



# WINN FELINE FOUNDATION

For the Health and Well-being of All Cats

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637 Wyckoff Ave., Suite 336, Wyckoff, NJ 07481 • [www.winnfelinefoundation.org](http://www.winnfelinefoundation.org)  
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## TOWARDS CANCER PREVENTION IN CATS: FELINE GAMMAHERPESVIRUS1 GENE ANALYSIS

**PROJECT STUDY:** Towards cancer prevention in cats: FcaGHV1 gene expression analysis in feline lymphoma

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*Interim report summary, W17-011*

Lymphoma is the most significant cause of cancer death in pet cats. State of the art treatments for lymphoma, including chemotherapy and radiation, allow many patients to regain an acceptable quality of life for months or years. Even so, the majority of cats diagnosed with lymphoma still endure suffering because of side-effects or lack of access to treatments and cancer recurrence.

Cancer prevention through vaccination is an achievable goal for cancers caused by viruses. Feline leukemia virus (FeLV), which causes a subset of feline lymphomas, provides a good example. Since the introduction of vaccination to prevent FeLV infection in the 1970s, there has been a dramatic fall in FeLV-associated lymphoma from 70% to less than 15% of all feline lymphomas. Despite this progress, lymphoma remains the most common malignancy of cats and there is evidence that its incidence is increasing. It has been suggested that other viruses can cause feline lymphoma. Identification of candidate viruses and establishment of causation form the basis for the development of new anti-cancer vaccines specifically designed for cats.

FcaGHV1, a candidate feline lymphomagenic virus, was identified by targeted virus discovery in 2013. Gammaherpesviruses cause persistent infections that are typically clinically silent unless cell-mediated immunity is compromised when they cause lymphoproliferative and neoplastic disorders.

Understanding the oncogenic potential of FcaGHV1 presents specific challenges. In particular, detection of FcaGHV1 infection in cases of feline lymphoma does not imply causation. FcaGHV1 infection is widely endemic; virus DNA is detected in 10-19% of domestic cats from USA, Australia, Europe and Singapore and serology suggests that the true infection rate is up to 40%.

The human oncogenic gammaherpesvirus Epstein-Barr virus (EBV) presents a similar situation. Almost all adults are infected with EBV. Fortunately, most infections are asymptomatic but in others EBV causes lymphoproliferative diseases and lymphoid and epithelial cancers. In 2010, 143,000 cancer deaths, or 2% of the world's cancers, were attributable to EBV.

The gold standard for determining causality in EBV-associated lymphomas is the detection of specific viral gene expression signatures within the tumor cells themselves. These viral "latency-associated transcripts" hijack normal cellular mechanisms and promote uncontrolled growth. In this study, we will investigate an oncogenic role for FcaGHV1 by interrogating individual lymphoma cells for FcaGHV1 gene expression.

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The Winn Feline Foundation is a non-profit organization [501(c)(3)] established by The Cat Fancier's Association.  
Member Combined Federal Campaign #10321



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The investigators in this study have been able to design custom probes for FcaGHV1 for 6 virus gene targets. If virus is located within cancer cells, it increases the possibility that the virus has caused cancer.

They have detected FcaGHV1 in tumor cells in a high grade T cell lymphoma. While this is an exciting result, the project is ongoing. The significance of the results will depend on whether, how many and what subtype of other virus positive tumors are identified in this and future studies.

A final progress report will be due at a later date.

This study is available for sponsorship at Winn Feline Foundation.

*Summary prepared for Winn Feline Foundation © 2018*

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