

Hair growth finding could make baldness 'optional'

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The best way to avoid baldness is to stop hair from falling out in the first place. Now, researchers say a new hair growth discovery might help men keep their locks for a lifetime.

The new insight involves a structure lying within the [hair follicle](#).

"Our major discovery is a previously unknown smooth muscle that surrounds hair follicles and is called the dermal sheath," explained lead researcher Dr. Michael Rendl. He's associate director of the Black Family Stem Cell Institute at the Icahn School of Medicine at Mount Sinai, in New York City.

Rendl explained that in the life cycle of each human hair, a new hair shaft is created by so-called dermal papilla [cells](#). These specialized cells begin at the base of growing hair follicles, but then move slowly upwards toward stem cells that are found at the follicle's tip.

These stem cells receive signals from the nearby dermal papilla cells "to start the next growth phase and make a new hair shaft, while the previous hair shaft is shed," the researchers explained in a Mount Sinai news release.

However, sometimes this cell-to-cell partnership gets interrupted. And that could play a role in hair loss.

One question that's long puzzled researchers is how the [dermal papilla cells](#) travel up towards the [stem cells](#).

Working with mice, "we found an answer for how this works by discovering that the dermal sheath surrounding growing hair follicles is a smooth muscle, whose function is to contract and push up the hair shaft and pull up the dermal papilla," Rendl said.

Further experiments suggest that human hairs follow a similar mechanism, his team said.

And in the hair "destruction" phase of the hair-growth cycle, the dermal

sheath contracts, allowing for existing hair strands to fall out.

This happens naturally in full heads of hair, but when it occurs too often, baldness can begin to set in.

According to Rendl, this new insight into how the dermal sheath works could re-focus research into hair loss.

"Blocking the newly discovered muscle and its contraction cannot cure baldness caused by those processes," he explained. "Instead, blocking contraction and arresting the destruction phase of the cycle has the potential to retain the existing hair shaft that is otherwise lost when a new hair shaft is produced.

"This type of muscle cannot be controlled voluntarily, [it is] similar to the ones in blood vessels," Rendl said. "But we can control it by drugs that can block contraction."

That means men might someday have a treatment that simply allows them to maintain the head hair they have now, instead of slowly losing it.

"We are excited about the possibility to develop methods for blocking sheath contraction, stopping follicle regression and preventing the loss of the existing hair before a new hair can grow," Rendl said.

One dermatologist who knows about hair loss said the findings might offer new hope to follicularly challenged men.

"The future of [hair loss](#) looks very promising and this study shows that baldness may soon be optional," said Dr. Michele Green, of Lenox Hill Hospital in New York City.

"There have been numerous research [efforts] into regenerating hair, but

this study shows that the dermal sheath can preserve the hair follicle to regenerate new hair growth," she said.

Besides potentially arresting the hair-growth cycle before its "destruction" phase, tweaking the dermal sheath might also "prevent the hair [follicle](#) from going dormant," Green reasoned.

That's important, because "dormant hair follicles cannot be restored, therefore cannot regenerate hair," she said.

Still, a cure for balding pates isn't around the corner, Rendl stressed.

"There is a longer way to go realistically before blocking contraction of the sheath muscle can be made a reality to halt the hair cycle in the destruction phase," he said. "It needs to be proven effective in human [hair](#) follicles in the dish first and proven safe after knowing what happens to the arrested follicles long-term."

Still, "we are excited about exploring this," Rendl said.

The findings were published Dec. 19 in the journal *Science*.

More information: Nicholas Heitman et al. Dermal sheath contraction powers stem cell niche relocation during hair cycle regression, *Science* (2019). [DOI: 10.1126/science.aax9131](https://doi.org/10.1126/science.aax9131)

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