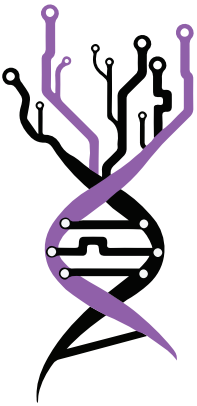
#BelBi2023 • Belgrade, Serbia

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

Title 4th Belgrade Bioinformatics Conference
BOOK OF ABSTRACTS

Publisher Institute of Molecular Genetics and Genetic Engineering, University of Belgrade
Vojvode Stepe 444a, Belgrade, Serbia
https://www.imgge.bg.ac.rs/

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Technical editor Dušan Radojević

ISBN **978-86-82679-14-1**

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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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POSTER PRESENTATION

PACSIN2 modifies miRNAs in extracellular vesicles, modulating thiopurine response

Alessia Norbedo[1]*, Marianna Lucafò[1], Carlotta Bidoli[1], Marco Gerdol[1], Metka Lenassi[2], Giuliana Decorti[1,3], Gabriele Stocco[1]

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Thiopurines, such as mercaptopurine, are antimetabolites, used in the treatment of acute lymphoblastic leukemia (ALL) and inflammatory bowel disease (IBD). *PACSIN2* rs2413739 is associated with gastrointestinal toxicity in children with ALL and with drug-efficacy in IBD pediatric patients. PACSIN2 is involved in vesicular trafficking and may affect the release and content of extracellular vesicles (EVs), which mediate cell communication and whose cargo modifies phenotypes of target cells. This study evaluates mechanisms associating *PACSIN2* polymorphism with interindividual variability in efficacy of thiopurines, by considering the role of PACSIN2 in sorting specific miRNA in EVs.
Effects of stable *PACSIN2* knock-down (KD) were evaluated in intestinal LS180 cells. MTT cytotoxicity assay was used to verify mercaptopurine-sensitivity. EVs, released by LS180 KD and MOCK control cells were isolated by ultracentrifuge and characterized by nanoparticle tracking analysis (NTA). EVs miRNA-sequencing was performed by Illumina Hi-seq 2000. EVs may alter drug cytotoxicity, therefore LS180 MOCK and KD cells were co-treated with mercaptopurine and EVs. Statistical analysis was performed using t-test and ANOVA.
Mercaptopurine was more cytotoxicity in LS180 KD cells (IC50 MOCK 3.23; IC50 KD 2.18 μM). No differences were observed by NTA in release of EVs between MOCK and KD cells (t-test, $p = 0.13$). *PACSIN2* KD altered intracellular and EVs expression of 6 and 24 miRNAs respectively. EVs released by reduced mercaptopurine cytotoxicity (about 10%) and Rac1 protein expression in KD cells (ANOVA, $p < 0.001$), probably because they transport different miRNAs.
In conclusion, *PACSIN2* KD increase mercaptopurine cytotoxicity, probably, by deregulation of miRNA expression in cells and EVs. These results will be further investigated to better explain the link between PACSIN2 and EVs, whose miRNAs could provide a new scenario in personalizing thiopurine treatment.

Keywords: PACSIN2, extracellular vesicles, miRNA-sequencing, mercaptopurine

Acknowledgement: This work was supported by the Italian Ministry of Health, through the contribution given to the Institute for Maternal and Child Health IRCCS Burlo Garofolo, Trieste, Italy, grant RC 23-23.

ISBN: 978-86-82679-14-1