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RESEARCH AREA

Schizophrenia is a complex neuropsychiatric disorder, with positive, and negative symptoms, and cognitive impairments. While the positive signs are well handled, the treatments of the other impairments have not been resolved.

Appropriate animal models are required to determine the exact pathomechanism of this disease and for testing new drugs. Our laboratory developed a complex (three-hit) rat model of schizophrenia, and these animals have several signs observed in schizophrenic patients, suggesting the translational relevance of this model.

The goals of our recent studies are to investigate, besides the acute behavioral test (Ambitus), the behavioral activities and cognitive functions of these animal in stress-free condition with environmental enrichment for prolonged period (Home-Manner). The analysis of the huge amount of data obtained during the experiments requires high levels of mathematics/informatics methods. This study might be appropriate not only for testing new method for the treatments of this disease, but also to characterize the effects of different drugs with addictive potential in these animals (since substance abuse is highly prevalent in schizophrenia).

TECHNIQUES AVAILABLE IN THE LAB

- Acute pain tests in rats.
- Acute behavioral testing in the Ambitus test.
- Prolonged testing in the Home-Manner test.
- Intraperitoneal injections of rats.
- Converting and analyzing of the huge number of behavioral parameters obtained in the Ambitus test involving AI methods, too.
- Converting and analyzing of the huge number of behavioral parameters obtained in the Home-Manner test, involving AI methods, too.

SELECTED PUBLICATIONS

Horvath, G., Kertész, I., Nagy, T., Adlan, LG., Kekesi, G., Büki, A., Tuboly, G., Trencsényi, G. (2022) Caffeine-Induced Acute and Delayed Responses in Cerebral Metabolism of Control and Schizophrenia-Like Wisket Rats. **Int J Mol Sci 23(15):** 8186.

Büki, A., Kekesi, G., **Horvath, G.**, Vécsei, L. (2021) A Potential Interface between the Kynurenine Pathway and Autonomic Imbalance in Schizophrenia. **Int J Mol Sci 22(18):** 10016.

Petrovszki, Z., Adam, G., Tuboly, G., Kekesi, G., Benedek, G., Keri, S., **Horvath, G.** (2013) Characterization of gene-environment interactions by behavioral profiling of selectively bred rats: the effect of NMDA receptor inhibition and social isolation. **Behav Brain Res 240:** 134-45.

Nagy, E., Toth, K., Janositz, G., Kovacs, G., Feher-Kiss, A., Angyan, L., **Horvath, G.** (2004) Postural control in athletes participating in an ironman triathlon. **Eur J Appl Physiol 92(4-5):** 407-13.

Horvath, G. (2000) Endomorphin-1 and endomorphin-2: pharmacology of the selective endogenous mu-opioid receptor agonists. **Pharmacol Ther 88(3):** 437-63.