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Abstract Book

CoMBoS2

2nd Congress of Molecular Biologist of Serbia

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WELCOME SPEECH



Professor Dušanka **Savić-Pavićević** President of the Serbian Society for Molecular Biology



Dr. Melita **Vidaković** President of the Steering Committee of the Serbian Society for Molecular Biology

Dear colleagues and friends,

On behalf of the Serbian Society for Molecular Biology (MolBioS), we warmly welcome you to Belgrade for the Second Congress of Molecular Biologists of Serbia (CoMBoS2).

The congress is gathering almost 250 participants from 13 countries (Sweden, United Kingdom, Italy, Switzerland, USA, Australia, Hungary, Czech Republic, Romania, Montenegro, Croatia, Bosnia and Herzegovina, and Serbia).

The program covers various fields of Molecular Biology, including Molecular Biomedicine, Molecular Biotechnology and Molecular Cell Biology, and consists of plenary and invited lectures, the MolBioS award winner lecture, poster sessions and the project corner. Special attention is paid to students and young scientists through the MolBioS Student Session, flash presentations and workshops on state-of-the-art molecular biology methods.

We wish you to be inspired by exciting and outstanding lectures given by renowned scientists and experts, exchange ideas, find opportunities for new collaborations, and have good fun.

WELCOME TO



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Serbian Society for Molecular Biology (MolBioS)



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MolBioS is committed to preserving the memory of the great Serbian scientists who paved the way for fruitful research and education in Molecular Biology in Serbia.

CoMBoS2 is dedicated to our outstanding teachers and great scientists

Professor **Ana Savić** (1936-2022) and Professor **Vladimir Glišin** (1930-2020)





Professor Ana Savić (left photo) and Professor Vladimir Glišin (right photo) and the first-generation students of the study program Molecular Biology and Physiology May 1975, Kotor, Yugoslavia



Award **Winner**

For achievements in the field of Molecular Biology and contribution to its development and promotion in Serbia

Academician **Milena Stevanović** graduated Molecular Biology and Physiology in 1983 at Faculty of the Natural Sciences at the University of Belgrade. She received M.Sc in Molecular Biology and Biochemistry in 1986 and Ph.D. in Biological Sciences in 1990 at the University of Belgrade. She received first post-doctoral training in human molecular genetics at the Imperial Cancer Research Fund (UK) from 1991-1992 and second in Genetics Department at the Cambridge University (UK) from 1992-1994. After returning to Serbia, she become a group leader by founded the Laboratory for Human Molecular Genetics at the Institute for Molecular Genetics and Genetic Engineering, which she has been leading since 1994. Since 1999 she has been participating in the teaching activities and in 2017 she became Full Professor in the field of Biochemistry and Molecular Biology at the Faculty in Biology, University of Belgrade. In 2009 she was elected as corresponding and then in 2015 as a full member of Serbian Academy of Sciences and Arts.

She has performed seminal work on cloning and first characterization of human SOX genes and she has continued research by studying the roles of SOX genes in maintaining pluripotency, cell fate determination, differentiation and oncogenesis. Currently, she is leading the EU funded project STREAMLINE focused on neurodevelopmental disorders (NDDs) in patients with 22q11.2 microdeletion syndrome and development of modern technologies for modelling NDDs using induced pluripotent stem cells and organoids.

She has been principal investigator on 17 projects (10 national and 7 international) and she has published more than 100 papers in peer reviewed journals.

Milena **Stevanović**

Adrian J Harwood



Adrian J Harwood is Co-Director of Cardiff University's Neuroscience and Mental Health Innovation Institute (NMHII), a multidisciplinary research centre of neuroscientists, psychologists, human geneticists, and clinicians. His research studies patient derived and CRISPR-engineered induced pluripotent stem cells (iPSCs) to study psychiatric disorders, including those associated with Rare Genetic Syndromes. These activities include projects with the pharmaceutical industry and the founding of MeOmics, a university spinout company based on large-scale patient iPSC-based neuronal assays. He chairs MINDDS, a research network to bring together European researcher in the NDD, and currently Chairs MINDDS-connect, which aims to develop a federated data platform for building patient meta-cohorts of CNV carriers with an associated NDD.

