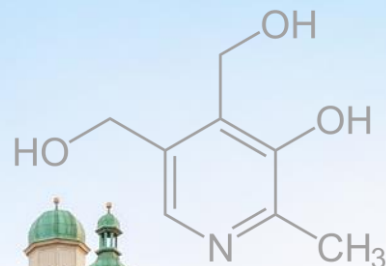
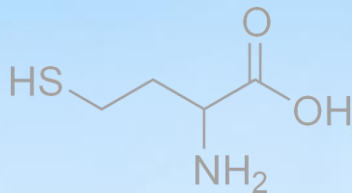


# 13TH INTERNATIONAL CONFERENCE ONE-CARBON METABOLISM B VITAMINS AND HOMOCYSTEINE

Poznań, Poland  
September 12-16, 2021



POZNAŃ  
UNIVERSITY  
OF LIFE SCIENCES

## - 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  $\beta$ -synthase Deficiency*  
**Hieronim Jakubowski**

15:00 – 15:30 *Long-term functional correction of cystathionine  $\beta$ -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  $\beta$ -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 Methylenetetrahydrofolate 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, cysteinyl-glycine, 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 Kalecký**

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 **19:10 – 19:25 Break**

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

19:25 – 19:55 *N-Homocysteinylation: Identification, pathological mechanisms, genetic factors, treating strategies and demodification*  
**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 cbIC and cbIG 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-KO mouse model*  
**Karim Matmat**

14:0 – 14:45 *Efficacy and pharmacokinetics of betaine in CBS and cbIC 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 – 18:30 **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 Fidler**

15:45 – 16:00 *Dimer-dimer interface interactions involving R85 and T63 are key for methionine adenosyltransferase MAT $\alpha$ 1 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**
- P15** *Maternal nonalcoholic fatty liver disease and dietary choline intake modify gene expression profiles in rat offspring*  
**Joanna Mikołajczyk-Stecyna**
- P16** *Homocysteine determination and single-use plastic laboratory waste*  
**Kamila Borowczyk**
- P17** *Microbiome Associations with Vitamin B12 Status in Adults*  
**Marijke Rittmann**
- P18** *Monocarbon metabolism disorders in Huntington's disease*  
**Mathilde Renaud**
- P19** *Robustness of the CDC Folate Microbiologic Assay Kit during simulated delayed shipping*  
**Ming Zhang**
- P20** *Impact of high maternal folate intake during pregnancy on embryonic development*  
**Yan Luan**
- P21** *Ionizing Radiations Induce Shared Epigenomic Signatures Unraveling Adaptive Mechanisms of Multiple Cancerous Cell Lines to Radiation-Induced Cellular Stress*  
**Youssef Siblani**
- P22** *Erythrocyte folate forms appear stable in washed red blood cell lysates stored frozen for up to 2 years at -70°C*  
**Zia Fazili**
- 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**



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