István Katona short bio:

István Katona is a neuroscientist. He got his PhD from Semmelweis University in Budapest (2000) and continued as an EMBO postdoctoral fellow in Heidelberg. He established his lab in Hungary with a prestigious European Research Council grant (ERC, 2009) and served as Head of the Dept of Molecular and Developmental Neuroscience at Institute of Experimental Medicine (2011-2020). He has been the Naus Endowed Chair of Addiction Sciences in Bloomington since 2020.

His most significant contribution as a graduate student was the direct demonstration of cannabinoid receptors on nerve terminals (Journal of Neuroscience, 1999). His study became a Citation Classic (cited: 1507) and was referred as one of the three "Monumental Discoveries" in cannabinoid research in the Cambridge University Press book on the cannabinoid system (2020), because it laid the foundation for understanding cannabis effects and how endogenous cannabinoids operate in synapses. He later discovered which enzyme produces retrograde synaptic endocannabinoids (Journal of Neuroscience, 2006, cited: 650) and proposed the framework for this unusual signaling in an influential Nature Medicine review (cited: 730). His next major contribution was a new microscopic approach based on super-resolution imaging that can quantify nanoscale molecular changes in complex tissues. Using this approach, his team provided the first visualization of molecular tolerance to cannabis exposure (Nature Neuroscience, 2015, cited: 291). This study was used as reference in cannabis policy discussion in the US Congress. His team also showed the nanoscale molecular impact of maternal cannabis use (Nature Neuroscience, 2019, cited: 165), this study received broad publicity for example in "The Economist". Another innovation enabled the nanoscale quantification of drug binding sites (Nature Communications, 2021). This study was highlighted by the National Institute on Drug Abuse as "Top 5" basic science discoveries in 2021. Recently, his lab in Bloomington discovered the quantitative molecular principles for retrograde synaptic signaling (Science Advances, 2024, cover page article). Together, Istvan Katona published 73 studies in leading journals such as Nature, Nature Medicine, Nature Neuroscience, Nature Communications, Nature Protocols, Science, Science Advances, Neuron and PNAS. His work is cited more than 18,000 times and his h-index is 51.

Four former students from his lab became professors (Baylor College of Medicine, Dundee University, Nottingham University and Lund University). His graduate students continued their research at institutions such as Stanford, Columbia, and University College London. More than 50 international guest researchers learned super-resolution imaging methods in his Budapest-based lab and now in the Bloomington-based lab.

His scientific achievements garnered significant international attention, with over 120 invited lectures at prestigious conferences and universities (Harvard, Stanford, Scripps, Allen Institute, Oxford, Karolinska, Charité Berlin, College de France etc). He was invited speaker at the Society of Neuroscience conference in US (2009, 2014, 2018) and was plenary speaker at the Canadian Neuroscience Congress in 2025. He organized the elite event in his field, the Gordon Conference on Cannabinoids in 2019. He was recognized with the International Association for Cannabinoids as Medicines award (2009), and he is a European Molecular Biology Organization fellow (EMBO, 2016).

He has been a lifetime member of the Academia Europaea (European Academy of Sciences) since 2013, which is the European equivalent of the US National Academy of Sciences.

Budapest, October 15th 2025 István Katona

Curriculum Vitae

Name: István Katona

Full postal address: Department of Psychological & Brain Sciences, Indiana University, MSBII 154, 702 N Walnut Grove Ave, Bloomington, IN 47405-2204

Office Phone: 812-855-1453

Fax: 812-856-7181

E-mail: ikatona@iu.edu

Education:

1. PhD in Neuroscience: János Szentágothai Doctoral School of Neurosciences, Semmelweis Medical University, Budapest, Hungary (09/1997-09/2000).
2. MSc in Biology: Loránd Eötvös University, Budapest, Hungary (09/1992-06/1997).

Employment:

1. Naus Family Chair of Addiction Sciences (80%), Department of Psychological and Brain Sciences, Indiana University, Bloomington, IN, USA (since 02/2020).
2. Scientific advisor (20%), Laboratory of Molecular Neurobiology, Institute of Experimental Medicine, Hungarian Academy of Sciences (since 01/2020).
3. Professor, Head of Department of Molecular and Developmental Neuroscience, Institute of Experimental Medicine, Hungarian Academy of Sciences (01/2011-12/2019).
4. Senior Research Fellow, Head of Laboratory of Molecular Neurobiology, IEM HAS (01/2007-12/2010).
5. Bolyai Research Fellow, Cerebral Cortex Research Group, Head: Prof. Tamás F. Freund, IEM HAS, (01/2003-12/2006).
6. EMBO Postdoctoral Fellow, Department of Molecular Neurobiology, Max-Planck Institute for Medical Research, Heidelberg, Germany, Head: Prof. Peter Seeburg and Prof. Hannah Monyer, (09/2000-12/2002).
7. PhD student, Laboratory of Functional Neuroanatomy, IEM HAS, Supervisor: Prof. Tamás F. Freund, (09/1997-09/2000).
8. Student Research Assistant, Laboratory of Functional Neuroanatomy, IEM HAS, Supervisor: Prof. Tamás F. Freund, (10/1993-08/1997).

