



**UW Veterinary Care**  
UNIVERSITY OF WISCONSIN-MADISON

# LOOKING FOR Boxer Dogs and Other Healthy Dogs

## Genetic and Environmental Risk for Lymphoma in Boxer Dogs

### The Study

Lymphoma is a fatal cancer of the blood cells of dogs. Lymphoma is more common in Boxers, Golden Retrievers and several other purebreds, which suggest involvement of inherited genes. Research shows mutations in the tumors of dogs with lymphoma, but it is unclear why some of these mutations develop or persist in certain dogs. Better understanding of this process may lead to lymphoma prevention.

Canine lymphoma resembles Non-Hodgkin lymphoma (NHL) in people. Non-Hodgkin lymphoma is associated with chemicals found in tobacco smoke, certain household products and pesticides. Glutathione-S-transferase (GST) enzymes break down toxic chemicals in the body and can prevent these chemicals from causing tumor mutations. Because of this, low activity variants of GST enzymes increase the risk of developing NHL.

This study will look for low activity variants in GST genes, which may put boxer dogs at higher risk for lymphoma. In addition, environmental exposures will be assessed by a questionnaire, and the presence of DNA damage will be assessed from a small blood sample.

### Who Qualifies

Any purebred boxer dog, with or without lymphoma, qualifies for the study. Healthy dogs, any breed and aged-matched, are needed for controls.

### What Happens

The inside of the patient's cheek is swabbed to obtain a DNA sample for GST gene sequencing. The client completes a 5-page questionnaire about the dog's environment. This may be done at the UW Veterinary Care or at the dog's primary care veterinarian. In some dogs, a small blood sample will be collected for DNA testing.

### Why Participate

Better characterization of genetic and environmental risk factors for lymphoma risk may help us to recommend evidence-based preventative care and monitoring for individual dogs, such as avoidance of specific environmental risk factors.

### More Information

If you are interested in participating in this study or want more information, please contact Joanne Ekena ([joanne.ekena@wisc.edu](mailto:joanne.ekena@wisc.edu)) or Dr Lauren Trep-anier ([lauren.trepanier@wisc.edu](mailto:lauren.trepanier@wisc.edu)) Thank you.

