

Scientific Program

Inaugural Conference of the International Transmembrane Transporter Society: “The Transporter Transition”

Tuesday, September 18th

09:00 - 11:00 **Registration**

11:00 - 11:15 **Opening Harald H. Sitte**

11:15 - 12:15 **Keynote lecture 1**

Chair: **Lynette Daws**
(University of Texas Health Science Center at San Antonio, USA)

11:15 - 11:20 *Introduction*

11:20 - 12:05 **Susan G. Amara**
(National Institute of Mental Health, National Institutes of Health, USA)

Regulation of neurotransmitter transporters by G-protein signaling in dopamine neurons: new insights into psychostimulant action

12:05 - 12:15 Discussion

12:15 - 13:00 **Lunch break, mounting of posters**

13:00 - 14:50 **Session 1**

The importance of organic cation transporters (OCTs, MATEs) in drug therapy

Chair: **Anne Nies**
(Dr. Margarete Fischer-Bosch Institute of Clinical Pharmacology, Stuttgart, Germany)

13:00 - 13:10 *Introduction*

13:10 - 13:30 **Anne Nies**
(Dr. Margarete Fischer-Bosch Institute of Clinical Pharmacology, Stuttgart, Germany)

The role of OCTs and alternative transporters in transport of and response to protein kinase inhibitors

13:30 - 13:35 Discussion

13:35 - 13:55 **Tanja Dujic**
(University of Sarajevo, Sarajevo, Bosnia and Herzegovina and University of Dundee, Dundee, Scotland, UK)

Association of OCT1 with intolerance to metformin in Type 2 diabetes

13:55 - 14:00 Discussion

14:00 - 14:20 **Mladen Tzvetkov**
(Center of Drug Absorption and Transport (C_DAT), University Medicine, Greifswald, Germany)

OCT1 pharmacogenetics in pain management: is clinical application within reach?

14:20 - 14:25 Discussion

14:25 - 14:45 **Felix P. Mayer**
(Brain Institute, Florida Atlantic University, USA)

The combination of alcohol and cocaine affects monoamine transporters of the SLC-6 family and organic cation transporter 3

14:45 - 14:50 Discussion

14:50 - 15:20 **Coffee/Tea break, refreshments**

15:20 - 17:30 **Session 2**

Young Scientists Session - Young ISN Neurochemistry Awardees selected from abstract



Chair: **Peter Chiba**
(Medical University Vienna, Austria)

15:20 - 15:30 *Introduction*

15:30 - 15:42 **Freja Herborg**
(University of Copenhagen, Denmark)

Loss of function variants in monoamine transporters as a risk factor for neuropsychiatric disease? – Insights from a population based case-cohort sample

15:42 - 15:45 Discussion

15:45 - 15:57 **Jenny I. Aguilar**
(Vanderbilt University, USA)

Phosphatidylinositol (4, 5)-biphosphate coordinates functional interactions in the dopamine transporter to promote amphetamine preference

15:57 - 16:00 Discussion

16:00 - 16:12 **Louise Fets**
(Cancer Metabolism Laboratory, The Francis Crick Institute, UK)

MCT2-mediated MOG transport dictates intracellular target engagement to drive toxicity in cancer cells

16:12 - 16:15 Discussion

16:15 - 16:27 **Rita R. Fagan**
(University of Massachusetts Medical School, USA)

PKC-stimulated dopamine transporter internalization: Interdependent roles of Rin, Ack1 and transporter amino- and carboxy termini

16:27 - 16:30 Discussion

16:30 - 16:42 **Manuele Rebsamen**
(CeMM, Austria)

Identification of solute carriers involved in responses to amino acid starvation by gain-of-function genetic screens

16:42 - 16:45 Discussion

16:45 - 16:57 **Bala Krishna Prabhala**
(University of Copenhagen, Denmark)

Chloramphenicol is a substrate of prototypical proton coupled oligopeptide transporter from E. coli

16:57 - 17:00 Discussion

17:00 - 17:12 **Alyssa West**
(University of South Carolina, USA)

