

Krisztián Zichó



Personal data:

Adress: Hungary, H-1148 Budapest, Kalapács utca 19/b
Phone: +36-30-364-80-93
E-mail: zicho.krisztian@koki.hu
Birth date: 1996.02.23

Studies:

- Semmelweis University-János Szentágothai Doctoral School of Neurosciences (2020-)
- Semmelweis University-Faculty of Medicine (2014-2020), *Summa cum laude* (5,00)
- High School Graduation Exam (2014), higher level in Biology (85%) and Chemistry (94%)
- Budapest Piarist High School (2008-2014)
- Németh Imre Elementary School (2002-2008)

Scientific competitions:

- Semmelweis University **Excellent Student's Scientific Award** (2021)
- Semmelweis University Rectoral Competition Thesis **1st prize** (2020)
- Semmelweis University **Publication Award** (2020)
- Semmelweis University **Dr. Aladár Beznák Commemorative Medal and Award** (2020)
- Member of the Semmelweis University Excellence List (from 2019)
- Semmelweis University Pathology competition **1st place** (2017)
- Semmelweis University Microbiology competition **2nd place** (2017)
- Semmelweis University Dermatology competition **2nd place** (2017)
- Semmelweis University Cardiology competition **2nd place** (2017)
- Semmelweis University Medical Physiology competition **1st place** (2016)
- Semmelweis University Medical Biochemistry competition **1st place** (2016)
- Semmelweis University Anatomy and histology competition **1st place** (2015)
- National Secondary School Academic Competition in Chemistry **29th place** (2014)
- National Secondary School Academic Competition in Biology **37th place** (2014)
- Piarist High School **Scientific Award** (2014)

Awards from scientific conferences:

- 5th HunDoc **Best oral presentation** (2022)
- IBRO Meeting **3rd best poster award** (2022)
- KOKI Young Scientist Network Mini-Conference **Best oral presentation** (2021)
- Semmelweis University PhD Scientific Days (Neuroscience section) **1st prize** (2021)
- National Student's Scientific Conference (Anatomy section) **2nd prize** (2021)
- Semmelweis University Student's Scientific Conference (Neuroscience section) **1st prize** (2020)
- National Student's Scientific Conference (Anatomy section) **1st prize** (2019)
- National Student's Scientific Conference (Anatomy section) **2nd prize** (2019)
- National Student's Scientific Conference (Anatomy section) **special award** (2019)
- Frigyes Korányi Scientific Forum (Neuroscience section) **1st prize** (2019)
- Semmelweis University Student's Scientific Conference (Neuroscience section) **2nd prize** (2019)
- Frigyes Korányi Scientific Forum (Neuroscience section) **1st prize** (2018)
- Semmelweis University Student's Scientific Conference (Anatomy section) **1st prize** (2018)
- Semmelweis University Student's Scientific Conference (Neuroscience section) **1st prize** (2018)

Scholarships:

- Stephen W. Kuffler PhD Scholarship (2022)
- New National Excellence Program 2021/2022 (ÚNKP-21-3-SE-9)
- New National Excellence Program 2020/2021 (ÚNKP-20-3-SE-31)
- Semmelweis 250+ Excellent PhD Scholarship 2020/2021/2, 2021/2022/1, 2021/2022/2
- Semmelweis University Scientific Scholarship 2019/2020
- KOKI Young Investigator Award (2019)
- Hungarian National Higher Education Scholarship (2019/2020)
- New National Excellence Program 2019/2020 (ÚNKP-19-2-I-SE-13)
- New National Excellence Program 2018/2019 (ÚNKP-18-2-I-SE-22)
- Hungarian National Higher Education Scholarship (2018/2019)

Publications:

- Szőnyi A*, **Zichó K***, Barth AM, Gönczi RT, Schingloff D, Török B, Sipos E, Major Á, Bardóczi Zs, Sós KE, Gyulás AI, Varga V, Zelena D, Freund FT, Nyiri G
Median raphe controls acquisition of negative experience in the mouse,
Science (2019) doi: 10.1126/science.aay8746 *contributed equally
IF: 41,06

Conference attendance:

