



ACNE, ROSACEA, AND RELATED DISORDERS (INCLUDING HIDRADENITIS SUPPURATIVA)

A WAY TO COMEDOGENESIS: SEBACEOUS STEM CELLS ARE A TARGET FOR AHR LIGANDS POTENTIALLY PRESENT IN FOODS

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Background: The progenitor cells located in the isthmus region of hair follicles and expressing LRIG1 drive sebaceous gland (SG) formation during the morphogenesis of the pilosebaceous unit. Various xenobiotics activating the aryl hydrocarbon receptor (AhR) are known to disrupt the physiological turnover of sebaceous glands, and thus might target LRIG1-expressing cells in the skin.

Objective: To analyse the role of LRIG1 expressing cells on SG formation in mouse skin, using AhR agonists and selective cutaneous Lrig1 ablation.

Materials and Methods: The AhR agonists 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) and beta-naphthoflavone (BNF) were applied on mouse skin. A selective ablation of LRIG1 expressing cells of the skin was performed in another group of mice by the conditional gene modification technology. Then the density of SG, the expression of SG and epidermal markers were monitored in both mouse groups as a function of time. TCDD and BNF were also injected intraperitoneally to mice, then the expression of CYP1A1 α , which is highly induced following AhR activation, was analysed in ear skin by immunohistochemistry.

Results: Both AhR agonists and the selective Lrig1 ablation led to a reversible SG atrophy, without affecting the interfollicular epidermis and hair growth. Systemic exposure to TCDD and BNF led to a strong expression of CYP1A1 which colocalized with LRIG1 expressing cells.

Conclusion : The LRIG1+ SG progenitor cells play a crucial role in the renewal of sebocytes and are highly susceptible to comedogenic AhR agonists. As various food constituents do activate AhR, they may participate in comedogenesis, which should be considered in the acne diet.

