The carB gene encoding the large subunit of carbamoylphosphate synthetase from Lactococcus lactis is transcribed monocistronically

The biosynthesis of carbamoylphosphate is catalysed by the heterodimeric enzyme carbamoylphosphate synthetase (CPSase). The genes encoding the two subunits in procaryotes are normally transcribed as an operon, whereas in Lactococcus lactis, the gene encoding the large subunit (carB) is shown to be an isolated transcriptional unit. Carbamoylphosphate is a precursor in the biosynthesis of both pyrimidine nucleotides and arginine. By mutant analysis L. lactis is shown to possess only one carB gene; the same gene product is thus required for both biosynthetic pathways. Furthermore, arginine may satisfy the requirement for carbamoylphosphate in pyrimidine biosynthesis through degradation by the arginine deiminase pathway. The expression of the carB gene is subject to regulation at the level of transcription by pyrimidines most probably by an attenuator mechanism. Upstream of the carB gene, an open reading frame, showing a high degree of similarity to glutathione peroxidases from other organisms was identified.