



ДНС / SNS  Друштво за неуронауке Србије / Serbian Neuroscience Society

**31 May - 02 June**  
**Belgrade Youth Center**  
**Belgrade**

**Congress**  
**Serbian Neuroscience Society**

# Book of Abstracts



**8th CONGRESS OF SERBIAN NEUROSCIENCE SOCIETY with international participation**

**31 May – 2 June 2023. Belgrade, Serbia - BOOK OF ABSTRACTS**

**Published by:**

Serbian Neuroscience Society  
Bulevar despota Stefana 142, 11060 Belgrade, Serbia

**Editors**

Selma Kanazir and Danijela Savić

**Assistant editors:**

Anica Živković  
Željko Pavković

**Technical editor:**

Anđela Vukojević

**Graphic design:**

Olga Dubljević, Irina Veselinović

Copyright © 2023 by Serbian Neuroscience Society and associates. All rights reserved. No part of this publication may be reproduced in any form without written permission from the publisher.

**ISBN: 978-86-917255-4-9**

## **CONGRESS ORGANIZERS**

**Serbian Neuroscience Society**

**University of Belgrade, Institute for Biological Research "Siniša Stanković", National Institute of the Republic of Serbia**

## **CONGRESS CO-ORGANIZERS**

**University of Belgrade, Faculty of Medicine**

**University of Belgrade, VINČA Institute of Nuclear Sciences,  
National Institute of the Republic of Serbia**

**University of Belgrade, Faculty of Biology**

## **SPONSORED BY**

**Labena**

**Promedia**

**Zeiss**

## **SCIENTIFIC COMITTEE**

### **Chair:**

Selma Kanazir

### **Members:**

Aleksandra Isaković  
Carmen Sandi  
Cláudia Nunes Dos Santos  
Danijela Savić  
Dragomir Milovanović  
Elka Stefanova  
Frank Jessen  
Ivanka Marković  
Jelena Radulović  
Milena Stevanović  
Miroslav Adžić  
Nadežda Nedeljković  
Nataša Lončarević  
Nina Vardjan  
Panayiota Poirazi

## **ORGANIZING COMITTEE**

### **Chair:**

Ivana Bjelobaba

### **Members:**

Danijela Savić  
Milena Jović  
Jelena Ćirić  
Smilja Todorović



**In memory of Acad. Prof. Ljubisav Rakić**



# Contents:

**Programme**.....14

## **Lectures:**

### ***Opening Lectures:***

Neural circuits and metabolic pathways on the links between stress, anxiety  
& motivation  
*Professor Carmen Sandi*..... 20

### ***Keynote Lectures***

First symptomatic manifestation of Alzheimer's disease  
*Professor Frank Jessen*..... 21

Brain permeability and neuroprotection by the gut (poly)phenol metabolites  
*Cláudia Nunes Dos Santos, PhD*..... 22

Modulation of neuroinflammation by autophagy  
*Marina Jendrach, PhD*..... 23

Representation of stressful experiences in memory circuits  
*Professor Jelena Radulović*.....24

### ***Lectures:***

## **Brain Stimulation, Phase Separation and Open Data**

Brain-computer interface for electrotactile sensory training after stroke  
*Andrej Savić, PhD*.....25

Using noninvasive brain stimulation to modulate memory in humans: from  
mechanisms to clinical applications  
*Jovana Bjekić, PhD*.....26

Transcranial magnetic stimulation as a therapeutic approach for neurodegenerative  
disorders - insights from animal models  
*Milorad Dragić, PhD*.....27

Phase separation in neuronal physiology and pathology  
*Dragomir Milovanović, PhD*.....28

Open-access data and resources in neuroscience research  
*Ivan Zaletel, MD, PhD*..... 29

## **Brain Metabolism & Dietary Interventions**

Adrenergic regulation of astrocyte glucose and lipid droplet metabolism <i>Nina Vardjan, PhD</i> .....	30
Expression regulation and roles of insulin produced in the brain <i>Predrag Vujović, PhD</i> .....	31
The role of the Thioredoxin detoxification system in glioma progression and drug resistance <i>Ana Podolski-Renić, PhD</i> .....	32
Can consumption of (poly) phenol-rich food ameliorate molecular and behavioral PD-like pathology in MPTP-treated mice? <i>Nataša Lončarević, PhD</i> .....	33
Dietary restriction as an anti-aging intervention <i>Smilja Todorović, PhD</i> .....	34