Serotonin in the Medial Prefrontal Cortex: How Transport is Altered in Autism Spectrum Disorder Models

17:12 - 17:15 Discussion

17:15 - 17:27 **Shreyas Bhat**
(Medical University of Vienna, Austria)

Correction of folding deficits exhibited by monoamine transporter mutants using a non-classical pharmacological approach

17:27 - 17:30 Discussion

18:30 - 21:30 Welcome Dinner, Van Swieten Hall, MedUni Vienna
Van-Swieten-Gasse 1a, 1090 Vienna

Wednesday, September 19th

08:00 - 08:45 **Registration**

08:45 - 10:35 **Session 3**

Regulation of Dopamine Transporters: From Molecules to Behavior and Beyond

Chair: **Haley Melikian**
(University of Massachusetts Medical School, USA)
Co-Chair: **Habibeh Khoshbouei**
(University of Florida, USA)

08:45 - 08:55 *Introduction*

08:55 - 09:15 **Habibeh Khoshbouei**
(University of Florida, USA)

Immune regulation of dopamine transporter activity

09:15 - 09:20 Discussion

09:20 - 09:40 **Suzanne Underhill**
(National Institute on Mental Health, USA)

Mechanisms of amphetamine-mediated DAT trafficking

09:40 - 09:45 Discussion

09:45 - 10:05 **Ulrik Gether**
(University of Copenhagen, Denmark)

Nanoscale architecture of presynaptic dopamine terminals: regulation of the dopamine transporter at the single molecule level

10:05 - 10:10 Discussion

10:10 - 10:30 **Haley Melikian**
(University of Massachusetts Medical School, USA)

Dopamine transporter trafficking and regulation: Native mechanisms and behavioral consequences

10:30 - 10:35 Discussion

10:35 - 11:00 **Coffee/Tea break, refreshments**

11:10 - 12:10 **Keynote lecture 2**

Chair: **Balazs Sarkadi**
(Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary)

11:10 - 11:15 *Introduction*

11:15 - 12:00 **Satoshi Murakami**
(Tokyo Institute of Technology, Japan)

Structure and function of tripartite drug efflux transporters in Gram-negative bacteria

12:00 - 12:10 Discussion

12:10 - 13:00 **Lunch break**

12:10 - 14:15 **Postersession**

14:15 - 16:05 **Session 4**

NCCR TransCure: interdisciplinary membrane transport research

Chair: **Bruno Stieger**
(University of Zürich, Switzerland)
Co-Chair: **Cristina Manatschal**
(University of Zürich, Switzerland)

14:15 - 14:25 *Introduction*

14:25 - 14:45 **Roch-Philippe Charles**
(University of Bern, Switzerland)

The LAT1 inhibitor JPH203 reduces growth of thyroid carcinoma in a fully immunocompetent mouse model

14:45 - 14:50 Discussion

14:50 - 15:10 **Cristina Manatschal**
(Department of Biochemistry, University of Zürich, Switzerland)

Structural and mechanistic basis of proton-coupled metal ion transport in the SLC11/NRAMP family

15:10 - 15:15 Discussion

15:15 - 15:35 **Scott Jackson**
(Institute of Molecular Biology and Biophysics, ETH Zurich, Switzerland)

Structural basis of small-molecule inhibition of human multidrug transporter ABCG2

15:35 - 15:40 Discussion

15:40 - 16:00 **Roberta de Ceglia**
(Department of Fundamental Neurosciences, University of Lausanne, Switzerland)

Exploring astrocyte-specific VGLUTs activity: a new role in controlling glutamatergic circuits relevant in Parkinson's disease and epilepsy

16:00 - 16:05 Discussion

16:05 - 16:40 **Coffee/Tea break, refreshments**

16:40 - 18:30 **Session 5**

Innovative approaches to structural/computational/biophysical analyses of the glutamate and biogenic amine transporter families

Chair: **Susan G. Amara**
(National Institute of Mental Health, National Institutes of Health, USA)
Co-Chair: **Ivet Bahar**
(School of Medicine, University of Pittsburgh, USA)

