

## Researchers Observe Hair Follicle Communication for Hair Growth

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Researchers at the University of Southern California's Keck School of Medicine have discovered that stem cells in hair follicles communicate with each other via a specific molecular activator/inhibitor pair to stimulate hair growth. [This discovery](#) could lead to more efficacious treatments for hair loss.

The researchers, headed by Cheng-Ming Chuong, PhD, a professor of pathology at the school, analyzed the changes in the hair growth patterns on shaved mice and rabbits, which indicated cyclic progression between active and quiescent states by stem cells in hair follicles. They found that hair stem cells coordinate their regeneration with each other via the pair of the molecular activator pathway Wnt and molecular inhibitor BMP. According to the researchers, when Wnt and BMP signals are used repetitively among a population of thousands of hair follicles across the entire skin surface, complex regenerative hair growth behavior emerges through the process of self-organization.

The researchers believe that this discovery could be used to find a cure for alopecia, where human hair follicles have lost the ability to communicate, or to treat hair loss. Therefore, if a treatment could stimulate the communication between human stem cells, it potentially could trigger the regeneration of [hair](#). This discovery reportedly may also provide insight into potential stem cell behavior in other organs, where it is hypothesized that those stem cells may similarly communicate to encourage growth.

The researchers from Keck, also including Chih-Chiang Chen, Damon de la Cruz and Randall Widelitz, collaborated with mathematical biologists from the University of Oxford to publish this research in the article, "[Self-Organizing and Stochastic Behaviors During the Regeneration of Hair Stem Cells](#)," which appeared in *Science*. The article's lead author was Maksim Plikus, PhD, now a postdoctoral research associate at the University of Pennsylvania.

The research was supported by the postdoctoral training grant from California Institute for Regenerative Medicine. The USC Stevens Institute for Innovation has already applied for a patent on the composition and method to modulate hair growth. The study builds upon an earlier paper that a team led by Plikus and Chuong published three years ago in *Nature* on the macro-environment surrounding the hair growth in mice.

Original article: <http://www.cosmeticsandtoiletries.com/research/biology/122683374.html> - Article Captured: June 1<sup>st</sup>, 2011