

Evidence for spinal membrane as a source of stem cells may advance spinal cord treatment

October 28 2011

Italian and Spanish scientists studying the use of stem cells for treating spinal cord injuries have provided the first evidence to show that meninges, the membrane which envelops the central nervous system, is a potential source of self-renewing stem cells. The research, published in *Stem Cells*, develops the understanding of cell activation in central nervous system injuries; advancing research into new treatments for spinal injuries and degenerative brain disorders.

The team focused their research on spinal cord injuries, caused when the spinal cord is damaged by trauma rather than disease. Depending on the severity a spinal injury can lead from pain to full paralysis, with high social and [medical care costs](#). As the spinal cord lacks the ability to regenerate, the potential for [patient recovery](#) is severely limited.

"Our research offers the first evidence that the spinal cord meninges, the system of membranes which cover the surface of the brain and the spinal cord, contains [stem cells](#) which are capable of self-renewal and proliferation," said lead authors Dr Ilaria Decimo and Dr Francesco Bifari, at the University of Verona.

Following a spinal injury meningeal cells increase in number and migrate to form glial scars and the team believe this process explains part of the mechanism of stem cell activation in [central nervous system](#) diseases; a mechanism which could in turn be used for treatments. Dr Decimo's team microdissected samples of spinal cord meninges from adult rats revealing that meningeal cells contain crucial stem cell properties. It is

these properties which increase following a spinal cord injury.

"Our research emphasizes the role of meninges cells in the reaction to spinal cord trauma and indicates for the first time that spinal cord meninges harbour stem cells which are activated by injury," concluded Dr. Decimo. "Further testing could result in a strategic turnaround for advancing regenerative medicine for treating neurological disorders and [spinal cord injuries](#)."

"This study underlines the importance of endogenous stem cells," said *Stem Cells* Editor Dr Miodrag Stojkovic. "Identification of these cells is crucial for understanding the basic mechanisms of cell biology and tissue repair, but also to identify drugs and chemicals which might be used to mobilize meningeal stem cells."

Provided by Wiley

Citation: Evidence for spinal membrane as a source of stem cells may advance spinal cord treatment (2011, October 28) retrieved 25 April 2024 from

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