# ISTVÁN HERNÁDI

**University of Pécs**
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## RESEARCH AREA

Investigating the neurocognitive underpinnings of ageing and neurocognitive impairment in rodents: identification of preclinical drug development strategies and development of combined cognitive enhancer therapies. The main objective of the project is to understand and model the processes underlying brain ageing and neurocognitive disorders (dementias) in rodents and to study cellular and behavioural processes in a coordinated manner in the same model. The research is carried out in two locations: our cellular biology (electrophysiology) laboratory is located at the Faculty Sciences and our small animal behavioural pharmacology laboratory is located at the Szentágothai Research Centre (SzRC). Our preclinical animal models include e.g. pharmacologically induced amnesia, natural ageing, repetitive mild traumatic brain injury and genetic (DREADD) models. Behavioural changes are investigated in state-of-the-art test packages. Our results are further utilized in both basic and applied drug discovery research. Our main long-term goal is to unravel the yet unknown mechanisms underlying neurocognitive diseases and to identify biomarkers that may later play a crucial role in the diagnosis and treatment of cognitive disorders and in the development of new drug candidates.

## TECHNIQUES AVAILABLE IN THE LAB

Faculty of Sciences: in vivo extracellular neurophysiological and cellular neurochemical studies (microiontophoresis), stereotaxic surgery, microinjections, optogenetic and chemogenetic studies (DREADD technique). Szentagothai Research Centre, rodent behaviour laboratory and core facility. Behavioural pharmacology studies in rodents: Neurological tests, open field test, elevated cross-maze and zero maze tests, forced swim test, food preference tests, spatial memory tasks (T-maze, Morris Water Maze), computer-controlled operant behavioural tests (psychomotor vigilance and decision-making tasks) reversible inactivations, systemic/central application of bioactive compounds and drug candidates, drug development in rodent models of psychiatric and neurocognitive disorders.

## SELECTED PUBLICATIONS

Bruszt N., Bali Z.K., Tadepalli S.A., Nagy L.V., **Hernádi I.** (2021) Potentiation of cognitive enhancer effects of Alzheimer's disease medication memantine by alpha7 nicotinic acetylcholine receptor agonist PHA-543613 in the Morris water maze task. **Psychopharmacology (Berl) 238:** 3273–3281.

Nagy L.V., Bali Z.K., Kapus G., Pelsőczi P., Farkas B., Lendvai B., Lévay G., **Hernádi I.** (2021) Converging Evidence on D-Amino Acid Oxidase–Dependent Enhancement of Hippocampal Firing Activity and Passive Avoidance Learning in Rats. **Int J Neuropsychopharmacol 24:** 434.

Bali Z.K., Nagy L.V., **Hernádi I.** (2017) Alpha7 nicotinic acetylcholine receptors play a predominant role in the cholinergic potentiation of N-methyl-D-aspartate evoked firing responses of hippocampal CA1 pyramidal cells. **Front Cell Neurosci 11:** 271.

Grabenhorst F., **Hernádi I.**, Schultz W. (2016) Primate amygdala neurons evaluate the progress of self-defined economic choice sequences. **Elife 12:** e18731.

**Hernádi I.**, Grabenhorst F., Schultz W. (2015) Planning activity for internally generated reward goals in monkey amygdala neurons. **Nat Neurosci 18:** 461-469.

Stefanics G., Hangya B., **Hernádi I.**, Winkler I., Lakatos P., Ulbert I. (2010) Phase entrainment of human delta oscillations can mediate the effects of expectation on reaction speed. **J Neurosci 30:** 13578-13585.