

**Structure and Dynamics of Thioredoxins and its cellular partners
thioredoxin reductase (Trr1) and alkyl hydroxiperoxide reductase (Ahp1).**

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Thioredoxins are small proteins present in all organisms. They function as disulfide oxido-reductases, through the reversible oxidation of two cysteine residues, present in a conserved active site. Thioredoxins are involved in a large number of cellular processes, protection against oxidative stress and cellular signalization. Details of the interaction of thioredoxins with their cellular targets are not fully understood. Yeast thioredoxins are suitable system to study these interaction, since it contains two paralogous thioredoxins genes: Trx1 and Trx2. To establish a structure and dynamics-function relationship for the interactions involving Trxs, our group is studying the dynamics of these proteins in the presence and absence of two cellular targets: Trr1 and Ahp1. The backbone dynamics of both reduced and oxidized forms of Trx1 and Trx2 have been measured by NMR. Longitudinal and transverse ¹⁵N relaxation rate constants and {¹H}-¹⁵N NOEs were measured for the proteins in the presence and absence of the targets. We will also show data of the dynamics of human thioredoxin, that displays similar structure but does not interact with neither of the targets. We are also measuring the interaction by looking at the targets, Ahp1 (40 KDa) and Trr1 (~70 KDa). We have deuterium labeled Ahp1 and will show the dynamics in the free state.

Keyword: Thioredoxin, NMR, Dynamics

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