



TwinPrebioEnz

International conference:

BIOCHEMICAL ENGINEERING & BIOTECHNOLOGY

For Young Scientists

BOOK of ABSTRACTS





TwinPrebioEnz

International Conference

BIOCHEMICAL ENGINEERING AND BIOTECHNOLOGY FOR YOUNG SCIENTISTS

– Book of Abstracts –

Belgrade, 2023

Publisher:

UNIVERSITY OF BELGRADE, FACULTY OF TECHNOLOGY AND METALLURGY
Karnegijeva 4, Belgrade
www.tmf.bg.ac.rs

For publisher:

Dr Petar Uskoković, dean
Faculty of Technology and Metallurgy, University of Belgrade

Editor-in-chief:

Dr Dušan Mijin, full professor
Faculty of Technology and Metallurgy, University of Belgrade

Editors:

Dejan Bezbradica, full professor FTM
Milica Simović, senior research associate FTM
Marija Ćorović, senior research associate FTM
Sonja Jakovetić Tanasković, assistant professor FTM
Ana Milivojević, teaching assistant FTM

Cover design:

Katarina Banjanac, senior research associate ICFTM
Milica Veljković, ICFTM

Print:

R&D Center of Printing Engineering,
Faculty of Technology and Metallurgy, University of Belgrade

Circulation:

50

ISBN 978-86-7401-389-2



The project is funded by the European Union Framework Program for Research and Innovation
Horizon Europe (contract no. 101060130)

All material appearing in this Book of Abstracts is protected by copyright under Copyright laws and is the property of the UNIVERSITY OF BELGRADE - FACULTY OF TECHNOLOGY AND METALLURGY or the party credited as an author of the content. You may not copy, reproduce, distribute, publish, display, perform, modify, create derivative works, transmit, or in any way exploit any such content, nor may you distribute any part of this content over any network, sell or offer it for sale without permission of the UNIVERSITY OF BELGRADE - FACULTY OF TECHNOLOGY AND METALLURGY.

CONGRESS COMMITTEES

HONORARY COMMITTEE

Antonia Montilla, Institute of Food Science Research, The Spanish National Research Council, Spain
Blanca de las Rivas, Institute of Science and Technology of Food and Nutrition, The Spanish National Research Council, Spain

Cesar Mateo, Institute of Catalysis and Petrochemistry, The Spanish National Research Council, Spain

Dejan Bezbradica, Faculty of Technology and Metallurgy, University of Belgrade, Serbia

Ellen van den Bogaard, Radboud University Medical Center, The Netherlands

Javier Moreno, Institute of Food Science Research, The Spanish National Research Council, Spain

Jose Miguel Palomo, Institute of Catalysis and Petrochemistry, The Spanish National Research Council, Spain

Koen Venema, Centre for Healthy Eating & Food Innovation, Maastricht University, The Netherlands

Mirjana Rajilić-Stojanović, Faculty of Technology and Metallurgy, University of Belgrade, Serbia

Nikola Nikačević, Faculty of Technology and Metallurgy, University of Belgrade, Serbia

Rada Pjanović, Faculty of Technology and Metallurgy, University of Belgrade, Serbia

Rosario Muñoz, Institute of Science and Technology of Food and Nutrition, The Spanish National Research Council, Spain

Suzana Dimitrijević, Faculty of Technology and Metallurgy, University of Belgrade, Serbia

SCIENTIFIC COMMITTEE

Aleksandra Đukić Vuković, Faculty of Technology and Metallurgy, University of Belgrade, Serbia

Ana Muñoz-Labrador, Institute of Food Science Research, The Spanish National Research Council, Spain

Bojana Balanč, Innovation Center of Faculty of Technology and Metallurgy, Serbia

Branislav Todić, Faculty of Technology and Metallurgy, University of Belgrade, Serbia

Carla Garcia Sanz, Institute of Catalysis and Petrochemistry, The Spanish National Research Council, Spain

Clara Ortega Nieto, Institute of Catalysis and Petrochemistry, The Spanish National Research Council, Spain