## **Brain Disorders – From Genetics to Markers**

SOX Transcription Factors – choosing between stemness and neuronal differentiation <i>Marija Švirtlih, MD, PhD</i> .....	35
Genetics of neurodegeneration: from global resemblance to regional differences <i>Milena Janković, MD, PhD</i> .....	36
ALS IgG - translation to a physiological diagnostic marker <i>Milena Milošević, PhD</i> .....	37
Downregulation of LKB1/AMPK signaling in blood mononuclear cells is associated with the severity of Guillain-Barre syndrome <i>Verica Paunović, PhD</i> .....	38
The humanized CYP2C19 transgenic mouse exhibits cerebellar atrophy and movement impairment reminiscent of ataxia <i>Marin Jukić, PhD</i> .....	39

## **Neuroimmunoendocrine Interactions**

GABAergic cells and synaptic plasticity, are they affected by early life stress in and area specific manner? <i>Joko Poleksić, MD, PhD</i> .....	40
---	----

Sex bias in neuroscience research: challenges and implications of including both sexes in preclinical experiments <i>Ivana Jarić, PhD</i> .....	41
Distinct clinical outcomes of Complete Freund's adjuvant-free experimental autoimmune encephalomyelitis induced in DA rats <i>Milica Lazarević, PhD</i> .....	42
Anxiety-related behavior and inflammation: experimental and translational aspects <i>Dragan Hrnčić, MD, PhD</i> .....	43
The role of gut microbiota in depressive behavior and the effects of antidepressants <i>Iva Lukić, PhD</i> .....	44

## **Poster Sessions**

### **Brain Stimulation & Signalling, Phase Separation and Open Data**

Effect of enriched environment on serotonin and RNA editing of serotonin 2C receptor is specific for brain regions and mouse strains <i>Jelena Karanović et al.</i> .....	46
The impact of early life maternal deprivation on the perineuronal nets in the prefrontal cortex and hippocampus of young adult rats <i>Ana Jakovljevic et al.</i> .....	47
Intermittent theta burst stimulation exhibits promising effects in mitigating oxidative stress and reactive gliosis in the 6-hydroxydopamine model of Parkinson's disease <i>Milica Zeljkovic et al.</i> .....	48
GABAergic parvalbumin-expressing interneurons play a role in memory impairment in rat models of Parkinson's disease <i>Ljiljana Radovanovic et al.</i> .....	49
Effect of ELF-MF (50 Hz, 0.5 mT) on psychomotor behavior of rats caused by acute administration of MK-801 <i>Srđan Kesić, et al.</i> .....	50
Background norepinephrine impacts activity of cortical astrocytes <i>Ljiljana Nikolić et al.</i> .....	51
Effects of different anesthetics on hippocampal and reticulo-thalamic GABAergic parvalbumin-expressing interneurons <i>Andrea Novakovic et al.</i> .....	52
GnRHR signaling in neuronal cells: in vitro and in vivo data <i>Ana Milosevic et al.</i> .....	53
Chronic aerobic physical activity reduces brain hyperexcitability in an experimental model of chronic prostatitis/chronic pelvic pain syndrome <i>Nikola Šutulović et al.</i> .....	54