Visiting Appointments:

1. Visiting Professor, Department of Biomedical Science, University of Cagliari, Italy, Host: Prof. Miriam Melis, (06/2017-07/2017).
2. Visiting Professor, Department of Neurobiology and Anatomy, University of California, Irvine, USA, Host: Prof. Ivan Soltész, (01/2011-06/2011 and 01/2012-03/2012).
3. Visiting scientist, Laboratory for Neuronal Circuit Development, RIKEN BSI, Wako-shi, Japan, Host: Prof. Takao K. Hensch, (06/2004-09/2004).

Awards and Recognitions:

2023 Outstanding PhD instructor of the Semmelweis Medical University, Budapest, Hungary

2019 Elected Chair, Gordon Conference on Cannabinoid Functions in the CNS

2017 NIH Neuroscience Seminar Series Lecture, Bethesda, MD

2016 Elected lifetime member of the European Molecular Biology Organization (EMBO)

2016 The Academy Prize of the Hungarian Academy of Sciences

2016 NIH COBRE Lecture, National Center for Natural Products Research, Oxford, MS

2013 Elected lifetime member of Academia Europea (*European Academy of Sciences)*

2013 Momentum Award of the Hungarian Academy of Sciences

2010 The Wellcome Trust International Senior Research Fellowship

2009 European Research Council, Starting Independent Researcher Grant

2009 International Association for Cannabinoids as Medicines (IACM) Award

2007 Central European Talent Award, Best Life Scientist

2003-2010 János Bolyai Fellow, Excellent Achievements Category

2000-2002 European Molecular Biology Organization (EMBO), Long-term Fellowship

2000 Eötvös Hungarian State Fellowship

1997 Richter-Gedeon Research Award

1996-1997 Pro Renovanda Culturae Hungariae Student Scholarship

1996 Scholarship of the Hungarian Republic

1996 Student of the Year Award, Loránd Eötvös University, Budapest, Hungary

National and International Service:

2025 Program Committee member of the 35th Annual ICRS Symposium on the Cannabinoids

2018 Head, Advisory Board of the Research Institutes of the Hungarian Academy of Sciences, Section of Life Sciences, Member 2015-2017, Head 2018-2019

2015-2017 Member, Advisory Board of the Research Institutes of the Hungarian Academy of Sciences, Section of Life Sciences

2017 Member, Portuguese Science and Technology Research Fund, Neuroscience Study Section

2016 Head, Hungarian Scientific Research Fund, Neuroscience Study Section, Member 2012-2014,

2012-2014 Member, Hungarian Scientific Research Fund, Neuroscience Study Section

2014 Program Committee of the 15th Biannual Conference of the Hungarian Neuroscience Society

2012 Program Committee of the 8th Federation of European Neurosciences (FENS) Forum

2008 Young Investigator Advisory Board of the President of the Hungarian Academy

Professional Societies:

Member, International Cannabinoid Research Society (2006-present)

Member, Society for Neuroscience (2006-present)

Member, Federation of European Neurosciences (1996-present)

Member, Hungarian Neuroscience Society (1996-present)

Summary of publication activity:

Peer-reviewed papers: 73
Citations (Google Scholar): 17,736
h-index (Google Scholar): 51

Complete List of Published Work on Google Scholar:
https://scholar.google.com/citations?user=IyGmWKcAAAAJ&hl=en

Selected important publications:

1. Katona I, Sperlágh B, Sik A, Kőfalvi A, Vizi ES, Mackie K and Freund TF (1999) Presynaptically located CB1 cannabinoid receptors regulate GABA release from axon terminals of specific hippocampal interneurons. ***The Journal of Neuroscience,*** 19: 4544-4558.

2. Katona I, Urbán GM, Wallace M, Ledent C, Jung KM, Piomelli D, Mackie K and Freund TF (2006) Molecular composition of the endocannabinoid system at glutamatergic synapses. ***The Journal of Neuroscience*****,** 24:5268-5237.

3. Katona I and Freund TF (2008) Endocannabinoid signaling as a synaptic circuit breaker in neurological disease. ***Nature Medicine***, 14:923-930.

4. Katona I and Freund TF (2012) Multiple functions of endocannabinoid signaling in the brain. ***Annual Review of Neuroscience***, 35:529-558.

5. Dudok B, Barna L, Ledri M, Szabó SI, Szabadits E, Pintér B, Woodhams SG, Henstridge CM, Balla GY, Nyilas R, Varga C, Lee SH, Matolcsi M, Cervenak J, Kacskovics I, Watanabe M, Sagheddu C, Melis M, Pistis M, Soltesz I and Katona I (2015) Cell-specific STORM

superresolution imaging reveals nanoscale organization of cannabinoid signaling. ***Nature Neuroscience***, 18:75-86.

6. Barna L, Dudok B, Miczán V, Horváth A, László ZI and Katona I (2016) Correlated confocal and super-resolution imaging by VividSTORM. ***Nature Protocols***, 11:163-183.

