

Fidelity of Transgene Transmission and Expression in the Transgenic Mice

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In this study, we examined transmission efficiency and expression level of the transgenes in the transgenic mice. The transgenic lines secreting a considerable amount of human lactoferrin(LF), thrombopoietin(TPO), interleukin-10(IL-10) into their milk were subjected to access the inheritance and maintenance of transgenic phenotype. They were bred through three generations. The transmission frequency for each generations(F9, F10, F11) of 3 lines was $38.03 \pm 10.43\%$ (13/35), $48.33 \pm 13.76\%$ (19/39) and $31.83 \pm 8.88\%$ (9/28) in the LF line, $51.33 \pm 18.98\%$ (20/38), $63.70 \pm 35.71\%$ (12/20) and $29.57 \pm 15.05\%$ (8/26) in the TPO line, $38.27 \pm 17.74\%$ (15/37), $47.47 \pm 29.88\%$ (14/28) and $50.87 \pm 5.85\%$ (14/28) in the IL-10 line, respectively. The results suggest that all transgenic lines transmitted their transgenes from generation to generation in a Mendelian fashion. Thus, there was no significant difference in the transmission frequency of transgens($p < 0.05$). The expression level of target proteins in the milk from each generation was $0.90 \pm 0.33\text{mg/ml}$ (F9) and $0.94 \pm 0.21\text{mg/ml}$ (F10) in LF line, $1.07 \pm 0.33\text{mg/ml}$ (F9) and $1.05 \pm 0.45\text{mg/ml}$ (F10) in TPO line, and $3.60 \pm 1.20\text{mg/ml}$ (F9) and $4.20 \pm 0.92\text{mg/ml}$ (F10) in IL-10 line. We concluded that transgenic mice faithfully passed the transgenes 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. Our results indicate that the transgenes are stably being integrated into chromosomes of the transgenic mice.

Key words) *Transgenic mice, Lactoferrin, Thrombopoietin, Interleukin-10*