



SEMMELWEIS UNIVERSITY

Department of Physiology

Acting Director

PROF. ATTILA MÓCSAI, MD, PhD, DSc

TDK topics (2022/23)

Topic	Supervisor
Physiology and pathophysiology of the ryanodine receptor	Dr. Almásy János assistant professor, PhD
Investigation of biased agonism of plasma membrane receptors	Dr. Balla András, associate professor, PhD
Investigation of small G proteins activation in vascular smooth muscle cells	Dr. Balla András, associate professor, PhD
Investigation of effects of angiotensin II in vascular smooth muscle cells	Dr. Balla András, associate professor, PhD
Role of oxidative-nitrative stress in the physiological and pathological processes of the cardiovascular system	Dr. Benkő Rita, assistant professor, PhD, Dr. Horváth Eszter Mária, associate professor, PhD
Investigation of TMEM175 lysosomal potassium channel	Dr. Czirják Gábor, associate professor, DSc
Investigation of TRESK background potassium channel regulation	Dr. Czirják Gábor, associate professor, DSc
Role of GTPase activating proteins in inflammatory diseases	Dr. Csépanyi-Kömi Roland, assistant professor, PhD
Investigation of the regulation of GTPase activating proteins	Dr. Csépanyi-Kömi Roland, assistant professor, PhD
Brain exposure under conditions of open heart surgery investigated by NIRS-based approaches	Dr. András Eke, associate professor, PhD, Dr. Péter Mukli, assistant lecturer, PhD
Investigation of the physiological underpinnings of breast tumor diagnosis by optical topography	Dr. András Eke, associate professor
Imaging of complex cerebral hemodynamics in neurological and cerebrovascular diseases	Dr. András Eke, associate professor, PhD
Human cognition and cognitive dysfunction assessed by fNIRS	Dr. András Eke, associate professor, PhD, Dr. Péter Mukli, assistant lecturer, PhD
Interpersonal synchronization of brain dynamics assessed by noninvasive imaging approaches	Dr. András Eke, associate professor, PhD, Dr. Péter Mukli, assistant lecturer, PhD
Investigating tissue damage induced inflammation	Dr. Enyedi Balázs, associate professor, PhD
Investigating signaling pathways and nuclear swelling associated to tissue damage	Dr. Enyedi Balázs, associate professor, PhD
Using novel fluorescent biosensors and optogenetic tools to investigate the sterile inflammatory response	Dr. Enyedi Balázs, associate professor, PhD

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Function and regulation of the two pre-domain (K2P) potassium channels	Dr. Enyedi Péter, full professor, DSc
Potassium channels in the vessels of the pulmonary circulation	Dr. Enyedi Péter, full professor, DSc; Dr. Almássy János assistant professor, PhD
Deciphering the molecular mechanisms underlying osteoclast activation during bone metastasis formation	Dr. Dávid Győri, assistant professor, PhD
Role of HCN channels in the regulation of vascular and endocrine function	Dr. Horváth Eszter Mária, associate professor, PhD
Oxidative-nitrative stress and poly(ADP-ribose) polymerase activation in diabetes mellitus and insulin resistance; especially in the development of late complications	Dr. Horváth Eszter Mária, associate professor, PhD, Dr. Benkő Rita, assistant professor, PhD
The role of poly(ADP-ribose) polymerase in the animal model of Crohn's disease	Dr. Horváth Eszter Mária, associate professor, PhD, Dr. Benkő Rita, assistant professor, PhD
The role of inositols in the reduction of insulin resistance and oxidative-nitrative stress	Dr. Horváth Eszter Mária, associate professor, PhD
Investigation of nephrogenic diabetes insipidus causing mutations	Dr. Hunyady László full professor, Member of the Hungarian Academy of Sciences
Investigation of disease causing mutations of V2 vasopressin receptor	Dr. Hunyady László, full professor, Member of the Hungarian Academy of Sciences
Investigation of angiotensin II induced gene-expression changes	Dr. Hunyady László, full professor, Member of the Hungarian Academy of Sciences; Dr. Balla András, associate professor, PhD
Studying the organ-specific development and function of the lymphatic vasculature	Dr. Zoltán Jakus, associate professor, PhD
Molecular basis of the circadian control	Dr. Káldi Krisztina, associate professor, PhD
Establishing methods for the investigation of protein-protein interactions in the regulation of the circadian clock	Dr. Káldi Krisztina, associate professor, PhD
Daily rhythm of phagocyte responses	Dr. Káldi Krisztina, associate professor, PhD, Dr. Ella Krisztina, assistant professor, PhD
Investigation of interactions between metabolism and circadian rhythm	Dr. Káldi Krisztina, associate professor, PhD, Dr. Ella Krisztina, assistant professor, PhD
Role of the circadian clock in the control of immune cells	Dr. Káldi Krisztina, associate professor, PhD, Dr. Ella Krisztina, assistant professor, PhD
The physiological and pathophysiological role of hydrogen sulfide in the cardiovascular system	Dr. Kiss Levente, associate professor, PhD
Molecular mechanisms in osteoclast function and bone resorption	Dr. Mócsai Attila, full professor, Corresponding Member of the Hungarian Academy of Sciences
Examination of signal transduction pathways using genetically modified (knockout) mice	Dr. Mócsai Attila, full professor, Corresponding Member of the Hungarian Academy of Sciences

