Adult Stem Cells Treat Spinal Cord Injury in Humans and Animals:


**2004**  Ohio State researchers transplanted bone marrow stromal cells into rats that had contusive spinal cord injuries, and found that the adult stem cells provided a protective environment that preserved spinal cord tissue and helped guide nerve regeneration. Ankeny DP *et al.*, “Bone marrow transplants provide tissue protection and directional guidance for axons after contusive spinal cord injury in rats,” *Experimental Neurology* 190, 17-31, 2004.

2003 University of South Florida and Korean researchers used human umbilical cord blood stem cells to treat rats with spinal cord injuries. They found that the cord blood stem cells migrated to areas of injury, and the rats showed significant behavioral improvements even when treated several days after the injury. Saporta S et al., “Human umbilical cord blood stem cells infusion in spinal cord injury: Engraftment and beneficial influence on behavior,” *J Hematotherapy Stem Cell Research* 12, 271-278, 2003.

2002 A collaboration between researchers at Tulane and in Sweden found that adult bone marrow stromal cells promote healing of spinal cord injuries, and that the cells produced significant functional improvement. The study concluded that bone marrow stromal cells are an accessible, expandable source of cells that offer a promising future for spinal cord repair. Hofstetter CP et al., “Marrow stromal cells form guiding strands in the injured spinal cord and promote recovery,” *Proc Natl Acad Sci USA* 99, 2199-2204, February 19, 2002.

Touted ESCR Spinal Cord Injury Studies in Animals:

2006 Johns Hopkins researchers turned embryonic stem cells into motor neurons and showed some improvement in mobility of spinal cord injured rats; however, one of the factors needed for success was adult neural stem cells to provide a growth factor and migration path for the embryonic stem cells. Deshpande DM et al., *Recovery from paralysis in adult rats using embryonic stem cells*, *Annals of Neurology* 60, 32-44, 2006.

2005 California researchers used human embryonic stem cells to treat rats with new but not long-term spinal cord injury. The stem cells were turned into the nerve cells that surround spinal cords, and the rats showed modest functional improvement. The experiment was not continued long enough to test for tumors. Keirstead H et al., “Human embryonic stem cell derived oligodendrocyte progenitor cell transplants remyelinate and restore locomotion after spinal cord injury,” *J Neuroscience* 25, 4694-4705, May 11, 2005.

2005 Researchers at Washington University, St. Louis, found that transplanting embryonic stem cells into rat spinal cord gave no improvement, and caused tumors in a number of animals. Howard MJ et al., *Transplantation of apoptosis-resistant embryonic stem cells into the injured rat spinal cord*, *Somatosensory and Motor Research* 22, 37-44, March/June 2005.

2005 Researchers used human embryonic stem cells to remyelinate the protective sheath around injured rat spinal cords. However, there was no test for any functional recovery. Nistor GI et al., “Human embryonic stem cells differentiate into oligodendrocytes in high purity and myelinate after spinal cord transplantation,” *Glia* 49, 385-396, February 2005.