Nonsynaptic cellular mechanisms in epilepsy <i>Marija Stanojević et al.</i> .....	55
Maternal deprivation decreases the density of perineuronal nets in medial prefrontal cortex <i>Gorana Agatonović et al.</i> .....	56
Fractal properties of hippocampal amyloid plaques in Alzheimer’s disease and non-Alzheimer’s disease individuals <i>Katarina Milutinović et al.</i> .....	57
Olanzapine effects on parvalbumin/GAD67 protein expression in the layers of the retrosplenial cortex in chronically socially isolated rats <i>Andrijana Stanisavljević Ilić, Dragana Filipović.</i> .....	58
Prolonged zaleplon treatment enhance GABAergic and glutamatergic signaling in the hippocampus of male Wistar rats <i>Jelena Martinovic et al.</i> .....	59
Long-term alprazolam treatment may cause tolerance development by modulating components of glutamatergic neurotransmission in the hippocampus of male Wistar rats <i>Marina Zarić Kontić et al.</i> .....	60
Neuroarthistory. Theoretical concepts, method and ideas <i>Emilija Vuković.</i> .....	61
Intermittent theta burst stimulation ameliorates cognitive impairment and hippocampal astrogliosis in the Streptozotocin-induced model of Alzheimer's disease <i>Jelena Stanojevic et al.</i> .....	62
<b>Brain Metabolism &amp; Dietary Interventions</b>	
Tenascin C modulates biochemical composition of adult hippocampal neurogenic niche <i>Milena Tucić et al.</i> .....	63
Developmental effects of repeated antenatal synthetic glucocorticoid treatment on purinergic signaling in the auditory brainstem <i>Dunja Dimitrijević et al.</i> .....	64
Short-term fish oil treatment increases number of microglial cells and expression level of TREM-2 in parietal cortex of 5XFAD mice <i>Milena Jovic et al.</i> .....	65
The high-dose fish oil (FO) supplementation increased Mfsd2a expression in the retina of healthy mice <i>Irena Jovanovic Macura et al.</i> .....	66
Dams on high-fat diet have metabolic disturbances and decreased anxiety-like behavior <i>E. Djuric et al.</i> .....	67

Effect of sauerkraut brine in central and peripheral LPS-induced inflammation in C57BL/6 mice <i>Anđela Vukojević et al.</i> .....	68
Dietary restriction during puberty changes locomotor and vertical activity of adult female Wistar rats in an onset- and duration-dependent manner <i>Valentina Simeunovic et al.</i> .....	69
Propofol reduces the tendency for alcohol consumption in adolescent rats <i>Željko Pavković et al.</i> .....	70
New anti-glioblastoma strategy with natural compounds sclareol and doxorubicin <i>Ana Stepanović et al.</i> .....	71
Evading multidrug resistance in glioblastoma with natural compound sclareol and its novel derivatives <i>Ema Lupšić et al.</i> .....	72
Effects of long-term caloric restriction on pituitary-gonadal axis functionality of aged male Wistar rats <i>Sokanovic S et al.</i> .....	73
MTORC1 signaling pathway changes under the effect of caloric restriction in the hippocampus of male Wistar rats <i>Milica Prvulovic et al.</i> .....	74
Mitochondrial respiratory function of PBMCs is decreased in Leber's hereditary optic neuropathy <i>Pavlovic Kasja et al.</i> .....	75
Exploring the effects of prolonged 6-hydroxydopamine and 1-methyl-4-phenylpyridinium induced neurotoxicity on mTORC2 <i>Sanja Blagojević et al.</i> .....	76
Investigating the effect of ERK inhibition on mTOR complex 2 signaling pathway in neurotoxic models of parkinson's disease <i>Marija Jeremic et al.</i> .....	77
Hyperbaric oxygen prevents dendrite degeneration and loss of DCX-positive newborn immature neurons in the dentate gyrus after traumatic brain injury <i>Jeremic R et al.</i> .....	78
Anxiety-related behavioral alterations time evolution in model of chronic sleep fragmentation: correlation with redox distress <i>Željko Grubač et al.</i> .....	79
Effects of cuprizone-induced demyelination on autophagy markers in different neural structures with the evaluation of behavior in rats <i>Janko Zeković et al.</i> .....	80

