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POSTERS

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Abstracts submitted to the 49th FEBS Congress from 5th to 9th July 2025 and accepted by the Congress Organizing Committee are published in this Supplement of *FEBS Open Bio*. The abstracts are available as two PDF files: Talks (Plenary Lectures, Symposia and Special Sessions) and Posters.

About these abstracts

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* Each poster has been given a unique number beginning with the letter P (or LB for 'late-breaking abstracts'); the next numerical part relates to the topic grouping as listed below.

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P-28-035
Study of *Lactobacillus leichmannii* NDT II properties under transglycosylation reaction conditions: influence of pH value on reaction progress and target nucleosides yield

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Enzymes belong to the class of glycosyltransferases used to produce biologically active compounds by enzymatic transglycosylation. Enzymatic transglycosylation is a stereo- and regiospecific reaction that allows obtaining target nucleosides of high purity, following the principles of 'green chemistry'. Transglycosylation catalysed by *Lactobacillus leichmannii* nucleoside deoxyribosyltransferase type II (*L. leichmannii* NDT II) in different value pH media were studied. Some natural 2′-deoxynucleosides (dIno, Thd) and modified purine nucleoside 7-methyl-2′-deoxyguanosine (7-mdGuo) were used as the donors of sugar moiety, various purine and pyrimidine heterocyclic bases were used as the acceptors. Both dIno, Thd, and 7-mdGuo have been shown to be suitable substrates, whereas modifications in the deoxyribose ring (4′-N_3-Thd) result in a loss of substrate properties of the latter. It was revealed that the pH value of the reaction mixture can affect the reaction rate if the heterocyclic base contains a carbonyl group 6 in the case of purine bases or 4 position in the case of pyrimidine bases. The highest rate of transglycosylation is observed at pH 5.5 and the lowest at pH 8.5. It was also found that in the case of the presence of a substituent in the 5-position of uracil, the pH value also influences the yield of the reaction of pyrimidine nucleosides. Maximum yields are observed at pH 7.0, at pH 5.5 the yield decreases by about 10%, and at pH 8.5 there is a significant decrease in yields. The obtained results can be used to develop environmentally friendly biotechnological methods for synthesis of practically important nucleosides. This work was supported by the Russian Science Foundation (project No. 24-24-00542).

P-28-036
Biochemical composition and functional application of enzyme-assisted extracts from leaves of *Cannabis sativa* L.

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Enzyme-assisted extraction (EAE) has recently gained attention for its effectiveness and eco-friendly manner of extracting valuable compounds, enhancing their nutritional value at a lower cost. *Cannabis sativa* L. is a widely distributed and one of the oldest plant species in the Cannabaceae family. However, the plant leaves have not been widely studied for their biochemical and functional applications. This study aimed to investigate the biochemical composition, antioxidant activity, and prebiotic potential of EAE from *C. sativa* leaves. Extracts were obtained under optimal conditions (3:15 h of extraction, temperature 45°C, pH 4.9, and 1% enzyme (v/w of dry matter)). The extractions were performed using Viscozyme L, Cellulase enzymes, and control without enzyme. The antioxidant activity of *C. sativa* leaf extracts was assessed using $ABTS^{\bullet+}$, FRAP, and ORAC assays, while the total phenolic content was obtained using the Folin-Ciocalteu method. The prebiotic potential of *C. sativa* leaf extracts was evaluated in an *in vitro* screening model using probiotic strains *Lactobacillus casei* 01 and *Bifidobacterium animalis* BLC. Extracts were tested at 5% (v/v) and 50% (v/v) concentrations. The results indicated that the yield after EAE with Viscozyme L enzyme mixture increased by up to 44% compared with EAE with Cellulase enzyme and control. Moreover, the highest antioxidant activity was established in EAE with Viscozyme L enzyme extract within all tested assays. Furthermore, all tested extracts were established to possess prebiotic potential with tested probiotic strains, but the greatest results were obtained in EAE with Viscozyme L enzyme mixture extract. In conclusion, EAE may be an effective and sustainable method for biorefining bioactive compounds, potentially applicable in high-value functional foods and nutraceuticals. Acknowledgment: This work was supported by the Research Council of Lithuania research and experimental development project No. S-MIP-24-75.

P-28-037
Characterization of a recombinant multifunctional enzyme CBM2a-GH3 with enhanced catalytic activity towards cellulosic substrates

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Cellulose, a major component of plant cell walls, is a promising renewable biomass for the production of biofuels and chemicals. However, its hydrolysis into simple sugars remains a significant bottleneck. In this study, a recombinant multifunctional cellulase CBM2a-GH3 was cloned, expressed, and characterized for its biochemical properties and substrate specificity. The enzyme consists of a carbohydrate-binding module (CBM2a) fused to a glycoside hydrolase family 3 (GH3) catalytic domain. Our results show that CBM2a-GH3 exhibits high catalytic efficiency towards various cellulosic substrates, including crystalline cellulose, carboxymethyl cellulose, L-arabinose, D-galactose, and α-lactose monohydrate. The enzyme displayed optimal activity at pH 7 and 50°C, with a high stability across a wide range of pH and temperature conditions. Furthermore, the kinetic parameters of CBM2a-GH3 were evaluated, revealing a higher catalytic efficiency towards L-arabinose and D-galactose. The enzyme activity was also enhanced by the presence of Na^+ ions and was relatively unaffected by other metal ions and additives. Thin-layer chromatography analysis confirmed the hydrolysis of various cellulosic substrates into simple sugars. Overall, our findings suggest that CBM2a-GH3 is a promising candidate for