26th – 28th March, 2026

HUN-REN Biological Research Centre Szeged

8th Mini-Symposium on the BBB from Basic to Clinical Research

sponsored by the Hungarian Neuroscience Society

PROGRAM BOOKLET

Scientific Programme

Oral Presentations

March 26, 2026

15:00 –	**Registration**
16:00 – 16:10	**Opening remarks** Maria Deli & Fruzsina Walter *(Biological Barriers Research Group and Momentum Translational Lab-on-a-chip Models Research Group; Institute of Biophysics, HUN-REN Biological Research Centre Szeged, Hungary)*
16:10 – 17:10	**Keynote I.** *Chair: Maria Deli, HUN-REN BRC* **Diseases of the blood-brain barrier and their treatments** William A. Banks *(Geriatric Research Educational and Clinical Center, Veterans Affairs Puget Sound Health Care Center, and Division of Gerontology and Geriatric Medicine, Department of Medicine, University of Washington School of Medicine, USA)*
17:10 – 18:10	**Keynote II.** *Chair: István Krizbai, HUN-REN BRC* **Opportunities for anti-edema treatment explored in experimental acute ischemic stroke** Eszter Farkas *(HCEMM-USZ Cerebral Blood Flow and Metabolism Research Group; Department of Cell Biology and Molecular Medicine, University of Szeged, Hungary)*
18:15 –	**Welcome Dinner** HUN-REN Biological Research Centre, Aula

Oral Presentations

March 27, 2026

8:00 –	**Registration**
9:00 – 11:00	**Session I. – Novel BBB Models** Chair: *Andrej Kovac* *Institute of Neuroimmunology, SAS, Bratislava, Slovakia*
9:00 – 9:40	**Keynote III.** **Intrinsic blood–brain barrier dysfunction drives progressive multiple sclerosis revealed by hiPSC-derived models** Hideaki Nishihara *(Department of Neurology, Yamaguchi University Graduate School of Medicine)*
9:40 – 10:00	**Endothelial tight junctions and cell-matrix adhesions reciprocally control blood-brain barrier integrity** Gergő Porkoláb *(Biological Barriers Research Group, HUN-REN Biological Research Centre Szeged, HU; Smurfit Institute of Genetics, Trinity College and FutureNeuro Research Ireland Centre, Trinity College Dublin, Ireland)*
10:00 – 10:20	**An isogenic self-assembled blood–brain barrier model coupled to cerebral organoids to investigate transport dysregulation in Alzheimer's disease** Sarah Spitz *(Department of Mechanical Engineering and Biological Engineering, Massachusetts Institute of Technology, MA, USA; Technical University, Vienna, Austria)*
10:20 – 10:40	**Human autologous vascularized immunocompetent brain organoids: a translational platform to study the neuro-vascular unit *in vitro*** Clémence Disdier *(Paris-Saclay University, CEA, INRAE, MTS, SPI, Neurovascular Unit Research & Therapeutic Innovation Laboratory, Gif-sur-Yvette cedex, France)*
10:40 – 11:00	**Stem cell-derived BBB and brain-on-a-chip platforms to study neurovascular adverse effects and drug penetration** Fruzsina Walter *(Biological Barriers Research Group and Momentum Translational Lab-on-a-chip Models Research Group; Institute of Biophysics, HUN-REN Biological Research Centre Szeged, Hungary)*
11:00 – 11:40	**Coffee Break**

11:40 – 13:00	**Session II. – BBB in Diseases** Chair: *Yoichi Morofuji* *Department of Neurosurgery, Showa Medical University School of Medicine, Tokyo, Japan*
11:40 – 12:00	**Sympathetic denervation attenuates pulmonary edema following experimental aneurysmal subarachnoid hemorrhage by protecting the pulmonary vascular endothelial glycocalyx** Nozomi Sasaki *(Department of Neurosurgery, Gifu University Graduate School of Medicine and Molecular Pharmacology, Department of Biofunctional Evaluation, Gifu Pharmaceutical University, Gifu, Japan)*
12:00 – 12:20	**Central nervous system fibroblasts remodel the cerebrovascular basement membranes through osteopontin signaling in Alzheimer's disease** Akihiko Urayama *(Department of Neurology, McGovern Medical School, University of Texas Health Science Center, Houston, Texas, USA)*
12:20 – 12:40	**CLDN5-related neurological disease** Yosuke Hashimoto *(Graduate School of Biomedical and Health Sciences, Hiroshima University, Hiroshima, Japan and Smurfit Institute of Genetics, Trinity College Dublin, Ireland)*
12:40 – 13:00	**Blood–brain barrier dysfunction in tick-borne encephalitis: NS1 as a potential antiviral and therapeutic target** Martin Palus *(Institute of Parasitology, Biology Centre of the Academy of Sciences of the Czech Republic, České Budějovice, Czech Republic; Department of Virology, Veterinary Research Institute; and Department of Experimental Biology, Faculty of Science, Masaryk University, Brno, Czech Republic)*

