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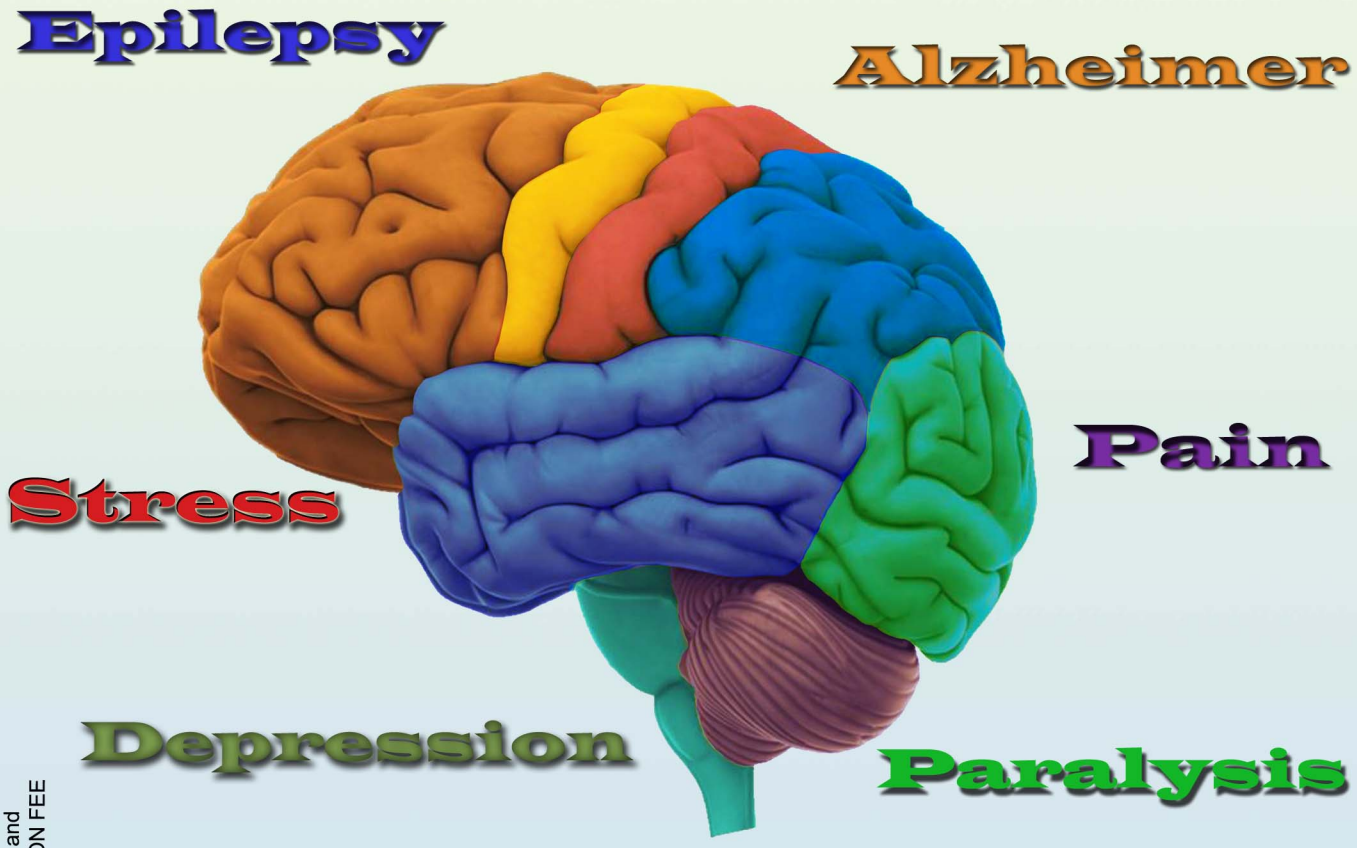

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AIM AND SCOPES
Journal of Cellular Neuroscience and Oxidative Stress is an online journal that publishes original research articles, reviews and short reviews on the molecular basis of biophysical, physiological and pharmacological processes that regulate cellular function, and the control or alteration of these processes by the action of receptors, neurotransmitters, second messengers, cation, anions, drugs or disease.

