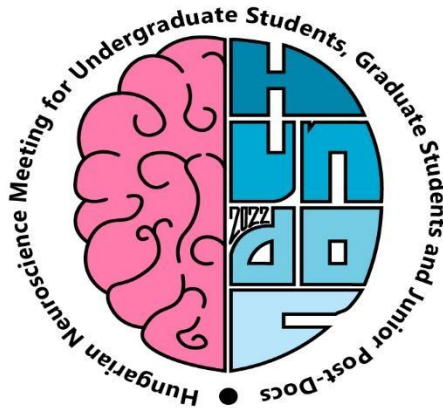


HuNDoC

5th Hungarian Neuroscience Meeting
for Undergraduate Students, Graduate
Students and Young Postdocs

OFFICIAL
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ELTE, Lágymányosi Campus, North Building
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**5th Hungarian Neuroscience Doctoral Conference for Undergraduate Students,
Graduate Students and Junior Postdocs
26 January 2022, Budapest**

DETAILED PROGRAM

09:00 – 09:45 – Registration (North Entrance)

09:45 – 10:00 – Welcome speech (Eötvös Hall)

10:00 – 10:45 – Invited speaker (Eötvös Hall)

Dr. Nóra Bunford (Institute of Cognitive Neuroscience and Psychology, Research Centre for Natural Sciences)

Heterogeneity in adolescent attention-deficit/hyperactivity disorder (ADHD): In search for bio-behavioral risk and protective factors

10:45 – 11:00 – Coffee break

11:00 – 12:30 – Student symposia I. - Learning and connectivity (Eötvös Hall)

11:00 – Bence Fogel: Contribution of synaptic and intrinsic currents to in vivo-like neuronal activity

11:15 – Camila Miranda: Morphological and neurochemical characterization of glycinergic neurons in laminae I to IV of the mouse spinal dorsal horn

11:30 – Vivien Szendi: Lateral septum affects maternal adaptation via a parathyroid hormone 2 neuropeptide-containing pathway arising from the thalamus

11:45 – Anna Virág Bakacsi: The cellular and synaptic connectivity of the colliculo-thalamic network

12:00 – Krisztián Zichó: Brainstem can recall fear memory via hippocampal somatostatin interneurons

12:15 – Kata Szamosfalvi: Functional imaging of hippocampal CA1 pyramidal neurons during virtual navigation in mice

12:30 – 13:00 – Lunch break

13:00 – 14:00 – Poster session (Gömb Aula)^{2*}

14:00 – 15:30 – Student symposia II. - Diseased brain (Eötvös Hall)

14:00 – Barbara Asbóth: Progenitor cells in the adult human retina

14:15 – Evelin Patkó: The protective effects of PACAP1-38 on the retinal vasculature and hypoxic molecules in rat glaucoma model

14:30 – Diána Pejtsik: Neurobiological correlates of trait anxiety

14:45 – Péter Sere: Cortical and subcortical neural dynamics during absence epilepsy

15:00 – Panna Hegedüs: Immunohistochemical characterization of the human and mouse septal area

15:15 – Tibor Nánási: Deep plasma proteomics reveal age-related molecular pathways modulated by GRF6019 treatment in Alzheimer's disease patients

^{2*} For poster groups, see page 17

5th Hungarian Neuroscience Doctoral Conference for Undergraduate Students, Graduate Students and Junior Postdocs 26 January 2022, Budapest

THE CELLULAR AND SYNAPTIC CONNECTIVITY OF THE COLLICULO-THALAMIC NETWORK

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- 5 Institute of Experimental Medicine, Budapest, Hungary

Associative learning is essential for adaptation in a constantly changing environment. When a neutral (conditioned) stimulus (e.g. sound; CS) appears along with an affective (unconditioned) stimulus (e.g. pain; US), a memory trace about the conditioned signal is formed. Then, at a later time-point, a fear response is elicited even if only the CS (the former neutral stimulus) is presented. This phenomenon is called associative fear learning. The anatomical background behind CS-US pairing contains a network, where these two pieces of information are able to converge on a single neuron. Our recent data suggests that this occurs before the conventionally accepted brain area, the lateral amygdala (LA), in the tecto-thalamic circuit, at the level of the LA-projecting calretinin-expressing lateral thalamic (CR+LT) cells. However, the exact anatomical evidences for this theory are missing. The tectal part consists of the midbrain's paired structures, the inferior (IC) and the superior colliculus (SC). They can transmit uni- and multimodal information (auditory, visual, somatosensory, etc.) to the thalamus. To investigate the organization principles of dual tecto-thalamic circuits, we used classical and viral tracing combined with immunohistochemical approaches in mice. We demonstrate that, although the colliculo-thalamic innervations have different topography, both are positioned to form synaptic contact on the same CR+LT cell. This convergence is likely to be present both between glutamatergic and the GABAergic collicular cell populations. Our findings show that multisensory information mediated by the SC and the IC can be converged on the same CR+LT cell. In summary, the presented tecto-thalamic pathways can jointly inhibit or excite the CR+LT cells and these complex synaptic transmissions can shape thalamic signal integration during the associative fear learning process.

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