Dietary supplementation with flaxseed oil ameliorates trimethyltin (TMT)-induced neurodegeneration and gliosis in female Wistar rats <i>Nataša Mitrović et al.</i> .....	81
Ketamine ameliorates fear extinction learning in adolescent males via hippocampal mTOR signaling <i>Emilija Glavonić et al.</i> .....	82
The effect of different subanesthetic doses of ketamine on BDNF levels in different brain structures in the mouse model of depression <i>Ana Zivanovic et al.</i> .....	83
Chronic mild stress induces sustained-activation of p38 MAPK signaling in the female WKY rats with endogenous depression <i>Kristina Virijević et al.</i> .....	84
Chronic unpredictable stress in adolescence causes disruption of colon morphology that is associated with depressive phenotype in adult mice <i>Miloš Mitic et al.</i> .....	85
Combination of Dasatinib and Quercetin improves working spatial memory in aged Wistar rats <i>Adam Krzystyniak et al.</i> .....	86
<b>Brain Disorders – From Genetics to Markers</b>	
Genetic risk factors in patients with Myasthenia gravis <i>Nemanja Garai et al.</i> .....	87
Changes in ecto-nucleotidase activities in selected brain regions in the 6-hydroxydopamine model of Parkinson's disease <i>Marina Anastasov et al.</i> .....	88
Unsupervised hierarchical clustering of patients with Myotonic dystrophy type <i>Lana Radenković et al.</i> .....	89
Analysis of circulating myomiRs as potential biomarkers of muscular impairment progression in myotonic dystrophy type 1 patients <i>J Pešović et al.</i> .....	90
One year of newborn screening for spinal muscular atrophy – results of a Serbian pilot project <i>Miloš Brkušanin et al.</i> .....	91
Neuroinflammation in Alzheimer’s disease: bioinformatic screening approach <i>Katarina Živančević.</i> .....	92
Linking EEG with ECG changes in a rat model of myocardial infarction: clue to digital biomarkers <i>Marko Vorkapić et al.</i> .....	93



Analysis of clinical exome panel in rare neurodegenerative disorders in Serbian population <i>Marija Brankovic et al.</i> .....	94
C9orf72 intermediate repeats in neurodegenerative disorders from Serbia <i>Marjanović Ana et al.</i> .....	95
Hypoxia preconditioning reduces the differentiation potential of human pluripotent stem cells and alters the expression of SOX genes and miR-21 <i>Stefan Lazic et al.</i> .....	96
Genomic and clinical findings in patients with 22q11.2 duplication syndrome <i>Jovana Kostic et al.</i> .....	97
Analysis of cohort of patients with 22q11.2 deletion syndrome - a Single-center Experience from Serbia <i>Ivana Simeunovic et al.</i> .....	98
The role of specific SOX genes and microRNAs in reactivation and senescence of human astrocytes derived from pluripotent NT2/D1 cells. <i>Vanda Balint et al.</i> .....	99

## **Neuroimmunoendocrine Interactions**

Regional differences in CD73/A2AR expression in selected brain regions in a rat model of multiple sclerosis <i>Tamara Dokmanovic et al.</i> .....	100
$\alpha$ V $\beta$ 3-Integrin and mitochondria mediate astrocyte response to autoreactive immune cells <i>Katarina D. Milicevic et al.</i> .....	101
Streptozotocin, an FDA approved drug, affects the oxidative stress parameters and purinergic signaling components in primary rat astrocyte cultures <i>Marija Adzic Bukvic et al.</i> .....	102
Establishment of an in vitro astrocyte model to test the efficacy of dual blockade of ecto-5'-nucleotidase (CD73)/adenosine A2A receptor subtype in neuroinflammation and neurodegeneration <i>Katarina Mihajlović et al.</i> .....	103
Impairments of olfactory function and social behavior precede neuroinflammation in the olfactory bulb and motor disabilities in a rat model of multiple sclerosis <i>Andjela Stekic et al.</i> .....	104
Growth Hormone and Prolactin Gene Expression and Protein Levels Are Not Affected During EAE in Rats <i>Anica Živković et al.</i> .....	105
Agmatine upregulates Nrf2/HO-1 pathway in Lps-stimulated microglia <i>Katarina Milosevic et al.</i> .....	106