Areas of particular interest are four topics. They are;

A- Ion Channels (Na^+- K^+ Channels, Cl^- channels, Ca^{2+} channels, ADP-Ribose and metabolism of NAD^+, Patch-Clamp applications)

B- Oxidative Stress (Antioxidant vitamins, antioxidant enzymes, metabolism of nitric oxide, oxidative stress, biophysics, biochemistry and physiology of free oxygen radicals)

C- Interaction Between Oxidative Stress and Ion Channels in Neuroscience
(Effects of the oxidative stress on the activation of the voltage sensitive cation channels, effect of ADP-Ribose and NAD^+ on activation of the cation channels which are sensitive to voltage, effect of the oxidative stress on activation of the TRP channels in neurodegenerative diseases such Parkinson's and Alzheimer's diseases)

D- Gene and Oxidative Stress
(Gene abnormalities. Interaction between gene and free radicals. Gene anomalies and iron. Role of radiation and cancer on gene polymorphism)

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Keywords
Ion channels, cell biochemistry, biophysics, calcium signaling, cellular function, cellular physiology, metabolism, apoptosis, lipid peroxidation, nitric oxide, ageing, antioxidants, neuropathy, traumatic brain injury, pain, spinal cord injury, Alzheimer's Disease, Parkinson's Disease.

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Speak No. 1

Pathophysiology of cation channels in pain: Focus on TRP Channels

Mustafa NAZIROĞLU
Neuroscience Research Center, Suleyman Demirel University, Isparta, Turkey

In neurons such as dorsal root ganglion (DRG) and trigeminal ganglia, calcium (Ca^{2+}) and sodium ion concentrations are higher in in outside than in cytosol, although potassium ion concentration was higher in inside of the neurons than outside of the neurons. Within the ions, it has been suggested that a dysregulation of Ca^{2+} homeostasis acts a key role in the pathogenesis of oxidative stress associated nerve damage. Ca^{2+} is a main intracellular messenger involved in several physiological functions of neurons such survival, death, synaptic plasticity and neurotransmitter release. It has specific role in induction of peripheral pain. Ca^{2+} passes cell membrane via different channels such as chemical and voltage gated channels. Apart from the well-known cation channels, there is recently discovered channels namely transient receptor potential (TRP) family. The TRP superfamily is containing 6 subfamilies with 28 members in mammalian. Activation and inhibition mechanisms of the TRP channels are very different from the voltage gated calcium channels. Some TRP channels such as TRP melastatin 2 (TRPM2), melastatin 7 (TRPM7) and TRP ankyrin 1 (TRPA1) are activated by oxidative stress. Expression levels of TRPA1, TRPM2 and TRPM7 are high in DRG, phagocytic cells and hippocampus, respectively. Therefore, TRPM2 is important channels in physiological activity of phagocytic cells such as neutrophil and monocytes (Heiner et al. 2006). TRPM7 and TRPA1 have main roles in cerebral ischemia and peripheral pain molecular pathways, respectively (Carrasco et al. 2018; Sun, 2017). Till today specific antagonists of most TRP channels have not been discovered yet and they have potential targets for discovering drugs in neuroscience. In pain etiology, Ca^{2+} is important and it has been demonstrated in some studies that the administration of an antagonist to Ca^{2+} channels induces a reduction in chemotherapeutic agents-induced neuropathic pain. In the presentation, I discussed novel results of Ca^{2+} on the peripheral pain by the regulation of TRP channels.

I concluded that the results of recent studies suggest that increased cytosolic Ca^{2+} has through inhibition of TRP channels main role in etiology of peripheral pain. It seems to that the TRP channels are potential target for treatment of peripheral pain.

Key words: Peripheral Pain; Calcium ion; TRP channels; Dorsal root ganglion.

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