**Title:** Transcriptome Profiling of Autoimmune Skin Disease Lesions using RNA Sequencing

**Investigators:**
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**Study description:**
The pemphigus complex (PF) and cutaneous lupus erythematosus (CLE) variants represent the most common autoimmune skin diseases in dogs. A molecular profile of involved cytokine and chemokine pathways in both diseases has not yet been investigated. The treatment of canine autoimmune skin diseases can be challenging and typically requires life-long therapy with immunosuppressive medications like glucocorticoids, often with severe side effects. There is a clear need to characterize the active skin disease RNA-seq transcriptome (as defined by lesional vs. nonlesional skin gene expression differences) in autoimmune skin diseases in dogs. The results of this study will identify new therapeutic molecular targets and serve as the baseline and foundation for clinical studies regarding drug-effect correlations with disease activity.

12 client-owned dogs of any breed, body weight and sex diagnosed with PF and 12 dogs diagnosed with CLE variant (based on history, clinical signs, microscopic demonstration of acantholytic keratinocytes with no clinical or microscopic signs of skin infection on previous skin biopsy for PF, microscopic demonstration of cell-rich interface dermatitis on previous skin biopsy for CLE variant) will be enrolled into the study. To limit the influence of medications on active PF or CLE skin lesions, withdrawal times for all dogs from previous medications will be 2 weeks for topical (skin and ear) and oral glucocorticoids, and 8 weeks for injectable glucocorticoids. None of the dogs may be receiving cyclosporine or oclacitinib prior to entering the study.

All dogs will have PF or CLE skin lesions photographed before sampling. Skin biopsies will be collected once at the initial visit. All dogs will be sedated and local anesthesia will be administered prior to biopsy. Up to three 8-mm skin samples will be collected from lesional (active skin lesions like erythematous macules, papules or plaques) and non-lesional skin (no presence of inflammation and >5 cm from any active lesion) of dogs with PF or CLE variant. The biopsy samples will be processed for RNA sequencing.

Costs pertaining to the collection of the skin biopsies and subsequent analysis are paid for by the study. In addition, the costs of the Dermatology referral visit/recheck will be also be paid for by study funds. Clients are responsible for the costs of any treatment that may be prescribed.

**Duration of study:**
The study is ongoing and will continue until a total of 12 dogs with PF and 12 dogs with CLE are enrolled.

**Potential benefits to veterinary medicine:**
The study of comparative transcriptome analysis of canine PF and CLE lesional and non-lesional skin specimens will reveal differences in gene expressions related to innate and adaptive immune responses, which will improve our understanding of molecular pathways in canine autoimmune skin diseases.