Final report for OTKA grant 115613

This research grant has started in february 1, 2015, and should have been closed in January 31, 2019. Due to some significant drawbacks, however (extreme difficulty purchasing supplies through public procurement, the separation of the University of Veterinary Medicine, (where the research facilities of the grant are), from Szent István University, (where the PI holds his position), the major reorganization of the Szent István University, and last , but not least, the Covid-19 pandemic), this grant has been extended by almost a full calendar year.

In spite of the flaws listed above, we could keep a fairly impressive pace with our scheduled experiments, and published vast amounts of new research results, as reported in our previous mid-term reports.

Although the last, extended phase of the grant was even harder than all others, it is safe to say that we practically accomplished our goals set in our research plan, with the notion that much raw data are still to be analyzed before they can be published.

Results from the ending year of this grant have been partly analyzed already and published in the following articles:

Kiss DS, Toth I, Jocsak G, Bartha T, Frenyo LV, Barany Z, Horvath TL, Zsarnovszky A. Metabolic Lateralization in the Hypothalamus of Male Rats Related to Reproductive and Satiety States. Reprod Sci. 2020 May;27(5):1197-1205. (IF: 2,616)

Kiss DS, Toth I, Jocsak G, Barany Z, Bartha T, Frenyo LV, Horvath TL, Zsarnovszky A. Functional Aspects of Hypothalamic Asymmetry. Brain Sci. 2020 Jun 19;10(6):389 (IF: 3.332)

David Sandor Kiss, Csaba Szabo, Annamaria Kerti, Zsuzsanna Toth, Gergely Jocsak, Tamas L. Horvath, Attila Zsarnovszky. Comparison of endocrine disruptor-modulated nuclear receptor (ERs, TRs and PPARgamma) mRNA expression and simultaneous mitochondrial respiration rates in mouse hypothalamic tissue homogenates. (To be published soon. Content: Results show that all EDs used in the present study can modify mitochondrial respiration in a concentration dependent fashion, however, effects of distinct EDs differed from each other. These findings indicate that exposure to various EDs not only alter a number of physiological regulatory pathways, but also affect the intensity of the biological fuel-generator mitochondrial metabolism.)

Jócsák Gergely, Kiss Dávid Sándor, Tóth István, Bárány Zoltán, Frenyó V. László, Bartha Tibor, Zsarnovszky Attila: Az endokrin diszruptorkezelés indukálta peroxiszóma proliferátor aktivált gamma-; ösztrogén- és pajzsmirigyhormon receptor expressziós változások összehasonlítása egér kisagyi- és hipotalamikus szövetmintákban (Állatorvostudományi egyetem, akadémiai beszámoló, 2020)

ED treated hypothalamic samples obtained from mice were processed for electron microscopic examination to assess the effects of bisphenol A, zearalenone or arsenic on the morphology and ultrastructure of hypothalamic mitochondria. Electron micrographs are ready for the measurement of mitochondrial morphological parameters, including the assessment of changes of cellular mitochondria in response to different ED treatments. These results will not only be

informative on ED effects on mitochondrial morphology, but related functional measurements in mitochondrial metabolism will be directly correlated with the morphological findings. We anticipate that these results will also be ready for publication in year 2021.