

〈シンポジウム I〉

『毛髪研究の最前線：毛包幹細胞から毛髪特性まで』

髪を生みの親，育ての親—発生生物学から見た毛髪—

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Parents and Foster Parents of Hair—Views from Developmental Biology—

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Abstract

Hair growth is supported by vigorous proliferation of the hair matrix cells in anagen and ceased by their apoptosis in catagen. For regeneration of hair, the hair matrix needs to be reproduced from the follicular epithelial stem cells that reside in the bulge. In addition to the bulge stem cells, the dermal papillae are also important for proliferation and differentiation of the hair matrix cells. The dermal papillae can induce hair formation in glabrous skin if they are contacted with its epidermis. This fact shows that they actually have hair-inducing activity and would lose it in catagen and telogen. However, it has been unclear whether the hair-inducing activities of the dermal papillae change during anagen and also whether the follicular epithelial cells change their competences to the activities during hair cycle. We found in mice that hair-inducing activities of the dermal papillae were qualitatively different between early anagen and mid anagen. Similarly, there are distinct follicular epithelial populations with the competence specific to the dermal papilla signals either in early anagen or mid anagen. The expression patterns of alkaline phosphatase were also different between early anagen and mid anagen in both the dermal papillae and the hair bulb epithelia. These differences would be closely associated with the change of functions of the dermal papillae during anagen and well accorded with the expression of BMPs and BMP antagonists. Thus, we speculate that functional changes of the dermal papillae and follicular epithelia during anagen as well as catagen and telogen would be crucial to control hair cycle.

Key words: hair cycle, stem cell, dermal papilla, alkaline phosphatase, BMP.