Novel lung stem/progenitor cells in infection

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Abstract
A novel subset of lung stem/progenitor cells expressing CD34 and Oct-4 were identified in human lung. These cells could be isolated from the lung of newborn mice and they are susceptible to infection of a variety of viruses in vitro, including SARS coronavirus and highly pathogenic avian influenza H5N1 virus. In the autopsy human lung, the lung stem/progenitor cells are indeed the major target for SARS and H5N1 infection. The lung stem/progenitor cells also express a C-type lectin pathogen-binding receptor L-SIGN (CD209L), whose polymorphism is significantly associated with SARS susceptibility through modulating the viral degradation via a proteasome-dependent pathway. Furthermore, infection of these viruses induces a unique regulatory pattern of the production of soluble factors and molecules critical for fat metabolism. The lung stem/progenitor cells can also rescue pulmonary function insufficiency induced by chemicals by regenerating type II pneumocytes in vivo. Finally, cells expressing similar phenotype also exist in the small bowel surface layer of the neonates and its polymorphism affects the disease progression of neonatal necrotising enterocolitis.