Protein tyrosine phosphatase receptors N and N2 regulate gonadotropin-releasing hormone neuron function <i>Sokanovic S. et al.</i> .....	107
Microglial morphological response to the lack of direct social contact in periadolescent rats <i>Milica Potrebić et al.</i> .....	108
Upregulation of glial markers with absence of a typical proinflammatory profile in the hippocampus of A53T mice as a model of Parkinson's disease <i>Olga Dubljević et al.</i> .....	109
The impact of sex on behavioral deficits in APP knock-in mouse model of Alzheimer's disease <i>Nikola Milovanovic et al.</i> .....	110
Thyroid hormone metabolism in the cortex of male and female APP knock-in mice <i>Jelena Ciric et al.</i> .....	111
The effect of light/dark cycle changes on vascular permeability, inflammation, and visual cycle in streptozotocin-induced diabetic retinopathy in rats <i>Dolika D. Vasović et al.</i> .....	112
The role of endoplasmic reticulum stress and its modulation in the pathogenesis of experimental autoimmune encephalomyelitis <i>Sasenka Vidicevic-Novakovic et al.</i> .....	113
Graphene Quantum Dots show protective effect in animal model of neuroinflammation <i>Jelena Tasić et al.</i> .....	114
Concentrations of proinflammatory cytokines in patients with schizophrenia <i>Tatjana Nikolić et al.</i> .....	115
IL8 as a risk factor for elevated beta amyloid in the serum of patients with premature ovarian failure <i>Milena Erić Jovičić et al.</i> .....	116
Progesterone treatment preserves cortical pro-/antioxidant balance, DNA integrity and cell morphology in rat cerebral hypoperfusion model <i>I. Guševac Stojanović et al.</i> .....	117
Fatty acid amide hydrolase inhibitor URB597 shows antidepressant effects through reduction of neuroinflammation and restoration of BDNF levels in mPFC of chronically stressed rats <i>Milica Jankovic et al.</i> .....	118
Progesterone modulates striatal lipid profile in rat cerebral hypoperfusion model <i>Katarina Bobić et al.</i> .....	119

Ecto-5'-nucleotidase marks amoeboid microglial cells in the rat model of neurodegeneration <i>Ivana Grković et al.</i> .....	120
A complex role of Galectin-3 in anxiety level regulation <i>Dragica Selakovic et al.</i> .....	121
Age-related changes in neuroglial cells morphology <i>Radošević Dragana et al.</i> .....	122
Growing Up Under Constant Light or Dark Mode: A Challenge to the Pineal <i>Milica Trkulja et al.</i> .....	123
Myasthenia gravis and pathohistological findings in thymus - review of literature <i>Jovanka Trifunović.</i> .....	124
Anomalous Epstein - Barr virus Reactivation Associates with Elevated CXCL10 Levels in the Plasma of Multiple Sclerosis Patients <i>Vasileios Gouzouasis et al.</i> .....	125
Role of Microglia in the Secondary Brain Injury after Subarachnoid Hemorrhage <i>Andjela Stojev et al.</i> .....	126
<b><u>Short Presentations</u></b> .....	127
<b><u>Poster Presentations Schedule</u></b> .....	129

## **Programme:**

**31 May**

### **Belgrade Youth Center-Hall**

**12:00-16:00 Registration**

### **Belgrade Youth Center-Amerikana**

**12:00-13:00 FRM2019 Highlights**

**13:00-14:00 BAW Highlights**

**14:00-15:00 ZooBrainology**

**15:00-16:00 Euro-Neuro – edutainment, 2012**

### **University of Belgrade**

#### **Rectorate building - the Mansion of Miša Anastasijević**

**17:00-17:40 Opening Ceremony**

**17:40-18:30 Opening Lecture (Chairs: Selma Kanazir & Ivanka Marković)**

#### **Professor Carmen Sandi**

Laboratory of Behavioral Genetics, Brain Mind Institute, Swiss Federal  
Institute of Technology in Lausanne, Lausanne, Switzerland

