ISSN 0065-1400 (PRINT)
ISSN 1689-0035 (ONLINE)

2024 Volume 84
Supplement

ACTA NEUROBIOLOGIÆ EXPERIMENTALIS

www.ane.pl

25 – 27th April
Krakow
Poland

Neuronus 2024

NENCKI INSTITUTE OF EXPERIMENTAL BIOLOGY, WARSAW, POLAND

NEURONUS 2024
NEUROSCIENCE FORUM

CONTENTS

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PROGRAMME

24TH APRIL 2024
INSTITUTE OF PSYCHOLOGY OF JAGIELLONIAN UNIVERSITY

8:30–12:20 **Workshop I – Room 0.03**
Neuropixels by Cagatay Aydin
KU Leuven, Belgium

12:00–18:00 **Workshop II – Room 1.09**
QuPath by Ewelina Bartoszek
University of Basel, Switzerland

8:30–18:00 **Workshop III – Room 1.02**
DeepLabCut by Konrad Danielewski
Nencki Institute of Experimental Biology, Warsaw, Poland

9:00–13:00 **Workshop IV – Room 1.07**
NeuroImaging Data Analysis by Jakub Szewczyk and Mikołaj Compa
Institute of Psychology at the Jagiellonian University in Krakow, Poland

13:00–16:00 **Workshop V – Room 0.03**
Virtual reality, physiology and biofeedback by Slav Dimov
European Sales Executive bei BIOPAC Systems, Inc.

SCIENCE JAM – PIWNICA POD BARANAMI

19:00–20:00 **Career Development by Ali Jawaid[1] and Michał Ślęzak[2]**
[1] *Nencki Institute of Experimental Biology, Warsaw, Poland*
[2] *Łukasiewicz–PORT, Wroclaw, Poland*

20:15–21:15 **Scientific communication by Joanna Podgórska[1] and Ilona Kotlewska[2]**
[1] *SWPS*
[2] *Institute of Psychology, Jagiellonian University*

25TH APRIL 2024
AUDITORIUM MAXIMUM, JAGIELLONIAN UNIVERSITY

9:00–10:10 **Official Opening and Opening Lecture – Large hall A**
Karolina Warzecha (Head of Neuronus 2024)
Letter of Rector of the Jagiellonian University Prof. dr hab. Jacek Popiel
Translating computational mechanisms to clinical applications
Speaker: Quentin Huys (Max Planck & UCL, UK)

10:10–10:45 **Flashtalks – Large hall A**

10:45–11:15 **Coffee Break**

11:15–12:45 **Symposia Session I – Large hall A**
Towards Precision Psychiatry
Speakers: Juan P. Lopez, Charlotta Henningson, Magdalena Ziemiańska, Anna Guguła

Symposia Session II – Large hall B
Integrating Spiking Neural Networks in Neurobiology and Computer Science
Speakers: Matej Mertik, Maciej Wielgosz, Kinga Przybylska, Szymon Mazurek, Joan Falco-Roget, Jan Argasiński

Symposia Session III – Medium hall B
Visual perception in cognitive psychology
Speakers: Piotr Buczkowicz, Ingrida Zelionkaitė, Katarzyna Jurewicz, Julia Papiernik

12:45–13:15 **Lunch**

13:15–14:30 **Poster Session I – Exhibition room**

14:30–15:30 **Keynote lecture – Large hall A**
Dynamic Algorithmic Networks of Visual Categorizations
Speaker: Philippe Schyns (University of Glasgow, Scotland)

15:30–17:00 **Symposia Session IV – Large hall A**
Visual perception in naturalistic environment
Speakers: Marius Peelen, Natalia Rutkowska, Michał Bola, Marek A. Pedziwiatr, Diana Kollenda

Symposia Session V – Large hall B
Bilateral Brain-Body Interactions
Speakers: Urte Neniskyte, Edyta Bulanda, Weronika Tomaszewska, Magdalena Gomolka, Ivan Arzhanov

Symposia Session VI – Medium hall B
Aging Retina
Speakers: Kai Kaarniranta, Michał Bogocz, Piotr Rodak, Anna Pacwa

17:00–17:30 **Coffee Break**

17:30–18:30 **Keynote lecture – Large hall A**
Non-canonical mechanisms underlying amygdala mediated memory representation
Speaker: Andrew Holmes (NIAAA, NIH, USA)

