

Contents

The 70th Anniversary of the Foundation of the Institute of Physiology, Czech Academy of Sciences, Prague

Preface

Seventy Years of Systematic Biomedical Research at the Institute of Physiology of the Czech(oslovak) Academy of Sciences. Jan Kopecký (*Director, Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **i**

History of Research

From the Pineal Gland to the Central Clock in the Brain: Beginning of Studies of the Mammalian Biological Rhythms in the Institute of Physiology of the Czech Academy of Sciences. Helena Illnerová (*Lab. Biol. Rhythms, Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S1**

Czech Footprints in the Bioenergetics Research. Zdeněk Drahota, Josef Houštěk, Alena Pecinová (*Lab. Bioenergetics, Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S23**

Sixty years of heart research in the Institute of Physiology of the Czech Academy of Sciences. Bohuslav Ošťádal, František Kolář (*Lab. Dev. Cardiol., Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S35**

Research on Experimental Hypertension in Prague (1966-2009). Jaroslav Kuneš, Josef Zicha (*Lab. Exp. Hypertens., Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S49**

Epilepsy Research in the Institute of Physiology of the Czech Academy of Sciences in Prague. Pavel Mareš (*Lab. Dev. Epileptol., Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S67**

From Frog Muscle to Brain Neurons: Joys and Sorrows in Neuroscience. František Vyskočil (*Lab. Cell. Neurophysiol., Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S83**

Research Topics studied in the Institute of Physiology (Czech Academy of Sciences) 1954 – 2024 **S105**

New Generation

Nutrition and Bone Marrow Adiposity in Relation to Bone Health. Martina Dzubanová, Andrea Benová, Michaela Ferencaková, Roman Coupeau, Michaela Tencerová (*Lab. Mol. Physiol. Bone, Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S107**

Redox Status as a Key Driver of Healthy Pancreatic β -Cells. Blanka Holendová, Štěpánka Benáková, Monika Krívonosková, Lydie Plecíťá-Hlavatá (*Lab. Pancreatic Islet Res., Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S139**

Metabolic Pathways of Acylcarnitine Synthesis. Jana Brejchová, Kristýna Brejchová, Ondřej Kuda (*Lab. Metab. Bioactive Lipids, Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S153**

Metabolomics and Lipidomics for Studying Metabolic Syndrome: Insights into Cardiovascular Diseases, Type 1 & 2 Diabetes, and Metabolic Dysfunction-Associated Steatotic Liver Disease. Stanislava Rakusanová, Tomas Cajka (*Lab. Translat. Metab., Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S165**

Epitranscriptomic Regulations in the Heart. Daniel Benak, František Kolar, Marketa Hlavackova (*Lab. Dev. Cardiol., Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S185**

The Role of Cornichons in the Biogenesis and Functioning of Monovalent-Cation Transport Systems. Klára Papoušková, Karolína Černá, Viktorie Radová, Olga Zimmermannová (*Lab. Membrane Transport, Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S199**

Current Research

Mitochondrial Physiology of Cellular Redox Regulations. Petr Ježek, Andrea Dlasková, Hana Engstová, Jitka Špačková, Jan Tauber, Pavla Průchová, Eduardo Kloppel, Oleksandra Mozheitova, Martin Jabůrek (*Lab. Mitochondrial Physiol., Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S217**

Variability of Clinical Phenotypes Caused by Isolated Defects of Mitochondrial ATP Synthase. Kateřina Tauchmannová, Alena Pecinová, Josef Houštěk, Tomáš Mráček (*Lab. Bioenergetics, Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S243**

Adaptive Induction of Nonshivering Thermogenesis in Muscle Rather than Brown Fat Could Counteract Obesity. Kristina Bardova, Petra Janovska, Anna Vavrova, Jan Kopecky, Petr Zouhar (*Lab. Adipose Tissue Biol., Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S279**

Influence of Lipid Class Used for Omega-3 Fatty Acid Supplementation on Liver Fat Accumulation in MASLD. Isaiah Sabinari, Olga Horakova, Tomas Cajka, Mariusz R. Wieckowski, Martin Rossmeisl (*Lab. Adipose Tissue Biol., Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S295**

Circadian Disruption as a Risk Factor for Development of Cardiovascular and Metabolic Disorders – From Animal Models to Human Population. Alena Sumová, Martin Sládek (*Lab. Biol. Rhythms, Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S321**

Vascular Damage and Repair - Are Small-Diameter Vascular Grafts Still the “Holy Grail” of Tissue Engineering? Lucie Bačáková, Jaroslav Chlupáč, Elena Filová, Jana Musílková, Júlia Tomšů, Yu-Chieh Wu, Lucie Svobodová, Šimon Pražák, Antonín Brož (*Lab. Biomater. Tissue Eng., Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S335**

Hemodynamic Mechanisms Initiating Salt-Sensitive Hypertension in Rat Model of Primary Aldosteronism. Michal Pravenec, Petr Mlejnek, Miroslava Šimáková, Jan Šilhavý (*Lab. Genetics Model Dis., Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S365**

Gliflozins in the Treatment of Non-diabetic Experimental Cardiovascular Diseases. Ivana Vaněčková, Josef Zicha (*Lab. Exp. Hypertens., Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S377**

Muscarinic Receptors in Cardioprotection and Vascular Tone Regulation. Eva Dolejší, Alena Janoušková, Jan Jakubík (*Lab. Neurochem., Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S389**

Look for the Scaffold: Multifaceted Regulation of Enzyme Activity by 14-3-3 Proteins. Veronika Obsilova, Tomas Obsil (*Lab. Struct. Biol. Signal. Proteins, Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S401**

Disease-Associated Variants in GRIN1, GRIN2A and GRIN2B genes: Insights into NMDA Receptor Structure, Function, and Pathophysiology. Miloslav Korinek, Miriam Candelas Serra, Fatma Elzahraa S. Abdel Rahman, Mark Dobrovolski, Viktor Kuchtiak, Vera Abramova, Klevinda Fili, Eni Tomovic, Barbora Hrcka Krausova, Jan Krusek, Jiri Cerny, Ladislav Vyklicky, Ales Balik, Tereza Smejkalova (*Lab. Cell. Neurophysiol., Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S413**

Anandamide-Mediated Modulation of Nociceptive Transmission at the Spinal Cord Level. Diana Spicarova, Jiri Palecek (*Lab. Pain Res., Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S435**

Chemogenetic Tools and their Use in Studies of Neuropsychiatric Disorders. Markéta Neřoldová, Aleš Stuchlík (*Lab. Neurophysiol. Memory, Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S449**

Mathematical Models of Diffusion in Physiology. Jiří Janáček (*Lab. Biomathematics, Inst. Physiol Czech Acad. Sci, Prague, Czech Republic*) **S471**