Researchers discover how cells limit inflammation in lung injury

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(Medical Xpress) -- Researchers at the University of Illinois at Chicago College of Medicine have found in an animal model of acute lung injury a molecular mechanism that allows cells of the immune system to reduce tissue damage from inflammation.

The study is reported in *Nature Immunology*.

Inflammation is part of the normal response to infection. One aspect of inflammation is the production of negatively charged oxygen-rich molecules by specialized white blood cells called phagocytes. The molecules, called reactive oxygen species (ROS), help to break up bacteria, allowing the phagocytes to "mop up" the broken pieces and clear out the infection. Unfortunately, ROS can also cause damage to normal tissue.

The UIC researchers found that a channel through the cell membrane of phagocytes is able to modulate this destructive phase of inflammation.

"Although the channel, called TRPM2, is found in many cell types in the immune system, including phagocytes, it's function in these cells has been unknown," said Anke Di, UIC research assistant professor in pharmacology and first author of the study.

The researchers were able to show that TRPM2 had a protective anti-inflammatory role in the animal model of ALI, and, further, it played a previously unknown role in protecting against inflammation and tissue

injury generally.

TRPM2's protective effect was a result of its ability to dampen the production of the negatively charged ROS by modulating the electrochemical gradient -- the difference in charge between molecules within the cell and outside the plasma membrane of the cell.

ALI and its more severe form, acute respiratory distress syndrome (ARDS) result from pulmonary edema (leaky blood vessels) and inflammation. Both direct lung injury from infection and indirect lung injury from trauma, sepsis, pancreatitis, transfusions, radiation exposure and drug overdose can trigger ALI. It is fatal in almost 40 percent of cases.

Inflammation plays an important role in ALI and a number of other human diseases, said Dr. Asrar Malik, UIC Schweppe Family Distinguished Professor and head of pharmacology and principal investigator of the study. Understanding how inflammatory damage to tissues is controlled normally may help develop therapies in the future, he said.

Provided by University of Illinois at Chicago