

Canine Skeletal Dysplasia

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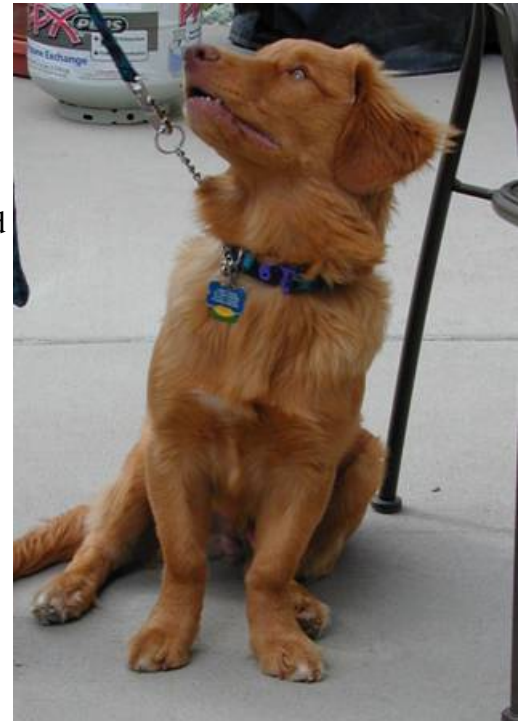
Funding provided by the AKC Canine Health Foundation and the UC Davis Center for Companion Animal Health

Chondrodysplasia is a category of skeletal dysplasia caused by abnormalities of the growth or development of bone or cartilage that result in distinct dwarf characteristics. Certain dog breeds, such as Basset Hounds, Dachshunds, and Corgis, have traditionally been classified as chondrodysplastic and are fixed for the phenotype (all dogs in the breed exhibit it). Chondrodysplasia has been described as a disease that segregates in several breeds. Although the clinical and morphological signs in these breeds are often similar, the molecular mechanisms leading to the phenotype are poorly understood.

We have identified a disease in Chesapeake Bay Retrievers, Newfoundlands, and Nova Scotia Duck Tolling Retrievers that resembles chondrodysplasia but does not appear to be as severe. We have classified it generally as skeletal dysplasia. This phenotype is characterized by asynchronous growth of the radius and ulna, leading to bowing of the radius and valgus of the front limbs. In extreme cases, the phenotype is so debilitating that some owners elect to euthanize their dogs. There appears to be considerable phenotypic variation within breeds, and dogs that appear to be normal may actually be mildly affected. This complicates the construction of phenotypically-based pedigrees.

As a result of the challenges encountered in obtaining accurate phenotypes, we adopted a candidate gene approach to begin to address the molecular basis of this condition. Due to the similarity of this phenotype to the classic chondrodysplastic phenotype, the same set of candidate genes was investigated in all breeds included in our study. Five candidate genes were sequenced in Chesapeake Bay Retrievers, Newfoundlands, Nova Scotia Duck Tolling Retrievers, Basset Hounds, Dachshunds, Pembroke and Cardigan Welsh Corgis, and Pekinese. To date no causative mutations have been found. The next step in determining the gene responsible for skeletal dysplasia will be a whole genome association study.

The identification of the molecular basis of skeletal dysplasia could lead to the development of a DNA test. Such a test would enable breeders to select against the disease phenotype and ultimately eradicate it from breeds that segregate the disease.



A Nova Scotia Duck Tolling Retriever with skeletal dysplasia.

* We are currently collecting samples from dogs affected with this condition. If you would like more information or would like to contribute a sample, please contact Amy Young at ayoung@ucdavis.edu.