E-ISSN: 2149-7222 (Online)

Journal Cellular Neuroscience and Oxidative Stress

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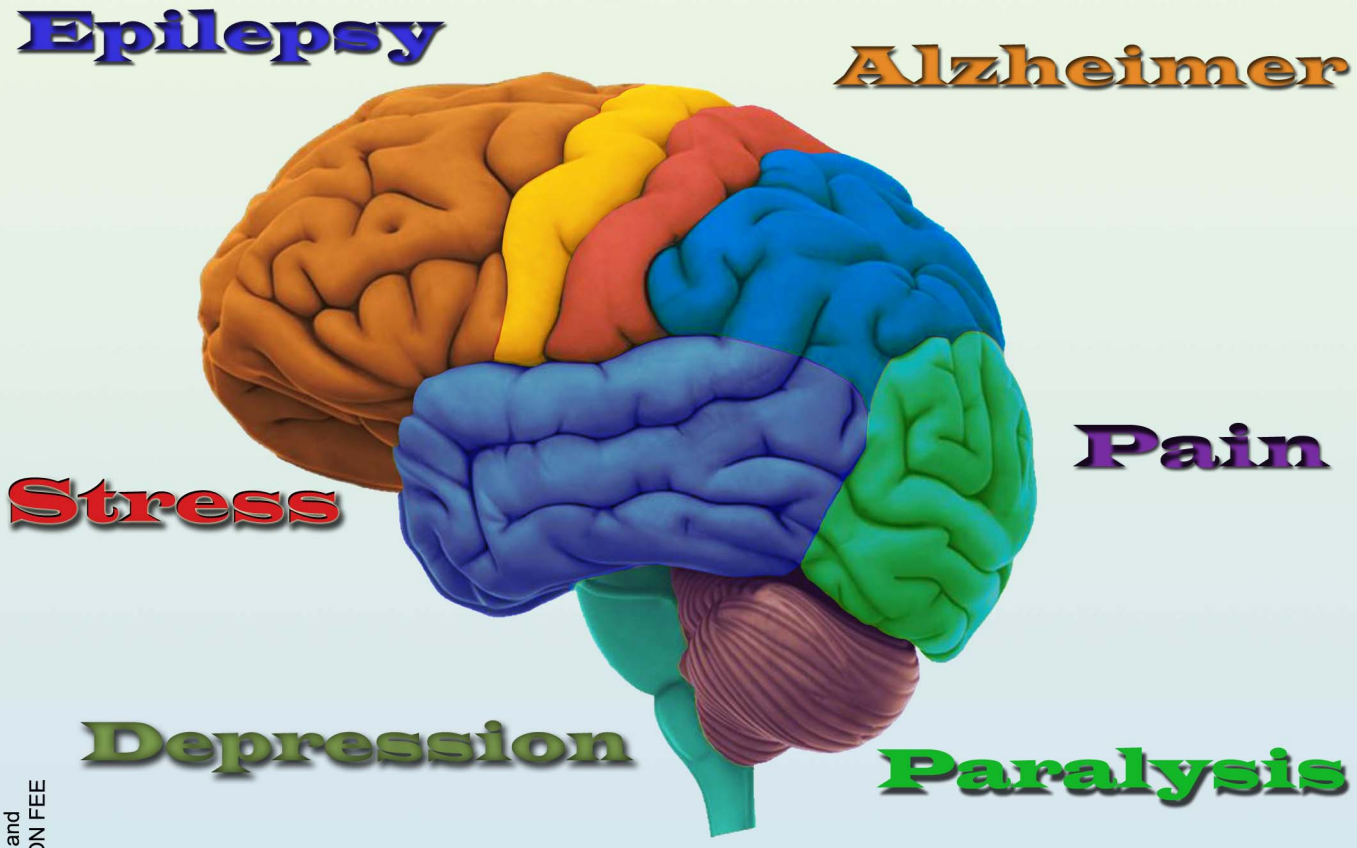

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Brain Research School

Editor in Chief
Prof.Dr. Mustafa NAZIROĞLU

Volume 10, Number 3, 2018

Journal of Cellular Neuroscience and Oxidative Stress

http://dergipark.gov.tr/jcnos

An Official Journal of the Cellular Neuroscience and Oxidative Stress Society

http://hsord.org.tr/en/

Formerly known as:

Cell Membranes and Free Radical Research (2008 - 2014)

Volume 10, Number 3, 2018

3rd International Brain Research School

25 June – 1 July 2018 Isparta /TURKEY

2018.brs.org.tr

Volume 10, Number 3, 2018
E-ISSN Number: 2149-7222 (Online)
Indexing: Google Scholar, Index Copernicus, Chemical Abstracts, Scopus (Elsevier),
EBSCOhost Research Database, Citation Index Database,

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. 2

Calcium imaging techniques in cell lines

Laszlo PECZE
Unit of Bioinformatics and Bioengineering, Institute of Chemistry, Faculty of Materials Science and Engineering, University of Miskolc, Hungary

Calcium imaging is a scientific technique which is designed to measure the intracellular free calcium concentration (Ca^{2+}) in an isolated cell or tissue. Calcium imaging techniques utilizes fluorescent molecules so called Ca^{2+} indicators that can respond to the binding of Ca^{2+} ions by changing their fluorescence properties. Binding of a Ca^{2+} ion to a fluorescent indicator molecule leads to either an elevation in its fluorescence intensity or emission/excitation wavelength shift.

Two main classes of calcium indicators are chemical indicators and genetically encoded calcium indicators. Chemical indicators are small molecules that can bind calcium ions. This group of indicators includes Fura-2, Fluo-3, Fluo-4, Rhod-2. These dyes are often used with acetoxymethyl esters, in order to render the molecule lipophilic and to allow easy entrance into the cell. Genetically encoded indicators do not need to be loaded onto cells, instead the genes encoding for these proteins can be easily transfected to cells. These indicators are fluorescent proteins derived from green fluorescent protein (GFP).

The time-scan mode of laser confocal microscopy is often used for calcium imaging. Intracellular Ca^{2+} ions generate versatile intracellular signals that control key functions in all types of cells. In sensory neurons Ca^{2+} signals are associated with pain transmission.

Keywords: Calcium imaging; Confocal microscope, Calcium indicators; Neuron.

References

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