13TH INTERNATIONAL CONFERENCE
ONE-CARBON METABOLISM
B VITAMINS AND HOMOCYSTEINE
Poznań, Poland
September 12-16, 2021

PROGRAM
13:45 – 14:00 Welcome remarks

14:00 – 19:50 Session 1
Genetics and Epigenetics of Hyperhomocysteinemia
Chair: Warren Kruger, Viktor Kožich, Hieronim Jakubowski

14:00 – 14:30 Cystathionine beta-synthase deficiency: six decades of research and recent contribution of the E-HOD consortium
Viktor Kožich

14:30 – 15:00 Molecular Bases of Cystathionine β-synthase Deficiency
Hieronim Jakubowski

15:00 – 15:30 Long-term functional correction of cystathionine β-synthase deficiency in mice by adeno-associated viral gene therapy
Warren D. Kruger

15:30 – 15:45 Dysregulation of sulfur metabolome in murine homocystinuria
Tomas Majtan

15:45 – 16:00 Structural insight into the unique conformation of Cystathionine β-synthase from Toxoplasma gondii
Luis Alfonso Martinez-Cruz

16:00 – 16:15 COVID-19 pandemic impact in a sample of 34 Brazilian patients with classic homocystinuria and methylmalonic acidemia type cblC
Ida Vanessa Doederlein Schwartz

16:15 – 16:35 Discussion

16:35 – 17:25 Lunch

17:25 – 17:55 MTHFR deficiency in mice, due to genetic mutation or high folate diet, leads to hyperhomocysteinemia, altered choline/methyl metabolism and disturbances in liver and brain function
Rima Rozen

17:55 – 18:20 MTHFR and risk of stroke, ischemic heart disease and other non-vascular diseases: a Mendelian randomization study of >150,000 Chinese adults
Robert Clarke

18:20 – 18:35 Biochemical Studies in Patients with Mutations in the MTHFD1 gene encoding Methylene tetrahydrofolate Dehydrogenase 1
David Watkins

18:35 – 18:50 Probing the functional consequence and clinical relevance of CD320 p.E88del, a variant in the transcobalamin receptor gene
Faith Pangilinan

18:50 – 19:05 The endogenous human Dihydrofolate reductase 2 gene is not translated into a mitochondrial reductase enzyme
Niamh Bookey

19:05 – 19:20 The BHMT-betaine pathway epigenetically influences oligodendrocytes
Sarah Sternbach

19:20 – 19:50 Discussion

19:50 – 21:10 Welcome reception
13:15 – 14:00  Lunch

14:00 – 20:30  Session 2
Homocysteine and CVD and Nervous System
Chair: Helga Refsum, Amany Elshorbagy, Hong Wang

14:00 – 14:30  Cardiovascular Manifestations of Intermediate and Major Hyperhomocysteinemia Due to Vitamin B12 and Folate deficiency and/or Inherited Disorders of One-Carbon Metabolism: A 3.5-years Retrospective Cross-sectional Study of Consecutive Patients
Jean-Louis Guéant

14:30 – 15:00  Nuclear One-Carbon Metabolism and Folate-Associated Pathologies
Patrick Stover

15:00 – 15:30  The link between one-carbon metabolism and lipid metabolism
Agata Chmurzyńska

15:30 – 15:45  Associations of homocysteine-thiolactone, cysteinylglycine, and cysteine with stroke
Ewa Bretes

15:45 – 16:00  Evaluation of pathologies associated with hyperhomocysteinemia in human autopsy brain tissue
Erica Weekman

16:00 – 16:15  A Healthy Nordic Diet and its associations with plasma levels of metabolites of the choline oxidation pathway: A cross-sectional study based on data from Northern Sweden
André Heselink

16:15 – 16:45  Discussion

16:45 – 17:00  Break

17:00 – 17:30  The High Folate/Low B12 Interaction is a Novel Cause of Vitamin B12 Depletion with a Specific Etiology: A Hypothesis
Joshua Miller

