



**Serbian Biochemical Society
Sixth Conference**

“Biochemistry and Interdisciplinarity: Transcending the Limits of Field”

Proceedings

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*“Biochemistry and Interdisciplinarity: Transcending the Limits
of Field”*

Foreword

Dear Colleagues

It is my distinct pleasure to welcome you to the 6th Conference of the Serbian Biochemical Society, entitled "Biochemistry and Interdisciplinarity: Transcending the Limits of Field". It is an honor for me to be selected as the Editor of Proceedings of the Conference. I am grateful to the Steering Committee of Serbian Biochemical Society for giving me this opportunity to shape the premiere forum in biochemistry in the region. We have been tremendously fortunate to have Mihajlo B. Spasić as the first Editor. He nurtured this Conference (and Society) through its re-starting years as it grew in quality and relevance. Clearly, following in his footsteps is a challenge.

We have invited Djuro Josić from the University of Rijeka and eight experts from four major universities in Serbia to give lectures at the 6th Conference. The visit of our dear colleague from Croatia is a part of an initiative for closer collaboration within FEBS3+ (Croatia, Hungary, Slovenia, and Serbia) Meeting Programme that was established by FEBS in 2010. We have also invited students at the final years of PhD studies to present their work in our Proceedings as Abstracts. Official languages at the Conference will be Serbian, Croatian, and English.

I would like to express my gratitude to the members of the Scientific Board who suggested lecturers and to all respected colleagues who accepted the invitation.

Editor of the Proceedings
Ivan Spasojević

Rational design of raw starch degrading α -amylase from *Bacillus licheniformis* 9945a for possible surface binding sites identification

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Raw starch degrading enzymes often possess extra substrate binding regions that enhance their activity to starch granule *via* physical adsorption. These can be found either on separate domains termed starch binding domains (SBDs) or in the form of surface binding sites (SBSs) situated on the surface of enzymes. Conservation of SBS is not known nor expected amongst amylase families. However, within same subfamily it can be expected to have occurrence of same or similar residues being involved in starch binding. Confirmed adsorption of α -amylase from *Bacillus licheniformis* ATCC 9945a (*BliAmy*), a potent enzyme for raw starch hydrolysis on raw starch granules is indicative for presence of SBS as enzyme is lacking SBD. Suspected sites responsible in *BliAmy* were identified by homology modeling and *in silico* analysis. Site-directed mutagenesis of target amino acid residues was performed. Wild type enzyme and mutants were produced using an optimized fed-batch approach in a defined media with significant overexpression of 1.2 g L⁻¹. A mixed mode NuviaTMcPrimeTM resin was used for downstream processing with yields of 96% directly from the fermentation broth. Role of enzyme domain C in raw starch adsorption has been elucidated by deletion analysis. The Langmuir model was applied for adsorption kinetics study of mutants to starch granules, while kinetics of hydrolysis was followed by Michaelis-Menten equation.

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