

ATTILA LOSONCZY, M.D., Ph.D.

Born: November 17, 1974, Nagykanizsa, Hungary
Professor (tenured)
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FIELD OF SPECIALIZATION

The focus of my research is to provide a biophysically based, mechanistic understanding of neuronal processes supporting cognitive functions of the mammalian brain, such as episodic learning, memory, and decision-making. My lab is using the mouse as a model organism, where synaptic, cellular, and microcircuit processes can be causally linked to evolutionally conserved adaptive behaviors under both normal and diseased conditions, such as epilepsy, schizophrenia, and aging. My prior experimental work established dendrites as independent computational units of principal excitatory neurons (Losonczy and Magee, *Neuron*, 2006; Losonczy et al., *Nature*, 2008; Losonczy et al., *Nature Neurosci*, 2010). Research in my own lab aims to dissect the role that excitatory, inhibitory, and neuromodulatory circuit motifs play in learning and memory formation. For this, we use large-scale, subcellular-resolution *in vivo* functional imaging in combination with electrophysiology, cell-type specific manipulations, *in vitro* experiments, and computational modeling. My work has provided the first evidence for the functional dissociation of inhibitory circuits in regulating neuronal input-output transformations *in vitro* (Lovett-Barron et al., *Nature Neurosci*, 2012). Subsequent series of *in vivo* imaging studies aimed at dissecting hippocampal circuit operations *in vivo*. For example, we characterized the type of information carried by septal GABAergic (Kaifosh et al., *Nature Neurosci*, 2013) and locus coeruleus catecholaminergic (Kaufman et al., *Neuron*, 2020) inputs to the hippocampus at a single synapse-level *in vivo*, dissected the roles of identified hippocampal inhibitory circuits during navigation, reward and fear learning (Lovett-Barron et al., *Science*, 2014, Lee et al., *Neuron*, 2014; Basu et al., *Science*, 2016, Turi et al., *Neuron*, 2019, Geiller et al., *Neuron*, 2020). In another series of studies, we characterized ensemble dynamics of several types of developmentally- and genetically defined principal cells (Denny et al., *Neuron*, 2014; Danielson et al., *Neuron*, 2016a, 2016b, 2017; Zaremba et al., *Nature Neurosci*, 2017) during navigation and learning. In a recent series of studies, we uncovered novel circuit mechanisms of episodic memory formation (Geiller et al., *Nature*, 2022) and consolidation (Grosmark et al., *Nature Neurosci*, 2021, Terada et al., *Nature*, 2022). Another line of research in my lab is focused on synaptic and subcellular mechanisms of learning (O'Hare et al., 2022, *Science*; Rolotti et al., *Neuron*, 2022; Gonzalez et al., *Nature*, 2024). I also investigated how the fundamental processes of learning and memory are disrupted under pathological conditions, including schizophrenia (Zaremba et al., *Nature Neurosci*, 2017) and temporal lobe epilepsy (Sparks et al., *Nature Commun*, 2020). To aid these investigations, my lab has developed several novel methods for anatomical and functional circuit mapping (Reardon et al., 2016, Geiller et al., 2022) and introduced novel frameworks for computational modeling of dendritic operations and circuit dynamics (Ahmed et al, *Neuron*, 2020; Turi et al., 2019, Kaifosh et al., *Neuron*, 2016; Liao et al., *Nature Neurosci*, 2024). I have established successful collaborations with other cellular-circuit and systems neuroscientists (I. Soltesz, Z. Nusser, G. Buzsaki), computational and theoretical neuroscientists (S. Fusi, Y. Poirazi, and L. Paninski), molecular neuroscientists (B. Zemelman, F. Polleux, R. Hen, I. Spiegel), and optical physicists (A. Vaziri, M. Schnitzer, D. Peterka), among others, to develop integrated experimental approaches and theoretical frameworks for investigations into cognitive memory functions under normal and pathological conditions. The following publications from my laboratory exemplify my scientific approach:

1. Gonzalez KC, Negrean A, Liao Z, Terada S, Zhang G, Lee S, Ocsai K, Rozsa BJ, Michael ML, Polleux F, Losonczy A. Synaptic Basis of Behavioral Timescale Plasticity. *bioRxiv*, 2024:2023.10.04.560848. doi: 10.1101/2023.10.04.560848. *in press*, **Nature**.
2. O'Hare JK, Gonzalez KC, Herrlinger SA, Hirabayashi Y, Hewitt, VL, Blockus H, Szoboszlai M, Rolotti SV, Geiller, TC, Negrean A, Chelur V, Polleux F, and Losonczy A. Compartment-specific tuning of dendritic feature selectivity by intracellular Ca(2+) release. **Science**. 2022.

3. Terada S, Geiller T, Liao Z, O'Hare J, Vancura B, Losonczy A. Adaptive Stimulus Selection for Consolidation in the Hippocampus. **Nature**. 2022.
4. Geiller T, Sadeh S, Rolotti SV, Blockus H, Vancura B, Negrean A, Murray AJ, Rozsa B, Polleux F, Clopath C, Losonczy A. Local circuit amplification of spatial selectivity in the hippocampus. **Nature**. 2022.
5. Lovett-Barron M, Kaifosh P, Kheirbek MA, Danielson N, Zaremba JD, Reardon TR, Turi GF, Hen R, Zemelman BV, Losonczy A. Dendritic inhibition in the hippocampus supports fear learning. **Science**. 2014.

Papers in top-tier journals: Science: 6, Nature: 4, Nature Neuroscience: 11, Neuron: 21, Cell: 1

Citations: 10209, h-index: 43 <https://scholar.google.com/citations?user=bVtNih0AAAAJ&hl=en>

Publication list: <https://pubmed.ncbi.nlm.nih.gov/?term=Losonczy+A&sort=date>

Funding track record: #5 highest funded neuroscientist in the US (2024)

Trainee track-record highlights: six academic faculty (*Columbia, Yale, UCSD, EPFL, U Conn, U Colorado*), a scientific director at pharma (*Regeneron*), two founders and chief scientists at industry (*Meta/Reality Labs*)

A. EDUCATION

University Medical School, Pecs, Hungary M.D., 1993 – 1999

Semmelweis University, Budapest, Hungary Ph.D., in Neurobiology, 2000 – 2004
 Dissertation title: *Underlying mechanisms of short-term synaptic plasticity at identified central synapses.*
 Dissertation advisor: Prof. Zoltan Nusser