17:30 – 18:00  Homocysteine-methionine cycle as a metabolic sensor system for methylation-regulated pathological signaling
Hong Wang

18:00 – 18:30  The plasma sulfur amino acid profile – possible determinants and associations with health outcomes
Amany Elshorbagy

18:30 – 18:45  Subclinical inflammation, telomere shortening, homocysteine, B vitamins, and mortality: the LURIC study
Wolfgang Herrmann

18:45 – 19:00  Serum folate forms in fasting US adults by folic acid intake sources, NHANES 2011-2018
Christine Pfeiffer

19:00 – 19:15  Discussion
Break
19:15 – 19:30  One-carbon metabolism and L-Arginine pathway interaction is associated with increased risk of hypertension
Carla Ramos-Rodriguez

19:30 – 19:45  Age- and ethnicity-related reference intervals for serum vitamin B12
Agata Sobczyńska-Malefora

19:45 – 20:00  A dietary vitamin B12 deficiency impairs motor function, neuronal survival, and choline metabolism after ischemic stroke to the sensorimotor cortex in adult male and female mice
Nafisa Jadavji

20:00 – 20:15  Involvement of homocysteine in atherosclerosis-related changes in the aortic rabbit wall in the absence and presence of hypercholesterolemia
Oksana Tehlivets

20:15 – 20:30  Discussion

20:30 – 20:45  Break

20:45 – 22:15  Session 3
Microbiome and One-carbon Metabolism in Health and Disease
Chair: Agata Chmurzyńska, Suresh Tyagi

20:45 – 21:15  Dysbiotic 1-Carbon Metabolism in Growth Retardation
Suresh Tyagi

21:15 – 21:30  The impact of folate biosynthesis by Lactobacillus plantarum on colonic health in mice
Dieuwertje Kok

21:30 – 21:45  Classical homocystinuria: the relationship between the gut microbiota and short-chain fatty acids
Ida Vanessa Doederlein Schwartz

21:45 – 22:00  Associations of atrophic gastritis with vitamin B12 status and bone mineral density in older adults from the TUDA study
Michelle Clements

22:00 – 22:15  Discussion
14:00 – 19:10  Session 4  
**Homocysteine and Neurodegeneration**  
*Chair: A. David Smith, Domenico Praticò, Richard E. Frye*

14:00 – 14:30  GlyNAC supplementation improves mitochondrial dysfunction, oxidative stress, inflammation, metabolic defects and aging hallmarks to improve muscle strength and reverse cognitive decline in aging  
Rajagopal V. Sekhar

14:30 – 15:00  One-Carbon Metabolism Abnormalities in Autism Spectrum Disorder  
Richard E. Frye

15:00 – 15:30  Methylation status and sulfur amino-acids as risk factors for cognitive decline over 15 years: A longitudinal population based study  
Babak Hooshmand

15:30 – 16:00  It is well past time to apply our understanding of homocysteine metabolism to the treatment and prevention of age related Vascular Dementia  
Irwin Rosenberg

16:00 – 16:20  Discussion

16:20 – 17:05  Lunch

17:05 – 17:35  Homocysteine and the pathophysiology of Alzheimer’s disease  
Domenico Praticò

17:35 – 17:50  One-Carbon Metabolism in Brain Cortex in Alzheimer’s and Parkinson’s Disease in Relation to Cognitive Impairment  
Karel Kalecky

17:50 – 18:05  Phf8-mediated epigenetic dysregulation of mTOR/autophagy increases amyloid beta accumulation and cognitive deficits in hyperhomocysteinemic and bleomycin hydrolase-deficient mice  
Łukasz Witucki

18:05 – 18:20  Prenatal hyperhomocysteinemia upregulates mTOR signaling, downregulates autophagy, and increases accumulation of amyloid beta and tau in adult 3xTG-AD mice  
Joanna Suszyńska-Zajczyk

18:20 – 18:35  Prenatal administration of SRT2104, a SIRT1 activating compound, reduces the cognitive defects associated with methionine synthase deficiency in mice  
Manon Jeandel