- 2022 IBRO Workshop Budapest conference (poster presentation):
Zichó K, Sós KE, Papp P, Orosz Á, Mayer MI, Sebestény RZ, Nyiri G
Brainstem can recall fear memory via hippocampal somatostatin cells
- 2022 5th Hungarian Neuroscience Meeting for Undergraduate Students, Graduate Students and young Post-Docs (HunDoc) (oral presentation):
Zichó K, Sós KE, Papp P, Orosz Á, Mayer MI, Sebestény RZ, Nyiri G
Brainstem can recall fear memory via hippocampal somatostatin cells
- 2021 KOKI Young Scientist Network Mini-Conference (oral presentation):
Zichó K, Sós KE, Papp P, Orosz Á, Mayer MI, Sebestény RZ, Nyiri G
Brainstem can recall fear memory via hippocampal somatostatin cells
- 2021 FENS Regional Meeting neuroscience conference (virtual poster presentation):
Zichó K, Szőnyi A, Barth A, Gönczi R, Major Á, Bardóczi Zs, Sós KE, Varga V, Freund FT, Nyiri G
Median raphe controls acquisition of negative experience
- 2020 IBRO Workshop Szeged conference (poster presentation):
Zichó K, Szőnyi A, Barth A, Gönczi R, Sós KE, Varga V, Freund FT, Nyiri G
Median raphe controls negative experience: The behavioral evidence
- 2019 16th meeting of the hungarian neuroscience society conference (poster presentation):
Zichó K, Szőnyi A, Gönczi R, Sós KE, Freund FT, Nyiri G
Raphe-habenular connection can shape fear behavior.
- 2017 FENS Regional Meeting neuroscience conference (poster presentation):
Zichó K, Szőnyi A, Schingloff D, Sós KE, Pósfai B, Hegedüs P, Bardóczi Zs, Gyulás AI, Freund FT, Nyiri G
The nucleus incertus specifically targets neurons responsible for the formation of contextual memory.

Skills:

- IT skills: Microsoft Office, Adobe Photoshop, Inkscape, Statistica
- Laboratory skills: stereotaxic surgeries on mice (tracer injections, optic fiber implantations), transcardial perfusion, immunohistochemistry, epifluorescent and confocal microscopic analysis, electron microscopic analysis, stereology techniques, behavioral experiments (fear conditionings, place aversion/preference, operant learning experiments)

Language skills:

- English (B2, complex), German (basic)

Sport:

- Amateur long-distance runner
- 3 marathons, best time: **3:21:14**; 26 half-marathons, best time: **1:22:25**
- 10km best time: **37:16**; 5km best time: **18:12**

Research interest:

I started my scientific activity in 2016 in Workgroup of Quantitative Functional Anatomy of the Institute of Experimental Medicine under supervision of Gábor Nyiri. In that time, I joined a project where we discovered a new glutamatergic cell type in brainstem median raphe region (MRR). While we investigated these cells, I learned the methodology of opto- and chemogenetical behavioral experiments with mice and several anatomical techniques: immunohistochemistry; viral and non-viral anterograde and retrograde cell labeling experiments; microscopic imaging with epifluorescent microscope, confocal laser-scanning fluorescent microscope and electron microscope; stereological and other anatomical measurement techniques. With the help of this technical repertoire, we investigated the connections and the functions of these previously unrecognized MRR glutamatergic neurons. We found that these MRR cells innervate the main aversive centers and the memory-processing related septo-hippocampal system in the brain. Their activity is both sufficient and necessary to induce aversive behavior and their over-activation can cause aggressive or depression-like behavior. We published these results with my contribution as a co-first author in 2019. A year before my graduation, I started to investigate memory functions and engram formation in connection with hippocampal interneurons and brainstem nucleus incertus. Using optogenetical behavioral experiments and anatomical measurements, we observed that inactivity pattern of hippocampal dendrite-targeting interneurons or the activity pattern of their brainstem inhibitory input can recall fear memories. Our observations suggest a novel disinhibition-based memory mechanism, which can support acquisition and retrieval of fear memories in the hippocampus. My plan in the near future is to understand how brainstem nuclei coordinate normal and pathological cognitive functions (fear, reward, memory), which might give us an opportunity to develop better treatments for psychiatric disorders such as anxiety, depression or dementias.