

Towards an Understanding Epithelial-Mesenchymal Interactions in the Adult Lung

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The lung is a very dynamic organ system and its multiple functions depend to a large extent on the maintenance of its complex, three dimensional tissue architecture. We know a considerable amount about the composition and turnover of the epithelial cells that make up the lining of the airways and alveoli. However, much less is known about the mesoderm-derived cells of the lung and other components such as the nerves and immune cells. Mesodermal cells include the endothelial cells, vascular smooth muscle and pericytes of the blood vessels and lymphatics, airway smooth muscle, and lipofibroblasts and other stromal cells. The talk will summarize what is known about the make-up and embryonic development of the mesodermal components of the lung and how they respond in various injury and repair models in the adult lung. There is evidence for a dynamic interplay between the mesodermal components and the epithelium. For example, failure to repair or regenerate the epithelium after damage can lead to abnormal proliferation and differentiation of the associated stromal and immune cells, resulting in transient or persistent fibrosis. Likewise, in other organ systems there is evidence that abnormal behavior of stroma can promote changes in the phenotype of epithelial cells. In order to understand the mechanisms underlying normal and pathologic epithelial-mesenchymal interactions in the lung we need to apply new genetic and imaging tools to both in vivo and in vitro systems. Progress towards achieving these goals will be discussed.