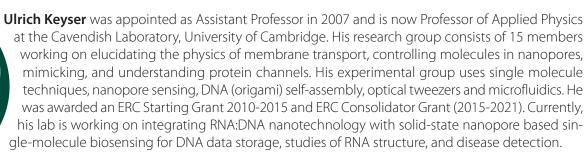
Radoje (Rade) **Drmanac**

Radoje (Rade) Drmanac is one of the founders of the field of Genomics and serial inventor including the process of massively parallel sequencing (MPS) using DNA nanoarrays. Currently he is CSO at Complete Genomics, Inc. (CGI) he co-founded in 2005 in Silicon Valley for efficient whole genome sequencing using DNBSEQ, an advanced MPS technology based on PCR-free DNA nanoballs, and LFR/stLFR, a MPS co-barcoding technology for haplotype phasing (Science 2010, Nature 2012, Genome Research 2015, Genome Research 2019). CoolMPS is his latest MPS invention where base-specific antibodies read DNA sequence (BioRxiv 2020).

CGI was acquired by BGI (China) in 2013 and Dr. Drmanac now serves as CSO of MGI, a life-science tool spinout from BGI. MGI/CGI is first to sequence human genome for \$100 in 2020. Earlier, he cofounded Callida Genomics in 2001 to advance MPS and Hyseq (1994) to discover novel genes. Prior to that he was a group leader at Argonne National Labs (1991-1994) within HGProject and postdoc (1989-

1990) in ICRF (London). He started his career at the Center for Genetic Engineering (IMGGI) in Serbia (1982-1988). He received Ph.D. 1988 in Molecular Biology at Belgrade University for the first MPS technology (Science 1993, Scientia Yugoslavica 1990, Genomics 1989) and BS in Molecular Biology and Biochemistry in 1981.

Ulrich Keyser



Web: www.keyserlab.org

Snežana Maljević

Snežana Maljević is a molecular neuroscientist and ion channel physiologist with a strong focus on ion channels and other genes linked to epileptic disorders. She studied Molecular Biology and Physiology at the University of Belgrade before pursuing a PhD at the University of Ulm in Germany. Following her doctoral studies, she embarked on postdoctoral training and later became a Junior Group leader at the Hertie Institute for Clinical Brain Research in Tübingen. In 2015, the Australian Government awarded Snezana an Endeavour Research Fellowship, which allowed her to join The Florey Institute as a visiting researcher. This led to her recruitment to the Florey in 2016 where she currently leads a team of 20 researchers focusing on the development of stem cell disease models and antisense oligonucleotide therapies. Snezana's ultimate goal is to translate her research findings into novel and effective treatments for patients suffering from epilepsy and related conditions.

Biljana Ristić

Biljana Ristić is a Research associate at Institute for Medical Research, University of Belgrade. She obtained a PhD degree in Molecular Medicine at Faculty of Medicine, University of Belgrade studying the antioxidant, photodynamic cytotoxic and antibacterial effects of graphene quantum dots nanoparticles (GQD) in human glioma cells and antibiotic-resistant bacteria. Dr Ristić was awarded by the "Stanka Romac Foundation - FOSTAR" prize for the best PhD dissertation in human molecular genetics and biomedicine in 2018. Her research interests are mainly focused on the examination of biological activity of various nanoparticles and their potential applications in nanomedicine. A significant part of her research included examination of autophagy regulation and role in cancer therapy, nutrient deprivation, neurodegenerative and infective diseases. She is a member of the FENS, FEBS, MolBios, ISOS. Dr Ristić is an author/co-author of 22 SCI-indexed articles with 1054 citations and an h-index 12 (Scopus; July 5, 2023).

Stojan Perić

Stojan Perić is employed at the Department for Neuromuscular Disorders of the Neurology Clinic, University Clinical Center of Serbia. He is engaged as a teaching assistant at the Faculty of Medicine, University of Belgrade. Dr Perić defended his doctoral thesis on myotonic dystrophy type 1. Main field of his clinical and scientific work are muscular dystrophies and other myopathies, neuromuscular junction diseases, acquired and inherited polyneuropathies, as well as motor neuron diseases. He has published more than 120 scientific papers. His h-index is 21. He is a member of the Editorial Board of the Journal of the Peripheral Nervous System. He is the winner of the Bruce Schoenberg Award of the American Academy of Neurology for 2015. Dr Perić is a member of the European Academy of Neurology and co-chair of the EAN Panel for Neuropathies. He is a co-chair of the global Myotonic Dystrophy Registry.

