Abstract No.246

Positive Homotropic Effect in two-phasic Non-Michaelis Kinetics of Xanthan Lyase

*Saeedeh Jafari Nodooshan**, *S.Zahra Moosavi-Nejad*, *Mohammad Reza Soudi*

Dept. of Biology, Faculty of Basic Sciences, Alzahra University, Tehran, IR
(E-mail: sjearthpeace@yahoo.com)

Xanthan gum, a bacterial anionic heteropolysaccharide, structurally consists of a main chain of D-glucose units which linked by β-1,4 bounds, as it is in cellulose, plus side chains attached to glucose residues alternately. Trisaccharide side chain contains of a D-glucuronic acid unit between two D-mannose residues. Xanthan, produced by xanthomonas campestris,has found commercial applications as a viscosity enhancing agent in aqueous solutions. Viscosity of xanthan solutions may be controlled via degrading its backbone or side chain by using hydrolyzing enzymes including xanthanase (for hydrolyzing the backbone) or xanthan lyase (for hydrolyzing the side chain).In this study, xanthan lyase activity was measured by monitoring ΔA235 of a solution containing appropriate concentration of xanthan in 50mM sodium phosphate buffer pH=7 and xanthan lyase enzyme secreted by a xanthan lyase producing bacterium at 30 °C. According to our results, the enzyme saturation curve showed non-Michaelis behavior (positive homotropic effect). More analysis, using Eadie-Hofstee and Hill plots, demonstrated the enzyme shows two phases during saturation by xanthan as substrate, resulting in enzyme activation. We concluded that xanthan is not only the enzyme substrate but also its activator. so that increasing concentrations of xanthan can induce a more active conformation in xanthan lyase.

Keywords: Xanthan lyase, Homotropic effect, Non-Michaelis-Menten, Xanthan.

Abstract No.247

Isolation of a β-mannanase Producing Bacterium, Secretion Optimization and Biochemical Properties of the Enzyme

*Fatemeh Honari**, *Hamid Reza Karbalaei-Heidari*

Department of Biology, Faculty of Sciences, Shiraz University, Shiraz, IR
(E-mail: fhonari@gmail.com)

In the present work, a halo-alkali tolerant mannan-degrading bacterium (strain FH-1) was isolated from soil samples of Jahrom city, Fars, Iran. Phenotypic classification and 16S rDNA sequence analysis placed FH-1 in the genus Gracilibacillus. Strain FH-1 grew well at salinities and alkalinities of 0-20% NaCl and pH of 7-10. When grown on 1% locust bean gum (LBG) as the carbon source at 5 % NaCl and pH 9.0, maximal β-mannanase activity was produced in the culture supernatant after 3 days. Partial purification of the enzyme was done by a combination of ammonium sulfate precipitation and DEAE-Cellulose ion exchange chromatography. The endo-1,4-ß-D-mannanase activity of the enzyme was confirmed by using specific substrate, Azo-carob galactomannan. The optimum temperature and pH for β-mannanase activity on LBG as a substrate were 50 oC and 10.0 respectively. The enzyme exhibited its optimal activity at 0-1 M NaCl and 50 % of its initial activity remained when assayed in 2 M NaCl, indicating a high degree of halostability. These results suggest that the β-mannanase secreted by the newly isolated Gracilibacillus sp. strain FH-1 is a suitable candidate for using as a detergent ingredient due to its activity at a broad pH and NaCl concentrations.

Keywords: β-mannanase, Alkalophile, Gracilibacillus, Locust bean gum, Halostability.

Abstract No.248

Monitoring Surface Plasmon Resonance of Gold Nanorods in Biological Buffers

Hossein Barkheh[1], *Bijan Ranjbar**[1,2], *Tahereh Tohidi Moghadam*[2]

1. Department of Biophysics, Faculty of Biological Sciences, Tarbiat Modares University, Tehran, IR
2. Department of Nanobiotechnology, Faculty of Biological Sciences, Tarbiat Modares University, Tehran, IR
(E-mail: h.barkheh@yahoo.com)

Nobel metal nanoparticles with their shape and size dependent properties have the potential to be exploited in many research areas, such as nanoscale electronics, catalysis, optical sensing, imaging, gene/drug carrier, therapeutics etc. In the light of this, nanostructures of gold with rod morphology (GNRs) have attracted much more attention in novel medical and paramedical applications. It is important to investigate the stability of GNRs in different biological buffers, since presence of some ions might affect the structure and morphology of the nanostructures. Herein, we present the effect of three biological buffers on the longitudinal plasmon resonance of GNRs, to check the sensitivity of LSPR and maintenance of rod morphology. Short gold