

The Dalmatian Club of America

DNA Study of Dalmatians with Copper-associated Liver Disease

**Study Group on Kidney & Liver Disorders
Health & Research Committee
Dalmatian Club of America**

This page by Former Director James E. Seltzer, Ph.D.

A team of researchers at the Veterinary Teaching Hospital, Colorado State University, believes that copper-associated liver disease, which has been reported in Dalmatians is hereditary and that a DNA test can be developed to identify carriers. The disease is serious and can be fatal. To identify the gene responsible for the disease in Dalmatians they will need the cooperation of the Dal community. The study requires that blood samples be obtained from a number of affected Dalmatians whose disease has been verified by liver biopsy. In addition, blood samples should be obtained from litter mates and parents whenever possible so that the DNA transmission pattern can be determined.

It is important to the future of the breed that Dalmatian owners and breeders cooperate in this study. If undetected, hereditary diseases that at first seem rare and insignificant can permeate the entire gene pool of a breed. However, if carriers of the disease can be identified by a DNA test, it is possible to select against the disease, restrict the further spread of the defective gene, and ultimately eliminate the disease from the breed.

The study protocol written by Dr. David Twedt is provided below. Further questions on the study should be addressed to Dr. David Twedt or Dr. Craig Webb by telephone or email as indicated.

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**David C. Twedt DVM, Diplomate ACVIM
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We have previously reported on Dalmatians having liver disease secondary to copper accumulation in the liver. The exact cause of the copper build up is unknown but evidence thus far suggests it is an inherited disorder. As copper accumulates in the liver it becomes toxic to the liver cells causing hepatitis and frequently progressing to cirrhosis or end stage liver failure and death. Early identification of this problem can result in successful treatment using copper chelators or drugs that remove the copper from the liver.

The Bedlington terrier has a similar copper-associated liver disease that has been shown to be a genetic defect in copper metabolism and there is now a DNA test that can detect a copper gene to determine if a dog is affected or a carrier for the disorder. Through this genetic evaluation Bedlington terrier breeders are now better able to remove this problem from their breed. Our goal is to identify a similar DNA marker for Dalmatians in order to eliminate this liver disease from the breed before it becomes more wide spread.

Colorado State University in conjunction with researchers at the University of Utrecht in the Netherlands (they have developed a Bedlington terrier DNA test) have funding to screen Dalmatians in an attempt to identify a marker gene for copper accumulation in the liver. To be successful we need the help of Dalmatian owners and breeders in identifying dogs having liver disease. Our aim is to first identify dogs documented having copper associated liver disease. This must be documented via liver biopsy and copper determination. We will also require blood samples of these dogs for DNA analysis. For our research to be successful and to identify the gene we will also need to collect DNA samples from all littermates and the mother and father of affected dogs or as many as possible.

For analysis all that is required are blood samples (for DNA and to screen liver enzymes) sent via Fed-ex overnight to us. Any dog that will be having a future liver biopsy we will be glad to perform the liver histology and copper analysis. For dogs diagnosed with liver disease that have had a previous liver biopsy we can also perform copper determination on the liver sample if there is any remaining tissue at the diagnostic laboratory. We will also be willing to test or if needed, biopsy any dog that can be brought to Colorado State University. Once samples are collected there will be no further cost to the owners (we will cover shipping charges and all laboratory testing). All information obtained will remain confidential. We will also be available for consultation on diagnosis or treatment of affected dogs.

For further information or to enter into this study please contact either Dr. David Twedt (970-491-1202 or twedt@colostate.edu) or Dr. Craig Webb

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Page last modified on December 29, 2003