Research & Reviews
Research and Reviews: Neuroscience
Abstract

The Glial Scar

Kyle Muscat
Middlesex University Malta, Malta

Abstract:
The glial scar forms following damage to the central nervous system. Astrocytes, oligodendrocyte precursors, microglia, meningeal cells and progenitor cells are brought in to the injury site that also contains myelin debris and oligodendrocytes. Most of the studies on this topic have been carried out in the last twenty years, and it is only recently that evidence has started to show the beneficial effects of glial scar formation. Studies show that most of the cell types within the glial scar generate inhibitory molecules for axon regeneration, and thus also inhibit functional recovery following damage to the central nervous system. On the other hand, more recent studies have showed that the glial scar is in fact necessary following damage to central nervous system as it prevents spread of damage to the spared neurones. This essay delves into the components of the glial scar and the inhibitory molecules produced by the different cell types. It also analyses the possible inducers of glial scar formation. The heterogeneity of the glial scar is also discussed following different types of lesions to the central nervous system. The essay also probes into the inhibitory nature of the glial scar environment, and also its beneficial aspects. Possible therapeutic strategies will also be considered. The glial scar is a complex structure that follows damage to the central nervous system (CNS). It develops over a couple of days and is made up mainly of astrocytes, oligodendrocyte precursors (OPCs), and microglia (Fawcett & Asher, 1999). Its function is to separate the damaged tissue from adjacent healthy tissue, in order to maintain the viability of the undamaged neurones, which would otherwise be susceptible to the toxic microenvironment that follows injury to the CNS (Rolls et al., 2009). However, the glial scar does not come without its drawbacks. There is a great amount of evidence showing that the glial scar is a major source of inhibition for axonal growth, providing a molecular and physical barricade to axon regeneration after CNS injury.

Biography:

Kyle Muscat is working at Middlesex University Malta, Malta.

Addiction, Depression & Suicidal risk; Rome, Italy; September 30, 2020

Citation: Kyle Muscat; The Glial Scar; Webinar on Depression; Rome, Italy; September 30, 2020