B. POSITIONS HELD SINCE MEDICAL DOCTORATE CONFERRED

09/1993 – 09/1999	University Medical School, Pecs, Hungary <i>Research Assistant</i> (Prof. G. Lazar, Dept. of Anatomy)
10/1999 – 03/2000	University Medical School, Pecs, Hungary <i>Graduate student</i> (Prof. L. Seress, Central Electron Microscope Laboratory; Prof. G. Czeh, Dept. of Pharmacology)
04/2000-07/2000	MRC Anatomical Neuropharmacology Unit, Oxford, UK, <i>Visiting student</i> (Prof. P. Somogyi)
08/2000 – 07/2003	Semmelweis University, Budapest, Hungary <i>Graduate student</i> (Prof. Z. Nusser, Institute of Experimental Medicine)
08/2003 – 07/2006	Louisiana State University, Neuroscience Center, La, USA <i>Postdoctoral Fellow</i> (Prof. J. C. Magee)
08/2006 – 04/2007	Yale University, Department of Cell Biology, CT, US <i>Postdoctoral Fellow</i> (Prof. G. Miesenbock)
05/2007 – 10/2009	Howard Hughes Medical Institute, Janelia, Va, USA <i>Research Specialist</i> (Prof. J. C. Magee)
11/2009 – 4/2016	Columbia University, Department of Neuroscience, NY, USA <i>Assistant Professor</i>
10/2010 – present	Kavli Institute for Brain Science, Columbia University, NY, USA <i>Faculty Member</i>
07/2015 – present	Mortimer B. Zuckerman Mind Brain Behavior Institute, Columbia University, NY, USA <i>Faculty Member</i>

04/2016 – 12/2018 Columbia University, Department of Neuroscience, NY, USA
Associate Professor (with tenure)

01/2019 – present Columbia University, Department of Neuroscience, NY, USA
Full Professor (with tenure)

C. TEACHING EXPERIENCE

C.1 Courses Taught

Synaptic Transmission & Plasticity (doctoral course; instructor, 2012–2018, co-director 2018–2022)
Issues in Neural Circuitry (doctoral course; co-director, instructor, 2011, 2014)
Survey of Neuroscience (doctoral course; lecturer, 2010–present)
NRSA grant writing course (doctoral course, 2018–present)
Neuroscience Section of “The Body in Health & in Disease (medical student lecture, fall 2015, 2016, 2017)
MD-PhD research seminar series (lecturer, 2011–present)

C.2 Mentoring Experience

† denotes student/postdoc in applying for successfully funded fellowships from the National Institute of Health, National Science Foundation, Howard Hughes Medical Institute, or other private foundations.

Postdoctoral Researchers

<u>Dr. Satoshi Terada</u> † (2018–present)	JSPS Fellow, Uehara Foundation, NARSAD-BBRF
<u>Dr. Stephanie Herrlinger</u> † (2019–present, with J. Gogos)	DSPAN-K00, Burroughs-Wellcome PDEP Award
<u>Dr. Eunji Kong</u> † (2022–present)	Korean Government Foundation Fellowship
<u>Dr. Hyun Choong Yong</u> (2023–present)	
<u>Dr. Yu Xin</u> (2023–present)	
<u>Dr. Ivan Voitov</u> † (2023–present)	HFSP Fellow
<u>Dr. Asako Noguchi</u> † (2023–present)	HFSP Fellow, JSPS Fellow
<u>Dr. Lidor Spivak</u> (2024–present, with N. Sawtell)	
<u>Dr. Hayley Bounds</u> (2024–present, with S. Fusi)	Schmidt Fellowship, Kanzer Fellowship

Former:

Dr. Tristan Geiller† (2017–2024), *Assistant Professor*, Yale (Peter and Patricia Gruber International Research, Award by the Society for Neuroscience, NIH K99-R00)
Dr. Justin O’Hare† (2017–2024), *Assistant Professor*, U Colorado, (NIH K99-R00)
Dr. Miklos Szoboszlay (2018–2024), Senior Data Scientist, Neunos Ltd, Hungary
Dr. Gergely F. Turi (2010–2016): *Assistant Professor*, New York State Psychiatric Institute
Dr. Andres Grosmark† (2015–2022) *Assistant Professor*, UConn (Revson Fellowship)
Dr. Mohsin Ahmed† (2013–2022), *Associate Medical Director*, Regeneron (NIH K08)
Dr. Rita Nyilas (2016–2019): Senior Research Fellow, IEM HAS, Budapest, Hungary
Dr. Fraser Sparks† (2016–2021), Senior Scientist, Regeneron (NSERC Fellowship)
Dr. Adrian Negrean (2016–2022), Senior Scientist, Allen Brain Institute
Dr. Wenke Li (2016–2019): Senior Data Scientist, Bank of America

Sponsor of Ph.D. dissertations at Columbia University

Former:

Matthew Lovett-Barron† (2010-2014) “Functional consequences of dendritic inhibition in the hippocampus”
NSERC Fellowship
2014 Dean's Award for Excellence in Research at Columbia

Current position: *Assistant Professor*, UCSD

Patrick W. Kaifosh† (2011–2015) “The neural circuit basis of learning”

Howard Hughes Medical Institute Predoctoral Fellowship

NSERC Fellowship

2016 Dean's Award for Excellence in Research at Columbia

Current position: Co-Founder and Chief Science Officer at CTRL-Labs (Meta/Reality Labs)

Thomas Reardon (2011–2016) “Improved mono-synaptic tracing tools for mapping, monitoring, and manipulation of neural circuits” (co-mentor with Dr. Thomas Jessell)

Current position: Co-Founder and Chief Executive Officer at CTRL-Labs (Meta/Reality Labs)

Nathan Danielson† (MD/PhD; 2012–2016) “Functional subdivisions among principal cells of the hippocampus”

NIH Predoctoral Fellowship

Current position: research scientist at CTRL-Labs (Meta)

Jeffery Zaremba† (2011–2017) “Spatial memory in health and disease: hippocampal stability deficits in the Df(16)A mouse model of schizophrenia”

NIH Predoctoral Fellowship

Current position: senior research scientist at Perceptive Automata

Joseph Tsai (MD/PhD; 2013–2018)

“The role of SRGAP2 in modulating synaptic dynamics in adult sensory cortex”

Current position: residency UW, medical doctor

Alexandra Kaufman† (2015–2020) “Non-canonical members of circuits: A role for the locus coeruleus in reward related place field plasticity, and investigating differences in astrocyte calcium signaling between hippocampal layers”

NSF Predoctoral Fellowship (2015–2018)

NIMH F31

Current position: postdoctoral researcher at Regeneron

Elizabeth Balough (MD/PhD; 2015–2020) “Keeping Time: Parvalbumin Interneurons' Orchestration of Episodic Memory in Health and Disease”

Current position: Residency, Harvard, medical doctor

Sebastien Rolotti † (2015–2021) “Neural circuit control of feature tuning in CA1 during spatial learning”

NSF Predoctoral Fellowship (2015–2018)

NIMH F31

Current position: research scientist at Meta

Bert Vancura † (MD/PhD, 2018–2022) “Hippocampal Interneuron Dynamics Supporting Memory Encoding and Consolidation”

