Title: Transcriptome profiling of lesional and non-lesional skin in feline allergic dermatitis using deep RNA sequencing

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Study description:
Allergic dermatitis due to environmental, food or flea hypersensitivities is commonly encountered in cats and presents a unique set of challenges to the veterinary practitioner. Frequently, the allergic feline patient will present with at least one of the four common cutaneous reaction patterns indicative of pruritus and inflammation: head/neck/pinnal pruritus with excoriations, self-induced alopecia, miliary dermatitis, and/or eosinophilic dermatitis (including eosinophilic plaques, eosinophilic granulomas, and indolent ulcers). On a cellular level, the skin lesions are characterized by massive eosinophil and lymphocytic infiltration caused by an underlying allergic response. Although feline allergic dermatitis (FAD) has been clinically characterized in-depth, the treatment options are still poor, and currently limited to systemic glucocorticoids which are associated with severe adverse effects. Increased knowledge about the molecular phenotype of human and canine allergic skin diseases has contributed to development of novel successful therapeutics, including trials with targeted therapeutics.

20 client-owned cats of any breed, body weight and sex presenting with pruritus and one or more of the FAD clinical patterns listed above may be enrolled. Cats with other pruritic diseases (due to ectoparasites, fungal or bacterial infections), breeding cats, and cats with malignant neoplasia will not be included. To limit the influence of previous medications, withdrawal times for all cats from previous medications will be 2 weeks for antihistamines, 2 weeks for topical (skin and ear), 4 weeks for oral and 6 weeks for injectable glucocorticoids.

Cats meeting the inclusion criteria will have a one-time collection of skin biopsies. Lesions will be photographed and scored for severity before sampling. All cats will be sedated and local anesthesia will be administered prior to biopsy. Up to three 8-mm skin samples will be collected and processed for RNA sequencing. In addition, a half-teaspoon of blood will be collected from a peripheral vein while cats are sedated to investigate the correlation between systemic and skin tissue biomarkers. Owners will be asked to assess their cat using a severity visual scale form. Treatment will be initiated after collection of biopsies.

Costs pertaining to the collection of the skin biopsies and subsequent analysis are paid for by the study. Clients will receive a $50 bill credit upon completion of their cat’s participation. The study does not cover the costs of the Dermatology referral visit/recheck and any other procedures or medications that may be prescribed.

Duration of study: The study is ongoing and recruiting participants.

Potential benefits to veterinary medicine: To our knowledge, this is the first description of the use of this technology in primary feline skin tissue to describe an inflammatory dermatologic disease. Results from this study may open the door to a new era of targeted treatment for this common and debilitating inflammatory skin disease.