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Glucose Signalling in *Escherichia coli* and *Saccharomyces cerevisiae*

Tae-Wook Nam*, Seung-Hyon Cho, Jin-Young Jeong and Yeong-Jae Seok
School of Biological Sciences, Seoul Naltional University

Glucose serves not only as the preferred carbon and energy source for prokaryotic and eukayotic cells, but also as the signal to regulate the expression of many genes related to metabolism and cell growth. The limiting step of glucose metabolism is its transport into the cytoplasm, and glucose sensing mechanisms play crucial roles in the physiology of many cells. The model prokaryote *Escherichia coli* transports many sugars including glucose through the phosphoenolpyruvate:sugar phosphotransferase system (PTS), and a global repressor Mlc regulates the expression of PTS proteins. The membrane-bound glucose transporter, enzyme $IICB^{Glc}$, is the final phosphate receiver of glucose PTS and its primary function is concomitant phosphorylation and translocation of glucose. In the presence of glucose, PTS proteins including enzyme $IICB^{Glc}$ exist as dephospho-forms. Our result shows that the dephospho-form of enzyme $IICB^{Glc}$, but not its phospho-form, strongly interacts with Mlc. Therefore, the glucose induction of Mlc-regulated genes is caused by the dephospho-form of enzyme $IICB^{Glc}$, which directly recruits Mlc to derepress its regulon. In *Saccharomyces cerevisiae*, glucose signaling is composed of two different kinds of proteins, hexose transporters and hexokinase. The structure of two hexose transporter homologues, Snf3 and Rgt2, is distinct from that of other transporters, especially in the long C-terminal cytosolic tail, and these C- terminal tails are believed to mediate the glucose signaling through these transporters. Hxk2, the major hexokinase in *S. cerevisiae*, is also believed to play crucial roles in glucose signaling by the phosphorylation state-dependent mechanism. We compare glucose signaling mechanisms between *E. coli* and *S. cerevisiae*.

[SPI-4]

A Study on the Characterization and Production of Exopolysaccharide Produced by Marine Bacterium *Alteromonas* sp. 00SS11568.

Se Hoon Ahn*, Sung Jin Kim, Jung Han Lim, Te Young Ahn[1], Hong Kum Lee[1)]
Microbiology Lab. Korea Ocean Research & Development Institute. Dan Kook University[1)]

To find novel exopolysaccharide, 620 marine bacterial strains of mucoid type were isolated from samples collected in coastal regions of South Sea, Korea. Strain 00SS11568 was selected as a producer for viscous exopolysaccharide, named as p-11568. The isolate was identified as *Altermonas* sp. based on 16S rDNA sequence, morphological, and biochemical properties. p-11568 was found to have average molecular masse of 4.4×10^5 dalton. The sugar composition revealed a heteropolysaccharidic nature and consisted of glucose and xylose in a molar ratio 3 : 1. The emulsion stability of p-115568 was stable to 96 h and exhibited similar trends as xanthan. The effects of salt, pH, temperature, inorganic compounds, and C, N-source were tested to get the optimal composition of medium for the production of p-11568. From this study, M-11568 medium was suggested as follows; glucose 7 g, yeast extract 5 g, $(NH_4)_2SO_4$ 5 g, K_2HPO_4 1 g, $MgSO_4$ 4 g, $CaCl_2$ 1 g, $FeSO_4$ 1 mg, $CaSO_4$ 1 mg, $MnSO_4$ 1 mg, $ZnSO_4$ 1 mg, $CoCl_2 \cdot 6H_2O$ 1 mg per liter of aged sea water. The optimal pH and temperature were 9 and 25℃. About 19.2 g/l of p-11568 was obtained with M-11568 after cultivation for 72 h in 5-liter jar fermentor with aeration rate of 1.5 vvm. p-11568 solution showed a characteristics of non-Newtonian fluid properties. At the concentration of 1.0%, the consistency index and the flow behavior index were 4,404 poise · sec and 0.42, respectively. All dispersions were pseudoplastic fluids described by Power-law model.