'Master regulator' of skin formation discovered

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CORVALLIS, Ore. â€“ Researchers at Oregon State University have found one gene in the human body that appears to be a master regulator for skin development, in research that could help address everything from skin diseases such as eczema or psoriasis to the wrinkling of skin as people age.

Inadequate or loss of expression of this gene, called CTIP2, may play a role in some skin disorders, scientists believe, and understanding the mechanisms of gene action could provide a solution to them.

"We found that CTIP2 is a transcriptional factor that helps control different levels of skin development, including the final phase of a protective barrier formation," said Arup Indra, an OSU assistant professor of pharmacy. "It also seems particularly important in lipid biosynthesis, which is relevant not only to certain skin diseases but also wrinkling and premature skin aging."

The findings of this research, done in collaboration with Mark Leid, OSU professor of pharmacy, were recently published in the Journal of Investigative Dermatology. This work is supported by the National Institutes of Health, which has provided $1.5 million for its continuation.

Skin is actually the largest organ in the human body, and has important functions in protecting people from infection, toxins, microbes and solar radiation. But it's not static â€“ skin cells are constantly dying and being replaced by new cells, to the extent that human skin actually renews its surface layers every three to four weeks. Wrinkles, in fact, are a reflection of slower skin regeneration that occurs naturally with aging.

Major advances have been made in recent years in understanding how skin develops in space and time, and in recent breakthroughs scientists learned how to re-program adult skin cells into embryonic stem cells.

"When you think about therapies for skin disease or to address the effects of skin aging, basically you're trying to find ways to modulate the genetic network within cells and make sure they are doing their job," Indra said. "We now believe that CTIP2 might be the regulator that can do that. The next step will be to find ways to affect its expression."

One of the ways that some ancient botanical extracts or other compounds may accomplish their job in helping to rejuvenate skin, Indra said, is by stimulating gene expression. A more complete understanding of skin genetics might allow that process to be done more scientifically, effectively and permanently.