SEMMELWEIS UNIVERSITY
Department of Physiology

Acting Director
PROF. ATTILA MÓCSAI, MD, PhD, DSc

TDK topics (2021/22)

Topic	Supervisor
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, PhD
Investigation of TRESK background potassium channel regulation	Dr. Czirják Gábor, associate professor, PhD
Role of GTPase activating proteins in inflammatory diseases	Dr. Csépányi-Kömi Roland, assistant professor, PhD
Investigation of the regulation of GTPase activating proteins	Dr. Csépányi-Kömi Roland, assistant professor, PhD
Multifractality in physiological processes	Dr. Eke András, associate professor, PhD
Imaging of complex cerebral hemodynamics in neurological and cerebrovascular diseases	Dr. Eke András, associate professor, PhD
Human cognition and cognitive dysfunction assessed by fNIRS	Dr. Eke András, associate professor, PhD, Dr. Mukli Péter, assistant lecturer, PhD
Interpersonal synchronization of brain dynamics assessed by noninvasive imaging approaches	Dr. Eke András, associate professor, PhD, Dr. Mukli Péter, assistant lecturer, PhD
Investigating tissue damage induced inflammation	Dr. Enyedi Balázs, associate professor, PhD
Investigating signaling pathways and nuclear swelling associeted to tissue damage	Dr. Enyedi Balázs, associate professor, PhD
Using novel fluorescent biosensors and optogenetic tools to investigate the steril inflammatory response	Dr. Enyedi Balázs, associate professor, PhD
Structure, function and regulation of the two pre-domain (K2P) potassium channels	Dr. Enyedi Péter, full professor, DSc
Dechipering the molecular mechanisms underlying osteoclast activation during bone metastasis formation	Dr. Dávid Győri, assistant 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

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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. Jakus Zoltán, 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 role of hydrogen sulfide in the regulation of vascular tone	Dr. Kiss Levente, associate professor, PhD, Dr. Dongó Eleni PhD-Student
Examination of heritablity of microvascular endothelial function	Dr. Kollai Márk, professor emmeritus, DSc, Dr. Cseh Domonkos assistant lecturer
Identification of receptors and signaling pathways in production of antibacterial exptracellular vesicles	Dr. Ligeti Erzsébet, professor, Member of the Hungarian Academy of Sciences
Alteration of neturophil functions in pathologic conditions	Dr. Ligeti Erzsébet, professor, Member of the Hungarian Academy of Sciences
Characterization of extracellular vesicles generated from neutrophilic granulocytes	Dr. Ligeti Erzsébet, professor, Member of the Hungarian Academy of Sciences, Dr. Kolonics Ferenc, assistant research fellow, PhD
Clinical diagnostic approaches based on flow cytometry	Dr. Lőrincz Márton Ákos, research fellow, PhD
Molecular mechanisms in octeoclast function and bone resorption	Dr. Mócsai Attila, full professor, DSc
Examination of signal transduction pathways using genetically modified (konckout) mice	Dr. Mócsai Attila, full professor, DSc
Examination of autoimmun inflammatory dieases in transgenic mice	Dr. Mócsai Attila, full professor, DSc
Identification of new therapeutic targets in inflammatory diseases	Dr. Mócsai Attila, full professor, DSc

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Investigating brain network dynamics and cognitive performance during mental stress by electroencephalographic measurements and cognitive stress	Dr. Mukli Péter, assistant lecturer, PhD, Dr. Orestis Stylianou
Biomechanical and pharmaco-physiological control mechanisms in coronary vessels	Dr. Nádasy György, associate professor, PhD
Adaptation of the venous system to gravitational stress	Dr. Nádasy György, associate professor, PhD
Biomechanics of the human aneurysm sack	Dr. Nádasy György, associate professor, PhD
Biomechanical and pharmaco-physiological control mechanisms in experimental hypertension	Dr. Nádasy György, associate professor, PhD, Dr. Kollai Márk, professor emmeritus, DSc
Investigation of NADPH oxidase 4 & 5 function in genetically modified animals	Dr. Petheő Gábor, associate professor, PhD
Function of the cytosolic/mitochondrial Ca2+ and mitochondrial NAD(P)H system	Dr. Spät András, professor emeritus, Member of the Hungarian Academy of Sciences
Mitochondrial Ca2+ 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 netrophil-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
Automatized classification of mental state using entropy-based measures and machine learning	Dr. Frigyes Samuel Racz, assistant lecturer, PhD
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
Regulation of ARHGAP25 protein	Dr. Wisniewski Éva, assistant lecturer

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