13:00 – 14:00 **Lunch – BRC Cantine**

14:00 – 15:30 **Poster Session – BRC Aula**

15:30 – 16:00 **Coffee Break**

16:00 – 18:00	**Session III. – Neuroimmune interactions and transport at the brain barriers** *Chair: Szilvia Veszelka* Biological Barriers Research Group, HUN-REN BRC, Szeged, Hungary
16:00 – 16:40	**Keynote IV.** **Microglia modulate neurovascular responses under systemic inflammatory conditions** Ádám Dénes *(Laboratory of Neuroimmunology, HUN-REN KOKI, Budapest, Hungary)*
16:40 – 17:00	**Brain shuttle target expression levels vary by individual, not by brain region, disease, age, or gender** Ana Raquel Santa-Maria (online presentation) *(Wyss Institute for Biologically Inspired Engineering at Harvard University, Boston, MA, USA)*
17:00 – 17:20	**A proof of concept: a delivery system to transport antimicrobial peptides across BBB against neuropathogens** Mangesh Bhide *(Laboratory of Biomedical Microbiology and Immunology, University of Veterinary Medicine and Pharmacy in Košice, Slovakia and Institute of Neuroimmunology, Slovak Academy of Sciences v. v. i., Bratislava, Slovakia)*
17:20 – 17:40	**Expression of alpha smooth muscle actin decreases with ageing and increases upon lumen obstruction in mouse brain pericytes** Fanni Győri *(Neurovascular Unit Research Group, Institute of Biophysics, HUN-REN Biological Research Centre, Szeged, Hungary)*
17:40 – 18:00	**Brain diffusion of Tau and its transport across the blood–CSF barrier in neurodegeneration** Petra Majerova *(Institute of Neuroimmunology, Slovak Academy of Sciences, Bratislava, Slovakia)*
18:00 – 18:20	**The histone deacetylase inhibitor suberoylanilide hydroxamic acid promotes blood-brain barrier protection during reperfusion in a cell culture model of ischemic stroke** Zuhao Cui *(Biological Barriers Research Group; Institute of Biophysics, HUN-REN Biological Research Centre Szeged, Hungary)*

18:20 – 18:30 **Closing remarks**

19:00 – **Dinner (optional)**

March 28, 2026 **10:00 – 21:00** **Social Program (optional)**

Poster Presentations

March 26, 2026

14:00 – 15:30

Poster 1	**Bidirectional communication between brain metastatic cells and cells of the neurovascular unit** Rabiya Bano[1], Csilla Fazakas[1], Adél Lüvi[1], Maryam Naeem[1], Kinga Molnár[1], Attila E. Farkas[1], István Krizbai[1], Imola Wilhelm[1] *[1]HUN-REN Biological Research Centre, Szeged, Hungary*
Poster 2	**Tick-borne encephalitis virus and its NS1 protein disrupt endothelial monolayer integrity and contribute to endothelial glycocalyx disruption** Monika Čížková[1,2], Marika Davídková[1], Markéta Dvořáková[1], Hana Sehadová[2,3], Veronika Prančlová[1,2], Eliška Kotounová[1,2], Martin Palus[1,4,5] *[1]Biology Centre CAS, Laboratory of Arbovirology, Ceske Budejovice, Czech Republic* *[2] University of South Bohemia, Faculty of Science, Ceske Budejovice, Czech Republic*
Poster 3	**Investigation of the effects of antidepressant compounds from traditional chinese medicine on brain endothelial cells, and their permeability across the blood-brain barrier: a China-Hungary collaborative study** Zuhao Cui[1,2], Ana Martins[1], Aniko Szecsko[1,2], Tivadar Kiss[3], Andrea Vasas[3], Fruzsina R. Walter[1], Szilvia Veszelka[1], Attila Hunyadi[3], Gang Chen[4], Maria A. Deli[1] *[1]Institute of Biophysics, HUN-REN Biological Research Centre, Szeged, Hungary* *[2]Doctoral School of Biology, University of Szeged, Szeged, Hungary*
Poster 4	**Capillary pericytes regulate vascular tone and local blood flow in inflammation** Tamás Dudás[1,2], Ádám Mészáros[1], Kinga Mészáros-Molnár[1], Attila E. Farkas[1], Imola Wilhelm[1], István Krizbai[1] *[1]Institute of Biophysics, Biological Research Centre, Szeged* *[2]Doctoral School of Experimental and Preventive Medicine, University of Szeged, Szeged, Hungary*
Poster 5	**Extracellular vesicles from triple negative breast cancer cells disrupt the blood–brain barrier via miR-146a-5p- and TGF-β1-mediated downregulation of endothelial Paqr5** Csilla Fazakas[1], Attila G. Végh[1], Tamás Dudás[1,2], Dorina Varga[1], Adél Lüvi[1], Mónika Krecsmarik[1], András Dér[1], Attila E. Farkas[1], István A. Krizbai[1,3,4,*], Imola Wilhelm[1,4,*,#] *[1]Institute of Biophysics, HUN-REN Biological Research Centre, Szeged, Hungary* **Authors contributed equally*

