# Serbian Biochemical Society
# Fifth Conference

Faculty of Chemistry, University of Belgrade,
13.11.2015. Belgrade, Serbia.

*"Integrated research in life science"*

# Foreword

Dear Colleagues,

It is my great pleasure to wish you warm welcome to the 5th Conference Conference of the Serbian Biochemical Society entitled "Integrated research in life science".

Official languages for 5th Conference of the Serbian Biochemical Society will be Serbian and English. We have invited eight lecturers from Serbia to present their achievements in their respective fields of work and their presentations will be published in the Proceedings. For the first time we invited students of PhD studies from Belgrade University to present their work in form of Posters and their presentations will be published in our Proceedings as Abstracts or extended Abstracts.

Please find enclosed information on 41th FEBS Congress to be held on 03 – 08 September, 2016 in Kusadasi, Aydin, Turkey.

I would like to express my gratitude to the members of the governing board of the Serbian Biochemical Society who suggested lecturers and to all of those who accepted the invitation.

*Editor of the Proceedings*
*Prof. Mihajlo B.Spasić*
*President of the*
*Serbian Biochemical Society*

# Mixed-mode resins: taking shortcut in downstream processing of raw-starch digesting α-amylases

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*Bacillus licheniformis* 9945a α-amylase (*Bli*Amy) has been described as potent enzyme for raw starch hydrolysis. Starch represents an inexpensive source for production of glucose, maltose syrups and fructose which are widely used in food industries. Regarding energy costs, effective utilization of natural resources and viscosity problems, direct hydrolysis of raw starch below the gelatinization temperature by using raw-starch-digesting enzymes, such as α-amylase is desirable. In spite of the extensive studies concerning the structure and thermal properties of *B. licheniformis* amylase and the numerous reports in the literature referring to the molecular mechanism of irreversible thermoinactivation, little attention has been paid to its enzymological characterisation. Detailed knowledge about subsite architecture of *B. licheniformis* amylase is scarce. No report on kinetics and mode of action of this industrially important enzyme can be found in the literature especially when raw starch is used as a substrate. For mechanistic studies enzyme preparations of high purity are required and improving downstream processing is very beneficial. *Bli*Amy was produced using optimized fed-batch approach in defined media and significant overexpression of 1.2 g $L^{-1}$ was achieved. These amylases have exposed tyrosine and tryptophan residues as part of their surface binding sites. Mixed mode Nuvia cPrime™ resin is tested as improvement of the downstream processing of raw starch digesting amylases aiming at exploiting hydrophobic patches at their surface. This resin combines hydrophobic interactions with cation exchange groups. Presence of salt facilitates hydrophobic interactions while ion-exchange groups enable proper selectivity. Surface response methodology was used to optimize binding and eluting conditions of *Bli*Amy. This single step procedure enables simultaneous concentration, pigments removal and purification of amylase with a yield of 96% directly from fermentation broth.

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