

Astrocytes ER Ca²⁺ signalling and its pathological relevance

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The evolution of the central nervous system (CNS) resulted in an appearance of highly specialised neuronal networks optimised for rapid information transfer. In the course of this specialisation neuronal cells lost their metabolic independence and the ability to survive in the absence of homeostatic systems. These homeostatic systems, represented by neuroglia regulate all aspects of CNS function in physiological and pathological conditions. The neurological diseases should be therefore considered as primary gliopathologies, which determine the progression and outcome of neuropathological process. Glial function is intimately regulated by cellular calcium signalling that underlies the specific form of “glial calcium excitability”. Glial Ca²⁺ signals are triggered by activation of multiple receptors, and are primarily driven by Ca²⁺ release from the endoplasmic reticulum. In this review we summarise the role of glial calcium signalling in various forms of pathological processes including neurological and psychiatric disorders and neurodegeneration.