

# Program

**WEDNESDAY, September 13, 2017**

**International Cultural Centre; 25 Main Market Square**

**The registration desk is located at the International Cultural Centre. Registration will start at 10:00. The registration desk will remain open for the duration of the Symposium.**

13:00 – 13:15 Welcome

13:15 – 14:05 **Keynote presentation**

Mikio Furuse (*National Institute for Physiological Sciences, Japan*): Molecular basis of paracellular diffusion barrier

**Session 1. Junctional complexes of the brain barriers – beyond barrier regulation**

**Chairs:** Malgorzata Burek (*University of Würzburg, Germany*) and Ingolf Blasig (*Leibniz-Institut für Molekulare Pharmakologie, Germany*)

14:05 – 14:35 Ingolf Blasig (*Leibniz-Institut für Molekulare Pharmakologie, Germany*): BBB - far more than claudin-5

14:35 – 14:55 Joan Abbott (*King's College London, UK*): The BBB PPP – puzzle of the paracellular pathway

*Coffee break 14:55 – 15:10*

15:10 – 15:30 Eliseo Eugenin (*Rutgers Medical School, USA*): Novel cellular communication systems in HIV induced neuroinflammation and toxicity

15:30 – 15:50 Malgorzata Burek (*University of Würzburg, Germany*): Protocadherins at the blood-brain barrier

15:50 – 16:10 Maria Deli (*Institute of Biophysics Biological Research Center, Hungarian Academy of Sciences, Hungary*): Pericytes and BBB permeability- a co-culture model perspective

16:10 – 16:25 Luca Marchetti (*University of Bern, Switzerland*): Cellular and molecular mechanisms directing the pathway of Th1 versus Th17 T-cell diapedesis across the blood-brain barrier

16:25 – 16:40 Rainer F. Haseloff (*Charité – Universitätsmedizin, Germany*): Crossing cellular barriers by a tricellulin-derived peptide

16:40 – 16:55 David A. Antonetti (*The University of Michigan, USA*): Inhibiting Occludin Ser490 Phosphorylation Prevents Intracerebral Hemorrhage in Stroke

*Coffee break 16:55 – 17:15*

**Session 2. Pathology of the brain barriers – various aspects**

**Chairs:** Hazel Jones (*Fluids and Barriers of the CNS; King's College London, UK*) and Aleksandra Szczepkowska (*Institute of Animal Reproduction and Food Research of Polish Academy of Science*)

- 17:15 – 17:30 Claus U. Pietrzik (*University Medical Center of the Johannes Gutenberg-University Mainz, Germany*): Clearance mechanisms of amylogenic proteins across the blood brain barrier
- 17:30 – 17:45 Fabien Gosselet (*University Artois, France*): Down-regulation of ABCA7 at the BBB level impacts cholesterol and A $\beta$  peptide exchanges
- 17:45 – 18:00 Nienke M. de Wit (*VU University Medical Center, the Netherlands*): Possible different roles for LXR $\alpha$  and LXR $\beta$  in regulating blood-brain barrier integrity
- 18:00 – 18:15 István A. Krizbai (*Hungarian Academy of Sciences, Hungary*): Expression of pattern recognition receptors and activation of the non-canonical inflammasome pathway in brain pericytes
- 18:15 – 18:30 Winfried Neuhaus (*Austrian Institute of Technology GmbH, Austria*): The blood-brain barrier is altered during Rett Syndrome: Implications for Rett-therapeutics
- 18:30 – 18:45 Anette H. H. van Boxel-Dezaire (*Cleveland Clinic Foundation, USA*): IFN- $\gamma$ , IL-17A, and zonulin can all within 3 hours enhance permeability of the blood-brain and intestinal barrier in vitro; is a similar signal transduction pathway involved in very rapidly opening of these barriers?
- 18:45 – 19:00 Christina Simoglou Karali (*University of Oxford, Oxford, UK*): The impact of brain metastasis on endothelial cell function
- 19:30 – 21:00 Welcome reception (International Cultural Centre; 25 Main Market Square)

## **THURSDAY; September 14, 2017**

### **International Cultural Centre; 25 Main Market Square**

#### **08:30 – 09:20 Keynote presentation**

Michal Schwartz (*Weizmann Institute of Science, Israel*): Harnessing systemic immunity to combat Alzheimer's disease

