
Effect of Keratin Microsphere Gel on Hair Growth in Mice

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Keratin microsphere gel, consisting of keratin-based microspheres that swell in water to form a gel, has shown efficacy in promoting hair follicle growth in murine models. Its potential application as an active ingredient in hair regrowth treatments with minimal side effects is anticipated.

The skin serves as a barrier that restricts the penetration of particles and protects against exogenous threats. Recent research indicates that small particles containing hair growth-promoting substances can traverse this barrier to reach the hair follicles. A [study](#) conducted by the [University of Tsukuba](#) demonstrated that topical application of a gel composed of water-soluble oxidized keratin (keratin microsphere gel) on mice significantly enhanced cell proliferation and the expression of genes associated with hair growth in the papilla cells of hair follicles, thereby stimulating hair development.

When water-based keratin microsphere gel was applied to the shaved backs of mice, hair regrowth commenced on the second day post-application, with the rate of growth subsequently accelerating. This effect was similar to that of minoxidil, a renowned hair growth stimulant. Moreover, genetic analysis of the dorsal skin tissue samples in mice revealed a marked upregulation in the expression of genes involved in hair cycle regulation and skin homeostasis. In addition, a skin model was developed featuring a co-culture of a human-origin epidermal model on the upper layer and primary human papilla cells beneath, where the stimulatory impact of keratin microspheres on papilla cells was validated through gene expression analysis, demonstrating the gel's permeability via skin.

These findings represent the first evidence of the hair growth-promoting properties of keratin microsphere gel. Given that keratin is a primary constituent of hair and skin, its application as a hair growth agent is assumed to be safe and effective, with negligible adverse effects.

Read the [original article](#) on University of Tsukuba.