Crystal Structure of Chorismate Synthase from *Helicobacter pylori*

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Chorismate synthase catalyzes the conversion of 5-enolpyruvylshikimate 3-phosphate to chorismate in the shikimate pathway, which represents an attractive target for discovering antimicrobial agents and herbicides. Chorismate serves as a common precursor for the synthesis of aromatic amino acids and many aromatic compounds in microorganisms and plants. Chorismate synthase requires reduced FMN as a cofactor but the catalyzed reaction involves no net redox change. Here we have determined the crystal structure of chorismate synthase from *Helicobacter pylori* in both FMN-bound and FMN-free forms. It is a tetrameric enzyme, with each monomer possessing a novel "β-α-β sandwich fold." Highly conserved regions, including several flexible loops, cluster together around the bound FMN to form the active site. The unique FMN-binding site is formed largely by a single subunit, with a small contribution from a neighboring subunit. The isoalloxazine ring of the bound FMN is significantly non-planar. Our structure illuminates the essential functional roles played by the cofactor.