



XVII International Magnesium Symposium

MAGNESIUM IN HEALTH AND DISEASE



Grottaferrata (Roma, Italy) – Park Hotel Villa Grazioli
5-6 September 2024

SCIENTIFIC PROGRAM

(Central European Time)

Thursday, September 5th, 2024

08:30 – 08:45 Registration / Connection

08:45 - 09:00 Welcome Remarks

Federica I Wolf

UniCamillus International Medical School, Rome, Italy

09:00 - 09:20

INTRODUCTORY LECTURE

The Vascular Biology of Mg and TRPM7 in Health and Disease

Rhian M Touyz

McGill University Health Centre Montréal, Québec, Canada

09:20 - 11:10

SESSION 1 Magnesium Measurements and Requirements

Chairmen:

Stefano Iotti (*Bologna, Italy*)

Andrzej Mazur (*Clermont-Ferrand, France*)

09:20 - 09:40

Essential Role of Mg²⁺ and TRPM7 for Pre-Implantation Embryo Development in the Mouse

Rafael Fissore

Veterinary Department, University of Massachusset, NJ, USA

09:40 - 10:00

Aza-crown Fluorescent Derivatives: the Royal Family for Total Magnesium Detection

Giovanna Farruggia

Department of Biotechnological Sciences, University of Bologna, Italy

10:00 - 10:30

Oral Communications

10:00 - 10:10

OC01

From Mirage to Reality: an Improved Mg Assay to Assess Magnesium Modulation in Young and Senescent Bone Marrow Mesenchymal Stem Cells

Lorenzo Anconelli¹, Isabella Zafferri²

Chair: **Federica I Wolf** (Roma, Italy)

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¹Department of Pharmacy and Biotechnology, University of Bologna, **Italy**

²Department of Biomedical and Clinical Sciences, University of Milano, **Italy**

10:10 - 10:20 **OC02**
Deciphering the Physiological Repartition of Magnesium Forms across a Large Patient Cohort
Guillaume Grzych
CHU Lille, Service d'Hormonologie, Métabolisme, Nutrition, Oncologie, Lille, France

10:20 - 10:30 **OC03**
Evaluation of Magnesium Absorption: a Novel Experimental Model to Test Absorption of Magnesium Containing Compounds
Isabelle Guinobert - *online presentation*
PiLeJe Laboratoire, Paris, France

10:30 - 10:50 *Coffee / Tea Break*

10:50 - 11:10 **New approach to Magnesium Measurements**
Daniela Buccella - *online presentation*
Biomedical Chemistry Institute New York University, NY, USA

11:10 – 12:50 **SESSION 2: Magnesium Transporters**

Chairmen: **Vladimir Chubanov** (*Munich, Germany*)
Valentina Trapani (*Rome, Italy*)

11:10 - 11:30 **Regulatory mechanisms of TRPM7**
Vladimir Chubanov
Pharmacology & Toxicology Dept., Ludwig Maximilians University, Munich, Germany

11:30 - 11:50 **Cellular Regulators of the TRPM7 Channel**
Loren Runnels
Dept. of Pharmacology, Rutgers Robert Wood Johnson Medical School, Piscataway, NJ, USA

11:50 - 12:10 **TRPM6 and TRPM7 Kinases**
Alexej G Ryazanov
Dept. of Pharmacology, Rutgers Robert Wood Johnson Medical School, Piscataway, NJ, USA

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12:10 - 12:50 **Oral Communications**

12:10 - 12:20 **OC04**
Voltage-Dependent and Independent Inhibitors of TRPM7: Recent Findings

J. Ashot Kozak - *online presentation*

Department of Neuroscience, Cell Biology and Physiology, Boonshoft School of Medicine, Wright State University, Dayton, OH, USA

12:20 - 12:30 **OC05**
Molecular mechanisms of selective TRPM7 inhibition by pharmacological agents

Leonor Correia, Alexey Shalygin

Walther-Straub Institute of Pharmacology and Toxicology, LMU Munich, Munich, Germany

12:30 - 12:40 **OC06**
TRPM7 Kinase Domain Regulates Pancreatic Cancer Cell Migration and *In Vivo* Tumor Growth

Mathieu Gautier

Université de Picardie Jules Verne, UR-UPJV 4667, Amiens, France

12:40 - 12:50 **OC07**
ERMA (TMEM94) is a P-type ATPase Transporter for Mg²⁺ Uptake in the Endoplasmic Reticulum

Madesh Muniswamy - *online presentation*

Department of Medicine, Center for Mitochondrial Medicine, University of Texas Health San Antonio, San Antonio, USA

12:50 - 13:50 *Lunch Break*

13:50 - 15:20 **SESSION 3 Magnesium Translational Research**

Chairmen: **Jeanette AM Maier** (*Milano, Italy*)
Federica I Wolf (*Rome, Italy*)

13:50 - 14:10 **The role of Claudins in Paracellular Transport of Magnesium in the Kidney**

