Stimulation of Hair Growth
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BACKGROUND
Currently-available treatments for human hair loss take months to show efficacy and have numerous side effects. No treatment exists for efficiently activating lasting hair growth. UCI scientists have discovered cell- and biological agent- based therapy to stimulate faster new hair growth compared to conventional treatments.

FULL DESCRIPTION
Human hair loss conditions result from abnormalities in the so-called hair growth cycle, the recurrent process of hair production separated by periods of inactivity. Current anti-hair loss treatments modulate only part of this cyclic process e.g., Finasteride lengthens hair production phase leading to longer hairs, but it cannot activate re-entry of dormant hairs into new growth phase. Because of this, such treatments show extremely slow and incomplete recovery from hair loss, especially when the condition is advanced. Additionally, the efficacy of new hair regeneration via stem cell therapy or the so-called hair cloning was never conclusively demonstrated in the clinical settings.

Inspired by the naturally occurring human condition of excessive hair growth, UCI researchers have discovered that re-entry of dormant hairs into active growth cycle can be efficiently stimulated when hairs are exposed to a specialized type of pigment-producing cell or to the signaling molecules that this type of cell actively makes. This suggests that either transplanting cells into the skin or simply injecting their bioactive molecules is sufficient to drive new hair growth on the scalp.

UCI scientists also found that hair growth-inducing effect of pigment-producing cells is potentiated by other naturally occurring cells derived from blood. Moreover, they investigated the profile of secreted signaling molecules and determined that a wide range of skin specific cells, beyond pigment producing cells, can be coaxited to make them due to shared profiles of secreted factors. Injeting a synthesized cocktail of signaling molecules into an area with dormant hairs in vivo in an animal model induced rapid new hair growth. Prospective plans involve testing these effects on human skin. Targeting a signaling pathway for naturally robust hair growth in humans presents a promising approach for treating hair loss conditions.

STATE OF DEVELOPMENT
» Researchers have tested hair growth in vivo in several complimentary animal models.
» Verified that pigment-producing cells enhance hair growth
» Evaluated signaling molecule profiles of pigment cells derived from skin.
» Established several key molecular players for promoting hair growth.

FEATURES/BENEFITS
» Stimulates new hair growth for treating hair loss conditions
» Cocktail of hair growth inducing molecules is more potent than any given one molecule and provides option of varying treatment strengths
» Exploits naturally robust hair growth mechanism present in humans
» Minimizes risks of side effects e.g. cancer
» Permanent or semi-permanent solution to hair loss
» Multiple possible treatment delivery methods

PATENT STATUS
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