7. *Frau R, *Miczan V, Traccis F, Aroni S, Pongor C, Saba P, Serra V, Sagheddu C, Fanni S, Congiu M, Devoto P, Cheer J, *Katona I and *Melis M (2019) Prenatal THC exposure produces a hyperdopaminergic phenotype rescued by pregnenolone. ***Nature Neuroscience***, 22:1975-1985.

8. László Z, Lele Z, Zöldi M, Miczán V, Mógor F, Simon GM, Mackie K, Kacskovics I, Cravatt BF and Katona I (2020) ABHD4-mediated developmental anoikis safeguards the embryonic brain. ***Nature Communications***, 11:4363

9. Prokop S, Ábrányi-Balogh P, Barti B, Vámosi M, Zöldi M, Barna L, Urbán GM, Tóth AD, Dudok B, Egyed A, Deng H, Leggio GM, Hunyady L, van der Stelt M, Keserű GM and Katona I (2021) PharmacoSTORM nanoscale pharmacology reveals cariprazine binding on Islands of Calleja granule cells. ***Nature Communications***, 12:6505

10. Barti B, Dudok B, Kenesei K, Zöldi M, Miczán V, Balla GY, Zala D, Tasso M, Sagheddu C, Kisfali M, Tóth B, Ledri M, Vizi ES, Melis M, Barna L, Lenkei Z, Soltész I and Katona I (2024) Presynaptic nanoscale components of retrograde synaptic signaling. ***Science Advances***, 10: eado0077.

Grant Reviewer:

Agence Nationale de la Recherche, France; Biotechnology and Biological Sciences Research Council, UK; Wellcome/DBT India Allience, India; Deutsche Forschunggemeinschaft, Germany; European Molecular Biology Organization, EU; European Research Council, Panel member and ad hoc reviewer, EU; Fundação para a Ciência e a Tecnologia, Portugal; National Research, Development and Innovation Fund, Hungary; Hungarian Academy of Sciences, Momentum Program and Young Researcher Program, Hungary; Hungarian Brain Research Program, Hungary; Medical Research Council, UK; National Science Foundation, USA; Research Council, K.U. Leuven, Belgium; The Wellcome Trust, UK

Editorial Boards:

Reviewing Editor, European Journal of Neuroscience (2008-present)

Frontiers in Integrative Neurosciences (2008-present)

Frontiers in Neuroanatomy (2008-present)

Frontiers in Synaptic Neuroscience (2012-present)

Cannabis and Cannabinoid Research (2015-present)

Frontiers in Molecular Neuroscience Research Topic: Endocannabinoid-mediated Retrograde Transmission: Novel Molecular, Synaptic and Circuit Mechanisms (2019-2020)

Associate Editor, Journal of Cannabis Research (2024-present)

Invited Reviewer (72): Science, Nature Medicine, Nature Methods, Nature Neuroscience, Nature Cell Biology, Nature Communications, Nature Protocols, Neuron, Science Advances, PNAS, Journal of Neuroscience, Journal of Clinical Investigation, The Journal of Experimental Medicine, Brain, Current Biology, PLOS Biology, eLife, Biological Psychiatry, Molecular Psychiatry, Cell Reports, Science Signaling, Advanced Science, Nano Letters, Cerebral Cortex, Neuropsychopharmacology, The International Journal of Neuropsychopharmacology, The Journal of Physiology (London), Molecular Pharmacology, The FASEB Journal, Cellular and Molecular Life Sciences, European Neuropsychopharmacology, Journal of Comparative Neurology, British Journal of Pharmacology, Neuroimage, Neuropharmacology, European Journal of Neuroscience, Journal of Neurochemistry, Journal of Neurophysiology, Brain Structure and Function, Addiction Biology, Translational Psychiatry, Molecular Metabolism, Neurobiology of Aging, Scientific Reports, Cannabis and Cannabinoid Research, Methods, Molecular and Cellular Neuroscience, Journal of Proteome Research, eNeuro, PLoS One, Molecular and Cellular Endocrinology, F1000Research, Frontiers in Integrative Neurosciences, Hippocampus, Neuroscience, Frontiers in Synaptic Neuroscience, Frontiers in Neuroanatomy, Methods and Applications in Fluorescence, Endocrine, CNS & Neurological Disorders, Epilepsy Research, Multiple Sclerosis Journal, BBA-Molecular Cell Research, Pharmaceuticals, Neurochemistry International, Neuroscience Research, Journal of Chemical Neuroanatomy, Brain Research, Cellular Physiology and Biochemistry, Brain Research Bulletin, Cell and Tissue Research, Acta Biologica Hungarica

Invited Lectures and Organized Symposia (127):

2025 (4): "Visualizing the brain", Plenary Symposium speaker, 18th Canadian Neuroscience Meeting, *Toronto*, Canada; Neuroscience Seminar, Italian Institute of Technology, *Genoa*, Italy; Neuroscience Seminar, Department of Pharmacology and Toxicology, Medical College of Wisconsin, *Milwaukee*, USA; Department of Psychiatry Grand Rounds Lecture, IU School of Medicine, *Indianapolis*, IN;

