animals, due to its ability to provoke a histologic lung pattern similar to that described in patients undergoing chemotherapy. This pattern is characterized by patchy parenchymal inflammation, epithelial cell injury with reactive hyperplasia, epithelial-mesenchymal transition, activation and differentiation of fibroblasts to myofibroblasts, basement membrane and alveolar epithelium injuries.

■ BLM Induced IPF Model in Rodents



Animal	C57BL/6, SD
Evaluation	Clinical: Body weight,
	Cytokine: Hydroxyproline
	Pathology: HE & Masson

BLM Induced C57BL/6 IPF Model

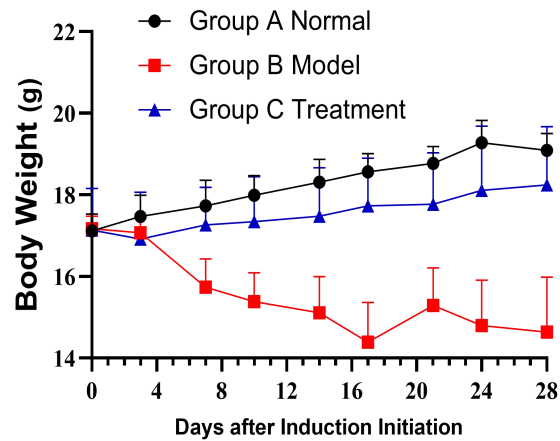


Fig 1 Body Weight

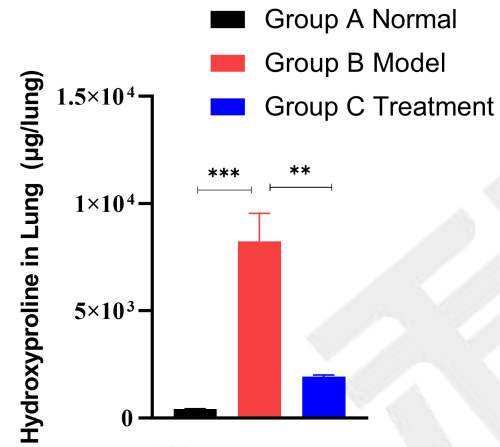


Fig 2 Hydroxyproline in lung

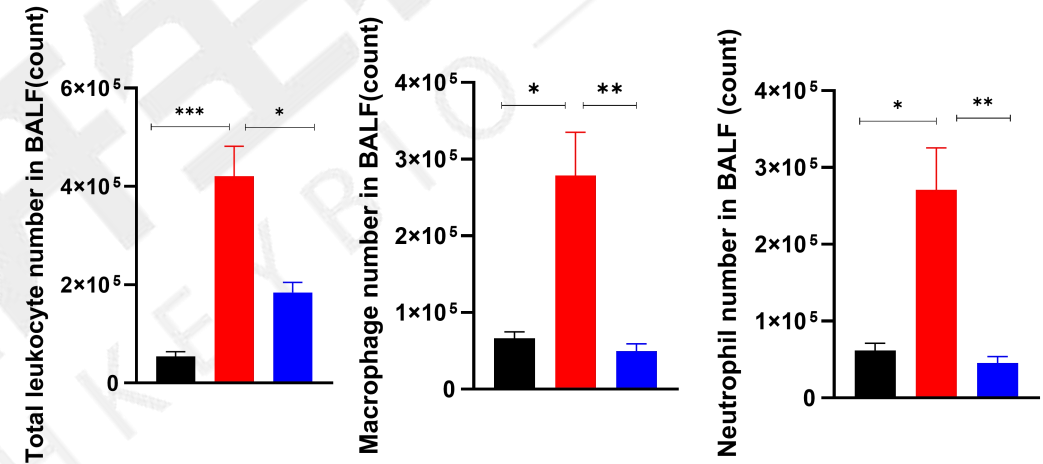


Fig 3. Cells in BALF

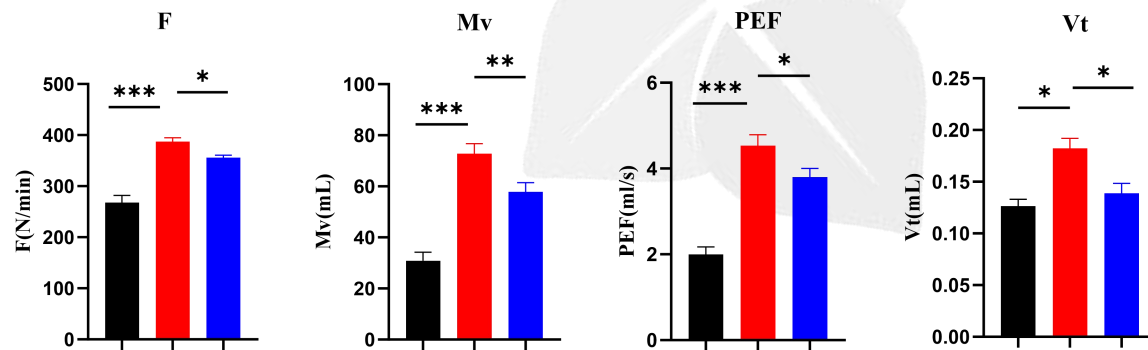


Fig 4 Lung function

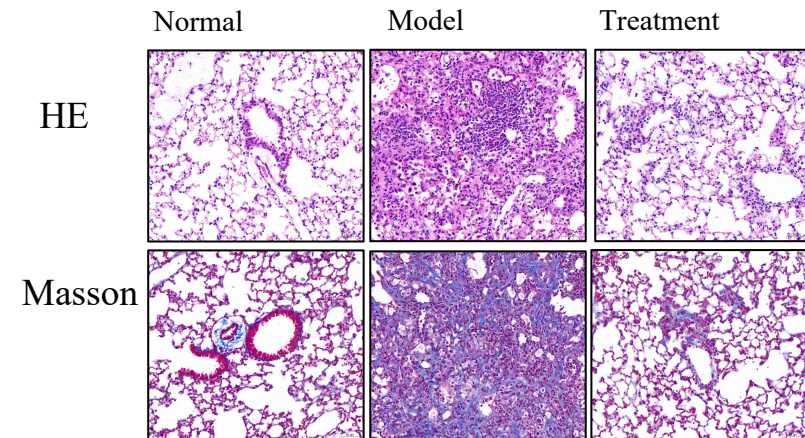
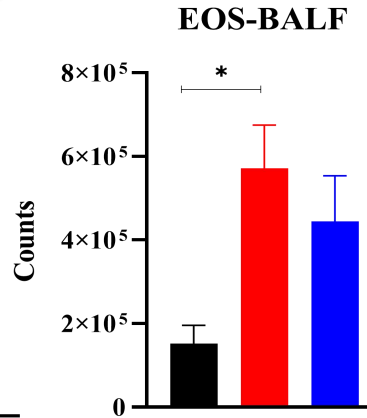
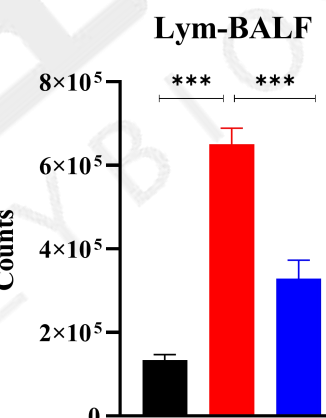
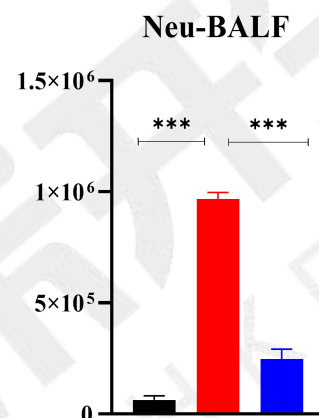
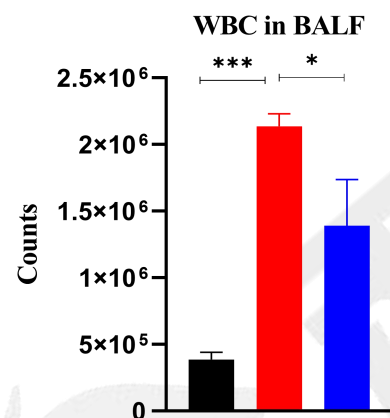
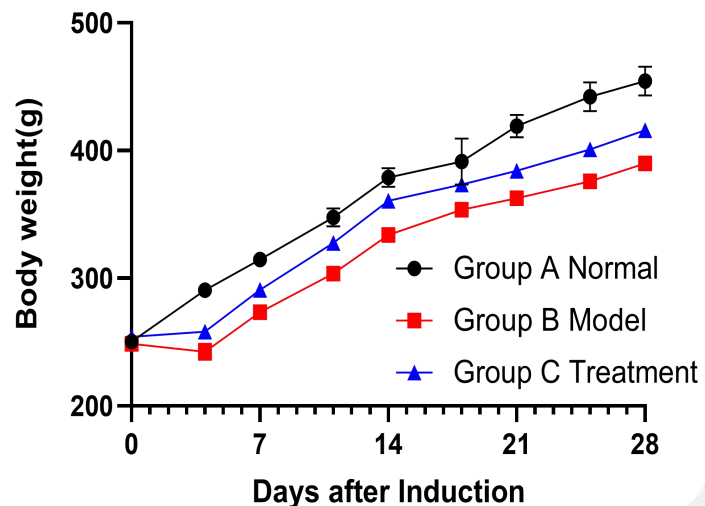


