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EDUCATION

Ph.D. in Neuroscience	University of Szeged, Hungary	2012 – 2016
Medical Economist	University of Szeged, Hungary	2014 – 2016
M.D.	University of Szeged, Hungary	2006 – 2012

PROFESSIONAL EXPERIENCE

Postdoctoral Fellow	New York University, New York	2018 – present
Visiting Researcher	University of Michigan, Ann Arbor	2016 – 2018
Graduate student	University of Szeged, Hungary	2012 – 2016
Production manager	Amplipex Ltd., Hungary	2012 – 2016

PUBLICATIONS

(***** denotes shared first authorship)

Refereed Journal Articles

2023 G. Buzsáki, **M. Vöröslakos**, "Brain rhythms have come of age." *Neuron*

2023 C. Böhler, M. Vomero, M. Soula, **M. Vöröslakos**, M. Porto-Cruz, R. Liljemalm, G. Buzsaki, T. Stieglitz, M. Asplund, "Multilayer Arrays for Neurotechnology Applications (MANTA): chronically stable thin-film intracortical implants." *Advanced Sciences*

2022 O. Yaghmazadeh*, **M. Vöröslakos***, L. Alon, G. Carluccio, C. Collins, D. K. Sodickson and G. Buzsáki, "Neuronal activity under transcranial radiofrequency stimulation in metal-free rodent brains in-vivo." *Nature Communications Engineering*

2022 P. C. Petersen*, **M. Vöröslakos***, G. Buzsaki, "Brain temperature affects quantitative features of hippocampal sharp wave ripples." *J. Neurophysiology*

2022 **M. Vöröslakos***, K. Kim*, N. Slager, E. Ko, S. Oh, S. S. Parizi, B. Hendrix, J. P. Seymour, K. D. Wise, G. Buzsáki, A. Fernández-Ruiz, E. Yoon, "HectoSTAR µLED Optoelectrodes for Large-Scale, High-Precision In Vivo Opto-Electrophysiology." *Advanced Sciences*

2022 Y. Lin, H. Song, S. Oh, **M. Vöröslakos**, K. Kim, X. Chen, D. D. Wentzloff, G. Buzsáki, S. Park, "A 3.1-5.2GHz, Energy-Efficient Single Antenna, Cancellation-Free, Bitwise Time-Division Duplex Transceiver for High Channel Count Optogenetic Neural Interface*." IEEE Trans. Biomed. Circuits Syst.*

2021 **M. Voroslakos,** H. Miyawaki, S. Royer, K. Diba, E. Yoon, P. Petersen, G. Buzsáki, "3D-printed Recoverable Microdrive and Base Plate System for Rodent Electrophysiology." *Bio-Protocol*

2021 **M. Vöröslakos***, P. C. Petersen*, B. Vöröslakos*, G. Buzsáki, "Metal microdrive and head cap system for silicon probe recovery in freely moving rodent" *Elife*

2021 S. Y. Park, N. Kyounghwan, **M. Voroslakos**, H. Song, N. Slager, S. Oh, J. P. Seymour, G. Buzsaki, E. Yoon, "A Miniaturized 256-Channel Neural Recording Interface with Area-Efficient Hybrid Integration of Flexible Probes and CMOS Integrated Circuits." *IEEE Trans. Biomed. Eng.*

2020 K. Kim, **M. Vöröslakos**, J. P. Seymour, K. D. Wise, G. Buzsáki, E. Yoon, "Artifact-free, high-temporal-resolution in vivo opto-electrophysiology with microLED optoelectrodes." *Nature Communications*

2020 K. Na, Z. J. Sperry, J. Lu, **M. Vöröslakos**, S. S. Parizi, T. M. Bruns, E. Yoon, J. P. Seymour, "Novel diamond shuttle to deliver flexible bioelectronics with reduced tissue compression." *Nature Microsystems & Nanoengineering*

2018 K. Kampasi, D. F. English, J. Seymour, E. Stark, S. McKenzie, **M. Vöröslakos**, G. Buzsáki, K. D. Wise, E. Yoon, "Dual color optogenetic control of neural populations using low-noise, multishank optoelectrodes." *Nature Microsystems & Nanoengineering*

