



Trends in **Molecular Biology** • Special issue

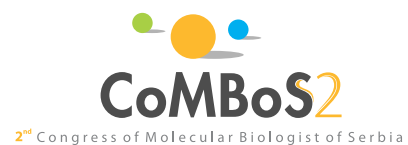
# Abstract Book

## CoMBoS<sup>2</sup>

2<sup>nd</sup> 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**

## INTEGRATION OF METABOLOMICS AND TRANSCRIPTOMICS DATA REVEALS THE MOLECULAR BACKGROUND OF THE IRIDOID DIVERSITY WITHIN THE GENUS *NEPETA* (FAM. LAMIACEAE)

Danijela Mišić,<sup>1</sup> Uroš Gašić,<sup>1</sup> Branislav Šiler,<sup>1</sup> Slavica Dmitrović,<sup>1</sup> Marijana Skorić,<sup>1</sup> Dragana Matekalo,<sup>1</sup> Jasmina Nestorović Živković,<sup>1</sup> Tijana Banjanac,<sup>1</sup> Biljana Filipović,<sup>1</sup> Milica Milutinović,<sup>1</sup> Jelena Božunović,<sup>1</sup> Neda Aničić,<sup>1</sup> Luka Petrović,<sup>1</sup> Tamara Lukić,<sup>1</sup> Miloš Todorović<sup>1</sup>

<sup>1</sup>Institute for Biological Research "Siniša Stanković" – National Institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia

**Introduction:** Recent intensive research on the genus *Nepeta* has resulted in increasingly accumulated information regarding the biosynthetic pathways and chemical evolution of iridoids; however, several intriguing aspects remain yet to be resolved. Our objective was to deeply investigate the molecular background of the diversity of iridoid compounds within the genus *Nepeta*, as well as regulative mechanisms of their biosynthesis.

**Methods:** Leaves of greenhouse-grown plants were analysed for the composition of iridoid aglycones (IAs) and iridoid glucosides (IGs) adopting non-targeted (UHPLC/LTQ Orbitrap MS<sup>n</sup>, GC/MS) and targeted (UHPLC/DAD/(±)HESI-MS<sup>2</sup>) metabolomics approaches. Following RNA-Seq, transcriptomes of phylodiverse *Nepeta* taxa were searched for the presence/absence of iridoid-related biosynthetic genes. Co-expression patterns (qPCR) of biosynthetic genes and transcription factors were determined following plants' exposure to various environmental stresses.

**Results:** The comparison of metabolite composition among phylodiverse *Nepeta* taxa provided a systematic understanding of qualitative and quantitative composition of iridoids in leaves of the selected *Nepeta* taxa. Mining of RNA-Seq data in search for iridoid biosynthesis-related genes pointed to significant differences between taxa producing both IAs and IGs and those producing only IGs. Comparative metabolomics and gene co-expression analysis provided new information about mechanisms of regulation of iridoid biosynthesis.

**Conclusion:** Integration of data from several techniques analysed by different methods resulted in identifying key genes involved in the regulation of metabolic flux through the iridoid biosynthetic pathway and offered an explanation why some *Nepeta* taxa produce only IGs, while others produce both IAs and IGs. The obtained results pointed to new gene targets for improving iridoid production through biotechnology-based approaches.

Key words: *Nepeta*; iridoids; metabolomics; transcriptomics; gene co-expression analysis

Acknowledgements: The research is financed by the Science Fund of the Republic of Serbia, Grant No. 7749433, project „Omics-guided disentangling of the iridoid diversity in the genus *Nepeta* L. for *in planta* metabolic engineering towards sustainable exploitation- NEPETOME“, and is also supported by the Ministry of Science, Technological Development and Innovation of the Republic of Serbia, Grant No. 451-03-47/2023-01/200007.