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Expression of Human Type II Collagen Gene in the Milk of Transgenic Mice

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Collagen has been widely studied for medical applications. Previous studies have shown that the bovine β-casein promoter were able to drive cell-specific and hormone-dependent expression to a mouse mammary cell line but failed to induce accurate expression to the mammary gland of transgenic mice. To analyze the ability of 1.7 kb or 3.1 kb bovine β-casein promoter sequences for the expression regulation of transgene *in vivo*, transgenic mice were produced with human type II collagen gene fused with 1.7 kb and 3.1 kb of bovine β-casein promoter by DNA microinjection. Transgenic founder mice were mated to produce transgenic F_1 and F_2 mice whose females were used for the analysis of tissue specificity and the level of human type II collagen in mammary gland. The mRNA expression of human type II collagen gene was analyzed in different tissues of lactating transgenic female mice by Northern blot and RT-PCR. RT-PCR and Northern blot analysis. The mRNA results revealed that the level of transgene mRNA in mammary gland of the transgenic mice was not significantly different between the 1.7 kb and 3.1 kb promoter sequences while tissue-wide leaking of expressions occurred in 1.7 kb promoter lines. And Western blot analysis of the transgenic mouse milk showed that milk of p3.1 kb transgenic mice contained more type II collagen than that of p1.7 kb transgenic mice. Thus, 3.1 kb bovine β-casein promoter direct a high-level expression of reporter gene to the lactating mammary glands of transgenic mice in a tissue-specific manner.

Key words: ***Bovine β-casein promoter, Transgenic mice, Gene expression; milk, Human type II collagen gene***