Rapid Communication: Nucleotide Sequence of Porcine OTCase cDNA

Jeanne B. Koger and Evan E. Jones

Department of Animal Science, North Carolina State University, Raleigh 27695-7621

Name of Sequence. Porcine Ornithine Transcarbamylase (OTCase), E.C. 2.1.3.3.
EMBL/GenBank Accession Number. Y13045.
Species. Sus scrofa, pig.
Origin of Clone. A cDNA clone that contains the nucleotide sequence of mature ornithine transcarbamylase has been isolated from a commercial λgt10 library constructed from adult male pig liver cDNA (Clontech). The clone was isolated by the analytical PCR method of Israel (1993). The sequence was obtained from three independent PCR reaction products and from the cloned phage itself using ThermoSequenase (Amersham) and [α-33P]dideoxy nucleotide triphosphates. All base identities were confirmed by sequencing from at least two independent templates. The nucleotide sequence and the deduced amino acid sequence are shown in Figure 1. The initial codon was identified by reference to sequence data from Edman degradation of the purified protein (Koger et al., 1994).

Comparison with Other Mammalian OTCases. The deduced amino acid sequence is 94.4% and 93.2% identical to human (Horwich et al., 1984) and rat (Takiguchi et al., 1984) OTCases, respectively. The pig and human nucleotide sequences are 92.1% identical.

Sequence Analysis. The porcine enzyme contains the carbamyl phosphate binding motif (STRTR) characteristic of transcarbamylases and the putative ornithine binding sequence (FLHCLP) conserved in OTCases from E. coli to mammals.

Comments. Porcine OTCase is a nuclear encoded mitochondrial matrix enzyme of three identical 322 amino acid monomers. It catalyzes the synthesis of citrulline from carbamyl phosphate and ornithine for biosynthesis of arginine and urea.

Literature Cited


Key Words: Arginine, Citrulline, Porcine, Ornithine Transcarbamylase, Urea Cycle


Figure 1. Nucleotide and deduced amino acid sequences of porcine ornithine transcarbamylase cDNA. The single underline corresponds to the putative carbamyl phosphate binding motif, STRTR, and the double underline to the putative ornithine binding motif, FLHCLP. The stop codon is indicated by an asterisk (*).