2018 A. Liu, **M. Vöröslakos**, G. Kronberg, S. Henin, M. R. Krause, Y. Huang, A. Opitz, A. Mehta, C. C. Pack, B. Krekelberg, A. Berényi, L. C. Parra, L. Melloni, O. Devinsky, G. Buzsáki, "Immediate neurophysiological effects of transcranial electrical stimulation." *Nature Communications*

2018 A. E. Mendrela, S. Y. Park, **M. Vöröslakos**, M. P. Flynn, E. Yoon. "A Battery-Powered Opto-Electrophysiology Neural Interface with Artifact- Preventing Optical Pulse Shaping." *IEEE Symposium on VLSI Circuits*

2018 **M. Vöröslakos**, Y. Takeuchi, K. Brinyiczki, T. Zombori, A. Oliva, A. Fernández-Ruiz, G. Kozák, Z. T. Kincses, B. Iványi, G. Buzsáki, A. Berényi. "Direct Effects of Transcranial Electric Stimulation on Brain Circuits in Rats and Humans." *Nature Communications*

Conference proceedings

2022 **M. Voroslakos*,** T. M. Arefin*, J. Zhang, L. Alon, G. Buzsaki, "Whole brain mapping of transcranial electrical stimulation-induced effects by BOLD-fMRI in rats." *Proceedings of the 31st Annual Meeting of ISMRM*

2022 O. Yaghmazadeh*, **M. Voroslakos***, M. Mattingly, Z. B. Y. Gironda, Y. Z. Wadghiri, S. Dehkharghani, L. Alon, "In-vivo Absolute Multinuclear Thermometry (AMT) in a Rat Model." *Proceedings of the 31st Annual Meeting of ISMRM*

2022 Z. Gironda, **M. Vöröslakos**, Y. Wadghiri, O. Yaghmazadeh, L. Alon, "Open-source modular 3D printed platform for in-vivo MRI experiments in awake mice and anesthetized mice and rats." *Proceedings of the 31st Annual Meeting of ISMRM*

2022 E. Ko, K. Kim, **M. Vöröslakos**, S. Oh, G. Buzsáki, K. D. Wise, E. Yoon, "Optogenetic Neural Probes: Fiberless, High-Density, Artifact-Free Neuromodulation." *2022 International Electron Devices Meeting (IEDM), IEEE*

Preprints

2023 N. R. Kinsky, **M. Vöröslakos**, J. R. Lopez Ruiz, L. Watkins de Jong, N. Slager, S. McKenzie, E. Yoon, K. Diba, "Simultaneous Electrophysiology and Optogenetic Perturbation of the Same Neurons in Chronically Implanted Animals using µLED Silicon Probes.", *bioRxiv*

2022 **M. Vöröslakos***, O. Yaghmazadeh*, L. Alon, D. K. Sodickson, G. Buzsáki, "Brain-implanted conductors amplify radiofrequency fields in rodents: advantages and risks." *bioRxiv*

2022 E. Ko, **M. Voroslakos**, G. Buzsaki, E. Yoon. "flexLiTE: flexible micro-LED integrated optoelectrodes for minimally-invasive chronic deep-brain study.", *bioRxiv*

Media Coverage

Cadaver study casts doubts on how zapping brain may boost mood, relieve pain, *Science*, 2016
https://www.sciencemag.org/news/2016/04/cadaver-study-casts-doubts-how-zapping-brain-may-boost-mood-relieve-pain

Brain Stimulation Is All the Rage--but It May Not Stimulate the Brain, *Scientific American*, 2018
https://www.scientificamerican.com/article/brain-stimulation-is-all-the-rage-but-it-may-not-stimulate-the-brain1/

Improved neural probe can pose precise questions without losing parts of the answers, 2020
https://news.engin.umich.edu/2020/05/improved-neural-probe-can-pose-precise-questions-without-losing-parts-of-the-answers/

Next generation neural probe leads to expanded understanding of the brain, 2022
https://news.engin.umich.edu/2022/08/next-generation-neural-probe-leads-to-expanded-understanding-of-the-brain/

TEACHING EXPERIENCE

Teaching Assistant, New York University, New York Fall 2021

Course: Brain and Behavior

Workshop instructor, University of Michigan, Ann Arbor 2018 – 2021

Course: Multimodal Integrated NeuroTechnology (MINT) workshop

Responsibilities: Developed and taught how to perform optogenetic experimentation using µLED optoelectrodes. Created training videos for the workshop:
https://www.youtube.com/channel/UCdvYlo8MudbP35X_S4nmQ-A

Lecturer, University of Szeged, Faculty of Medicine, Hungary 2010 - 2016

Course: Medical Physiology for medical students

Responsibilities: Gave an outline of the most important processes of the human body to a group of 15 medical students in a small seminar type (2 hours/week during fall and spring semesters).