16:40 - 16:50 *Introduction*

16:50 - 17:10 **Olga Boudker**
(Weill Cornell Medical College, USA)

Hills and valleys in the functional cycle of the thermophilic transporter GltPh

17:10 - 17:15 Discussion

17:15 - 17:35 **Claus Juul Løland**
(Department of Neuroscience, University of Copenhagen, Copenhagen, Denmark)

Substrate-induced conformational dynamics of the dopamine transporter

17:35 - 17:40 Discussion

17:40 - 18:00 **Ivet Bahar**
(School of Medicine, University of Pittsburgh, USA)

Signature dynamics of LeuT family of transporters: conserved vs. specific mechanisms of motions and their functional impact

18:00 - 18:05 Discussion

18:05 - 18:25 **Lei Shi**

(National Institute on Drug Abuse - Intramural Research Program, USA)

Characterization of the dynamics in the central binding site and the extracellular vestibule of the serotonin transporter reveals new ligand discovery opportunities

18:25 - 18:30 Discussion

20:30 - 22:30 Free evening / Jazz concert:

Benny Sharoni & Oliver Kent Trio

Porgy & Bess, Riemergasse 11, 1010 Vienna

(Details: <http://www.porgy.at/events/8778/>)

Thursday, September 20th

08:00 - 08:45 **Registration**

08:45 - 10:35 **Session 6**

Structure, Function and Regulation of Excitatory Amino Acid Transporters

Chair: **Claus Juul Løland**

(Department of Neuroscience, University of Copenhagen, Copenhagen, Denmark)

08:45 - 08:55 *Introduction*

08:55 - 09:15 **Nicolas Reyes**

(Molecular Mechanisms of Membrane Transport Laboratory, Institut Pasteur, Paris, France)

Ion Coupling in Human Excitatory Amino Acid Transporters

09:15 - 09:20 Discussion

09:20 - 09:40 **Renaë Ryan**

(Transporter Biology Group, Sydney Medical School, University of Sydney, Australia)

The Split Personality of Glutamate Transporters: A Chloride Channel and a Transporter

09:40 - 09:45 Discussion

09:45 - 10:05 **Baruch Kanner**

(School of Medicine-IMRIC-Biochemistry and Molecular Biology, The Hebrew University of Jerusalem, Israel)

Both reentrant loops of the sodium-coupled glutamate transporters contain molecular determinants of cation selectivity

10:05 - 10:10 Discussion

10:10 - 10:30 **Kenneth Madsen**

(Department of Neuroscience, University of Copenhagen, Denmark)

Functional regulation of GLT1b by the scaffold protein PICK1

10:30 - 10:35 Discussion

10:35 - 11:10 **Coffee/Tea break, refreshments**

11:10 - 12:10 **Keynote lecture 3**

Chair: **Michael Freissmuth**

(Medical University Vienna, Austria)

11:10 - 11:15 *Introduction*

11:15 - 12:00 **Christine Ziegler**

(University Regensburg, Germany)

Impact of specific lipid-protein interactions on membrane transport

12:00 - 12:10 Discussion

12:10 - 13:00 **Lunch break**

12:10 - 14:15 **Postersession**

14:15 - 14:45 **Business Meeting**

14:45 - 16:35 **Session 7**

Discovery of novel cell-type specific functions of the glutamate transporter GLT-1 using a conditional knockout approach

Chair: **Paul A. Rosenberg**
(Boston Children's Hospital and Harvard Medical School, USA)

14:45 - 14:55 *Introduction*

14:55 - 15:15 **Paul A. Rosenberg**
(Boston Children's Hospital and Harvard Medical School, USA)

Multiple lines of evidence suggest neuronal GLT-1 KO mice have a synaptopathy

15:15 - 15:20 Discussion

15:20 - 15:40 **Zhou Yun**
(University of Oslo, Norway)

Axon-terminals expressing EAAT2 (GLT-1; slc1a2) are common in the forebrain and not limited to the hippocampus

