

Thicker Hair, Bigger Penis produced by Researchers

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New Research

Overexpressing a gene resulted in thicker hair growth in mice, as well as smoother and longer penis!An article by ScienceDaily announces that overexpressing a certain gene resulted in thicker hair growth in mice, as well as smoother and longer penis!You heard right... a transgenic mouse designed to grow more hair than other mice has provided University of Southern California researchers with some surprising results, and insight into the development and regulation of growth in epithelial organs that extend beyond skin and hair.

In an upcoming paper in the American Journal of Pathology-now available online-Cheng-Ming Chuong, M.D., Ph.D., professor of pathology at the Keck School of Medicine of USC, and his colleagues describe the creation of a mouse in which a particular gene, called "noggin" is overexpressed in the skin. (Noggin works by suppressing the action of a protein called bone morphogenic protein, or BMP, which has a key role in a number of developmental pathways in mice and humans alike.)

Thicker Hair...

mightymouse.jpg

Because of the role that noggin appears to play in the development of skin and associated features, Chuong and his Keck School colleagues expected to see an increase in the number of hair follicles in the skin of the genetically modified mouse.

That is, indeed, what they saw. Not only was the fur of these mice thicker, with hair follicle density increasing by as much as 80 percent in the transgenic mice, but the transgenic mice also grew more whiskers than normal mice, with several whiskers sprouting from each follicle. That, however, was only the beginning. The overexpression of the noggin gene also led to some unusual and unexpected changes in the mice.

For instance, the meibomian glands in the eyes of the transgenic mice were transformed into follicles with small hairs "pointing inwards toward the cornea," Chuong explains. (Meibomian glands are the oil-producing glands that lubricate the eyelids in humans as well as mice; an infection in the meibomian gland is what we call a sty.) As if hairy eyes weren't enough, the sweat glands on the footpads of the mice's paws turned into hair-sprouting follicles as well. And some of them sported misshapen claws, or were missing claws altogether.

...and a Bigger Penis?

mightymouse1.jpg

While doing physical exams on the mice, Maksim Plikus, a graduate student in Chuong's lab, noticed one more unusual change in the transgenic mice: Their external genitalia were significantly larger than those of normal mice. "We now think that noggin plays a role in regulating the size of penile and clitoral tissues in mice, and that it can disrupt the balanced growth of these structures and result in their overgrowth," Chuong explains.

The changes in the genitalia aren't limited to size, however. Whereas the surface of the normal mouse penis has well-differentiated microappendages called "hairy spines," the transgenic mouse's penis is smoother, less bumpy.

"We don't know whether this affects sensation," says Chuong. "But we do know that they have the ability to reproduce."

But how safe...?

The researchers also considered whether or not these changes are physical variations or actual pathologies (disease states brought on by the genetic tinkering done on these mice). "Some of the features, like the complete loss of claws or hair growth in the eyelids, are definitely pathological," Chuong admits. "But some of the others, like the increase in size in the genitalia or the increased thickness of the fur, may be variations that might not be negative, particularly when the environment changes. For instance, too many hairs on a human would be considered abnormal. But when it occurred in the mammoth thirty thousand years ago, it was considered an advantage." "This makes one ponder the border between normal and abnormal," Chuong adds.

Photos Taken from the Study

[thumb06.jpg](#) [thumb02.jpg](#) [thumb03.jpg](#) [thumb04.jpg](#) [thumb05.jpg](#) [thumb01.jpg](#)

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Aside from providing a fascinating look at how the unexpected plays out in science, this transgenic mouse will have more concrete applications, says Chuong. "In the era of tissue engineering," he and his colleagues write in their paper, "one may want to modulate the number, size or the differentiation status of some ectodermal organs in humans or animals for various medical, agricultural and industrial reasons. The newly made transgenic mouse can be a useful animal model and tissue source for these analyses and evaluations."

Maksim Plikus, Wen Pin Wang, Jian Liu, Xia Wang, Ting-Xin Jiang, and Cheng-Ming Chuong, "Morpho-Regulation of Ectodermal Organs: Integument Pathology and Phenotypic Variations in K14-Noggin Engineered Mice through Modulation of Bone Morphogenic Protein Pathway." American Journal of Pathology, 2004 164: 1099-1114.

HLT

Editor's Note: As you can see in the comments below, one of our users rightfully asked "has april fools come early this year or is this for real". Its for real. Keep in mind, tinkering with genes can do a lot of amazing things. The safety factor is key however. Another good lesson for those of us prone to jumping bandwagon hair loss treatments. Just because dumping solvents on your head may make hair grow, doesn't mean its safe, or smart, or something that can be responsibly provided to the public. This is just research that found something interesting and new. As mentioned above, the safety factor is still a major obstacle.

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HairlossTalk spoke with Maksim Plikus, owner of www.clonemyhair.com, and participant in this study, about the photos above.

HairlossTalk: I assume WT is the unaffected mouse and K14N is the genetically altered one?

Maksim Plikus: Yes, that is correct.

HairlossTalk: What are we seeing in the comparison photos of the entire mice, laying side by side? The one on the right looks like hell compared to the one on the left.

Maksim Plikus: The one on the right is actually the mutant mouse. The thing is that the Noggin protein that we altered in this mouse caused a lot of changes. Many of them are bad. Affected mice actually look smaller and weaker compared to the normal. However, at the same time, changes in some parts of the body are beneficial. Such as increase in the hair density and the penis size. *The take home message is like this: we can learn from this mouse what kind of changes to expect from mis-expression of Noggin, and apply Noggin only to the parts of the body where it causes beneficial changes (penis, scalp hair), not all over.*