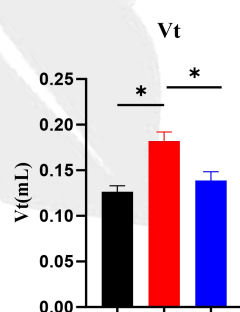
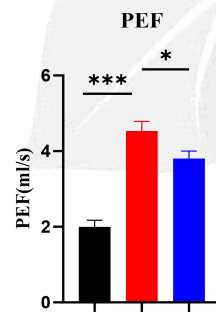
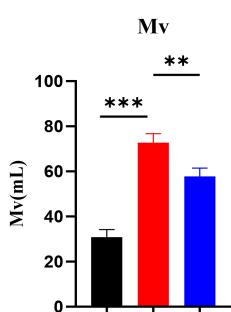
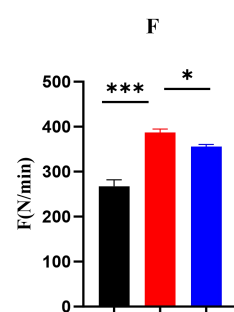
Fig 5. Lung histopathology

BLM Induced SD Rat IPF Model



Group A Normal
Group B Model
Group C Treatment

Fig 2. Cells in BALF



G1 Normal
G2 Model
G3 Treatment

Fig 3 Lung function

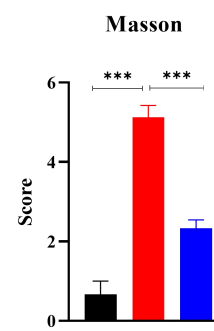
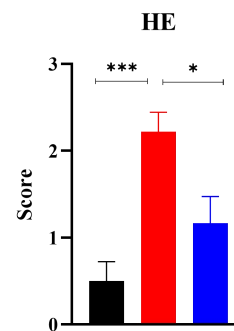


Fig 4 Lung pathology

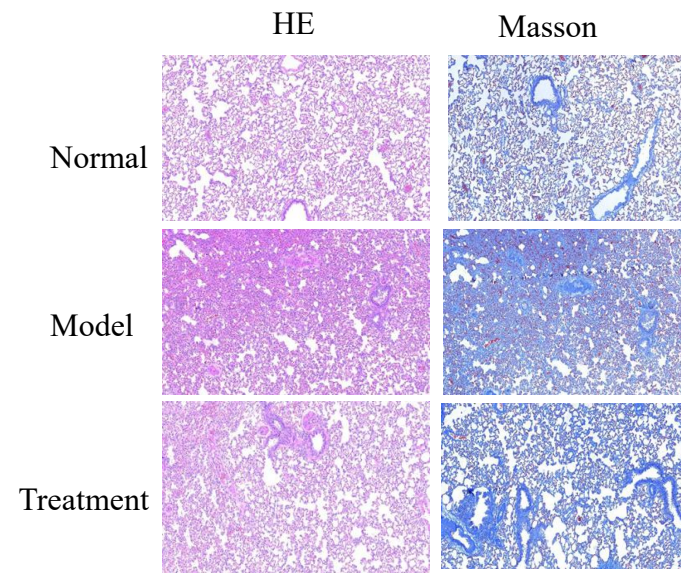


Fig 5 Typical pathological images

SiO₂ Induced Rat IPF Model

■ Mechanism

Silicosis is a fatal occupational chronic fibrotic lung disease caused by long-term exposure to respirable crystalline silica (silicon dioxide (SiO₂)) dust that was ultimately deposited in distal airways.

Upon silica particles stimulation, T lymphocytes were activated by antigen presenting cells (APC) such as dendritic cells (DC) and macrophages in the processing and presentation of silica antigen. Participation of CD4⁺ T cells, including Th1 and Th2 cells, in the pathogenesis of lung fibrosis induced by silica particles has been indicated in several studies.

