

NEWS RELEASE

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Functional Hair Follicles Grown from Stem Cells

Award-Winning Science Presented at the Annual Meeting of the International Society for Stem Cell Research

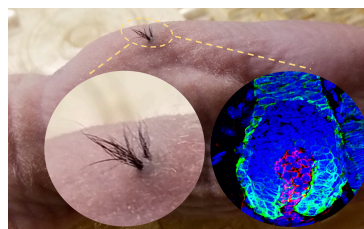
LOS ANGELES – June 27, 2019 – Scientists from [Sanford Burnham Prebys](#) have created natural-looking hair that grows through the skin using human induced pluripotent stem cells (iPSCs), a major scientific achievement that could revolutionize the hair growth industry. The findings were presented today at the annual meeting of the International Society for Stem Cell Research (ISSCR) and received a Merit Award. A newly formed company, [Stemson Therapeutics](#), has licensed the technology.

More than [80 million men, women and children](#) in the United States experience hair loss. Genetics, aging, childbirth, cancer treatment, burn injuries and medical disorders such as alopecia can cause the condition. Hair loss is often associated with emotional distress that can reduce quality of life and lead to anxiety and depression.

“Our new protocol described today overcomes key technological challenges that kept our discovery from real-world use,” says [Alexey Terskikh, Ph.D.](#), an associate professor in Sanford Burnham Prebys’ [Development, Aging and Regeneration Program](#) and the co-founder and chief scientific officer of Stemson Therapeutics. “Now we have a robust, highly controlled method for generating natural-looking hair that grows through the skin using an unlimited source of human iPSC-derived dermal papilla cells. This is a critical breakthrough in the development of cell-based hair-loss therapies and the regenerative medicine field.”

Terskikh studies a type of cell called dermal papilla. Residing inside the hair follicle, these cells control hair growth, including hair thickness, length and growth cycle. In 2015, Terskikh successfully [grew hair underneath mouse skin](#) (subcutaneous) by creating dermal papilla derived from human pluripotent stem cells—a tantalizing but uncontrolled process that required further refinement.

The approach detailed in the ISSCR presentation, which was delivered by lead researcher Antonella Pinto, Ph.D., a postdoctoral researcher in the Terskikh lab, features a 3D biodegradable scaffold made from the same material as dissolvable stitches. The scaffold controls the direction of hair growth and helps the stem cells integrate into the skin, a naturally tough barrier. The current protocol relies on mouse epithelial cells combined with human dermal papilla cells. The experiments were conducted in immunodeficient nude mice, which lack body hair.



Hair growth in nude mice transplanted with human iPSC-derived dermal papilla cells that were combined with mouse epithelial cells inside a biodegradable scaffold. *Left insert:* enlarged outside view. *Right insert:* fluorescent microscopy image of hair follicles under the skin; cell nuclei (blue), epithelial cells (green), human dermal papilla cells (red).

The derivation of the epithelial part of a hair follicle from human iPSCs is currently underway in the Terskikh lab. Combined human iPSC-derived epithelial and dermal papilla cells will enable the generation of entirely human hair follicles, ready for allogenic transplantation in humans. Distinct from any other approaches to hair follicle regeneration, human iPSCs provide an unlimited supply of cells and can be derived from a simple blood draw.

“Hair loss profoundly affects many people’s lives. A significant part of my practice involves both men and women who are seeking solutions to their hair loss,” says Richard Chaffoo, M.D., F.A.C.S., a triple board-certified plastic surgeon who founded La Jolla Hair MD and is a medical adviser to Stemson Therapeutics. “I am eager to advance this groundbreaking technology, which could improve the lives of millions of people who struggle with hair loss.”

The technology was discovered and developed at Sanford Burnham Prebys. Further development and commercialization activities will be conducted by Stemson Therapeutics. For updates on the technology’s progress and advancement, please visit www.stemsontx.com.

About Sanford Burnham Prebys Medical Research Institute

Sanford Burnham Prebys is a preeminent, independent biomedical research institute dedicated to understanding human biology and disease and advancing scientific discoveries to profoundly impact human health. For more than 40 years, our research has produced breakthroughs in cancer, neuroscience, immunology and children’s diseases, and is anchored by our NCI-designated Cancer Center and advanced drug discovery capabilities. For more information, visit us at SBPdiscovery.org or on Facebook at facebook.com/SBPdiscovery and on Twitter [@SBPdiscovery](https://twitter.com/SBPdiscovery).

About Stemson Therapeutics

Stemson Therapeutics, based in San Diego, was co-founded by Geoff Hamilton and Alexey Terskikh in 2018 to commercialize an iPSC-based cell therapy for hair loss developed at Sanford Burnham Prebys. At Stemson, we envision a world where anyone battling the emotional trauma or social stigma of hair loss has an opportunity to truly cure their condition and safely restore their natural hair. For more information, please visit www.stemsontx.com.