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Role of Specificity Protein-1 and Activating Protein-2 Transcription Factors in the Regulation of the Gap Junction Protein Beta-2 Gene in the Epididymis of the Rat¹

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Abstract

In prepubertal rats, connexin 26 (GJB2) is expressed between adjacent columnar cells of the epididymis. At 28 days of age, when columnar cells differentiate into adult epithelial cell types, *Gjb2* mRNA levels decrease to barely detectable levels. There is no information on the regulation of GJB2 in the epididymis. The present study characterized regulation of the *Gjb2* gene promoter in the epididymis. A single transcription start site at position -3829 bp relative to the ATG was identified. Computational analysis revealed several TFAP2A, SP1, and KLF4 putative binding sites. A 1.5-kb fragment of the *Gjb2* promoter was cloned into a vector containing a luciferase reporter gene. Transfection of the construct into immortalized rat caput epididymal (RCE-1) cells indicated that the promoter contained sufficient information to drive expression of the reporter gene. Deletion constructs showed that the basal activity of the promoter resides in the first -230 bp of the transcriptional start site. Two response elements necessary for GJB2 expression were identified: an overlapping TFAP2A/SP1 site (-136 to -126 bp) and an SP1 site (-50 bp). Chromatin