

# Research team lays bare melanin's DNA guarding mechanism

December 7 2016

---

With a little help from chickens and video cameras, scientists have captured live the moment when skin gets darker. In a study appearing in *Scientific Reports*, a Japanese team has filmed and demystified the process by which melanin—molecules that give skin its color—are carried to the epidermis.

"Our study settles a long-standing debate about how melanin is transported from melanocytes, cells where it is synthesized, to keratinocytes, cells which it protects in the actual body," says Ryosuke Tadokoro of Kyoto University's Graduate School of Science, who led the study.

Melanin pigments protect the skin from DNA damage by surrounding—and thus guarding—the nuclei of keratinocytes.

"The melanin production process has been extensively studied, but since it needs to travel somehow, it's also crucial to understand the transport process in order to develop effective dermatological treatments," explains Kyoto University's Yoshiko Takahashi, senior author of the study.

"In our experiments, we mimicked in 3-D how cells are actually organized. We also used chicken tissue, which is similar to ours in terms of how melanocytes are distributed throughout the skin."

Using a new in-house fluorescence imaging technique, the team found

that melanocyte membranes form 'blisters', which become vehicles for carrying melanosomes. Once the cargo is loaded, these structures pinch off, migrate, and are 'eaten' by [keratinocytes](#). The melanosomes then enter the [cells](#) and surround their nuclei, protecting them from damage.

"Controlling skin pigmentation is crucial for protecting our skin from UV damage," continues Takahashi, pointing out that vesicle formation and the proteins necessary for it are analogous to how [cancer cells](#) spread to different parts of the body.

"This finding, while just a first step, could have significant implications in cosmetic contexts and in studies of depigmentation syndromes and [skin](#) cancer."

**More information:** Ryosuke Tadokoro et al. Melanosome transfer to keratinocyte in the chicken embryonic skin is mediated by vesicle release associated with Rho-regulated membrane blebbing, *Scientific Reports* (2016). [DOI: 10.1038/srep38277](https://doi.org/10.1038/srep38277)

Provided by Kyoto University

Citation: Research team lays bare melanin's DNA guarding mechanism (2016, December 7) retrieved 6 May 2024 from <https://medicalxpress.com/news/2016-12-team-melanin-dna-mechanism.html>

|  |
|--|
| <p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p> |
|--|