[SPII-3]

시작→ **Purification and Characterization of a Catalase from Photosynthetic Bacterium *Rhodospirillum rubrum* S1 grown under Anaerobic Condition**

Yoon-Suk Kang* Duck-Chul Oh
Dept. of Life Science, College of Natural Sciences, Cheju National University

Anaerobically grown *Rhodospirillum rubrum* S1 produced 2 catalases. When *R. rubrum* was exposed to oxidative stresses, such as hydrogen peroxide, menadione, and benzyl viologen, the higher molecular weight catalase out of 2 catalases showed very stable enzyme activity. the higher molecular weight catalase was purified and characterized. It had an estimated molecular mass of 318kDa, consisting of four subunits of 79kDa and showed no peroxidase activity. The purified enzyme exhibited an apparent Km value of 30.4mM and a *Vmax* of 2,564U(mg protein)$^{-1}$ against hydrogen peroxide. The enzyme had a broad pH(5.0-9.0) optimum and was stable in the broad range of temperatures(20℃-70℃). It sustained 90% activity against organic solvent(ethanol/chloroform), inhibitior of hydroperoxidase, and was inhibited by catalase inhibitors, such as cyanide, azide, hydroxylamine, and 3-amino-1,2,4-triazole. Considering these results, the enzyme seems to be a class of monofunctional catalase.

[SPII-4]

Functional Genomic Study on the Gliding Motility of Cyanobacterium *Synechocystis* sp. PCC 6803

Joo-Hee Chung*[1], Yong-Cheol Yoo[2], Young-Ho Chung[2], Ohoak Kwon[1], Jeong-Kook Kim[3] and Young-Mok Park[2]
[1]Seoul Branch, Korea Basic Science Institute, [2]Proteome Analysis Team, Korea Basic Science Institute, [3]Graduate School of Biotechnology, Korea University

Cyanobacteria show the positive and negative phototaxis for optimization photosynthesis. This movement is called gliding motility by pili. To find the motility-relative genes and proteins in *Synechocystis* sp. PCC 6803, we used Tn5 mutants with non-motility. Five non-motile mutants were segregated and Tn*5* insertion site was analyzed by inverse PCR. Transposons interrupted *phoH, orfR, sigB, pknA, and glgA* genes and made nonmotile mutants. We found that 5 possible genes which is related motility of syn6803. Two mutants (Tn::*phoH* and Tn::*orfR*) of them was confirmed that the deletion of thick pili and the decrease of *pilA1* mRNA expression.

To elucidate motility-related protein with comparison to wild-type and two mutants, two-dimensional (2D) polyacrylamide gel electrophoresis and mass spectrometry was used. Four differential proteins are found the motility-related proteins (chaperone protein dnaK2 and CheA), photosystem II manganese-stabilizing polypeptide (MSP) for photosynthesis and ferric uptake regulation protein for electron transfer system.