Hyperthermostable Ferredoxin from *Pyrococcus Furiosus*

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Pyrococcus furiosus is a hyperthemophilic archaeon with a growth optimum of 373 K. Its ferredoxin is a 66 amino acid electron transfer protein, which contains one $[Fe_4S_4]$-cluster. An aspartate residue is coordinating one of the irons, which is easily lost so that the cluster converts to an $[Fe_3S_4]$-cluster under oxidizing conditions. The protein also contains a disulfide bond, which is redox active at approximately the same potential as the $[Fe_4S_4]$-cluster and exists in equilibrium between two conformations [1].

The structure of *pyrococcus furiosus* ferredoxin was determined to 1.5 Å by molecular replacement with ferredoxin from *Termotoga maritima* [2], [3]. It reveals an extensive hydrogen-bonding network, which provides an explanation for the thermostability. It has been suggested that *pyrococcus furiosus* ferredoxin is a dimer under physiological conditions [4]. The packing of the two molecules in the asymmetric unit indicates the intermolecular contacts in such a dimer. The disulfide bond is seen in two conformations.

Recently, we have managed to crystallize the $[Fe_4S_4]$-form of the protein. We are currently working on optimizing these crystals.

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