Pascal Houillier

Centre de Recherche des Cordeliers, INSERM, Université Paris Cité, Paris, France

14:10 - 14:30 **Exploring the Therapeutic Role of Magnesium Transporter CNNM4 in Regulating the Repair Activity of Protein-L-Isoaspartyl-O-Methyltransferase in Alcohol-Induced Liver Injury**

Malu Martinez Chantar

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*Liver Disease Lab, Center for Cooperative Research in Biosciences,
Basque Research and Technology Alliance, Derio, Spain*

14:30 - 14:50

Role of Magnesium and TRPM Channels in Pancreatic Islets

Thomas Gudermann

*Walther Straub Inst. of Pharmacology & Toxicology, Faculty of Medicine,
Munich, Germany*

14:50 – 15:20

Oral Communications

14:50 - 15:00

OC08

**The SGLT2 Inhibitor Dapagliflozin Increases Magnesium Transport
in an in Vitro-Generated Intestinal Barrier**

Elisabetta Turci

*Department of Biomedical and Clinical Sciences, Università di Milano,
Milano, Italy*

15:00 - 15:10

OC09

**A New In Vitro Human BBB-Brain Organoids Model to Study the
Role of Mg In Brain Development**

Giorgia Fedele

*Department of Biomedical and Clinical Sciences, University of Milan,
Italy*

15:10 - 15:20

OC10

**Low Level Hyperexcitability Induced by Chronic Magnesium
Deficiency**

Marija Stanojević

*University of Belgrade, Faculty of Medicine, Institute for Pathological
Physiology „Ljubodrag Buba Mihailović”, Belgrade, Serbia*

15:20 - 15:40

Coffee / Tea Break

15:40 - 17:00

**SESSION 4 Magnesium Time: from the Origin of
Life to Circadian Rhythm and Metabolism
Regulation**

Chairmen:

Stefano Iotti (Rome, Italy)

Jeanette AM Maier (Milano, Italy)

15:40 - 16:00

**A Return to the Regulation of Mammalian Mg⁺⁺ Circadian Rhythm
Levels by the PTP4A2 Protein and its Partners**

Michel L. Tremblay - *online presentation*

*Dept. of Biochemistry, Rosalind and Morris Goodman Cancer Research
Centre - McGill University, Montreal, QC, Canada*

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- 16:00 - 16:20** **The Regulation and Functional Consequences of Circadian Magnesium Rhythms in a Minimal Eukaryotic Model Cell**
Gerben van Ooijen
School of Biological Sciences, University of Edinburgh, UK
- 16:20 - 16:40** **Magnesium: the Joker of Metabolism**
Roberta Cazzola
Department of Biomedical and Clinical Sciences, University of Milano, Italy
- 16:40 – 17:00** **Mg another Brick in the Wall of Life**
Stefano Iotti
Department of Pharmacy and Biotechnology, University of Bologna, Italy
- 17:00 - 17:20** **HOT TOPIC**
Retrospective Association Studies: Benefits and Limitations
Qi Dai
Cancer Center Vanderbilt University, Nashville, TN, USA
- 19:00** **Social Dinner (Onsite at Villa Grazioli)**

Chair: Federica I Wolf (Roma, Italy)

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Friday, September 6th, 2024

09:00 - 10:30 **SESSION 5 Magnesium in Clinical Setting – Part I**

Chairmen: **Jeroen de Baaij** (Nijmegen, NL)
Qi Dai (Nashville, USA)

09:00 - 09:20 **Cannabinoids Inhibit TRPM7 and Protect from Kidney Fibrosis**
Andrea Fleig - online presentation
University of Hawaii, Cancer Center, Honolulu, Hawaii, USA

09:20 - 09:40 **Mg, Mitochondria, and Heart Disease**
Samuel Dudley
Lillelei Heart Institute, Minneapolis, MN, USA

09:40 - 10:00 **The Role of MUC1 in Mg Homeostasis**
Evan Ray
Renal-Electrolyte Div., University of Pittsburgh, PA, USA

10:00 - 10:30 **Oral Communications**

10:00 - 10:10 **OC11**
Mucin 1 Stimulates TRPM6 Single Channel Activity and TRPM6 Cell Surface Abundance by Impairing Dynamin Dependent TRPM6 Endocytosis
Matthias T.F. Wolf
Department of Pediatrics, Pediatric Nephrology, UT Southwestern Medical Center, Dallas, TX, USA
Department of Pediatrics, Pediatric Nephrology, University of Michigan, Ann Arbor, MI, USA

10:10 - 10:20 **OC12**
Low Magnesium Induces Significant Metabolic Alterations in C2C12-derived Myotubes
Sara Castiglioni
Department of Biomedical and Clinical Sciences, Università di Milano, Milano, Italy

