2-hydroxybiphenyl (2-HBP) has been widely used in disinfectant and preservative formulations, as an intermediate in the synthesis of dyes, resins and rubbers, and as a fungicide to control postharvest diseases of various fruits.  

HbpR tightly regulates the 2-HBP degradation pathway at the transcriptional level.  

HbpR adopts a dimeric conformation in solution.  

Mechanism of fluorescence labeling of the Agt-HbpR chimeric protein  

By measuring the diffusion rates of fluorescent molecules or particles in a focal volume, the size of particles can be determined by Fluorescence Correlation Spectroscopy.  

Transcriptional regulators belonging to the XylR family require a chemical effector and a cofactor (ATP) for activation. The interaction with the effector is thought to cause a conformational change through the B-linker which exposes the ATPase activity thereby stimulating the RNAP and activating transcription.  

Genetic organization of the genes in *P. azelaica HBP1*  

*Pseudomonas azelaica* HBP1 is able to use 2-HBP as sole carbon and energy source. The bacteria degrades 2-hydroxybiphenyl through a meta-oxidative pathway.  

2-HBP metabolism is catalyzed by the enzymes encoded by the hpcCAD genes.  

By Fluorescence Correlation Spectroscopy, we have determined that the Agt-HbpR protein adopts a dimeric form in solution even in the presence of 2-HBP and ATP. Under reducing conditions (DTT), or in the presence of detergent, the protein is denatured and becomes monomeric.  

Atomic Force Microscopy, we have demonstrated that the HbpR protein can attach to its DNA even as dimer. Addition of 2-HBP or ATP leads to formation of multimers in the presence of its DNA binding site. Larger particles seem to be formed in presence of ATP or ATP plus 2-HBP; but less of these particles are bound to the DNA.  

To determine the conformation of the Agt-HbpR-Cys in the presence of different compounds: 2-HBP, ATP, AMP, gamma- or alpha-ATP, glutaraldehyde (GA), Dithiothreitol (DTT) and Sodium Dodecyl Sulfate (SDS).  

Characterisation of the XylR family transcriptional regulator HbpR from *Pseudomonas azelaica*.  


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