The PhoU protein in bacteria plays a role in maintaining phosphate homeostasis by regulating the Pho regulon. Recent studies showed that PhoU is essential for normal growth and is also involved in persister formation. PhoU is a potential target for overcoming drug tolerance of pathogenic bacteria. However, the exact mechanism of PhoU functions is still unknown. Here we have determined the crystal structure of PhoU from Pseudomonas aeruginosa at 2.28 Å resolution by Se SAD method. P. aeruginosa PhoU exists as a dimer in the crystals. A monomer of P. aeruginosa PhoU consists of six alpha-helices, which form two similar helical bundles. P. aeruginosa PhoU shares four conserved sequence motifs. Interestingly, P. aeruginosa PhoU has distinct features in some loops and the surface charge distribution. Two monomers of P. aeruginosa PhoU dimerize in a slightly different manner to those of other PhoU proteins. The present structure of PhoU from a bacterial pathogen may be useful for the antibacterial drug discovery.

Keywords: PhoU, Pseudomonas aeruginosa, Persister