Editorial

Glia: A New Cellular Target in the Treatment of Major Depression

It was a great honor and pleasure to prepare this issue entitled “Glia: a new cellular target in the treatment of major depression” for the special issue in Current Drug Targets.

Depression is a common illness worldwide, with an estimated 350 million people affected. Projections even indicate that by 2020 it will be ranked second cause of disability worldwide. There are effective treatments for depression but it is estimated that one third of depressed patients do not respond adequately to conventional antidepressant drugs. Moreover, among responders, one of the main limitations of these agents lies in their long delay between the beginning of treatment and the onset of the therapeutic effects.

Understanding the mechanisms of action of antidepressant drugs and identifying new therapeutic strategies are the current priorities in the field of mental health research. Although, it is well accepted that the therapeutic activity of antidepressant drugs relies, at least in part, on their ability to enhance brain monoaminergic transmission, the long-term postsynaptic cellular targets of these medications are yet to be determined.

On this background, the current issue explores the potential role of glial cells and more particularly of astrocytes in major depression. Indeed, astrocytes are emerging as relevant elements in the physiopathology of depression and the mechanism of action of antidepressant drugs through their role in the regulation of neuronal activity, synaptic transmission and plasticity. As an example of the physiological role of astrocytes in brain plasticity, these cells modulate complex processes relevant to the behavioral activity of antidepressant drugs including synaptogenesis, hippocampal neurogenesis and restructuration of neuronal networks in the mature brain. Astrocytes make these changes possible through the release of gliotransmitters, neurotrophic factors, anti-inflammatory and metabolic substances thereby orchestrating molecular signals that regulate the homeostasis of neuronal circuits.

Astrocytes, as an active part of the tripartite synapse, have therefore a very great potential impact, at the clinical level and also as a basis for the development of antidepressant strategies. To encourage new in vivo studies in the field, the present issue summarizes the current knowledge in the area of glia associated with mood disorders and related treatments. Powerful tools have been recently developed to allow the specific overexpression or silencing of genes within astrocytes. They also provide new opportunities to better understand the importance of the bidirectional dialogue between neurons and astrocytes.

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