

# Journal Cellular Neuroscience and Oxidative Stress

<http://dergipark.gov.tr/jcnos>

Former name; Cell Membranes and Free Radical Research

**Epilepsy**

**Alzheimer**



**Pain**

**Stress**

**Depression**

**Paralysis**

**Brain Research School**

OPEN ACCESS and  
NO PUBLICATION FEE

Editor in Chief  
Prof.Dr. Mustafa NAZIROĞLU

Supp 1 Volume, 2019

# 4<sup>th</sup> International Brain Research School

24-30 June 2019 Isparta /TURKEY  
[2019.brs.org.tr](http://2019.brs.org.tr)

---

# Journal of Cellular Neuroscience and Oxidative Stress

<http://dergipark.gov.tr/jcnos>

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

<http://www.bsnsaglik.com.tr/>

[info@bsnsaglik.com.tr](mailto:info@bsnsaglik.com.tr)

**Formerly known as:**

Cell Membranes and Free Radical Research (2008 - 2014)

---

Supp 1 Volume, 2019

#### **EDITOR IN CHIEF**

Prof. Dr. Mustafa Naziroğlu,  
Department of Biophysics and Neurosciences,  
Medical Faculty, Suleyman Demirel University,  
Isparta, Turkey.  
Phone: +90 246 211 36 41, Fax:+90 246 237 11 65  
E-mail: mustafanaziroglu@sdu.edu.tr

#### **Managing Editors**

Kenan Yıldızhan and Yener Yazgan  
Department of Biophysics, Medical Faculty,  
Suleyman Demirel University, Isparta, Turkey.  
E-mail: biophysics@sdu.edu.tr

#### **Editorial Board**

##### **Neuronal Membranes, Calcium Signaling and TRP Channels**

Alexei Tepikin, University of Liverpool, UK.  
Jose A. Pariente, University of Extremadura,  
Badajoz, Spain.  
James W. Putney, Jr. NIEHS, NC, USA.  
Laszlo Pecze, University of Fribourg, Switzerland.  
Stephan M. Huber, Eberhard-Karls University,  
Tubingen, Germany.

##### **Neuroscience and Cell Signaling**

Denis Rousseau, Joseph Fourier, University,  
Grenoble, France.  
Makoto Tominaga, National Institute for Physiological  
Sciences (NIPS) Okazaki, Japan.  
Ömer Çelik, Süleyman Demirel University, Turkey.  
Ramazan Bal, Gaziantep University, Turkey.  
Saeed Semnanian, Tarbiat Modares University,  
Tehran, Iran.  
Yasuo Mori, Kyoto University, Kyoto, Japan.

##### **Antioxidant and Neuronal Diseases**

Suresh Yenugu, Osmania University, Hyderabad, India.  
Süleyman Kaplan, Ondokuz Mayıs University,  
Samsun, Turkey.  
Özcan Erel, Yıldırım Beyazıt University,  
Ankara, Turkey.  
Xingen G. Lei, Cornell University, Ithaca, NY, USA.  
Valerian E. Kagan, University of Pittsburg, USA.

##### **Antioxidant Nutrition, Melatonin and Neuroscience**

Ana B. Rodriguez Moratinos, University of  
Extremadura, Badajoz, Spain.  
Cem Ekmekcioglu, University of Vienna, Austria.  
Peter J. Butterworth, King's College London, UK.  
Sergio Paredes Department of Physiology, Madrid  
Complutense University, Spain.

#### **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<sup>+</sup>- K<sup>+</sup> Channels, Cl<sup>-</sup> channels, Ca<sup>2+</sup> channels, ADP-Ribose and metabolism of NAD<sup>+</sup>, 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<sup>+</sup> 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.

