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Vitamin D and calcium signaling in epidermal stem cells and their regeneration

Oda Y *et al.* VDR signaling in epidermal SCs

Yuko Oda, Daniel D Bikle

Abstract

Epidermal stem cells (SCs) residing in the skin play an essential role for epidermal regeneration during cutaneous wound healing. Upon injury, distinct epidermal SCs residing in the interfollicular epidermis and/or hair follicles are activated to proliferate. Subsequently, SCs and progeny migrate, differentiate and restore the epidermis. We review a role of the vitamin D signaling through its receptor of vitamin D receptor (*Vdr*) in these processes. *Vdr* conditional knockout (cKO) mouse skin experiences a delay in wound re-epithelialization under low dietary

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In particular, wounding activates **stem cells in the interfollicular epidermis** (IFE) and hair follicles (HF) to proliferate and send their progeny to re-epithelialize the **wound**. β -catenin and **calcium signaling** are important for this activation process. Mice lacking the VDR when placed on a low **calcium diet** have delayed wound healing.

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Thus **vitamin D and calcium signaling** play critical roles in **wound repair** at both the level of **stem cell** maintenance and activation as well as at the level of migration of the progeny across the wound and their subsequent differentiation to **restore** the intact **epidermis**.

Author: Daniel D. Bikle, Chia-ling Tu, Yuko Oda **Publish Year:** 2017

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Introduction. **Vitamin D and its receptor** have been shown to play an important role in **epidermal cells** [1]. Interest in the effects of the **vitamin D endocrine** system on the **skin** is based, in part, on the striking cutaneous phenotype of humans and animals with **vitamin D receptor mutations** [2], [3], [4], [5], [6].

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Publish Year: 2010

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