

**TRANSPOSON INSERTION AT ABC TRANSPORTER GENE
DISRUPTS GLIDING MOTILITY IN THE CYANOBACTERIUM
Synechocystis sp. PCC 6803**

**Jong-Soon Choi¹, Yong-Cheol Yoo^{1,2*}, Mi-Sun Cho^{1,3}, Eun-Ha Kim^{1,4},
Yoon-Jung Moon¹, Young-Ho Chung¹, Tae-Ryong Hahn², Yun-il Park³,
Choon-Hwan Lee⁴, and Young Mok Park¹**

¹Biomolecule Research Team, Korea Basic Science Institute, Taejeon 305-333,

²Department of Genetic Engineering, Kyunghee University, Yongin 449-701,

³Department of Biology, Chungnam National University, Taejeon 305-764,

⁴Department of Molecular Biology, Pusan National University, Pusan 609-735

The cyanobacterium *Synechocystis* sp. PCC 6803 (Syn6803) is a facultative photoheterotroph that displays phototaxis through gliding motility (Choi *et al.*, 1999. *Photochem. Photobiol.* 70, 95-102). Recently we established random mutagenesis in Syn6803 to search for genes involved to gliding motility. Using a derivative of transposon, Tn5, which is delivered by conjugation from *Escherichia coli*, the kanamycin-resistant mutants of Syn6803 were generated at a frequency of 2×10^{-6} . Among the pool of 4,500 mutants, we isolated 12 nongliding mutants on the surface of agar plates. The flanking genomic DNA sequence of transposon insertion in a nongliding mutant was determined by inverse PCR method. Protein responsible for the gliding motility was identified as a putative ABC transporter encoded by slr1149. Similar observation has been demonstrated for other gliding bacterium *Flavobacterium johnsoniae* (Agarwal *et al.*, 1997, *Proc. Natl. Acad. Sci. U.S.A.* 94, 12139-12144). The translated protein sequences produced by slr1149 revealed the representative domains of two ATP binding motifs and ABC transporter family signature in C-terminal region. Furthermore, 5 transmembrane-helices in N-terminal region were predicted by the analysis of Meta Predict Protein program. We suggest that the driving force for transport via ATP hydrolysis allow Syn6803 cells to glide. The biochemical and physiological study about the actual role of ABC transporter on gliding motility is under progress.