Dušan Veličković, Pacific Northwest National Laboratory, USA

Ivana Drvenica, Institute for Medical Research, University of Belgrade, Serbia

Jasmina Stojkowska, Faculty of Technology and Metallurgy, University of Belgrade, Serbia

Jelena Lađarević, Faculty of Technology and Metallurgy, University of Belgrade, Serbia

Jelena Repac, Faculty of Biology, University of Belgrade, Serbia

Jovana Zvicer, Innovation Center of Faculty of Technology and Metallurgy, Serbia

Kahlile Youssef-Abboud, Centre for Healthy Eating & Food Innovation, Maastricht University, The Netherlands

Ljiljana Tolić Stojadinović, Innovation Center of Faculty of Technology and Metallurgy, Serbia

Marija Ćorović, Faculty of Technology and Metallurgy, University of Belgrade, Serbia
Marijana Blažić, Karlovac University of Applied Sciences, Croatia
Maja Đolić, Faculty of Technology and Metallurgy, University of Belgrade, Serbia
Mateja Primožič, Faculty of Chemistry and Chemical Engineering, University of Maribor, Slovenia
Nataša Šekuljica, Innovation Center of Faculty of Technology and Metallurgy, Serbia
Nevena Luković, Faculty of Technology and Metallurgy, University of Belgrade, Serbia
Neus Feliu Torres, Fraunhofer Institute for Applied Polymer Research, Germany
Noelia Losada Garcia, BioISI, Faculty of Sciences, University of Lisbon, Portugal
Oswaldo Hernández-Hernández, Institute of Food Science Research, The Spanish National Research Council, Spain
Patrick Jansen, Radboud University Medical Center, The Netherlands
Pavle Spasojević, Innovation Center of Faculty of Technology and Metallurgy, Serbia
Sonja Jakovetić Tanasković, Faculty of Technology and Metallurgy, University of Belgrade, Serbia
Tanja Lunić, Faculty of Biology, University of Belgrade, Serbia

ORGANIZATION COMMITTEE

Ana Vukoičić, Innovation Center of Faculty of Technology and Metallurgy, Serbia
Ana Milivojević, Faculty of Technology and Metallurgy, University of Belgrade, Serbia
Anja Petrov Ivanković, Innovation Center of Faculty of Technology and Metallurgy, Serbia
Dragana Mladenović, Innovation Center of Faculty of Technology and Metallurgy, Serbia
Jelena Mijalković, Faculty of Technology and Metallurgy, University of Belgrade, Serbia
Katarina Banjanac, Innovation Center of Faculty of Technology and Metallurgy, Serbia
Milica Veljković, Innovation Center of Faculty of Technology and Metallurgy, Serbia
Milica Simović, Faculty of Technology and Metallurgy, University of Belgrade, Serbia
Radoslava Pravilović, Faculty of Technology and Metallurgy, University of Belgrade, Serbia
Slađana Davidović, Faculty of Technology and Metallurgy, University of Belgrade, Serbia

CONFERENCE AGENDA

Thursday, 7th December

10:00-10:30	Registration
10:30-10:40	Opening ceremony
10:40-11:00	Opening lecture

Coffee break and posters

Biotechnology Applications in Biomedical Sciences,

Chair: Ellen H. van den Bogaard and Patrick Zeeuwen

11:30-12:00	Invited speaker - Aryl hydrocarbon receptor signaling in health and disease: the potential and threats of targeting environmental sensors in human skin	Ellen H. van den Bogaard (RadboudUMC, The Netherlands)
12:00-12:15	Expanding the possibilities of the stratum corneum model for bacterial growth	Noor van Hout
12:15-12:30	3D in vitro skin models: a toolbox to study skin biology, disease pathophysiology, and therapeutics	Jaimy Klijnhout
12:30-12:45	Bacteria X: studying microbe-microbe interaction	Mona Fayyazi Jolandan
12:45-13:00	Advancing the studies of physiological and pathological bone conditions by using a 3D in vitro cell culture model based on bone-like biomaterial and a perfusion bioreactor	Ivana Banićević