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Examination of autoimmun inflammatory diseases in transgenic mice	Dr. Mócsai Attila, full professor, Corresponding Member of the Hungarian Academy of Sciences
Identification of new therapeutic targets in inflammatory diseases	Dr. Mócsai Attila, full professor, Corresponding Member of the Hungarian Academy of Sciences
Biomechanical and pharmaco-physiological control mechanisms in coronary vessels	Dr. Nádas György, associate professor, PhD
Adaptation of the venous system to gravitational stress	Dr. Nádas György, associate professor, PhD
Biomechanics of the human aneurysm sack	Dr. Nádas György, associate professor, PhD
Biomechanical and pharmaco-physiological control mechanisms in experimental hypertension	Dr. Nádas György, associate professor, PhD, Dr. Kollai Márk, professor emeritus, DSc
Investigation of NADPH oxidase 4 & 5 function in genetically modified animals	Dr. Petheő Gábor, associate professor, PhD
Function of the cytosolic/mitochondrial Ca ²⁺ and mitochondrial NAD(P)H system	Dr. Spät András, professor emeritus, Member of the Hungarian Academy of Sciences
Mitochondrial Ca ²⁺ and cAMP signalling	Dr. Spät András, professor emeritus, Member of the Hungarian Academy of Sciences, Dr. Szanda Gergő, associate professor, PhD
Computational analysis of the oncogenic role of G-Protein Coupled Receptors	Dr. Szalai Bence, assistant professor, PhD
Bioinformatic analysis of drug sensitivity in tumor cell lines	Dr. Szalai Bence, assistant professor, PhD
Intracellular interactions of metabolic regulators	Dr. Szanda Gergő, associate professor, PhD
Alteration of neutrophil functions in sepsis	Dr. Timár Csaba, assistant professor, PhD
Characterization of the surface of neutrophil-derived extracellular vesicles	Dr. Timár Csaba assistant, professor, PhD
Investigation of the cellular functions of inositol lipids	Dr. Tóth Dániel, assistant professor, PhD, Dr. Várnai Péter full professor, DSc
Investigation of phosphoinositide metabolism by acutely inducible enzyme degradation	Dr. Tóth Dániel, assistant professor, PhD, Dr. Várnai Péter full professor, DSc
Evaluation of decisive factors for the signaling efficacy of GPCRs	Dr. Turu Gábor, associate professor, PhD, Dr. Tóth András, research fellow, PhD
Regulation of the signal transduction through beat-arrestins	Dr. Turu Gábor, associate professor
Development of methods for altering intracellular inositol lipid levels	Dr. Várnai Péter, full professor, DSc
Development of molecular tools for detecting intracellular inositol lipids	Dr. Várnai Péter, full professor, DSc

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