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Neuroimmune molecules in human lung fibrosis

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Idiopathic pulmonary fibrosis (IPF) is an incurable condition characterized by the progressive accumulation of scar tissue in the adult human lung. It typically leads to death within approximately three years of diagnosis and while several pharmacologic agents can delay disease progression, the benefit of these interventions is limited, heterogeneous and accompanied by toxicity. Current paradigms of pulmonary fibrosis propose this process to result from a mismatch between epithelial cell injury and excessive fibroblast repair responses that may be amplified by interactions with macrophages and understanding all aspects of fibrogenesis is of particular importance in IPF, where patients present with established disease. An emerging interest in this area is the contribution of neuroimmune molecules to these processes. Our laboratory was the first to study this class of proteins in the context of human lung disease when we defined the association of the GPI-anchored membrane protein Semaphorin 7a with pulmonary fibrosis. Sema 7a regulates inflammatory responses via the competing effects of α1β1 integrin and the transmembrane protein Plexin C1. We have shown this interaction to be present in several forms of mammalian lung fibrosis and inflammation where Sema 7a’s stimulatory effects are enacted via an integrin-mediated process that is opposed by Plexin C1. We have also found a novel role for the laminin-like neuronal guidance protein Netrin-1 in the integrin-mediated processes and have detected altered expression of all of these components in IPF. Further study of this area might lead to new therapeutic insights into lung injury and pathologic remodeling.

Biography
Erica L Herzog is an Associate Professor of Medicine in the section of Pulmonary, Critical Care and Sleep at Yale School of Medicine. She directs YALE-ILD, the Interstitial Lung Disease Center of Excellence and conducts translational research in the field of pulmonary fibrosis. She has authored over 50 peer reviewed publications and is received by several NIH awards.

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