Lunch break and posters

Biotechnological Production and Assessment of Bioactive Compounds

Chair: Patrick Jansen and Nevena Luković

14:00-14:30	Invited speaker - The Spicy Solution: Capsaicin's Therapeutic Potential in Hepatocarcinoma through AMPK activation.	Alicia C. Bort (Alcalá University, Spain)
14:30-15:00	Invited speaker - Customized LNPs for targeted transfection	Marcus Janschel (Fraunhofer IAP Center, Germany)
15:00-15:15	Galactomannan extraction and characterization from Ceratonia siliqua seeds	Iván Benito
15:15-15:30	By-products from the processing of herbs as sources of antioxidants	Mihailo Mladenović

15:30-15:45	Discovering potential of polyphenol compounds from blueberry, cranberry and chokeberry extracts as skin prebiotics	Anja Petrov Ivanković
15:45-16:00	Sugar functionalized superparamagnetic nanoparticles for capturing of cancer cells in liquid biopsy	Ivana Banićević

Coffee break and posters

Enzyme Engineering and Immobilization

Chair: Jose Migel Palomo

16:00-16:30	Invited speaker - Enzyme-metal nanoparticle hybrids for modulating enzyme-like activity and chemoenzymatic cascade processes for sugar building blocks synthesis	Noelia Garcia Losada (University of Lisboa, Portugal)
16:30-16:45	Immobilization of xylanase on magnetic nanoparticles modified with polyethyleneimine and its application in xylooligosaccharides synthesis	Katarina Banjanac
16:45-17:00	New life of waste material: immobilized horseradish peroxidase for degradation of antraquinone dye	Tanja Nedeljkov
17:00-17:15	Determining the potential of submerged fermentation on wheat bran for production of xylanase	Ivana Gazikalović
17:15-17:30	Study and preparation of artificial manganese metalloenzymes with laccase-like activity	Ana Vukočić

Friday, 8th December

Environmental Biotechnology

Chair: Maja Đolić

09:30-10:00	Registration	
10:00-10:15	Characterization of emission from the combustion of solid biofuels in the residential heating appliances	Vasilije Matijašević
10:15-10:30	Removal of critical metals leached from fly ash using naturally derived cellulose-adsorbent	Vanja Lukić
10:30-10:45	Utilization of fibrous textile wastes for adsorption of Inorganic and organic pollutants from water	Nataša Karić
10:45-11:00	Chemometric modelling of the adsorption parameters of drug residues from water using modified fly ash as adsorbent	Dušan Trajković

Coffee break and posters

Bio-based products and industrial biotechnology

Chair: Mirjana Rajilić-Stojanović

11:30-12:00	Invited speaker - Biobased polymer materials as promising tool for efficient drug delivery	Maja Marković (ICFTM, Serbia)
12:00-12:15	The employment of pullulan and collagen in the preparation of electrospun nanofibers loaded with <i>Teucrium montanum</i> L. extract	Ana Mandura Jarić
12:15-12:30	The processing, bioactivity and biocompatibility of scaffolds based on multi-ion doped calcium-phosphates coated with chitosan	Teodora Jakovljević
12:30-12:45	The use of starch and β -lactoglobulin composite hydrogels as frameworks for preserving c-phycoyanin	Zorana Jovanović
12:45-13:00	Different treatments of lignocellulosic biomass for enhanced delignification and enzymatic hydrolysis	Jovana Grbić

Lunch break and posters

Functional food and feed

Chair: Oswaldo Hernández-Hernández

14:00-14:30	Invited speaker - The chemical features of dietary fibers with prebiotic potential - why is it important?	Kahlile Youssef Abboud (Maastricht University, The Netherlands)
14:30-14:45	Edible flowers of marigold (<i>Calendula officinalis</i> L.) as functional food	Sofia Kilibarda
14:45-15:00	Sensory analysis of nutritionally improved corn-based snack product with addition of protein- and fiber-rich ingredients	Jovana Delić
15:00-15:15	Exploring the microbial degradation profile of 3 different dietary fibers via bacterial monoculture and an in vitro fermentation model of the colon (TIM-2)	Yanyun Zhang
15:15-15:30	Broccoli microgreens-apple juice as novel beverages: total phenolic, flavonoids and antioxidant activity	Spasoje Belošević
15:30-15:45	Nanofiltration as a tool for high-yield purification of dietary oligosaccharides	Milica Veljković
15:45-16:00	Valorization of soybean meal for production of high protein animal feed and value-added products using new strain of <i>Aureobasidium pullulans</i>	Sladana Davidović
16:00-16:30	Closing ceremony	