NIMH F30

Current position: residency, Columbia Medical School

James Priestley † (2017–2022) “Dynamic and compressed memory coding in the hippocampus”

NIMH F31

Current position: *Assistant Professor* at EPFL, Lausanne, Switzerland (start: January, 2023)

Zhenrui Liao †(MD/PhD, 2019–2022) “Towards a neuroscience of stories: metric space learning in the hippocampus”

NINDS F30

Current position: residency at University of Edinburgh, UK

Jack Bowler †(2016–2023) “Direct Cortical Inputs to Hippocampal Area CA1 Transmit Complementary Signals for Goal-directed Navigation”

NINDS F31

Current position: postdoctoral fellow at University of Utah in Jim Heys’s lab (LSRF Fellow)

Current:

Kevin Gonzalez † (2019–present, co-mentored with Franck Polleux)

NINDS D-SPAN Fellowship

Bovey Rao (2020–present)

Tiberiu Mihaila (2022–present, co-mentored with Stavros Lomvardas)

NIH F30

Abhishek Shah† (2022–present, co-mentored with Stefano Fusi)

NSF Fellowship

Carl Shi (2023–present)

Margaret Conde† (2023–present, co-mentored with Erdem Varol)

Boehringer Ingelheim Foundation
Fellow

Non-sponsor member of Ph.D. thesis committees at Columbia University

Former:

Dr. Andrew Fink (2013, Thomas Jessell) “Exploring a behavioral role for presynaptic inhibition at spinal sensory-motor synapses”

Dr. Zev Rosen (2013, Steven Siegelbaum) “Dopaminergic modulation of hippocampal neural circuitry”

Dr. Timothy Spellman (2014, Joshua Gordon) “Modulation of hippocampal-prefrontal circuitry during spatial working memory”

Dr. Wanying Zhang (2014, Randy Bruno) “In vivo dissection of long range inputs to the rat barrel cortex”

Dr. Timothy Machado (2015, Thomas Jessell) “Probing Circuits for Spinal Motor Control”

Dr. Joseph Stujenske (2015, Joshua Gordon) “Microcircuits underlying fear and safety processing”

Dr. Jessica Jimenez (2017, Rene Hen) “The Role of the Ventral Hippocampus in Anxiety-Related Behavior”

Dr. Samuel Clark (2017, David Sulzer) “*In vivo* optical studies on the direct and indirect paths of the striatum and *in vivo* observation of the release of norepinephrine”

Dr. Benjamin Hoffman (2019, Ellen Lumpkin) “The peripheral nervous system: From molecular mechanisms to non-invasive therapeutics”

Dr. Ian Diascone (2019, Franck Polleux) “Global Synaptic Input Mapping of Cortical and Hippocampal Pyramidal Neurons”

Dr. Martin Vignovich (2019, Charles Zucker) “Integration of Taste and Odor in Agranular Insular Cortex”

Dr. Alexander Sisti (2020, Charles Zucker) “The Neural Basis of Sugar Preference”

Dr. Georgia M. Pierce (2021, Randy Bruno) “Movement related activity surpasses touch responses in secondary somatosensory thalamus”

Dr. Alexander Whitebitch (2021, Stephen Siegelbaum) “Inhibitory-excitatory imbalance in hippocampal subfield CA2 circuitry in a mouse model of temporal lobe epilepsy”

Francisco X. Pena (2021, Daniel Salzman) “The role of amygdala in non-homeostatic eating”

Dr. Dan Kato (2022, R. Bruno) “Effects of learning and experience on multisensory integration in primary sensory cortical areas”

Ongoing:

Olivia Lofaro (Steve Siegelbaum)

Sergio Manuel Garcia (Franck Polleux)

Aleksandra Recupero (Franck Polleux)

External member of Ph.D. thesis committees at other institutions

Former:

Dr. Jon Maffie (2011, Bernardo Rudy’s lab, NYU)

Dr. Georg Kosche (2016, Michael Long’s lab, NYU)

Dr. Laura McGarry (2017, Adam Carter’s lab, NYU)

Dr. Yuta Senzai (2018, Gyorgy Buzsaki’s lab, NYU)

Dr. Matthew Davis (2020, Boris Zemelman’s lab, UT Austin)

Member of Ph.D. qualifying exam committees at Columbia University

Christine Constantinople (2010, Randy Bruno's lab), Jessica Jimenez (2014, Rene Hen), Martin Vignovich (2013, Charles Zucker), Jozsef Meszaros (2013, David Sulzer), Nancy Padilla (2013, Joshua Gordon), Alexander Sisti (2015, Charles Zucker), Daniel Iascone (2015, Franck Polleux), Georgia Pierce (2016, Randy Bruno), Jack Berry (2017, Rene Hen), Dan Kato (2017, Randy Bruno), Andres Villegas (2019, Polleux)

Co-mentor, collaborator or consultant on federal research grants for postdoctoral fellows (selected)

NIH-NIMH T32 MH018870 (Jonathan Javitch, PI); 2014-to date (primary mentor)

NIH-NINDS T32 for Advanced Graduate Students in Neurobiology and Behavior (Lloyd A. Greene, PI); 2013-to date (primary mentor)

Dr. Tommy Lewis (Franck Polleux's lab): NIH K99 (co-mentor)

Dr. Talia Atkin (Joseph Gogos): NIH K01 (co-mentor)

Dr. Mazen Kheirbek (Rene Hen): NIH K01 (consultant)

Dr. Eiman Azim (Thomas Jessell): NIH K99/R00 (consultant)

Dr. Avishek Adhikari (Karl Deisseroth, Stanford): NIH K99/R00 (consultant)

Dr. Christoph Anacker (Rene Hen): NIH K99 (co-mentor)

Dr. Kimberly Kempadoo (Eric Kandel): NIH K22 (collaborator)

Dr. Justine Kupferman (Franck Polleux): NIH NRSA (co-mentor)

Dr. Victor Luna (Rene Hen): NIH K01 Career Development Award (co-mentor, awarded)

Dr. Bradley Miller (Rene Hen): NIH K01 (consultant)

Dr. Justin O'Hare (Franck Polleux): F32 (co-mentor)

Dr. Ewoud Schmidt (Franck Polleux): NIH K99 (consultant)

Dr. Heike Blockus (Franck Polleux): NIH R21 (consultant)

Dr. Xinyi Deng (Liam Paninski): NIH, K99 (consultant)

Dr. Heike Blockus (Franck Polleux): NIH K99 (co-mentor)

Dr. Sebnem Tundecmir (Rene Hen): NIH K99 (co-mentor)

Dr. Barna Dudok (Ivan Soltesz): NIH K99 (consultant)

Dr. Jordan Farrell (Ivan Soltesz): NIH K99 (consultant)

Dr. Erdem Varol (Liam Paninski): NIH K99 (co-mentor)