Poster 6

An integrated microphysiological platform for barrier modeling and whole-organoid imaging

Luíza Santa Brígida de Barros Góes[1,2,3], László Dér[1], Emese Bélai[4], Pirity Melinda Katalin[4], Sándor Valkai[1], András Dér[1], Mária A. Deli[1], Fruzsina R. Walter[1,*], Emanuel Carrilho[2,3,*]

[1] *Institute of Biophysics, HUN-REN Biological Research Centre, Szeged, Hungary*
[2] *Instituto de Química de São Carlos, Universidade de São Paulo 400, Brazil*
[3] *Instituto Nacional de Ciência e Tecnologia de Bioanalítica Lauro Kubota – INCTBio-LK Campinas SP, Brazil*
**Authors contributed equally*

Poster 7

Microfluidic synthesis and physicochemical characterization of petox-pcl nanoparticles

S. Göksever[1,2], B. Küçüktürkmen[1], UC. Oz[1], A. Hunyadi[3,4], A. Bozkır[1]

[1]*Ankara University, Department of Pharmaceutical Technology, Ankara, Turkey*
[2]*Ankara University, Institute of Health Sciences, Ankara, Turkey*
**Authors contributed equally*

Poster 8

Investigation of a pentapeptide carrier on a culture model of the blood-brain barrier

Ilona Gróf[1], Alexandra Bocsik[1], Milán Szántó[1], Enikő Szabó[2], Imre Norbert[3], Tamás Martinek[3] and Mária A. Deli[1]

[1]*Institute of Biophysics, HUN-REN Biological Research Centre, Szeged, Hungary*

Poster 9

A versatile brain-on-a-chip system to study pathological conditions of the central nervous system

Anna E. Kocsis[1,2], Judit P. Vigh[1,2], Ana R. Santa-Maria[1,3], Nóra Kucsápszky[1,2], Silvia Bolognin[4], Jens C. Schwamborn[4], András Kincses[1], Anikó Szecskó[1,2], Szilvia Veszelka[1], Mária Mészáros[1], Emese Bélai[1], Melinda Pirity[1], András Dér[1], Fruzsina R. Walter[1,*], Mária A. Deli[1,*]

[1]*HUN-REN Biological Research Centre, Szeged, Hungary*
[2]*Doctoral School of Biology, University of Szeged, Szeged, Hungary*
**Authors contributed equally*

Poster 10

Translational research aimed at improving heatstroke diagnosis

Andrej Kovac[1,*], Kazuyuki Miyamoto[2], Dorothy Wasike[1], Petra Majerova[1]

[1]*Institute of Neuroimmunology, SAS, Bratislava, Slovakia*
[2]*Showa University, Department of Emergency and Disaster Medicine, Tokio, Japan*

Poster 11

Blood-brain barrier disruption in acute pancreatitis: a clinical and cell-culture study

Nóra Kucsápszky[1,2,3*], Ármin Szeles[1,2*], Ana R. Santa-Maria[1,4], Judit P. Vigh[1,2,3], Luíza Santa Brígida de Barros Góes[1,2,5,6], Anna E. Kocsis[1,2,3], Zoltán Rakonczay[7], Péter Hegyi[8], Mária A. Deli[1], Fruzsina R. Walter[2]

[1]*Biological Barriers Research Group, Institute of Biophysics, HUN-REN Biological Research Centre, Szeged, Hungary*
[2]*HAS-HUN-REN BRC Lendület "Momentum" Translational Lab-on-a-chip models Research Group, Institute of Biophysics, HUN-REN Biological Research Centre, Szeged, Hungary*
[3]*Doctoral School of Biology, University of Szeged, Szeged, Hungary*
**Authors contributed equally*