2024 (6): Distinguished Lectures in Pharmacology, Physiology, & Neurobiology, College of Medicine, University of *Cincinnati*, OH; Neuroscience Seminar, Department of Molecular Physiology, Leiden University, *Leiden*, The Netherlands; Neuroscience Seminar, Indiana Alcohol Research Center, School of Medicine, *Indianapolis*, USA; Neuroscience Seminar, Department of Biological Sciences, University of Notre Dame, *South Bend*, USA; Synapses, Circuits, and Epilepsy: pathways to understanding the brain, Conference, *Santa Cruz*, USA

2023 (6): Department of Psychiatry, IU School of Medicine (*online*); World Congress of Psychiatry, *Vienna*, Austria; Stark Neurosciences Research Institute, *Indianapolis*, USA; Cannabinoid Function in the CNS, Gordon Research Conference (discussion leader), *Castelldefels*, Spain; Neuroscience Seminar, Department of Chemical Physiology and Biochemistry, Oregon Health and Science University, *Portland*, USA; Neuroscience Seminar, Department of Anatomy and Neurobiology, University of Maryland, *Baltimore*, USA

2022 (5): Nature Research Webcast "Nanoscale molecular imaging in complex tissues" (*online*); Plenary Lecture, Szentágothai Center Jubilee Conference, *Pécs*, Hungary; "New Advances in Preclinical Neuroscience", University of *Pécs*, Hungary; Neuroscience Seminar, Stanford University, *Palo Alto*, USA; Zoom lecture series of the Hungarian Society for Experimental and Clinical Pharmacology (*online*)

2021 (4): Neuro Zoom lecture series of the Stanford University and the Chinese Academy of Sciences (*online*); Keynote Lecture, Cannabinoid Gordon Conference, *Ventura*, USA; Neuroscience Seminar, University of Arizona, *Tucson,* USA; Neuroscience Seminar, National Institutes of Health, O'Brien Center for Advanced Microscopic Analysis, Indianapolis, USA (*online*)

2020 (1): 6th International Conference on Drug Discovery, Development and Lead Optimization, *Buffalo*, USA (*online*)

2019 (7): 6th Congress of the Spanish Epilepsy Society, *Malaga*, Spain; Cannabinoid Function in the CNS, Gordon Research Conference (Chair), *Castelldefels*, Spain; Inhibition in the CNS, Gordon Research Conference (speaker), *Newry*, USA; Neuroscience Seminar, Achucarro Basque Center for Neuroscience, *Leioa*, Spain; Pharmacokinetics and Drug Metabolism Conference, *Galyatető*, Hungary; Neuroscience Seminar, Indiana University, *Bloomington*, USA; Neuroscience Seminar, Neurocentre Magendie, Université *Bordeaux*, France

2018 (10): Cell Observatory Mini-Symposium, Universiteit *Leiden*, The Netherlands; New approaches and applications of STORM super-resolution imaging in life sciences, (organizer), Imaging Workshop, *Budapest*, Hungary; New Observations in Neuroscience using Superresolution Microscopy, Society for Neuroscience, Annual Meeting symposium, *San Diego*, USA; Institut de la Méditerranée, *Marseille*, France; FEBS+ Conference, *Siófok*, Hungary; International Cannabinoid Research Society 28th Annual Symposium, *Leiden*, Netherlands; Neuroscience Seminar, INSERM, Center of Psychiatry and Neurosciences, *Paris*, France; The BRI International Symposium: The innovative progress of neuroscientific research through the use of advanced animal models conference, *Niigata*, Japan; Neuroscience Seminar, Hotchkiss Brain Institute, University of *Calgary*, Canada; Winter Brain Conference "High Excitability: Cannabinoids, Neural Excitability and Implications for Neurological Disorders Symposium", *Whistler*, Canada

2017 (9): NIH Neuroscience Seminar Series, Porter Neuroscience Research Center, *Bethesda*, USA; Neuroscience Seminar, Harvard University, *Boston* USA; Neuroscience Seminar, Albert Einstein College of Medicine, *New York*, USA; Neuroscience Seminar, New York University, *New York*, USA; Neuroscience Seminar, Columbia University, *New York*, USA; FENS Featured Regional Meeting, Symposium on Imaging the brain and cerebrospinal fluid at a single-molecule level, *Pécs*, Hungary; Neuroscience Seminar, Università degli Studi di Cagliari, *Cagliari*, Italy; ReceptorLight High-End Light Microscopy Symposium, *Würzburg*, Germany; Symposium on Ti microscope applications, European Meeting, Nikon Instruments Europe, *Rome*, Italy