D. PUBLICATIONS

PUBLISHED PEER-REVIEWED RESEARCH ARTICLES

Peer-Reviewed Publications:

1. Gonzalez KC, Negrean A, Liao Z, Terada S, Zhang G, Lee S, Ocsai K, Rozsa BJ, Michael ML, Polleux F, Losonczy A. Synaptic Basis of Behavioral Timescale Plasticity. bioRxiv, *in press*, **Nature**. 2024:2023.10.04.560848. doi: 10.1101/2023.10.04.560848.
2. Liao Z, Terada S, Raikov IG, Hadjiabadi D, Szoboszlay M, Soltesz I, Losonczy A. Inhibitory plasticity supports replay generalization in the hippocampus. **Nature neuroscience**. 2024. Epub 20240903. doi: 10.1038/s41593-024-01745-w.
3. Liao Z, Gonzalez KC, Li DM, Yang CM, Holder D, McClain NE, Zhang G, Evans SW, Chavarha M, Yi J, Makinson CD, Lin MZ, Losonczy A, Negrean A. Functional architecture of intracellular oscillations in hippocampal dendrites. bioRxiv. 2024:2024.02.12.579750. doi: 10.1101/2024.02.12.579750. *in press* **Nature Commun**.

4. Virga DM, Hamilton S, Osei B, Morgan A, Kneis P, Zamponi E, Park NJ, Hewitt VL, Zhang D, Gonzalez KC, Russell FM, Grahame Hardie D, Prudent J, Bloss E, Losonczy A, Polleux F, Lewis TL, Jr. Activity-dependent compartmentalization of dendritic mitochondria morphology through local regulation of fusion-fission balance in neurons in vivo. **Nature Commun.** 2024;15(1):2142. Epub 20240308. doi: 10.1038/s41467-024-46463-w.
5. Tuncdemir SN, Grosmark AD, Chung H, Luna VM, Lacefield CO, Losonczy A, Hen R. Adult born hippocampal granule cells promote pattern separation by bidirectionally modulating the remapping of place and cue cells. **Neuron.** 2023. doi: 10.1016/j.neuron.2023.09.016.
6. Bowler JC, Losonczy A. Direct Cortical Inputs to Hippocampal Area CA1 Transmit Complementary Signals for Goal-directed Navigation. **Neuron.** 2023:2022.11.10.516009. doi: 10.1101/2022.11.10.516009.
7. Evans SW, Shi DQ, Chavarha M, Plitt MH, Taxidis J, Madruga B, Fan JL, Hwang FJ, van Keulen SC, Suomivuori CM, Pang MM, Su S, Lee S, Hao YA, Zhang G, Jiang D, Pradhan L, Roth RH, Liu Y, Dorian CC, Reese AL, Negrean A, Losonczy A, Makinson CD, Wang S, Clandinin TR, Dror RO, Ding JB, Ji N, Golshani P, Giacomo LM, Bi GQ, Lin MZ. A positively tuned voltage indicator for extended electrical recordings in the brain. **Nature methods.** 2023;20(7):1104-13. Epub 2023/07/11. doi: 10.1038/s41592-023-01913-z.
8. Vancura B, Geiller T, Grosmark A, Zhao V, Losonczy A. Inhibitory control of sharp-wave ripple duration during learning in hippocampal recurrent networks. **Nature neuroscience.** 2023. Epub 2023/04/21. doi: 10.1038/s41593-023-01306-7.
9. E. Troullinou, G. Tsagakatakis, A. Losonczy, P. Poirazi and P. Tsakalides, A Generative Neighborhood-based Deep Autoencoder for Robust Imbalanced Classification. **IEEE Transactions on Artificial Intelligence.** 2023 doi: 10.1109/TAI.2023.3249685
10. Liu LB, Losonczy A, Liao Z. tension: A Python package for FORCE learning. **PLoS Comput Biol.** 2022;18(12):e1010722. doi: 10.1371/journal.pcbi.1010722.
11. Liu X, Terada S, Ramezani M, Kim JH, Lu Y, Grosmark A, Losonczy A, Kuzum D. E-Cannula reveals anatomical diversity in sharp-wave ripples as a driver for the recruitment of distinct hippocampal assemblies. **Cell reports.** 2022;41(1):111453. doi: 10.1016/j.celrep.2022.111453.
12. Priestley JB, Bowler JC, Rolotti SV, Fusi S, Losonczy A. Signatures of rapid plasticity in hippocampal CA1 representations during novel experiences. **Neuron.** 2022;110(12):1978-92 e6. doi: 10.1016/j.neuron.2022.03.026.
13. O'Hare JK, Gonzalez KC, Herrlinger SA, Hirabayashi Y, Hewitt VL, Blockus H, Szoboszlai M, Rolotti SV, Geiller TC, Negrean A, Chelur V, Polleux F, Losonczy A. Compartment-specific tuning of dendritic feature selectivity by intracellular Ca(2+) release. **Science.** (New York, NY). 2022;375(6586):eabm1670. doi: 10.1126/science.abm1670.
14. Rao BY, Peterson AM, Kandror EK, Herrlinger S, Losonczy A, Paninski L, Rizvi AH, Varol E. Non-parametric Vignetting Correction for Sparse Spatial Transcriptomics Images. **Med Image Comput Comput Assist Interv.** 2021;12908:466-75. doi: 10.1007/978-3-030-87237-3_45.

