

Dr1^{GST}

Down-regulator of transcription 1, NC2 β , 19 kDa

human, recombinant, *E. coli*

Cat. No.	Amount
PR-800	10 μ g

For *in vitro* use only
Quality guaranteed for 12 months
Store at -80°C

Avoid freeze / thaw cycles

Form

Liquid. Supplied in 20 mM Tris-HCl, pH 8.0, 100 mM KCl, 0.2 mM EDTA, 1 mM DTT, 20% glycerol

Activity

100 units (ng) are sufficient for a protein-protein interaction assay.

Purity

> 95% by SDS-PAGE

Description

Dr1 is a general negative regulator of class II and class III gene expression. It binds to the basic repeat domain of TBP on promoter DNA and can prevent the RNA Polymerase II holoenzyme, or its TFIIB and/or TFIIA subunits, from assembling into an initiation complex. Dr1 is phosphorylated *in vivo* and this modification affects its interaction with TBP. In addition, Dr1 interacts with the hyperphosphorylated form of Pol II and with the repression domain of the AREB6 repressor. Dr1 forms a heterodimer complex with DRAP1 through its histone fold domain. More recently it was discovered that Dr1-DRAP1 is a bi-functional basal transcription factor that differentially regulates gene transcription through DPE (downstream promoter elements) or TATA box motifs. It can stimulate transcription *in vitro* from *Drosophila* promoters containing DPEs, whereas it represses transcription from TATA-containing promoters.

Recombinant GST-Dr1 is isolated from an *E. coli* strain that carries the coding sequence of the human Dr1 under the control of a T7 promoter.

GST-Dr1 has been applied in protein-protein interaction assays.

Selected References:

- Inostroza et al. (1992) Dr1, a TATA-binding protein-associated phosphoprotein and inhibitor of class II gene transcription. *Cell* **70**:477.
- White et al. (1994) Differential regulation of RNA polymerases I, II, and III by the TBP-binding repressor Dr1. *Science* **266**:448.
- Mermelstein et al. (1996) Requirement of a corepressor for Dr1-mediated repression of transcription. *Genes Dev.* **10**:1033.
- Kim et al. (1995) TATA-binding protein residues implicated in a functional interplay between negative cofactor NC2 (Dr1) and general factors TFIIA and TFIIB. *J. Biol. Chem.* **270**:10976.
- Castano et al. (2000) The C-terminal domain-phosphorylated IIO form of RNA polymerase II is associated with the transcription repressor NC2 (Dr1/DRAP1) and is required for transcription activation in human nuclear extracts. *Proc. Natl. Acad. Sci. USA* **97**:7184.
- Ikeda et al. (1998) Involvement of negative cofactor NC2 in active repression by zinc finger-homeodomain transcription factor AREB6. *Mol. Cell. Biol.* **18**:10.
- Goppelt et al. (1996) A mechanism for repression of class II gene transcription through specific binding of NC2 to TBP-promoter complexes via heterodimeric histone fold domains. *EMBO J.* **15**:3105.
- Willy et al. (2000) A basal transcription factor that activates or represses transcription. *Science* **290**:982.