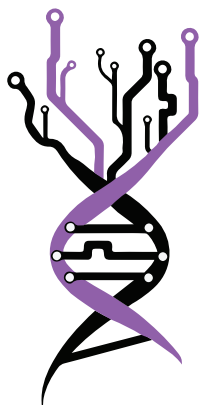


#BelBi2023 • Belgrade, Serbia

# BOOK OF ABSTRACTS



## 4th Belgrade Bioinformatics Conference

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EDITORS

**Dr. Ivana Morić**

**Dr. Valentina Đorđević**

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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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## Echocardiography-based Left Ventricle Cardiac Hypertrophy Simulations

Bogdan Miličević<sup>\*1,2</sup>, Miljan Milošević<sup>2,3,4</sup>, Vladimir Simić<sup>2,3</sup>, Danijela Trifunović<sup>5</sup>, Goran Stanković<sup>5,6</sup>, Nenad Filipović<sup>1,2</sup>, and Miloš Kojić<sup>2,6,7</sup>

<sup>1</sup> Faculty of Engineering, University of Kragujevac, Kragujevac 34000, Serbia

<sup>2</sup> Bioengineering Research and Development Center (BioIRC), Kragujevac 34000, Serbia

<sup>3</sup> Institute for Information Technologies, University of Kragujevac, Kragujevac 34000, Serbia.

<sup>4</sup> Belgrade Metropolitan University, Belgrade 11000, Serbia.

<sup>5</sup> Cardiology Department, University Clinical Center of Serbia, Visegradska 26, 11000 Belgrade, Serbia

<sup>6</sup> Serbian Academy of Sciences and Arts, Belgrade 11000, Serbia.

<sup>7</sup> Houston Methodist Research Institute, Houston TX 77030, USA.

**bogdan.milicevic@uni.kg.ac.rs**

Clinical scenarios can be evaluated using numerical modeling of the cardiac cycle prior to experimental or clinical application. Changes in wall thickness, displacement fields, and general cardiac function are all affected by hypertrophy. In our study, we calculated the effects of eccentric and concentric hypertrophy and monitored changes in ventricular thickness and shape. Concentric hypertrophy results in thicker walls, while eccentric hypertrophy results in thinner walls. Passive stresses were calculated using recently established material models based on Holzapfel's work. Our modeling approach is based on composite shell finite elements, allowing easier and more efficient modeling compared to traditional 3D finite elements. A left ventricular model was constructed using echocardiographic images. Our modeling technology is based on accurate patient-specific geometries and realistic constitutive curves, so it can be used as the basis for real-world applications. Our model can be used to test medical hypotheses about the development of hypertrophy in healthy and diseased hearts under the influence of different conditions and factors.

**Keywords:** composite shell finite elements, echocardiography, left ventricle, cardiac hypertrophy

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