15. Tuncdemir SN, Grosmark AD, Turi GF, Shank A, Bowler JC, Ordek G, Losonczy A, Hen R, Lacefield CO. Parallel processing of sensory cue and spatial information in the dentate gyrus. **Cell reports**. 2022;38(3):110257. doi: 10.1016/j.celrep.2021.110257.
16. Rolotti SV, Blockus H, Sparks FT, Priestley JB, Losonczy A. Reorganization of CA1 dendritic dynamics by hippocampal sharp-wave ripples during learning. **Neuron**. 2022;110(6):977-91 doi: 10.1016/j.neuron.2021.12.017.
17. Rolotti SV, Ahmed MS, Szoboszlay M, Geiller T, Negrean A, Blockus H, Gonzalez KC, Sparks FT, Solis Canales AS, Tuttman AL, Peterka DS, Zemelman BV, Polleux F, Losonczy A. Local feedback inhibition tightly controls rapid formation of hippocampal place fields. **Neuron**. 2022;110(5):783-94 doi: 10.1016/j.neuron.2021.12.003.
18. Kosmidis S, Negrean A, Dranovsky A, Losonczy A, Kandel ER. A fast, aqueous, reversible three-day tissue clearing method for adult and embryonic mouse brain and whole body. **Cell Rep Methods**. 2021;1(7):100090. doi: 10.1016/j.crmeth.2021.100090.
19. Farrell JS, Lovett-Barron M, Klein PM, Sparks FT, Gschwind T, Ortiz AL, Ahanonu B, Bradbury S, Terada S, Oijala M, Hwaun E, Dudok B, Szabo G, Schnitzer MJ, Deisseroth K, Losonczy A, Soltesz I. Supramammillary regulation of locomotion and hippocampal activity. **Science**. (New York, NY). 2021;374(6574):1492-6. doi: 10.1126/science.abh4272.
20. Terada S, Geiller T, Liao Z, O'Hare J, Vancura B, Losonczy A. Adaptive stimulus selection for consolidation in the hippocampus. **Nature**. 2022;601(7892):240-4. doi: 10.1038/s41586-021-04118-6.
21. Geiller T, Sadeh S, Rolotti SV, Blockus H, Vancura B, Negrean A, Murray AJ, Rozsa B, Polleux F, Clopath C, Losonczy A. Local circuit amplification of spatial selectivity in the hippocampus. **Nature**. 2022;601(7891):105-9. doi: 10.1038/s41586-021-04169-9.
22. Blockus H, Rolotti SV, Szoboszlay M, Peze-Heidsieck E, Ming T, Schroeder A, Apostolo N, Vennekens KM, Katsamba PS, Bahna F, Mannepalli S, Ahlsen G, Honig B, Shapiro L, de Wit J, Losonczy A, Polleux F. Synaptogenic activity of the axon guidance molecule Robo2 underlies hippocampal circuit function. **Cell reports**. 2021;37(3):109828. doi: 10.1016/j.celrep.2021.109828.
23. Grosmark AD, Sparks FT, Davis MJ, Losonczy A. Reactivation predicts the consolidation of unbiased long-term cognitive maps. **Nature neuroscience**. 2021;24(11):1574-85. doi: 10.1038/s41593-021-00920-7.
24. Dudok B, Szoboszlay M, Paul A, Klein PM, Liao Z, Hwaun E, Szabo GG, Geiller T, Vancura B, Wang BS, McKenzie S, Homidan J, Klaver LMF, English DF, Huang ZJ, Buzsaki G, Losonczy A, Soltesz I. Recruitment and inhibitory action of hippocampal axo-axonic cells during behavior. **Neuron**. 2021;109(23):3838-50 e8. doi: 10.1016/j.neuron.2021.09.033.
25. Hadjiabadi D, Lovett-Barron M, Raikov IG, Sparks FT, Liao Z, Baraban SC, Leskovec J, Losonczy A, Deisseroth K, Soltesz I. Maximally selective single-cell target for circuit control in epilepsy models. **Neuron**. 2021;109(16):2556-72 e6. doi: 10.1016/j.neuron.2021.06.007.
26. Dudok B, Klein PM, Hwaun E, Lee BR, Yao Z, Fong O, Bowler JC, Terada S, Sparks FT, Szabo GG, Farrell JS, Berg J, Daigle TL, Tasic B, Dimidschstein J, Fishell G, Losonczy A, Zeng H, Soltesz I. Alternating sources of perisomatic inhibition during behavior. **Neuron**. 2021;109(6):997-1012 e9. doi: 10.1016/j.neuron.2021.01.003.

27. Sparks FT, Liao Z, Li W, Grosmark A, Soltesz I, Losonczy A. Hippocampal adult-born granule cells drive network activity in a mouse model of chronic temporal lobe epilepsy. **Nature communications**. 2020;11(1):6138. doi: 10.1038/s41467-020-19969-2.
28. Geiller T, Vancura B, Terada S, Troullinou E, Chavlis S, Tsagkatakis G, Tsakalides P, Ocsai K, Poirazi P, Rozsa BJ, Losonczy A. Large-Scale 3D Two-Photon Imaging of Molecularly Identified CA1 Interneuron Dynamics in Behaving Mice. **Neuron**. 2020;108(5):968-83 e9. doi: 10.1016/j.neuron.2020.09.013.
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70. Bowler JC, Zakka G, Yong HC, Li W, Rao B, Liao Z, Priestley JB, Losonczy A. behaviorMate: An Intranet of Things Approach for Adaptable Control of Behavioral and Navigation-Based Experiments. **bioRxiv**. 2024:2023.12.04.569989. doi: 10.1101/2023.12.04.569989. (in press, *Elife*)
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Reviews and Book chapters:

- 72 Liao Z, Losonczy A. Learning, Fast and Slow: Single- and Many-Shot Learning in the Hippocampus. **Annu Rev Neurosci**. 2024. Epub 20240425. doi: 10.1146/annurev-neuro-102423-100258.
- 73 Geiller T, Priestley, JB, Losonczy, A. A local circuit-basis for spatial navigation and memory processes in hippocampal area CA1. **Current opinion in neurobiology**. 2023; 79, 102701, doi:10.1016/j.conb.2023.102701
- 74 Liu AA, Henin S, Abbaspoor S, Bragin A, Buffalo EA, Farrell JS, Foster DJ, Frank LM, Gedankien T, Gotman J, Guidera JA, Hoffman KL, Jacobs J, Kahana MJ, Li L, Liao Z, Lin JJ, Losonczy A, Malach R, van der Meer MA, McClain K, McNaughton BL, Norman Y, Navas-Olive A, de la Prida LM, Rueckemann JW, Sakon JJ, Skelin I, Soltesz I, Staerlina BP, Weiss SA, Wilson MA, Zaghoul KA, Zugaro M, Buzsaki G. A consensus statement on detection of hippocampal sharp wave ripples and differentiation from other fast oscillations. **Nature communications**. 2022;13(1):6000. doi: 10.1038/s41467-022-33536-x.
- 75 Sparks FT, Represa A, Losonczy A, and Soltesz. I. Principal cell heterogeneity in malformations of cortical development and acquired epilepsy. **Neurobiology of the Epilepsies: From Epilepsy: A Comprehensive Textbook**. 2022; (editor: Engel J).
- 76 Grosmark A, Milstein A, Losonczy A, and Soltesz I. Local circuits. **The Hippocampus Book**. (editor: Morris R.), *in press*

