



ДНС
SNS

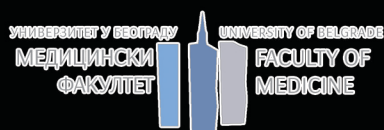


Друштво за неуронауке Србије
Serbian Neuroscience Society

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
Brain Metabolism & Dietary Interventions	
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
Brain Disorders – From Genetics to Markers	
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 Brkušanić 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
α V β 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
<u>Short Presentations</u>	127
<u>Poster Presentations Schedule</u>	129

Analysis of cohort of patients with 22q11.2 deletion syndrome - a single-center experience from Serbia

Ivana Simeunovic¹, Danijela Drakulic¹, Goran Cuturilo^{2,3}, Natasa Kovacevic-Grujicic¹, Jovana Kostic¹, Milena Stevanovic^{1,4,5}

¹*Institute of Molecular Genetics and Genetic Engineering, University of Belgrade, Belgrade, Serbia*

²*University Children's Hospital, Belgrade, Serbia*

³*Faculty of Medicine, University of Belgrade, Belgrade, Serbia*

⁴*Faculty of Biology, University of Belgrade, Belgrade, Serbia*

⁵*Serbian Academy of Sciences and Arts, Belgrade, Serbia*

Neurodevelopmental disorders (NDDs), such as autism spectrum disorders (ASD), intellectual disability (ID), schizophrenia, and bipolar disorder, are caused by disruption of brain development. They affect approximately 4% of the European population. However, molecular mechanisms underlying NDDs are still unknown. One of the syndromes with a high risk for NDDs is 22q11.2 Deletion Syndrome (22q11.2DS) caused by microdeletion 22q11.2. 22q11.2DS is the most common microdeletion in humans; approximately, 25% of patients with 22q11.2DS develop schizophrenia compared to 1% in the general population, while an ID is detected in approximately 45% of patients and ASD in 14-50% of cases. We analyzed genomic and clinical findings in our cohort of 35 patients with 22q11.2DS. The majority of patients have 3 Mb deletion and nine patients have inherited 22q11.2 microdeletion from their parents. Twenty-one different clinical presentations are revealed in the cohort with developmental delay detected in about 50% of patients. Approximately 80% of patients have heart malformations, palatal clefts/velopharyngeal insufficiency was detected in about 30% of them, facial dysmorphism in approximately 80% and hypocalcemia was seen in about 20% of patients. Here we presented a cohort of patients with 22q11.2DS which represents a good system for modeling NDDs *in vitro*.

Acknowledgment: This research was funded by European Union's Horizon Europe programme (Grant Agreement Number 101060201 (STREAMLINE)), Ministry of Science, Technological Development and Innovation of the Republic of Serbia (grant number 451-03-47/2023-01/200042) and the Serbian Academy of Sciences and Arts (Grant number F-172).