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# EXOSOMES SECRETED BY STIMULATED DERMAL FIBROBLASTS ENHANCE HAIR FOLLICLE GROWTH VIA REGENERATIVE ACTIVATION OF DERMAL PAPILLA CELLS

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**Dermal papilla (DP) plays a critical role in hair follicle (HF) cycling, stem cell persistence but also proper skin architecture. Wnt signaling, fibroblast growth factors and the bone morphogenetic protein (BMP) pathway are crucial for early DP development and maturation. PDGF-AA is another epidermal factor which contributes to the formation of DP. Intact DP or DP cells (DPCs) at ealy passages can be engrafted with epidermal cells to reconstitute HF on mice. However DPCs gradually lost their regenerative capacity after being passaged. Sphere formation increases the hair-inductive activity of cultured human DPCs that display expression profiles different from DPCs cultured in 2D but with many similarities to intact DPCs. To restore *in vitro*, their regenerative capacity, primary DPCs cultivated in 2D for 5 passages were treated with exosomes (EVs) purified from dermal fibroblasts (DFs) stimulated by both bFGF and PDGF-AA. 48h after treatment, expression profiles were compared to untreated cells and DPCs cultivated as spheres. Cell proliferation of EVs-treated DPCs was enhanced while a-SMA production was drastically reduced. EVs treatment restored the spheroid DPCs expression profile by recapitulating both the activation of Wnt pathway through Norrin (NDP) and the repression of two BMP antagonists Grem-1 and Bambi. Remarkably, these EVs, and not the soluble growth factors, enhanced the survival and growth of HF cultivated *ex-vivo*. EVs could become a valuable tool to maintain and restore DPC activity and HF cycling. These EVs could counteract human male androgenetic alopecia.**

## Biography

Alizée Le Riche obtained her master's degree in cellular biology from Université Paul Sabatier in Toulouse and she is now completing her PhD from Université Paris-Diderot in collaboration with a private cosmetic industry named SILAB. Alizée was interested in dialogue between hair follicle and its macro-environment via implication of extracellular vesicles.

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