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### Effect of spinal transplantation of embryonic stem cell-derived oligodendrocyte progenitor cells on spinal cord injury pain

Spinal cord injury (SCI) can cause chronic neuropathic pain. Currently, available therapies are inadequate for SCI-induced neuropathic pain. In the present study, we investigated the effect of spinal transplantation of mouse embryonic stem cell-derived oligodendrocyte progenitor cells (OPCs) on SCI pain using a rat contusion SCI model. We observed that chronic neuropathic pain was present on day 7 after SCI and persisted for the entire 56-day observation period. Spinal transplantation of OPCs enhanced remyelination in the injured spinal cord and reduced SCI-induced chronic neuropathic pain. Moreover, we found that SCI decreased the protein level of neuregulin-1 and ErbB4 in the injured spinal cord and that OPC transplantation can rescue the spinal expression of both proteins after SCI. Furthermore, intrathecal injection of neuregulin-1 siRNA, but not the control non-target RNA, reduced OPC transplantation-produced remyelination and counteracted

the antinociceptive effect of OPC transplantation. Our results suggest that spinal transplantation of embryonic stem cell-derived OPCs is an appropriate therapy for SCI pain and that neuregulin-1/ErbB signaling is involved in central remyelination under pathological conditions and contributes to OPC transplantation-mediated alleviation of SCI pain.

#### Speaker Biography

Feng Tao is an Associate Professor in the Department of Biomedical Sciences at Texas A&M University College of Dentistry. He received his RO1 award and Independent Scientist Award from NIH in 2012 and 2014, respectively. He has published more than 40 papers in peer-reviewed professional journals and he is serving as an Editorial Board Member for some professional journals. He also served as an invited reviewer for NIH NRCS Study Section, Johns Hopkins ACCM Seed Grant, NSF-sponsored Pilot Funding at Louisiana State University, Arizona Biomedical Research Commission, Britain Israel Research and Academic Exchange Partnership Regenerative Medicine Initiative, Wings for Life Spinal Cord Research Foundation in Austria, Department of Veterans Affairs Rehabilitation Research and Development Service Spinal Cord Injury and Neuropathic Pain Panel and The French National Research Agency (ANR) in France.

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