18:30 **Welcome Reception**

26TH APRIL 2024
AUDITORIUM MAXIMUM, JAGIELLONIAN UNIVERSITY

8:00–9:00 **NeuroFitness**
Speaker: Anna Pałasz

9:00–10:00 **Keynote lecture – Large hall A**
Neural circuits underlying curiosity-driven exploration
Speaker: Sebastian Haesler (NERF, Belgium)

10:00–11:30 **Symposia Session VII – Large hall A**
Inhibitory control: Responses, errors, and their neural and psychophysiological correlates
Speakers: Bob Barry, Krzysztof Bielski, Patrycja Kałamała- Ligęza, Christina Thunberg

Symposia Session VIII – Large hall B
Molecular profiling of neurodegenerative disorders
Speakers: Jörg Hanrieder, Jack Wood, Alicja Szadziewska

Symposia Session IX – Medium hall B
Posttranslational Modifications in the Brain
Speakers: Thomas Klarić, Ugne Kuliesiute, Natalia Pudełko-Malik, Savani Anbalagan

11:30–12:00 **Coffee Break**

12:00–13:30 **Symposia Session X – Large hall A**
Molecular Mechanisms of Synaptic Plasticity
Speakers: Jakub Włodarczyk, Monika Puchalska, Anbarieh Saadat, Bogna Badyra

Symposia Session XI – Large hall B
Computational approaches to understand brain complexity
Speakers: Wiktor Młynarski, Katarzyna Sawicka, Emilia Kaczmarczyk, Magdalena Szponar

Symposia Session XII – Medium hall B
Psychedelics
Speakers: Paweł Orłowski, Anastasia Ruban, Maja Wójcik, Čestmír Vejmola, Adam Wojtas

13:30–14:00 **Lunch**

14:00–15:15 **Poster Session II – Exhibition hall**

15:15–17:00 **Symposia Session XIII – Large hall A**
Untangling neural circuits supporting specific behavior
Speakers: Bianca Silva, Anthony Kischel, Katarzyna Hryniewiecka, Aleksandra Nogaj, Jakub Mlost, Oskar Markkula

Symposia Session XIV – Large hall B
Face Perception and its application in audiovisual integration
Speakers: Maria Ida Gobbini, Ilona Kotlewska, Magdalena Szmytke, Maria Nalberczak-Skóra

Symposia Session XV – Medium hall B
Exploring New Drugs for Brain Therapy
Speakers: Sara Xapelli, Angelika Jagielska, Nicolas Singewald, Judith Schweimer

17:00–17:30 **Coffee Break**

17:30–18:30 **Keynote lecture – Large hall A**
Hyperalignment: modeling shared and individuating information embedded in idiosyncratic fine-scale cortical topographies
Speaker: James Haxby (Dartmouth College, USA)

21:00 **Neuronus Party**

27TH APRIL 2024
AUDITORIUM MAXIMUM, JAGIELLONIAN UNIVERSITY

9:00–10:00 **Keynote lecture – Large hall A**
From Molecular Codes to Behavioral Patterns: Deciphering Autism Spectrum Disorders
Speaker: Gaia Novarino (IST, Austria)

10:00–11:30 **Symposia Session XVI – Large hall A**
Automatization in behavioral studies – a key to objectivity
Speakers: Aleksandra Badura, Veronika Kovarova, Patrycja Ziuzia, Julia Świderska, Anjaly Yadav

Symposia Session XVII – Large hall B
Microglia in Health and Disease
Speakers: João Relvas, Izabela Lepiarz-Raba, Natalia Małek, Natalia Stelmach

Symposia Session XVIII – Medium hall B
EEG correlates of consciousness
Speakers: Marcin Koculak, Klaudia Krystecka, Urszula Górska-Klimowska, Anna Zofia Leśniewska

11:30–12:00 **Coffee Break**

12:00–13:30 **Symposia Session XIX – Large hall A**
Neuroendocrine Brain
Speakers: Michael Greenwood, Svenja Leibnitz, Julian Zacharjasz, Natalia Konopinska, Naveen Nedunchezhian

Symposia Session XX – Large hall B
OpenfUS
Speakers: Marcin Lewandowski, Alan Urban, Michiel Camps, Nora Fitzgerald, Klaudia Csikós, Tianzi Wang

Symposia Session XXI – Medium hall B
How to train the brain
Speakers: Alicja Olszewska, Aurimas Mockevičius, Syanah Wynn, Tomasz Ściepuro, Gabriela Rajtar