- 77 Gonzalez KC, Losonczy A, Negrean A. Dendritic Excitability and Synaptic Plasticity In Vitro and In Vivo. **Neuroscience**. 2022; 89:165-75. doi: 10.1016/j.neuroscience.2021.12.039.
- 78 Sawtell N, Losonczy A, and Abbott L. Chapter in **Principles of Neural Science**. 2021; 6th Edition, McGraw Hill
- 79 Soltesz I and Losonczy. CA1 pyramidal cell diversity enabling parallel information processing in the hippocampus. **Nature Neuroscience**. 2018; 4:484-493. doi: 10.1038/s41593-018-0118-0
- 80 Piant S, Specht A, Zemelman B, Losonczy A and Bolze F. Two-photon sensitive photolabile protecting groups: From molecular engineering to nanostructuring. **Molecular Crystals and Liquid Crystals**. 2016; 627:56-65. doi: 10.1080/15421406.2015.1137119.
- 81 Kaifosh P and Losonczy A. The inside track: privileged neural communication through axon-carrying dendrites. **Neuron**. 2014; 83:1231-1234. doi: 10.1016/j.neuron.2014.09.003
- 82 Lovett-Barron M, Losonczy A. Behavioral consequences of GABAergic neuronal diversity. **Current Opinion in Neurobiology**. 2014; 26, 27-33. doi: 10.1016/j.conb.2013.11.002.
- 83 Lovett-Barron M, and Losonczy A. Circuits supporting the grid. **Nature Neuroscience**. 2013; 16, 255-257. doi: 10.1038/nn.3334
- 84 Bolze F, Nicoud JF, Bourgogne C, Gug S, Sun XH, Goeldner M, Specht A, Donato L, Warther D, Turi GF, and Losonczy A*. Two-photon uncaging: the chemist point of view. **Optical Materials**. 2012; 34, 1664-1669. doi: 10.1016/j.optmat.2012.03.007

E. FUNDING SOURCES

ACTIVE:

1RF1NS133381 (Losonczy, Soltesz) 09/01/2023 – 08/31/2028
NIH/NINDS/BRAIN

Local circuit control of rapid plasticity and tunable ensemble formation in the hippocampus
Role: PI

1R01NS131728 (Soltesz, Losonczy) 04/01/2023 – 03/31/2028
NIH/NINDS

Activity-dependent endocannabinoid control in epilepsy
Role: PI

1R01AG080818 (Losonczy, Fusi, Hen) 12/01/2023 – 11/30/2027
NIH/NIA

Dissecting the role of the dentate gyrus microcircuit to improve cognitive discrimination in aging and Alzheimer's Disease

1R01MH124867 (Losonczy, Poirazi) 01/01/2020 – 11/30/2025
NIH/NIMH

Experimental and modeling investigations into microcircuit, cellular and subcellular determinants of hippocampal ensemble recruitment to contextual representations

1R01MH124047 (Losonczy, Gogos) 09/1/2020 – 06/30/2025

NIH/NIMH

Microcircuit, cellular and molecular dissection of impaired hippocampal function in a mouse model of the 22q11.2 deletion.

1R01NS121106 (Soltesz, Losonczy) 04/1/2021 – 03/31/2026

NIH/NINDS

Control of the axon initial segment in epilepsy

1U01NS115530 (Vaziri, Losonczy) 09/01/2020 – 08/31/2024, NCE

NIH/NINDS/BRAIN

High-speed and hybrid multiphoton volumetric imaging of multimodal network dynamics across the intact hippocampus

COMPLETED (selected)

5U19NS104590-03 (Soltesz, Buzsaki, Losonczy, Schnitzer)

NIH/NINDS/BRAIN

Towards a complete description of the circuitry underlying sharp wave-mediated memory replay
The major goal of this project is to understand how the hippocampus generates sharp-wave-ripples.

Role: PI and Project Lead

Hippocampal inhibitory control of contextual fear learning

R01 MH100631

3/1/2014 – 2/28/2020

NIH/NIMH

Role: PI

High-speed volumetric imaging of neuronal network activity at depth using Multiplexed Scanned Temporal Focusing (MuST)

U01 NS094263

9/30/2015 – 7/31/2019

NIH/NINDS

Role: MPI/Subaward PI

Closed-loop intervention in epilepsy

5R01NS094668-04 (Soltesz & Losonczy)

9/30/2015 – 8/31/2020

NIH/NINDS

Role: MPI/Sub PI

Inhibitory control of hippocampal memory functions

Source: Searle Kinship Foundation

6/20/2011 – 6/20/2014

Role: PI

GABAergic inhibitory circuit deficits in schizophrenia
Brain and Behavior Research Foundation
2/1/2013 – 2/1/2015
Role: PI

In vivo imaging in hippocampal circuits
Kavli Foundation at Columbia University
12/1/2011 – 1/1/2013
Role: multi-PI (PI: Losonczy, Sawtell)

In vivo functional imaging in hippocampal circuits
Harvey L. Karp Neuroscience Discovery Award
3/1/2012 – 2/1/2013
Role: PI

Dissecting hippocampal microcircuit dysfunctions underlying cognitive memory deficits in schizophrenia
McKnight Foundation
2/1/2013 – 1/31/2016
Role: PI

In vivo functional imaging and high-resolution manipulations of hippocampal memory circuits Source: Human
Frontiers Science Program
9/1/2012 – 3/01/2015
Role: PI (co-PI: Bolze, Vaziri, Zemelman)

Towards a complete description of the circuitry underlying memory replay
Brain Initiative – National Institute of Health (U01)
9/30/2014 – 7/31/2017
Role: co-PI (PI: Soltesz, co-PI: Buzsaki, Lisman, Losonczy)

High-speed volumetric imaging of neuronal network activity at depth using Multiplexed Scanned Temporal
Focusing (MuST)
Brain Initiative – National Institute of Health (U01)
9/1/2015 – 8/31/2017
Role: co-PI (PI: Vaziri)

New Cells for Memory. Necessary, but why?
Zegar Family Foundation
1/1/2016 – 1/1/2018
Role: PI

F. PATENTS HELD OR PENDING

2P-NucTag: correlated functional and structural-molecular analysis of brain cells (US patent, pending)

G. AWARDS & HONORS

1993 1st Prize at the National High School Academic Competition (Biology)
1997 Scholarship – Hungarian Republic
1999 Pro Scientia Award – Hungarian Academy of Sciences for Excellence in Academic Research

- 2000 Scholarship – North Oxford Overseas Centre, Oxford, United Kingdom
- 2001 Graduate Student Scholarship – Boehringer Ingelheim Foundation, Germany
- 2010 Member – Kavli Institute for Brain Science, Columbia University
- 2011 Searle Scholar – Searle Kinship Foundation
- 2012 Kavli Grant Award – Kavli Institute for Brain Science at Columbia University
- 2012 HFSP Program Grant – Human Frontiers Science Program
- 2012 Harvey L. Karp Discovery Award
- 2013 Young Investigator Award – NARSAD
- 2013 Memory and Cognitive Disorders Award – McKnight Foundation
- 2014 Brain Initiative U01 Award – National Institute of Health
- 2015 Harold and Golden Lampport Award for Excellence in Basic Science Research at Columbia University
- 2015 Member – Mortimer B. Zuckerman Mind Brain Behavior Institute at Columbia University
- 2015 Member – Executive Committee, Mortimer B. Zuckerman Mind Brain Behavior Institute at Columbia University (2015 – 2020)
- 2015 Brain Initiative U01 Award – National Institute of Health
- 2016 Kavli Grant Award – Kavli Institute for Brain Science at Columbia University
- 2017 Zegar Family Foundation Award
- 2017 Senior Group Leader, Friedrich Miescher Institute, Basel (declined)
- 2017 Brain Initiative U19 Award – National Institute of Health
- 2018 Kavli-Simons Scholar – Kavli Institute for Brain Science at Columbia University
- 2023 Endowed Chair, UTSW (declined)
- 2025 Chair, Gordon Gordon Research Conference “Inhibition in CNS”