2016 (10): EMBO Members Meeting, *Heidelberg*, Germany; Neural Circuit Development and Plasticity, Universiteit Utrecht Summer School, *Utrecht*, The Netherlands; Joint Conference of the Hungarian Pharmacology, Anatomy, Microcirculation and Physiological Societies, *Pécs*, Hungary; 16th Annual Meeting of the European Light Microscopy Initiative, *Debrecen*, Hungary; 4th MedInProt Conference, *Budapest*, Hungary; Neuroscience Seminar, Hotchkiss Brain Institute, University of *Calgary*, Canada; Neuroscience Seminar, University of Arkansas for Medical Sciences, *Little Rock*, USA; NIH COBRE Distinguished Speaker at the National Center for Natural Products Research, University of Mississippi, *Oxford*, USA; Neuroscience Seminar, Allen Institute for Brain Science *Seattle*, USA; Neuroscience Seminar, University of Washington, School of Medicine, *Seattle*, USA

2015 (8): 4th International Frontiers in Neurophotonics Symposium, *Quebec*, Canada; Symposium on Advances in Medical Bioimaging, Charité Universitats Medicine, *Berlin*, Germany; Symposium on Superresolution Microscopy in Biological Sciences, Multinational Congress on Microscopy (organizer), *Eger*, Hungary; 63rd International Congress and Annual Meeting of the Society for Medicinal Plant and Natural Product Research (plenary speaker), *Budapest*, Hungary; Super-resolution in different dimensions, International Meeting on Advanced Microscopy, *Moscow*, Russia; Cannabinoid Function in the CNS, Gordon Research Conference (discussion leader), *Il Ciocco*, Italy; Neuroscience Seminar, Eötvös Loránd University, *Budapest*, Hungary; Neuroscience Seminar, University of Medicine and Pharmacology, *Tirgu Mures*, Romania

2014 (10): Symposium on Superresolution Microscopy (organizer and speaker), International Brain Research Organization Workshop, *Debrecen*, Hungary; Nanoscopy Conference, *Amsterdam*, The Netherlands; Symposium on Monoclonal Antibody Therapies BIO International Congress, *San Diego*, USA; Neuroscience Seminar, Scripps Institute, *La Jolla*, USA; 8th International Meeting on Metabotropic Glutamate Receptors, *Taormina*, Italy; Neuroscience Seminar, Freie Universitat, *Berlin*, Germany; Neuroscience Seminar, University of Maryland, *Baltimore*, USA; Endocannabinoids and Related Mediators, Society for Neuroscience, Annual Meeting symposium, *Washington*, USA; Symposium on "Super-resolution imaging approaches in Neuroscience"

(organizer), National Programme in Brain Sciences workshop, *Budapest*, Hungary; Super-Resolution Nanoscopy: Vision Beyond the Limits, MIC symposium, *Bern*, Switzerland

2013 (12): Benefri Neuroscience Workshop, Methods in Experimental and Clinical Neuroscience, *Bern*, Switzerland; Neuroscience Seminar, University of *Zürich*, Switzerland; Neuroscience Seminar, Semmelweis University, *Budapest*, Hungary; "From the Synapse to networks and disease", Inaugural Neuroscience Conference, *Irkutsk*, Russia; 2013; Gordon Conference on Cannabinoid signaling in the nervous system, *Waterville*, NH, USA; "Inhibitory control of brain plasticity", Neuroscience Conference, *Krakow*, Poland; 13th Austrian Neuroscience Association Meeting, *Vienna*, Austria; Neuroscience Seminar, College de France, *Paris*, France; Wellcome Trust Researcher Meeting, *Ashridge*, UK; Neuroscience Seminar, Nikon Bioscience Development Department, *Yokohama*, Japan; Symposium on Translational Research, Hungarian Academy of Sciences, *Budapest*, Hungary; Neuroscience Seminar, Universitat Johannes Gutenberg, *Mainz*, Germany

2012 (5): Neuroscience Seminar, University of California, *Irvine*, USA; Neuronus 2012 IBRO Neuroscience Forum, *Krakow*, Poland; Symposium on "The cannabinoid system as a therapeutic target in neurological disorders" satellite meeting for the 8th FENS Forum, *Barcelona,* Spain; Cold Spring Harbor Laboratory and University Pompieu Fabra joint conference on "International course on the cellular biology of addiction", *Barcelona*, Spain; Neuroscience Seminar, Charité Universitats Medizin, *Berlin*, Germany

2011 (3): Neuroscience Seminar, Stanford University, *Palo Alto*, USA; SiNAPSA Neuroscience Conference, FENS Featured Regional Meeting, *Ljubljana*, Slovenia (as organizer); 7th International Meeting on Metabotropic Glutamate Receptors, *Taormina*, Italy

2010 (2): 7th FENS Forum of European Neuroscience, *Amsterdam*, The Netherlands (as organizer); International Symposium on the Endocannabinoid System: From Physiology to Pathophysiology, *Bonn*, Germany

2009 (6): Neuroscience Seminar, IZN-Goethe Universitat, *Frankfurt*, Germany; Neuroscience Seminar, Richter-Gedeon Ltd, *Budapest*, Hungary; Neuroscience Seminar, Institute of Biochemistry, *Coimbra*, Portugal; 4thEuropean Workshop on Cannabinoid Research, *Madrid*, Spain; Gordon Research Conference on Cannabinoid Function in the CNS, *Biddeford*, Maine; Symposium on Endocannabinoid Mechanisms in Brain Disease, Society for Neuroscience, Annual Meeting, *Chicago*, USA