### **Session 3. Blood-brain barrier and HIV reservoirs in the CNS - formation and eradication** (sponsored by the National Institutes of Health/National Institute of Mental Health; NIH/NIMH)

**Chairs:** Jeymohan Joseph (*NIH/NIMH, USA*) and Joan Berman (*Albert Einstein College of Medicine, USA*)

- 09:20 – 09:25 Jeymohan Joseph (*NIH/NIMH, USA*): Opening remarks
- 09:25 – 09:45 Joan Berman (*Albert Einstein College of Medicine, USA*): Mechanisms of CNS viral seeding by transmigration of HIV+CD14+CD16+ monocytes across the blood brain barrier: establishment and reseeding of viral reservoirs contributing to HAND
- 09:45 – 10:05 Kenneth Williams (*Boston College, USA*): Modulation of perivascular macrophage traffic into and out of the CNS, targeting CNS macrophage reservoirs of HIV

*Coffee break 10:05 – 10:20*

- 10:20 – 10:40 Michal Toborek (*University of Miami, USA*): Regulatory impact of occludin on the formation of HIV reservoirs in neural progenitor cells and brain pericytes
- 10:40 – 11:00 Carmela Pinnetti (*National Institute for the Infectious Disease "L. Spallanzani", Italy*): Blood brain barrier function and the risk of CSF HIV escape
- 11:00 – 11:20 C. Sabrina Tan (*Harvard Medical School, USA*): Reaching the CNS with neutralizing antibodies

11:20 – 12:30 Lunch

#### **Session 4. Pathology of the brain barriers – experimental aspects**

**Chairs:** Joan Abbott (*King's College London, UK*) and Magdalena Zielińska (*Mossakowski Medical Research Centre, Polish Academy of Sciences, Poland*)

- 12:30 – 12:50 Richard F. Keep (*University of Michigan, USA*): Endogenous mechanisms involved in barrier protection
- 12:50 – 13:10 Yuri Persidsky (*Temple University, USA*): Blood brain barrier dysfunction in diabetes mellitus correlates with cognitive deficits
- 13:10 – 13:30 Shilpa Buch (*University of Nebraska Medical Center, USA*): A novel role of pericytes in cocaine-mediated neuroinflammation
- 13:30 – 13:50 Elga de Vries (*VU University Medical Center, The Netherlands*): Molecular control of the brain barriers in multiple sclerosis
- 13:50 – 14:10 Martin Lauritzen (*University of Copenhagen, Denmark*): 2-photon microscopy of cerebral capillaries

Coffee break 14:10 – 14:25

#### **Session 5. Pathology of the brain barriers – clinical aspects**

**Chairs:** Maciej Mrugala (*Mayo Clinic, USA*) and Anuska Andjelkovic-Zochowski (*University of Michigan, USA*)

- 14:25 – 14:45 Ofer Prager (*Ben-Gurion University of the Negev, Israel*): Neurovascular interactions under BBB dysfunction
- 14:45 – 15:05 Maciej Mrugala (*Mayo Clinic, USA*): Strategies to improve anti-cancer drugs delivery across blood-brain barrier
- 15:05 – 15:25 Edward A. Neuwelt (*Oregon Health & Science University, USA*): Blood brain barrier disruption therapy in neuro-oncology
- 15:25 – 15:45 Anuska Andjelkovic-Zochowski (*University of Michigan, USA*): The blood-brain barrier pathology in stroke – the role of junctional proteins
- 15:45 – 16:00 David J. Begley (*Kings College London, UK*): Novel insights into the blood-brain barrier crossing ability of Apo-E and polysorbate-80 modified human serum albumin nanoparticles and their distribution within the CNS: a possible strategy for protein and other therapeutic delivery to the brain

Coffee break 16:00 – 16:15

#### **Session 6. Interactions between the brain barriers and stem cells in the CNS**

**Chairs:** Jaroslaw Aronowski (*University of Texas Health Science Center at Houston, USA*) and Mehmet Kaya (*Koç University School of Medicine, Turkey*)

