



Trends in **Molecular Biology** • Special issue

Abstract Book

CoMBoS2

2nd Congress of Molecular Biologist of Serbia

Belgrade • 2023

ISBN-978-86-82679-15-8



**CoMBoS2 – the Second Congress of Molecular Biologists of Serbia,
Abstract Book – Trends in Molecular Biology, Special issue**

06-08 October 2023, Belgrade, Serbia

Online Edition

<https://www.imgge.bg.ac.rs/lat/o-nama/kapacitet-i-oprema/istrazivacka-delatnost>

<https://indico.bio.bg.ac.rs/e/CoMBoS2>

IMPRESSUM

PUBLISHER:

**Institute of Molecular Genetics and Genetic Engineering (IMGGE),
University of Belgrade**

FOR THE PUBLISHER:

Dr. Sonja **Pavlović**

EDITOR:

Dr. Zorana **Dobrijević**

EDITORIAL REVIEW BOARD:

Prof. Dr. Silvana **Andrić**

Dr. Valentina **Ćirković**

Dr. Ivica **Dimkić**

Prof. Dr. Branko **Jovčić**

Prof. Dr. Gordana **Matić**

Ass. Prof. Dr. Milena **Milutinović**

Dr. Aleksandra **Stanković**

Dr. Nemanja **Stanisavljević**

Dr. Maja **Stoiljković**

EDITOR IN CHIEF:

Prof. Dr. Dušanka **Savić-Pavićević**

DESIGN:

Ivan **Strahinić**

All rights reserved

Institute of Molecular Genetics and Genetic Engineering (IMGGE),

University of Belgrade

Belgrade, 2023

ISBN 978-86-7078-173-3

© Copyright 2023 by Institute of Molecular Genetics and Genetic Engineering (IMGGE), University of Belgrade
Belgrade • 2023

Content

Welcome speech 4

Congress Organizers 5

MolBioS Award Winner 9

Plenary speakers 10

Session plenary speakers

- MOLECULAR BIOMEDICINE 11
- MOLECULAR BIOTECHNOLOGY 13
- MOLECULAR MECHANISMS OF CELL FUNCTIONS 16

Abstracts

• Session PLENARY LECTURES 20

• Session MOLECULAR BIOMEDICINE 25

PLENARY LECTURES 26

INVITED LECTURES 31

POSTERS 38

Session MOLECULAR BIOTECHNOLOGY 100

PLENARY LECTURES 101

INVITED LECTURES 107

POSTERS 112

• Session MOLECULAR MECHANISMS OF CELL FUNCTIONS 126

PLENARY LECTURES 127

INVITED LECTURES 134

POSTERS 139

• MolBioS Student Session 157

Project Corner 182

Congress Friends 190

Sponsors 191

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



CONGRESS ORGANIZERS



Serbian Society for Molecular Biology (MolBioS)



University of Belgrade, Institute for
Biological Research "Siniša Stanković",
National Institute of the Republic of Serbia



University of Belgrade,
Faculty of Biology



University of Belgrade, Institute of Molecular
Genetics and Genetic Engineering



University of Belgrade,
Institute of Nuclear Sciences "Vinča",
National Institute of the Republic of Serbia



University of Novi Sad, Faculty of Sciences,
Department of Biology and Ecology



University of Kragujevac, Faculty of Science,
Department of Biology and Ecology



University of Belgrade,
Institute for Medical Research,
National Institute of the Republic of Serbia

CONGRESS COMMITTEES

HONORARY COMMITTEE

Jelena **BEGOVIĆ**

Minister of Science, Technological Development
and Innovations of the Republic of Serbia

Ljubiša **STANISAVLJEVIĆ**

Dean, University of Belgrade-Faculty of Biology

Milica **PAVKOV HRVOJEVIĆ**

Dean, University of Novi Sad, Faculty of Sciences

Marija **STANIĆ**

Dean, University of Kragujevac, Faculty of Science

Mirjana **MIHAILOVIĆ**

Director, University of Belgrade, Institute for
Biological Research "Siniša Stanković" -
National Institute of the Republic of Serbia

Ivana **STRAHINIĆ**

Acting Director, University of Belgrade, Institute
for Molecular Genetics and Genetic Engineering

Snežana **PAJOVIĆ**

Director, University of Belgrade, Institute for
Nuclear Sciences "Vinča" - National Institute of
the Republic of Serbia

Saša **RADOVANOVIĆ**

Director, University of Belgrade, Institute for
Medical Research - National Institute of the
Republic of Serbia

Goran **ANAČKOV**

Head of the Department of Biology and Ecology,
University of Novi Sad, Faculty of Sciences

Milan **STANKOVIĆ**

Head of the Department of Biology and Ecology,
University of Kragujevac, Faculty of Science

Gordana **MATIĆ**

retired Professor

Svetlana **RADOVIĆ**

retired Professor

Ljubiša **TOPISIROVIĆ**

retired Professor

Dragutin **SAVIĆ**

retired Professor

Radomir **CRKVENJAKOV**

retired Professor

Branka **VASILJEVIĆ**

retired Principal Research Fellow

Dragica **RADOJKOVIĆ**

retired Principal Research Fellow

Selma **KANAZIR**

retired Principal Research Fellow

Goran **POZNANOVIĆ**

retired Principal Research Fellow

Gordana **NIKČEVIĆ**

retired Principal Research Fellow

Diana **BUGARSKI**

retired Principal Research Fellow

SCIENTIFIC COMMITTEE

Chair: Dušanka **SAVIĆ-PAVIĆEVIĆ**

Members (in alphabetical order by last name):

