

Poster Presentation

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Structure of the stress response protein SAV1875 from S. aureus

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The DJ-1/ThiJ/Pfpl superfamily is a large protein group over diverse organisms, under this superfamily, there are multi-types of proteins such as protease, chaperones, heat shock protein, human parkinson's disease protein. The conserved protein from Staphylococcus aureus SAV1875 is a member of DJ-1 superfamily, but its function is unknown. We have determined the crystal structure of SAV1875 to a resolution of 1.8Å . As expected, the overall fold of the core domain of SAV1875 is similar to that of DJ-1. SAV1875 appears to be a dimer both in solution and the crystal, displaying an oligomerization interface similar to that observed for DJ-1. SAV 1875 contains a possible catalytic triad (Cys105-Glu17-His106) analogous to Pfpl, YhbO, and DR1199. The cysteine in this triad (Cys-105) is oxidized in this crystal structure, similar to modifications seen in the cysteine of the DJ-1. This Cys-sulfenic acid is stabilized by hydrogen bonding with Glu17, Gly72, His106. We also have determined the crystal structure of mutated form of reactive Cys, SAV1875 C105D to a resolution of 2.1 Å. Aspartate mutation mimics the the Cys-sulfenic acid, more oxidized form. The aspartate stabilization by hydrogen bonding with neighboring residues are maintained. On the basis of these results, we suggest that SAV1875 might work as a general stress protein involved in the detoxification of the cell from oxygen reactive species.

Keywords: catalytic triad, Cysteine, oxidation