ДНС Друштво за неуронауке Србије
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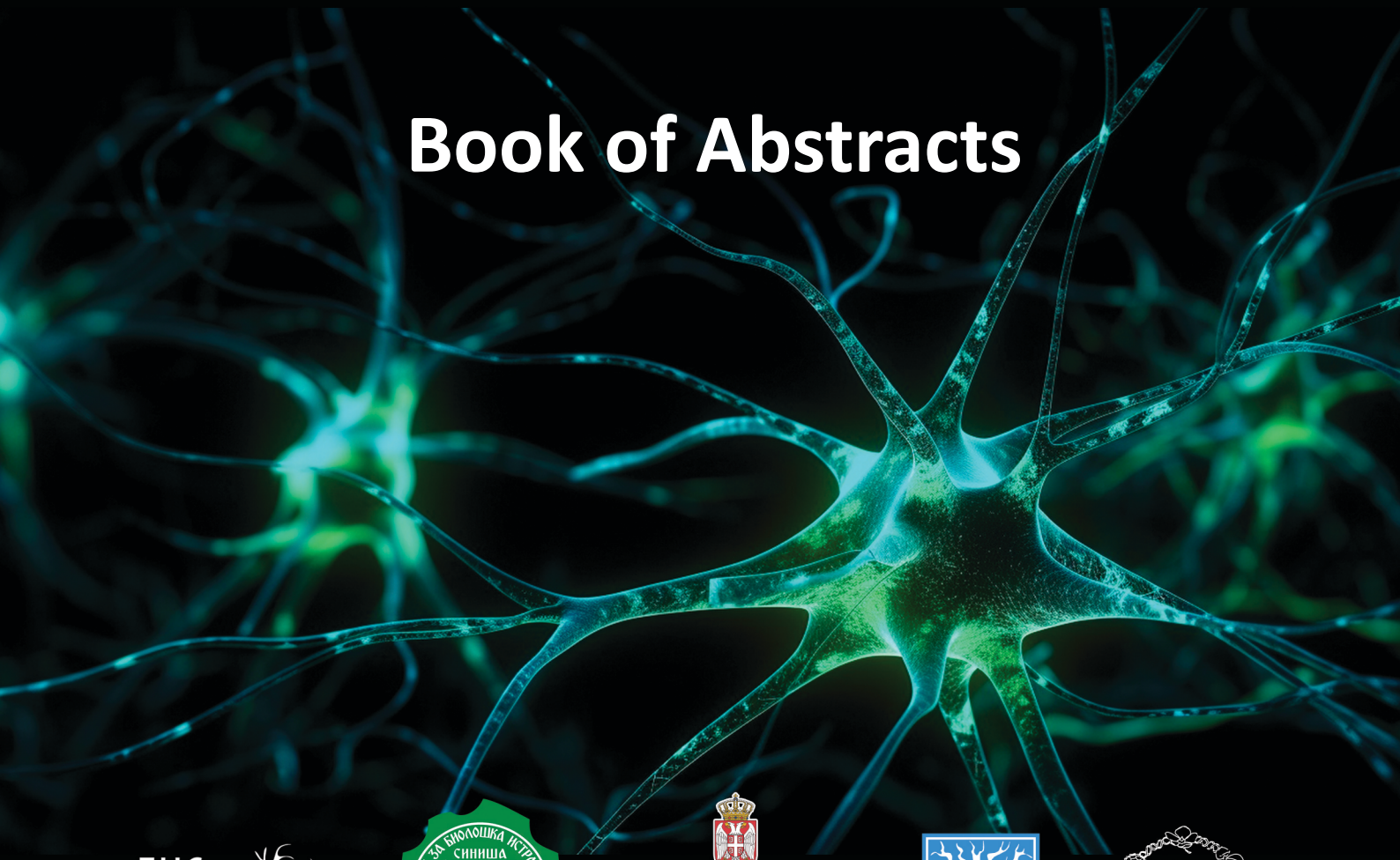

Book of Abstracts

ДНС SNS

Институт за биолошка истраживања Синиша Станковић ИБИСС Универзитет у Београду

Република Србија Министарство науке, технолошког развоја и иновација

Универзитет у Београду Медицински факултет University of Belgrade Faculty of Medicine

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PROMEDIA Laboratory supply specialists

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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

ISBN: 978-86-917255-4-9

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Developmental effects of repeated antenatal synthetic glucocorticoid treatment on purinergic signaling in the auditory brainstem

Dunja Dimitrijević[1,#], Sanja Boranijašević[1,#], Irena Lavrnja[2], Marija Adžić[1], Milorad Dragić[1], Anđela Stekić[1], Katarina Mihajlović[1], Ivan Milenković[3], Danijela Laketa[1,*]

[1]*Department for General Physiology and Biophysics, Faculty of Biology, University of Belgrade, Belgrade, Serbia*
[2]*Institute for Biological Research "Sinisa Stankovic", National Institute of Republic of Serbia, University of Belgrade, Belgrade, Serbia*
[3]*School of Medicine and Health Sciences, Carl von Ossietzky University Oldenburg, Oldenburg, Germany*
danijela@bio.bg.ac.rs
 # Equal contribution

In preterm infants, insufficient exposure to endogenous glucocorticoids often leads to fatal complications. Therefore, synthetic glucocorticoids (sGC) are commonly applied to pregnant women at risk of preterm delivery between the 24th and 34th week of gestation. Despite the risk of adverse neurodevelopmental effects, repeat courses are frequently given. In the auditory system, the repeated sGC treatment prolonged neural transmission time and increased auditory thresholds in Wistar rats. Purinergic signaling plays an important role in the development of the auditory system.

We investigated the effects of repeated antenatal treatment with sGC on the components of the purinergic system in the developing auditory brainstem, at postnatal days (PD) 8,14, and 20 (pre-, post-hearing onset, and juvenile stage, respectively). Pregnant C57BL/6 dams received 0.4 mg/kg dexamethasone (DEX) *s.c.*, at gestation days (GD) 15-17 (repeated course - 3DEX), mimicking clinical treatment for three consecutive weeks. In a single treatment (1 DEX), dams received DEX at GD 15, then saline at GD16 and 17. The control group (Sh) received saline.

After treatment with 3DEX, a sharp decrease in immunoreactivity for A1 receptors and P2Y1 mRNA expression was observed (in PD8-20 and PD8, respectively). Although treatment effects were not detected for P2X2 receptor, we observed a developmental increase in its mRNA expression. P2X3 receptor, as well as CD73, CD39, and NTPDase2, exhibited stable expression.

In conclusion, repeated antenatal DEX treatment induced changes in A1 and P2Y1 receptors expression in the developing auditory brainstem, suggesting adverse neurodevelopmental effects, urging for evaluation of the current protocols for antenatal sGC treatment.

Acknowledgement: Supported by Ministry of Science, Technological Development and Innovation, Republic of Serbia, grant 451-03-47/2023-01/ 200178 and Deutcher Akademischer Austauschdienst – DAAD.