- 16:15 – 16:35 Isabelle Aubert (*Sunnybrook Research Institute & University of Toronto, Canada*): Focused ultrasound and the modulation of BBB permeability, glial plasticity and adult neurogenesis
- 16:35 – 16:55 Simona Parrinello (*Imperial College London, MRC London Institute of Medical Sciences, UK*): Regulation of neural stem cell quiescence by the vascular niche
- 16:55 – 17:15 Ursula Wyneken (*Universidad de los Andes, Colombia*): CNS-periphery crosstalk by small extracellular vesicles
- 17:15 – 17:35 Salvador Martinez (*Neuroscience Institute, University Miguel Hernández - Spanish Council for Scientific Research, Spain*): Cellular interactions in the neurovascular unit during brain development
- 17:35 – 17:55 David Bueno i Torrens (*Universitat de Barcelona, Catalunya, Spain*): Regulation of embryonic cerebrospinal fluid composition: evolutionary implications for brain development and function

**18:00 – 19:30 Poster session**

20:00 – 23:00 Gala Dinner (Wesele Restaurant, 10 Main Market Square)

**FRIDAY, September 15, 2017**

**International Cultural Centre; 25 Main Market Square**

**09:00 – 09:50 Keynote presentation**

Britta Engelhardt (*University of Bern, Switzerland*): Brain Barriers: The movers and shapers in immune privilege of the CNS

**Session 7. Brain barriers and the metabolic axis**

**Chairs:** Matthew Campbell (*Trinity College Dublin, Ireland*) and Sabita Roy (*University of Miami, USA*)

09:50 – 10:10 John Kealy (*Trinity College Dublin, Ireland*): Unifying the neurovascular unit: Neurophysiology, behavior and the blood-brain barrier

10:10 – 10:30 Sabita Roy (*University of Miami, USA*): Opioid modulation of gut-brain-axis: implications in neurocognitive deficits

*Coffee break 10:30 – 10:45*

10:45 – 11:05 Stefan Liebner (*University Hospital Frankfurt, Germany*): Astrocyte-derived Wnts regulate brain vascular permeability in mice affecting BBB maintenance

11:05 – 11:25 Birger Brodin (*University of Copenhagen, Denmark*): Transport and metabolism of L-glutamate in brain capillary endothelial cells and astrocytes

11:25 – 11:45 Lester Drewes (*University of Minnesota, USA*): Blood-brain transport pathologies: a growing challenge to the field

11:45 – 12:45 Lunch

**Session 8. Behavioral modulations of the blood-brain barrier: diet and exercise**

(sponsored by Institute of Animal Reproduction and Food Research of Polish Academy of Science and The Jerzy Kukuczka Academy of Physical Education, Poland)

**Chairs:** Janina Skipor-Lahuta (*Institute of Animal Reproduction and Food Research of Polish Academy of Science, Poland*) and Andrzej Malecki (*The Jerzy Kukuczka Academy of Physical Education, Poland*)

- 12:45 – 13:05 Yoshichika Kawai (*Tokushima University Graduate School, Japan*): Accumulation and antioxidative action of dietary flavonoid quercetin in brain
- 13:05 – 13:25 Zsolt Radak (*University of Physical Education, Hungary*): The neuroprotective role of physical exercise
- 13:25 – 13:45 Damian Bailey (*University of South Wales, UK*): Oxygen, evolution and our radical BBB: pushing the limits with exercise
- 13:45 – 14:00 Aleksandra Szczepkowska (*Institute of Animal Reproduction and Food Research of Polish Academy of Science, Poland*): Impact of leptin on choroid plexus response to systemic LPS-induced inflammation in ewes
- 14:00 – 14:15 Arkadiusz Liśkiewicz (*The Jerzy Kukuczka Academy of Physical Education, Poland*): Protective impact of exercise on methamphetamine-induced BBB disruption and aberrant neurogenesis in the hippocampus
- 14:15 – 14:30 Matheus Uba Chupel (*University of Coimbra, Portugal*): Modulation of blood-brain barrier integrity through anti-inflammatory effect of combined exercise training and taurine supplementation in elderly

**14:30 – 14:45 Presentation of the Best Poster Awards (sponsored by IBBS)**

**14:45 – 15:00 Closing remarks**