POSSIBILITY OF BIODEGRADATION OF COTTON MEMBRANE CONTAINING TEMPO RADICAL AND CITRIC ACID

Nataša Knežević^{1*}, Aleksandar Jovanović², Mladen Bugarčić², Marija Vuksanović¹,
Milena Milošević³, Ivan Pešić³, Aleksandar Marinković⁴

¹ University of Belgrade, “VINČA” Institute of Nuclear Sciences - National Institute of the Republic of Serbia, Belgrade, Serbia

² Institute for Technology of Nuclear and Other Mineral Raw Materials, Belgrade, Serbia

³ University of Belgrade, Institute of Chemistry, Technology, and Metallurgy, National Institute of the Republic of Serbia, Belgrade, Serbia

⁴ University of Belgrade, Faculty of Technology and Metallurgy, Belgrade, Serbia

Cotton-based membranes, due to their exceptional biocompatibility and sustainability, have attracted considerable attention in various applications, especially in the field of bio and green technologies. This study investigates the biodegradation potential of cotton membranes modified with TEMPO (2,2,6,6-tetramethylpiperidine-1-oxyl) radical and citric acid (CA), with the aim of improving their properties and facilitating environmentally friendly disposal. TEMPO radicals, in conjunction with the crosslinker citric acid, are incorporated into the cellulose structure through a novel modification process. The citric acid component acted as a plasticizer, increasing the amorphous parts of the cellulose and promoting enzymatic attack. The TEMPO radical, with its nitroxyl group, contributed to the oxidation of cellulose, further facilitating biodegradation.

The biodegradation aspect of these modified membranes was investigated in controlled environmental conditions (Soil Burial test), simulating natural scenarios (humidity, influence of enzymes, and bacteria). Biodegradation parameters such as weight loss, structural changes, and degradation kinetics were examined during 90 days. Characterization of the structure was performed using FTIR and SEM methods.

Our findings suggest that cellulosic membranes possess complete (100%) biodegradability after 70 days compared to unmodified membranes. Obtained result shed light on the potential of membranes modified in this way as sustainable and biodegradable alternatives in various applications. The results emphasize their ecological nature and ability to reduce environmental stress. Such cellulose-based materials promise a much greener future in biotechnology, healthcare, and environmental protection.

Keywords: cotton linters, TOCell membrane, Soil Burial test, biodegradable polymers, cellulase

Acknowledgements: This work was supported by the Ministry of Science, Technological Development and Innovation of the Republic of Serbia (Contract No. 451-03-47/2023-01/200017, 451-03-47/2023-01/200023, 451-03-47/2023-01/200026, 451-03-47/2023-01/200135).

* Corresponding author, natasa.knezevic@vin.bg.ac.rs

CIP - Каталогизација у публикацији
Народна библиотека Србије, Београд

CIP

577.1(048)
60(048)

**INTERNATIONAL Conference Biochemical Engineering and Biotechnology
for Young Scientists (2023 ; Beograd)**

Book of Abstracts / International Conference Biochemical Engineering and
Biotechnology for Young Scientists, Belgrade, 2023 ; [editors Dejan Bezbradica ...
[et al.]]. - Belgrade : University, Faculty of Technology and Metallurgy, 2023
(Belgrade : R&D Center of Printing Engineering, Faculty of Technology and
Metallurgy). - 86 str. ; 30 cm

Tiraž 50.

ISBN 978-86-7401-389-2

a) Биохемија -- Апстракти b) Биотехнологија -- Апстракти

COBISS.SR-ID 132067849
