

W0216

Structural Study of Tomato Chloroplastic Cu,Zn Superoxide Dismutase. Susan T. Thomas, **Amir Liba, *Alexander B. Taylor, **Aram M. Nersissian, **Joan S. Valentine, *P. John Hart, *Dept. of Biochemistry, Univ. of Texas Health Science Center at San Antonio, 7703 Floyd Curl Drive, San Antonio, TX 78229-3900, **Dept. of Chemistry & Biochemistry, Univ. of California, Los Angeles, CA 90095.

Three isomorphous X-ray crystal structures of tomato chloroplastic (tc) copper/zinc superoxide dismutase (CuZnSOD) molecules have been determined through molecular replacement methods and refined to 1.9 Å, 2.0 Å, and 2.1 Å resolution respectively. The proteins crystallize in space group $P2_12_12$ with one homodimeric CuZnSOD molecule per asymmetric unit. All three structures have values of about $R = 0.20$ and $R_{\text{free}} = 0.27$. Each subunit of tc-CuZnSOD possesses a flattened, antiparallel eight-stranded Greek key β -barrel folding topology similar to that observed in structurally characterized CuZnSOD molecules from other species. Unlike other SOD structures, tc-CuZnSOD is somewhat devoid of both copper and zinc ions. Three different protein samples have different metallation states, and the degree of metal loading influences the conformations of the Zn and electrostatic loop elements. The relationship between metal binding and loop structure is discussed.