

The neurovascular unit: the contribution of endothelial cells and leukocytes

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The conventional notion that neurons are exclusively responsible for brain signaling is increasingly challenged by the idea that brain function in fact depends on a complex interplay between neurons, glial cells, vascular endothelium, and immune-related blood cells. But it's only in the last years that we consider the cerebrovasculature not simply as a passive conduit, but rather as a highly dynamic multicellular structure capable of **integrating** and **responding** to both systemic and neural cues (1). We are focusing since the last decade to the role of non-neuronal players modulating the neuronal activity. We will report experimental evidences of the contribution of endothelial cells and leukocytes in the neuronal abnormal excitation. In particular, our recently obtained-data demonstrated the role of endothelial cells in the initiation of the pathological cascade induced by Quantum-dots nanoparticles, as well as the primary role of cerebral endothelial cells in the pathogenesis of temporal lobe epilepsy induced by pilocarpine. We will furthermore report data indicating the role of neurovascular unit different players in the pharmaco-resistant epilepsy.

References

[1] Winkler, Bell & Zlokovic, Nature Neuroscience 14, 1398–1405 (2011) doi:10.1038/nn.2946

Keywords

NVU; bEnd.3 cells; neuromodulation; Quantum dots; epilepsy.