# Hair Regeneration By Small Molecules That Activate Autophagy

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## Technology description

Summary
UCLA researchers in the Department of Molecular and Medical Pharmacology, and the Department of Pathology & Laboratory Medicine have identified small molecules allowing stimulation of hair regeneration.
Background
The process of mammalian hair growth consists of cyclic repetitions of telogen (quiescence), anagen (regeneration), and catagen (degeneration) phases of the hair follicle, as regulated by both intrinsic and extrinsic signals that control quiescence and activation of hair follicle stem cells (HFSC). Inadequate HFSC activation and proliferation due to aging, hormonal dysfunction, autoimmunity, or cancer treatment result in hair loss, or alopecia, affecting millions of people worldwide. Methods and pharmaceutical reagents that promote hair regeneration and HFSC activation are highly sought after.
Innovation
Researchers at UCLA have demonstrated that autophagy plays a role in anagen initiation and hair regeneration. Autophagy is elevated as hair follicles progresses through anagen, and autophagy decreases in catagen and remains low in telogen. These researchers have shown that activation of autophagy by specific mammalian target of rapamycin (mTOR)-independent autophagy inducing small molecule, or mTOR inhibitor, or AMP-activated protein kinase (AMPK) activator is highly effective for promoting hair regeneration.

## Application area

- Hair regeneration

## Advantages

- Autophagy activation represents a novel mechanism of action for promoting hair regeneration

## Institution

University of California, Los Angeles

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