Researcher identifies new target to prevent fatal flu lung complication

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Research led by Dr. Jay Kolls, Professor and Chairman of Genetics at LSU Health Sciences Center New Orleans, has identified a therapeutic target for acute lung injury resulting in acute respiratory distress syndrome, a highly fatal complication of influenza infection.

The research, which will be published in The Journal of Immunology in October, is currently available in the Next in the JI section online.

Interleukin-17 (IL-17), an immune system cell involved in proinflammatory response, is a potent regulator of neutrophils (white blood cells). Following infection, IL-17 uses a signaling receptor called IL-17RA to direct large numbers of neutrophils to the infection. Neutrophils play a key role in the development of acute lung injury because they rapidly infiltrate the lung and are an important source of cytokines (immunomodulating agents), a byproduct of which is swelling, fluid in the lungs, and low levels of oxygen in the blood.

The research team wanted to determine whether blocking IL-17RA signaling would protect against acute lung injury following influenza infection. Using an influenza model in control and knockout mice (genetically engineered without IL-17RA), they worked to identify a pathway to control the function of IL-17RA and the migration and action of neutrophils. They found decreased levels of illness and death among the IL-17RA knockout mice, despite a higher viral load. The researchers found that the knockout mice had fewer neutrophils in the lung, thus lower levels of inflammation and less lung injury. Comparing

their results to studies of IL-17RA knockout mice in other models of viral infection, the researchers conclude that therapeutic regulation of IL-17 signaling may be beneficial not only in acute lung injury, but also in treating viral infections of other organs.

"Each year, more than 200,000 people are hospitalized with flu-related complications in the United States," notes Dr. Kolls. "A number of those who have died from H1N1 flu this year have had lung damage different than we typically see with seasonal flu. These cases have been marked by deep lung infections with diffuse damage to the alveoli - the structures that deliver oxygen to the blood. Advancing our findings has the potential to benefit both."

More information:
http://0-www.jimmunol.org.innopac.lsuhsc.edu/cgi/reprint/jimmunol.0900995v1

Source: Louisiana State University Health Sciences Center