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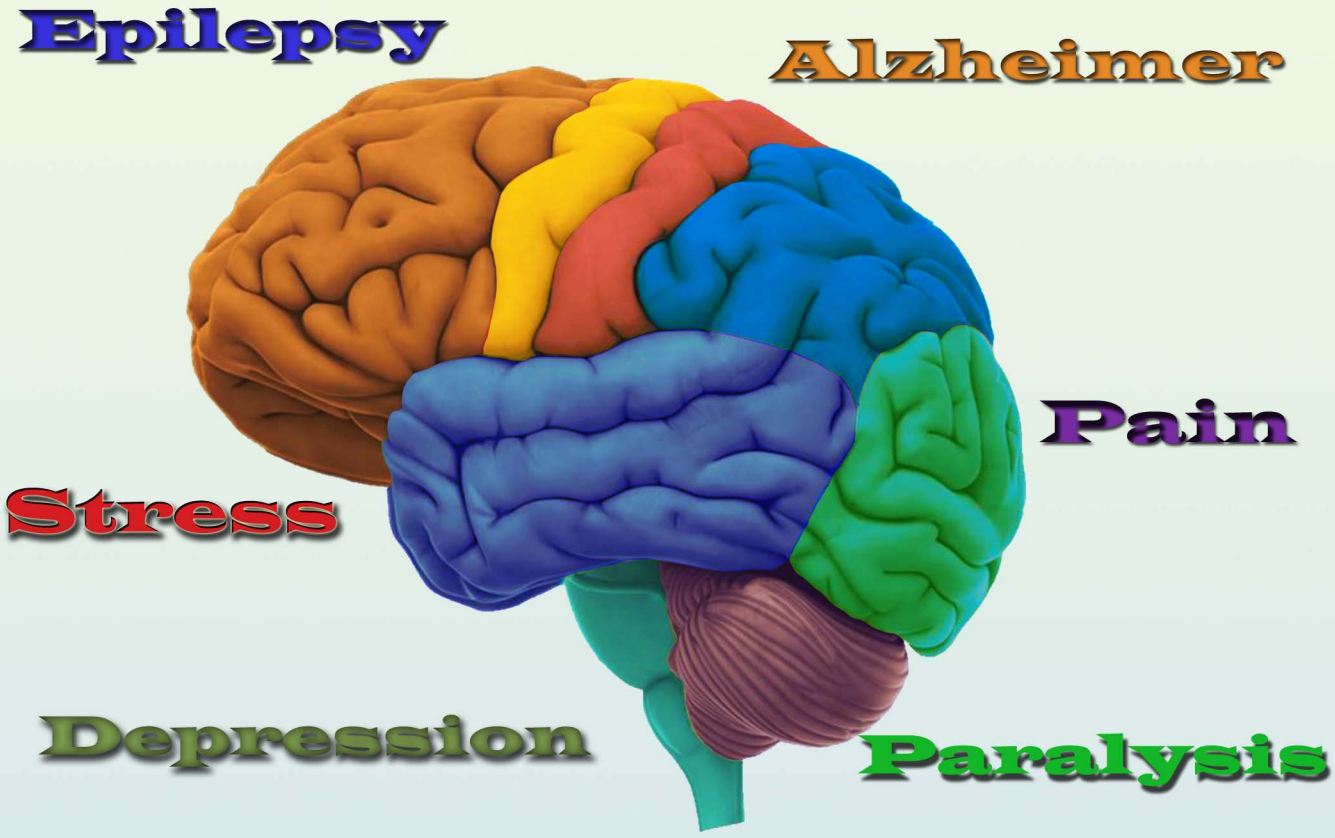

Brain Research School

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Journal of Cellular Neuroscience and Oxidative Stress

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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)

READERSHIP

Biophysics	Biochemistry
Biology	Biomedical Engineering
Pharmacology	PhysiologyGenetics
Cardiology	Neurology
Oncology	Psychiatry
Neuroscience	Neuropharmacology

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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Abstract Book

of

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24-30 June 2019

Isparta, Turkey

with collaboration of

BSN Health Analyses, Innovation, Consultancy, Organization, Industry and Trade Limited Company

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Poster Presentations

Poster No. 2

New derivatives of 2-deoxy-D-glucose (2-DG) in the therapy of glioblastoma multiforme - preliminary studies

Ewelina Siwiak[1*], Maja Sołtyka[1*], Anna Jaśkiewicz[1], Marcin Ziemniak[2], Waldemar Priebe[3], Beata Pająk[1]

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Tumor cells preferentially use the glycolysis process as a source of ATP regardless of the availability of oxygen (Warburg effect). GBM cells are particularly dependent on this process. A PET diagnostic test using a fluoro-labeled 2-DG derivative indicates that GBM cells accumulate 2-DG in their interior. Unfortunately, therapeutic use of 2-DG is limited due to insufficient pharmacokinetic parameters of the compound. However, a chemical modification involving the substitution of -OH groups with acetyl groups leads to an increase in 2-DG permeability across the BBB and its concentrations in GBM cells. Based on previous preliminary results using the O-acetylated 2-DG-2-deoxy-3,6-di-O-acetyl-D-glucose derivative (WP1122), we assume that the new halogen (2-BG, 2-IG, 2-CG) and acetyl 2-DG derivatives will be highly cytotoxic to GBM cells. In addition, we anticipate the analysis of a new class of 2-DG derivatives, which may be modulated with ethylbutyrate and VPA, may also modulate the activity of HDAC and thus the expression of genes involved in cell apoptosis.

The obtained preliminary results on the in vitro model showed that 2-DG decreases the viability of the U87 and U251 cell lines depending on the dose. The IC50 2-DG is for the following lines: U87-0.6mM, 0.5 mM (46,72h), U251-0.7mM, 0.45mM (48,72h). The percentage of apoptotic cells was evaluated by flow cytometry and cell staining with annexinV and PI. The MTT analysis of WP122 showed that the IC50 is in the cells of U87 line-1.5mM, 0.8mM (48,72h), U251-1.25mM, 0.8mM (48,72h). The MTT analyzes of the effects of HDIs: NaBt and VPA determined the IC50 for NaBt: U87-1.48mM, 0.95mM (48,72h), U251-2.1mM, 2mM (48,72h); for VPA: U87-6.2mM, 6.0mM (48,72h), U251-5.3mM, 4.2mM (48,72h). Preliminary studies in the analysis of halo-derivatives interaction with hexokinase allowed to develop a model of expression and obtain a recombinant hexokinase protein, which will then be used for crystallographic analyzes.

Keywords: GBM; 2-deoxy-D-glucose; WP1122; Apoptosis; Autophagy.

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