Isolation and Characterization of an Endosperm-Specific Promoter from Wheat (*Triticum aestivum* L.)

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Genes coding for avenin-like proteins (ALP) represent a new family of wheat storage protein genes. To find a wheat endosperm-specific promoter, a 1644-bp fragment upstream of the *ALP type-B* gene (GenBank accession number JN622144) was isolated. The important promoter elements of the *ALP type-B* gene were ascertained through sequence analysis which revealed that this fragment contains the TATA and CAAT boxes, which are important elements in gene expression. A prolamin box containing an endosperm motif and a GCN4-like motif (GLM) is present at about 300 bp upstream of the translation start site. The promoter sequence has two ESP-like elements and one of them is followed by an RY motif with the nucleotides CATG overlapping. The RY motif is considered the core functional sequence in a promoter. In an attempt to confirm the promoter activity, a series of 5′-deletions of the promoter were fused with the *b*-glucuronidase (GUS) gene, and the constructs were stably introduced into tobacco plants. GUS staining confirmed that the *AVL type-B* promoter is an endosperm-specific promoter in tobacco seeds. Quantitative analysis of GUS expression in transgenic plants showed that even the shortest 5′-deletion, *i.e.* a 290-bp promoter sequence within the prolamin box, was sufficient to drive GUS expression in the endosperm. The highest expression level was found in transgenic plants containing the 5′-deletion vector construct pALP-8. This suggests that the ESP-like element overlapping with the RY motif may play a crucial role in the regulatory function of the promoter.

Key words: Wheat, Endosperm-Specific Promoter, Tobacco