Crystal Structure of the Bacillus subtilis YwlE Protein

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YwlE is a 150 residue protein encoded by the ywlE gene in *Bacillus subtilis*. It is a putative low-molecular-weight protein tyrosine phosphatase (LMW PTP) by sequence comparison.

The full length YwlE was cloned into pET28a and expressed in good amount in soluble form, it was purified by two-step conventional chromatography on a FPLC system. Crystallization trials of the purified protein were preformed by hanging-drop vapor diffusion method, usable crystals appeared in some of the screen drops after a few days. One set of native diffraction data was collected at the MAD beamline of Beijing Synchrotron Radiation Facilities (BSRF), using the oscillation method, and processed to 1.8 Å. The crystal belongs to space group C2 and there is 1 molecule per asymmetric unit. The sequence homology to bovine LMW PTP (Blast score 50.2 bits, 29 %) enabled the structure to be determined through molecular replacement using the CNS program. This gave a model with an R_{free} of 0.48. The program ARP/wARP was used for automated model building and further refinement. A much improved model was obtained after this procedure with R_{free} of 0.27.

The YwlE structure shows significant structural homology to protein-tyrosine-phosphatases, especially in the active site (CX_5R motif). It's hoped that this structure together with enzymology studies will deepen our understanding of protein phosphorylation and signal transduction in general.

Keywords: YwlE protein, tyrosine-phosphotase, bacterial