# Inhibition of Pyruvate Oxidation to Promote Hair Growth

Published date: Aug. 9, 2018

## Technology description

UCLA researchers in the departments of Molecular, Cell & Developmental Biology and Biological Chemistry have elucidated a novel mechanism by which pyruvate oxidation can be inhibited in order to promote hair growth.

BACKGROUND

The global market for aging-related hair loss will grow to over $1.4 billion by 2020. However, commercially available products that combat hair thinning or balding have variable efficacy among users. Further, the targets of these products are either unknown or alter hormonal pathways, which may have undesirable side effects, such as the up-regulation of signaling pathways associated with cancerous growth. A hair loss remedy that has a higher success rate than current treatments and minimal side effects would greatly increase consumer satisfaction with and usage of hair loss treatments.

INNOVATION

The inventors have discovered that topical application of known electron transport chain (ETC) inhibitors stimulates the hair cycle. This work shows that pharmacological abrogation of ETC activity, rather complete ablation of ETC, can promote hair cycle activation without significant cell toxicity. Metabolic data suggest that ETC inhibition leads to increased pyruvate accessibility for the Ldh enzyme and therefore increased lactate production, which has been previously shown to promote hair cycle activation.

RELATED MATERIALS

Miranda, M.; Christofk, H.; Jones, D. L.; Lowry, W. E. Topical inhibition of the electron transport chain can stimulate the hair cycle. J. Invest. Dermatol. 2017, DOI: 10.1016/j.jid.2017.10.021.

## Application area

Hair growth treatment

## Advantages

Topical application

Operates via a novel mechanism of action not associated with cancerous growth

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