

## International Conference on

# Protein Engineering

October 26-28, 2015 Chicago, USA

### Comparison of the two thermophilic and mesophilic amylase enzymes stability and structure in deep eutectic solvent (DES)

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*Bacillus amyloliquefaciens* amylase (BAA) is a mesophilic and *Bacillus licheniformis* amylase (BLA) is a thermophilic enzyme that both are used in industrial microbial production of enzymes as well as fine biochemical. Deep eutectic solvents (DES) are recognized as green solvents for carbohydrates dissolution. DESs are a mixture of two or more compounds with a melting point lower than any of its individual components. In the present study the effect of various deep eutectic solvents on the activity, stability and structure of two related alpha amylases from *Bacillus amyloliquefaciens* and *Bacillus licheniformis* was investigated. Results showed that BLA was more active and stable in deep eutectic solvents containing 1:1 ratio of 6 M glycerol and choline chloride. Thermal stability of both enzymes was studied by incubating each enzyme for 2 hours at different temperatures (70, 80 and 90° C) in Tris buffer (pH 7.5). The BLA enzyme exhibited remarkable stability up to 70° C with tendency to aggregate at higher temperature. Secondary and tertiary structural changes were analyzed using circular dichroism and fluorescence spectroscopy. Due to the hydrophobic environment of these solvents, tertiary structural changes indicated a compact structure for both BLA and BAA. Circular dichroism analysis showed 53.68%  $\alpha$ -helix and 18.46%  $\beta$ -strand for BAA and 69.63%  $\alpha$ -helix and 6.64%  $\beta$ -strand for BLA in DESs.

#### Biography

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