# 4<sup>th</sup> International Brain Research School

---

## Abstract Book

of

4<sup>th</sup> International Brain  
Research School

24-30 June 2019

Isparta, Turkey

with collaboration of  
BSN Health Analyses, Innovation,  
Consultancy, Organization, Industry  
and Trade Limited Company  
& Neuroscience Research Center,  
Süleyman Demirel University

# 4<sup>th</sup> International Brain Research School

## [ Organization Committee ]

### **Organization Chairman**

**Prof. Dr. Mustafa NAZIROĞLU**

*Department of Biophysics, School of Medicine  
Suleyman Demirel University, Isparta, Turkey*

### **Organization Vice Chairman**

**Assoc. Prof. Dr. Ömer ÇELİK**

*Department of Biophysics, School of Medicine  
Suleyman Demirel University, Isparta, Turkey*

### **Organization Secretariat**

**Dr. Bilal ÇİÇ**

**Ahmi ÖZ & Ramazan ÇINAR**

*Department of Biophysics, School of Medicine  
Suleyman Demirel University, Isparta, Turkey*

### **Accountant**

**Kenan YILDIZHAN &**

**Yener YAZĞAN (Graphic Designer & Webmaster)**

*Department of Biophysics, School of Medicine  
Suleyman Demirel University, Isparta, Turkey*

# 4<sup>th</sup> International Brain Research School

## [ Scientific Committee ]

**Prof. Dr. Ana B. Rodríguez**

*Department of Physiology, Neuroimmunophysiology  
and Chrononutrition Research Group,  
Faculty of Science, University of Extremadura,  
Badajoz, Spain*

**Prof. Dr. Peter McNaughton**

*Wolfson Centre for Age-Related Diseases,  
King's College London, London, UK*

**Prof. Dr. İlker Y. Eyüpoğlu**

*Department of Neurosurgery,  
University of Erlangen-Nuremberg  
Erlangen, Germany*

**Prof. Dr. Hülya Bayır**

*Center for Free Radical and Antioxidant Health,  
Department of Environmental Health, University of Pittsburgh  
Pittsburg, USA*

**Prof. Dr. Mustafa Nazıroğlu**

*Department of Biophysics, School of Medicine  
Suleyman Demirel University, Isparta, Turkey*

**Prof. Dr. Peter W. Reeh**

*Institute of Physiology and Pathophysiology,  
Friedrich-Alexander-University Erlangen-Nuernberg,  
Erlangen, Germany*

**Prof. Dr. Makoto Tominaga**

*Division of Cell Signaling, Okazaki Institute for Integrative Bioscience  
(National Institute for Physiological Sciences),  
Okazaki, Japan*

**Prof. Dr. Ismail Laher**

*Department of Anesthesiology, Pharmacology and Therapeutics,  
The University of British Columbia,  
Vancouver, Canada*

**Prof. Dr. Yasuo Mori**

*Department of Synthetic Chemistry and Biological Chemistry,  
Graduate School of Engineering, Kyoto University  
Kyoto, Japan*

# 4<sup>th</sup> International Brain Research School

## [ Scientific Committee ]

**Prof. Dr. Jose A. Pariente**

*Department of Physiology, Neuroimmunophysiology  
and Chrononutrition Research Group,  
Faculty of Science, University of Extremadura,  
Badajoz, Spain*

**Prof. Dr. Anirban BASU**

*National Brain Research Centre  
Haryana, India*

**Prof. Dr. Paolo Bernardi**

*Padova University  
Padova, Italy*

**Assist. Prof. Dr. M. Cemal Kahya**

*İzmir Katip Çelebi University  
İzmir, Turkey*

**Assist Prof. Dr. Sergio D. Paredes**

*Madrid Complutense University  
Madrid, Spain*

**Assist Prof. Dr. Denis Rousseau**

*Applied and Fundamental Bioenergetic laboratory  
Joseph Fourier University  
Grenoble Cedex, France*

**Assist. Prof. Dr. Isabella Hininger-Favier**

*Joseph Fourier University  
Grenoble, France*

**Dr. Simon Hebeisen**

*B'SYS Analytics GmbH.  
Binningen, Switzerland*

**Dr. Sandra Derouiche**

*National Inst for Physiol. Sci.  
Okazaki, Japan*

**Dr. Nady Braidy**

*Centre for Healthy Brain Ageing, School of Psychiatry,  
University of New South Wales, Australia*



