

Expression and Characterization of the Human Lactoferrin in the Milk of Transgenic Mice

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Human lactoferrin (hLF) is an 80 kDa iron-binding glycoprotein that is expressed in high concentration in milk and in lesser amount in the secondary or specific granules of neutrophils and in plasma, LF is classically considered to be related to the binding, transport, and storage of iron. The transgenic mice carrying the human hLF gene in conjunction with the bovine β -casein promoter produced the human hLF in their milk during lactation. To screen transgenic mice, PCR was carried out using chromosomal DNA extracted from tail or toe tissues. In this study, stability of germ line transmission and expression of hLF were monitored up to generation F17 of a transgenic line. When female mouse of generation F9 was crossbred with normal male, generation F9 to F17 mice showed similar transmission rates ($66.0 \pm 12.57\%$, $42.0 \pm 14.98\%$, $72.2 \pm 25.45\%$, $50.0 \pm 16.70\%$, $65.7 \pm 6.45\%$, $48.6 \pm 14.65\%$, $54.1 \pm 18.11\%$, $57.8 \pm 16.16\%$ and $48.6 \pm 20.66\%$, respectively), implying that the hLF gene can be transmitted stably up to long term generation in the transgenic mice. For ELISA analysis, hLF expression levels were determined with an hLF ELISA kit in accordance with the supplier's protocol. Expression levels of human hLF from milk of generation F9 to F13 mice were 3.2 ± 0.69 mg/ml, 3.1 ± 0.81 mg/ml, 4.6 ± 1.38 mg/ml, 3.1 ± 0.42 mg/ml, and 4.5 ± 1.48 mg/ml, respectively. These expression levels were lower than that of founder (6.6 mg/ml) mouse. We concluded that transgenic mice faithfully passed the transgene on their progeny and successively secreted target proteins into their milk through several generations.

Key words) *hLF, Transmission, Expression, Transgenic Mice*