A cDNA clone encoding HBP-1b homologue in Arabidopsis thaliana

Takefumi Kawata¹, Takuya Imada³, Hideaki Shiraishi², Kiyotaka Okada², Yoshiro Shimura²,⁴ and Masaki Iwabuchi¹,³

¹Division of Developmental Biology, ²Division of Gene Expression and Regulation I, National Institute for Basic Biology, Okazaki 444, ³Department of Botany and ⁴Department of Biophysics, Faculty of Science, Kyoto University, Kyoto 606-01, Japan

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Our researches on the transcriptional regulation of wheat histone H3 gene have revealed the presence of several cis- and trans-acting factors (1). One of the best characterized regulatory sequences is the hexameric motif, AGCTCA (2), and we have identified two distinct hexamer-specific DNA-binding proteins, HBP-1a and HBP-1b, in wheat (3). HBP-1b can bind to the hexameric motifs found in the CaMV35S and NOS promoters as well as the hexameric motif of the H3 promoter, whereas the HBP-1a binds exclusively to the H3 promoter (3, 4). We have already isolated cDNA clones encoding HBP-1a and HBP-1b from wheat (5, 6). Structural analyses of the cDNAs revealed that both proteins are member of bZIP-type transcription factors (7). HBP-1b-like factors capable of binding to the hexameric (or related) motif of several T-DNA and plant viral gene promoters have been found as OCSTF in maize (8) and as ASF-1 in tobacco (9), and their cognate cDNAs, OCSTF-I, −2 (10), and TGA1a (11), have been isolated. All of these have bZIP domains and similar DNA-binding specificity. This prompted us to speculate that the genes of HBP-1b homologues may widely be present in various plant species. Isolation of the HBP-1b homologues from different species is important for understanding the real HBP-1b functions in vivo by using the T-DNA tagging and gene disruption techniques.

During the preparation of this manuscript, a cDNA clone (PosF21) encoding a bZIP-type DNA binding protein has been reported in A. thaliana (cv. Columbia) (12). There is no obvious homology in amino acid sequence between bA19 and PosF21, thus they are different transcription factors in A. thaliana.

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