

# Sebaceous lipids are essential for water repulsion, protection against UVB-induced apoptosis and ocular integrity in mice

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## Abstract

Sebocytes, which are characterized by lipid accumulation that leads to cell disruption, can be found in hair follicle-associated sebaceous glands (SGs) or in free SGs such as the Meibomian glands in the eyelids. Because genetic tools that allow targeting of sebocytes while maintaining intact epidermal lipids are lacking, the relevance of sebaceous lipids in health and disease remains poorly understood. Using *Scd3*, which is expressed exclusively in mature sebocytes, we established a mouse line with sebocyte-specific expression of Cre recombinase. Both RT-PCR analysis and crossing into *Rosa26-lacZ* reporter mice and *Kras<sup>G12D</sup>* mice confirmed Cre activity specifically in SGs, with no activity in other skin compartments. Importantly, loss of SCD3 function did not cause detectable phenotypical alterations, endorsing the usefulness of *Scd3*-Cre mice for further functional studies. *Scd3*-Cre-induced, diphtheria chain A toxin-mediated depletion of sebaceous lipids resulted in impaired water repulsion and thermoregulation, increased rates of UVB-induced epidermal apoptosis and caused a severe pathology of the ocular surface resembling Meibomian gland dysfunction. This novel mouse line will be useful for further investigating the roles of sebaceous lipids in skin and eye integrity.

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