INVITED SEMINARS and TALKS

- 2025 Northwestern University, Chicago (upcoming)
- 2024 Brain Science Symposium, Shanghai, China
- 2024 FENS, Vienna
- 2024 Max Planck Florida Institute
- 2024 University of Indiana
- 2024 Super-resolution Meeting, University of Pecs, Hungary
- 2023 Boehringer Ingelheim Funds 40th Anniversary Meeting, Woods Hole, MA (plenary)
- 2023 Gordon Research Conference “2023 Inhibition in the CNS”
- 2023 Gordon Research Conference “2023 Excitatory Synapses and Brain Function”
- 2023 Gordon Research Conference “2023 Dendrite”
- 2023 University of Bonn, DZNE, Germany
- 2022 UCLA, Department of Neuroscience
- 2022 John Hopkins University, Department of Neuroscience
- 2022 UPenn, Department of Neuroscience
- 2022 UT Austin, Department of Neuroscience
- 2022 UT Southwestern, Dallas
- 2022 16th Multinational Congress on Microscopy, keynote, Brno, Czech Republic
- 2022 Symposium: “Neuronal representation – from synapses and microcircuits to behavior”, Freiburg, Germany
- 2022 Japanese Neuroscience Society Meeting
- 2022 System Neuroscience Seminar, Department of Psychiatry, Columbia University
- 2022 AREADNE meeting on “Dendrites”, Greece
- 2022 Pathway to Memory Spring Conference, Irvine, USA
- 2022 Hungarian Microscopy Society, plenary, Budapest, Hungary
- 2022 Stanford University, California, USA

2021 Ruhr University Bochum, Germany
 2021 New York Medical College
 2021 INSERM, Marseille, France
 2020 Rutgers University
 2020 Case Western University
 2019 SFN, Symposium Lecture, Chicago, 2019
 2019 Neurological Research Institute, Baylor College of Medicine, Houston, Texas
 2019 NICHD, Bethesda
 2019 Max Planck Institute, Frankfurt, Germany
 2018 Gordon Research Conference “Optogenetic approaches to understanding neural circuits and behavior”
 2018 "Hippocampal Network and Memory Across the Lifespan: Circuit, Code, Cognition" – Plenary Lecture, Budapest, Hungary
 2018 Boston University, Departmental seminar
 2018 “Plasticity and Stability of Neuronal Circuits" Symposium, Tel Aviv, Israel
 2018 Penn State University, Departmental Seminar
 2018 Rockefeller University, Leon-Levy Foundation Seminar
 2018 Keystone Conference “State of the Brain”
 2017 Stanford University, Department of Biomedical Engineering, Stanford, CA
 2017 FENS Regional Meeting – Plenary Lecture, Pecs, Hungary
 2017 Yale, Department of Neuroscience
 2017 Gordon Research Conference “2017 Inhibition in the CNS”
 2017 SUNY Downstate, New York
 2017 IST, Vienna, Austria
 2017 Gordon Research Conference “2017 Dendrites”
 2017 NIEHS, Durham
 2017 UT Southwestern, Dallas
 2016 NIPS International Workshop, Keynote speaker, Okazaki, Japan
 2016 MIT Picower Institute, Boston, MA
 2016 INSERM Neuroscience Research Center, Marie Curie University, France
 2016 FMI, Basel, Switzerland
 2016 Keynote speaker, SUNY, Albany, Hudson-Berkshire Society for Neuroscience Chapter
 2016 Annual Meeting of the Japanese Neuroscience Society, Yokohama, Japan
 2016 FENS Meeting, Copenhagen, Denmark
 2016 AREADNE meeting on “Dendrites”, Greece
 2016 McKnight Foundation Meeting, Minneapolis, MN
 2016 “Synaptic Micro-networks in Health and Disease”, Bonn, Germany
 2016 Department of Neurosciences, University of Montreal
 2016 Department of Psychiatry, Yale, New Haven
 2016 King’s College, London, UK
 2015 Cold Spring Harbor Laboratories, Cold Spring Harbor, NY
 2015 HHMI Janelia Research Campus – “Hippocampal-Entorhinal Complexities”
 2015 Department of Epileptology, University of Bonn, Bonn, Germany
 2015 University College London, Wolfson Institute for Biomedical Research, London, UK
 2015 5th European Synapse Meeting, Bristol, UK
 2015 Conference on Learning and Memory, Austin, Texas
 2015 Gordon Research Conferences – “Dendrites: Molecules, Structure & Function”, Ventura Beach, California
 2015 Foundation des Treilles Meeting, Les Treilles, France
 2015 Vollum Institute, Oregon Health Science Center, Portland, Oregon
 2015 Harvard Center for Brain Science, Boston, Massachusetts

2015 Centre de Recherche Université Laval Robert-Giffard, Quebec City, Canada
 2014 GABAergic Signaling in Health and Disease, Washington DC
 2014 Max Planck Florida Institute, Jupiter, Florida
 2014 Center for Biomedical Neuroscience – Neurology Ground Round, San Antonio, Texas
 2014 Department of Neurobiology, Harvard Medical School, Boston Massachusetts
 2014 ENINET – Annual Meeting of European Neuroscience Societies, Freiburg, Germany
 2014 Institute of Science and Technology, Vienna, Austria
 2014 Gordon Research Conferences – “Synaptic transmission”, Waterville Valley, New Hampshire
 2014 FENS – Annual Meeting of Federation of European Neuroscience Societies, Milan, Italy
 2014 Conference Jacques Monod – “Optical imaging of brain structure and function on multiple spacial scales”, Roscoff, France
 2014 Department of Neuroscience, Yale University, New Haven – Swartz seminar series
 2014 National Institute of Health/NIGMS, Bethesda, Maryland
 2014 Epilepsy Research Center Symposium, UC Irvine, California
 2014 IBRO – International Brain Research Organization Workshop, Debrecen, Hungary
 2013 Institute of Experimental Medicine, Budapest, Hungary
 2013 Friedrich Miescher Institute, Basel, Switzerland
 2013 Gordon Research Conferences – “Inhibition in the CNS”, Les Diablerets, Switzerland
 2013 Gordon Research Conferences – “Dendrites”, Les Diablerets, Switzerland
 2013 Picower Institute, MIT, Boston, Massachusetts
 2012 HHMI Janelia Conference – “Neuron types in the hippocampal formation”
 2012 Department of Neurobiology, New York University, New York
 2012 Albert Einstein College of Medicine, Department of Neuroscience, New York
 2012 HHMI Janelia Conference – “Dendrites, substrates for information processing”
 2011 IBRO/FENS Conference, Ljubljana, Slovenia
 2011 Department of Physiology, Columbia University, New York
 2008 Department of Neuroscience, Yale, New Haven
 2008 Picower Institute, MIT, Boston, Massachusetts
 2005 Department of Anatomy, UC Irvine, California
 2005 Southern Photonics Conference, Atlanta, Georgia

