



CDB SEMINAR

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Friday, February 10, 2012

16:00~17:00 A7F Seminar Room

The stem cell niche is giving me goosebumps, and more

Summary

When you are angry, scared, or cold, your hairs stand up. This is because the tiny muscles associated with hair follicles, the arrector pili muscles (APMs), contract and raise hair follicles, causing goosebumps (in Japanese “torihada”). We reveal that stem cells in the hair follicle create a special niche in the underlying basement membrane (BM) that promotes the maturation of APMs and their attachment to the hair follicle stem cell niche “the bulge”. Hair follicle stem cells deposit nephronectin, an extracellular matrix (ECM) component, onto the BM. Nephronectin binds to $\alpha 8 \beta 1$ integrin expressed by muscle precursors and induces their differentiation. In nephronectin knockout mice, fewer arrector pili muscles form in the skin, and they attach to the follicle above the bulge, where there is compensatory upregulation of the nephronectin family member EGFL6. Wnt/ β -catenin signalling in the stem cells regulates the restricted expression of both epidermal nephronectin and dermal $\alpha 8 \beta 1$ integrin. Through this study, we proposed three novel concepts 1) the BM specialization is a key to establish distinct cell niches and developmental patterning, 2) stem cells themselves act as a niche for neighbouring mesenchymal cells and 3) hair follicle stem cells function as tendons for the APM. In this seminar, I will also describe another function of the hair follicle stem cell niche with our recent data.

Host:

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