13:30–14:00 **Lunch**

14:00–15:15 **Poster Session III – Exhibition hall**

15:15–16:45 **Symposia Session XXII – Large hall A**
Neuroimaging of abnormal brain functions in schizophrenia
Speakers: Todd Woodward, Rafał Skiba, Wiktor Więcławski, Camilo Enrique Sánchez

Symposia Session XXIII – Large hall B
Cellular Mechanisms of Pain and Touch
Speakers: Mateusz Kucharczyk, Felipe Meira de-Faria, Basil Duvernoy

Symposia Session XXIV – Medium hall B
Reading brain in blind individuals
Speakers: Anna-Lena Stroh, Maksymilian Korczyk, Małgorzata Paczyńska, Maciej Gaca, Jacek Matuszewski, Cemal Koba

16:45–17:15 **Coffee Break**

17:15–18:15 **Keynote lecture – Large hall A**
Habitats and human physiology on multiple time scales
Speaker: Kathrina Wulff (Umeå University, Sweden)

18:15 **Awards & Closing Ceremony – Large hall A**

OXIDATIVE STRESS CONTROL IN PENTYLENETETRAZOL (PTZ) KINDLING WITH CEREBELLAR TRANSCRANIAL DIRECT CURRENT STIMULATION (TDCS)

I.A. Shchehlov[1]*, M.P. Pervak[3], O.B. Poshyvak[2], O.D. Ryabenka[1]

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This work aimed to investigate the level of oxidative stress markers in pentylenetetrazol (PTZ)-kindled animals and the effects of cerebellar tDCS. Kindling was produced in Wistar male rats by administration of three-week PTZ (35.0 mg/kg, i.p.). tDCS (500 mcA, 15 min) of the zone of cerebellar surface was delivered in 30 min five days before testing PTZ administration. The tissue of hemispheres was gained in two hours from the last tDCS. Spectrophotometric measurements of thiobarbituric acid reactive substances (TBARS), the activity of superoxide dismutase (SOD), and catalase were performed. tDCS prevented generalized seizures in 7 out of 8 animals ($P<0.05$). The level of TBARS in kindled rats with tDCS was 6.87+0.74 nmol/mg of tissue and exceeded the control value by 2.47 times ($P<0.01$). In kindled rats, SOD (6.53+0.72 U/mg tissue) and catalase (2.37+0.23 nM) activity were less than in the control animals by 49.6% ($P<0.05$) and 16.2% ($P>0.05$) correspondently. tDCS reduced TBARS content by 45.0% ($P<0.01$) and elevated SOD activity by 35.6% ($P<0.05$) when compared with the kindled rats. Catalase activity increased after cerebellar tDCS – up to 2.15+0.33 nM ($P>0.05$). Hence, the obtained data revealed the significant contribution of oxidative stress suppression to the antiseizure effects of cerebellar tDCS.

Funding: Research was supported by the Ministry of Health Care of Ukraine (grant N0121U114510).

6-HZ REPEATED TRANSCORNEAL STIMULATIONS IN RATS FAILED TO INDUCE KINDLING SEIZURES

Arabadzhy* D.R., Ryabenka O.D., Shcheglov I.A., Prybolovets K.O., Kashchenko O.A., Bidnyuk V.K.

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Our work aimed to produce kindled seizures with transcorneal 6-Hz electrical stimulation (ES) (32 mA 6 Hz for 3 seconds (GRASS stimulator, Astro.Med.Inc., USA) that was performed daily 5 times per week. Altogether 25 stimulations were delivered to each rat. During ES, clonic seizures of body muscles were seen with trouble tails that were stopped immediately after ES cessation. During ES, all body's tail tonic tension and myoclonus were seen in response to each stimulus delivered. After stopping ES, no seizures were seen, and rats demonstrated intensive exploratory behavior during the first 1-5 min with sniffing, head nodding, horizontal and vertical locomotion, and maintenance of high tail tonus. During this period, decreased pain sensitivity was seen (one scored severity out of four score scales). Grooming was a prediction for the normalization of animal behavior. EEG registration revealed spike–wave bursts registered in the ventral hippocampus and frontal cortex from 5-10 sec up to 1.0-1.5 min after stimulation. Duration of epileptiform activity was stable in the course of the delivery of stimulations. Hence, daily performed repeated ES, no post stimulative seizures were seen, and electrographic post stimulative deteriorations were slight and did not increase with their length in the course of ES delivery.

Funding: Research was supported by the Ministry of Health Care of Ukraine (grant N0121U114510).