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AUJESZKY'S DISEASE VIRUS EARLY PROTEIN 0 ENHANCES  
VIRAI GENE TRANSCRIPTION AND REPLICATION

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The early protein 0 (EP0) of Aujeszky's disease virus (ADV) has been reported to be a homolog of the immediate-early protein ICP0 of herpes simplex virus type 1. EP0 contains a cysteine rich zinc finger domain near the amino terminal region with homology to ICP0 and the relevant proteins of other alphaherpesviruses. The function of EP0, however, is not known.

To elucidate function of EP0, an expression plasmid encoding EP0 was constructed, and the effect of coexpression of EP0 on transcription was analyzed by the chloramphenicol acetyltransferase (CAT) assay under the control of ADV immediate early (IE), thymidine kinase (TK) and glycoprotein X (gX) promoters. By coexpression with EP0, CAT production was enhanced in a dose-dependent manner, and the maximum CAT expression was 3.3-fold, 3.0-fold and 2.3-fold, respectively, as compared with the control. Cotransfection with expression plasmids encoding EP0 and the IE protein (IE180) resulted in further stimulation of transcription driven by the TK and gX promoters.

To examine whether EP0 enhances ADV replication, Vero cells were cotransfected with an EP0-expressing plasmid and infectious ADV DNA. In the cotransfected cells, plaque numbers increased approximately 9-fold as compared with the control.

These results indicate that EP0 activates ADV IE, early and late gene transcription and cooperates with IE180 to enhance early and late gene transcription, and that EP0 enhances the de novo synthesis of infectious virus.