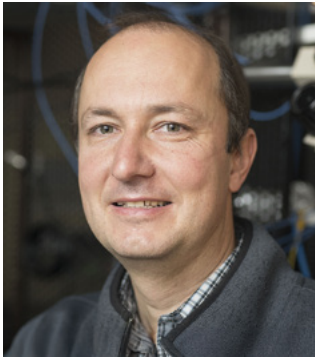


ALBERT MIKLÓS BARTH



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RESEARCH AREA

Our laboratory investigates how the brainstem regulates the processing of negative experiences. We have identified several brainstem nuclei and cell groups that are in close anatomical connection with other brain centers of fundamental importance in the processing of negative information. Based on our functional data, these newly discovered brainstem regions play a key role in the regulation of higher-order memory processes, particularly during the encoding and retrieval phases of negative experiences. The results obtained using complex approaches have major clinical significance, as they may provide a novel perspective on the pathomechanisms of depression, a disorder affecting approximately 280 million people worldwide.

TECHNIQUES AVAILABLE IN THE LAB

In vivo electrophysiology: multichannel Neuropixels recordings

In vivo miniscope imaging: miniature fluorescent microscope to monitor the activity of hundreds of neurons over multiple days in freely moving animals

In vivo optogenetics combined with multichannel electrophysiology, behavioral assays, and miniscope imaging

Complex data analysis, programming, electronics

SELECTED PUBLICATIONS

Zichó, K., Balog, B. Z., Sebestény, R. Z., Brunner, J., Takács, V., **Barth, A. M.**, Seng, C., Orosz, Á., Aliczki, M., Sebők, H., Mikics, E., Földy, C., Szabadics, J., & Nyiri, G. (2025). Identification of the subventricular tegmental nucleus as brainstem reward center. **Science** **387**(6732): eadr2191.

Barth, A. M., Jelitai, M., Vasarhelyi-Nagy, M. F., & Varga, V. (2023). Aversive stimulus-tuned responses in the CA1 of the dorsal hippocampus. **Nat Commun** **14**(1): 6841.

Zichó, K., Sos, K. E., Papp, P., **Barth, A. M.**, Misák, E., Orosz, Á., Mayer, M. I., Sebestény, R. Z., & Nyiri, G. (2023). Fear memory recall involves hippocampal somatostatin interneurons. **PLoS Biol** **21**(6): e3002154.

Szőnyi, A., Zichó, K., **Barth, A. M.**, Gönczi, R. T., Schlingloff, D., Török, B., Sipos, E., Major, A., Bardóczy, Z., Sos, K. E., Gulyás, A. I., Varga, V., Zelena, D., Freund, T. F., & Nyiri, G. (2019). Median raphe controls acquisition of negative experience in the mouse. **Science** **366**(6469): eaay8746.

Barth, A. M., Domonkos, A., Fernandez-Ruiz, A., Freund, T. F., & Varga, V. (2018). Hippocampal Network Dynamics during Rearing Episodes. **Cell Rep** **23**(6): 1706–1715.