Gabriele Stocco

Gabriele Stocco has been an Associate Professor of Pharmacology at the University of Trieste since 2019 and Clinical Pharmacology manager at the Institute for Maternal and Child Health I.R.C.C.S. Burlo Garofolo, Trieste since 2023. He graduated with honors in Pharmaceutical Chemistry and Technology from the University of Trieste and received his Ph.D. in Pharmacology from the same university. He completed postdoctoral training at the St. Jude Children's Hospital in Memphis, USA, in the laboratory of Prof. Evans from 2006 to 2011. His scientific activity is evidenced by more than 120 publications in international scientific journals and numerous presentations at national and international conferences. Dr. Stocco is a member of the Italian Society of Pharmacology and the American Society for Clinical Pharmacology and Therapeutics. Research activity is focused on translational studies on pharmacogenomics and personalization of therapy with antimetabolites, glucocorti-

coids and biologics used in chronic pediatric and oncological diseases, in particular chronic inflammatory bowel disease, acute lymphoblastic leukemia and juvenile idiopathic arthritis.

Branka Zukić

Branka Zukić is a Full Research Professor, head of the Group for Molecular Biomedicine at the Institute of Molecular Genetics and Genetic Engineering, University of Belgrade. She received her PhD in Molecular Biology from the University of Belgrade in 2010. Branka Zukić has over 20 years' experience in biomedical research of various diseases, with the focus on individualization of the therapy of childhood acute lymphoblastic leukemia. Her expertise includes the identification and validation of pharmacogenomic and pharmacotranscriptomic markers of response and adverse reactions to drugs. She is adept at designing and conducting translational research, using different traditional and state of the art molecular biology techniques and bioinformatics tools. She has published more than 50 research papers cited for more than 1000 times. Branka Zukić is currently a principal investigator of a HORIZON Europe funded project dedicated to pharmacogenomics at the Western Balkan region.

Mariagrazia Di Luca

Mariagrazia Di Luca is a Microbiologist. She got her PhD in "Microbiology and Genetics" (University of Pisa) in 2010. Then, she became Specialist in "Microbiology and Virology" in 2015 working on biofilms associated to chronic rhinosinusitis. In 2016 she joined Trampuz' group at Charité University Medicine Berlin as responsible for the scientific management of the Biofilm Research Lab working on phage therapy for treating prosthetic joint infections. Since June 2018 Dr Di Luca has been appointed as Assistant Professor at Biology Department of University of Pisa establishing the Phage&Biofilm Lab. Her current research interests include medical biofilms, the development of alternative strategies to target sessile bacteria, in vitro studies on the antibacterial activity of new drugs, bacteriophage-bacteria interaction and bacteriophage therapy. Furthermore, she is a founder member of the Italian Group of Viruses of Microbes and she is supporting infectious diseases doctors to develop phage therapy in Italy.

Nataša Skoko

Nataša Skoko graduated in Molecular Biology and obtained MSc degree in Molecular Biology and Biochemistry in 2002 at the University of Belgrade. From 2003 to 2006 she was a research fellow in the Molecular Pathology Laboratory at the ICGEB, Trieste working on the molecular mechanisms of pre-mRNA splicing in health and desease and obtained a PhD degree in 2006. From 2006 to 2017 she worked as a research scientist in the Biotechnology Development Unit (BDU) at the ICGEB on the development of biosimilars such as erythropoietin, GCSF, insulin, growth hormone using bacteria, yeast and mammalian cells expression systems. Since 2018 Dr. Skoko is a Head of the BDU and her current interest is focused at development of biosimilars to monoclonal antibodies. Dr. Skoko works in close collaboration with the industrial sector by coordinating the transfer of know-how for the production of biosimilars with aim to increase local pharmaceutical industries capacities in emerging markets. Over the past decade, BDU concluded over 70 collaboration agreements with industrial partners and has trained more than 150 scientists from 22 countries.