H. SERVICE

1. University/Department Service

Neuroscience Seminar Series committee (member, 2012–13, co-chair 2014 – 2017)
 Neuroscience Faculty Search committee (member, 2010, 2016–2020)
 Neuroscience Doctoral Program Open House committee (member 2013–2017)
 Institutional Animal Care and Use Committee (member, 2016–2023)
 Institutional Biosafety Committee (member, 2017–2022)

Thesis/Qualifying Exam committees are listed in section “C.2. Mentoring Experience” above.

2. Scientific Community Service

- **Reviewer for Journals and Funding Agencies**

Ad hoc Reviewer: Nature, Science, Cell, Nature Neuroscience, Nature Reviews Neuroscience, Neuron, Nature Communications, PNAS, Scientific Reports, Neuropsychopharmacology, Cell Calcium, Cell Reports, The

Journal of Neuroscience, Journal of Physiology, European Journal of Neuroscience, Elife, PLOS One, PLOS Biology, Hippocampus, Cerebral Cortex, IEEE Transactions on Neural Networks and Learning Systems, Journal of the Royal Society Interface, Physiological Reviews

Regular member:

NIH, Learning, Memory and Decision Neuroscience Study Section (2021– present)

Ad hoc reviewer:

NIH BRAIN Initiative: Team-Research BRAIN Circuit Program R01/U01 (2018– present)

NIH BRAIN Initiative: Team-Research BRAIN Circuit Program U19 (2018– present)

NIH Molecular and Cellular Substrates of Complex Brain Disorders Special Emphasis Panel ZRG1 MDCNP(57), NIH ZRG1 IFCN-J(02)

European Research Council: Starting, Consolidator, Advanced, and Synergy Grants

The Hungarian Scientific Research Fund

Hungarian Brain Project

The Wellcome Trust (UK)

Royal Society (UK)

Human Frontiers Science Program (HFSP)

Leibnitz Prize (Germany)

McArthur Genius Award (US)

Swiss Science Foundation

W. M. Keck Foundation (US)

Institute Pasteur (France)

Israel Science Foundation

Boehringer Ingelheim Foundation (Germany)

• **Editorial Board:**

2019 – present *Hippocampus*

2024 – present *PNAS*, Invited Editor (*ad hoc*)

• **Conference Organizer**

“Dissecting fear circuits in rodents” International Brain Research Organization (IBRO) Workshop – Annual Hungarian Neuroscience Society Meeting, 2014 (organizer)

Neuromatch 3.0, 2020 (organizer)

“Inhibition in the CNS” Gordon Research Conference, 2025, (chair)

• **Membership**

Society for Neuroscience (2000-present)

• **Meeting Participation (selected)**

Gordon Research Conference “Inhibition in CNS”, 2023

Gordon Research Conference on “Excitatory Synaptic Transmission 2023

Gordon Research Conference on “Dendrites: Molecules, Structure&Function”, 2023

Gordon Research Conference “Inhibition in CNS”, 2019

Gordon Research Conference “Optogenetic approaches to understanding neural circuits and behavior”, 2018

Keystone Meeting, 2018

“Dendrites” FENS-IBRO meeting (Crete, Greece) 2016, 2022

Annual Society for Neuroscience meeting: 2001-2008, 2010-2016

Federation of European Neuroscience Societies (FENS) Meeting (Brighton, UK), 2000

Federation of European Neuroscience Societies (FENS) Meeting (Milan, Italy), 2014

McKnight Foundation Meeting, 2014-2016

Searle Foundation Meeting, 2012-2014

Les Treilles Foundation Meeting “What does the cortex do?” (Les Treilles, France), 2014
International Brain Research Organization (IBRO) Workshop – Annual Hungarian Neuroscience Society Meeting (Hungary), 1999-2002, 2014, 2016
Annual Meeting of the Japanese Neuroscience Society, Yokohama, Japan, 2016
International Brain Research Organization (IBRO) Meeting (Ljubljana, Slovenia), 2011
“Hippocampal-Entorhinal Complexities” (HHMI Janelia, USA), 2015
“Dendrites: Substrates for Information Processing” (HHMI Janelia, USA), 2012
“Neuron Types in the Hippocampal Formation: Structure, Activity, and Molecular Genetics” (HHMI Janelia, USA), 2012
Gordon Research Conference on Gordon Conference on “Excitatory Amino Acids” (Il Ciocco, Italy), 2001
Gordon Research Conference on “Dendrites: Molecules, Structure&Function” (Les Diablerets, Switzerland), 2013
Gordon Research Conference on “Inhibition in the CNS” (Les Diablerets, Switzerland), 2013
Gordon Research Conference on “Synaptic Transmission” (Waterville Valley, USA), 2014
Gordon Research Conference on “Dendrites: Molecules, Structure&Function” (Ventura, California), 2015
European Neuroscience Institutes Network (ENINET) Meeting (Freiburg, Germany): 2014
“Optical imaging of brain structure and function on multiple spacial scales” Conference Jacques Monod (Roscoff, France), 2014
International Epilepsy Research Center (EpiCenter) Symposium (Irvine, USA), 2014
Austin Meeting on Learning and Memory (Austin, USA), 2015
5th European Synapse Meeting, Bristol, UK, 2015
“Synaptic Micro-networks in Health and Disease”, Bonn, Germany, 2016

- **Major Collaborations**

Prof. Franck Polleux, Columbia University, New York, USA
Prof. Ivan Soltesz, Stanford University, Stanford, USA
Prof. Boris Zemelman, University Texas, Austin, USA
Prof. Ivo Spiegel, Weizmann Institute, Rehovot, Israel
Prof. Zoltan Nusser IEM, Budapest, Hungary
Prof. Yiota Poirazi, IMBB-FORTH, Crete, Greece
Prof. Balazs Rozsa, Femtonics, Budapest, Hungary
Prof. Claudia Clopath, Imperial College London, London, UK
Prof. Alipasha Vaziri, Rockefeller University, New York, USA
Prof. Joseph Gogos, Columbia University, New York, USA
Prof. Stefano Fusi, Columbia University, New York, USA
Prof. Gyorgy Buzsaki, New York University, New York, USA
Prof. Mark Schnitzer, Stanford University, Stanford, USA