2008 (7): Neuroscience Seminar, MRC Anatomical Neuropharmacology Unit, *Oxford*, UK; Neuroscience Seminar, Max Planck Institute for Brain Research, *Frankfurt*, Germany; International Cannabinoid Research Society, *Aviemore*; UK; Neuroscience Seminar, *Dundee*, UK; Neuroscience Seminar, Abbott GMBH, Center for Drug Discovery, *Ludwigshaven*, Germany; Neuroscience

Seminar, Department of Pharmacology and Toxicology, University of *Zürich*, Switzerland; Symposium on "Cannabinoids and Pain", European Winter Brain Conference, *Les Arcs*, France

2007 (4): Symposium on "Cannabinoid Signaling in the Nervous System", 17. Neuropharmacology conference, *San Diego*, USA; Symposium on "Endocannabinoid Functions in the Developing and Adult Nervous System", Karolinska Institute, *Stockholm*, Sweden; Symposium on "Synapses, Cells and Networks in Cortical Microcircuits", Hungarian Neuroscience Society, *Szeged*, Hungary; Genaddict EU Consortium Symposium, *Bonn*, Germany

2006 (4): Symposium on Cannabinoid Research in Pain, University of *Heidelberg*, Germany; Genaddict EU Consortium Symposium, *Barcelona*, Spain; International Cannabinoid Research Society Annual Meeting, *Tihany*, Hungary; Molecular Pharmacology Symposium, Hungarian Biochemical Society, *Balatonoszod*, Hungary

2004 (2): Neuroscience Seminar, National Institute of Physiological Sciences, *Okazaki*, Japan; Neuroscience Seminar, RIKEN Brain Science Institute, *Wako-shi*, Japan

2002 (1): Neuroscience Seminar, Pharmacologisches Institut, *Heidelberg*, Germany

2000 (1): Neuroscience Seminar, Friedrich Miescher Institute, *Basel*, Switzerland

Funding ID as PI:

Active grants:

1. Agency: National Institute of Health R21 grant. Title: Novel tool development for quantitative PharmacoSTORM super-resolution imaging of the nanoscale distribution of D3 dopamine receptors. Period: 2022-2025.
2. Agency: National Institute of Health P30 grant. Title: Indiana University Bloomington (IUB) Center for Cannabis, Cannabinoids, and Addiction (co-PI with Ken Mackie). Period: 2023-2028.

Completed grants:

1. Agency: National Institute of Health RO1 grant. Title: Neurodevelopmental Effects of THC on The VTA Dopamine System and Behavior (Co-PI with Joe Cheer, University of Maryland, USA). Period: 2018-2024.
2. Agency: National Research, Development and Innovation Office, Frontline Research. Title: Nanoscale molecular diversity and neuropsychiatric significance of canonical and non-canonical forms of cannabinoid signaling. Period: 2019-2023.
3. Agency: Hungarian Brain Initiative. Title: GPR12, a cryptic orphan receptor associated with neuronal plasticity. Period: 2018-2021.
4. Agency: National Institute of Health RO1 grant, Title: Cannabinoid control of epilepsy (Co-PI with Ivan Soltesz, Stanford University, USA). Period: 2017-2021.

5. Agency: National Institute of Health RO1 grant, Title: Mechanisms underlying radiation and chemotherapy induced cognitive impairment (Co-PI with Charles Limoli, University of California, Irvine, USA). Period: 2016-2020.
6. Agency: National Research, Development and Innovation Office, Title: The Abhd4 serine hydrolase, an enigmatic member of the endocannabinoid system: molecular, anatomical and functional characterization in the developing neocortex. Period: 2016-2020.
7. Agency: National Research, Development and Innovation Office, Title: New research, diagnostic and therapeutic target identification and analysis by super-resolution imaging and immunolabeling-based approaches (Co-PI as consortium member). Period: 2015-2019.
8. Agency: National Research, Development and Innovation Office, Highly Cited Papers Research Grant, Title: Controlling hippocampal GABAergic neurotransmission by the DGL-alpha enzyme. Period: 2017-2019.
9. Agency: National Research, Development and Innovation Office, Competitive Central Hungary Operative Programme (CCHOP) European funds for the Central Hungary region. Title: Equipment grant for the development of super-resolution pharmaco-microscopy to study the operation of the brain and its disorders. Period: 2017-2018.
10. Agency: National Programme in Brain Sciences, Title: Equipment grant to apply optogenetic approaches in patch-clamp recording. Period: 2015-2016.
11. Agency: Hungarian Academy of Sciences, Momentum Programme, Title: Quantitative molecular characterization of synaptic endocannabinoid signaling. Period: 2013-2018.
12. Agency: Hungarian Academy of Sciences, Title: Equipment grant to study the nanoscale architecture of the brain. Period: 2012-2013.
13. Agency: The Wellcome Trust, Title: Molecular architecture and physiological role of novel N-acyl-ethanolamines in neurons.
14. Agency: Swiss Contribution, Title: Unraveling the role of novel molecular signaling pathways in the regulation of pain (Co-PI with Hanns Ulrich Zeilhofer, University of Zürich, Switzerland). Period: 2010-2015.
15. Agency: European Research Council, Starting Independent Researcher Grant, Title: Understanding the molecular blueprint and functional complexity of the endocannabinoid metabolome in the brain. Period: 2009-2014.
16. Agency: Hungarian Scientific Research Fund and the Norwegian Contribution Fund, Title: Molecular diversity and plasticity of endocannabinoid signaling at cortical synapses; Period: 2009-2011.
17. Agency: Royal Society International Joint Projects (Co-PI with Andy Irving, University of Dundee, UK), Title: GPR55: a novel cannabinoid receptor expressed in the central nervous