Ivica Dimkić

Ivica Dimkić is the group leader of the Microbial Biotechnology Group at the Department of Biochemistry and Molecular Biology (FBUB), and his current interest is in developing microbial solutions for sustainable agriculture. His team works with beneficial bacteria and has complementary expertise in biotechnology and collaboration with industrial partners. As a project leader, he has been involved in international, bilateral and national projects, including leading several R&D sector projects for the needs of companies and other institutions, and he is the founder of the startup company BioCombact. In addition to plenary and guest lectures at scientific congresses, he has lectured at various institutions and has been involved in reviewing numerous scientific papers and projects. He has published 170 bibliographic records, including 70 scientific papers (> 1600 citations, Hirsch index 20, cumulative IF > 200).

Nemanja Mirković

Nemanja Mirković was born on 12/06/1982 in Belgrade. In 2008, he graduated from the Faculty of Agriculture, University of Belgrade with a degree in Food Technology. In 2016, he defended his dissertation at the Faculty of Agriculture, University of Belgrade, obtaining the title of Doctor of Science - Technological Engineering. From 2011 to 2013, he worked at the Institute of Hygiene and Meat Technology in Belgrade and from 2013 to 2017 at the Faculty of Agriculture, University of Belgrade. From 2017 to 2019, he was employed at the Institute of Molecular Genetics and Genetic Engineering in Belgrade. In 2019, he was hired as a teaching assistant at the Faculty of Agriculture in Belgrade at the Department of Food Microbiology. In 2020, he was elected Assistant Professor at the Department of Food Microbiology, and in 2023 he was appointed Assistant Professor at the Department of Food Microbiology. Dr. Nemanja Mirković was involved in the implementation of 7 projects, in-

cluding two national, three international and two projects of the Science Fund of the Republic of Serbia. Dr. Nemanja Mirković published and communicated a total of 67 scientific papers, including one PhD thesis. According to the data from SCOPUS, the total number of citations was 206, excluding self-citations, and the h-index was 10.

Jelena Lozo

Jelena Lozo is a full professor at the Chair of Biochemistry and Molecular Biology, University of Belgrade - Faculty of Biology. So far she has published 50 scientific papers in international journals, and she is a co-author on one university textbook and one student handbook. Her papers have been cited over 1000 times, and the h-index is 18 (according to the Scopus database). She is engaged in research in the field of interaction between microorganisms and plants from the point of view of biological control in the broadest sense, with special emphasis on the study of bacteria that promote plant growth and help them overcome the effects of drought as abiotic stress. The biochemical and genetic characterization and the determination of the mechanisms of action of antimicrobial compounds with protein character, bacteriocins, is also a scientific field in which she is active. She participates in several international and national scientific projects, is a reviewer for leading scientific journals in various fields of microbiology, is an associate editor of the journal BMC Microbiology and is a

member of the Editorial Board of the Archive of Biological Science. She is one of the founders of the Serbian Society for Molecular Biology.

Jasmina Nikodinović-Runić

Jasmina Nikodinović-Runić is a full research professor, and an Eco-biotechnology and Drug Development group leader at the Laboratory for Microbial Molecular Genetics and Ecology, Institute of Molecular Genetics and Genetic Engineering, University of Belgrade. She conducts research in the field of molecular genetics of bacteria, directs the evolution of enzymes, isolates and characterizes novel biocatalysts, converts petrochemical plastic monomers to biopolymers (PHA), and works on biotechnological process optimizations. Her research interests include microbial biotechnology, biocatalysis, bacterial bioactive secondary metabolites, and novel bio-materials. The group is active in eco-green molecular biotechnologies and in the design and optimization of bioactive molecules. She has co-authored 180 scientific articles, 3 book chapters and holds 5 patents in the field of biotechnology.

Tomasz Jurkowski

Tomasz Jurkowski studied Molecular Biology at Warsaw University (PL) (1999-2004). He did his MSc thesis in the laboratory of Dr Janusz Bujnicki (IIMCB, PL) and Dr Monika Radlinska (Warsaw University, PL). Afterwards, he joined the group of Dr Albert Jeltsch at Jacobs University Bremen for his doctoral training, which he completed in 2008. After 4 years of post-doctoral training at Jacobs University in 2012, he joined the Faculty of Chemistry at the University of Stuttgart as a Junior Professor in Biochemistry and Molecular Epigenetics. In 2019 he joined Cardiff University as Senior Lecturer in Mammalian Systems and in 2022 was promoted to Reader. His group employs an interdisciplinary, modular approach to dissect the chromatin networks responsible for establishing and maintaining the epigenetic signals.

