Protein molecule may improve survival in deadly lung disease

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Researchers at the University of Illinois at Chicago College of Medicine have discovered a protein molecule that seems to slow the progression of pulmonary fibrosis, a progressive lung disease that is often fatal three to five years after diagnosis.

The finding is reported in the *American Journal of Respiratory and Critical Care Medicine*.

Nearly five million people worldwide are affected by pulmonary fibrosis, which causes the lungs to become covered in fibrous scar tissue and leads to shortness of breath that gets more severe as the disease progresses.

Chronic inflammatory and autoimmune diseases can cause pulmonary fibrosis, as can exposure to asbestos, certain toxic gases, and even radiation therapy to treat lung cancer. Treatment options are limited because once scarring occurs, it is permanent. Lung transplantation remains the only effective treatment, but it is usually reserved for advanced cases.

"Finding a new therapeutic target for the treatment of pulmonary fibrosis is exciting, especially because the therapies available generally only slow the disease in very few patients," said Long Shuang Huang, UIC postdoctoral research associate in pharmacology and first author of the paper.

In previous genetic studies of patients with idiopathic pulmonary fibrosis—where no cause can be identified—the researchers found variations in several genes known to be involved in pulmonary fibrosis, including in the gene coding for a protein called lysocardiolipin acyltransferase, or LYCAT.

To investigate the potential role of LYCAT in pulmonary fibrosis, the researchers measured its levels in the blood of idiopathic pulmonary fibrosis patients. Patients with the highest levels of LYCAT had significantly better lung function and higher three-year survival rates than those with lower levels.

"Since higher LYCAT levels directly correlate with better lung function and outcomes, we think the protein is playing some kind of protective role, or could be slowing the progress of pulmonary fibrosis," Huang said. "This suggests that boosting LYCAT levels in patients with pulmonary fibrosis may be a viable new therapeutic approach to treating the disease," Huang said.

The researchers also looked at the role of LYCAT in a mouse model of lung tissue scarring, and found that in mice where the LYCAT gene was knocked out, scar tissue developed more readily compared to mice with the gene. In mice engineered to produce elevated levels of LYCAT the development of scarring was much slower.

Looking for compounds or small molecules that increase the production of LYCAT is the next step for Huang and his colleagues.

Provided by University of Illinois at Chicago