MENTORING EXPERIENCE

Mentor for Evan Reich, New York University, New York *Current status: Undergraduate student at Cornell University*	Summer 2022
Mentor for Aryeh Rothstein, New York University, New York *Current status: Pre-medical student at Columbia University*	2021 – present
Mentor for Yunchang Zhang, New York University, New York *Current status: Graduate student at Princeton University*	2020 – 2022
Mentor for Iyana Jackson, New York University (SURP), New York *Current status: Undergraduate student at Mount Holyoke College*	Summer 2021
Mentor for Jolene Chou, New York University, New York *Current status: Research technician at Weill Cornell Medicine*	2019 – 2021
Mentor for Paola Rioja, University of Michigan (UROP), Ann Arbor *Current status: Graduate student at University of Michigan*	2017 – 2019
Mentor for Arpad Kormanyos, University of Szeged, Hungary *Current status: Associate professor at University of Szeged, Hungary*	2013 – 2016

HONORS & AWARDS

2022	Most read protocols of 2021 in neuroscience, Bio-protocol
2022	APSselect. Best recently published articles in physiological research.
2020	Travel Award, 43rd annual meeting of Japan Neuroscience Society
2013	Best practice leader of 2nd year medical students', University of Szeged

PRESENTATIONS

Oral Presentations

2022	Spatially and temporally targeted neuromodulation by tES in rats **International Network of Neuroimaging Neuromodulation (INNN) Webinar Series**
2022	How small electric fields still affect neurons **Neuroergonomics Conference & NYC Neuromodulation Conference**
2022	Transcranial Electrical Stimulation Induced Synaptic Plasticity in Freely Moving Rats **Translational Research in Progress Seminars NYU**

2021 microLED Optoelectrode virtual training workshop with Q&A
The NeuroNex MINT hub

2020 How to Use µLED Optoelectrodes: Surgery, Data Collection and µLED Control
NeuroLight Webinar Series

2020 Non-invasive neuromodulation using transcranial radio frequency stimulation in rodents
The 43rd Annual Meeting of the Japan Neuroscience Society

2020 Instantaneous neuronal effects of TES in vivo (When and Why do we need it?)
NYC Neuromodulation 2020 Online Conference

2020 Spatially and temporally targeted neuromodulation by transcranial Intersectional Short Pulse (ISP) stimulation
NYC Neuromodulation 2020 Online Conference

2020 Contactless neuromodulation using transcranial radio frequency stimulation
IBRO workshop, Szeged, Hungary

2017 Neuronal circuit control
NYU-TES conference, New York

Poster Presentations

2022 Transcranial electrical stimulation induced synaptic plasticity in freely moving rats; *Society for Neuroscience*

2019 Transcranial Radio Frequency Stimulation (TRFS): a novel noninvasive contact less neuromodulation technique based on Radio Frequency waves; *Society for Neuroscience*

2019 Effects of transcranial direct current stimulation on ongoing brain activity, *International Conference on Advanced Neurotechnology*

2018 Direct Effects of Transcranial Electric Stimulation on Brain Circuits in Rats and Humans, *International Conference on Advanced Neurotechnology*

2017 Ground truth dataset for validating extracellular spike sorting algorithms; *Society for Neuroscience*

2017 Modular High-Density Optoelectrodes for Local Circuit Analysis; *International Conference on Advanced Neurotechnology*

2015 Targeted transcranial electrical stimulation protocols: Spatially restricted intracerebral effects via improved stimulation and recording techniques; *Society for Neuroscience*

2015 Conductance measurements and simulations of electrical fields generated by focused transcranial electrical stimulation (TES); *Meeting of the Hungarian Neuroscience Society*

2013 Conductance measurements of electrical fields generated by transcranial electrical stimulation (TES); *Society for Neuroscience*