

TRANSPLANTATION OF MENINGEAL-DERIVED OLIGODENDROCYTES REMYELINATE LYSOPHOSPHATIDYLCOLINE (LPC) SPINAL CORD LESION

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In spinal cord diseases, demyelination plays an important role in the generation and progression of the neurodegenerative lesion. Transplantation of oligodendrocytes represents a promising avenue for treatment of demyelinating disorders, although clinical application is hindered by the lack of adequate cell sources. Our group has described a population of neural stem/progenitor cells that resides in the adult leptomeninges and can be isolated and differentiate into neural lineages. By developing a highly efficient multi-step protocol, we were able to obtain a large number of transplantable oligodendrocytes from small meningeal biopsies. With this work we aim to assess the remyelinating potential of meningeal-derived oligodendrocytes. To address this aim we developed a model of in vivo spinal cord demyelination by injecting in the spinal cord parenchyma the demyelinating drug lysophosphatidylcholine (LPC). After 7 days from the injection of LPC, we transplanted 6×10^5 eGFP-labelled meningeal-derived oligodendrocytes in the site of the demyelinated area. We analysed the fate and the myelinating potential of meningeal derived 21 days after the transplantation. Immunofluorescence analysis revealed that eGFP meningeal-derived oligodendrocytes were localized in the spinal cord parenchyma and express the myelin-specific protein, MBP. Importantly, Luxol Fast Blue analysis of spinal cord sections showed a statistical significant increased of the percentage in myelin of the transplanted LPC-treated group compared to the control LPC-treated group. In conclusion, our data highlight the remyelinating potential of meningeal-derived oligodendrocytes suggesting that meningeal-derived oligodendrocytes may be exploited in regenerative therapies of demyelinating disorders.