

**P016** TrmB and TrmBL1, two transcriptional regulators in the heart of the cross-regulatory network of sugar metabolism in *Pyrococcus furiosus*

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The transcriptional regulators TrmB and TrmBL1 of the hyperthermophilic archaeon *Pyrococcus furiosus* were characterized. TrmB inhibits transcription of the maltose/trehalose and the maltodextrin operons by binding to the respective operator site and preventing subsequent RNA polymerase recruitment.

TrmB-mediated inhibition of transcription is counteracted by specific carbohydrates. A distinctive sugar specificity of the repressor in a promoter-dependent manner could be revealed with the aid of *in vitro* transcription assays using purified components of *Pyrococcus furiosus*.

The repressor binds to different DNA sequences on both promoters. Using different TrmB mutants containing point mutations within potential HTH sequences in the DNA binding domain of the repressor, it could be shown that TrmB recognizes the promoters with different binding sites.

TrmBL1 is homologue to TrmB and is involved in the regulation of glycolytic genes by binding to the respective promoters, where it recognizes a conserved sequence called TGM (*Thermococcales*-Glycolytic-Motif). Additionally, it autoregulates its own synthesis. TrmBL1-mediated inhibition is also neutralized by specific carbohydrates.

Furthermore, TrmBL1 recognizes the target promoters of TrmB and vice versa. So both regulators play a crucial role in the cross regulatory network of sugar metabolism in *Pyrococcus furiosus*.