Peripheral nerves promote basophil infiltration via TLR2 in murine atopic-dermatitis-like inflammation

Chisa Nakashima, Atsushi Otsuka, Kenji Kabashima

Department of Dermatology, Kyoto University Graduate School of Medicine

Background

Atopic dermatitis (AD) is characterized by hyperactivated cytokines of T helper type 2 (Th2), infiltration of basophils and eosinophils, and associated with intractable pruritus. In addition, it is well known that microbial dysbiosis especially *Staphylococcus aureus* (*S. aureus*) colonization is correlated to disease severity of AD and contribute to the pathogenesis of AD (*Genome research* 2012; 22:850-9). Recently, several reports suggest that peripheral nerves play an essential role in skin immune defense system (*Nature* 2014; 510:157-61). A study demonstrated that peripheral nerves directly sense *Candida albicans* (*C. albicans*), which was also one of the skin resident commensals, to drive IL-23 production from dermal dendritic cells, and then were involved in the resistance to cutaneous candidiasis (*Immunity* 2015; 43:515-26).

Purpose

- (1) To examine whether stimulate DRGs (dorsal root ganglia) produce neuropeptide, chemokines, and cytokines.
- (2) To evaluate the interaction between infiltrating immune cells (especially basophils and eosinophils) and peripheral nerves.

Method and Result

Heat killed *S.aureus* (HKSA)-induced dermatitis model

Ear swelling and the number of basophils were attenuated in denervated mice.

Summary

- (1) Basophils were existed near peripheral nerves in HKSA-induced dermatitis and human AD.
- (2) The ear-swelling responses in basophil depleted mice and denervated mice were attenuated in HKSA induced dermatitis.
- (3) Stimulation of murine DRGs with TLR2 ligands induced production of proinflammatory chemokines.

Method and Result

Stimulation of murine DRGs with HKSA, and TLR2 ligand induced the expression of RANTES/CCL5 and MCP-1/CCL2

Ear swelling was attenuated in basophil-depleted mice.

COI Disclosure

Chisa Nakashima

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