

Communication between internal stem cell niche and the external environment: insight from hair follicles

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Abstract:

For most mammals, hair serves as the first barrier that protects and insulates our body from external insults. When skin is injured or the hair coat is impaired, prompt transition from a resting to a growing phase to regenerate new hair enables timely recovery of this important protective barrier. Hair follicle regeneration is powered by epithelial hair follicle stem cells (eHFSC) whose activity is subject to non-cell-autonomous regulation from their niche. In adaption to the ever-changing external environment and skin conditions, eHFSC niche must be endowed with the ability to detect these changes and responds adaptively to modulate eHFSC activity for organismal needs. In this talk, I will demonstrate how the eHFSC niche enables eHFSCs to detect external light and temperature changes for hair follicle regeneration. I will also talk about how inflammation triggered by skin irritation modulates eHFSC metabolism to promote hair growth. Targeting these pathways can be new strategies for the treatment of alopecia.