18:35 – 18:50  Disruption of the one carbon metabolism could be a risk factor in Huntington’s disease  
Carine Bossenmeyer-Pourié

18:50 – 19:10  Discussion

19:25 – 21:00  Session 5  
**Protein Modification by Homocysteine in Health and Disease**  
*Chair: Hieronim Jakubowski, Jean-Louis Guéant*

Xinyu Mei

19:55 – 20:10  B vitamins prevent negative effects of anti-N-Hcy-protein autoantibodies on cognition in mild cognitive impairment  
Olga Włoczkowska

20:10 – 20:25  Leptin receptor antagonists reduces fibrinogen hyper-N-homocysteinylation in diet-induced obesity  
Jerzy Beltowski

20:25 – 20:40  The yeast map of protein lysine N-homocysteinylation  
Joanna Perła-Kaján

20:40 – 21:00  Discussion

21:00 – 22:00  Virtual poster session | posters are listed at the end of the program
13:15 – 14:00  Lunch

14:00 – 15:30  Session 6
Methionine, One-carbon Metabolism, and Life Span
Chair: Rima Rozen, Joshua Miller, Babak Hooshmand

14:00 – 14:15  Mitochondrial dysfunction associated with cblC and cblG inherited defects of cobalamin metabolism fibroblasts can be corrected by the SIRT1 activating compound SRT2104
Ziad Hassan

14:15 – 14:30  Influence of methionine synthase on proliferation and differentiation of neural stem cells and postnatal neurogenesis. Study in the Mtr-KOc mouse model
Karim Matmat

14:00 – 14:45  Efficacy and pharmacokinetics of betaine in CBS and cblC deficiency: a cross over randomized controlled trial
Apolline Imbard

14:45 – 15:00  Maternal choline, folate and lutein intakes during pregnancy were positively associated with developmental outcomes in children at 2 years of age
Xinyin Jiang

15:00 – 15:15  Tracing Metabolic Fate of Mitochondrial Glycine Cleavage System Derived Formate In Vitro and In Vivo
En-Pei Isabel Chiang

15:15 – 15:30  Discussion  15:30 – 15:45  Break

15:45 – 18:00  Session 7
B-vitamins, Homocysteine, Early Development and Pregnancy Outcomes
Chair: Michelle M. Murphy, Patrick Stover

15:45 – 16:15  The U-shaped curve of folic acid and birth defect prevention: Can there be too much of a good thing?
John Steele for Richard H. Finnell

16:15 – 16:45  Maternal and paternal folate and cobalamin status, pregnancy outcome and early development. The Reus-Tarragona Birth Cohort Study
Michelle M. Murphy

16:45 – 17:00  Investigating interactions between mitochondrial one-carbon metabolism and the canonical Wnt co-receptor, LRP6, in neural tube defect models
John Steele

17:00 – 17:15  Interactions between mild choline deficiency and MTHFD1-synthetase deficiency increase incidence of embryonic defects in mice
Karen E. Christensen

17:15 – 17:30  Associations between pregnancy homocysteine and cobalamin status and metabolic score in the offspring
Alejandra Rojas-Gómez

17:30 – 17:45  Mutations in Hcfc1 and Ronin (Thap11) result in both an inborn error of cobalamin metabolism and a ribosomopathy impacting embryonic development
Ross Poche

17:45 – 18:00  Cobalamin, MMACHC and the methionine dependence of cancer cells
Mark Sorin

18:00 – 18:30  Discussion

19:30  Gala Dinner
13:15 – 14:00 Lunch

14:00 – 17:00 Session 8
Homocysteine, One-carbon Metabolism, and Cancer
Chair: Amanda J. MacFarlane, Joel Mason, Ruma Banerjee

14:00 – 14:30 H2S targets mitochondrial bioenergetics and induces metabolic remodeling
Ruma Banerjee

14:30 – 15:00 Folate intake and genome stability – a complex relationship
Amanda J. MacFarlane

15:00 – 15:15 Assessment of B12 vitamin status in patients with Gaucher disease type I.
Ida Vanessa Doederlein Schwartz

