



## RESEARCH PROGRESS REPORT SUMMARY

**Grant 02109-MOU:** Studying Hypertrophic Osteodystrophy (HOD) In Irish Setter Dogs

**Principal Investigator:** Dr. Danika L Bannasch, DVM PhD

**Research Institution:** University of California, Davis

**Grant Amount:** \$65,340.00

**Start Date:** 8/1/2014                      **End Date:** 7/31/2015

**Progress Report:** End-Year 1 (FINAL)

**Report Due:** 7/31/2015                      **Report Received:** 7/31/2015

**Recommended for Approval:** Approved

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*(Content of this report is not confidential. A grant sponsor's CHF Health Liaison may request the confidential scientific report submitted by the investigator by contacting the CHF office. The below Report to Grant Sponsors from Investigator can be used in communications with your club members.)*

### **Original Project Description:**

Hypertrophic Osteodystrophy (HOD) is a canine developmental disease that affects dogs between eight weeks and eight months of age. Sick dogs exhibit swelling and pain in their legs with reluctance to stand or walk. In addition to bone pain, there are variable general signs including fever, lethargy, depression, and loss of appetite.

The prognosis for severe cases is poor due to relapsing episodes and the low quality of life for the affected puppies which often results in euthanasia. HOD has a strong familial component and is reported among closely related individuals in the Irish Setter breed as well as other large breeds such as the Weimaraner, Great Dane, German Shepherd Dog, German Shorthaired Pointer, Labrador Retriever, Great Pyrenees, and Boxer. Although the exact cause of HOD is unknown, frequent occurrences within an inbred population of dogs suggests an inherited component plays a role in HOD.

A similar disease in children is called Chronic Recurrent Multifocal Osteomyelitis (CRMO). Affected children suffer from recurrent episodes of unexplained debilitating bone pain between the ages of five and 18 years that prevents them from experiencing a normal childhood. The aims of this study are to better describe the immune component, and to identify the genetic basis of HOD in Irish Setter dogs. This will allow breeders to reduce the number of HOD affected puppies and perhaps save puppies and owners from the devastating outcome of



euthanasia. Results from this study have the potential to assist other breeds with HOD, and children with CRMO.

### **Publications:**

In preparation.

### **Report to Grant Sponsor from Investigator:**

Hypertrophic osteodystrophy (HOD) is a painful bone disease that can cause lameness in rapidly growing large-breed puppies. In Irish Setters, HOD can be a very severe condition with systemic signs of fever, anorexia, inability to walk, and painful swelling of the growth plates in the leg bones. Sick Irish Setter puppies may have several episodes of HOD requiring hospitalization for intensive care. The severe pain and poor quality of life, accompanied by the high costs of hospitalization, have led some owners to elect euthanasia. Other commonly affected large breed dogs include Weimaraner, Great Dane, Great Pyrenees, Boxer, Standard Poodle, and German Shepherd dogs.

We investigated how genetic variants play a role in triggering HOD episodes in dogs, like Irish Setters, that have a high prevalence for the disease. By comparing the genetic make-up of dogs with HOD and unaffected control dogs, we identified a region along one of the chromosomes where affected dogs are different than unaffected dogs. This region includes an appealing candidate gene. Future sequencing of the coding region of the candidate gene may uncover candidate causative DNA changes. We also investigated the immune profile of HOD affected Irish Setters and found that they have elevated levels of inflammatory markers and that they are different than unaffected Irish Setters. This result contributes to the definition of HOD in the breed as an immune-mediated condition. Based on the immune markers involved, new treatment modalities could be investigated to provide alternatives to corticosteroid treatment of HOD in Irish Setter dogs.