

Nucleotide sequence of the human ornithine decarboxylase gene

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Submitted October 10, 1989

EMBL accession no. X16277

We have cloned and sequenced the human gene for ornithine decarboxylase (ODC; EC 4.1.1.17). The entire ODC gene is located on a \pm 10 kb BamHI fragment and comparison with the human ODC cDNA sequence (1) reveals that it consists of 12 exons. Protein coding exons (III - XII) have a homology ranging from 81% up to 91% when compared with the corresponding exons of the rat ODC gene (2). The noncoding exons I and II show lower homologies of 74% and 68%, respectively. The length of the introns and their homology with the rat ODC introns vary considerably, which is in part caused by the presence of three Alu-repeats in the human gene (two in intron I and one in intron VIII). Comparison of the 5' nontranscribed region of the human gene with those of the rat (2) and mouse (3) reveals that several putative promoter/enhancer elements are conserved in this region: TATA box (pos.763); CAAT box (pos.712); GC box (pos.677). Interestingly the sequence motif TGTTTG (pos.723), which is thought to be involved in cell type-specific expression (4), is also conserved between these three ODC genes. As expected for a cAMP inducible gene, human ODC contains a consensus sequence of a CRE (5). However, its position (nt 617) relative to the capsite differs from the one observed in the rat and mouse ODC gene. Finally, computer searches for AP-1 (6) and AP-2 (7) binding sites revealed no conservation of such sites in the ODC genes of human, rat and mouse.

Figure 1. Genomic sequence of the human gene for ornithine decarboxylase. Exons are underlined. The translation initiation codon (ATG) and termination codon (TAG) are at positions 4090 and 8396, respectively. Conserved putative promoter/enhancer elements are indicated by boxes.

Acknowledgement

We wish to thank H.M. Hodemaekers and D. Murris for their skillful technical assistance and H.J. van Kranen for the computer searches.

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