

## Stem cell therapy may offer hope for acute lung injury

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Researchers at the University of Illinois at Chicago College of Medicine have shown that adult stem cells from bone marrow can prevent acute lung injury in a mouse model of the disease.

Their results are reported online in the October issue of the journal *Stem Cells*.

<u>Acute lung injury</u> (ALI) is responsible for an estimated 74,500 deaths in the U.S. each year. ALI can be caused by any major inflammation or injury to the lungs and is a major cause of death in patients in hospital ICUs. There is no effective drug treatment.

In ALI, the layer of cells that forms the lining of the blood vessels surrounding the lung's air sacs is damaged, allowing fluid to leak in and fill the sacs. Repair of these breaks in the <u>endothelium</u>, or lining, is complicated by the fact that <u>endothelial cells</u> are long-lived, says Kishore Wary, UIC assistant professor of pharmacology and lead author of the study. Turnover of new cells takes as long as two to five years, and few of the precursor cells needed for replacement circulate in the body at any given time.

"The stem cells that might be able repair the damage caused by ALI are simply not on hand," he said.

Wary and his colleagues were able to identify progenitor stem cells in the <u>bone marrow</u> of mice that could prevent and treat experimentally-



induced ALI. These progenitor stem cells, named Flk-1 and CD34 for the proteins on their surfaces, constitute a very small percentage of the stem cell population in the bone marrow, but the researchers were able to develop a way of culturing the cells that increased their numbers and their "stickiness."

The stem cells stud their surface with molecules called integrins that allow the cells to stick to their targets and affect the repair. "Increasing this capacity for stickiness in our culture system was likely to make the stem cells more effective in repair," Wary said.

When mice that had been injected with a compound that causes ALI were injected with the purified and cultured Flk and CD34 <u>stem cells</u>, the progenitor cells were able to repair the lung injury, prevent fluid build-up, and led to improved survival.

The mouse disease model not only demonstrated that stem cell treatment is a promising therapy for ALI, Wary said, "but also provided us with the means to understand how these progenitor cells did their repair work. These therapeutic cells employed integrins to stick to the site of injury and turn on cellular and molecular repair machinery," he said.

The researchers hope to explore the possibility of using stem cell therapy in human acute <u>lung injury</u>.

Source: University of Illinois at Chicago (<u>news</u> : <u>web</u>)

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