



HAIR DISORDERS

# INTEREST OF A MIX OF NASTURTIUM OFFICINALE AND TROPAEOLUM MAJUS EXTRACTS FOR CHRONIC HAIR LOSS TREATMENT

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**Introduction:** The hair follicle (HF) undergoes cycles of growth (anagen), regression (catagen) and resting (telogen) phases. Chronic hair loss is caused by the shortening of the active growing phase (anagen) and the extension of the quiescence phase (telogen) of the HF. This imbalance leads first to the miniaturization of HFs, then to the loss of their ability to generate new hair shafts.

**Objective:** The aim of this study was to evaluate the effect of a mix of Nasturtium officinale and Tropaeolum majus dry extracts on signals and molecular markers of human dermal papilla cells (HDPCs) that regulate anagen onset, HF growth maintenance and the transition of anagen to catagen phase. Potential synergistic activities with adenosine triphosphate (ATP) were also investigated.

**Materials and Method:** Wnt/b-catenin pathway activation was measured using a gene reporter assay strategy (transfection of HDPCs with a lentivirus expressing luciferase gene under the control of TCF/LEF promoter). Keratinocyte Growth Factor (KGF), Hepatocyte Growth Factor (HGF) and Dickkopf-related protein 1 (DKK1) protein expression levels were measured in HDPCs culture supernatants using ELISA and Luminex technology. Aromatase expression in HDPCs was analysed at mRNA level (Q-PCR analysis) and proteic level (western blot analysis) following respectively 24 and 48 hours of incubation with the extracts.

**Results:** We found that the mix of Nasturtium officinale and Tropaeolum majus dry extracts activated Wnt/b-catenin pathway (+38%), enhanced KGF and HGF secretion when tested in association with ATP with synergistic activities (respectively +72% and +133%), and inhibited DKK1 production and release (-65%). Aromatase expression was also induced by this combination of extracts (+48%).

**Conclusion:** The results of this study indicate that the mix of Nasturtium officinale and Tropaeolum majus dry extracts is a good candidate for chronic hair loss treatment and could be associated with ATP to potentiate their respective effects.

