



Morris Animal Foundation FINAL REPORT

Determining Genetic Associations for Hypertrophic Osteodystrophy in Weimaraners and Other Susceptible Breeds.
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Results: Genetic Regions Associated with HOD Identified in Weimaraners

Hypertrophic osteodystrophy (HOD) is a painful bone disease that can cause lameness in large-breed puppies, which tend to grow rapidly. In Weimaraners, HOD can be a very severe condition accompanied by systemic signs of fever, anorexia, inability to walk and painful swelling of the growth plates in the leg bones. Sick Weimaraner 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 Great Danes, Great Pyrenees, Boxers, German Shorthaired Pointers, German Shepherds and Irish Setters.

With Morris Animal Foundation funding, researchers from the University of California-Davis studied how genes play a role in triggering HOD episodes in dogs, like Weimaraners, that have a high prevalence for the disease. By comparing the genetic makeup of dogs with HOD and unaffected control dogs, they identified two genomic regions that may contribute to HOD in

Weimaraners. Interestingly, they found that these regions are not shared by other breeds with HOD. This suggests that these regions are either unique to Weimaraners or that they are modifier genes that contribute to HOD in Weimaraners and are missing from other breeds. Data from this study suggest that the genetic basis of HOD is complex and that more than one genetic mutation likely leads to this painful disease. A recent publication (Safra N, Johnson EG, Lit L, et al. Clinical manifestations, response to treatment, and clinical outcome for Weimaraners with hypertrophic osteodystrophy: 53 cases (2009-2011). *J Am Vet Med Assoc.* 2013; 242:1260-1266.) gives an overview of diagnosis, medical records, treatment protocols, vaccine history and outcome data on dogs enrolled in this study.

Identifying genetic markers associated with HOD is the first step toward the development of a genetic test that would not only aid in the early diagnosis of HOD but would also enable breeders to select against the disease and breed healthier dogs. This study has provided valuable data toward this goal. This fellowship grant also supported the training of a promising new veterinary canine researcher. (D10CA-404)

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