Nucleotide sequence of a 1,3,1,4-β-glucanase-encoding gene in *Bacillus circulans* WL-12

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We have previously reported (1) the molecular cloning of a DNA fragment from *Bacillus circulans* WL-12 which directs the synthesis of *E. coli* of an enzyme that specifically degrades lichenan (mixed-linkage 1,3-1,4-β-glucan). The nucleotide sequence of the 1987-bp BamHI-HindIII fragment containing the 1,3-1,4-β-glucanase gene (BGC), has been determined. The BGC gene comprises an open reading frame of 1227 bp coding for a 409-amino acid precursor polypeptide with a calculated molecular weight of 4481 daltons, in close agreement with the value of 4050 previously estimated for the mature extracellular form by SDS-polyacrylamide gel electrophoresis. The Kyte and Doolittle hydrophathy plot of the deduced amino acid sequence shows a protein in the N-terminus is the most hydrophobic region, with structural features resembling those found in signal peptides of secreted proteins. A search for putative promoters upstream from the proposed translation initiation codon identified two hexamers related to the −35 and −10 consensus sequences, located at the appropriate distance (17 bp): TTGACG (positions −190 to −185) and GATGAT (positions −167 to −162). A presumed ribosome-binding sequence AAAGGACGU, which is complementary to the 3' end of *B. subtilis* 16S rRNA, is found immediately preceding (6 bp) the initiation codon. Beyond the translation stop codon, a sequence of 33 nucleotides (positions +1328 to +1360) can be folded into a stem-loop structure which might function as a transcriptional terminator. No significant amino acid sequence homology was found between the BGC product and other 1,3-1,4-β-glucanases from different *Bacillus* species, such as *B. subtilis* (2) and *B. amyloyiquefaciens* (3), or with a 1,3-β-glucanase from the same microorganism *B. circulans* WL-12 recently reported (4).

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REFERENCES