

Is atopic dermatitis a response to *Malassezia* overgrowth in dogs?

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The surface of skin create a special ecosystem concerning of site-specific microbial communities. Skin barrier dysfunction and host-microbiome interactions are primary alterations in canine Atopic Dermatitis (AD). Among others AD is consider to be an IgE mediated hypersensitivity response. Fungi are a part of normal skin biota (Skin Mycobiota). *Malassezia pachydermatis* are fungi for which dogs are natural hosts. Fungal colonization is confined to the *stratum corneum* which is barely reached by leukocytes.

The aim of this review is to provide an update on recent advances in the explanation of the role of microorganisms like *Malassezia* in evolving the acute stage of AD in dogs. Citation databases, abstracts and proceedings from international meetings published recently were reviewed, supported by our own observation.

Dendritic cells, Langerhans cells, mast cells and keratinocytes have cross-interaction with environmental antigens and microorganisms during induction of inflammation. In atopic dogs the amount of fungi in *stratum corneum* increases dramatically. The development of AD is characterized by destroying a balance between a variety of T-cell phenotypes and inflammatory mediators; cytokines and noncytokine factors. It is hypothesized the AD is a risk factor for *M. pachydermatis* infection, but in our opinion it is inversely; some factors which are favorable for abundant yeasts colonization may provoke increasing reactivity against the normal skin microbiota. Antimicrobial peptides (AMPs) like β-Defensins (BDs) and cathelicidins (Caths) are produced by epithelial and immune cells. Increased cutaneous expression of AMPs was reported in atopic humans and in dogs with experimentally induced atopy. These peptides participate also in many cellular functions; chemotaxis, wound healing and even determination of canine coat color. The development of AD involves the activation and differentiation of allergen-specific lymphocytes and response of noncellular factors (complement and protease-activated receptors). The host-microbiome interactions are primary alterations in canine AD and it is clear that for successful therapy AD studies should focused on the development of drugs and procedures able to control the Skin Microbiome.