

## **Saccharomyces cerevisiae kinetochore protein (rDsn1p) induced apoptosis in Chinese hamster ovary cells**

### **ABSTRACT**

Dsn1p is a member of the MIND complex that forms part of the yeast kinetochore, which is essential for the proper chromosomal segregation during cell division. Its functionality is gene dosage dependent and it has characteristics of haploinsufficiency. Bioinformatics alignments predicted the existence of nuclear homologues in higher eukaryotic organisms. Literature on the possibility of Dsn1p being a functional homologue of these organisms is scarce. In this study we employed recombinant DNA expression technology to explore whether Dsn1p can function in a mammalian cell line, Chinese Hamster Ovary (CHO). Expression of rDsn1p in CHO cells induced cytopathic effects including changes in cellular morphology and cell size. Inhibition of cell growth was observed at the beginning the fourth post-transfection week. The recombinant CHO cell culture showed cytotoxic effects following the accumulation of the Dsn1p, resulting in apoptotic cell death; as evidenced by the presence of nuclear fragmentation and surface blebbing in the dying cells. This suggests that rDsn1p may interact with the counterpart/ligand of the nuclear homologue of this protein in CHO cells, resulting in nuclear anomalies and inhibition of cell growth, as observed in our previous study using yeast cells.

**Keyword:** *Saccharomyces cerevisiae*; Kinetochore; Dsn1p; Apoptosis; Chinese hamster ovary (CHO)