system. Period: 2007-2009.

18. Agency: Hungarian Medical Research Council, Title: Molecular architecture of the endocannabinoid system in brain areas involved in reward signaling, Period: 2006-2009.
19. Agency: Hungarian Scientific Research Fund, Title: Role of novel lipid-sensitive receptors in the regulation of cortical network activity, Period: 2005-2008.

Trainees as PI in Budapest, Hungary:

Postdoctoral Research Fellows:

Dr. Máté Kisfali (2018-2021), continued as BiTrial Clinical Research manager, Budapest, Hungary

Dr. Kata Kenesei (2017-2020), continued as a computer engineer at Kyoto University, Japan

Dr. Ana Bernal Chico (2015-2019), she was supported by a Basque Government grant, continued as a Research Fellow at the Faculty of Medicine and Nursery, UPV/EHU, Department of Neuroscience, Leioa, Spain

Dr. Zsolt Balogi (2015-2017); became a senior research fellow at the University of Pécs, Hungary

Dr. Marco Ledri, (2013-2015) he was supported by a Swedish Government postdoctoral grant; continued as an independent group leader at Lund University, Sweden

Dr. Ashley Dorning (2013-2014); continued as a staff scientist at MRC Centre for Reproductive Health, Edinburgh, UK

Dr. Stephen Woodhams (2012-2016); continued as a senior research fellow at the University of Nottingham, UK

Dr. Szilárd Szabó (2011-2013); continued as a postdoctoral researcher at University of Freiburg, Germany

Dr. Chris Henstridge (2010-2014), he was supported by Long-Term EMBO Fellowship; became an independent group leader at the University of Dundee, UK

Dr. Eszter Horváth (2010-2014); after maternity leave she became a permanent senior research fellow in our Laboratory of Molecular Neurobiology at IEM HAS, Budapest, Hungary

Graduate Students:

Rita Nyilas (2010, *summa cum laude);* received Young Researcher Award of the Hungarian Academy of Sciences, continued as a postdoctoral researcher at Columbia University, New York, USA

Anikó Ludányi (2011, *summa cum laude)*; received Junior Prima Prize of the Hungarian Development Bank (MFB), continued as a postdoctoral researcher at University College London, UK

Barna Dudok (2017, *summa cum laude);* received Young Researcher Award of the International Association of Cannabinoids as Medicines (IACM), continued as a postdoctoral researcher at Stanford University, Palo Alto, USA, currently Assistant Professor at Baylor College of Medicine, Houston, USA

László Barna (2018, *summa cum laude)*; received Dennis Gabor Award of the Novofer Foundation, continued as the Head of the Nikon Center of Excellence for Neuronal Imaging Microscopy Core Facility at IEM, Budapest

*Zsófia László (*2020, *summa cum laude);* received Junior Prima Prize of the Hungarian Development Bank (MFB), continued as a postdoctoral researcher at Dundee University, UK

Vivien Miczán (2020, *summa cum laude*); received Pro Scientia Gold Medal of the National Student Research Association, continued as research scientist at Biological Research Center, Szeged, Hungary

Susanne Prokop (2022, *summa cum laude*) received Junior Prima Prize of the Hungarian Development Bank (MFB), received Human Frontiers Science Program Postdoctoral Fellowship, currently on maternal leave

Benjamin Barti (expected to finish in 2024)

Miklós Zöldi (expected to finish in 2024)

Visiting researchers:

Julia Leschik (2 months in 2017; Institute of Physiological Chemistry, Johannes Gutenberg Universitat, Mainz, Germany)

Claudia Sagheddu (2 months EMBO fellowship in 2017; University of Cagliari, Italy)

Vincent Paget Blanc (2 months in 2016; 1 month in 2017; 2 months in 2018, Istituto Italiano di Tecnologia, Genova, Italy)

Krisztina Kelemen (2 months in 2015, 6 months in 2017, University of Medicine and Pharmacology, Tirgu Mures; Romania;

Antonio di Fusco (3 months in 2015; Istituto Neurologico Mediterraneo Neuromed, Pozzilli, Italy)

Esther Baliko (5 months in 2015; Medical University of Vienna, Austria)

Vanessa Anna Stempel (1 month in 2015; Charite University, Berlin, Germany)

István Mihály (3 months in 2014; University of Medicine and Pharmacology, Tirgu Mures; Romania)

