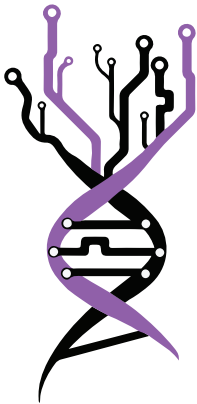


#BelBi2023 • Belgrade, Serbia

# BOOK OF ABSTRACTS



## 4th Belgrade Bioinformatics Conference

**HYBRID • 19 - 23 JUNE 2023**

EDITORS

**Dr. Ivana Morić**

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ISBN: 978-86-82679-14-1

[belbi.bg.ac.rs](http://belbi.bg.ac.rs)

<b>Title</b>	4 <sup>th</sup> Belgrade Bioinformatics Conference BOOK OF ABSTRACTS
<b>Publisher</b>	Institute of Molecular Genetics and Genetic Engineering, University of Belgrade Vojvode Stepe 444a, Belgrade, Serbia <a href="https://www.imgge.bg.ac.rs/">https://www.imgge.bg.ac.rs/</a>
<b>Editors</b>	dr. Ivana Morić dr. Valentina Đorđević
<b>Technical editor</b>	Dušan Radojević
<b>ISBN</b>	<b>978-86-82679-14-1</b>
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# FOREWORD

Dear colleagues and friends,

The 4th Belgrade Bioinformatics Conference - BelBi2023, where many high-quality scientific contributions were presented, has just ended. With great thanks to all participants, we now proudly present a book of abstracts that both reflects the scientific abundance and diversity of the conference and serves as a reminder of a memorable event.

Several research institutions, faculties, and scientific societies from Serbia joined forces in organizing this international conference, which covered numerous topics in computational biology, bioinformatics, and biomedical and health informatics. The main goal of BelBi2023 was to foster contact between scientists, both early stage career and senior researchers, allowing them to share experiences and latest advances in their fields. We sincerely hope that BelBi2023 has served as a platform for researchers from around the world to meet, initiate new collaborations, and expand professional contacts, and that all of you would become a part of the growing BelBi community.

We are grateful and proud to have welcomed more than 250 researchers from 21 countries. We have had 28 scientific sessions, consisting of more than 60 lectures (including eight Keynote talks), 47 presented posters, as well as three workshops and one satellite event – COST action. We have also organized seven industry lectures, including the NGS Challenge,

two Meet the Expert Sessions, and one Business Coffee Break where ten start-up companies took part. And finally, the future BIO4 campus was presented and first panel on Serbia's resources for storage and analyses of genetic data was organized.

We would like to thank all the members of the International Advisory Board and the International Program Committee for their efforts and help in making this event a success. We are very grateful to the Ministry of Science, Technological Development and Innovation of the Republic of Serbia, SAIGE project, and UNDP-Serbia for their support. Finally, the Local Organizing Committee is very grateful to all the sponsors of the conference - BGI, Illumina & Elta'90MS, PacBio & East Diagnostics, ThermoFisher Scientific & Vivogen, Huawei, Labena, DSP Chromatography, RNIDS, Telekom Srbija, Alfa Genetics, Kefo and Superlab, hoping that they will stay with us for many years to come.

Looking forward to seeing you again at the 5<sup>th</sup> Belgrade Bioinformatics Conference.

Belgrade, July 2023

*Dr. Valentina Đorđević*  
& *Dr. Ivana Morić,*  
On behalf of BelBi2023  
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**To be folded, to be unfolded or to be aggregated with important functions:  
application of the directed coaggregation mechanism to  
combat bacterial communities**

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One of the reasons for the mortal danger to humans is the ability of pathogenic bacteria to form biofilms. The formation of biofilms is an evolutionarily conservative defense mechanism against adverse conditions. The use of this protection by pathogenic bacteria reduces the effectiveness of the main means of combating them - antibiotics, which complicates the production of new types of drugs. There are two types of antimicrobial agents that are not known antibiotics: nanoparticles and antimicrobial peptides. We demonstrated that peptides synthesized based on the amino acid sequence of proteins and capable of amyloid formation and coaggregation with the whole protein exhibit antimicrobial activity. The ability of peptides to coaggregate with target proteins can help combat biofilm-forming bacterial communities.

We evaluated the antimicrobial effects of ten synthesized hybrid peptides, which were obtained based on the sequences of the S1 ribosomal protein of *P. aeruginosa* and *S. aureus*. It is important that some peptides demonstrated high antimicrobial activity comparable to the antibiotic gentamicin sulfate against pathogenic strains of MRSA, *S. aureus*, and *P. aeruginosa*. These peptides showed no toxicity to eukaryotic cells. Our study demonstrates the promise of hybrid peptides based on the amyloidogenic regions of the S1 ribosomal protein for the development of new antimicrobials against Gram-positive and Gram-negative bacteria resistant to traditional antibiotic.

**Keywords:** amyloid, coaggregation, antimicrobial peptides

**Acknowledgement:** This research was funded by the Russian science foundation, Grant Number 18-14-00321.





ISBN: 978-86-82679-14-1