Poster 12	**The effects of paracellular barrier tightening on the structure and functions of focal adhesions in a human blood-brain barrier model** Lucien Lemaitre[1*], Ilona Gróf[1*], Gergő Porkoláb[1,2*], Imola Rajmón[1,3], Róbert Horváth[1,3], Mária A. Deli[1] *[1]Institute of Biophysics, HUN-REN Biological Research Centre, Szeged, Hungary* *[2]Smurfit Institute of Genetics, Trinity College Dublin, D02 VF25 Dublin, Ireland* **Authors contributed equally*
Poster 13	**Astrocyte-activated NLRP3 inflammasome promotes brain metastasis formation** Adél Lüvi[1], Ádám Mészáros[1], Kinga Molnár[1], Csilla Fazakas[1], Tamás Dudás[1], Attila E. Farkas[1], István A. Krizbai[1], Imola Wilhelm[1] *[1] Biological Research Centre, Szeged, Hungary*
Poster 14	**Microplastics and the Blood–Brain Barrier** Petra Majerova[1], Andrej Kovac[1] *[1]Institute of Neuroimmunology, Slovak Academy of Sciences, Bratislava, Slovakia*
Poster 15	**Clazosentan suppresses endothelin-1-induced ROS production and metabolic alterations in cerebral capillary pericytes** Hiroki Nagatsuka[1], Genki Chikamatsu[3], Eri Shiozaki[2,3], Yoichi Morofuji[1] *[1]Department of Neurosurgery, Showa Medical University, Tokyo, Japan*
Poster 16	**Modulation and measurement of endothelial and epithelial barrier integrity by FluidFM** Imola Rajmon[1,2,3], Inna Székács[1], Mária A. Deli[2], Róbert Horváth[1,2] *[1]Nanobiosensorics Laboratory, Centre for Energy Research, Institute of Technical Physics and Materials Science, HUN-REN, 1121 Budapest, Hungary* *[2]Institute of Biophysics, Biological Research Centre, Hungarian Research Network, Szeged H-6726, Hungary* *[3]Doctoral School of Biology, University of Szeged, Szeged H-6720, Hungary*
Poster17	**Protection of the blood-brain barrier in the cell culture model of ischemic stroke** Koppány Párdi[1], Anikó Szecskó[1,2], Zuhao Cui[1,2], Gergő Porkoláb[1,+], Zsófia Hoyk[1], Csilla Kovács[1], Janet Folasade Adegbite[1,++], Nárcisz M. Cser[1], László Dér[3], Krisztina Nagy[3,4], Virág Fodor[1], Mária A. Deli[1], Szilvia Veszelka[1] *[1]Biological Barriers Research Group, Institute of Biophysics, HUN-REN Biological Research Centre, Szeged, Hungary*
Poster 18	**Neuroprotective roles of HSPB1 in a mouse model of Alzheimer's disease** Bettina Rákóczi[1], Zsófia Ruppert[1], Mária Péter[1], Gábor Balogh[1], Ede Migh[1], László Vígh[1], Zsolt Török[1], Melinda E. Tóth[1] *[1]Institute of Biochemistry, HUN-REN Biological Research Centre, Szeged*