Carolin von Shoultz (1 month in 2014; University of Zürich; Switzerland)

Daniel Ganszky (2 months; University of Dundee, UK)

Ana Bernal Chico (3 months in 2013; University of Bilbao, Spain)

Ashley Dorning (1 year in 2012; University of Dundee, UK)

Pascal Gratz (1 month in 2010; University of Zürich; Switzerland)

Michelle Stewart (2 months in 2009; Carnegie Mellon University, Pittsburgh, USA)

Chris Henstridge (3 weeks in 2008; University of Dundee, UK)

Amy Pohodich (2 months in 2008; University of Texas, Austin, USA)

Undergraduate students:

Dárius Leszkó (2020-present)

Dániel Nagy (2020-present)

Márton Vámosi (2018-present; First Prize at the Student Research Conference of the Semmelweis Medical University, 2020)

Bernadett Molnár (2018-2019)

Judit Glavinics (2015-2019; First Prize at the Student Research Conference of the Pázmány University, 2015 and First Prize at the National Student Research Conference, 2019)

Fruzsina Mógor (2015-2019)

Miklós Zöldi (2015-2016; First Prize at the National Student Research Conference, 2015)

Emese Kovács (2013-2015)

Benjámin Barti (2013-2015; Special Award at the National Student Research Conference, 2015)

Norbert Fehér (2013-2014; participated in the lab work as a high school student then continued as a student at University of Cambridge, UK)

Vivien Miczán (2013-2015; Pro Scientia Gold Medal and First Prize at the National Student Research Conference, 2015)

Emese Baráth (2012-2013)

Eszter Székely (2011-2012)

Zsófia László (2009-2013, Second Prize at the National Student Research Conference, 2013)

Eszter Balázs (2009-2012)

Benjámin Márkus (2008-2009)

Barna Dudok (2004-2009; Second Prize at the National Student Research Conference, 2009)

Anikó Ludányi (2003-2007; First Prize at the National Student Research Conference, 2007)

Norbert Szabó (2003-2005)

Teaching in Hungary:

1. Classes on the Neurobiology of Addiction for students attending pedagogy, psychology, physical education, and recreation as their major at the Faculty of Education and Psychology, Lorand Eötvös University, Budapest. Book chapter in "The Basics of Addictology" edited by Z. Demetrovics.
2. Classes on The Biology of the Synapse, on Retrograde Endocannabinoid Signaling and on Light and Electron Microscopy for undergraduate students attending Biology as their major at the Faculty of Science, Lorand Eötvös University, Budapest.
3. Classes in Cellular, Molecular and Developmental Neuroscience for PhD students attending the János Szentágothai Doctoral School in Neurosciences, Semmelweis Medical University, Budapest.

Public outreach in Hungary:

Brain Awareness and Drug Prevention lectures at universities, high schools, and social institutions. Some examples from the last few years include the Budapest Science Meetup (2021, online); "Impakták" podcast of Qubit popular science journal; Városmajori High School, *Budapest*; Trefort High School, *Budapest*; ELTE Spring School, *Leányfalu*; Szent Imre High School, *Budapest*; Kerpel Fronius Műhely, Semmelweis University, *Visegrád*; Eötvös Műhely, *Szeged*; Kossuth Klub, *Budapest*; Élőadás lecture, ELTE Institute of Biology, *Budapest*; Jóvá Tett Hely, *Budapest*; Erzsébetvárosi High School, *Budapest*; *Szentes* High School, *Karcag* High School; *Heves* High School; "Peace" Residential Group Home for Children, *Budapest*

Trainees at Indiana University, Bloomington, USA:

<u>Undergraduate students:</u>

Caroline Grace Shumaker (2022-), received American Association of University Woman (AAUW) Selected Professions Fellowship

Aditi Aalati (2023-2024)

Lisette Gold (2024-)

Mia Sniadecki (2025-)

Teaching at Indiana University:

Molecular, Cellular and Circuit Mechanisms of Addiction, PSY-P 457, PSY-657, Topics in Psychology

Spring 2022; Overall Rating: 4.9

Spring 2023; Overall Rating: 4.9

Spring 2024; Overall Rating: 4.8

Fall 2024; Overall Rating: 4.9

Quals/Thesis Committee and Grant mentorship for graduate and postgraduate colleagues:

Taryn Bosquez (Straiker lab)

Gabriel Henrique de Abreu (Lu lab)

Kelsey Guenther (Hohmann lab)

Jui Jeng Huang (Lu lab)

Vishakh Iyer (Hohmann lab)

Taylor Joel Woodward (Hohmann lab)

Andrea Enriquez (Lu lab)

Zhen Xian Niou (Lu lab)

Jung Hyun Park (Lu lab)

Emily Richter (Bradshaw lab)

Joshua James Ziarek (Shriver lab)

Joshua Michael Watkins (Hohmann lab)

Public outreach at Indiana University:

The Nick Lugo Show podcast: Your brain on weed: The basics of marijuana use (2022)

Nu Rho Psi Student Seminar on Neuroscience (2023)