



SLOVENIAN
BIOCHEMICAL
SOCIETY

**15th Meeting of the
Slovenian Biochemical Society
with International Participation**

September 20–23, 2023
Portorož, Slovenia
Convention Centre Portus

Book of Abstracts



40



15th Meeting of the Slovenian Biochemical Society
with International Participation

15. srečanje Slovenskega biokemijskega društva
z mednarodno udeležbo

Book of Abstracts

Zbornik povzetkov

Portorož, 20–23 September 2023

Organizers of 15th Meeting of the Slovenian Biochemical Society with International Participation:

- **Slovenian Biochemical Society** (<https://sbd.si>)
- **University of Ljubljana, Faculty of Chemistry and Chemical Technology** (<https://www.fkkt.uni-lj.si>)
- **University of Ljubljana, Biotechnical Faculty** (<https://www.bf.uni-lj.si>)



15th Meeting of the Slovenian Biochemical Society with International Participation, September 20–23, 2023, Portorož, Slovenia / Book of Abstracts

15. srečanje Slovenskega biokemijskega društva z mednarodno udeležbo, 20.–23. september 2023, Portorož, Slovenija / Zbornik povzetkov

Editors: Kristina Sepčič, Miha Pavšič

Technical editors: Aljaž Gaber, Miha Pavšič

Reviewed by: Mihaela Skrt, Miha Bahun, Ajda Taler-Verčič

Cover designed by: Miha Pavšič (graphics from OpenAI)

Published by: Slovenian Biochemical Society (Slovensko biokemijsko društvo)

Place and date: Ljubljana, September 2023

Complimentary publication.

Available online at the following address:

https://portoroz2023.sbd.si/upload/docs/SBD2023_Portoroz-Book_of_Abstracts.pdf

Kataložni zapis o publikaciji (CIP) pripravili v Narodni in univerzitetni knjižnici v Ljubljani

[COBISS.SI](https://cobiss.si)-ID [165790723](https://cobiss.si)

ISBN 978-961-95941-1-7 (PDF)

Committees

Committee members are listed in alphabetical order and with their main affiliation.

Organizing committee

Miha Pavšič (Chair), *University of Ljubljana, Faculty of Chemistry and Chemical Technology*

Vera Župunski (Co-chair), *University of Ljubljana, Faculty of Chemistry and Chemical Technology*

Miha Bahun, *University of Ljubljana, Biotechnical Faculty*

Matej Butala, *University of Ljubljana, Biotechnical Faculty*

Blaž Cigič, *University of Ljubljana, Biotechnical Faculty*

Aljaž Gaber, *University of Ljubljana, Faculty of Chemistry and Chemical Technology*

Jošt Hočevar, *University of Ljubljana, Faculty of Chemistry and Chemical Technology*

Mihaela Skrt, *University of Ljubljana, Biotechnical Faculty*

Matej Skočaj, *University of Ljubljana, Biotechnical Faculty*

Ajda Taler-Verčič, *University of Ljubljana, Faculty of Chemistry and Chemical Technology*

Scientific committee

Kristina Sepčič (Chair), *University of Ljubljana, Biotechnical Faculty*

Aljoša Bavec, *University of Ljubljana, Faculty of Medicine*

Barbara Breznik, *National Institute of Biology*

Marko Dolinar, *University of Ljubljana, Faculty of Chemistry and Chemical Technology*

Vita Dolžan, *University of Ljubljana, Faculty of Medicine*

Kristina Gruden, *National Institute of Biology*

Gregor Gunčar, *University of Ljubljana, Faculty of Chemistry and Chemical Technology*

Iva Hafner Bratkovič, *National Institute of Chemistry*

Janko Kos, *University of Ljubljana, Faculty of Pharmacy*

Igor Križaj, *Jožef Stefan Institute*

Brigita Lenarčič, *University of Ljubljana, Faculty of Chemistry and Chemical Technology*

Metka Lenassi, *University of Ljubljana, Faculty of Medicine*

Mateja Manček Keber, *National Institute of Chemistry*

Marjetka Podobnik, *National Institute of Chemistry*

Nataša Poklar Ulrich, *University of Ljubljana, Biotechnical Faculty*

Uroš Potočnik, *University of Maribor, Faculty of Medicine*

Tadeja Režen, *University of Ljubljana, Faculty of Medicine*

Boris Rogelj, *Jožef Stefan Institute*

Ferhan Sağın, *Ege University, Faculty of Medicine, Turkey*

Boris Turk, *Jožef Stefan Institute*

Tom Turk, *University of Ljubljana, Biotechnical Faculty*

P59

An innovative process for the production of bioethanol: Optimization and kinetic assessment

Marinela Šokarda Slavić¹, Aleksandra Margetić¹, Biljana Dojnov¹, Miroslava Vujčić¹, Marina Ristović¹, Nataša Božić¹, Zoran Vujčić²

¹University of Belgrade, Institute of Chemistry, Technology and Metallurgy – National Institute, Serbia

²University of Belgrade, Faculty of Chemistry, Department of Biochemistry, Serbia

Given the growing concern about the depletion of fossil fuels, global warming, and the loss of natural resources, bioethanol made from sugar cane, molasses, and corn continues to garner interest globally and is regarded as the safest and cleanest alternative to oil. Starch is a widely available renewable carbohydrate from which bioethanol is conventionally obtained through energy demanding liquefaction and saccharification processes. A significant simplification of the process and a reduction of starch processing costs would be possible by applying raw starch hydrolysis using enzymes capable of degrading starch below the gelatinization temperature. A novel strategy for highly concentrated raw corn starch (30 % w/v) hydrolysis based on a modified simultaneous saccharification and fermentation process is optimized for the production of bioethanol. Different ratios of *Bacillus paralicheniformis* ATCC 9945a (*Bli*Amy) and glucoamylase (Dextrozyme[®] GA), glucoamylase addition time, incubation time, and pH were investigated using a Box–Behnken experimental design to ensure high process efficiency. A two-step synergistic hydrolysis and fermentation with *Saccharomyces cerevisiae* at 30 °C was carried out in a single bioreactor vessel at the same pH (4.5). The obtained bioethanol concentration at 129.2 g/L, with a productivity of 2.94 g/L/h and ethanol yield ($Y_{p/s}$) at 0.50 g EtOH/g total sugar, equivalent to 87.8 % theoretical yield indicates the viability of the proposed innovative process.