■ BLM Induced IPF Model in Rodents



Animal	SD
Evaluation	Clinical: Body weight
	Cytokine:
	Pathology: HE & Masson

SiO₂ Induced Rat IPF Model

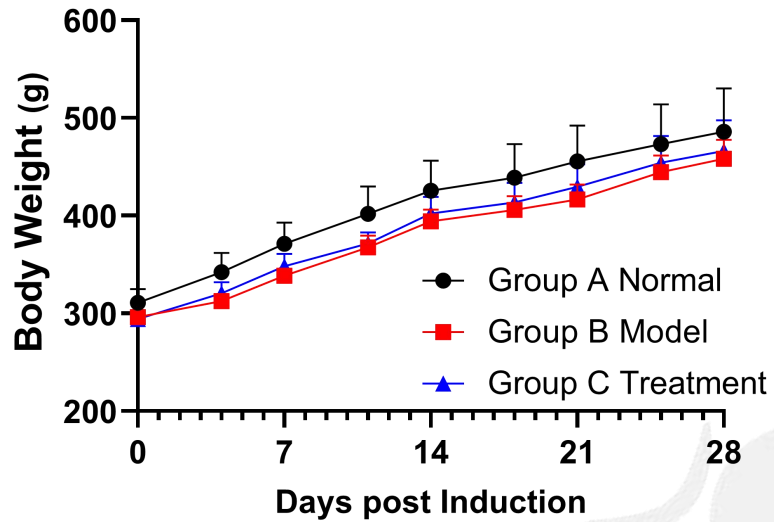


Fig 1. Body weight

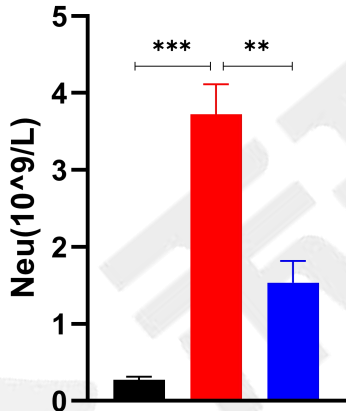


Fig 2. Neutrophils in BALF

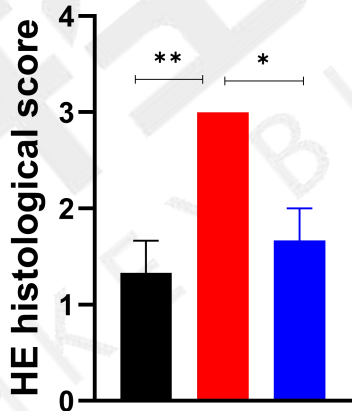
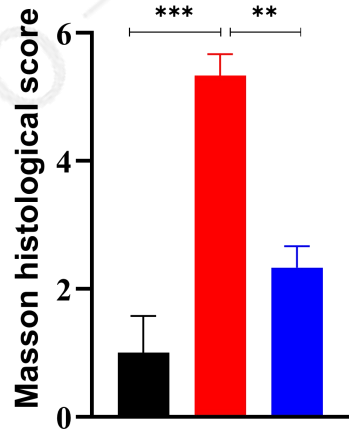


Fig 3 Lung pathology



Group B Model
Group A Normal
Group C Treatment

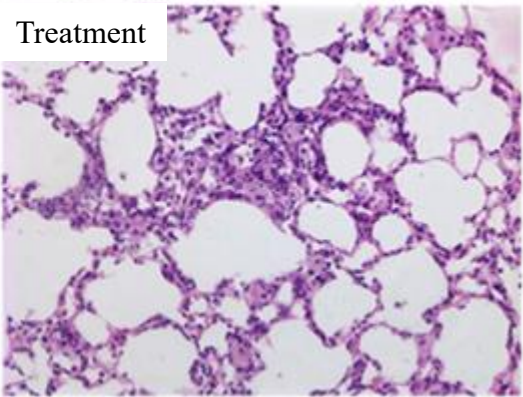
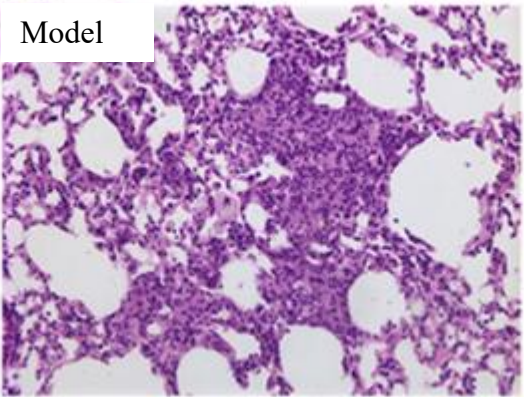
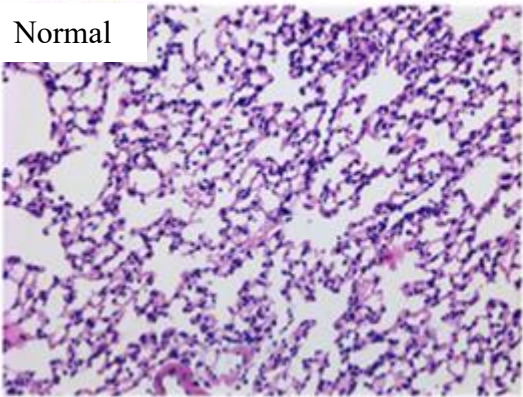


Fig 4 Typical pictures of HE



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Analysis Center: Suzhou
Rodent Center: Suzhou



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