15:40 - 15:45 Discussion

15:45 - 16:05 **Laura F. McNair**
(University of Copenhagen, Denmark)

The glutamate transporter GLT-1 expressed in neurons is important for glutamate homeostasis and synaptic energy metabolism

16:05 - 16:10 Discussion

16:10 - 16:30 **Selva Baltan**
(Cleveland Clinic, Lerner Research Institute, Cleveland, USA)

Oligodendrocytes Support Axon Function via Glutamate Signaling through Glutamate Transporters (GLT-1) in a Gender and Age-specific Manner

16:30 - 16:35 Discussion

16:35 - 17:10 **Coffee/Tea break, refreshments**

17:10 - 19:25 **Session 8**

ReSOLUTE: an academic-industry IMI partnership to tackle SLCs

Chair: **Giulio Superti-Furga**
(Research Center for Molecular Medicine of the Austrian Academy of Sciences – CeMM, Austria)

17:10 - 17:20 *Introduction*

17:20 - 17:40 **Giulio Superti-Furga**
(Research Center for Molecular Medicine of the Austrian Academy of Sciences – CeMM, Austria)

ReSOLUTE: an academic-industry IMI partnership to tackle SLCs

17:40 - 17:45 Discussion

17:45 - 18:05 **Claire Steppan**
(Pfizer, USA)

SLCs and drug discovery - a pharma perspective

18:05 - 18:10 Discussion

18:10 - 18:30 **Daniel Lackner**
(CeMM, Austria)

A deorphanization pipeline for SLCs

18:30 - 18:35 Discussion

18:35 - 18:55 **Daniela Digles**
(University of Vienna, Austria)

ReSOLUTE databases and tools for the scientific community

18:55 - 19:00 Discussion

19:00 - 19:20 **Katharina L. Duerr**
(University of Oxford, UK)

Harnessing the SGC integral membrane pipeline for solute carrier protein production

19:20 - 19:25 Discussion

19:30 - 22:00 **Wine and Cheese / Postersession**

And:

Josephinum - Collection Of The Medical University Of Vienna:

Währinger Straße 25, 1090 Vienna

Guided tours through their exhibitions:

- The 18th century anatomical wax models for surgeons / Chiasmata 17-18 Anna Artaker/Tatiana Lecomte (arts exhibition)
- The Medical Faculty of Vienna 1938 to 1945
- The Josephina Library (superb books on medicine and botany/pharmacy)

Details: <http://www.josephinum.ac.at/?L=1>

Friday, September 21st

08:00 - 08:45 **Registration**

08:45 - 10:35 **Session 9**

Transmembrane transport of drugs and xenobiotics

Chair: **Douglas B. Kell**
(The University of Manchester, UK)

08:45 - 08:55 *Introduction*

08:55 - 09:15 **Douglas B. Kell**
(The University of Manchester, UK)

The 'real' (natural) substrates of pharmaceutical drug transporters

09:15 - 09:20 Discussion

09:20 - 09:40 **Elizabeth Bilsland**
(Unicamp, São Paulo, Brazil)

The transporter-mediated uptake and efflux of drugs across the blood-brain barrier

09:40 - 09:45 Discussion

09:45 - 10:05 **Irina Borodina**
(The Novo Nordisk Foundation Centre for Biosustainability, Danish Technical University, Denmark)

Deciphering the transport mechanisms of small molecules for improved cell factories

10:05 - 10:10 Discussion

10:10 - 10:30 **David Dickens**
(University of Liverpool, UK)

Cellular uptake of the atypical antipsychotic clozapine is a carrier-mediated process

10:30 - 10:35 Discussion

10:35 - 11:10 **Coffee/Tea break, refreshments**

11:10 - 12:10 **Keynote lecture 4**

Chair: **Harald Sitte**
(Medical University Vienna, Austria)

11:10 - 11:15 *Introduction*

11:15 - 12:00 **Thomas Jentsch**
(Leibniz-Institut fuer Molekulare Pharmakologie, Berlin, Germany)

