

## **A BRANCHED-CHAIN AMINO ACID AMINOTRANSFERASE GENE ISOLATED FROM *HORDEUM VULGARE* IS DIFFERENTIALLY REGULATED BY DROUGHT STRESS**

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Differential display was used to isolate cDNA clones showing differential expression in response to ABA, drought and cold in barley seedling shoots. One drought-regulated cDNA clone (DD12) was further analyzed and found to encode a branched-chain amino acid aminotransferase (HvBCAT-1). A genomic clone was isolated by probing the Morex BAC library with the cDNA clone DD12 and the structure of *Hvbcacat-1* was elucidated. The coding region is interrupted by six introns and contain a predicted mitochondrial transit peptide. *Hvbcacat1* was mapped to chromosome 4H. A comparison was made to rice and *Arabidopsis* genes to identify conserved structural patterns. Complementation of a yeast (*Saccharomyces cerevisiae*) double knockout strain revealed that HvBCAT-1 can function as the mitochondrial (catabolic) BCATs *in vivo*. Transcript levels of *Hvbcacat-1*, increased in response to drought stress. As the first enzyme in the branched-chain amino acid (BCAA) catabolic pathway, HvBCAT-1 might have a role in the degradation of BCAA. Degradation of BCAA could serve as a detoxification mechanism that maintains the pool of free branched-chain amino acids at low and non toxic levels, under drought stress conditions.