Urs Albrecht

Urs Albrecht studied Biochemistry at the University of Zürich and subsequently did a PhD in Molecular and Cellular Biology at the University of Bern, working on RNA splicing and studying polyDNA viruses in a parasitic wasp. In 1993 he joined the Department of Biochemistry at Baylor College of Medicine, Houston, Texas, USA, where he performed seminal work on circadian clock genes in humans and mice that earned him a position as Assistant Professor. In 1999 he joined the Max-Planck Institute for experimental Endocrinology in Hannover, Germany, where he established his research group working on circadian clocks. He returned to Switzerland in 2001 as Associate Professor to the Department of Biochemistry at the University of Fribourg where he still leads a research group as full Professor. His research interests are centered around the question how different tissue clocks adjust to environmental cues and how the brain integrated this information to produce coherent systemic and metabolic rhythms.

Matej Orešič

Matej Orešič holds a PhD in biophysics from Cornell University (1999; Ithaca, NY, USA). He is professor of medicine, with specialization in systems medicine at Örebro University (Sweden) and a group leader in systems medicine at the University of Turku (Finland). Prof. Orešič's main research areas include exposomics and metabolomics applications in biomedical research and systems medicine. He is particularly interested in the identification of environmental exposures (exposome) and disease processes associated with different metabolic phenotypes and the underlying mechanisms linking these processes with the development of specific disorders or their co-morbidities. Prof. Orešič also initiated the popular MZmine open-source project, which led to the development and release of popular software for metabolomics data processing. As of 2016, he was made a Lifetime

Honorary Fellow of the Metabolomics Society. Prof. Orešič currently serves as member of the Board of Directors of the Metabolomics Society and is one of the founders of the Nordic Metabolomics Society, previously serving as its chair of the board. In 2019, he co-chaired the 1st Gordon Research Conference on 'Metabolomics and Human Health' (Ventura, CA, USA). Previously, he also chaired the Keystone Symposium on Systems Biology of Lipid Metabolism (2015; Breckenridge, CO, USA).

Tatjana S. Kostić

Tatjana S. Kostić, Ph.D., is a Professor of Animal Physiology at the Faculty of Sciences, University of Novi Sad. She concurrently heads the Department of Animal Physiology and leads the Laboratory for Chronobiology and Aging (https://www.dbe.uns.ac.rs/nauka/laboratorije/chronage/). Tatjana is also a founder and active participant in the Accredited Center of Excellence for Reproductive Endocrinology and Signaling, as well as a member of the Laboratory for Reproductive Endocrinology and Signaling. Tatjana Kostić obtained her Ph.D. degree in Biology at the University of Novi Sad and furthered her expertise as a visiting fellow at the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), National Institutes of Health (NIH), USA, from 1999 to 2002. She commenced her career as an Assistant at the Department of Biology and Ecology, Faculty of Sciences, University of Novi Sad and now holds the position of Full Professor at the same institution. Tatjana's teaching portfolio spans Animal Physiology, Cellular Signaling, Molecular and Cellular Im-

munology, Reproductive Physiology/Endocrinology, and Chronobiology, which she imparts at the Bachelor's, Master's, and Ph.D. levels. With a robust focus on Cellular Signaling, Reproductive Endocrinology, Circadian Rhythms, Stress, and Aging, Tatjana's research output includes over 60 peer-reviewed papers. Her contributions have resulted in a h-index of 24 and a citation count of over 1477 in the SCOPUS.

Đorđe Miljković

Dorđe Miljković is a research professor (from 2008) at the Institute for Biological Research "Siniša Stanković", University of Belgrade, where he is the head of the Department of Immunology (appointed in 2015) and leader of the Group for Neuroimmunology (from 2010). He obtained his PhD in immunology at the University of Belgrade in 2002. His main research interest is in autoimmunity, multiple sclerosis in particular. His recent and ongoing projects: Cellular and molecular mechanisms of recovery of rats from experimental autoimmune encephalomyelitis, Characterization of cell death mechanisms in the central nervous system of rats suffering from experimental autoimmune encephalomyelitis, Human gut microbiota transfer for novel insights into central nervous system autoimmunity pathogenesis, The role of gut microbiota and gut immune cells in the CNS-directed autoimmunity induced in rats without the use of the complete Freund's adjuvant, Modulation of gut ILC3 by a FFAR2 agonist for the treatment of autoimmune diseases.

