



RESEARCH PROGRESS REPORT SUMMARY

Grant 02297-MOU: Understanding the Genetics of Hepatic Copper Toxicosis in the Dalmatian

Principal Investigator: Andrew Mason, PhD
Research Institution: University of Alberta
Grant Amount: \$100,000.00
Start Date: 3/1/2017 **End Date:** 2/28/2019
Progress Report: End-Year 1
Report Due: 2/28/2018 **Report Received:** 3/1/2018

(The content of this report is not confidential and may be used in communications with your organization.)

Original Project Description:

Copper toxicosis, leading to early death from liver disease, was first described in Bedlington Terriers in 1975, with similar diseases described in other dog breeds including the Labrador Retriever, West Highland White Terrier, Skye Terrier, and Doberman Pinscher. Genes have been linked to copper toxicosis in the Bedlington Terrier and the Labrador Retriever, but the genes differ by breed. In most breeds the genes are not known. Copper toxicosis was considered rare in the Dalmatian but may be more common than previously believed. Symptomatic dogs may be misdiagnosed as having other liver diseases, never appropriately diagnosed or only diagnosed with copper overload at a terminal stage. The investigators aim to identify the faulty gene(s) in Dalmatians using an advanced whole genome sequencing strategy to obtain the genome sequences of carefully selected members of an affected Dalmatian pedigree. Identification of the problem gene is the first step towards genetic testing and to improved breeding practices necessary to eradicate hepatic copper toxicosis from the Dalmatian breed. Gene identification will help raise awareness of copper toxicosis in the Dalmatian breed, lead to more rapid diagnosis of the condition, and support the search for the most effective therapy.

Funding for the research is provided through the efforts and generosity of the Dalmatian Club of America/DCA Foundation. The AKC Canine Health Foundation supports the funding of this effort and will oversee administration of funds and scientific progress reports.

Publications:

None at this time.



Presentations:

None at this time.

Report to Grant Sponsor from Investigator:

Dalmatians may be at risk of inheriting a rare copper storage disorder of the liver, canine copper toxicosis (CT). CT can be fatal and can quickly spread through a pedigree if left unmanaged. The disease is known to affect several breeds, including the Bedlington terrier and Labrador. The problem genes have been identified in these two breeds. Many dogs respond to copper chelation therapies. So it is important to catch dogs early in their disease process, even before symptoms appear. A genetic test can help identify dogs-at-risk early in the disease process. The test can also help to reduce the spread of problem genes by enabling breeders to make informed choices prior to breeding carriers of CT-associated genes.

We are working with the DCA Copper Storage Disorder Study Group (CSDSG) to try to understand the extent of the problem in Dalmatians in the US and Canada. Early indications are that the CT is an inherited condition, as in other breeds, but we need more information to be sure. Our goal is to find the culprit gene, or genes, with a view to understanding the disease, to develop a genetic test to improve the lives of affected dogs, and to help eradicate CT from the Dalmatian breed.

Over several years, many breeders have submitted information about their dogs to the CSDSG and/or to Dr. Twedt. We have designed a new consent form for previous submitters, to allow the use of their data, and possibly precious samples, by our CT research group. Members of the CSDSG continue to contact owners to facilitate their participation in our study. The response to date has been excellent.

Knowledge is power and the opportunity to join our study is ongoing. There are several ways to participate in our study. Not all require the submission of samples. Previously collected information on your dog and its relatives may be sufficient. Please contact Dr. Georgina Macintyre, gm3@ualberta.ca for further information.

We would like to thank the CSDSG, DCA and CHF for the opportunity to evaluate CT in the Dalmatian breed, and all of the concerned breeders who have committed funds and information in support of these studies.