Poster 19	**Traumatic brain injury induces senescence in the cells of the neurovascular unit** Tejal Shreeya[1,2], Zsófia Hernádi[1], Imola Wilhelm[1], Endre Czeiter[3], Krisztina Amrein[3], Zsolt Kristóf Bali[4], Nóra Bruszt[4], István Hernádi[4], Attila E. Farkas[1], István Krizbai[1] [1]*Institute of Biophysics, HUN-REN Biological Research Centre, Szeged, Hungarian Research Network, Szeged, Hungary* [2]*Doctoral School of Experimental and Preventive Medicine, University of Szeged, Szeged, Hungary*
Poster 20	**Complex temporal activity patterns replayed with fast 3D acousto-optical stimulation for partial visual restoration** Gergely Szalay[1,2*], Linda Judák[1,2*], Pál Maák[3], András Fehér[1], Andrius Plauska[1], Abhrajyoti Chakrabarti[1], Gábor Juhász[1], Balázs Tarján[1], Máté Veress[1], Zoltán Szadai[1,2], Balázs Rózsa[1,2,4] [1]*BrainVisionCenter, Budapest-1094, Hungary* [2]*Laboratory of 3D functional network and dendritic imaging, HUN-REN, Budapest-1083, Hungary* **Authors contributed equally*
Poster 21	**The protection of the blood-brain barrier by a small-molecule cocktail, cARLA in a cell culture model of ischemic stroke** Anikó Szecskó[1,2], Koppány Párdi[1], Zuhao Cui[1,2], Gergő Porkoláb[1,3], Zsófia Hoyk[1], Csilla Kovács[1], Nárcisz M. Cser[1], Krisztina Tóth[4], Ádám Dénes[4], Csilla Sajben[5], Roland Tengölics[5], Mária A. Deli[1], Szilvia Veszelka[1] [1]*BrainVisionCenter, Budapest-1094, Hungary* [2]*Laboratory of 3D functional network and dendritic imaging, HUN-REN, Budapest-1083, Hungary* **Authors contributed equally*
Poster 22	**Increased BBB permeability to a-synuclein in dextran sulfate sodium-induced colitis mice** Fuyuko Takata[1], Junko Mizoguchi[1], Takuro Iwao[1], Yasuyoshi Tanaka[1], Akio Nakashima[2], Kazunori Sano[3], Osamu Imakyure[2], Shinya Dohgu[1] [1]*Department of Pharmaceutical Care & Health Sciences, Faculty of Pharmaceutical Sciences, Fukuoka University* [2]*Department of Pharmacy, Fukuoka University Chikushi Hospital* [3]*Department of Physiology and Pharmacology, Faculty of Pharmaceutical Sciences, Fukuoka University*
Poster 23	**Albumin-induced blood-brain barrier dysfunction and its role in neuroinflammation relevant to epileptogenesis** Daiki Uchida[1], Yoichi Morofuji[2], Daisuke Watanabe[3], Shiro Baba[1], Takayuki Matsuo[1] [1]*Department of Neurosurgery, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan*

Poster 24	**Interfacial water organization in glycocalyx model systems: towards understanding blood-brain barrier hydration structure** Dános Sebestyén Varga[1,2,3,4], Ilona Grósf[1], Lóránd Kelemen[1], Mária Anna Deli[1], Róbert Horváth[1,3], Zsuzsanna Heiner[4], András Dér[1] *[1]Institute of Biophysics, HUN-REN Biological Research Centre, Szeged, Hungary* *[2]Doctoral School of Multidisciplinary Medical Sciences, University of Szeged, Szeged, Hungary* *[3]Nanobiosensorics Laboratory, HUN-REN Centre for Energy Research, Budapest, Hungary* *[4]Institute of Chemistry and School of Analytical Sciences Adlershof, Humboldt-Universität zu Berlin, Berlin, Germany*
Poster 25	**Effects of clinically used iodinated contrast agents on blood-brain barrier integrity after oxygen-glucose deprivation** Judit P. Vigh[1,2;*], Anna E. Kocsis[1,2,*], Ilona Grósf[1,*], Ana Raquel Santa-Maria[1,3], Yuki Matsunaga[4], Daisuke Watanabe[5], Yoichi Morofuji[6], Mária A. Deli[1,*], Fruzsina R. Walter[1,*] *[1]Biological Barriers Research Group, Institute of Biophysics, HUN-REN Biological Research Centre, Szeged, Hungary* *[2]Doctoral School of Biology, University of Szeged, Szeged, Hungary* **Authors contributed equally*
Poster 26	**Development of a human *in vitro* blood-brain barrier model for pharmacoresistant epilepsy** Emílie Kučerová[1], Jitka Viktorová[1] *[1]University of Chemistry and Technology Prague, Technická 5, 166 28, Prague 6, Czechia*
Poster 27	**Protective effects of isonicotinamides on BBB integrity** Katja Vuković[1], Valentina Bušić[2], Dajana Gašo Sokač[2], Maja Katalinić[1], Antonio Zandona[1] *[1]Division of Toxicology, Institute for Medical Research and Occupational Health, Zagreb, Croatia*
Poster 28	**Species- and model-dependent efficacy of barrier-protective compounds under ROS-induced stress** Antonio Zandona[1], Anikó Szeckó[2], Valentina Bušić[3], Dajana Gašo Sokač[3], Maja Katalinić[1], Mária Deli[2], Szilvia Veszelka[2] *[1]Division of Toxicology, Institute for Medical Research and Occupational Health, Zagreb, Croatia*
Poster 29	**Integrated proteomic analysis of resected tumor tissues and longitudinally collected plasma from patients with glioblastoma** Xiuyuan Zhan[1], Adam McGlinchey[2], Angela Garcia-Gallardo[2], Jeffrey O'Callaghan[2], Yosuke Hashimoto[1], Yasuo Uchida[1], Kieron Sweeney[3], Donncha O'Brien[3], Matthew Campbell[2] *[1]Graduate School of Biomedical and Health Sciences, Hiroshima University, Hiroshima, Japan*

NOTES

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