Aleksandra Uskoković

Aleksandra Uskoković is employed as Principle Research Fellow at the Department of Molecular Biology, Institute for Biological Research, University of Belgrade. She graduated from Department of Biochemistry, Faculty of Chemistry, University of Belgrade, completed her MA thesis at the same faculty and obtained her PhD degree at the Faculty of Biology, University of Belgrade. Aleksandra Uskoković has published over 60 papers in scientific journals with high impact factors. Besides national projects, she participated in the Project of 7th Framework Programme of European Commission (Globaqua) and in several COST actions being a part of management comities. Her scientific interests are focused on the basic mechanisms of DNA demethylation with emphasis on the regulation of TET activity, manipulation of the process of DNA (de)methylation and epigenetic regulation of gene expression in the treatment of diabetes and cancer.

Danijela Mišić

Danijela Mišić is the Principal Research Fellow at the Dpt. of Plant Physiology of the Institute for Biological Research "Siniša Stanković" - National Institute of the Republic of Serbia, University of Belgrade. After earning the PhD degree (2009) at the University of Belgrade- Faculty of Biology, she was a postdoctorate fellow at the Wageningen University, The Netherlands (2011-2012). She was a fellow of "Norman Borlaug Fellowship" sponsored by U.S. Department of State (USDA) (2005), and a PIFI fellow of the Chinese Academy of Sciences (CAS) (2019). Danijela is a PI of the multidisciplinary research group working in the area of plant sciences, and covering fields of plant physiology, plant specialized metabolism, plant stress physiology, plant molecular biology, functional genomics, metabolic engineering, biodiversity and conservation, plant-biotic interactions, and plant genetics. The group currently numbers 16 permanent members, and is especially devoted to the investigation of biol-

ogy, chemistry, ecology and biotechnology of iridoids- and phenolics-rich plant species.

Abstracts

CORRELATIONS OF CDKN1A AND ADAM17 EXPRESSION WITH A CHANGE OF LEFT VENTRICULAR REMODELING ECHOCARDIOGRAPHIC PARAMETERS IN PBMC OF PATIENTS SIX MONTHS AFTER THE FIRST MYOCARDIAL INFARCTION

Jovana Kuveljic,¹ Ivan Zivotic,¹ Milica Dekleva,² Maja Zivkovic,¹ Tamara Djuric¹

¹Laboratory for Radiobiology and Molecular Genetics, "Vinca" Institute of Nuclear Sciences, National Institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia;

²Faculty of Medicine, University of Belgrade, Belgrade, Serbia

Introduction: Myocardial infarction (MI) and consequential ischemia with cardiomyocyte loss are followed by left ventricular (LV) remodeling. LV remodeling is crucial process for cardiac function preservation, although when prolonged it can become maladaptive and lead to impaired systolic function and further cardiovascular complications. Echocardiographic parameters are used as a measure of LV structure and function. *ADAM17* (a disintegrin and metalloprotease domain) and *CDKN1A* (cyclindependent kinase inhibitor 1A) have shown regulating role in DNA repair, inflammation, remodeling and fibrosis. The aim of this preliminary study was to investigate the potential effect of *CDKN1* and *ADAM17* mRNA in post MI heart remodeling.

Methods: Sixty four patients with the first MI were prospectively followed-up 6 months after MI. Change (Δ) of echocardiographic parameters within 6 months was calculated as a difference between the value at 6-month follow-up and value at admission. Relative gene expression was detected using the TaqMan® technology. Statistical analyses were done by Statistica 8 software.

Results: We have observed correlation between *CDKN1A mRNA* expression and change of LV end-diastolic diameter (Δ LVEDD, R=0.3, p=0.01) and LV end-systolic diameter (Δ LVESD, R=0.3, p=0.02), but not with LV ejection fraction and stroke volume. *ADAM17* expression was not in correlation with analyzed parameters of LV remodeling. However, *CDKN1A* and *ADAM17* mRNA expression in PBMC six months after MI were positively correlated (R=0.6, p<0.001).

Conclusion: Preliminary results suggest that *CDKN1* has a role in post MI LV remodeling, correlating with changes in echocardiographic parameters of LV structure. The validation on a larger sample size is required.

Key words: myocardial infarction; LV remodeling; CDKN1A; ADAM17; gene expression

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