

Serbian Biochemical Society

President: Marija Gavrović-Jankulović

Vice-president: Suzana Jovanović-Šanta

General Secretary: Isidora Protić-Rosić

Treasurer: Milica Popović

Scientific Board

Marija Gavrović-
Jankulović

Mihajlo B. Spasić

Vesna Niketić

Ivanka Karadžić

Svetlana Dinić

Nevena Đukić

Jelena Bašić

Ivan Spasojević

Ivana Beara

Mojca Stojiljković

Andjelka Celić

Željko Popović

Žanka Bojić

Trbojević

Milan Nikolić

Ana Ninić

Adela Pitea

Zupkó István

Vlatka Zoldos

Aleksandra Inić-

Kanada

Tomasz Jurkowski

Yaraslau Dzichenka

Brankica Janković

Sanja Krstić

Organization Committee

Suzana Jovanović-
Šanta

Jelena Purać

Milica Popović

Emilija Svirčev

Miloš Opačić

Milena Dimitrijević

Tatjana Majkić

Sofija Bekić

Diandra Pintać

Isidora Protić-Rosić

Marina Crnković

Maja Marinović

Iva Uzelac

Jovana Drljača

Miloš Avramov

Srdana Đorđievski

Milana Bosanac

Vanja Tatić

Proceedings

Editor: Ivan Spasojević

Technical support: Jelena Korać Jačić

Cover design: Zoran Beloševac

Publisher: Faculty of Chemistry, Serbian Biochemical Society

Printed by: Colorgrafx, Belgrade

Serbian Biochemical Society
Eleventh Conference

Scientific meeting of an international character

September 22nd and 23rd, 2022, Novi Sad, Serbia

“Amazing Biochemistry”

Production of a novel opine dehydrogenase

Nevena Kaličanin^{1*}, Ana Marija Balaz¹, Olivera Prodanović², Radivoje Prodanović³

¹University of Belgrade - Institute of Chemistry, Technology and Metallurgy, National Institute of the Republic of Serbia, Belgrade, Serbia

²University of Belgrade - Institute for Multidisciplinary Research

³University of Belgrade - Faculty of Chemistry

*e-mail: nevena.kalicanin@ihm.bg.ac.rs

Opine dehydrogenases are a family of NAD(P)H dependent oxidoreductases, which catalyze the reductive condensation of an α amino group from an amino acid with an α -keto acid during anaerobic glycolysis by regenerating NAD^{1,2}. They are widespread in cephalopods and mollusks. Opines are associated with crown gall tumor pathogenesis caused by *A. tumefaciens* providing nutrients to the pathogen, and novel opine compounds acting as metallophores have been identified.¹ Besides, opine-type secondary amine dicarboxylic acids are chiral intermediates of angiotensin-converting enzyme inhibitors³. A novel enzyme originating from an extremophile bacterium, with assumed opine dehydrogenase function was successfully expressed in *Escherichia coli* STAR cells and purified by affinity chromatography. Molecular mass determined by SDS-PAGE was approximately 40 kDa. The activity was measured by using pyruvate and alanine as substrates, by which proved that it has opine dehydrogenase activity.

Acknowledgments

This work was financially supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia. [Grant No. 451-03-68/2022-14/200026, University of Belgrade-Institute of Chemistry, Technology and Metallurgy; Grant No. 451-03-68/2022-14/200168, University of Belgrade-Faculty of Chemistry; and Grant No. 451-03-68/2022-14/200053, University of Belgrade-Institute for Multidisciplinary Research].

References

1. McFarlane JS, Davis CL, Lamb AL. Staphylopine, pseudopaline, and yersinopine dehydrogenases: A structural and kinetic analysis of a new functional class of opine dehydrogenase. *J Biol Chem* 2018;293:8009-19.
2. Gohlke H, et al. Binding region of alanopine dehydrogenase predicted by unbiased molecular dynamics simulations of ligand diffusion. *J Chem Info Model* 2013;53:2493-8.
3. Kato Y, Yamada H, Asano Y. Stereoselective synthesis of opine-type secondary amine carboxylic acids by a new enzyme opine dehydrogenase use of recombinant enzymes. *J Mol Catal B Enzym* 1996;1:151-60.