

BRIGITTA TÓTH



**HUN-REN Research Centre for Natural Sciences
Institute of Cognitive Neuroscience and Psychology**

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RESEARCH AREA

Cognitive neuroscience of auditory and speech perception across the human lifespan, with a primary focus on early brain development and neonatal neural plasticity. My research examines auditory scene analysis, statistical learning, and predictive processing, as well as the long-term neurocognitive impact of perinatal conditions, particularly perinatal asphyxia. I apply a multimodal approach combining EEG-based functional connectivity analysis, behavioral methods, and biomarker assessment to advance early diagnosis and clinical translation.

TECHNIQUES AVAILABLE IN THE LAB

- EEG data acquisition and analysis in neonates, infants, and adults
- Functional connectivity and graph-theoretical network analysis
- Time–frequency and neural oscillatory analyses
- Design of auditory experimental paradigms (scene analysis, speech perception)
- Behavioral and developmental assessment methods
- Longitudinal study design and data management
- Multimodal data integration (EEG, behavioral, biochemical markers)

SELECTED PUBLICATIONS

Tóth, B., Velősy, P. K., Kovács, P., Háden, G. P., Polver, S., Sziller, I., & Winkler, I. (2023). Auditory learning of recurrent tone sequences is present in the newborn's brain. *Neuroimage* **281**: 120384.

Tóth, B., Honbolygó, F., Szalárdy, O., Orosz, G., Farkas, D., & Winkler, I. (2020). The effects of speech processing units on auditory stream segregation and selective attention in a multi-talker (cocktail party) situation. *Cortex* **130**: 387–400.

Tóth, B., Urbán, G., Háden, G. P., Márk, M., Török, M., Stam, C. J., & Winkler, I. (2017). Large-scale network organization of EEG functional connectivity in newborn infants. *Hum Brain Mapp* **38**(8): 4019–4033.

Tóth, B., Kocsis, Z., Háden, G. P., Szerafin, Á., Shinn-Cunningham, B. G., & Winkler, I. (2016). EEG signatures accompanying auditory figure-ground segregation. *Neuroimage* **141**: 108–119.