# 4<sup>th</sup> International Brain Research School

## Oral Presentations

- Oral Presentation 1.** Using fluorescent calcium indicators in neuronal ion channel studies  
*Bilal Çiğ*.....9
- Oral Presentation 2.** The effects of quercetin on antioxidant and cytokine levels in rat hippocampus exposed to acute cadmium toxicity  
*İhsan KISADERE, Nurcan DÖNMEZ, Hasan Hüseyin DÖNMEZ*.....10
- Oral Presentation 3.** Involvement of oxidative stress and TRP channels in cerebral ischemia  
*Hamit Hakan ARMAĞAN*.....11
- Oral Presentation 4.** Interactions between chemotherapy-induced neuropathic pain and TRPV1 channel  
*Hacı Ömer OSMANLIOĞLU* .....12
- Oral Presentation 5.** Experimental traumatic brain injury models in rodents  
*Özgür ÖCAL*.....13
- Oral Presentation 6.** Ischemic stroke models in adult experimental animals  
*Aymer COŞAR*.....14
- Oral Presentation 7.** Potential therapeutic role of melatonin in traumatic brain injury: A literature review  
*Kemal ERTILAV*.....15
- Oral Presentation 8.** The anticonvulsant effects of salmon calcitonin on pentylenetetrazole-kindled rats  
*Ahmet Şevki TAŞKIRAN* .....16
- Oral Presentation 9.** The protective role of *Hypericum perforatum* in treatment of oxidative stress-induced multiple sclerosis is affected by extraction procedure: A literature review  
*Tunhan DEMİRCİ*.....17
- Oral Presentation 10.** Chemotherapeutic agents increase mitochondrial oxidative stress and apoptosis in optic nerve  
*Dilek ÖZKAYA, Mustafa NAZIROĞLU*.....18
- Oral Presentation 11.** Psychological and oxidative stress induce apoptosis through TRPV1 channel activation in granulosa cells of oocyte during in vitro fertilization  
*Dilek ULUSOY KARATOPUK*.....19

# Oral Presentations

## ▶ Oral Presentation 1

### Using fluorescent calcium indicators in neuronal ion channel studies

**Bilal Çiğ**

Department of Biophysics, Faculty of Medicine,  
Suleyman Demirel University, Isparta, Turkey

Calcium ion ( $\text{Ca}^{2+}$ ) is the most prominent secondary messenger of physiological cellular signals and ion channels research (Moeder et al. 2019). Neurotransmission, muscle contraction and fertilization are only a few of the physiological properties that make calcium ion important in most eukaryotic cells (Pharris et al. 2018). The extracellular calcium concentration is 1-3 mM whereas the intracellular concentration is around 80-100 nM. This tremendous difference is tightly controlled by dozens of different ion channels embedded in the membrane (Van Hook et al. 2019). Activation of these channels causes calcium ions to entry into the cell with density gradient. This produce the calcium signal. It is very important to control that prolonged elevation of intracellular calcium concentration due to channelopathies in ion channels due to various nervous system diseases because it activates caspase cascades leading to permanent damage and apoptosis. In this respect, the calcium indicators are unrivaled in terms of taking clear results by photographing all the points in these steps from the stage they were developed to the final stages. The use of these indicators to address the roles of these ion channels in terms of their contribution to the pathogenesis of neurological diseases has been an indispensable method of molecular analysis in recent years (Xu and Dong, 2019). In this presentation, we will discuss the chemical structures of calcium indicators, their contribution to the examination of cellular

signaling pathways, their advantages and disadvantages in the investigation of ion channels in neurological diseases.

**Key words;** Calcium ion indicators;

### References

- Moeder W, Phan V, Yoshioka K. 2019.  $\text{Ca}^{2+}$  to the rescue -  $\text{Ca}^{2+}$  channels and signaling in plant immunity. *Plant Sci.* 279:19-26.
- Pharris MC, Patel NM, Kinzer-Ursem TL. 2018. Competitive Tuning Among  $\text{Ca}^{2+}$ /Calmodulin-Dependent Proteins: Analysis of in silico Model Robustness and Parameter Variability. *Cell Mol Bioeng.* 11(5):353-365.
- Van Hook MJ, Nawy S, Thoreson WB. 2019. Voltage- and calcium-gated ion channels of neurons in the vertebrate retina. *Prog Retin Eye Res.* pii: S1350-9462(19)30012-6.
- Xu Q, Dong X. 2019. Calcium imaging approaches in investigation of pain mechanism in the spinal cord. *Exp Neurol.* 7;317:129-132.