**Neural circuits and metabolic pathways on the links between stress,  
anxiety & motivation**

**18:30-20:00 Cocktail Party**

## 01 June

### Belgrade Youth Center - Amerikana & Hall

- 9:00-9:45** **Keynote Lecture** (Chairs: Elka Stefanova & Ivanka Marković)  
**Professor Frank Jessen**  
Department of Psychiatry, University of Cologne, Medical Faculty, Cologne, Germany  
**First symptomatic manifestation of Alzheimer's disease**
- 09:45-10:00** **Coffee Break**
- 10:00-10:35** **Single-cell and SPATIAL transcriptomics in Neuroscience**, lecture by 10X Genomics, sponsored by Labena
- 10:35-12:45** **Morning Session** (Chairs: Dragomir Milovanović & Saša Filipović)  
**Brain Stimulation, Phase Separation and Open Data**
- 10:40-11:05** **Andrej Savić, PhD**  
Science and Research Centre, School of Electrical Engineering, University of Belgrade, Belgrade, Serbia  
**Brain-computer interface for electrotactile sensory training after stroke**
- 11:05-11:30** **Jovana Bjekić, PhD**  
Group for Neuroscience, Institute for Medical Research, National Institute of Republic of Serbia, University of Belgrade, Belgrade, Serbia  
**Using noninvasive brain stimulation to modulate memory in humans: from mechanisms to clinical applications**
- 11:30-11:55** **Milorad Dragić, PhD**  
Laboratory for Neurobiology, Department of General Physiology and Biophysics, Faculty of Biology, University of Belgrade, Belgrade, Serbia  
**Transcranial magnetic stimulation as a therapeutic approach for neurodegenerative disorders - insights from animal models**
- 11:55-12:20** **Dragomir Milovanović, PhD**  
Laboratory for Molecular Neuroscience, German Center for Neurodegenerative Diseases, Charité University Clinic in Berlin, Berlin, Germany  
**Phase separation in neuronal physiology and pathology**
- 12:20-12:45** **Ivan Zaletel, MD, PhD**  
Institute of Histology and Embryology "Aleksandar Đ. Kostić", Faculty of Medicine, University of Belgrade, Belgrade, Serbia  
**Open-access data and resources in neuroscience research**

**12:45-15:00** **Lunch Break and Poster Session** (13:30-14:30 Selected Abstracts will be presented in Amerikana)

**15:00-17:10** **Afternoon Session** (Chairs: Nina Vardjan & Aleksandra Mladenović)

**Brain Metabolism & Dietary Interventions**

**15:05-15:30** **Nina Vardjan, PhD**

Laboratory of Neuroendocrinology, Molecular Cell Physiology, Institute of Pathophysiology, Faculty of Medicine, University of Ljubljana, Ljubljana, Slovenia

**Adrenergic regulation of astrocyte glucose and lipid droplet metabolism**

**15:30-15:55** **Predrag Vujović, PhD**

Department for Comparative Physiology and Ecophysiology, Institute for Physiology and Biochemistry “Ivan Djaja”, Faculty of Biology, University of Belgrade, Belgrade, Serbia

**Expression Regulation and Roles of Insulin Produced in the Brain**

**15:55-16:20** **Ana Podolski-Renić, PhD**

Department of Neurobiology, Institute for Biological Research “Siniša Stanković”, National Institute of Republic of Serbia, University of Belgrade, Belgrade, Serbia

**The role of the Thioredoxin detoxification system in glioblastoma progression and drug resistance**

**16:20-16:45** **Nataša Lončarević, PhD**

Molecular Nutrition and Health Lab, Centro de Estudos de Doenças Crónicas, NOVA Medical School, Universidade Nova de Lisboa, Lisbon, Portugal

**Can consumption of (poly) phenol-rich food ameliorate molecular and behavioral PD-like pathology in MPTP-treated mice?**

**16:45-17:10** **Smilja Todorović, PhD**

Department of Neurobiology, Institute for Biological Research “Siniša Stanković”, National Institute of Republic of Serbia, University of Belgrade, Belgrade, Serbia

**Dietary restriction as an anti-aging intervention**

**17:10-17:30** **Coffee Break**

**17:30-18:15** **Keynote Lecture** (Chairs: Selma Kanazir & Jelena Đorđević)

**Cláudia Nunes Dos Santos, PhD**

Molecular Nutrition and Health Lab, Centro de Estudos de Doenças Crónicas, NOVA Medical School, Universidade Nova de Lisboa, Lisbon, Portugal

**Brain permeability and neuroprotection by the gut (poly)phenol metabolites**

## 02 June

### Belgrade Youth Center - Amerikana & Hall

**09:00-09:45** **Keynote Lecture** (Chairs: Vladimir Trajković & Danijela Savić)

**Marina Jendrach, PhD**

Department of Neuropathology, Charité, Universitätsmedizin Berlin, corporate member of Freie Universität Berlin, Humboldt-Universität Zu Berlin, Berlin Institute of Health, Germany

**Modulation of neuroinflammation by autophagy**

**09:45-10:00** **Coffee Break**

**10:00-12:10** **Morning Session** (Chairs: Pavle Anđus & Marin Jukić)

**Brain Disorders – From Genetics to Markers**

**10:05-10:30** **Marija Švirtlih, PhD**

Laboratory for Human Molecular Genetics, Institute of Molecular Genetics and Genetic Engineering, University of Belgrade, Belgrade, Serbia

