5-Enolpyruvylshikimate-3-phosphat synthase (EPSPS) catalyzes the formation of EPSP from shikimate-3-phosphate (S3P) and phosphoenolpyruvate (PEP) in bacteria and plants. The reaction is an essential step in the shikimate pathway, which is absent in mammals. This makes the enzyme a promising target for antibiotic development. Previously, structures of the homologous EPSPSs from \textit{E. coli} and \textit{S. pneumonia} were determined [1,2].

We expressed the \textit{Mycobacterium tuberculosis} EPSPS (MtEPSPS) in \textit{E. coli} and crystallized it both free of ligands and sulfate or phosphate, as well as in complex with the substrate S3P. Microcrystals (two dimensions \(\sim 10 \, \mu m\)) of the unliganded (open form) MtEPSPS diffracted at BW6 to the resolution 1.9 Å. The structure has been solved by molecular replacement with MOLREP [3]. In addition, the open form structure was solved at low resolution (3.5-5 Å) in four closely related conformations exhibiting differences in the relative domain orientations.

Diffraction data from the crystals of MtEPSPS in complex with S3P were collected at BW6 to 1.15 Å resolution. Structure refinement is in progress.

Figure 1: Ribbon diagram of the open form MtEPSPS

References