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## Proceedings

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Serbian Biochemical Society

Tenth Conference

with international participation

24.09.2021. Kragujevac, Serbia

***“Biochemical Insights into Molecular Mechanisms”***

# PROGRAMME

- 10:00-10:15      Opening ceremony
- 10:15-10:50      Samo Kreft  
Faculty of Pharmacy, University of Ljubljana, Slovenia  
**Phytochemical, pharmacological and clinical investigations of the extract from the branches of *Abies alba***  
(FEBS3+ Lecture)
- 10:50-11:10      Dragica Selaković  
Faculty of Medical Sciences, University of Kragujevac  
**Molecular mechanisms of platinum-based chemotherapeutics-induced behavioral manifestations of neurotoxicity – a beneficial role of antioxidant supplementation**
- 11:10-11:30      Simeon Minić  
University of Belgrade - Faculty of Chemistry  
**Bioactive properties of Spirulina-derived phycobiliproteins and phycobilins**
- 11:30-12:00      Coffee break
- 12:00-12:20      Nikola Gligorijević  
Institute for Application of Nuclear Energy, University of Belgrade  
**Ligand binding to fibrinogen influences its structure and function**
- 12:20-12:40      Ivan Čapo  
Faculty of Medicine, University of Novi Sad  
**New aspects of vitamin C during prenatal period of development**

- 12:40-13:00 Milan Dragičević  
Institute for Biological Research "Siniša Stanković", University of Belgrade  
**Arabinogalactan protein mining and diversity - the case of *Centaurium erythraea***
- 13.00-14.00 **Poster session**
- 14.00-15.00 Cocktail / Lunch break
- 15:00-15:20 Miloš Prokopijević  
University of Belgrade - Institute for Multidisciplinary Research  
**Natural polymers: suitable carriers for enzyme immobilization**
- 15:20-15:40 Ana Ninić  
University of Belgrade - Faculty of Pharmacy  
**Link between resistin, low-grade systemic inflammation and obstructive sleep apnea**
- 15:40-16:00 Branka Đorđević  
Faculty of Medicine, University of Niš  
**Blood-retinal barrier breakdown in diabetic retinopathy – the protective role of melatonin**
- 16:00-16:30 Coffee break
- 16:30-17:00 Poster awards and closing ceremony

Dragica Bulajić

Faculty of Medicine, University of Novi Sad

**Cytotoxicity of pulp-capping materials NeoMTA Plus, ProRoot MTA, and Biodentine on human deciduous dental pulp stem cells**

Sunčica Buljević

Faculty of Medicine, University of Rijeka

**The impact of CD26 deficiency on peptide YY and substance P expression patterns in Crohn's disease**

Marina Crnković

Faculty of Agriculture, University of Novi Sad

**Effect of soil liming on phenolic compounds in soybean**

Jelena Danilović Luković

University of Belgrade - Institute for Multidisciplinary Research

**The effect of increased nickel concentrations on *Chlorella sorokiniana* culture**

Srdana Đorđević

Faculty of Sciences, University of Novi Sad

**The effect of spermidine on the malondialdehyde levels in honey bees (*Apis mellifera* L.)**

Nevena Đukić

Faculty of Science, University of Kragujevac

**Accumulation of malondialdehyde in different varieties of *Triticum aestivum* L. under conditions of heat stress**

Jovana Drljača

Faculty of Medicine, University of Novi Sad

**Glioblastoma-associated microglia as a new target and strategy to fight with**

Yaraslau U. Dzichenka

Institute of Bioorganic Chemistry of National Academy of Sciences, Minsk

**Modified steroids as modulators of cholesterol level in humans by acting on CYP7A1 and CYP7B1**

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## Foreword

Dear Colleagues,

It is a distinct pleasure to welcome you to the 10<sup>th</sup> Conference of the Serbian Biochemical Society, entitled '*Biochemical Insights into Molecular Mechanisms*'.

In contrast to the 9<sup>th</sup> Conference, when we had one year results presented in three conference days, this time we have two years results presented in only one day. To some surprise, the latter was more abundant, reflecting high spirit and resilience of biochemists in this time of crisis. The participation of Professor Samo Kreft from Ljubljana, who is our FEBS3+ guest, and eight invited lecturers from all four major universities in Serbia, mark the winter of our discontent and the return to homeostasis.

I would like to thank again all the participants for their valuable contributions and to the Organizing Board and the Scientific Board for their efforts invested into this meeting.

*Editor of the Proceedings*  
*Ivan Spasojević*

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## The effect of increased nickel concentrations on *Chlorella sorokiniana* culture

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Microalgae show significant biotechnological potential for remediation of wastewaters polluted with metals, including nickel <sup>1</sup>. Ni enters aquatic ecosystems from fuel combustion, smelting, mining, and electroplating endeavors, and represents a particularly important problem for the access to safe drinking water <sup>2</sup>. It is noteworthy that microalgae utilize Ni as a co-factor of urease. Herein we analyzed the impact of high levels of Ni(II) on freshwater microalga *Chlorella sorokiniana* in the stationary phase of culture growth. In the concentration range 0.5 to 30 mM, Ni induced a drop in cell density and biomass after 7 days of incubation, whereas significant negative impact was present as early as 2 days for 30 mM. High concentrations also induced a decrease in the level of chlorophylls (*a* and *b*) in biomass. In contrast, microalgae that were exposed to moderate stress (1 and 2 mM of Ni) appear to increase photosynthetic activity, indicating the activation of some adaptive mechanism. Scanning electron microscopy showed that *C. sorokiniana* does not release significant amounts of mucilage polymers in response to Ni, in contrast to the response to some other metals <sup>3</sup>. Further, Ni at 1 mM induced an increase in the intracellular production of reactive oxygen species, which appears to reach a plateau after 1 h. The concentration of free thiol groups showed a gradual drop during 24 h of incubation with the same Ni concentration. On the other hand, the decrease in the concentration of reduced glutathione that was observed after 1 h was reversible for 1 mM Ni at 24 h. Ni at 5 mM had a more lasting impact on glutathione. It is important to stress out that the concentrations of reduced glutathione and total glutathione showed very similar trends. This implies that free thiols and reduced glutathione may be 'lost' due to glutathionylation of proteins and synthesis of phytochelatins. Our results demonstrate that the response of *C. sorokiniana* to high Ni levels involves multiple components that may be different than for other metals. Redox regulation and protection of thiol (switches) may represent a crossroad between adaptation and death.

## Acknowledgements

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## References

1. Wong JPK, Wong YS, Tam NFY. Nickel biosorption by two chlorell species, *C. vulgaris* (a commercial species) and *C. Miniata* (a local isolate). *Bioresource Technol* 2000;73:133-7.
2. Alam N, Corbett SJ, Ptolemy HC. Enviromental health risk assessment of nickel contamination of drinking wather in a contry town in NSW. *N S W Public Health Bull* 2008;19:170-3.
3. Vojvodić S, et al. Mechanisms of detoxification of high copper concentrations by the microalga *Chlorella sorokiniana*. *Biochem J* 2020;477:3729-41.