

**Cloning and Characterization of Porcine Uroplakin II Gene**

**D. N. Kwon**, H. K. Shin, C. K. Hwang, D. W. Ok and J. H. Kim

Dept. of Dairy Science, Division of Applied Life Science,  
Gyeongsang National University

Mammalian urothelium undergoes unique membrane specialization by making the asymmetric unit membrane (AUM) that is covered with the apical cell surface during terminal differentiation. The AUM contains several major integral membrane proteins including uroplakin Ia, Ib, II and III. The genes for uroplakins have been cloned from humans and mice, but not from porcine. In this study, we report the cloning of the UPII genomic DNA, which codes for the full length open reading frame for the uroplakin II protein. The deduced amino acid sequence encodes of a hydrophobic NH<sub>2</sub>-terminal peptide, a prosequence, and a mature protein. The prosequence contains three potential N-glycosylation sites and a RGRR cleavage site that may be involved in uroplakin II processing and maturation. Northern and immunohistochemistry analyses showed that the porcine UPII gene is only expressed in urothelium and that the protein was specifically localized in urothelial superficial cells. A 2kb of upstream in the promoter sequence contains multiple transcription factor binding sites, including GC-box, SPI, AP2, and GATA-box sites, but not for TATA or CAAT-box sequences. Comparison of the porcine UPII promoter sequence with that of the murine by MEME system presented two conserved motifs, suggesting a cis-acting regulatory role for the conserved sequences. Sequence homology between two species in motif A and B was 79% and 80% respectively, although their relative locations were different. During the gestation, mouse bladder at estrus stages and day 10 after parturition showed higher UPII expression, while showed lower expression at peri-implantation stage. Taken together, our results showed that the porcine UPII gene was expressed highly and specifically in the bladder urothelium and that steroid hormones for implantation changed the expression of UPII in the bladder, although the biological significance of UPII remains to be not determined.

(Key words) *uroplakin, cloning, bladder*