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More attention on glial cells to have better recovery after spinal cord injury

Functional improvement after spinal cord injury remains an unsolved difficulty. Glial scars, a major component of SCI lesions, are very effective in improving the rate of this recovery. Such scars are a result of complex interaction mechanisms involving three major cells, namely, astrocytes, oligodendrocytes, and microglia. In recent years, scientists have identified two subtypes of reactive astrocytes, namely, A1 astrocytes that induce the rapid death of neurons and oligodendrocytes, and A2 astrocytes that promote neuronal survival. Moreover, recent studies have suggested that the macrophage polarization state is more of a continuum between M1 and M2 macrophages. M1 macrophages that encourage the inflammation process kill their surrounding cells and inhibit cellular proliferation. In contrast, M2 macrophages promote cell proliferation, tissue growth, and regeneration. Furthermore, the ability of oligodendrocyte precursor cells to differentiate into adult oligodendrocytes or even neurons has been reviewed. Here, we first scrutinize recent findings on glial cell subtypes and their beneficial or detrimental effects after spinal cord injury. Second, we discuss how we may be able to help the functional recovery process after injury.

Keywords: Spinal cord injury, A1 astrocyte, A2 astrocyte, OPCs, M1 and M2 macrophages.

Biography

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