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Identification of cis-regulatory elements of butyrophilin gene of the mammary gland

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Butyrophilin subfamily 1 member A1 is a highly expressed gene in mammary gland of all mammals during lactation. It is found to be the major integral protein in the milk fat globule membrane. Its interactions with other membrane elements and soluble protein of the mammary epithelial cells regulate the secretion of milk fat. In order to reveal any shared cis-acting elements, the human butyrophilin subfamily 1member A1 5' genomic sequence was analyzed and compared with four mammals comprising of a rodent and three primates, viz., Mus musculus Macaca mulata, and three other mammary specific human milk genes using publicly available bioinformatics tools. Prior to a multiple sequence analysis, low complexity DNA sequences were masked using CENSOR. The multiple sequence analysis revealed nine highly conserved regions of similarities in the 5' butyrophilin genes across species. Consensus putative transcription factor binding sites were identified using MatInspector and compared with SiteGA results. They were subsequently examined for the expression in the mammary gland as well as for their occurrence in the previously identified region of homology. Finally, CCCTC binding factor (CTCF) and nuclear receptor subfamily 2 at a similar distance from the transcription start site in the 5' butyrophilin gene across the species. However, the exact interaction of these transcription factors with the butyrophilin gene is not known, which needs further investigation.

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