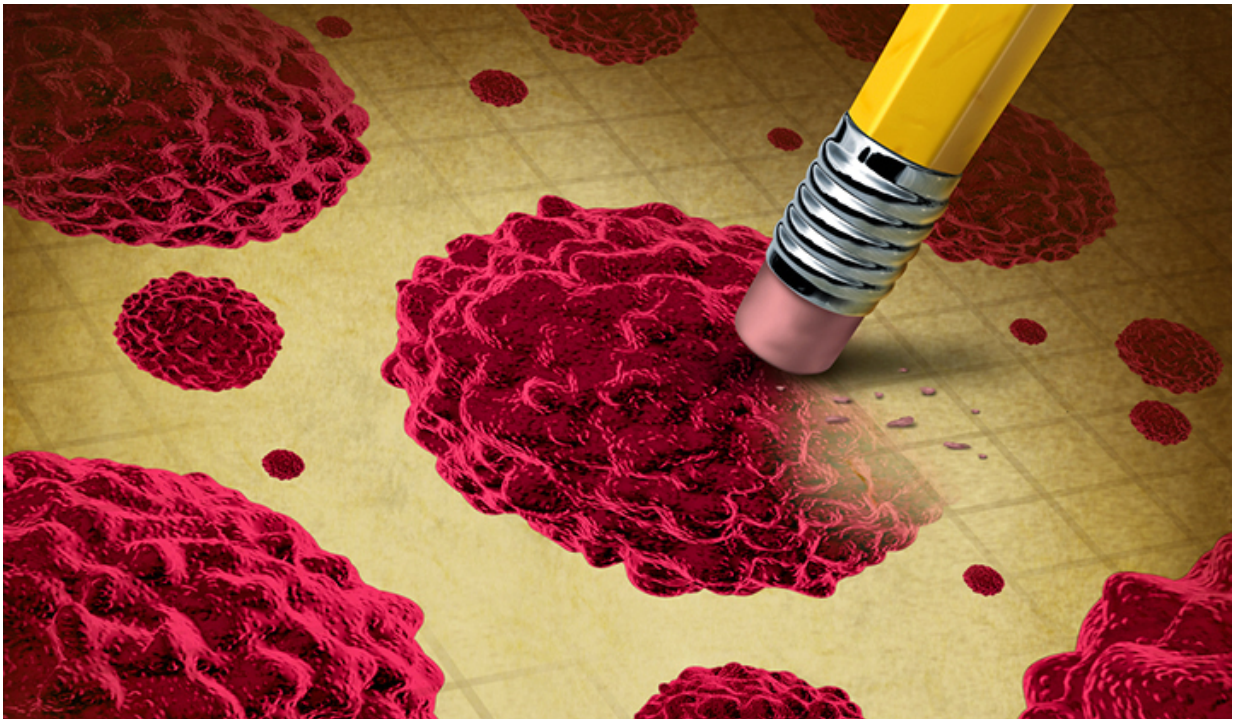


# Tiny hair follicle offers big clues about the life and death of stem cells

April 7 2015, by Vicky Agnew

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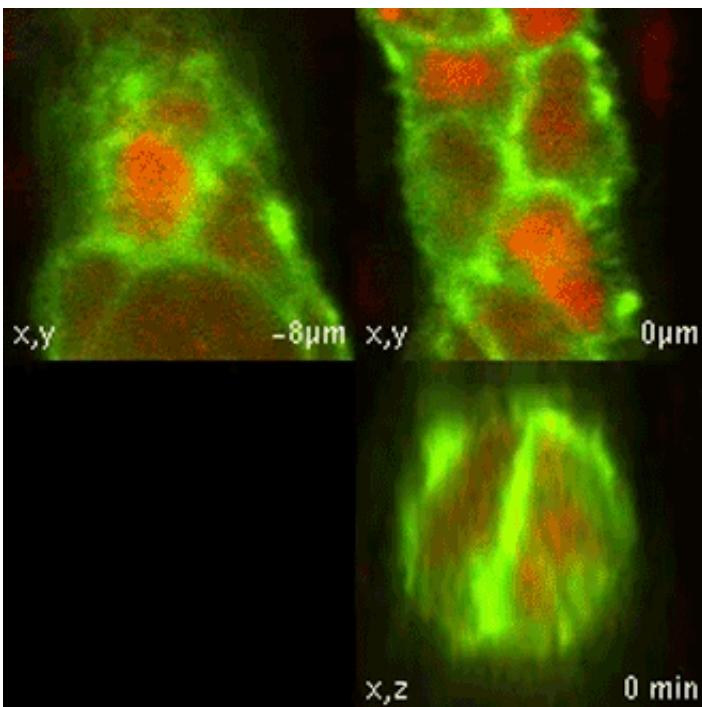


Inside the microscopic world of the mouse hair follicle, Yale Cancer Center researchers have discovered big clues about how stem cells regenerate and die. These findings, published April 6 in the journal *Nature*, could lead to a better understanding of how the stem cell pool is maintained or altered in tissues throughout the body.

Stem cells are [undifferentiated cells](#) that replenish themselves and, based on their tissue location, can become specialized cells such as blood or [skin cells](#). The [hair follicle](#) is an ideal site for exploring stem cell behavior because it has distinct and predictable oscillations in the number and behavior of stem cells, said the study's lead author, Kailin R. Mesa, a third-year doctoral student in the lab of Valentina Greco, associate professor of genetics, cell biology, and dermatology.

Using live microscopic imaging to track stem cell behavior in the skin of living mice, researchers observed that the stem cell niche, or surrounding area, plays a critical role in whether stem cells grow or die.

"Prior to this, it wasn't clear whether stem cell regulation was intrinsic or extrinsic, and now we know it is external in that the niche instructs the stem cells," Mesa said. "In terms of cancer, we can next explore how we might perturb or change the niche in hopes of affecting the growth of [cancer stem cells](#)."



A stem cell pool cannibalizing dying epithelial stem cells, a finding from the study. Credit: Valentina Greco lab

Also, researchers were surprised to find that the stem cells within the pool fed on other dying [stem cells](#). This reveals a mechanism for removing dead cells, a process previously observed in mammary glands but never in the skin.

**More information:** Niche-induced cell death and epithelial phagocytosis regulate hair follicle stem cell pool, *Nature*, [DOI: 10.1038/nature14306](#)

Provided by Yale University

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