Silvana **ANDRIĆ**
Goran **BRAJUŠKOVIĆ**
Valentina **ĆIRKOVIĆ**
Ana **DJORDJEVIĆ**
Gordana **MATIĆ**
Mirjana **MIHAILOVIĆ**
Sonja **PAVLOVIĆ**
Milena **STEVANOVIĆ**
Aleksandra **STANKOVIĆ**

ORGANIZING COMMITTEE

Chair: Melita **VIDAKOVIĆ**

Members (in alphabetical order by last name):

Zorana **DOBRIJEVIĆ**
Svetlana **DINIĆ**
Maja **ŽIVKOVIĆ**
Dušan **KECKAREVIĆ**
Milena **MILUTINOVIĆ**
Biljana **POKIMICA**
Jelena **PURAĆ**
Jovana **RAJIĆ**
Jelena **SAMARDŽIĆ**

TECHNICAL COMMITTEE

Chair: Svetlana **DINIĆ**

Members (in alphabetical order by last name):

Marija **ATANASKOVIĆ**
Stefan **BLAGOJEVIĆ**
Anastasija **BUBANJA**
Tatjana **ČELIĆ**
Marija **ĐORĐEVIĆ**
Srđana **ĐORĐIEVSKI**
Sofija **DUNJIĆ MANEVSKI**
Nemanja **GARAI**
Valentina **IGNJATOVIĆ JOCIĆ**
Bojan **ILIĆ**
Milivoje **KONSTANTINOVIĆ**
Tijana **MARKOVIĆ**
Stefan **MARKOVIĆ HADŽIĆ**
Jana **MILENKOVIĆ**
Jovan **PEŠOVIĆ**
Nikola **RADENKOVIĆ**
Ana **SARIĆ**
Katarina **ŠAPIĆ**
Teodor **SKENDŽIĆ**
Jelena **SPREMO**
Milan **STEFANOVIĆ**
Jovana **STEVANOVIĆ**
Stefana **STOJANOVIĆ**
Marija **VUKOVIĆ**
Ivan **ŽIVOTIĆ**

SCIENTIFIC AND ORGANIZING COMMITTEE

(MoBioS STUDENT SECTION)

Natalija **MILADINOVIĆ**
Natalija **MIŠKOV**
Milena **STEPIĆ**
Jana **MILENKOVIĆ**
Milivoje **KONSTANTINOVIĆ**

AUTOPHAGY RECEPTOR P62 REGULATES SARS-COV-2-INDUCED INFLAMMATION IN COVID-19

Danijela Stevanovic,¹ Verica Paunovic,¹ Ljubica Vucicevic,² Maja Misirkic Marjanovic,² Vladimir Perovic,¹ Biljana Ristic,¹ Mihajlo Bosnjak,¹ Milos Mandic,¹ Ljubica Harhaji-Trajkovic,² Kristina Janjetovic,² Milica Kosic,¹ Jovan Lalosevic,^{3,4} Milos Nikolic,^{3,4} Branka Bonaci-Nikolic,^{4,5} Vladimir Trajkovic¹

¹Institute of Microbiology and Immunology, Faculty of Medicine, University of Belgrade, Belgrade, Serbia;

²Department of Neurophysiology, Institute for Biological Research "Sinisa Stankovic"—National Institute of Republic of Serbia, University of Belgrade, Belgrade, Serbia; ³Clinic of Dermatovenereology, University Clinical Center of Serbia, Belgrade, Serbia; ⁴Faculty of Medicine, University of Belgrade, Belgrade, Serbia;

⁵Clinic of Allergy and Immunology, University Clinical Center of Serbia, Belgrade, Serbia

Introduction: Since the interaction between autophagy and virus-induced inflammation is complex, we investigated the interplay between autophagy and inflammation in COVID-19 patients and THP-1 cells expressing SARS-Cov2 proteins NSP5 and ORF3a.

Methods: Autophagy markers in blood from 19 control subjects and 26 COVID-19 patients at hospital admission and one week later were measured by ELISA, while cytokine levels were examined by flow cytometric bead immunoassay. The level of p62 in cells and its concentration in cell culture supernatants was measured by immunoblot/ELISA. The mRNA levels of proinflammatory cytokines were measured by RT-qPCR.

Results: IFN- α , TNF, IL-6, IL-8, IL-17, IL-33, and IFN- γ were elevated in COVID-19 patients at both time points, whereas IL-10 and IL-1 β were elevated at admission and one week later, respectively. Autophagy markers LC3 and ATG5 were unchanged in COVID-19. The concentration of autophagic cargo receptor p62 was significantly lower and positively correlated with TNF, IL-10, IL-17, and IL-33 at hospital admission, returning to normal levels after one week. The expression of SARS-CoV-2 proteins NSP5 or ORF3a in THP-1 cells caused an autophagy-independent decrease/autophagy-inhibition-dependent increase of intracellular and secreted p62. This was associated with an NSP5-mediated decrease in TNF/IL-10 mRNA and an ORF3a-mediated increase in TNF/IL-1 β /IL-6/IL-10/IL-33 mRNA levels. A genetic knockdown of p62 mimicked the immunosuppressive effect of NSP5, while a p62 increase in autophagy-deficient cells mirrored the immunostimulatory action of ORF3a.

Conclusion: The autophagy receptor p62 is reduced in acute COVID-19, and the balance between autophagy-independent decrease and autophagy blockade-dependent increase of p62 levels could affect SARS-CoV-induced inflammation.

Key words: inflammation; COVID19; p62; NSP; ORF3a

Acknowledgements: This research was funded by the Science Fund of the Republic of Serbia (grant no. 7552006, Special Program of Research on COVID-19) and the Ministry of Science, Technological Development and Innovation of the Republic of Serbia (contract no. 451-03-47/2023-01/200007 and 451-03-47/2023-01/200110).