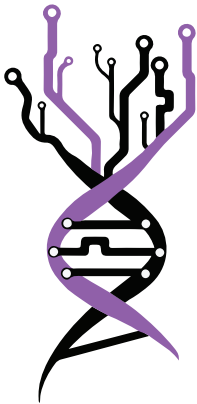


#BelBi2023 • Belgrade, Serbia

BOOK OF ABSTRACTS



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Dr. Ivana Morić

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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 5th Belgrade Bioinformatics Conference.

Belgrade, July 2023

*Dr. Valentina Đorđević
& Dr. Ivana Morić,*
On behalf of BelBi2023
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Oral presentation

AI-powered framework to predict the toxicity of microplastics

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Numerous articles have been published investigating the health effects of exposure to micro- and nanoplastics (MNPs). However, these studies have yielded inconclusive findings due to the lack of comparability between them and the complex and diverse nature of the existing toxicity data on MNPs. This study presents a predictive modeling framework for assessing the cytotoxicity of MNPs using machine learning techniques based on classification. Through a thorough literature search, a dataset comprising 1824 sample points was compiled, incorporating nine features that describe the physicochemical properties of MNPs, cell-related attributes, and experimental factors. The decision tree ensemble classifier constructed using all the features (referred to as DTE1) exhibited a high predictive accuracy of 0.95, along with a recall and precision of 0.86 each. To identify the key factors influencing the toxic properties of MNPs, feature selection was performed. A simplified classifier utilizing six influential features demonstrated a comparable performance to DTE1. These findings can guide future studies by improving experimental design and reporting practices, ultimately enhancing our understanding of the urgent health concerns related to MNPs. As more representative research data is incorporated, the developed model holds the potential for broad applicability in various settings concerning MNP cytotoxicity.

Keywords: microplastic, nanoplastic, cytotoxicity, health effect, machine learning

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