**SOX Transcription Factors – choosing between stemness and neuronal differentiation**

**10:30-10:55** **Milena Janković, MD, PhD**

Laboratory for Molecular Genetic Diagnostic of Neurological Diseases, Neurology Clinic, University Clinic Center of Serbia, University of Belgrade, Belgrade, Serbia

**Genetics of neurodegeneration: from global resemblance to regional differences**

**10:55-11:20** **Milena Milošević, PhD**

Center for Laser Microscopy, Institute for Physiology and Biochemistry "Jean Giaja", Faculty of Biology, University of Belgrade, Belgrade, Serbia

**ALS IgG - translation to a physiological diagnostic marker**

**11:20-11:45** **Verica Paunović, PhD**

Institute of Microbiology and Immunology, Faculty of Medicine, University of Belgrade, Belgrade, Serbia

**Downregulation of LKB1/AMPK Signaling in blood mononuclear cells is associated with the severity of Guillain-Barre syndrome**

**11:45-12:10** **Marin Jukić, PhD**

Department of Physiology, Faculty of Pharmacy, University of Belgrade, Belgrade, Serbia

**The humanized CYP2C19 transgenic mouse exhibits cerebellar atrophy and movement impairment reminiscent of ataxia**



## Hypoxia preconditioning reduces the differentiation potential of human pluripotent stem cells and alters the expression of *SOX* genes and miR-21

Stefan Lazic<sup>1</sup>, Danijela Stanisavljevic Ninkovic<sup>1</sup>, Isidora Petrovic<sup>1</sup>, Aleksandra Medic<sup>1</sup>, Milena Milivojevic<sup>1</sup>, Luka Bojic<sup>1</sup>, Slaven Erceg<sup>2,3,4</sup>, Milena Stevanovic<sup>1,5,6</sup>, Marija Schwirtlich<sup>1</sup>

<sup>1</sup>*Institute of Molecular Genetics and Genetic Engineering, University of Belgrade, Belgrade, Serbian*

<sup>2</sup>*Stem Cell Therapies in Neurodegenerative Diseases Lab., Centro de Investigación Príncipe Felipe (CIPF), c/ Eduardo Primo Yúfera 3, Valencia, Spain;*

<sup>3</sup>*Institute of Experimental Medicine, Department of Neuroregeneration, Czech Academy of Science, Prague, Czech Republic;*

<sup>4</sup>*National Stem Cell Bank-Valencia Node, Centro de Investigacion Príncipe Felipe, c/ Eduardo Primo Yúfera 3, Valencia, Spain.*

<sup>5</sup>*University of Belgrade, Faculty of Biology, Belgrade, Serbia*

<sup>6</sup>*Serbian Academy of Sciences and Arts, Belgrade, Serbia*

Brain trauma leads to the induction of neural stem cell proliferation and the migration of young neurons to injured areas. However, these neurons are insufficient to fully restore neuronal function due to the limited potential of adult neurogenesis. This study aimed to investigate the effect of hypoxia, a condition that underlines a wide spectrum of brain pathologies, on pluripotency and the capacity of stem cells to differentiate into neural progenitors. We analyzed the expression of *SOX* genes and microRNAs as they control a variety of cellular processes during neuronal differentiation, including cell proliferation and cell fate determination. *In vitro* neuronal differentiation of human embryonal carcinoma cell line NT2/D1 and induced pluripotent stem cells were used as a model system of adult neurogenesis. Cobalt chloride was used to induce hypoxia.

The results of the analysis showed that, following hypoxia, the efficiency of neuronal induction was significantly decreased, that coincident with decline in mRNA expression levels of *SOXB* and *SOXC* genes. In contrast to that, the expression level of miR-21 was significantly increased.

Our findings advance the study of *SOX* TFs, miR-21, and their possible interplay in ischemia-related pathologies, establishing them as prospective biomarkers and possible targets for future diagnostic and therapeutic approaches.

**Acknowledgment:** This study was supported by the Ministry of Science, Technological Development and Innovation of the Republic of Serbia (Contract No. 451-03-47/2023-01/200042), Strategic project of Serbian Academy of Arts and Sciences (F172) and Science Fund of the Republic of Serbia, Serbian Science and Diaspora Collaboration Program: Knowledge Exchange Vouchers, (6436225).