**Title:** Effect of Lokivetmab on Molecular Signature of Canine Atopic Dermatitis using RNA Sequencing

**Investigators:**
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**Study description:**
Atopic dermatitis (AD) is a common, chronic, recurrent, inflammatory and pruritic allergic skin disease that spontaneously develops with nearly identical clinical phenotypes in humans and dogs; up to 20% of dogs are affected worldwide. Treatment of canine and human AD can be challenging, and canine AD is often associated with diminished quality of life in dogs and an economic burden for their owners. A relatively new drug on the market, Lokivetmab, has been proven to reduce the pruritic response in dogs for three weeks after injection without any side effects. The main objective of this study is to evaluate lokivetmab modulation of the canine AD molecular signature using next-generation RNA sequencing (RNA-seq).

12 client-owned dogs of any breed, body weight and sex diagnosed with moderate to severe atopic dermatitis will be enrolled into the study. To limit the influence of previous medications on active AD skin lesions, withdrawal times for all dogs from previous medications will be 2 weeks for antihistamines, 4 weeks for topical (skin and ear) and oral glucocorticoids and 8 weeks for injectable glucocorticoids. None of the dogs will be receiving cyclosporine or oclacitinib for 4 weeks prior to entering the study. None of the above-mentioned medications will be allowed during the study; only topical antiseptics can be used during the study for the control of bacterial and yeast colonization.

Dogs meeting the inclusion criteria will have skin lesions photographed and scored for severity before sampling. All dogs 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. Skin biopsies will be collected at the initial visit before Lokivetmab treatment is administered and once again 20-35 days after treatment. Owners will be asked to assess the effectiveness of the treatment by completing a pruritus severity visual scale form. If any dogs deteriorate during the trial, the skin will be biopsied and rescue therapy with glucocorticoids will be initiated.

Costs pertaining to the collection of the skin biopsies and subsequent analysis are paid for by the study, in addition to the Lokivetmab treatment. Clients will receive a $50 bill credit upon completion of their dog’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 will continue until a total of 12 dogs with atopic dermatitis are enrolled.
**Potential benefits to veterinary medicine:**

Results from this study may suggest that inhibition of a single target has the potential to reverse atopic dermatitis pathomechanisms, opening the door to a new era of targeted treatment for this common and debilitating inflammatory skin disease.