MS02-2-6 Structural determination of Mycobacterium tuberculosis and Rhodococcus erythropolis mycothiol disulfide reductases
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Abstract
Low molecular thiols are involved in many processes in all organisms playing a protective role against reactive oxygen, chlorine and electrophilic species, heavy metals, toxins and antibiotics. Not only they maintain the reduced state of cytosolic proteins but also act as cofactors of many oxidoreductases. This is the case of the mycothiol disulfide reductase (Mtr), an oxidoreductase of Actinobacteria that is able to reduce mycothiol disulfide (MSSM) to mycothiol (MSH) which could be oxidized again by reactive species, thus contributing to the redox homeostasis. To catalyze the reduction of MSSM, Mtr oxidizes $NADP+H^+$ into $NADP^+$ through a flavin cofactor ($FADH_2$ to FAD). In this work we aim to obtain high-resolution three-dimensional structures of *Mycobacterium tuberculosis* and *Rhodococcus erythropolis* mycothiol disulfide reductases (MtMtr and ReMtr respectively) to unveil their mechanism of action, the binding of mycothiol disulfide and to analyze the increased affinity ReMtr shows by certain additional substrates, such as the telluride oxyanion tellurite ($TeO3_2^-$). This information will also allow us to design potential compounds targeting Mtr with therapeutic purposes.

References
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