

〈特別講演〉

皮膚において遺伝子はどのように機能しているのか？

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How Do Genes Function in the Skin ?

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Abstract

The complete sequence of human genome will change the way we think about biology. In this post-genome era, it is one of the most important issues to clarify gene functions. Establishment of gene “knock-out mice” is powerful to search the gene functions *in vivo*. However, some conventional “knock-out mice” have resulted in lethality during embryogenesis or soon after birth, preventing analysis of gene functions in adulthood. To overcome these difficulties and analyse the gene functions in the skin, skin specific gene targeting using Cre/loxP system was established. The system required two different transgenic mouse lines; K 5-Cre mice expressing Cre in basal keratinocytes and loxP-bearing mice. Upon mating of the two mice lines, progeny with the keratinocyte-specific disruption of loxP-bearing gene were obtained. To analyse the functions of Stat 3 which plays pivotal roles for signal transduction, the skin specific gene targeting of Stat 3 was performed. Despite functional ablation of Stat 3 in the keratinocytes from the mutant mice, no developmental abnormality was observed. However, skin remodeling such as wound healing and second hair cycling was profoundly impaired in the mutant mice. These results implicate that the skin specific gene targeting provides a new opportunity to analyse the gene functions in the skin.

Key words: skin specific gene targeting, Cre/loxP system, Stat 3.