**In vivo and in vitro Hair Inducing Activity of Reconstructed DP-Like Tissue Employing MSCs for New Therapy of Alopecia**

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**Introduction**

The methods currently used for treating alopecia have some limitations. The number of hair transplantation restricts less than 3 times because total transplantable hair number is no increase. To overcome these problems, researchers have attempted the in vitro culturing of hair follicle cells and implanting these cells in the treatment area. In the present study, culture-expanded mesenchymal stem cells (MSCs) that do not possess aggregative activity were used to produce cell-aggregated spheroidal dermal papilla like tissues (DPLTs) with the aid of a special culture condition in vitro, and hair follicle inductive capacity pertinent to the aggregative activity was then evaluated.

**Materials and Methods**

Isolated and cultivated MSCs from bone marrow and umbilical cord in vitro. After propagated MSCs underwent preconditioning in dermal papilla forming medium (DPFM), then subcultured MSCs formed self-aggregated DPLTs. We compared real human scalp dermal papilla cells (hDPCs) with DPLT employing DPCs, DPLT employing hBM-MSCs and DPLTs employing hUC-MSCs.

**Results**

Light microscopy and immunohistochemical staining were used to confirm that reconstructed DPLTs generated by this procedure had the size, shape, and expression of proteins similar to actual DP.

![Fig. 1](image1.png)

**Discussion and Conclusions**

The DPLTs have the same hair follicle inductive ability as natural dermal papilla (DP) tissue in vitro. As a result, MSCs from bone marrow and umbilical cord may be an applicable and novel cell source for the generation of human hair cell therapy.

**References**


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