

NOVEL INTERACTION BETWEEN TWO CHE-A LIKE
MOLECULES INVOLVED IN GLIDING MOTILITY OF
CYANOBACTERIUM *SYNECHOCYSTIS* SP. PCC 6803

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The unicellular cyanobacterium *Synechocystis* sp. PCC 6803 displays gliding motility that depends on the type IV-like thick pili. All disruptants of chemotaxis-like gene locus (*slr1041-slr1044*, called *Tax3* by Bhaya *et al*) did not show gliding motility. Predicted proteins of *slr1041*, *slr1042*, *slr1043* and *slr1044* are homologous to PatA, CheY, CheW and MCP, respectively. The missing *cheA*-like gene in this cluster was identified, as novel split genes, *slr0073* and *slr0322*. The two disruptants of *cheA*-like genes did not show gliding motility on the agar surface. To elucidate functional relationship between two CheA-like molecules, we examined possible phosphorelay cascade between histidine kinase domain of Slr0322 and Hpt domain of Slr0073 using yeast two-hybrid and co-immunoprecipitation analysis. We detected the strong and specific interactions between Slr0322 and Slr0073. These results suggest that the phosphorelay signal of Slr0322-HK to Slr0073-Hpt exists in *Synechocystis* sp. PCC 6803. Recently, we are performing the kinetic analyses of CheA's autophosphorylation and phospho-transfer between two CheA molecules. And we detected CheA-CheW, CheA-CheY interaction. The results of interaction are demonstrated that MCP-CheW-CheA-CheY is complexes. We will discuss the possible working model for a signal transduction pathway of the gliding motility.