Properties and physiological roles of VRAC/LRRC8 volume-regulated anion channels

12:00 - 12:10 Discussion

12:10 - 13:10 **Lunch break**

13:10 - 15:00 **Session 10**

Chloride Physiology/Homeostasis: Channels and co-transporters in Neuronal and Pancreatic B cell physiology and disease

Chair: **Lydia Aguilar-Bryan**
(Pacific Northwest Diabetes Research Institute, USA)

13:10 - 13:20 *Introduction*

13:20 - 13:40 **Claudio Rivera**
(University of Helsinki, Neuroscience Center, Finland)

Depolarizing GABA triggers Glutamatergic sprouting in epilepsy

13:40 - 13:45 Discussion

13:45 - 14:05 **Eric Delpire**
(Vanderbilt University Medical Center, Anesthesiology, Molecular Physiology and Biophysics, USA)

GABA, K-Cl and Na-K-2Cl cotransporters in epilepsy and pain

14:05 - 14:10 Discussion

14:10 - 14:30 **Mauricio Di Fulvio**
(Wright State University, School of Medicine, USA)

Chloride transporters and channels in β -cell physiology and insulin secretion

14:30 - 14:35 Discussion

14:35 - 14:55 **Lena Eliasson**
(Lund University Diabetes Centre, Sweden)

Chloride transporters and channels in alpha-cell physiology and glucagon secretion

14:55 - 15:00 Discussion

15:00 - 15:30 **Coffee/Tea break, refreshments**

15:30 - 16:40 **Session 11**

Young Scientists Session - Young ISN Neurochemistry Awardees selected from abstract



Chair: **Thomas Stockner**
(Medical University Vienna, Austria)

15:30 - 15:40 *Introduction*

15:40 - 15:52 **Andre Bazzone**
(Nanon Technologies GmbH, Germany)

H⁺ coupling and pH regulation in MFS sugar transporters: An application of SSM-based electrophysiology

15:52 - 15:55 Discussion

15:55 - 16:07 **Caroline Neumann**
(Aarhus University, Denmark)

Investigations into the binding site promiscuity of MhsT

16:07 - 16:10 Discussion

16:10 - 16:22 **Ahmad Reza Mehdipour**
(Max Planck Institute of Biophysics, Germany)

Mechanism of recognition of lipid substrates by ABC transporters

16:22 - 16:25 Discussion

16:25 - 16:37 **Dániel Szöllösi**
(Medical University of Vienna, Austria)

ABCB1 nucleotide binding domain dimerization cycle

16:37 - 16:40 Discussion

16:40 - 16:45 Refreshments

16:45 - 18:35 **Session 12**

Invertebrates as a model organism to study transporter function and dysfunction

Chair: **Renae Ryan**
(University of Sydney, Australia)
Co-Chair: **Aurelio Galli**
(University of Alabama Birmingham, USA)

16:45 - 16:55 *Introduction*

16:55 - 17:15 **Sonja Sucic**
(Medical University of Vienna, Austria)

Functional rescue of misfolded dopamine transporter variants by pharmacochaperoning

17:15 - 17:20 Discussion

17:20 - 17:40 **Don van Meyel**
(McGill Centre for Research in Neuroscience, Canada)

Using Drosophila to understand the function (and dysfunction) of Excitatory Amino Acid Transporters

17:40 - 17:45 Discussion

17:45 - 18:05 **Laura Bianchi**
(Miller School of Medicine, University of Miami, USA)

Glial channels and transporters that mediate excretion of ions in the microenvironment between glia and neurons shape neuronal output in C. elegans

18:05 - 18:10 Discussion

18:10 - 18:30 **David Krantz**
(David Geffen School of Medicine at UCLA, USA)

Transporter trafficking mutations and their effects on circuit function

16:30 - 18:35 Discussion

18:35 - 18:45 **Closing words/poster awards**
Harald H. Sitte

20:00 - 23:00 **Farewell Dinner**

Heuriger Ing. Werner Welser, Probusgasse 12, 1190 Vienna