15:15 – 15:30 Insights into genetic and nutritional determinants of uracil accumulation in mitochondrial DNA
Martha Field

15:30 – 15:45 Loss of SHMT2 and folate deficiency impair energy metabolism in mouse embryonic fibroblasts cells
Joanna Fiddler

15:45 – 16:00 Dimer-dimer interface interactions involving R85 and T63 are key for methionine adenosyltransferase MATa1 tetramerization and kinetics
María Ángeles Pajares

16:00 – 16:15 Modulation of L-cysteine metabolism in human brain cancer 1321N1 and T98 cells differing in the degree of malignancy
Halina Jurkowska

16:15 – 17:45 Discussion

16:45 – 16:55 Closing remarks

16:55 – 17:15 Business meeting

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VIRTUAL POSTER SESSION

All poster presentations will be accessible online any time and questions related to specific posters can also be asked and responded to anytime online.

P1  B vitamin intake and lipid metabolism biomarkers in postmenopausal women
Agata Muzsik-Kazimierska

P2  Homocysteine and disorders in endothelial iron metabolism
Andżelika Borkowska

P3  Effect of iron and folate transporters on metabolic status in response to dietary supplementation with iron and folic acid in the rat
Anna Radziejewska

P4  Alterations in Glutathione Degradation in Individuals with Classical Homocystinuria
Brian Gilfix

P5  Investigating the relationship between B vitamins and mitochondrial DNA mutations
Darren Walsh

P6  Misclassification of vitamin B12 status in US adults using individual, conventional markers versus the combined indicator of vitamin B12 status, cB12
Ekaterina Mineva

P7  The CTH polymorphism is not associated with a first-ever fatal or non-fatal myocardial infarction
Elisabet Söderström

P8  Betaine supplementation influence on body composition, anabolic/catabolic hormones and blood lipids
Emilia Zawieja

P9  Clinical and biochemical characterization of Brazilian patients with Classical Homocystinuria with the p.Trp323Ter variant
Gabriela Silvano

P10 Genetic basis of classical homocystinuria in Brazil: report of 48 patients and 4 novel mutations
Gabriela Silvano

P11 Serum folate and vitamin B12 levels are not associated with the incidence risk of atherosclerotic events over 12 years: the Korean Genome and Epidemiology Study
Ha-Na Kim

P12 Longitudinal study on B12 levels in hepatic Glycogen Storage Diseases
Ida Vanessa Doederlein Schwartz

P13 Identification of brazilian cases of defects in the synthesis of intracellular cobalamine referred for next generation sequencing investigation
Ida Vanessa Doederlein Schwartz
**P14**

Hyperhomocysteinemia evoked by methionine enriched diet induces hippocampal histopathological, plasma metabolomic and behavioral pattern’s changes in rats

Jan Lehotsky

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**P15**

Maternal nonalcoholic fatty liver disease and dietary choline intake modify gene expression profiles in rat offspring

Joanna Mikołajczyk-Stecyna

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**P16**

Homocysteine determination and single-use plastic laboratory waste

Kamila Borowczyk

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**P17**

Microbiome Associations with Vitamin B12 Status in Adults

Marijke Rittmann

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**P18**

Monocarbon metabolism disorders in Huntington’s disease

Mathilde Renaud

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**P19**

Robustness of the CDC Folate Microbiologic Assay Kit during simulated delayed shipping

Ming Zhang

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**P20**

Impact of high maternal folate intake during pregnancy on embryonic development

Yan Luan

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**P21**

Ionizing Radiations Induce Shared Epigenomic Signatures Unraveling Adaptive Mechanisms of Multiple Cancerous Cell Lines to Radiation-Induced Cellular Stress

Youssef Siblini

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**P22**

Erythrocyte folate forms appear stable in washed red blood cell lysates stored frozen for up to 2 years at -70°C

Zia Fazili

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**P23**

Assessing the effect of eight weeks of diets with different contents of fat and one-carbon micronutrients, on plasma metabolome and atherosclerosis progression in apoE null mice

Courtney Whalen