10:20 - 10:30 **OC13**
Heat Stress Alters Mitochondrial Mg²⁺ and Ca²⁺ Levels in Mouse Myoblasts and Skeletal Muscle
Yifan Chen – online presentation
Department of Military and Emergency Medicine, Uniformed Services University, USA

10:30 - 11:00 *Coffee / Tea Break*

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11:00 - 12:30 **SESSION 5 Magnesium in Clinical Setting – Part I**

Chairmen: *Thomas Gudermann* (Munich, Germany)
Rhian Touyz (Montreal, Canada)

11:00 - 11:20 **Novel Genetic Causes of Hypomagnesemia**
Jeroen De Baaij
Radboud Institute for molecular life sciences, Nijmegen, the Netherlands

11:20 - 11:30 **Oral Communication**
OC14
“Hipofam: from the Hypomagnesemic Patient’s Voice”
Antonio and Susana Cabrera Cantero
Hipofam Association, Barcelona, Spain

11:30 - 11:50 **Fact or Fiction: SGLT2 Inhibitors as A Novel Class of Medications in The Treatment of Hypomagnesemia**
Chintan V. Shah
University of Florida – College of Medicine, Gainesville FL, USA

11:50 - 12:10 **The Missing Puzzle Piece: Insulin Receptor Substrate 4 Mediates the Insulin Effect on TRPM6**
Matthias Wolf
University of California, San Francisco, USA

12:10 - 12:30 **The Pharmacologist Point of View**
Giorgio Minotti
Campus Biomedico University, Rome, Italy

12:30 - 13:30 *Lunch Break*

13:30 - 15:20 **SESSION 6 Magnesium in Clinical Setting - Part II**

Chairmen: *Valentina Trapani* (Rome, Italy)
Federica I Wolf (Rome, Italy)

13:30 - 13:50 **Magnesium Intake and Pregnancy Outcomes: Findings from the nuMoM2b Study**
Ka Kahe - online presentation
Department of Obstetrics and Gynecology and Department of Epidemiology, Columbia University, USA

13:50 - 14:10 **Intestinal Barrier: a Breach in the Wall**
Valentina Petito

Chair: *Federica I Wolf* (Roma, Italy)

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Department of Translational Medicine and Surgery, Università Cattolica del Sacro Cuore, Roma, Italy

14:10 - 14:30 **Mg²⁺ Supplementation Treats Secretory Diarrhea in Mice by Activating Calcium-sensing Receptor in Intestinal Epithelial Cell**
Onur Cil - *online presentation*
Department of Pediatrics, UCSF, San Francisco, California, USA

14:30 - 15:20 **Oral Communications**

14:30 - 14:40 **OC15**
Magnesium Content and Release from Nationally Representative Adult and Children's Calcium ± Vitamin D Dietary Supplements (DS)
Pavel A. Gusev - *online presentation*
Methods and Application of Food Composition Laboratory (MAFCL), USDA, Beltsville, USA

14:40 - 14:50 **OC16**
Hypomagnesaemia In High Serum Triglycerides Patients May Determine An Increase of some Atherosclerosis Risk Factors and Inflammation in Cardiovascular Disease
Ioan Axente Gutiu
Carol Davila University of Medicine and Pharmacy-Bucharest, Romania

14:50 - 15:00 **OC17**
New Data on Ionized Magnesium
Klaus Kisters
Med. University Policlinic, Münster, Operasan Dialysis Centre, Herne, Society for Magnesium Research, Tutzing, Germany

15:00 - 15:10 **OC18**
Magnesium in Oncology – Update 2024
Oliver Micke
Dept of Radiotherapy, Radiation Oncology, Franziskus Hosp., Bielefeld, Germany

15:10 - 15:20 **OC19**
Absence of Allergic Manifestations after Oral Magnesium Supplementation in Patients with Essential Hypertension
Nikolina Banjanin
University of Belgrade, Faculty of Medicine, Institute of Hygiene and Medical Ecology, Belgrade, Serbia

15:20 - 15:30 *Coffee / Tea Break*

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15:30 - 16:10 **SESSION 7 Magnesium in Alloys**

Chairmen: ***Jeanette AM Maier*** (Milano, Italy)
 Andrzej Mazur (Clermont, France)

15:30 – 15:50 **The Role Magnesium Plays as an Implant Material and how we might use it in the Future to Tailor Tissue Regeneration after Accident or Surgery**

Regine Willumeit – Roemer

*Helmholtz-Zentrum hereon GmbH, Geesthacht, **Germany***

15:50 - 16:10

The use of Magnesium-based Alloys in Human Diseases: Clinical Data

Frank Witte

*Institute for Biomechanics and Musculoskeletal Regeneration at Charité – Universitätsmedizin Berlin, **Germany***

16:10 - 16:30 **Awards Nomination and Closing Ceremony**

Chairmen: ***Andrzej Mazur*** (Clermont-Ferrand, France)
 Federica I Wolf (Rome, Italy)

Chair: *Federica I Wolf* (Roma, Italy)

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