

## High-level Expression and Characterization of the Human Interleukin-10 in the Milk of Transgenic Mice

**Zheng, Z. Y<sup>1</sup>**, B. H. Sohn<sup>1</sup>, K. B. Oh<sup>1</sup>, W. J. Shin<sup>2</sup>, Y. M. Han<sup>1</sup> and K. K. Lee<sup>1</sup>

<sup>1</sup>Laboratory of Development and Differentiation, Korea Research Institute of Bioscience and Biotechnology, <sup>2</sup>Department of Animal Resources Science, Chonbuk National University

Interleukin-10 (IL-10) is a homodimeric protein with a wide spectrum of anti-inflammatory and immune activities. It inhibits cytokine production and expression of immune surface molecules in various cell types. The transgenic mice carrying the human IL-10 gene in conjunction with the bovine  $\beta$ -casein promoter produced the human IL-10 in milk during lactation. Transgenic mice were generated using a standard method as described previously. To screen transgenic mice, PCR was carried out using chromosomal DNA extracted from tail or toe tissues with a primer set. In this study, stability of germ line transmission and expression of IL-10 gene integrated into host chromosome were monitored up to generation F15 of a transgenic line. When female mouse of generation F9 was crossbred with normal male, generation F9 to F15 mice showed similar transmission rates ( $66.0 \pm 20.13\%$ ,  $61.5 \pm 16.66\%$ ,  $41.1 \pm 8.40\%$ ,  $40.7 \pm 20.34\%$ ,  $61.3 \pm 10.75\%$ ,  $49.2 \pm 18.82\%$ , and  $43.8 \pm 25.91\%$ , respectively), implying that the IL-10 gene can be transmitted stably up to long term generation in the transgenic mice. For ELISA analysis, IL-10 expression levels were determined with an hIL-10 ELISA and a mIL-10 ELISA kit in accordance with the supplier's protocol. Expression levels of human IL-10 from milk of generation F9 to F13 mice were  $3.6 \pm 1.20$  mg/ml,  $4.2 \pm 0.93$  mg/ml,  $5.7 \pm 1.46$  mg/ml,  $6.3 \pm 3.46$  mg/ml, and  $6.8 \pm 4.52$  mg/ml, respectively. These expression levels are higher than in generation F1 (1.6 mg/ml) mice. We concluded that transgenic mice faithfully passed the transgene on their progeny and successively secreted target proteins into their milk through several generations, although there was a little fluctuation in the transmission frequency and expression level between the generations.

Key words) *IL-10, Transmission, Expression, Transgenic mice*